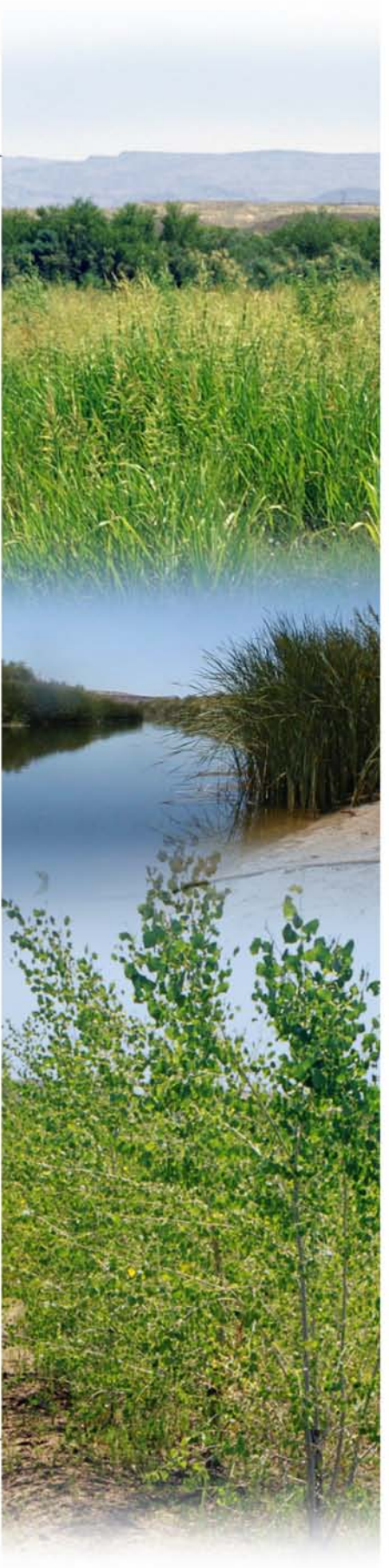
LOWER COLORADO RIVER
Multi-Species Conservation Program



Responses to Comments on LCR MSCP Volumes I-IV

Volume V

December 17, 2004

LOWER COLORADO RIVER
Multi-Species Conservation Program

Responses to Comments
on LCR MSCP
Volumes I-IV

Volume V

December 17, 2004

TABLE OF CONTENTS

SECTION I Introduction I

SECTION II State Letters of Financial Commitment II

SECTION III Evaluation of Effects Associated with Updated Hydrologic Information III

SECTION IV Public Comment Letters IV

FEDERAL AGENCY LETTERS IV-1

U.S. Environmental Protection Agency IV-3

U.S. Section, International Boundary and Water Commission IV-10

STATE AGENCY LETTERS IV-153

Arizona Game and Fish Department IV-155

California Department of Fish and Game IV-161

State of California, Governor's Office of Planning and Research IV-174

State of Nevada, Department of Administration, State Clearinghouse IV-176

Nevada Department of Wildlife IV-177

LOCAL AGENCY LETTERS IV-179

QuadState County Government Coalition IV-181

Imperial County Planning/Building Department IV-185

City of Henderson IV-188

City of Yuma, Riverfront Development Team IV-189

TRIBAL LETTERS IV-191

Fort Mojave Indian Tribe IV-193

Morisset, Schlosser, Jozwiak & McGaw IV-195

ORGANIZATION LETTERS IV-199

National Wildlife Federation IV-201

Defenders of Wildlife, Environmental Defense, Grand Canyon Wildlands Council, Pacific Institute, Sierra Club, Yuma Audubon Society IV-207

Environmental Defense IV-278

INDIVIDUAL LETTERS IV-281

Robert S. Lynch & Associates IV-283

B. Sachau IV-286

Carey L. Ochs IV-287

Dennis Bell IV-288

D. Hurst-matulewicz (Common Letter) IV-290
J.C. Martin I IV-291
J.C. Martin II IV-292
Mark Belles IV-293
Margaret Adam IV-296
Bobbie Flowers IV-297
Donald Lipmanson IV-298
Ann Pinkerton IV-299
Diana Singleton IV-300
Alanna Louin IV-301
Christel Allacher IV-302
Terry Woods I IV-303
Terry Woods II IV-303
PUBLIC HEARING TRANSCRIPTS IV-305
LCR MSCP Public Hearing Transcript, Henderson, Nevada IV-307
LCR MSCP Public Hearing Transcript, Blythe, California IV-317
LCR MSCP Public Hearing Transcript, Phoenix, Arizona IV-371
SECTION V Responses to Comments V
FEDERAL AGENCY RESPONSES V-1
U.S. Environmental Protection Agency V-3
U.S. Section, International Boundary and Water Commission V-7
STATE AGENCY RESPONSES V-11
Arizona Game and Fish Department V-13
California Department of Fish and Game V-15
State of California, Governor's Office of Planning and Research V-37
State of Nevada, Department of Administration, State Clearinghouse V-38
Nevada Department of Wildlife V-38
LOCAL AGENCY RESPONSES V-39
QuadState County Government Coalition V-41
Imperial County Planning/Building Department V-43
City of Henderson V-44
City of Yuma, Riverfront Development Team V-44

TRIBAL RESPONSES V-45
Fort Mojave Indian Tribe V-47
Morisset, Schlosser, Jozwiak & McGaw V-47
ORGANIZATION RESPONSES V-51
National Wildlife Federation V-53
Defenders of Wildlife, Environmental Defense, Grand Canyon Wildlands Council, Pacific Institute, Sierra Club, Yuma Audubon Society V-59
Environmental Defense V-81
INDIVIDUAL RESPONSES V-83
Robert S. Lynch & Associates V-85
B. Sachau V-86
Carey L. Ochs V-86
Dennis Bell V-87
D. Hurst-matulewicz (Common Letter) V-87
J.C. Martin I V-89
J.C. Martin II V-89
Mark Belles V-89
Margaret Adam V-90
Bobbie Flowers V-90
Donald Lipmanson V-90
Ann Pinkerton V-90
Diana Singleton V-90
Alanna Louin V-91
Christel Allacher V-91
Terry Woods I V-91
Terry Woods II V-91
PUBLIC HEARING TRANSCRIPTS RESPONSES V-93
LCR MSCP Public Hearing Transcript, Henderson, Nevada V-95
LCR MSCP Public Hearing Transcript, Blythe, California V-95
LCR MSCP Public Hearing Transcript, Phoenix, Arizona V-98
ACRONYMS AND REFERENCES V-99
ATTACHMENT A List of Signatories to the Common Letter A-1

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Section I

Introduction

INTRODUCTION

Approximately 360 copies of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) draft documents (Volume I: Draft Environmental Impact Statement/ Environmental Impact Report [EIS/EIR], Volume II: Draft Habitat Conservation Plan [HCP], Volume III: Draft Biological Assessment [BA], and Volume IV: Appendices to Volumes I–III [Appendices]) were distributed to agencies, public libraries, Indian tribes, organizations, and individuals for review during a 60-day period ending on August 18, 2004. Additionally, three public hearings were held in Henderson, Nevada; Blythe, California; and Phoenix, Arizona on July 20–22, 2004 in order to receive public comments on these draft documents. Comment letters and verbal comments provided during the public review period are included in this volume, along with responses to comments and other documentation addressing issues raised by the commenters.

Comment letters and transcripts of the public hearings are included in section IV. Comment letters are reproduced as they were received. Each substantive comment is numbered, and a corresponding response is provided in section V. Section V also contains references cited in the responses to comments and a list of acronyms used in the responses. Copies of a form letter containing comments on the LCR MSCP documents were submitted to the joint lead agencies by a number of individuals. One representative copy of this form letter, signed by Darcia Hurst-matulewicz and referred to as the "Common Letter," is included in section IV. The names and addresses of others who submitted the same letter are listed in Attachment A, along with the date of submission. Responses to the comments provided for the representative Common Letter are applicable to the same comments provided by those listed in Attachment A. Thirty-two comment letters were received from the following agencies, Indian tribes, organizations, and individuals, in addition to the form letters referenced above. The acronyms provided after the name of each commenter are used in section IV to identify substantive comments and in section V to identify comment responses.

FEDERAL AGENCIES

- U.S. Environmental Protection Agency (EPA)
- U.S. International Boundary and Water Commission (USIBWC)

STATE AGENCIES

- Arizona Game and Fish Department (AGFD)
- California Department of Fish and Game (CDFG)
- California Office of Planning and Research, California State Clearinghouse
- Nevada Department of Administration, State Clearinghouse (NSC)
- Nevada Department of Wildlife (NDOW)

LOCAL AGENCIES

- QuadState Coalition (Quad)
- Imperial County (IC)
- City of Henderson (Hend)
- City of Yuma (Yuma)

INDIAN TRIBES

- Fort Mojave Indian Tribe (Ft. M)
- Morisset, Scholosser, Jozwiak & McGaw (MSJM)

ORGANIZATIONS

- National Wildlife Federation (NWF)
- Defenders of Wildlife, Environmental Defense, Grand Canyon Wildlands Council Pacific Institute, Sierra Club, Yuma Audubon Society (DW)
- Environmental Defense, Jennifer Pitt (Env. D.)

INDIVIDUALS

- Robert S. Lynch & Associates (RSLA)
- B. Sachau (BS)
- Carey L. Ochs (CO)
- Dennis Bell (DB)
- Darcia Hurst-matulewicz (Common Letter [CL])
- J. C. Martin I (JM1)
- J. C. Martin II (JM2)
- Mark Belles (MB)
- Margaret Adam (MA)
- Bobbie Flowers (BF)
- Donald Lipmanson (DL)
- Ann Pinkerton (AP)
- Diana Singleton (DS)
- Alanna Louin (AL)
- Christel Allacher (CA)
- Terry Woods (TW)

PUBLIC HEARING TRANSCRIPTS

- Henderson Public Hearing (Henderson)
- Blythe Public Hearing (Blythe)
- Phoenix Public Hearing (Phoenix)

A number of public comments focused on the financial assurances necessary to implement the LCR MSCP. Section II of this volume contains letters of financial commitment from representatives of the States of Arizona, California, and Nevada that were received by the Secretary of the Interior during the public comment period and additional information regarding funding of the LCR MSCP. Other commenters noted that the modeling conducted by the U.S. Bureau of Reclamation (Reclamation) for the LCR MSCP relied on hydrologic data that does not reflect the recent dry conditions in the Colorado River Basin. The comments suggested that because of the change in hydrologic conditions, the modeled results underestimate the magnitude of potential impacts to environmental resources within the LCR MSCP planning area. These issues are addressed in section III of this volume, "Evaluation of Effects Associated with Updated Hydrologic Information," which was prepared by the participating agencies to determine whether an analysis based on the updated hydrologic information would result in any significant new impacts or changed effects to covered species.

Section II

State Letters of Financial Commitment

STATE LETTERS OF FINANCIAL COMMITMENT

During the public comment period, a number of commenters sought information regarding the necessary financial assurances necessary to implement the LCR MSCP. While not structured as formal comment letters, letters of financial commitment from representatives of the States of Arizona, California, and Nevada were received by the Secretary of the Interior on August 17, 2004 during the public comment period for the Draft LCR MSCP documents. These letters provide a commitment to "share in the agreed upon LCR MSCP costs equally with the United States on a 50/50 Federal/non-Federal basis."

The commitments contained in these letters have been incorporated into a Draft Final Funding and Management Agreement (FMA), which has been developed during negotiations between the Federal and non-Federal parties to the LCR MSCP and is published as Exhibit A to the Final HCP. In addition, the parties have developed a Draft Final Implementation Agreement (IA), which is published as Exhibit B to the Final HCP. The Final HCP, including these exhibits, is LCR MSCP Volume II.

These Agreements will be presented to the relevant approving officials and respective boards following publication of the Final EIS/EIR and other program documents. No final decisions have been made by the Federal or non-Federal parties with respect to the financial commitments set forth in the August 17th letters and the Draft Final FMA, or with respect to the provisions in the Draft Final IA. Appropriate revisions, if any, will be included at such time as a Final FMA and IA are executed. Appropriate information regarding the issues addressed in the Draft Final FMA and the Draft Final IA for the LCR MSCP will also be included in any Record of Decision issued by the Secretary of the Interior with respect to this program.

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SOUTHERN NEVADA
WATER AUTHORITY

STATE OF NEVADA

COLORADO RIVER COMMISSION
OF NEVADA

August 17, 2004

The Honorable Gale A. Norton
Secretary of the Interior
United States Department of the Interior
1849 C Street, NW
Washington, DC 20240

Re: Lower Colorado River Multi-Species Conservation Program

Dear Secretary Norton:

The state water and power agencies of Arizona, California and Nevada are writing in follow up to our letter of June 1, 2004 concerning our commitment to fund the nonfederal share of the Lower Colorado River Multi-Species Conservation Program (MSCP) for the full 50 years. Please accept this letter as a further, more detailed, statement of our financial commitment to complete the MSCP on its current schedule in a manner that meets the United States Fish and Wildlife Service (FWS) requirements for firm and clear funding assurances to support implementation of the program.

On June 18, 2004, a notice was published in the Federal Register alerting the public to the availability of the MSCP documents (EIR/EIS and HCP) and seeking public review and comment. On July 20, 21, and 22 public hearings were held in the cities of Henderson, Nevada; Blythe, California; and Phoenix, Arizona for the purpose of obtaining public comment on the details of the proposed program. That information will now be assimilated into the final program documents and the MSCP should then be ready for approval in accordance with the program schedule. Of course, formal program commitment and implementation would take place when the Record of Decision is issued by the United States Department of the Interior (Department) and when an Implementation Agreement is executed with the FWS, the Section 7 Biological Opinion is issued by the FWS, a Section 10 permit is issued by the FWS, and a Program Implementation-Operations Agreement is executed with the Bureau of Reclamation (BOR). Similarly, the binding legal commitment of the water and power agencies represented in this letter will occur after actions by their respective governing boards and execution of such agreements with FWS and BOR.

After much discussion with the Department and among the MSCP participants, the water and power agencies of the three states are willing to commit to share the agreed upon MSCP costs equally with the United States on a 50/50 federal-nonfederal basis. Please understand that this decision was difficult for each agency to reach given the significant program costs involved and the competing financial needs of each agency. This significant state cost share represents the maximum contribution the nonfederal parties can commit to the program, and no further movement can be expected on this point.

Southern Nevada Water Authority
1001 S. Valley View Blvd., Las Vegas, Nevada 89153

Colorado River Commission of Nevada
555 E. Washington Ave., Suite 3100, Las Vegas, Nevada 89101

In summary, the nonfederal parties have agreed to assure funding of their 50 percent cost share as follows: California 50%; Arizona 25%; and Nevada 25%. However, because this cost is much higher than the cost share anticipated by the nonfederal parties, not all nonfederal parties are willing or able to commit to their full cost share ratio at this time. To address these concerns and at the same time allow the MSCP to move forward, certain nonfederal parties are willing to financially underwrite the remaining balance of the nonfederal cost share. These agencies are currently the Metropolitan Water District of Southern California, the Southern Nevada Water Authority, and the Colorado River Commission of Nevada (collectively Underwriters). Thus, the nonfederal parties have further negotiated the nonfederal 50% cost share portion pertaining to existing operations as follows: Nevada 15%; Arizona 10%, increasing to 15% within three years, with repayment of the Underwriters for those three years; and California 30%, with the Underwriters providing funding assurances for the remaining balance of the nonfederal cost share. The nonfederal parties who are paying less than their full cost share ratio will have coverage for existing operations but will not be able to implement future covered actions without additional funding. Those parties that are not fully participating will have up to10 years from the effective date of the program to decide to fully fund their share, and if they do so, they will receive the benefit of the mitigation provided by the MSCP for their future covered actions. If those parties do not elect to fund their full cost share ratio, the Underwriters will be entitled to the benefits from mitigation credits associated with those future covered actions.

The nonfederal parties have worked diligently over the last few months to stay on schedule and arrive at an acceptable funding plan. This proposal is a product of numerous hours of discussion and expresses the good faith commitment of all the nonfederal parties to the MSCP. While there remains a significant amount of work to accomplish in the upcoming months, including finalizing the Implementation Agreement and obtaining final approvals from the participating boards and commissions, we believe this proposal significantly advances our progress and provides a foundation for a successful program.

We are committed to providing the necessary resources to complete all remaining work by the end of this year. We look forward to working with you on the timely implementation of this important program.

Sincerely,

Patricia Mulroy, General Manager
Southern Nevada Water Authority

George M. Caan, Director
Colorado River Commission of Nevada

PM:GMC:df

cc: Honorable Harold Craig Manson, Assistant Secretary for Fish, Wildlife and Parks
Honorable Bennett William Raley, Assistant Secretary for Water and Science
Honorable Steven A. Williams, Director, U.S. Fish and Wildlife Service
Honorable John W. Keys, III, Commission, U.S. Bureau of Reclamation
Mr. Dale Hall, Regional Director, U.S. Fish and Wildlife Service
Mr. Robert W. Johnson, Regional Director, Lower Colorado Region, USBR

CENTRAL ARIZONA PROJECT
P.O. Box 43020 • Phoenix, Arizona 85080-3020 • 23636 North Seventh Street (85024)
(623) 869-2333 • www.cap-az.com

August 17, 2004

The Honorable Gale Norton
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240

Dear Secretary Norton:

Re: Lower Colorado River Multi-Species Conservation Program

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After much discussion with the Department of the Interior (Department) and among the MSCP participants, the water and power agencies of the three states are

willing to commit to share the agreed upon MSCP costs equally with the United States on a 50/50 federal-nonfederal basis. Please understand that this decision was difficult for each agency to reach given the significant program costs involved and the competing financial needs on each agency. This significant state cost share represents the maximum contribution the nonfederal parties can commit to the program, and no further movement can be expected on this point.

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Sincerely,

George R. Renner, President
Central Arizona Water Conservation District

Herbert R. Guenther, Director
Arizona Department of Water Resources

cc: Mr. Harold Craig Manson, Assistant Secretary for Fish, Wildlife, and Parks
Mr. Bennett William Raley, Assistant Secretary for Water and Science
Mr. Steven A. Williams, Director, U.S. Fish and Wildlife Service
Mr. John W. Keys, III, Commissioner, U.S. Bureau of Reclamation
Mr. Dale Hall, Regional Director, U.S. Fish and Wildlife Service
Mr. Robert W. Johnson, Regional Director, Lower Colorado Region, USBR

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Executive Office

August 17, 2004

Honorable Gale Norton
Secretary of the Interior
Department of the Interior
1849 C Street, NW
Washington, DC 20240

Dear Secretary Norton:

Lower Colorado River Multi-Species Conservation Program

The state water and power agencies of Arizona, California and Nevada are writing in follow up to our letter of June 1, 2004 concerning our commitment to fund the non-federal share of the Lower Colorado River Multi-Species Conservation Program (MSCP) for the full 50 years. Please accept this letter as a further, more detailed statement of our financial commitment to complete the MSCP on its current schedule in a manner that meets the United States Fish and Wildlife Service (FWS) requirements for firm and clear funding assurances to support implementation of the program.

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After much discussion with the Department and among the MSCP participants, the water and power agencies of the three states are willing to commit to share the agreed upon MSCP costs equally with the United States on a 50/50 federal/non-federal basis. Please understand that this decision was difficult for each agency to reach given the significant program costs involved and the competing financial needs of each agency. This significant state cost share represents the maximum contribution the non-federal parties can commit to the program, and no further movement can be expected on this point.

700 N. Alameda Street, Los Angeles, California 90012 • Mailing Address: Box 54153, Los Angeles, California 90054-0153 • Telephone (213) 217-6000

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

In summary, the non-federal parties have agreed to assure funding of their 50 percent cost share as follows: California, 50%; Arizona 25%; and Nevada 25%. However, because this cost is much higher than the cost share anticipated by the non-federal parties, not all non-federal parties are willing or able to commit to their full cost share ratio at this time. To address these concerns and at the same time allow the MSCP to move forward, certain non-federal parties are willing to financially underwrite the remaining balance of the non-federal cost share. These agencies are currently The Metropolitan Water District of Southern California, the Southern Nevada Water Authority and the Colorado River Commission of Nevada (collectively "Underwriters"). Thus, the non-federal parties have further negotiated the non-federal 50% cost share for existing operations as follows: Nevada 15%, Arizona 10%, increasing to 15% within three years, with repayment of the Underwriters for those three years, and California 30%, with the Underwriters providing funding assurances for the remaining balance of the non-federal cost share. The non-federal parties who are paying less than their full cost share ratio will have coverage for existing operations but will not be able to implement future covered actions without additional funding. Those parties that are not fully participating will have up to10 years from the effective date of the program to decide to fully fund their share, and if they do so, they will receive the benefit of the mitigation provided by the MSCP for their future covered actions. If those parties do not elect to fund their full cost share ratio, the Underwriters will be entitled to the benefits from mitigation credits associated with those future covered actions.

The non-federal parties have worked diligently over the last few months to stay on schedule and arrive at an acceptable funding plan. This proposal is a product of numerous hours of discussion and expresses the good faith commitment of all the non-federal parties to the MSCP. While there remains a significant amount of work to accomplish in the upcoming months, including finalizing the Implementation Agreement and obtaining final approvals from the participating boards and commissions, we believe this proposal significantly advances our progress and provides a foundation for a successful program. We are committed to providing the necessary resources to complete all remaining work by the end of this year. We look forward to working with you on the timely implementation of this important program.

Sincerely,

Ronald R. Gastelum
Chief Executive Officer
Metropolitan Water District of Southern California

Gerald R. Zimmerman
Executive Director
Colorado River Board of California

DU:vb
c:\mydocs\du\Ltr_MSCP_081704.doc

cc: Honorable Harold Craig Manson, Assistant Secretary for Fish, Wildlife, and Parks
Honorable Bennett William Raley, Assistant Secretary for Water and Science
Honorable Steven A. Williams, Director, U.S. Fish and Wildlife Service
Honorable John W. Keys, III, Commission, U.S. Bureau of Reclamation
Mr. Dale Hall, Regional Director, U.S. Fish and Wildlife Service
Mr. Robert W. Johnson, Regional Director, Lower Colorado Region, USBR

Section III

Evaluation of Effects Associated with Updated Hydrologic Information

EVALUATION OF EFFECTS ASSOCIATED WITH UPDATED HYDROLOGIC INFORMATION

Table of Contents

1. Introduction
2. Summary of Results
3. Regulatory Context (NEPA/ESA/CEQA)
4. Concerns Raised by Public Comments
5. Relevance of the Updated Information to Analysis in the Draft BA/HCP
   - 5.1 RESERVOIR INITIAL CONDITIONS
   - 5.2 NATURAL FLOWS
6. Treatment of Updated Hydrologic Information
   - 6.1 RESERVOIR INITIAL CONDITIONS
   - 6.2 NATURAL FLOWS
   - 6.3 DATA INTERPRETATION PROCEDURES
7. Analysis of Updated Hydrologic Information on Biological Resources
   - 7.1 EFFECT ON LAKE MEAD WATER SURFACE ELEVATIONS
     - 7.1.1 Results from Previous Hydrologic Modeling
     - 7.1.2 Results from New Hydrologic Modeling
     - 7.1.3 Comparison of Previous and New Hydrologic Modeling
     - 7.1.4 Analysis of Effect on Biological Resources
       - 7.1.4.1 Riparian Vegetation
       - 7.1.4.2 Marsh Vegetation
       - 7.1.4.3 Razorback Sucker Spawning Habitat
       - 7.1.4.4 Transitory River Segments
       - 7.1.4.5 Sticky Buckwheat and Threecorner Milkvetch
   - 7.2 EFFECT ON THE RIVER CORRIDOR (REACHES 3–5)
     - 7.2.1 Results from Previous Hydrologic Modeling
     - 7.2.2 Results from New Hydrologic Modeling

7.2.3 Comparison of Previous and New Hydrologic Modeling

7.2.4 Analysis of Effect on Biological Resources

7.3 EFFECT ON REACH 7

7.3.1 Results from Previous Hydrologic Modeling

7.3.2 Results from New Hydrologic Modeling

7.3.3 Comparison of the Previous and New Hydrologic Modeling

7.3.4 Analysis of Effect on Biological Resources

8. Conclusions

8.1 LAKE MEAD WATER SURFACE ELEVATIONS

8.1.1 Riparian Vegetation

8.1.2 Marsh Vegetation

8.1.3 Razorback Sucker

8.1.4 Transitory River Segments

8.1.5 Sticky Buckwheat and Threecorner Milkvetch

8.2 EFFECT ON THE RIVER CORRIDOR

8.3 EFFECT ON FLOWS IN REACH 7

9. References

10. Personal Communications

11. Acronyms

EVALUATION OF EFFECTS ASSOCIATED WITH UPDATED HYDROLOGIC INFORMATION

1. INTRODUCTION

Public comments received during the comment period for the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR, June 18, 2004), Draft Biological Assessment (Draft BA, June 18, 2004) and Draft Habitat Conservation Plan (Draft HCP, June 18, 2004), as published in the Federal Register (69 FR 12202, 3/15/04) noted that the modeling conducted by the U.S. Bureau of Reclamation (Reclamation) for the LCR MSCP relied on hydrologic data that does not reflect the recent dry conditions in the Colorado River Basin. The comments suggested that because of the change in hydrologic conditions, the modeled results underestimate the magnitude of potential impacts to environmental resources within the LCR MSCP planning area.

As a result of these public comments, the participating agencies have prepared this evaluation. The purpose of this evaluation is to determine whether an analysis based on the updated hydrologic information would result in any significant new impacts or changed effects to covered species. This evaluation specifically compares model runs based on the updated hydrologic information, with the model runs based on the previous hydrologic information and considers whether: (1) the impact analysis and the effect determinations provided in the Draft BA/HCP are still accurate in light of the updated hydrologic information; and (2) revisions need to be made in the LCR MSCP documents (EIS/EIR, BA, HCP) pursuant to the regulatory and statutory provisions cited in Section 3 of this document.

2. SUMMARY OF RESULTS

Hydrologic modeling conducted for the Draft BA/HCP utilized hydrologic information based on actual December 31, 2002 elevations of Colorado River reservoirs and the best natural flow data available at that time. The modeling was based on the historic record of natural flow in the river system over the 85-year period from 1906 through 1990.

The analysis conducted as part of this evaluation utilized hydrologic information based on the actual September 30, 2004 elevations of Colorado River reservoirs (including Lake Mead) and updated natural flow data (including years 1991 through 1995). This evaluation concludes that the inclusion of this updated hydrologic information does not identify any significant new impacts or change the conclusions of effect to covered species in the Draft BA/HCP, and no changes are required to the BA, HCP, and EIS/EIR.

The summary findings of this evaluation include the following:

- Use of the December 31, 2002 Colorado River reservoir elevations (including Lake Mead) was appropriate at the time the modeling was prepared for the Draft BA/HCP in early 2003.
- Actual Lake Mead reservoir elevations between January 1, 2003 and the date of this evaluation were within the range projected and analyzed in the Draft BA/HCP.
- Re-computation of flows from 1971–1990 resulted in slightly greater natural inflow into Lake Powell (an increase of approximately 4 percent of the total natural inflow volume over the 20-year period).
- The lower initial reservoir conditions result in an increased probability of shortage conditions under both the Baseline and Action Alternative for the first 25 years.
- Notwithstanding the lower initial reservoir conditions and updated natural flows, the relative differences between Lake Mead elevations under the Baseline and Action Alternative[1] for the Previous and New Modeling were slight, and determined not to be significant.
- The lower initial reservoir conditions result in a slight reduction in the probability of occurrence of flows to Reach 7 under both the Baseline and Action Alternative. However, the relative differences between the Baseline and Action Alternative under the Previous and New Modeling were similar.
- Within the 1.574 million acre-feet (maf) limit of reduced flows in the river modeled and covered by the LCR MSCP, this analysis identified no additional impacts below Hoover Dam in Reaches 3–5.
- The evaluation based on the updated hydrologic information did not identify any significant new environmental impacts or change the conclusions of effect to covered species from the previous analyses.

When dealing with an environmental review process that takes several years, changes in hydrologic conditions are inevitable, and the nature of the hydrologic model utilized by Reclamation is designed to reflect a variety of future possible outcomes. For example, while the initial elevation for Lake Mead has changed between the Previous Modeling (December 31, 2002) and the New Modeling (projected December 31, 2004 conditions), this change was within the variability expected in the Previous Modeling, and depicted in

[1] The use of the term "Baseline" (also referred to as "Baseline scenario" in the LCR MSCP BA and HCP) in this document regarding hydrologic modeling refers to the current operations of the LCR and should not be confused with the definition of "baseline" as used in the ESA regulations or CEQA. Similarly, the use of the phrase "Action Alternative" (also referred to as "Action Alternative scenario" in the LCR MSCP BA and HCP) regarding hydrologic modeling refers to the future operations of the LCR. See Appendix J for further details on the modeling assumptions.

the Draft BA/HCP. As a consequence of the above findings, the participating agencies have determined that no changes in the Draft BA/HCP assessment of effects of covered activities on covered species are required, and a supplemental EIS/EIR is not required.

3. REGULATORY CONTEXT (NEPA/ESA/CEQA)

According to Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [C.F.R.] §1502.9(c)(1)), a Federal agency must prepare a supplement to a Draft EIS if:

- The Federal agency makes substantial changes in the proposed action that are relevant to its environmental effects.
- There are significant new circumstances or information relevant to the environmental concerns that bear on the proposed action or its impacts.

Similarly, the California Environmental Quality Act (CEQA) (Public Resources Code §21000 et seq.) requires the preparation of a subsequent or supplemental EIR if:

- Substantial changes are proposed in the project which will require revisions of the previous EIR.
- Substantial changes occur with respect to the circumstances under which the project is undertaken; or
- New information is available that results in one or more new significant effects or a previously identified effect will be substantially more severe than shown in the previous EIR.

This evaluation is prepared to assist the participating agencies in their determination as to whether a supplement to the Draft EIS/EIR is required at this time based on the updated hydrologic information and effects analysis. In addition, the Federal Endangered Species Act (ESA) requires use of the best available scientific and commercial data in the preparation of a biological assessment (16 U.S.C. §1536(a)(2)). This evaluation will ensure the most accurate analysis by considering the best available and current hydrologic information.

4. CONCERNS RAISED BY PUBLIC COMMENTS

The impact analysis in the Draft BA/HCP was based, in part, on simulations of possible future hydrologic conditions in the Colorado River Basin, including Lake Mead elevations and the frequency of surplus and shortage conditions. These simulations were based upon the historic records of flow in the Colorado River Basin compiled over an 85-year period (1906 through 1990).

Several comment letters on the Draft EIS/EIR and Draft BA/HCP suggested that the environmental impact analysis and effects analysis for covered species "understate the

magnitude of potential effects" because they do not include more current hydrologic information from the past few years. Specifically, two issues were raised:

1) In 2003, when work on the Draft EIS/EIR and Draft BA/HCP was undertaken, the initial conditions (starting elevations for each reservoir) used in the modeling were the actual reservoir water surface elevations as of December 31, 2002 (1152 feet above mean sea level [msl] for Lake Mead). Continued drought conditions within the Colorado River Basin have resulted in continued decline of the water surface elevations of the major system reservoirs since the modeling was prepared (projected to be 1123.9 feet msl at Lake Mead as of December 31, 2004).
2) The period of record used as the input hydrology for the modeling was based on the natural flow record that was considered final data at the time of the LCR MSCP analysis in the Draft BA/HCP. The natural flow data, based on the actual recorded data for the period between 1906 through 1990, was used for the analysis. The most recent 13 years of record (1991 through 2003) were not included in the modeling. This recent 13-year period includes both high and low flow years, including one of the driest four-year periods on record (2000 through 2003).

5. RELEVANCE OF THE UPDATED INFORMATION TO ANALYSIS IN THE DRAFT BA/HCP

As stated above, the impact analysis in the Draft BA/HCP was based in part on computer model simulations of future possible hydrologic inflows and current and future Lower Colorado River (LCR) operations. The future LCR system operations for two distinct operational scenarios (Baseline and the Action Alternative) were simulated with the computerized model and the results were compared to determine the relative differences and potential impacts that may result from the Action Alternative (which includes the covered activities in the LCR MSCP) as compared to the Baseline.

The following discussion summarizes the different assumptions used in the two modeled scenarios. Further detail is provided in Appendix J, Volume IV of the LCR MSCP documents. The Baseline condition assumes 1) transfers of up to 400 thousand acre-feet (kaf) from below to above Parker Dam by 2051 (consistent with the October 10, 2003 Colorado River Water Delivery Agreement); 2) Interim Surplus Guidelines (ISG) remain in place through 2016 and then revert to "70R"[2] (consistent with the January 16, 2001 ISG); and 3) shortages are imposed to maintain Lake Mead at or above elevation 1,083 feet approximately 80 percent of the time in the future, and additional shortages are imposed if needed to protect elevation 1000 feet all of the time.

[2] The term "70R" refers to a particular surplus strategy that is based on avoiding spills at Lake Mead (see ISG Record of Decision, Section IV (1), January 16, 2001).

The Action Alternative assumes 1) An additional 1.174 maf of transfers by 2051; 2) extension of the ISG through 2051; and 3) shortages are imposed to maintain Lake Mead at or above elevation 1050 feet approximately 80 percent of the time in the future, and additional shortages are imposed if needed to protect elevation 950 feet all of the time.

5.1 RESERVOIR INITIAL CONDITIONS

Simulated future Lake Mead water surface elevations were used in the analysis of potential impacts to covered species and their habitats in Reach 1, including southwestern willow flycatcher, razorback sucker, humpback chub, sticky buckwheat, and threecorner milkvetch. Lake Mead water surface elevations also affect the frequency of occurrence and magnitude of flood control releases, which in turn may affect flows in Reach 7. The evaluation of potential future conditions was also used to evaluate the potential frequency of shortage and surplus years on the Colorado River. The computerized model and modeling assumptions use certain Lake Mead water surface elevations as triggers to determine the occurrence of shortage or surplus water supply conditions. Surplus and shortage years result in greater or lesser releases from Lake Mead, with potential corresponding changes in flows of the downstream river reaches (Reaches 2–6).

Simulations using the current lower reservoir water surface elevations as the initial conditions[3] show an increase in the probability of lower Lake Mead water surface elevations in future years, as well as an increase in the probability of occurrence of shortage conditions and the associated reductions in Lake Mead releases. These potential changes in future conditions were used to determine if there are any changes in the impacts to covered species and their habitats.

While the model simulations provide the best available information to analyze potential impacts in the future, the model does not provide a prediction as to the elevation of Lake Mead at any point in time. As with most reservoirs, Lake Mead is likely to experience a wide range of elevations over the next 50 years.

5.2 NATURAL FLOWS

Despite the differences in the operating assumptions for the Baseline and the Action Alternative, the future state of the Colorado River system is most sensitive to the future inflows. Predictions of the future inflows, particularly for long-range studies, are highly uncertain. Although the model does not predict future inflows, it can be used to analyze future conditions for a range of possible future inflow conditions.

The possible future inflows used in the Previous Modeling were based on the historic record of natural flow in the river system over the 85-year period from 1906 through 1990. This was the most up-to-date record that was available at the time of

[3] Initial conditions simply refer to the starting elevations of the reservoir in each of the model runs.

the modeling. In May of 2004, Reclamation updated the available record of natural flow. This update included an extensive review of the natural flows from 1971 through 1990. This review resulted in some modifications to the natural flow record. In addition, the record was extended by adding an additional five years, 1991 through 1995 (see Section 6.2).

As a result of the updated natural flow record, projections of future reservoir elevations and releases from Lake Mead may change. These potential changes in future conditions were used to determine if there are any changes in the previously identified impacts to covered species and their habitats as analyzed earlier in the Draft BA/HCP.

While the model simulations provide the best available information to analyze potential impacts in the future, the model does not provide a prediction as to the volume of future releases from Lake Mead in any given year.

6. TREATMENT OF UPDATED HYDROLOGIC INFORMATION

For the purposes of this evaluation, future system conditions were modeled for the Baseline and Action Alternative using the updated reservoir initial conditions and updated natural flow record[4]. All other modeling assumptions (assumptions common to both scenarios as well as assumptions specific to one scenario) were identical to those described in sections J.6.2 and J.6.3 of Appendix J in the June 18, 2004 version of the LCR MSCP Volume IV appendix document. With the exception of the updated reservoir initial conditions (projected for December 31, 2004) the model period in this analysis is the same as in the Draft BA/HCP (i.e., through 2051).

The new model output was evaluated and used to ascertain whether the revisions to the model and modeling assumptions provide different results from the previous impact analysis and effect determinations in the Draft BA/HCP.

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[4] Reclamation utilized recorded hydrological data compiled over the past century in the Draft BA/HCP. Public comments received on these documents suggested that Reclamation utilize estimates of hydrologic conditions that predate the flow record of the past century. Comments also suggested that Reclamation predict the effect of climate change on flows in the Colorado River. Reclamation believes that use of the actual data recorded over the past century provides the best basis for ongoing Colorado River management activities and analyses associated with those activities. Accordingly, Reclamation has not modified this approach in this evaluation or in the Final BA/HCP. If Reclamation were to use a different modeling approach in the analysis of the LCR MSCP, it would conflict with all of the other Colorado River management actions and analyses that Reclamation has taken and is currently taking. It is important to note that by periodically including additional hydrologic data, Reclamation will account for changes related to runoff patterns and or human demand. While these particular comments focused on potential affects of climate change on inflows into the Colorado River, this is just one of many variables that may affect runoff and demand within the Colorado River basin. Attempting to predict global changes in climate, shifts in demographic patterns, and other factors affecting Colorado River hydrology are far more speculative than Reclamation's reliance on actual annual hydrologic data.

For the purposes of discussion and comparison of the modeling results, the modeling conducted as part of the previous impact analysis is hereinafter referred to as the "Previous Modeling." The new model runs that were conducted specifically for this evaluation and that reflect the projected December 31, 2004 reservoir initial conditions and the updated natural flow record period between 1906–1995 is hereinafter referred to as the "New Modeling."

The revisions to the model are detailed below.

6.1 RESERVOIR INITIAL CONDITIONS

A comparison of the previous and updated initial reservoir conditions is presented in Table 1. Use of the December 31, 2002 Lake Mead elevation was appropriate at the time the modeling for the Draft BA/HCP was prepared during 2003 (Previous Modeling), as it represented the most recent actual end of the year data.

The updated initial reservoir starting conditions for this evaluation (New Modeling) are based on the actual elevations of Colorado River reservoirs as of September 30, 2004. Reclamation's mid-term operations model (the 24-Month Study) was used to project these elevations to December 31, 2004, using projected operations for the remainder of the 2004 calendar year that include projected unregulated inflows into the Upper Basin, as well as projected inflows and demand schedules for the Lower Basin.

As depicted in Table 1, the new initial reservoir conditions on Lake Mead are approximately 28 feet lower than the previous initial reservoir conditions.

Table 1
Comparison of Previous and New Modeled Initial Reservoir Conditions

	Previous Initial Reservoir Conditions (midnight, December 31, 2002)		New Initial Reservoir Conditions (midnight, December 31, 2004)	
Reservoir	Water Surface Elevation (feet msl)	Storage (kaf)	Water Surface Elevation (feet msl)	Storage (kaf)
Fontenelle	6487.79	213	6485.47	199
Flaming Gorge	6009.71	2,632	6012.06	2,709
Taylor Park	9288.42	41	9307.52	66
Blue Mesa	7444.59	283	7480.47	509
Morrow Point	7150.72	110	7153.73	112
Crystal	6742.41	14	6746.05	15
Navajo	6010.55	827	6017.93	893
Powell	3620.10	13,774	3565.19	8,724
Mead	**1152.13**	**16,718**	**1123.93**	**13,744**
Mohave	642.27	1,679	638.71	1,583
Havasu	446.21	547	445.80	539
Total system storage	**Not Applicable**	**36,838**	**Not Applicable**	**29,093**

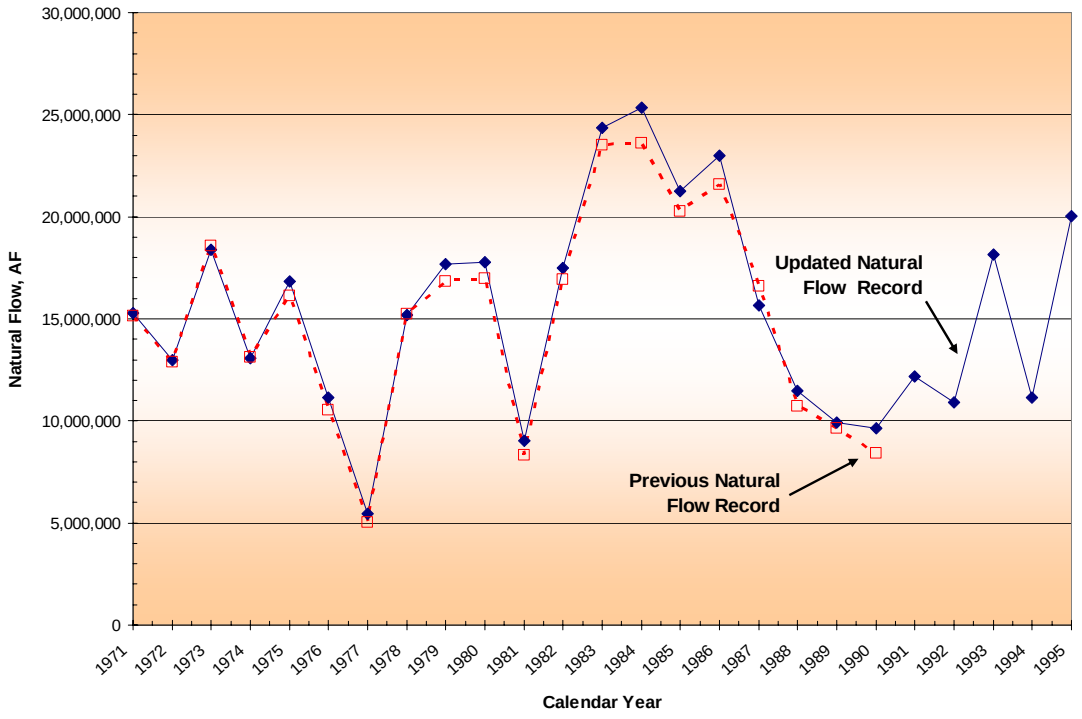
Note: msl = above mean sea level; kaf = thousand acre-feet

6.2 NATURAL FLOWS

The term "natural flow" is defined as the observed flow, corrected for upstream consumptive uses and the effects of upstream reservoirs. In May 2004, Reclamation updated the available historic record of natural flow for all 29 inflow points represented in the model. This update included an extensive review of the 1971–1990 Upper Basin consumptive uses and reservoir regulation.[5] Some errors and omissions were corrected and the natural flows were re-computed for that period. In addition, the consumptive uses and reservoir regulation records were completed and reviewed for the 1991–1995 period and natural flows were computed through 1995. In order to include the most recent and accurate information in this evaluation, this updated natural flow information was included in the New Modeling.

Figure 1 compares the previous and updated records of natural inflow to Lake Powell for 1971–1995. The re-computation over the period 1971–1990 resulted in somewhat higher natural flows than were previously published (an increase of approximately 10.9 maf or about 4 percent of the total volume for that 20-year period).

Figure 1
Previous and Updated Natural Flow Record



[5] This extensive review was conducted by Reclamation's Upper and Lower Colorado Region modeling staff, the Work Group of the Colorado River Salinity Control Forum, and water resources staff from each of the seven Colorado River Basin states, as well as by peer review of articles submitted for publication to appropriate refereed technical journals.

These data were used as input to the Index Sequential Method (ISM) to obtain a range of possible future inflows (see Section J.6.6 of Appendix J). The ISM in the Previous Modeling resulted in 85 separate simulations (referred to as "traces") for each operating scenario that was analyzed. The inclusion of the updated natural flow record period (1906–1995) now results in 90 separate simulations or traces for each operating scenario.

The most recent eight years of record (1996–2003), which includes one of the driest four-year periods on record, were not included in the modeling for this evaluation because the natural flow analysis has not been completed for these years. The records of consumptive use in the Upper Basin for 1996–2000 are currently only available in provisional form and the resulting natural flows have not been thoroughly peer reviewed. Because of this, Reclamation determined that the provisional data should not be used for evaluation of potential environmental impacts. Furthermore, consumptive uses in the Upper Basin for 2001–2003 are currently not available. It should be noted that even if the most recent eight years of record were included, no substantial changes to the future conditions would be expected, since the eight years includes years of above-average flow, as well as below-average flow. The historic record used by Reclamation in its hydrologic modeling includes periods of low flow on the Colorado River that are similar to the current drought.[6] Moreover, if additional low-flow years were added to the data used for the hydrologic modeling, the lowest expected elevation of Lake Mead would not change, because Reclamation's modeling assumptions for management of Lake Mead is designed to prevent Lake Mead from declining below 950 feet msl.[7] The records being provided and used comprise the most current and best available information at the time of this evaluation.[8]

6.3 DATA INTERPRETATION PROCEDURES

As previously stated, the model generates 85 traces for the Previous Modeling or 90 traces for the New Modeling using the ISM. For a given point in time (e.g., year 2010) and for each variable (e.g., Lake Mead elevation), there are 85 or 90 possible

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[6] For example, the following periods of low flow are included in the historic record: 1931-1935 (5 year average: 11.4 maf); 1953-1956 (4 year average: 10.2 maf); 1959-1964 (6 year average: 11.4 maf); 1988-1992 (5 year average: 10.9 maf). Current estimates of the most recent five years of data, 2000-2004 show that the 5 year average is 9.9 maf.

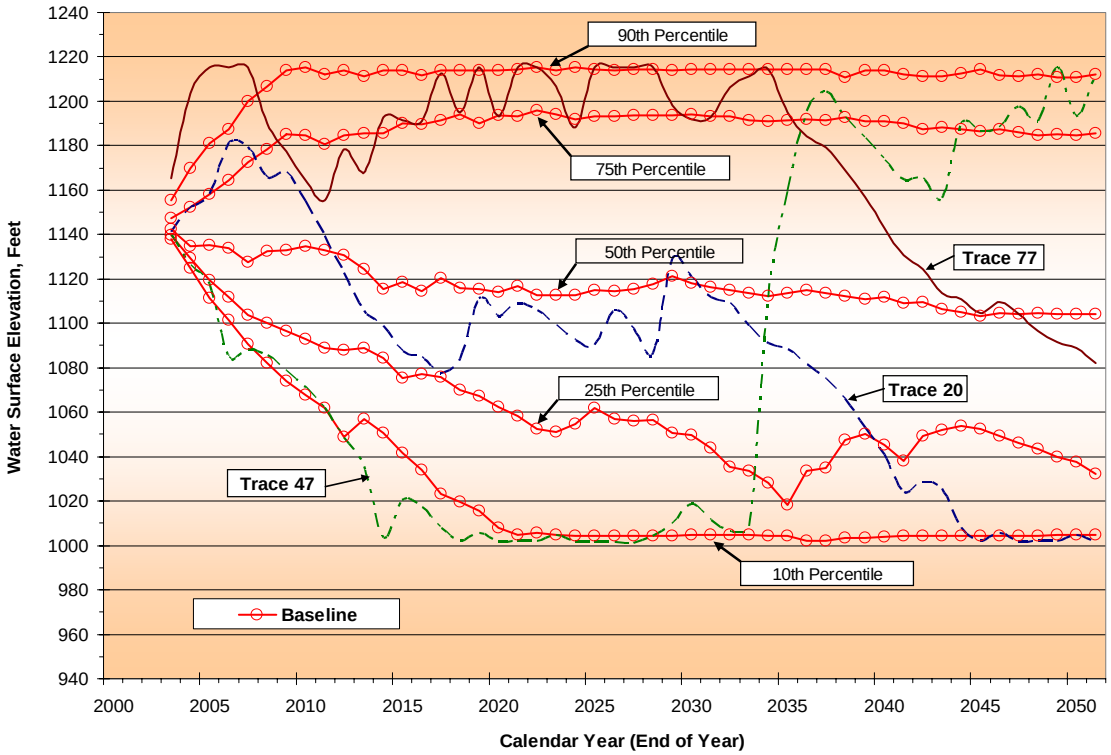
[7] For a full discussion of the modeling assumptions regarding Lake Mead elevation management strategies, see Appendix J, Section 6.1.

[8] Reclamation continuously reviews its processes for determining the consumptive uses throughout the Upper Basin (in cooperation with the Upper Basin States) and is committed to identifying improvements that when implemented, should allow for the collection, analysis, and publication of Upper Basin consumptive uses and natural flows on a more frequent basis.

outcomes for that variable. Various statistical and numerical techniques can be applied to those outcomes and used for the subsequent hydrologic and resource impact analyses.

For example, Figure 2 shows three of the 85 traces for Lake Mead elevation under the Baseline for the Previous Modeling (traces 20, 47, and 77). Recall that each trace represents the projection for a particular future inflow scenario and a comparison of the traces illustrates the variability in future Lake Mead elevations. However, none of the traces is a prediction of future Lake Mead elevations. The highs and lows shown in the three traces would likely be temporary conditions and the reservoir level would be expected to fluctuate within the ranges shown. Neither the timing of water level variations between the highs and lows, nor the length of time the water level would remain high or low can be predicted.

Figure 2
Lake Mead End-of-December Water Elevations under Baseline (Previous Modeling) — 90th, 75th, 50th, 25th, and 10th Percentile Values and Representative Traces



A common analysis technique simply ranks the possible outcomes at each time (in this example, the end-of-December Lake Mead elevations for each year) and uses the ranked outcomes to compute other statistics of interest. For example, if end-of-December Lake Mead elevations are ranked for each year, the median outcome for a given year is the elevation for which half of the values are below and half are above. This outcome is therefore referred to as the "median value" or the "50th percentile

value." Similarly, the elevation for which 25 percent of the values are less than or equal to in a given year, is denoted as the 25th percentile value. Several presentations of the ranked data are then possible. A graph (or table) may be produced that compares the 75th percentile, 50th percentile, and 25th percentile outcomes from both the Previous and New Modeling. In addition to the three traces noted above, the 10th, 25th, 50th, 75th, and 90th percentile lines derived from all 85 traces are also shown on Figure 2.

Again, it must be noted that a specific percentile line is not the result of any one future hydrologic inflow scenario, nor is it a prediction of future reservoir elevations. A simple interpretation of the 25th percentile shown in Figure 2 is that in a given year (e.g., 2010), Lake Mead elevations are likely to be above the 25th percentile value (approximately 1095 feet) with a 75 percent probability. This interpretation is based on the assumption that the flow sequences seen in the historical record will be repeated in the future, as assumed by the ISM.

7. ANALYSIS OF UPDATED HYDROLOGIC INFORMATION ON BIOLOGICAL RESOURCES

The potential effects of the updated information on future LCR reservoir and river operations conditions were evaluated. This evaluation is consistent with those previously conducted and is intended to provide an indication as to whether the updated hydrologic information has an effect on the previous impact analysis in the Draft BA/HCP. In particular, this evaluation was conducted to determine:

- effect on Lake Mead water surface elevations,
- effect on the river corridor (Reaches 3–5), and
- effect on flows to Reach 7.

For each of these three topic areas, this section presents 1) a summary of the results from the previous hydrologic modeling, 2) a summary of the results from the new hydrologic modeling, 3) a comparison of the new to previous hydrologic modeling results, and 4) an analysis of the effect of the new hydrologic modeling on biological resources.

The biological resources analysis in this section describes potential effects to habitats utilized by those covered species that are potentially affected by the updated hydrologic information. The habitat types (i.e., riparian, marsh, etc.,) considered are consistent with the analysis in the Draft BA/HCP.

In evaluating the effect of the updated hydrologic information, this evaluation focuses on the difference between the Baseline and Action Alternative for the Previous Modeling as compared to the New Modeling. However, the evaluation also considers the context in which these differences occur. For example, consider a comparison of the differences between the median Lake Mead water surface elevations under the Action Alternative

and Baseline for a particular year. Assume that under the Previous Modeling, the analysis indicated that the median water surface elevation under the Action Alternative was 10 feet lower than under the Baseline. Further assume that the new analysis indicated that the water surface elevation under the Action Alternative would be 15 feet lower than under the Baseline for that particular year. This evaluation considers not only the incremental 5-foot difference in the median Lake Mead elevation, but also whether that difference may have additional impacts because it occurs at a lower elevation in the reservoir.

7.1 EFFECT ON LAKE MEAD WATER SURFACE ELEVATIONS

As discussed in Appendix J, the covered activities would have no effect on the operation of Lake Mohave, Lake Havasu, or Imperial Dam. Therefore, the only reservoir system conditions that were previously analyzed are the Lake Mead water levels. The previous analysis of potential effects of the LCR MSCP on Lake Mead water levels was summarized in Appendix J, Section J.6.

The previous analysis provided a comparison of the results of the future Lake Mead water level simulations for the Baseline and the Action Alternative. A similar analysis was conducted based on the New Modeling.

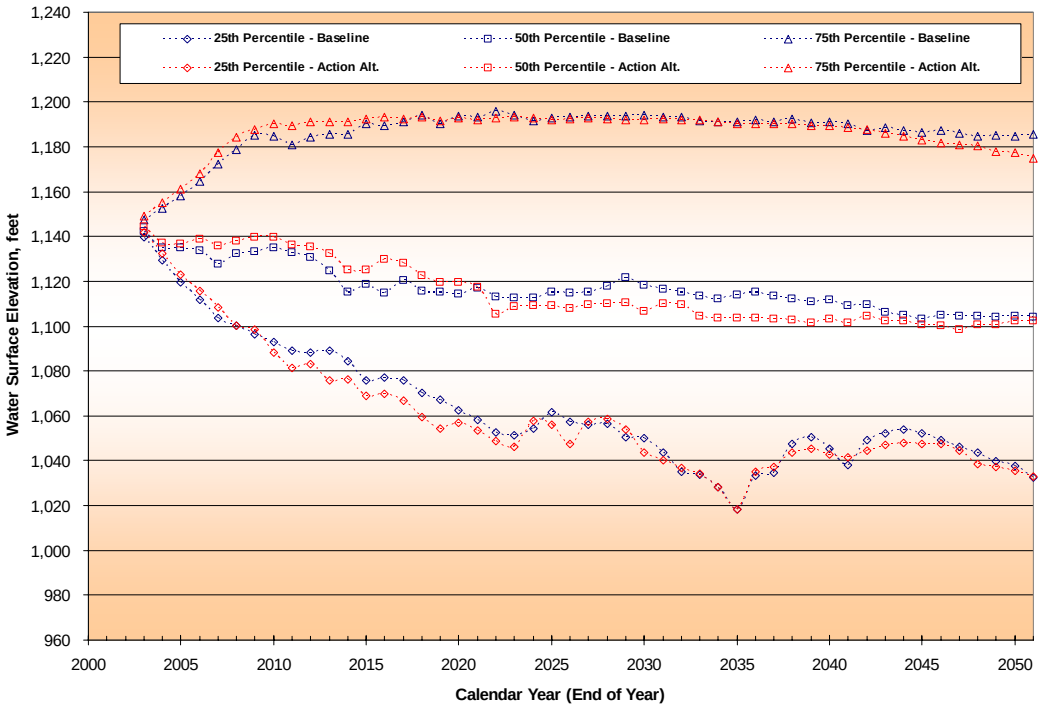
For comparison purposes, lake levels are presented on an annual basis using water levels at the end of December for each year.

7.1.1 Results from Previous Hydrologic Modeling

Figure 3 presents a comparison of the 75th, 50th, and 25th percentile lines obtained for the Baseline to those obtained for the Action Alternative under the Previous Modeling. These lines represent the respective 75th, 50th, and 25th percentile values of the 85 traces (simulations) for each respective year.

As illustrated in Figure 3, median Lake Mead elevations under the Baseline and Action Alternative decline throughout the period of analysis. This is due to the effect of increasing Upper Basin depletions, which decreases the probability of equalization releases from Lake Powell over time. Figure 3 also illustrates that up to 2020, median elevations are higher under the Action Alternative when compared to the Baseline (an average of approximately 5.3 feet higher over the period 2003–2020). As noted in Appendix L, Volume IV of the LCR MSCP documents, this result can be attributed to the implementation of water transfers under the Action Alternative that reduce the call for surplus water from Lake Mead, resulting in somewhat higher Lake Mead levels. After 2020, at the median level, the positive effect due to the transfers is outweighed by the effects of extending the ISG to 2051 and lowering the shortage strategy (an average difference of approximately –6.7 feet over the period 2021–2050).

Figure 3
Previous Modeling
Lake Mead End-of-December Water Elevations
Comparison of Baseline to Action Alternative
for 75th, 50th, and 25th Percentile Values



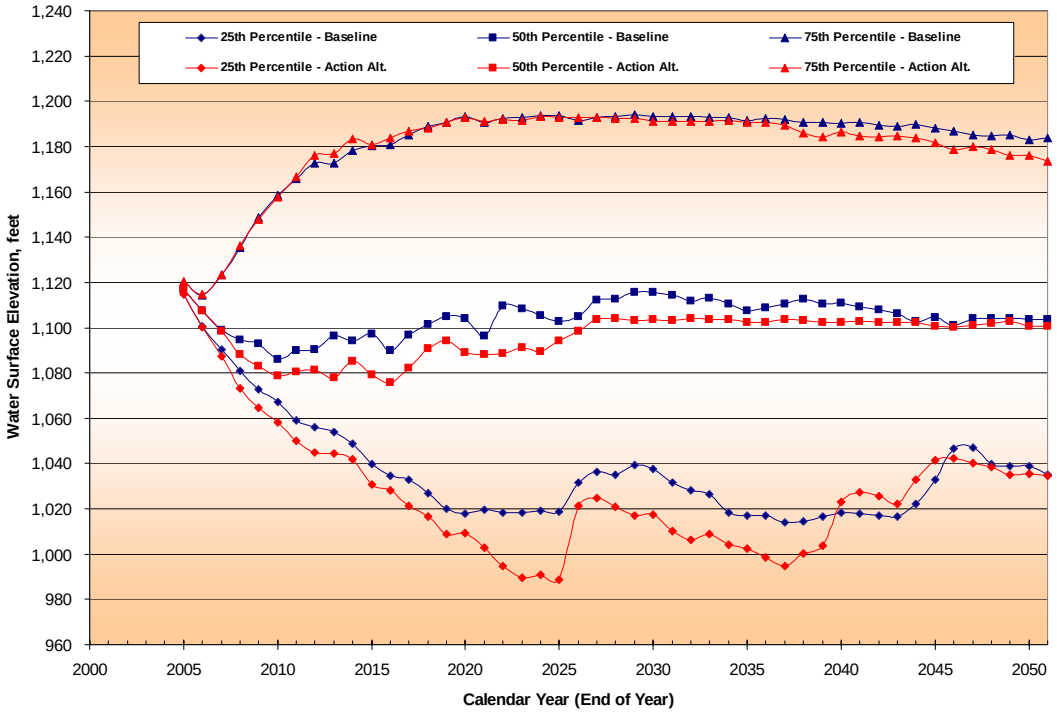
7.1.2 Results from New Hydrologic Modeling

Figure 4 presents a comparison of the 75th, 50th, and 25th percentile lines obtained for the Baseline to those obtained for the Action Alternative under the New Modeling. These lines represent the respective 75th, 50th,and 25th percentile values of the 90 traces (simulations) for each respective year.

As illustrated in Figure 4, the 75th, 50th, and 25th percentile lines for both the Baseline and Action Alternative begin at a lower elevation than that shown in Figure 3 (Previous Modeling), which is due to the lower Lake Mead initial reservoir conditions. Recall that for the Previous Modeling, the initial reservoir water surface elevation was 1152.13 feet above mean sea level (msl) (December 31, 2002) and for the New Modeling, the initial water surface elevation was 1123.93 feet msl (December 31, 2004), a difference of about 28 feet.

Figure 4 shows that the median Lake Mead elevations under the modeled Baseline and Action Alternative decline through year 2010, then increase through year 2027, and remain generally level thereafter. The decline in median Lake Mead elevations resulting from increasing Upper Basin depletions (shown in Figure 3 for the 50th percentile) does not occur under the

Figure 4
New Modeling
Lake Mead End-of-December Water Elevations
Comparison of Baseline to Action Alternative
for 75th, 50th, and 25th Percentile Values



New Modeling. This is because the probability of equalization in the near term is less due to the lower starting elevations at both Lake Powell and Lake Mead. Therefore, the effect of increasing Upper Basin depletions is negligible in the near term. The median Lake Mead elevations under the Action Alternative are generally lower than under the Baseline until about 2044, whereas thereafter, they are approximately the same. Through year 2010, the median Lake Mead elevations under the Action Alternative are, on average, approximately 4 feet lower than those under the Baseline. Between years 2010 and 2040, the median Lake Mead elevations under the Action Alternative are an average of approximately 10 feet lower than those under the Baseline.

7.1.3 Comparison of Previous and New Hydrologic Modeling

This section provides a comparison of New and Previous Modeling results.

Figure 5 provides a graphical comparison of the 75th, 50th, and 25th percentile lines obtained for the Baseline and Action Alternative under the New and Previous Modeling. A similar comparison in tabular format is provided in Table 2.

Figure 5
Comparison of New to Previous Modeling Results
Lake Mead End-of-December Water Elevations
for 75th, 50th,and 25th Percentile Values

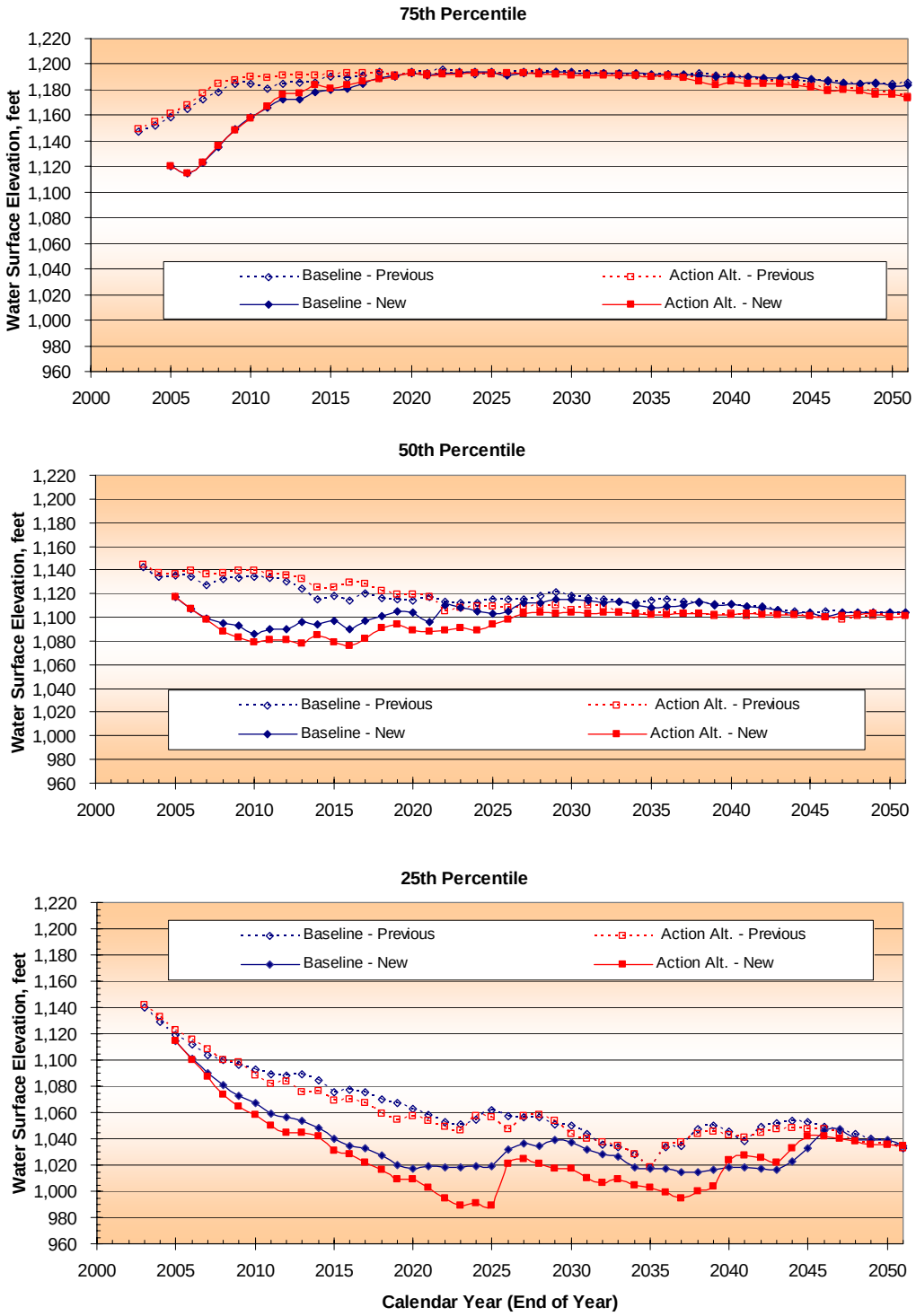


Table 2
Comparison of Lake Mead End-of-December Water Elevations (feet msl)
Under Previous and New Modeling for 75th, 50th, and 25th Percentiles Values

		Previous Modeling							New Modeling					
		Baseline			Action Alternative				Baseline			Action Alternative		
[1]		*[2]*	*[3]*	*[4]*	*[5]*	*[6]*	*[7]*		*[8]*	*[9]*	*[10]*	*[11]*	*[12]*	*[13]*
Year		25th Percentile	50th Percentile	75th Percentile	25th Percentile	50th Percentile	75th Percentile		25th Percentile	50th Percentile	75th Percentile	25th Percentile	50th Percentile	75th Percentile
2003		1,140	1,142	1,147	1,142	1,144	1,149							
2004		1,129	1,135	1,152	1,132	1,137	1,155							
2005		1,119	1,135	1,158	1,123	1,137	1,161		1,115	1,117	1,121	1,115	1,117	1,121
2006		1,112	1,134	1,165	1,116	1,139	1,168		1,101	1,108	1,114	1,100	1,108	1,115
2007		1,104	1,128	1,172	1,108	1,136	1,177		1,090	1,099	1,123	1,087	1,098	1,123
2008		1,100	1,132	1,178	1,100	1,138	1,184		1,081	1,095	1,135	1,073	1,088	1,136
2009		1,096	1,133	1,185	1,099	1,140	1,188		1,073	1,093	1,149	1,064	1,083	1,148
2010		1,093	1,135	1,185	1,088	1,139	1,190		1,067	1,086	1,159	1,058	1,079	1,157
2011		1,089	1,133	1,181	1,081	1,136	1,189		1,059	1,090	1,166	1,050	1,081	1,167
2012		1,088	1,131	1,184	1,083	1,135	1,191		1,056	1,090	1,173	1,045	1,081	1,176
2013		1,089	1,125	1,186	1,076	1,132	1,191		1,054	1,096	1,173	1,044	1,078	1,177
2014		1,084	1,115	1,186	1,076	1,125	1,191		1,049	1,094	1,178	1,042	1,085	1,183
2015		1,076	1,119	1,190	1,069	1,125	1,192		1,040	1,097	1,180	1,031	1,079	1,181
2016		1,077	1,115	1,190	1,070	1,130	1,193		1,035	1,090	1,181	1,028	1,076	1,184
2017		1,076	1,120	1,191	1,067	1,128	1,193		1,033	1,097	1,185	1,021	1,082	1,187
2018		1,070	1,116	1,194	1,059	1,123	1,193		1,027	1,102	1,189	1,017	1,091	1,188
2019		1,067	1,115	1,190	1,054	1,120	1,191		1,020	1,105	1,191	1,009	1,094	1,191
2020		1,062	1,114	1,193	1,057	1,119	1,193		1,018	1,104	1,193	1,009	1,089	1,193
2021		1,058	1,117	1,193	1,053	1,117	1,192		1,019	1,096	1,191	1,003	1,088	1,191
2022		1,053	1,113	1,196	1,049	1,105	1,193		1,018	1,110	1,193	995	1,089	1,192
2023		1,051	1,113	1,194	1,046	1,109	1,193		1,018	1,108	1,193	989	1,091	1,192
2024		1,054	1,113	1,192	1,058	1,109	1,193		1,019	1,105	1,194	991	1,089	1,193
2025		1,062	1,115	1,193	1,056	1,109	1,192		1,019	1,103	1,194	989	1,094	1,193
2026		1,057	1,115	1,193	1,048	1,108	1,192		1,032	1,105	1,191	1,021	1,098	1,193
2027		1,056	1,115	1,194	1,057	1,110	1,193		1,036	1,112	1,193	1,025	1,104	1,193
2028		1,057	1,118	1,194	1,058	1,110	1,193		1,035	1,112	1,193	1,021	1,104	1,192
2029		1,051	1,121	1,194	1,054	1,110	1,192		1,039	1,116	1,194	1,017	1,103	1,192
2030		1,050	1,118	1,194	1,043	1,107	1,192		1,038	1,116	1,193	1,017	1,104	1,191
2031		1,044	1,116	1,193	1,040	1,110	1,192		1,032	1,114	1,193	1,010	1,103	1,191
2032		1,035	1,115	1,193	1,037	1,110	1,192		1,028	1,112	1,193	1,006	1,104	1,191
2033		1,034	1,114	1,191	1,034	1,104	1,192		1,027	1,113	1,193	1,009	1,104	1,191
2034		1,028	1,112	1,191	1,028	1,104	1,191		1,018	1,110	1,193	1,004	1,103	1,192
2035		1,018	1,114	1,191	1,018	1,104	1,190		1,017	1,108	1,192	1,002	1,102	1,191
2036		1,033	1,115	1,192	1,035	1,104	1,190		1,017	1,109	1,192	999	1,102	1,191
2037		1,035	1,113	1,191	1,037	1,103	1,190		1,014	1,110	1,192	995	1,104	1,189
2038		1,047	1,112	1,193	1,043	1,103	1,190		1,014	1,113	1,191	1,000	1,103	1,186
2039		1,050	1,111	1,191	1,045	1,101	1,189		1,017	1,111	1,191	1,004	1,102	1,184
2040		1,045	1,112	1,191	1,043	1,103	1,190		1,018	1,111	1,190	1,023	1,102	1,186
2041		1,038	1,109	1,190	1,041	1,101	1,188		1,018	1,109	1,190	1,027	1,103	1,185
2042		1,049	1,110	1,187	1,045	1,104	1,188		1,017	1,108	1,189	1,026	1,103	1,184
2043		1,052	1,106	1,188	1,047	1,102	1,186		1,017	1,106	1,189	1,022	1,102	1,185
2044		1,054	1,105	1,187	1,048	1,102	1,185		1,022	1,103	1,190	1,033	1,102	1,184
2045		1,052	1,103	1,187	1,048	1,101	1,183		1,033	1,104	1,188	1,042	1,101	1,182
2046		1,049	1,105	1,187	1,047	1,100	1,182		1,047	1,101	1,187	1,042	1,100	1,179
2047		1,046	1,104	1,186	1,045	1,098	1,181		1,047	1,104	1,185	1,040	1,101	1,180
2048		1,044	1,104	1,185	1,038	1,101	1,180		1,040	1,104	1,185	1,038	1,102	1,179
2049		1,040	1,104	1,185	1,037	1,101	1,178		1,039	1,104	1,185	1,035	1,103	1,176
2050		1,037	1,104	1,185	1,036	1,102	1,177		1,039	1,104	1,183	1,036	1,101	1,176
2051		1,032	1,104	1,186	1,033	1,102	1,175		1,035	1,104	1,184	1,035	1,101	1,174

Note: msl = above mean sea level

As previously noted, the median Lake Mead elevations for both the Baseline and Action Alternative under the New Modeling begin at a lower elevation than those under the Previous Modeling due to the lower initial reservoir conditions[9].

In Table 3, the relative differences due to the updated information are compared. Columns 2–4 and Columns 5–7 of Table 3 compare the differences between the 75th, 50th, and 25th percentile values obtained under the Baseline and Action Alternative under the Previous and New Modeling, respectively. In Columns 8–10 of this same table, the relative differences between the New and Previous Modeling results are compared.

As shown in Table 3, differences between the Baseline and Action Alternative median Lake Mead water surface elevations under the New Modeling are somewhat greater than those under the Previous Modeling. These differences are greater between years 2006 and 2024. During this period, the maximum difference is 29 feet and the average is approximately 11 feet. Contributing to these differences is the fact that under the Previous Modeling, the Action Alternative provided higher median Lake Mead water surface elevations than under the Baseline (see Figure 3 for the 50th percentile). As noted above and described in Appendix L, this result is due to the reduced need for surplus water attributed to the implementation of water transfers. Under the New Modeling, this effect is negated as a result of the lower initial reservoir conditions (i.e., the Lower Basin is not in surplus as often in the years up to 2024).

7.1.4 Analysis of Effect on Biological Resources

7.1.4.1 Riparian Vegetation

The operation of Lake Mead is analogous to a natural ecosystem with cycles of riparian vegetation growth and loss, particularly in the delta areas of the Virgin River, Muddy River, and Colorado River as it exits the Grand Canyon. However, these cycles that include scouring of vegetation may occur with different frequency than on a natural stream system.[10]

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[9] Notwithstanding the lower initial conditions reflected in the New Modeling, actual Lake Mead elevations between January 1, 2003 and the date of this analysis were within the range projected in the Draft BA/HCP based on Previous Modeling.

[10] As more fully described in Chapter 2 of the Draft BA, Lake Mead elevations are driven by downstream water use needs and Glen Canyon Dam releases, except when the Lake Mead Water Control Manual for Flood Control dictates operations. Glen Canyon releases are primarily a function of operation for delivery of water from Lake Powell in accordance with the Colorado River Compact, and Hoover Dam releases are primarily a function of non-discretionary water deliveries from Lake Mead to the lower Division States and Mexico. Thus Reclamation has very limited discretion over the management of reservoir levels in Lake Mead, and lake levels may fluctuate greatly (see discussion of Reclamation's discretion found in Chapter 2 of the Draft BA).

Table 3
Comparison of Differences Between Previous and New Modeling Results
Lake Mead End-of-December Water Elevations[11] (feet msl)
75th, 50th, and 25th Percentiles Values

	Previous Modeling Differences[12] Between Baseline and Action Alternative			New Modeling Differences[5] Between Baseline and Action Alternative			Differences[5] Between New to Previous Modeling		
[1]	*[2]*	*[3]*	*[4]*	*[5]*	*[6]*	*[7]*	*[8]*	*[9]*	*[10]*
Year	25th Percentile	50th Percentile	75th Percentile	25th Percentile	50th Percentile	75th Percentile	25th Percentile	50th Percentile	75th Percentile
2003	2	2	2						
2004	3	2	3						
2005	4	2	3	(0)	0	(0)	(4)	(2)	(3)
2006	4	5	3	(0)	(0)	1	(4)	(5)	(3)
2007	5	8	5	(3)	(1)	(0)	(8)	(9)	(5)
2008	0	6	6	(8)	(7)	1	(8)	(12)	(5)
2009	2	7	3	(8)	(10)	(1)	(11)	(16)	(3)
2010	(5)	5	5	(9)	(7)	(1)	(4)	(12)	(6)
2011	(7)	3	9	(9)	(9)	1	(1)	(13)	(8)
2012	(5)	5	7	(11)	(9)	3	(7)	(13)	(3)
2013	(13)	8	5	(10)	(18)	4	3	(26)	(1)
2014	(8)	10	5	(7)	(9)	5	2	(19)	(0)
2015	(7)	6	2	(9)	(18)	1	(2)	(24)	(1)
2016	(8)	15	4	(7)	(14)	3	1	(29)	(1)
2017	(9)	8	1	(12)	(15)	2	(3)	(22)	1
2018	(11)	7	(1)	(10)	(11)	(1)	1	(18)	(0)
2019	(13)	4	1	(11)	(11)	(0)	1	(15)	(1)
2020	(5)	5	(1)	(8)	(15)	(1)	(3)	(20)	0
2021	(5)	0	(1)	(17)	(8)	0	(12)	(9)	2
2022	(4)	(8)	(3)	(23)	(21)	(1)	(20)	(14)	2
2023	(5)	(4)	(1)	(29)	(17)	(1)	(24)	(13)	(0)
2024	3	(4)	1	(28)	(16)	(1)	(32)	(12)	(2)
2025	(6)	(6)	(1)	(30)	(9)	(1)	(25)	(3)	(0)
2026	(10)	(7)	(1)	(11)	(7)	1	(1)	(0)	2
2027	1	(6)	(1)	(12)	(9)	(0)	(13)	(3)	1
2028	2	(8)	(1)	(14)	(8)	(1)	(16)	(1)	0
2029	3	(11)	(2)	(22)	(12)	(2)	(26)	(1)	(0)
2030	(6)	(12)	(2)	(20)	(12)	(2)	(14)	(0)	0
2031	(4)	(6)	(1)	(21)	(11)	(2)	(18)	(5)	(1)
2032	2	(6)	(1)	(22)	(8)	(2)	(23)	(2)	(1)
2033	1	(9)	0	(17)	(9)	(2)	(18)	(0)	(2)
2034	0	(9)	(0)	(14)	(7)	(1)	(14)	2	(1)
2035	(0)	(10)	(1)	(15)	(5)	(1)	(15)	5	(0)
2036	2	(11)	(2)	(18)	(6)	(1)	(20)	5	0
2037	2	(10)	(1)	(19)	(7)	(3)	(22)	3	(2)
2038	(4)	(10)	(2)	(14)	(10)	(5)	(10)	0	(3)
2039	(5)	(9)	(2)	(13)	(8)	(6)	(8)	1	(5)
2040	(2)	(9)	(2)	5	(9)	(4)	7	(0)	(2)
2041	3	(8)	(2)	9	(7)	(6)	6	1	(4)
2042	(5)	(5)	0	8	(5)	(5)	13	(0)	(5)
2043	(5)	(4)	(3)	6	(4)	(4)	11	0	(2)
2044	(6)	(3)	(3)	10	(1)	(6)	16	2	(3)
2045	(5)	(2)	(4)	9	(4)	(6)	13	(1)	(3)
2046	(2)	(5)	(6)	(4)	(1)	(8)	(3)	4	(2)
2047	(2)	(6)	(5)	(7)	(3)	(5)	(5)	3	(0)
2048	(5)	(4)	(4)	(2)	(2)	(6)	4	1	(2)

[11] Although the modeling results are at a high precision, differences presented in this table reflect rounding to the nearest integer value.
[12] The differences between the Baseline and Action Alternative were calculated by subtracting Baseline Value from the Action Alternative Value and the differences between the New and Previous Modeling conditions were calculated by subtracting the Previous Modeling Value from the New Modeling Value.

2049	(2)	(3)	(7)	(4)	(1)	(9)	(1)	2	(2)
2050	(2)	(2)	(7)	(3)	(3)	(7)	(1)	(1)	0
2051	1	(2)	(11)	(0)	(3)	(10)	(1)	(2)	1

Note: msl = above mean sea level

The Lake Mead delta areas have a great potential for use by a large and diverse number of avian species, but are limited in their importance due to their ephemeral nature. This ephemeral riparian vegetation that establishes in these delta areas can provide habitat for many bird species, including covered species, such as the southwestern willow flycatcher, yellow warbler, summer tanager, and Bell's vireo, and is used for breeding, migration stopover, and as wintering habitat. As riparian vegetation develops as habitat for these species, their abundance and productivity rises substantially. Conversely, as vegetation dries out when reservoir elevations decline, or is inundated when elevations rise, species abundance and productivity decrease (Braden, et al. unpublished data 2002). This ephemeral habitat, thus, has a high productivity value and is beneficial to riparian-associated species when it is present.

Habitat in the delta areas may consist of (1) predominantly native willow, (2) predominantly exotic saltcedar (tamarisk sp.) or (3) mixed native willow/exotic saltcedar. The Colorado River delta has previously produced a vegetation community largely composed of native willow with relatively little saltcedar (McKernan 1997). A major factor governing the types of riparian vegetation that could establish is the timing of when sediments suitable for establishment of riparian vegetation are exposed. Willow-dominated communities have become established in the deltas of Lake Mead only when declining reservoir elevations have coincided with the timing of willow seed dispersal. During periods when reservoir elevations have declined before or after the willow seed dispersal period, saltcedar-dominated riparian communities have become established (see Appendix M, Section M.5.3). Cottonwoods and willows that do become established when reservoir elevations decline could be lost if reservoir elevations continue to decline and groundwater elevations drop below their root depths. Conversely, riparian vegetation that becomes established on exposed sediments would be inundated and lost during wetter periods when Lake Mead reservoir elevations rise.

For example, while from 1990–1996 Lake Mead reservoir levels remained within a relatively narrow 1170–1200-foot range, creating dense stands of willow habitat (approximately 1000 acres) (McKernan and Braden 1998), the levels from 2000–2004 dropped nearly three times as much (from 1214–1125 feet), creating a delta that does not

today support the same dense habitat and has created an environment in which the willows and even saltcedar are rapidly dying (USBR unpublished data 2004). This would suggest that a sustained lake level would create the best-suited habitat for the LCR MSCP covered bird species, and that extreme rises or falls in reservoir elevations would not support covered species habitat in the Lake Mead delta areas. As lake levels continue to drop, new delta habitat may form lower in the lake. This would be limited by soil conditions in submerged portions of the Lake Mead shoreline because most of the shoreline does not have the soil types necessary for the establishment of riparian vegetation. The extent of riparian vegetation that could establish as reservoir elevations decline, however, cannot be predicted.

The Previous Modeling for Lake Mead, including the Baseline and the Action Alternative, show the median elevations of the lake declining over the modeled period due to increasing Upper Basin depletions (see Figure 3). The probability of water levels historically used for vegetation establishment and survival therefore decreases over the term of the LCR MSCP. It is not clear whether similar areas of vegetation will establish and survive at lower levels. It may be that covered species habitats over time become more limited in the delta areas as the probability for lower lake levels increases. Under the 50th percentile (Figure 5), because of the lower Lake Mead initial conditions, the New Modeling indicates an increased probability of lower lake elevations until year 2024 (as compared to the Previous Modeling) and thereafter the probabilities are approximately the same. This would indicate that, during the first 25 years, the probabilities for covered species habitat establishment may be slightly more limited in those years. At the 25th percentile there is a greater reduction in reservoir elevation between the Baseline and Action Alternative under the New Modeling as compared to the Previous Modeling. In addition, this relative reduction in elevation under the New Modeling could extend to 2045 compared to 2020 under the Previous Modeling. At the 75th percentile, differences between the New and Previous Modeling are evident only during the first 10 years of the modeled period. Overall, the habitat quantity and quality would not be significantly different over the 50-year period.

Results of the New Modeling indicate that the impacts of implementing the covered activities on covered species that use riparian vegetation in the delta areas of Lake Mead would not be measurably different from those described in the Draft BA/HCP under the Previous Modeling. This is because the impact mechanisms associated with the creation

and loss of riparian vegetation are the same under the New and Previous Modeling, the only difference being that riparian vegetation could be established at lower elevations under the New Modeling. The extent of exposed soils suitable for establishment of riparian vegetation could be slightly less, however, at lower elevations.

7.1.4.2 Marsh Vegetation

Ephemeral marsh vegetation can periodically establish at inflow points of Lake Mead (e.g., Lake Mead delta, Virgin River delta, Muddy River delta, Las Vegas Wash), when Lake Mead water surface elevations are below full pool elevation. This ephemeral marsh vegetation can provide nesting and dispersal habitat for marsh-associated wildlife, including the Yuma clapper rail and western least bittern covered under the LCR MSCP. Habitat that does become established when reservoir elevations decline could be lost if reservoir elevations continue to decline and groundwater elevations drop below the rooting depths of emergent vegetation. Marsh vegetation that does become established on exposed sediments would be inundated and lost during wetter periods, when Lake Mead reservoir elevations rise. The extent of habitat and attendant species benefits that could be periodically created and subsequently lost as a result of changes in reservoir elevations over the term of the modeling cannot, however, be predicted based on the available information.

As described in Section 7.1.4.1, for riparian vegetation, it is likely that a sustained lake level would create the best-suited habitat for marsh-associated LCR MSCP covered bird species, and that rises or falls in reservoir elevations would not support covered species habitat in the Lake Mead delta areas. Because the rooting depth of emergent vegetation is shallow relative to riparian trees, however, marsh vegetation could be affected by less extreme reductions in reservoir elevations than would be required to desiccate woody riparian vegetation. When lake levels drop, new marsh vegetation may form lower in the lake. This would be limited because most of the shoreline does not have the soil necessary for the establishment of marsh vegetation. The extent of marsh vegetation that could establish as reservoir elevations decline, however, cannot be predicted. Under the 50th percentile (Figure 5), because of the lower Lake Mead initial conditions, the New Modeling indicates an increased probability of lower lake elevations until year 2024 (as compared to the Previous Modeling) and thereafter the probabilities are approximately the same. This would indicate that during the first 25 years, the probabilities for

the establishment of marsh vegetation that provides covered species habitat may be slightly more limited. At the 25th percentile there is a greater reduction in reservoir elevation between the Baseline and Action Alternative under the New Modeling as compared to the Previous Modeling. In addition, this relative reduction in elevation under the New Modeling could extend to 2045 compared to 2020 under the Previous Modeling. At the 75th percentile, differences between the New and Previous Modeling are evident only during the first 10 years of the modeled period. Overall, the extent and value of marsh vegetation that could provide covered species habitat under the New Modeling would not be significantly different than under the Previous Modeling.

Results of the New Modeling indicate that the impacts of implementing the covered activities on covered species that use marsh vegetation would not be measurably different from that described in the Draft BA/HCP under the Previous Modeling. This is because the impact mechanisms associated with the creation and loss of marsh vegetation are the same under the New and Previous Modeling, the only difference being that marsh vegetation could be established at lower elevations under the New Modeling. The extent of exposed soils suitable for establishment of marsh vegetation could be slightly less, however, at lower elevations.

7.1.4.3 Razorback Sucker Spawning Habitat

The analysis based on the Previous Modeling concluded the razorback sucker and associated critical habitat in Lake Mead may be affected by the proposed Action Alternative. The analysis contained in this evaluation does not modify this conclusion. However, the change in the potential degree of effect between results of the Previous Modeling and the New Modeling cannot be quantified.

As stated in the Draft BA, implementation of flow-related covered activities may result in adverse impacts on razorback sucker spawning habitat and designated critical habitat for the razorback sucker in Reach 1. The known spawning elevations that may be important for the razorback sucker occur between 1120 and 1150 feet msl in Lake Mead. Current information shows that during the spawning seasons of 1997–2001, razorback sucker spawned at or near the cliff spawning site at the back of Echo Bay. This site was dry in 2002, and spawning occurred in a different area along the south shore of Echo Bay. During the 2003 spawning season, the 2002 spawning site was dry. However, razorback sucker apparently spawned along the same shore just east of the 2002

spawning site on a gravelly point submerged in 2–5 feet of water. In 2004, larval concentrations and habitat use of a telemetered fish indicated the Echo Bay population spawned approximately 250 meters east of the 2003 site (Welker and Holden 2004). These changes in spawning location over the past few years indicate the razorback sucker will successfully move their spawning location into progressively lower elevations where suitable spawning substrate is present as the lake recedes. Findings of recent investigations (Twichell and Rudin 1999) indicate that it is unlikely that sediment accumulation over available spawning substrate will affect spawning habitat area. However, indications are that in 2004 sediment from the Las Vegas Bay delta has moved farther out and caused the presumptive spawning area in the bay to become covered with encroaching sediment and may have influenced spawning success (Welker and Holden 2004). This encroaching sediment is a result of outflow from Las Vegas Wash and is not typical of sediment encroachment in the rest of Lake Mead. That encroachment is not only a function of lowering lake levels, but is likely also related to high rainfall events and growing wastewater discharge as a result of growth in the Las Vegas area.

The number of razorback suckers present in Lake Mead represents a small percentage of the total LCR population. The 2004 population estimates for the Echo Bay population range from 23–52 fish and estimates for the Las Vegas Bay population range from 11–310 fish (Welker and Holden 2004). To put the Lake Mead razorback sucker population in context, the largest extant population of razorback suckers in the entire Colorado River system is found in Lake Mohave (Reach 2) with an estimated population of 35,000 fish.

Results of razorback sucker studies indicate successful recruitment of minimal numbers of razorback suckers in Lake Mead during years when favorable rearing conditions are present. This makes the population of razorback suckers in Lake Mead unique in that it is the only population that has persisted over a long period of time in any portion of the LCR. However, these conditions are infrequent, and the numbers of fish naturally recruited to the population may not be sufficient to sustain the population under existing conditions. Reservoir operations and other factors that create the conditions that result in new fish successfully entering the population are not well understood. It has been postulated that during periods of lower lake elevations, vegetation becomes established along the shoreline. Then when the lake rises, the vegetation that becomes inundated provides cover for young razorback suckers. Recruitment has occurred fairly

regularly from 1974–1998. Sufficient information is not available to determine if changes in reservoir elevation with implementation of the action alternative could adversely affect the current observed rate of recruitment. However, it can be postulated that due to the probability of lower lake levels in the foreseeable future, short-term annual rises in lake elevation could inundate established vegetation that would provide cover for juvenile razorback suckers, thus maintaining a similar level of recruitment to the population.

As described above, the change in effects on razorback sucker in Lake Mead from using an updated initial reservoir elevation and the additional period of record between the Previous and New Modeling results cannot be quantified. However, the results of the New Modeling do not indicate that the impacts of implementing the covered activities on the razorback sucker would be significantly different than that described in the Draft BA/HCP. With substantial recent declines in reservoir elevations, the razorback sucker has demonstrated the ability to successfully spawn on suitable substrates present at lower reservoir elevations when previously used spawning habitat is exposed and no longer available. Therefore, we conclude that spawning behavior and success would be similar under both the Previous and New Modeling.

7.1.4.4 Transitory River Segments

As described in the Draft BA/HCP, when Lake Mead reservoir elevations decline, segments of the Colorado River and Virgin River channels that existed prior to construction of Hoover Dam can become exposed within the full-pool elevation of Lake Mead (when these areas appear, they are called transitory river segments). These transitory river segments can provide for and be occupied by the humpback chub and the flannelmouth sucker, which are covered under the LCR MSCP. The few humpback chub currently occurring in the Grand Canyon could move downstream and utilize as much as an estimated 62 miles of transitory Colorado River channel that forms when reservoir elevations lower to an elevation of 950 feet msl. This is the elevation that is assumed to be protected by the modeled shortage assumptions. The flannelmouth sucker could occur in transitory river segments of both the Colorado River and Virgin River that form when reservoir elevations are below full pool elevations. This transitory habitat could be lost during wetter periods when Lake Mead reservoir elevations increase and inundate habitat.

The mechanisms described above are the same under the New Modeling and the Previous Modeling. However, the presence and extent of transitory river segments might occur more frequently under the New Modeling due to the potentially lower reservoir elevations as described in Section 7.1. Consequently, the benefits associated with creating transitory river segments that provide humpback chub and flannelmouth sucker habitat may be somewhat greater under the New Modeling assumptions than under the Previous Modeling assumptions. However, these potential beneficial effects are not considered significant because the probabilities of the entire transitory river channel becoming available at the 950 feet msl lake level are extremely low under both the Previous and New Modeling, and because such benefits would be ephemeral in nature.

7.1.4.5 Sticky Buckwheat and Threecorner Milkvetch

As described in the Draft BA/HCP, sticky buckwheat and threecorner milkvetch can establish and occur along the Lake Mead shoreline on sites that have the soil characteristics required by each species and that are exposed when Lake Mead water surface elevations are below full-pool elevation. Sticky buckwheat and threecorner milkvetch plants that establish on these sites would be inundated and lost during wetter periods, when Lake Mead reservoir elevations increase.

The mechanisms described above are the same under the New Modeling and the Previous Modeling. However, the presence and extent of exposed suitable soils that can support sticky buckwheat and threecorner milkvetch might occur more frequently under the New Modeling due to the lower reservoir elevations as described in Section 7.1. Consequently, the benefits associated with exposing suitable soils for these plant species might be somewhat greater under the New Modeling assumptions than under the Previous Modeling assumptions. However, these potential beneficial effects are not considered significant due to the ephemeral nature of any potential benefits.

7.2 EFFECT ON THE RIVER CORRIDOR (REACHES 3–5)[13]

As discussed in Section 6.3 and in Appendix J, Reclamation uses a reservoir model to project the possible future states of the reservoir system under a range of possible future inflow conditions. When analyzing impacts to the river, backwaters, and groundwater along the Colorado River corridor below Hoover Dam, more detail is necessary. Accordingly, Reclamation used a more detailed analysis to assess the potential impacts to covered species and their habitat along the river corridor below Hoover Dam.

The analysis that Reclamation utilized for Reaches 3–5 was summarized in Appendix K, Volume IV of the LCR MSCP documents ("Hydrologic Depletion Analysis of the Effects of the Changes in Points of Diversion on Backwater and Groundwater Elevations"). The analysis followed four main steps:

1) Estimate the hourly flows likely to be released from the dam, both before and after the flow reductions have been applied;
2) Route the hourly release patterns downstream to locations of interest;
3) Convert the modeled flows at each location to river stage (elevation) to determine the drawdown (reduction in river stage) due to the flow reduction; and,
4) Determine the effect of the drawdown on river width and depth, backwater area extent and depth, and depth to groundwater proximate to the river.

As described in Section 6, updated information with respect to the initial conditions of the reservoirs and the natural flow record is analyzed in this evaluation. This updated information only applies to analyses based on the reservoir model and does not affect the analysis of reductions in river flows and the associated analysis of effects on open water and groundwater along the river corridor, as described in Appendix K.

The updated information, however, suggests an increased probability that future shortages may occur in the Lower Basin[14]. The Draft BA/HCP analyzed reductions in flow of up to 0.845 million acre-feet per year (mafy) in the river from Hoover Dam

[13] Conditions in Reach 2 (river channel and Lake Mohave reservoir) are not expected to be measurably affected with implementation of future flow-related covered activities, as noted in Section 5.2.3.3 of the Draft BA and Section 4.2.3.3 of the Draft HCP. The new information has no effect on the hydrology in Reach 6 as described in "Reaches 6 and 7: Imperial Dam to Southerly International Boundary" in Section 5.2.2.1 of the Draft BA, and in Section 4.2.2.1 of the Draft HCP. Accordingly, no analysis of Reach 2 or 6 is made in this evaluation.

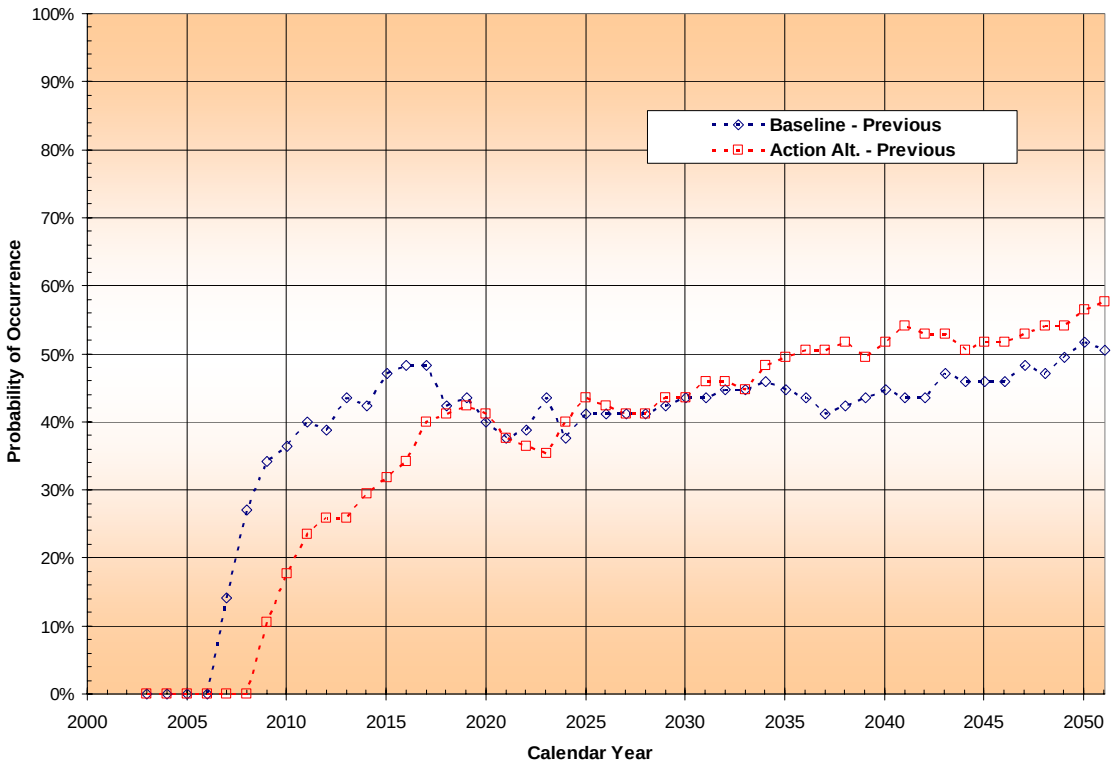
[14] Shortage determinations would result in reduced discharges from reservoir storage which would reduce flow in downstream river reaches, similar to the effect from changes in point of diversions.

to Davis Dam, up to 0.860 mafy in the river from Davis Dam to Parker Dam, and up to 1.574 mafy in the river from Parker Dam to Imperial Dam. The effect of the updated information does not change these analyzed amounts, but simply increases the probability that some of the analyzed amounts could be used to cover flow reduction due to shortage determinations. The hydrologic model described in Appendix J was used to quantify the effect of the updated information on the probability of future shortages.

7.2.1 Results from Previous Hydrologic Modeling

Figure 6 provides a graph of the probability of shortage under the Previous Modeling. The probability of shortage is computed by counting the number of modeled traces that incurred a shortage condition in each year and dividing by the total respective number of traces (85 traces under the Previous Modeling and 90 traces under the New Modeling, respectively). As shown in Figure 6, under the Baseline, the probability of shortage is about 48 percent in year 2016 and 2017. Thereafter, the probability varies between 38 percent and 52 percent through year 2051. By comparison, the Action Alternative shows a lower probability of shortage compared to the Baseline through year 2019. This is attributed both to the implementation of water transfers under the Action Alternative that reduce the call for surplus water from Lake Mead as explained

Figure 6
Previous Modeling
Probability of Shortage



in section 7.1.1, as well as the lower shortage elevation triggers used in the Action Alternative. The probability of shortage under the Baseline and Action Alternative is nearly the same from 2020 through 2033. The probability of shortage under the Action Alternative is somewhat higher (2 percent to 11 percent) after 2033. This higher probability can primarily be attributed to the extension of the ISG through 2051 under the Action Alternative.

7.2.2 Results from New Hydrologic Modeling

Data from the New Modeling was used to conduct a similar analysis as discussed above and is used to evaluate the effect of the updated information on the probability of future shortages. Figure 7 illustrates the probability of shortages under the New Modeling. This figure is similar to Figure 6 and compares the Baseline and Action Alternative based on the New Modeling.

Figure 7
New Modeling
Probability of Shortage

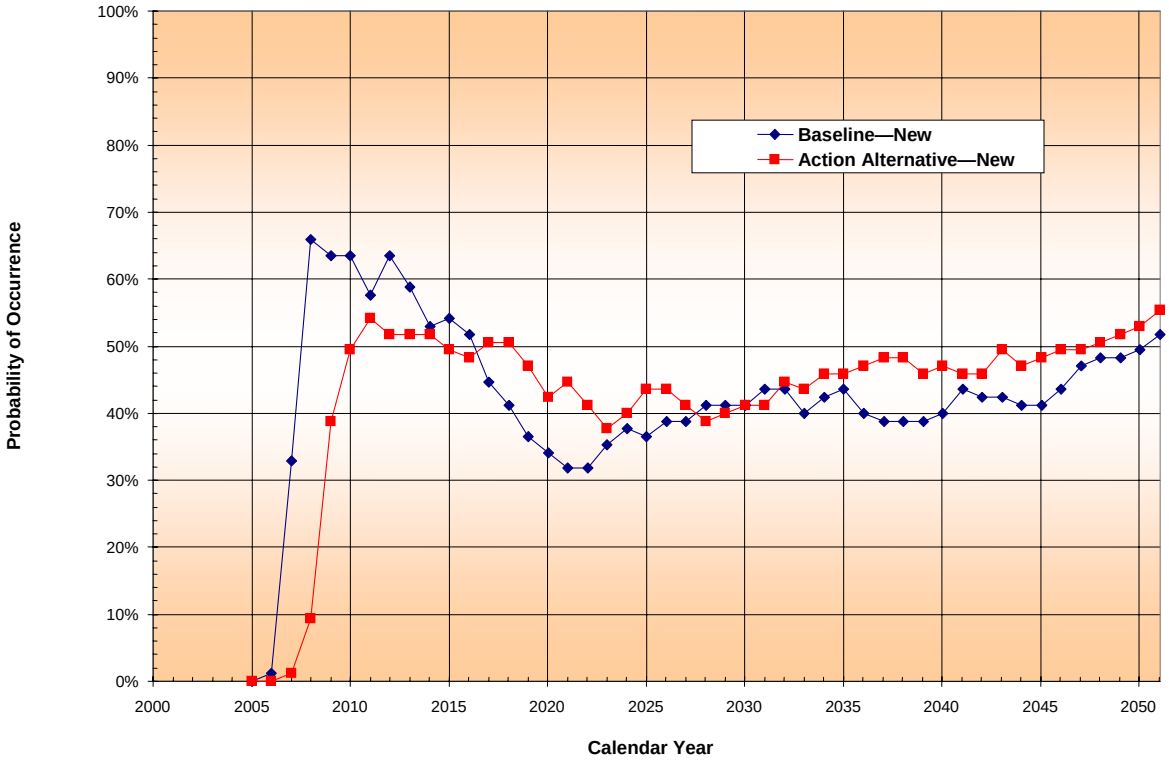


Figure 7 shows trends between the Baseline and Action Alternative under the New Modeling, similar to the trends observed under the Previous Modeling. The most noticeable difference between the data shown in Figures 6 and 7 is that, under the New Modeling, there is a higher probability of shortage during the initial years. This applies to both the Baseline and Action Alternative and

is attributed to the lower initial reservoir conditions that were considered in the New Modeling.

As seen under the Previous Modeling and explained in Section 7.2.1, the Action Alternative shows a lower probability level compared to the Baseline in the initial years (through year 2016). Except for a few years (2028 through 2032), the probability level is, in general, somewhat higher (1 percent to 13 percent) under the Action Alternative. This higher level of probability can primarily be attributed to the extension of the ISG through 2051 under the Action Alternative.

7.2.3 Comparison of Previous and New Hydrologic Modeling

Figure 8 provides a comparison of the probability of shortage under the Previous and New Modeling. As expected, the reduced reservoir starting elevations increase the probability of shortage in the near-term (2005–2018) for both the Baseline and Action Alternative under the New Modeling. In the later years, however, the effect of the lower initial reservoir elevations is negligible and the New Modeling shows a slight decrease in the probability of shortage for both Baseline and Action Alternative. This difference is attributed to the slight increase in the natural flows as described in Section 6.2.

Figure 8
Comparison of the New to Previous Modeling Results
Probability of Shortage

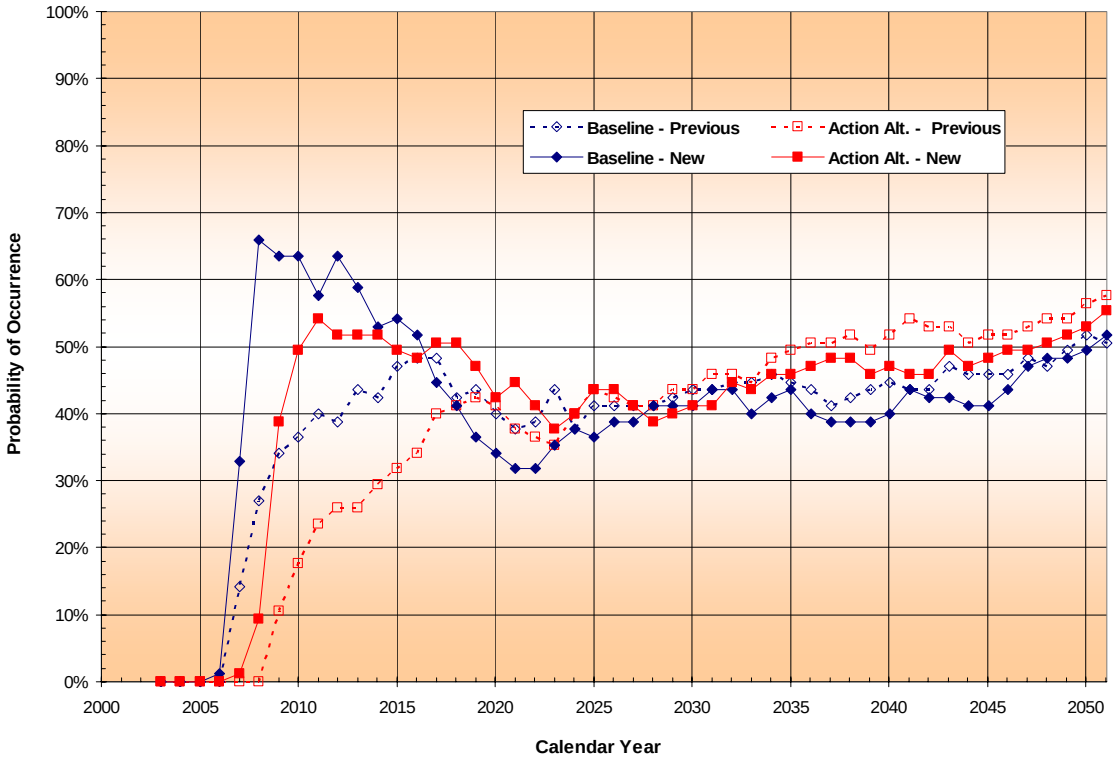


Table 4 provides a tabular comparison of the probability levels presented in Figure 8 and the relative differences due to the updated information are compared. Columns 4 and 7 of Table 4 compare the differences between the probability of shortage under the Baseline and Action Alternative under the Previous and New Modeling, respectively. In Column 8 of this same table, the relative differences between the New and Previous Modeling results are compared. Although the New Modeling reflects an increase in the probability of shortage conditions as compared to the Previous Modeling, the relationship between the Action Alternative and the Baseline remains essentially the same– (i.e. the probability of shortage is lower under the Action Alternative in the near term and slightly increased in the later years).

7.2.4 Analysis of Effect on Biological Resources

The covered activities described in the Draft BA/HCP allow for a reduction in flow of up to 0.845 mafy in the river from Hoover Dam to Davis Dam (Reach 2), up to 0.860 mafy in the river from Davis Dam to Parker Dam (Reach 3), and up to 1.574 mafy in the river from Parker Dam to Imperial Dam (Reaches 4 and 5). These reductions in flow could result from changes in the points of diversion, from shortage determinations, and/or from other covered activities as described in the Draft BA/HCP. Because the analysis assumes that the reduction of 1.574 maf occurs immediately, the timing of these shortages is irrelevant to the assessment of impacts (see Draft BA/HCP Section 5.2.1.3, "Key Assumptions Related to Groundwater Effects on Land Cover Types and Covered Species Habitat"). Nothing in the updated information analyzed as part of this evaluation changes the reduction in flow coverage as identified in the Draft BA/HCP.

Accordingly, the analysis of effects of the covered activities on surface water or groundwater levels is not affected by the New Modeling. Consequently, the effects of implementing flow-related covered activities on backwater, marsh, and cottonwood-willow land cover types that provide covered species habitat are the same as described for each of the covered species in the Draft BA/HCP. Thus, there is no change in the effect to the covered species and their habitat as a result of the updated hydrologic information.

Table 4
Comparison of New to Previous Modeling
Probability of Shortage

	Previous Modeling			New Modeling			
[1]	*[2]*	*[3]*	*[4]*	*[5]*	*[6]*	*[7]*	*[8]*
Year	Baseline	Action Alternative	Difference Between Baseline and Action Alternative	Baseline	Action Alternative	Difference Between Baseline and Action Alternative	Difference Between New and Previous Modeling
2003	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2004	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2005	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2006	0.0%	0.0%	0.0%	1.2%	0.0%	-1.2%	-1.2%
2007	14.1%	0.0%	-14.1%	32.9%	1.2%	-31.8%	-17.6%
2008	27.1%	0.0%	-27.1%	65.9%	9.4%	-56.5%	-29.4%
2009	34.1%	10.6%	-23.5%	63.5%	38.8%	-24.7%	-1.2%
2010	36.5%	17.6%	-18.8%	63.5%	49.4%	-14.1%	4.7%
2011	40.0%	23.5%	-16.5%	57.6%	54.1%	-3.5%	12.9%
2012	38.8%	25.9%	-12.9%	63.5%	51.8%	-11.8%	1.2%
2013	43.5%	25.9%	-17.6%	58.8%	51.8%	-7.1%	10.6%
2014	42.4%	29.4%	-12.9%	52.9%	51.8%	-1.2%	11.8%
2015	47.1%	31.8%	-15.3%	54.1%	49.4%	-4.7%	10.6%
2016	48.2%	34.1%	-14.1%	51.8%	48.2%	-3.5%	10.6%
2017	48.2%	40.0%	-8.2%	44.7%	50.6%	5.9%	14.1%
2018	42.4%	41.2%	-1.2%	41.2%	50.6%	9.4%	10.6%
2019	43.5%	42.4%	-1.2%	36.5%	47.1%	10.6%	11.8%
2020	40.0%	41.2%	1.2%	34.1%	42.4%	8.2%	7.1%
2021	37.6%	37.6%	0.0%	31.8%	44.7%	12.9%	12.9%
2022	38.8%	36.5%	-2.4%	31.8%	41.2%	9.4%	11.8%
2023	43.5%	35.3%	-8.2%	35.3%	37.6%	2.4%	10.6%
2024	37.6%	40.0%	2.4%	37.6%	40.0%	2.4%	0.0%
2025	41.2%	43.5%	2.4%	36.5%	43.5%	7.1%	4.7%
2026	41.2%	42.4%	1.2%	38.8%	43.5%	4.7%	3.5%
2027	41.2%	41.2%	0.0%	38.8%	41.2%	2.4%	2.4%
2028	41.2%	41.2%	0.0%	41.2%	38.8%	-2.4%	-2.4%
2029	42.4%	43.5%	1.2%	41.2%	40.0%	-1.2%	-2.4%
2030	43.5%	43.5%	0.0%	41.2%	41.2%	0.0%	0.0%
2031	43.5%	45.9%	2.4%	43.5%	41.2%	-2.4%	-4.7%
2032	44.7%	45.9%	1.2%	43.5%	44.7%	1.2%	0.0%
2033	44.7%	44.7%	0.0%	40.0%	43.5%	3.5%	3.5%
2034	45.9%	48.2%	2.4%	42.4%	45.9%	3.5%	1.2%
2035	44.7%	49.4%	4.7%	43.5%	45.9%	2.4%	-2.4%
2036	43.5%	50.6%	7.1%	40.0%	47.1%	7.1%	0.0%
2037	41.2%	50.6%	9.4%	38.8%	48.2%	9.4%	0.0%
2038	42.4%	51.8%	9.4%	38.8%	48.2%	9.4%	0.0%
2039	43.5%	49.4%	5.9%	38.8%	45.9%	7.1%	1.2%
2040	44.7%	51.8%	7.1%	40.0%	47.1%	7.1%	0.0%
2041	43.5%	54.1%	10.6%	43.5%	45.9%	2.4%	-8.2%
2042	43.5%	52.9%	9.4%	42.4%	45.9%	3.5%	-5.9%
2043	47.1%	52.9%	5.9%	42.4%	49.4%	7.1%	1.2%
2044	45.9%	50.6%	4.7%	41.2%	47.1%	5.9%	1.2%
2045	45.9%	51.8%	5.9%	41.2%	48.2%	7.1%	1.2%
2046	45.9%	51.8%	5.9%	43.5%	49.4%	5.9%	0.0%
2047	48.2%	52.9%	4.7%	47.1%	49.4%	2.4%	-2.4%
2048	47.1%	54.1%	7.1%	48.2%	50.6%	2.4%	-4.7%
2049	49.4%	54.1%	4.7%	48.2%	51.8%	3.5%	-1.2%
2050	51.8%	56.5%	4.7%	49.4%	52.9%	3.5%	-1.2%
2051	50.6%	57.6%	7.1%	51.8%	55.3%	3.5%	-3.5%

7.3 EFFECT ON REACH 7[15]

This analysis discusses the potential effects of the updated information on covered species in Reach 7, which extends from the Northerly International Boundary (NIB) to the Southerly International Boundary (SIB). As discussed in Appendix L, water flowing into Reach 7 is controlled by Mexico's operation of the Morelos Diversion Dam located at the upper end of Reach 7. Currently, water generally only flows into Reach 7 under the following conditions: (1) the result of seepage from Morelos Diversion Dam; (2) flow releases from Morelos Diversion Dam (flood releases from the LCR and Gila River, and excess water Mexico does not divert); (3) return flows from canal wasteways in the United States side; and (4) groundwater accumulation from both the United States and Mexico.

As noted in Chapter 5 of the Draft BA, Chapter 4 of the Draft HCP, and Appendix L, flood control releases on the mainstem are dictated by the flood control regulations established by the U.S. Army Corps of Engineers for Lake Mead/Hoover Dam and are highly dependent on hydrologic conditions. For modeling purposes it is assumed Mexico can schedule up to 200,000 acre-feet per year (afy) over its annual allotment (pursuant to Section 3, Article 10, of the 1944 Water Treaty) during years when flood control releases occur. However, these flood control releases are typically of such magnitude that they cannot be diverted at Morelos Diversion Dam. In this document, these resulting flows in Reach 7 are termed "excess flows below Morelos Diversion Dam."

7.3.1 Results from Previous Hydrologic Modeling

The previous analysis of potential effects of the LCR MSCP on Reach 7 was summarized in Appendix L. This previous analysis was based on a comparison of future operations under Baseline and Action Alternative using the Previous Modeling. A similar analysis has been conducted for this evaluation using the New Modeling and is used to evaluate the effects of the updated hydrologic information.

As more fully discussed in Appendix L, both the frequency and magnitude of excess flows are considered important factors in restoring and maintaining riparian habitat below Morelos Diversion Dam. Mexico's management decisions at and below Morelos Diversion Dam are not modeled because of the uncertainty of what Mexico chooses to do with any water that arrives at Morelos Diversion Dam that is in excess of their allotment.[16] As such, this evaluation and the previous analyses assume that any water in excess of

[15] See footnote 11 for discussion of Reach 6.

[16] Mexico is entitled to manage and divert any quantity of water arriving at the Mexican points of diversion pursuant to Section 3, Article 10 (b) of the 1944 Water Treaty.

Mexico's scheduled normal or surplus deliveries are flows that would not be diverted by Mexico and would continue down the LCR channel below Morelos Diversion Dam through Reach 7. This assumption is necessary to be able to model the quantities of water that have the potential to flow past Morelos Diversion Dam. In actual practice, however, Mexico may divert some portion of these excess flows.

The relative differences in the probability of occurrence of flows greater than a specified volume (differences between Baseline and Action Alternative) were evaluated, as was done in the Draft BA/HCP. For this analysis, three different magnitudes or annual volumes were considered; (1) flows of any magnitude, (2) flows of greater than 250,000 acre-feet, and (3) flows of greater than 1,000,000 acre-feet. Reclamation has utilized these different flows in a number of recent environmental analyses. A volume of 250,000 acre-feet was selected because this flow volume is near the amount generally believed to be required for the scouring action needed for regeneration of riparian habitat in the river corridor in Reach 7. A volume greater than 1,000,000 acre-feet was selected because this flow volume is believed to have significantly improved habitat in Reach 7 in the past. These flows provided scouring action to promote new vegetation when the water receded, and provided essential moisture over a longer duration that benefited existing vegetation.

The potential for future excess flows of any magnitude under the Previous Modeling to Reach 7 is shown in the top graph of Figure 9. The probability of occurrence is computed by counting the number of modeled traces for each year that has excess annual flows and dividing by the total respective number of traces (85 traces under the Previous Modeling and 90 traces under the New Modeling). As shown in Figure 9, under Baseline, the maximum probability of occurrence of excess flows is about 21 percent and that occurs in year 2018. Thereafter, the probability follows a gradual declining trend through year 2051. This declining trend can be attributed to the increasing Upper Basin depletions. Under Baseline, the frequency of occurrence of any magnitude flow declines to about 15 percent in 2051. By comparison, the Action Alternative shows a slightly higher probability level compared to the Baseline through year 2019. This higher level of probability can be attributed to the implementation of water transfers on the LCR that reduce the call for surplus water from Lake Mead, resulting in somewhat higher Lake Mead levels. With higher Lake Mead levels, the probability of flood control releases increases. After 2019, the probability of occurrence of excess flows of any magnitude for the Baseline is equal to or is slightly less than under the Action Alternative.

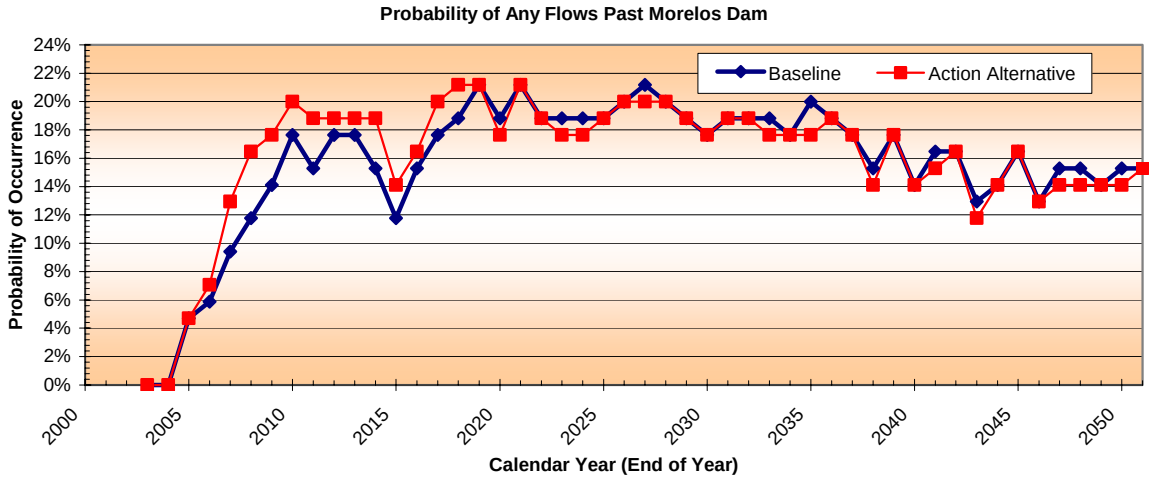
The middle graph in Figure 9 shows the probability under Previous Modeling of occurrence of excess flows of 250,000 acre-feet or greater, and the lower

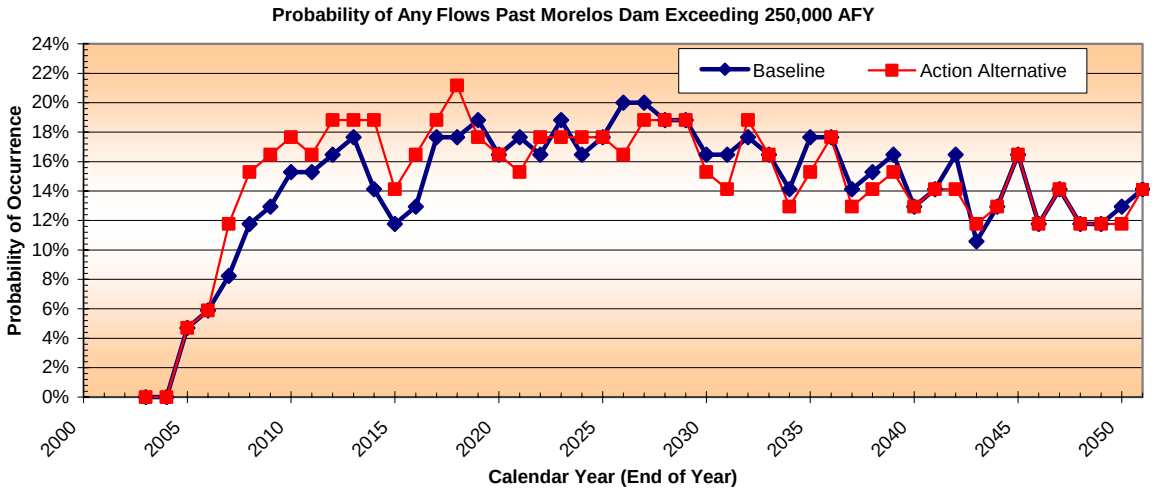
graph in Figure 9 shows the probability of occurrence of excess flows of 1,000,000 acre-feet or greater past Morelos Diversion Dam under the Baseline and Action Alternative.

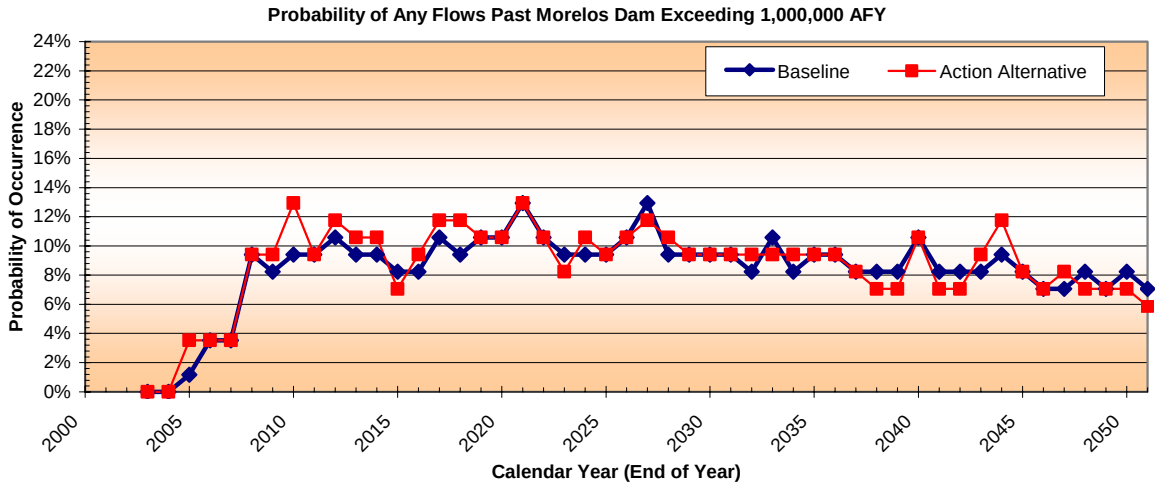
As illustrated in Figure 9, the probability of excess flows under the Baseline exceeding 250,000 acre-feet is a maximum of 20 percent in 2026 and then gradually declines to about 14 percent in 2051. Similar to the analysis of the probability of occurrence of any size flows past Morelos Diversion Dam, the Action Alternative shows a slightly higher level of probability of occurrence compared to the Baseline through about 2019. After 2019, the probability of occurrence of excess flows for the Baseline is equal to or is slightly less than under the Action Alternative. Note that probability of occurrence is generally the same for flows of any magnitude and for flows of greater than 250,000 acre-feet and the same general trend occurs for both the Baseline and Action Alternative. Again, this happens because the occurrence of excess flows is directly related to the flood control releases from Lake Mead. These conditions are largely the result of hydrologic conditions (high-flow years coupled with higher reservoir levels) and when they occur, the respective flows are generally larger than 250,000 acre-feet.

Similar patterns and trends are observed in the lower graph of Figure 9, which shows the probability of flows past Morelos Diversion Dam exceeding 1,000,000 acre-feet under the Previous Modeling. However, the probability levels are somewhat lower than those shown in the top and middle graph, showing that there are some flood control releases that are not of magnitude 1,000,000 acre-feet or greater. However, the same relative differences between the Baseline and Action Alternative occur in all three graphs in Figure 9. This is because the actions considered under the Action Alternative have a minimal effect on excess flows past Morelos Diversion Dam, again because those occurrences are largely hydrologically driven.

Figure 9
Previous Modeling
Probability of Flows Past Morelos Diversion Dam







7.3.2 Results from New Hydrologic Modeling

Data from the New Modeling was used to conduct a similar analysis as discussed above and is used to evaluate the effect of the updated hydrologic information on Reach 7. Figure 10 illustrates the probability of excess flows past Morelos Diversion Dam under the New Modeling. This figure is similar to Figure 9 and compares the Baseline and Action Alternative based on the New Modeling for 1) flows of any magnitude, 2) flows of greater than 250,000 acre-feet, and 3) flows of greater than 1,000,000 acre-feet. A comparison of the three graphs on Figure 10 to those of Figure 9 shows that similar probability levels and similar trends occur under the Previous and New Modeling. The most noticeable difference is that, under the New Modeling, there is a lower level of probability of excess flows during the initial years for all flow magnitudes. This applies to both the Baseline and Action Alternative. This can be entirely attributed to the lower initial reservoir conditions that were considered in the New Modeling. With the current lower reservoir water levels, the probability of flood control releases is reduced since there is a large amount of vacant storage capacity system-wide that will need to be filled before flood control release conditions are reached at Lake Mead. The effect of the lower initial reservoir conditions becomes negligible after year 2014.

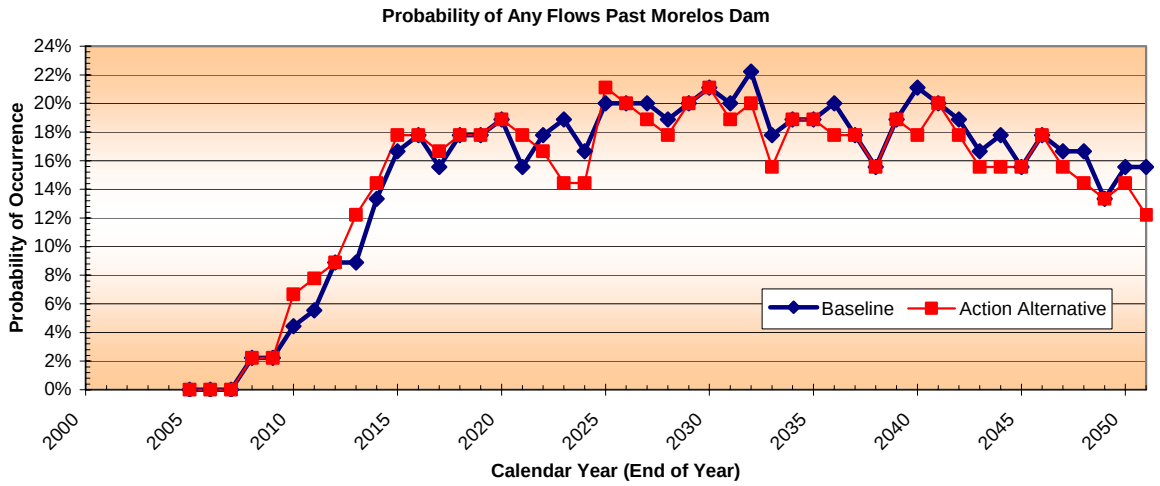
Another observation from Figure 10 is that the differences between the Baseline and Action Alternative under the New Modeling are very similar to those previously described for the Previous Modeling.

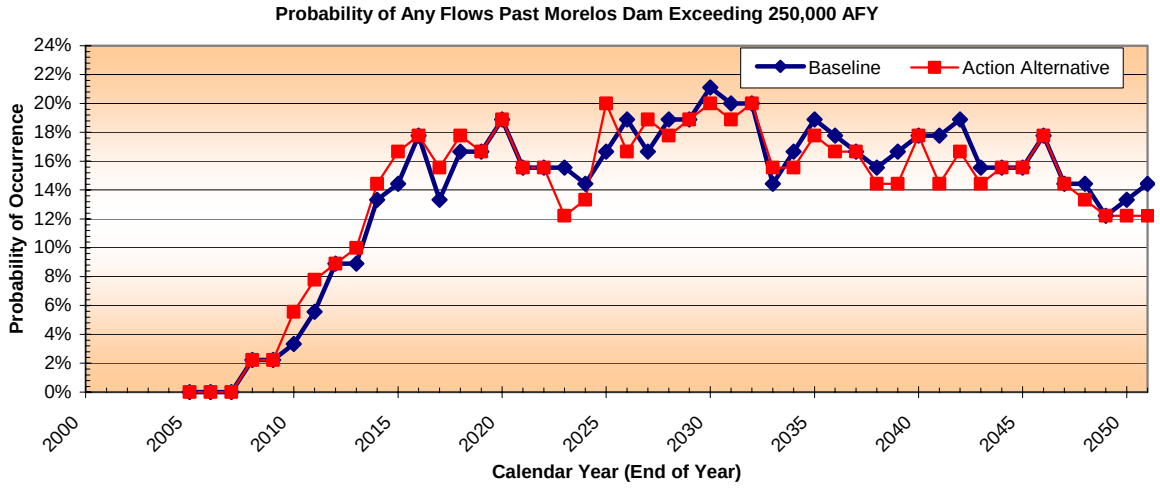
7.3.3 Comparison of the Previous and New Hydrologic Modeling

Figure 11 provides a graphical comparison of the probability levels presented in Figures 9 and 10. Tables 5, 6 and 7 provide a tabular comparison of the probability levels presented in Figures 9 and 10. Specifically, Table 5 compares the probability of occurrence of flows past Morelos Diversion Dam of any magnitude (volume) under the Previous and New Modeling. Table 6 compares the probability of occurrence of flows past Morelos Diversion Dam exceeding 250,000 acre-feet and Table 7 compares the probability of occurrence of flows past Morelos Diversion Dam exceeding 1,000,000 acre-feet under the Previous and New Modeling.

Under both the Previous and New Modeling, the Action Alternative provides the same or slightly higher probabilities than the Baseline through about 2019. After 2019, the probability of occurrence of excess flows for the Baseline is equal to or is slightly less than under the Action Alternative under both the Previous and New Modeling.

Figure 10
New Modeling
Probability of Flows Past Morelos Diversion Dam





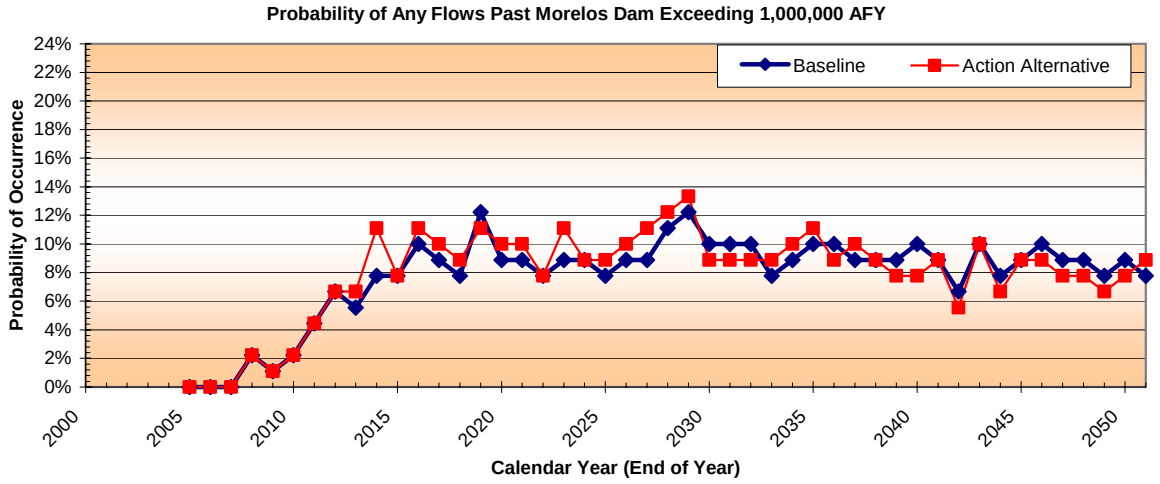
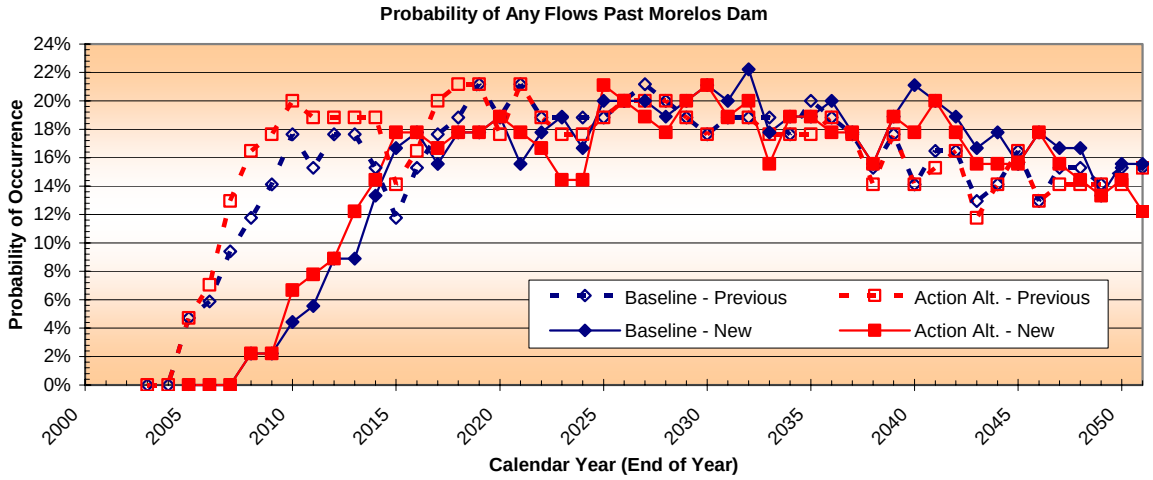
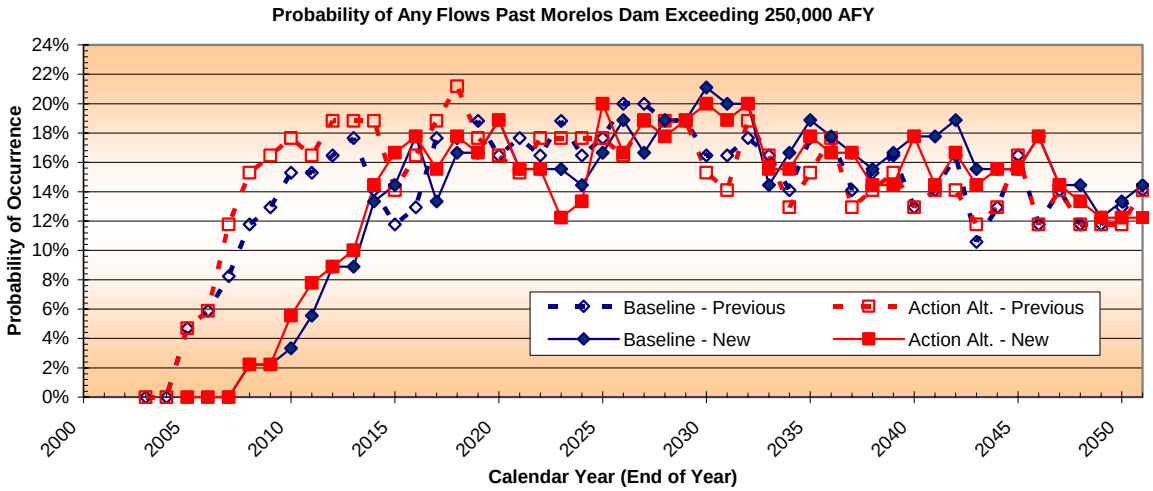


Figure 11
Comparison of New to Previous Modeling
Probability of Flows Past Morelos Diversion Dam





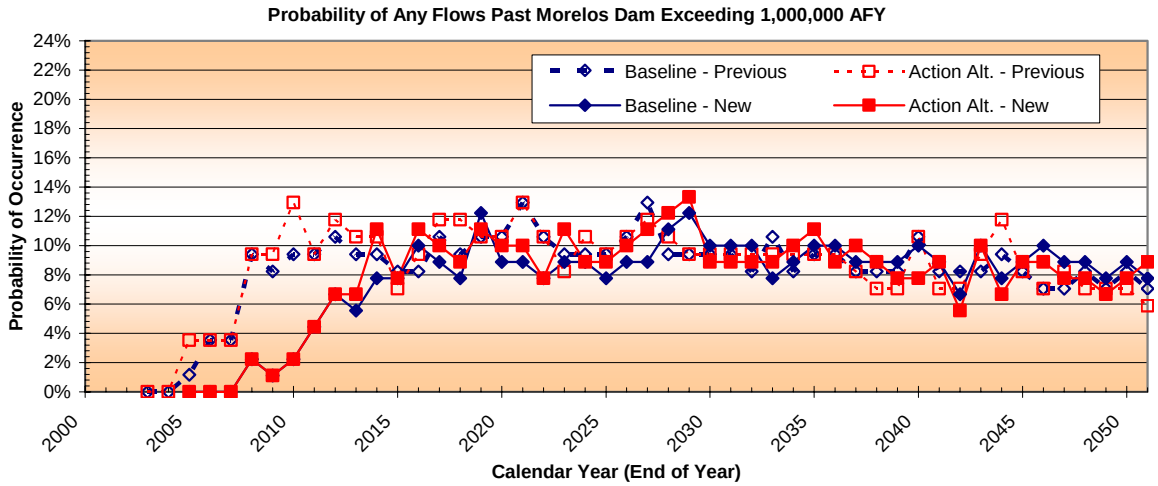


Table 5
Comparison of New to Previous Modeling
Probability of Any Flows Past Morelos Diversion Dam[17]

[1]		Previous Modeling				New Modeling				
		[2]	[3]	[4]		[5]	[6]	[7]		[8]
Year		Baseline	Action Alternative	Difference Between Baseline and Action Alternative		Baseline	Action Alternative	Difference Between Baseline and Action Alternative		Difference Between New and Previous Modeling
2003		0%	0%	0%						
2004		0%	0%	0%						
2005		5%	5%	0%		0%	0%	0%		0%
2006		6%	7%	1%		0%	0%	0%		-1%
2007		9%	13%	4%		0%	0%	0%		-4%
2008		12%	16%	5%		2%	2%	0%		-5%
2009		14%	18%	4%		2%	2%	0%		-4%
2010		18%	20%	2%		4%	7%	2%		0%
2011		15%	19%	4%		6%	8%	2%		-1%
2012		18%	19%	1%		9%	9%	0%		-1%
2013		18%	19%	1%		9%	12%	3%		2%
2014		15%	19%	4%		13%	14%	1%		-2%
2015		12%	14%	2%		17%	18%	1%		-1%
2016		15%	16%	1%		18%	18%	0%		-1%
2017		18%	20%	2%		16%	17%	1%		-1%
2018		19%	21%	2%		18%	18%	0%		-2%
2019		21%	21%	0%		18%	18%	0%		0%
2020		19%	18%	-1%		19%	19%	0%		1%
2021		21%	21%	0%		16%	18%	2%		2%
2022		19%	19%	0%		18%	17%	-1%		-1%
2023		19%	18%	-1%		19%	14%	-4%		-3%
2024		19%	18%	-1%		17%	14%	-2%		-1%
2025		19%	19%	0%		20%	21%	1%		1%
2026		20%	20%	0%		20%	20%	0%		0%
2027		21%	20%	-1%		20%	19%	-1%		0%
2028		20%	20%	0%		19%	18%	-1%		-1%
2029		19%	19%	0%		20%	20%	0%		0%
2030		18%	18%	0%		21%	21%	0%		0%
2031		19%	19%	0%		20%	19%	-1%		-1%
2032		19%	19%	0%		22%	20%	-2%		-2%
2033		19%	18%	-1%		18%	16%	-2%		-1%
2034		18%	18%	0%		19%	19%	0%		0%
2035		20%	18%	-2%		19%	19%	0%		2%
2036		19%	19%	0%		20%	18%	-2%		-2%
2037		18%	18%	0%		18%	18%	0%		0%
2038		15%	14%	-1%		16%	16%	0%		1%
2039		18%	18%	0%		19%	19%	0%		0%
2040		14%	14%	0%		21%	18%	-3%		-3%
2041		16%	15%	-1%		20%	20%	0%		1%
2042		16%	16%	0%		19%	18%	-1%		-1%
2043		13%	12%	-1%		17%	16%	-1%		0%
2044		14%	14%	0%		18%	16%	-2%		-2%
2045		16%	16%	0%		16%	16%	0%		0%
2046		13%	13%	0%		18%	18%	0%		0%
2047		15%	14%	-1%		17%	16%	-1%		0%
2048		15%	14%	-1%		17%	14%	-2%		-1%
2049		14%	14%	0%		13%	13%	0%		0%
2050		15%	14%	-1%		16%	14%	-1%		0%
2051		15%	15%	0%		16%	12%	-3%		-3%

[17] Although the modeling results are at a high precision, differences presented in this table reflect rounding to the nearest integer value.

Table 6
Comparison of New to Previous Modeling
Probability of Flows Past Morelos Diversion Dam Exceeding 250,000 Acre-Feet[18]

		Previous Modeling				New Modeling				
[1]		*[2]*	*[3]*	*[4]*		*[5]*	*[6]*	*[7]*		*[8]*
Year		Baseline	Action Alternative	Difference Between Baseline and Action Alternative		Baseline	Action Alternative	Difference Between Baseline and Action Alternative		Difference Between New and Previous Modeling
2003		0%	0%	0%						
2004		0%	0%	0%						
2005		5%	5%	0%		0%	0%	0%		0%
2006		6%	6%	0%		0%	0%	0%		0%
2007		8%	12%	4%		0%	0%	0%		-4%
2008		12%	15%	4%		2%	2%	0%		-4%
2009		13%	16%	4%		2%	2%	0%		-4%
2010		15%	18%	2%		3%	6%	2%		0%
2011		15%	16%	1%		6%	8%	2%		1%
2012		16%	19%	2%		9%	9%	0%		-2%
2013		18%	19%	1%		9%	10%	1%		0%
2014		14%	19%	5%		13%	14%	1%		-4%
2015		12%	14%	2%		14%	17%	2%		0%
2016		13%	16%	4%		18%	18%	0%		-4%
2017		18%	19%	1%		13%	16%	2%		1%
2018		18%	21%	4%		17%	18%	1%		-2%
2019		19%	18%	-1%		17%	17%	0%		1%
2020		16%	16%	0%		19%	19%	0%		0%
2021		18%	15%	-2%		16%	16%	0%		2%
2022		16%	18%	1%		16%	16%	0%		-1%
2023		19%	18%	-1%		16%	12%	-3%		-2%
2024		16%	18%	1%		14%	13%	-1%		-2%
2025		18%	18%	0%		17%	20%	3%		3%
2026		20%	16%	-4%		19%	17%	-2%		1%
2027		20%	19%	-1%		17%	19%	2%		3%
2028		19%	19%	0%		19%	18%	-1%		-1%
2029		19%	19%	0%		19%	19%	0%		0%
2030		16%	15%	-1%		21%	20%	-1%		0%
2031		16%	14%	-2%		20%	19%	-1%		1%
2032		18%	19%	1%		20%	20%	0%		-1%
2033		16%	16%	0%		14%	16%	1%		1%
2034		14%	13%	-1%		17%	16%	-1%		0%
2035		18%	15%	-2%		19%	18%	-1%		1%
2036		18%	18%	0%		18%	17%	-1%		-1%
2037		14%	13%	-1%		17%	17%	0%		1%
2038		15%	14%	-1%		16%	14%	-1%		0%
2039		16%	15%	-1%		17%	14%	-2%		-1%
2040		13%	13%	0%		18%	18%	0%		0%
2041		14%	14%	0%		18%	14%	-3%		-3%
2042		16%	14%	-2%		19%	17%	-2%		0%
2043		11%	12%	1%		16%	14%	-1%		-2%
2044		13%	13%	0%		16%	16%	0%		0%
2045		16%	16%	0%		16%	16%	0%		0%
2046		12%	12%	0%		18%	18%	0%		0%
2047		14%	14%	0%		14%	14%	0%		0%
2048		12%	12%	0%		14%	13%	-1%		-1%
2049		12%	12%	0%		12%	12%	0%		0%
2050		13%	12%	-1%		13%	12%	-1%		0%
2051		14%	14%	0%		14%	12%	-2%		-2%

[18] Although the modeling results are at a high precision, differences presented in this table reflect rounding to the nearest integer value

Table 7
Comparison of New to Previous Modeling
Probability of Flows Past Morelos Diversion Dam Exceeding 1,000,000 Acre-Feet[19]

		Previous Modeling				New Modeling				
[1]		*[2]*	*[3]*	*[4]*		*[5]*	*[6]*	*[7]*		*[8]*
Year		**Baseline**	**Action Alternative**	**Difference Between Baseline and Action Alternative**		**Baseline**	**Action Alternative**	**Difference Between Baseline and Action Alternative**		**Difference Between New and Previous Modeling**
2003		0%	0%	0%						
2004		0%	0%	0%						
2005		1%	4%	2%		0%	0%	0%		-2%
2006		4%	4%	0%		0%	0%	0%		0%
2007		4%	4%	0%		0%	0%	0%		0%
2008		9%	9%	0%		2%	2%	0%		0%
2009		8%	9%	1%		1%	1%	0%		-1%
2010		9%	13%	4%		2%	2%	0%		-4%
2011		9%	9%	0%		4%	4%	0%		0%
2012		11%	12%	1%		7%	7%	0%		-1%
2013		9%	11%	1%		6%	7%	1%		0%
2014		9%	11%	1%		8%	11%	3%		2%
2015		8%	7%	-1%		8%	8%	0%		1%
2016		8%	9%	1%		10%	11%	1%		0%
2017		11%	12%	1%		9%	10%	1%		0%
2018		9%	12%	2%		8%	9%	1%		-1%
2019		11%	11%	0%		12%	11%	-1%		-1%
2020		11%	11%	0%		9%	10%	1%		1%
2021		13%	13%	0%		9%	10%	1%		1%
2022		11%	11%	0%		8%	8%	0%		0%
2023		9%	8%	-1%		9%	11%	2%		3%
2024		9%	11%	1%		9%	9%	0%		-1%
2025		9%	9%	0%		8%	9%	1%		1%
2026		11%	11%	0%		9%	10%	1%		1%
2027		13%	12%	-1%		9%	11%	2%		3%
2028		9%	11%	1%		11%	12%	1%		0%
2029		9%	9%	0%		12%	13%	1%		1%
2030		9%	9%	0%		10%	9%	-1%		-1%
2031		9%	9%	0%		10%	9%	-1%		-1%
2032		8%	9%	1%		10%	9%	-1%		-2%
2033		11%	9%	-1%		8%	9%	1%		2%
2034		8%	9%	1%		9%	10%	1%		0%
2035		9%	9%	0%		10%	11%	1%		1%
2036		9%	9%	0%		10%	9%	-1%		-1%
2037		8%	8%	0%		9%	10%	1%		1%
2038		8%	7%	-1%		9%	9%	0%		1%
2039		8%	7%	-1%		9%	8%	-1%		0%
2040		11%	11%	0%		10%	8%	-2%		-2%
2041		8%	7%	-1%		9%	9%	0%		1%
2042		8%	7%	-1%		7%	6%	-1%		0%
2043		8%	9%	1%		10%	10%	0%		-1%
2044		9%	12%	2%		8%	7%	-1%		-3%
2045		8%	8%	0%		9%	9%	0%		0%
2046		7%	7%	0%		10%	9%	-1%		-1%
2047		7%	8%	1%		9%	8%	-1%		-2%
2048		8%	7%	-1%		9%	8%	-1%		0%
2049		7%	7%	0%		8%	7%	-1%		-1%
2050		8%	7%	-1%		9%	8%	-1%		0%
2051		7%	6%	-1%		8%	9%	1%		2%

[19] Although the modeling results are at a high precision, differences presented in this table reflect rounding to the nearest integer value

As noted before, the most noticeable difference is that under the New Modeling there is a lower level of probability of excess flows during the initial years for all flow magnitudes. This is attributed to the lower initial reservoir conditions that were considered in the New Modeling. The effect of the lower initial reservoir conditions becomes negligible after year 2014. This applies to both the Baseline and Action Alternative.

7.3.4 Analysis of Effect on Biological Resources

Excess flows below Morelos Diversion Dam are a potential mechanism for creating soil moisture conditions necessary for the natural establishment of cottonwood and willow trees that provide habitat for cottonwood-willow associated covered species. Based on the Previous Modeling, the Draft BA/HCP indicated that implementation of the flow-related covered activities was not expected to measurably affect river channel conditions in Reach 7. As described in Section 7.3.2, results of the New Modeling indicate somewhat lower probabilities for flows passing Morelos Diversion Dam during the initial years (Tables 5, 6, and 7). This is attributed to the lower initial reservoir conditions that were considered in the New Modeling. However, under both the Previous and New Modeling, the Action Alternative provides the same slightly higher probabilities than Baseline through about year 2019. Thereafter, the probability of flows passing Morelos Diversion Dam under the Action Alternative is equal to or is slightly less than under the Baseline, under both the Previous and New Modeling.

The change in probabilities for excess flows below Morelos Diversion Dam with implementation of the Action Alternative between the Previous Modeling and the New Modeling are minimal and would not change the effects on covered species habitats as described in the Draft BA/HCP.

8. CONCLUSIONS

This evaluation concludes that the inclusion of this updated hydrologic information does not identify any significant new impacts or change the conclusions of effect to covered species in the Draft BA/HCP, and no changes are required to the BA, HCP, or EIS/EIR.

8.1 LAKE MEAD WATER SURFACE ELEVATIONS

8.1.1 Riparian Vegetation

Because of the lower Lake Mead initial conditions, the New Modeling (for the 50th percentile) indicates an increased probability of lower lake elevations until year 2024 (as compared to the Previous Modeling) and thereafter the probabilities are approximately the same. This would indicate that during the first 25 years, the probabilities for covered species habitat establishment may

be slightly more limited in those years. Overall, however, the habitat quantity and quality would not be significantly different over the 50-year period.

Results of the New Modeling indicate that the impacts of implementing the covered activities on covered species that use riparian vegetation in delta areas of Lake Mead would not be measurably different from that described in the Draft BA/HCP under the Previous Modeling. This is because the impact mechanisms associated with the creation and loss of riparian vegetation are the same under the New and Previous Modeling, the only difference being that riparian vegetation could be established at lower elevations under the New Modeling. The extent of exposed soils suitable for establishment of riparian vegetation could be slightly less, however, at lower elevations.

8.1.2 Marsh Vegetation

Because of the lower Lake Mead initial conditions, the New Modeling (for the 50th percentile) indicates an increased probability of lower lake elevations until year 2024 (as compared to the Previous Modeling), and thereafter the probabilities are approximately the same. This would indicate that during the first 25 years, the probabilities for the establishment of marsh vegetation that provides covered species habitat may be slightly more limited. Overall, however, the extent and value of marsh vegetation that could provide covered species habitat under the New Modeling would not be significantly different than under the Previous Modeling.

Results of the New Modeling indicate that the impacts of implementing the covered activities on covered species that use marsh vegetation would not be measurably different from those described in the Draft BA/HCP under the Previous Modeling. This is because the impact mechanisms associated with the creation and loss of marsh vegetation are the same under the New and Previous Modeling, the only difference being that marsh vegetation could be established at lower elevations under the New Modeling. The extent of exposed soils suitable for establishment of marsh vegetation could be slightly less, however, at lower elevations.

8.1.3 Razorback Sucker

The results of the New Modeling do not indicate that the impacts of implementing the covered activities on the razorback sucker would be measurably different than those described in the Draft BA/HCP. With substantial recent declines in reservoir elevations, the razorback sucker has demonstrated the ability to successfully spawn on suitable substrates present at lower reservoir elevations when previously used spawning habitat is exposed and no longer available. Therefore, we conclude that spawning

behavior and success would be similar under both the Previous and New Modeling.

8.1.4 Transitory River Segments

The presence and extent of transitory river segments might occur more frequently under the New Modeling due to the potentially lower reservoir elevations as described in Section 7.1. Consequently, the benefits associated with creating transitory river segments that provide humpback chub and flannelmouth sucker habitat may be somewhat greater under the New Modeling assumptions than under the Previous Modeling assumptions. However, these potential beneficial effects are not considered significant because the probabilities of the entire transitory river channel becoming available at the 950 feet msl lake level are extremely low under both the Previous and New Modeling, and because such benefits would be ephemeral in nature.

8.1.5 Sticky Buckwheat and Threecorner Milkvetch

The presence and extent of exposed suitable soils that can support sticky buckwheat and threecorner milkvetch might occur more frequently under the New Modeling due to the lower reservoir elevations as described in Section 7.1. Consequently, the benefits associated with exposing suitable soils for these plant species might be somewhat greater under the New Modeling assumptions than under the Previous Modeling assumptions. However, these potential beneficial effects are not considered significant due to the ephemeral nature of any potential benefits.

8.2 EFFECT ON THE RIVER CORRIDOR

The analysis of effects of the covered activities on surface water or groundwater levels is not affected by the New Modeling. Consequently, the effects of implementing flow-related covered activities on backwater, marsh, and cottonwood-willow land cover types that provide covered species habitat are the same as described for each of the covered species in the Draft BA/HCP. Accordingly, there is no change in the effect to the covered species and their habitat as a result of the updated hydrologic information.

8.3 EFFECT ON FLOWS IN REACH 7

Results of the New Modeling indicate somewhat lower probabilities for flows passing Morelos Diversion Dam during the initial years (Tables 5, 6, and 7). This is attributed to the lower initial reservoir conditions that were considered in the New Modeling. However, under both the Previous and New Modeling, the Action Alternative provides the same slightly higher probabilities than Baseline through about year 2019. Thereafter, the probability of flows passing Morelos Diversion

Dam under the Action Alternative is equal to or is slightly less than under the Baseline, under both the Previous and New Modeling.

The change in probabilities for excess flows below Morelos Diversion Dam with implementation of the Action Alternative between the Previous Modeling and the New Modeling are minimal and would not change the effects on covered species habitats as described in the Draft BA/HCP.

9. REFERENCES

McKernan, R. L. 1997. *Status, distribution, and habitat affinities of the southwestern willow flycatcher along the lower Colorado River: Year 1 – 1996.* Prepared for U.S. Bureau of Reclamation, Lower Colorado River Region, Boulder City, NV, and U.S. Fish and Wildlife Service, Carlsbad Field Office, Carlsbad, CA.

McKernan, R. L., and G. Braden. 1998. *Status, distribution, and habitat affinities of the southwestern willow flycatcher along the LCR: Year 2-1997.* Prepared for U.S. Bureau of Reclamation, Lower Colorado River Region, Boulder City, NV, and U.S. Fish and Wildlife Service, Carlsbad Field Office, Carlsbad, CA.

Twichell, D.C. and M.J. Rudin. 1999. *Surficial geology and distribution of post-impoundment sediment of the western part of lake mead based on a sidescan sonar and high-resolution seismic-reflection survey.* Based on U.S. Geological Survey Open-File Report 99-581. Available: <http://pubs.usgs.gov/of/of99-581/>. Accessed: August 14, 2003.

Welker, T.L. and P.B. Holden. 2004. Razorback sucker studies on Lake Mead, Nevada and Arizona: 2003-2004 Draft Annual Report (PR-578-8). Prepared for Southern Nevada Water Authority, Department of Resources, Las Vegas, NV.

10. PERSONAL COMMUNICATIONS

Braden, G. and R.L. McKernan. unpublished report. Status, distribution, and habitat affinities of the southwestern willow flycatcher along the lower Colorado River: Year 7--2002. Prepared for U.S. Bureau of Reclamation, Lower Colorado River Region, Boulder City, NV, and U.S. Fish and Wildlife Service, Carlsbad Field Office, Carlsbad, CA.

USBR unpublished data 2004. John Swett, Wildlife Biologist, USBR Lower Colorado Resource Management Office, unpublished field report. Braden, et al. unpublished data 2002.

11. ACRONYMS

afy	acre-feet per year
BA	Biological Assessment
CEQ	Council on Environmental Quality

CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Federal Endangered Species Act
FR	Federal Register
HCP	Habitat Conservation Plan
ISG	Interim Surplus Guidelines
ISM	Index Sequential Method
kaf	thousand acre-feet
LCR	Lower Colorado River
LCR MSCP	Lower Colorado River Multi-Species Habitat Conservation Plan
msl	mean sea level
maf	million acre-feet
mafy	million acre-feet per year
NEPA	National Environmental Policy Act
NIB	Northerly International Boundary
SIB	Southerly International Boundary
USBR	U.S. Bureau of Reclamation

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Section IV

Public Comment Letters

FEDERAL AGENCIES

Comment Letters

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

August 19, 2004

Glen Gould
U.S. Bureau of Reclamation
P.O. Box 61470 - LC - 2011
Boulder City, NV 89006-1470

Subject: Draft Environmental Impact Statement (DEIS) for the Lower Colorado River Multi-Species Conservation Program (CEQ #040277)

Dear Mr. Gould:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) and Section 309 of the Clean Air Act.

The programmatic DEIS evaluates the impacts of implementing the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) in the planning area from Lake Mead to the Southerly International Boundary with Mexico. EPA is very supportive of the habitat restoration efforts planned by this program, and commends the lead agencies for developing a well-written document that establishes baseline requirements for future individual restoration projects. EPA-1

Based on our review, we have rated the DEIS as Environmental Concerns - Insufficient Information (EC-2). We have concerns with meeting National Ambient Air Quality Standards (NAAQS) for particulate matter, effects of chemical contaminants on backwater biota, potential impacts of water diversions, and outreach to environmental justice populations. We also suggest additional information be provided on revised NAAQS, future actions required for specific projects, and funding of the MSCP. Please see the enclosed Detailed Comments for a description of these concerns and our recommendations. A *Summary of EPA Rating Definitions* is also enclosed. EPA-2

Due to the scope of this project, the planning area of the LCR MSCP does not include the entire Colorado River ecosystem, something that is necessary to effectively conserve and restore habitat along the entire river corridor. EPA recommends that as the MSCP is implemented, program participants look for ways to coordinate and integrate with restoration efforts in the Upper Colorado River Basin and in the Colorado River Delta. EPA-3a EPA-3b

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We appreciate the opportunity to review this DEIS. When the Final EIS is released for public review, please send one copy to the address above (mail code: CMD-2). If you have any questions, please contact me or David P. Schmidt, the lead reviewer for this project. David can be reached at 415-972-3792 or schmidt.davidp@epa.gov. EPA-4

Sincerely,

Lisa B. Hanf, Manager
Federal Activities Office
Cross Media Division

Enclosures:
EPA's Detailed Comments
Summary of EPA Rating Definitions

cc: Steve Spangle, U.S. Fish and Wildlife Service
Laura Simonek, The Metropolitan Water District of Southern California

EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR THE LOWER COLORADO RIVER MULTI-SPECIES HABITAT CONSERVATION PROGRAM (LCR MSCP), August 19, 2004

Air Quality

EPA-5

The DEIS indicates the proposed action could result in potential short-term, unavoidable air quality impacts resulting from large project development or prescribed burns (Section 3.3.2.1). Fugitive dust emissions and emissions from controlled fires could exceed or contribute to the exceedance of the ambient 24-hour PM10 standard (particulate matter with a diameter of 10 microns or less). The DEIS states that even with implementation of proposed mitigation measures (AQ-1 and AQ-2), the emissions from these large projects may still exceed the established *significance criteria*, i.e., violation of an air quality standard or substantial contribution to an existing or projected air quality violation (p. 3.3-7, Residual Impacts). Having stated this, however, the document also indicates that the lead agencies will ensure that proposed habitat establishment complies with all applicable air regulations (p. 3.3-4, line 22). It is not clear how the lead agencies will ensure compliance if implementation of the proposed mitigation measures may still allow exceedance of the *significance criteria*.

> **Recommendation**: The Final Environmental Impact Statement (FEIS) should address the effectiveness of the proposed mitigation measures to avoid violations or prevent increases of criteria pollutants in non-attainment areas, or indicate the specific actions that will be taken by the lead agencies to assure exceedances of the National Ambient Air Quality Standards (NAAQS) will not occur.

EPA-6

The NAAQS for ozone was revised on July 18, 1997 (62 Federal Register 38856) when EPA promulgated an ozone standard of 0.08 ppm as measured over an 8-hour period. EPA's final rule designating non-attainment areas under the 8-hour NAAQS was published in the Federal Register on April 30, 2004. On that date, EPA announced the designation of Imperial County, California, as a Subpart 2 "Marginal" non-attainment area for the new ozone standard, effective June 15, 2004. EPA intends to revoke the 1-hour ozone standard on June 15, 2005. If the project is approved by Federal agencies before June 15, 2005, and the action commences before that date, then the project will need to meet the conformity requirements for the 1-hour ozone standard at 40 CFR Part 93.150-160.

The fine particulates NAAQS was established on July 18, 1997 (62 FR 38652). Fine particulates are those less than 2.5 micrometers in diameter and are also referred to as PM2.5. The standards include an annual standard set at 15 micrograms per cubic meter (based on the 3-year average of annual mean PM2.5 concentrations) and a 24-hour standard of 65 micrograms per cubic meter (based on the 3-year average of the 98th percentile of 24-hour concentrations). Earlier this year, the State of California and EPA both recommended that portions of Riverside and San Bernadino Counties be designated as PM2.5 non-attainment areas. For Imperial County, EPA recommended that the Imperial Valley be designated as attainment with the PM2.5 standard. EPA expects to make final PM2.5 designations in November of 2004.

Recommendation: The FEIS should discuss the transition from the 1-hour ozone standard to the new 8-hour ozone NAAQS for the areas affected, including revocation of the 1-hour NAAQS. The FEIS should ~~also~~ discuss how the pending designations of the new PM2.5 NAAQS affect the impacted areas such as Imperial, Riverside and San Bernadino Counties. Section 3.3.1 of the document should be revised to reflect these regulatory changes, and provide information on the availability of monitoring data for these two criteria pollutants. Section 3.3.2 should be expanded to address the potential impacts to air quality of implementing the LCR MSCP in these non-attainment areas. EPA-6 con't

Water Quality

The DEIS discusses how habitat establishment may result in short-term adverse effects from the release of pesticides, salts and various other naturally occurring and man-made chemicals (HYDRO-2 and HYDRO-3, p.3.9-17). The impacts to water quality in the Colorado River are determined to be *less than significant* due to dilution. However, the impacts to fish and other wildlife in the newly created backwaters are not fully addressed. For example, the DEIS acknowledges research that shows selenium levels in biota of the Lower Basin have been found to equal or exceed the guidelines for reproductive impairment of biota (p. 3.9-10), yet there is no evaluation of how selenium levels in isolated backwaters may affect reproduction of the bonytail, humpback chub, or razorback sucker. EPA-7

Recommendation: The FEIS should discuss the potential impacts to water quality of creating backwaters on lands with naturally high selenium levels or that have been used for agricultural purposes, the implications for species that will reproduce in those waters, and the types of monitoring strategies that will be utilized to adaptively manage those areas.

Water Supply

The DEIS indicates it will take 57,400 acre-feet per year to establish and maintain the 8,132 acres of LCR MSCP conservation areas. Water for the restoration projects would be diverted from other uses, and although the proposed action would not increase the amount of water used in the Lower Basin beyond existing entitlements, the source and current use of the water is not known. Accordingly, based on information in the DEIS, it is not possible at this time to assess the environmental impacts of these water diversions. EPA-8

Recommendation: The FEIS should discuss the potential impacts of diverting Colorado River water from its current uses to supplying the needs of the MSCP. It should describe how, as each specific project is considered for implementation, the source and current use of that water will be evaluated to assess potential environmental impacts caused by its diversion.

Environmental Justice

The DEIS provides good documentation of low-income and minority populations within the LCR MSCP planning area (Section 3.7). It indicates there is the potential for disproportionate adverse impacts to these populations from short-term air emissions, short-term and long-term noise, and loss of agricultural jobs. We commend the lead agencies for this analysis that clearly states potential impacts on the environmental justice community and describes appropriate mitigation measures to address these impacts. EPA-9

As stated in the DEIS, one of the purposes of Executive Order 12898 is to encourage the participation of minority and low-income populations in the National Environmental Policy Act (NEPA) process. However, the document provides little information on the actions taken to elicit participation of these populations. For example, neither the DEIS nor the referenced Public Involvement Plan (PIP) found on the Bureau of Reclamation (Bureau) website indicate efforts made to reach the large Hispanic population in the planning area. Such outreach activities could include Spanish versions of major documents, newsletters and summary meeting notes, having a Spanish translator available at public meetings, and holding meetings during the evening when more of the working public would be able to participate.

Finally, it should be noted that the PIP states it is anticipated that the LCR MSCP will not result in disproportionately high and adverse human health or environmental effects on minorities and/or low income populations. This is contradicted by the DEIS.

Recommendations: The FEIS should document the public involvement methods used to communicate with environmental justice communities within the planning area. Assessment of the project's impact on minority and low-income populations should reflect coordination with those populations affected. We also recommend the PIP be updated to reflect the findings of the DEIS, and to provide additional information on outreach to, and involvement of, these populations.

Tribal Resources and Consultation with Tribal Governments

EPA-10

Nearly one third of the land in the MSCP planning area is owned by tribes (p. 2-35, Table 2.1-4). The DEIS provides good information on efforts that have been made to partner with tribes in the development of the LCR MSCP. The Bureau initiated government-to-government consultation with tribes early in the planning process. The Hualapai Tribe has been identified as a cooperating agency based on technical expertise and its jurisdiction over land that may be used for conservation. Representatives of three other tribes (Colorado River Indian Tribes, Chemehuevi Tribe and Cocopah Tribe) are identified as current program participants in the MSCP. The document also acknowledges that implementing conservation measures on tribal land could result in changes to all classes of Indian Trust Assets, and clearly describes a process to cooperatively identify and resolve potential impacts.

Recommendation: EPA commends the lead agencies for their efforts to partner with tribes in the development of the MSCP. We recommend that this cooperation continue and that efforts be made to fully involve all the tribes within the planning area. EPA-10 con't

Future Actions and Funding

EPA-11

The DEIS references numerous requirements, plans, and activities that must be accomplished prior to the implementation of specific projects under the MSCP. These items include but are not limited to: obtaining appropriate Federal and State permits, conducting a conformity analysis and environmental justice analysis, and development of plans and strategies for environmental monitoring, mitigation, fire suppression, and invasive species.

Recommendation: In order to clarify the responsibilities and obligations of MSCP participants consistent with this programmatic DEIS, EPA recommends that the FEIS include a comprehensive checklist of actions, including permits, plans and other actions that will be required under the MSCP when the decision has been made to implement a specific project.

EPA-12

The DEIS provides very little information on funding that will be committed to implement the MSCP. The LCR MSCP Draft Habitat Conservation Plan (HCP) indicates the 50-year term of the MSCP is estimated to cost $626 million in 2004 dollars and that Federal and non-Federal participants are currently finalizing cost share negotiations. The results of those negotiations shall be reflected in a Joint Participation Agreement (JPA). The HCP indicates that MSCP participants will also sign an Implementing Agreement that will specify the legal obligations, roles and responsibilities of each signatory. The DEIS provides little information on these issues that are vitally important to the success of the MSCP.

Recommendation: The FEIS should: (1) include a summary of the funding and governance mechanisms of the MSCP, (2) refer to in-depth information on funding and governance that can be found in other documents, (3) provide information on the status of all on-going negotiations, and (4) document any outstanding funding and governance issues that need resolution or agreement among the Federal, state, local and tribal participants of the MSCP.

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

AUG 17 2004

Mr. Glen Gould
U.S. Bureau of Reclamation
P.O. Box 61470 - LC - 2011
Boulder City, NV 89006-1470

Dear Mr. Gould:

The United States Section, International Boundary and Water Commission, has reviewed the documentation on the Lower Colorado River Multi-Species Conservation Program. We appreciate the opportunity to provide the attached comments concerning the environmental document.

If you have any questions, please contact me at (915) 832-4118.

Sincerely,

Bernardino Olague, P.E.
Principal Engineer

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Attachment:
As Stated

The Commons, Building C, Suite 310 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

Review Comments of the United States Section International Boundary and Water Commission, Environmental Management Division, on the Notice of Availability and Draft Programmatic Environmental Impact Statement/Environmental Impact Report, Lower Colorado River Multi-Species Conservation Program, Volume I

General Comment:

According to the Draft Programmatic Environmental Impact Statement/Environmental Impact Report (EIS/EIR), Lower Colorado River Multi-Species Conservation Program (LCR MSCP), reach 7 is a planning area and river reach consisting of the limitrophe section. Based on information from the Environmental Defense (ED), EDs perspective may be that the 140,000 cubic feet per second (cfs) design flood flow in the limitrophe was over designed. According to ED, the design flood flow and levee design are a 10,000 year flood flow event, based on flood occurrence frequency analysis. EDs perspective might be that there is a greater level of design protection that is available than is actually needed. The U.S. Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers (Corps) and the United States Section, International Boundary and Water Commission (USIBWC), should again discuss the above information. Reclamation should reevaluate the design flood flow and frequency of occurrence including the degree of acceptable risk associated with whatever is the outcome based on the results of the analysis. It seems that another meeting is needed to determine what work is the appropriate action first, otherwise our design flood flow may differ. USIBWC-1

Specific Comments:

Page "2-36," Line "13." Reach 7 is a conservation plan area of the LCR MSCP. USIBWC-2

The conservation plan may overlap the preliminary construction alignments. Preliminary alignments in the floodplain are being developed for the USIBWC Lower Colorado River Boundary and Capacity Preservation Project (LCRBCPP) Environmental Impact Statement. The likelihood of the LCRBCPP impacting potential project enhancement sites is minimized because the USIBWC Environmental Management Division takes into consideration such factors during reviews of proposed activities.

Regarding any berms or access roads in reach 7, the USIBWC's position is that any modification by construction of works in the floodplain on any side in the limitrophe section of the international boundary must be submitted to USIBWC. The submission is for consideration of approval by both sections of the International Boundary and Water Commission (IBWC) per the 1970 Boundary Treaty, and United States/Mexico Treaty of 1944 (1944 Water Treaty). USIBWC-3

Please provide three sets of construction plans for review by USIBWC before construction is initiated. The construction plans must depict the type and size of facilities and structures and appurtenances. The USIBWC must review and approve such plans, and will render a USIBWC-4

finding within 30 days of receipt of any plans or request for approval. That period will be extended if coordination with the Mexican Section International Boundary and Water Commission is required. No fill will be allowed in the floodplain. USIBWC-4 con't

When information on facilities first becomes available, the USIBWC requests that the preliminary construction plans be provided for review. Please provide a copy of the preliminary and subsequent versions of the construction plans to the Engineering Services Division (ESD) and the Operations and Maintenance Division at the above address.

The ESD requests that project proponents submit a hydraulic study, including addressing the potential 140,000 cfs design flood event, to ensure that the proposed construction will not cause any increase of water surface elevation between the levees. USIBWC-5

Regarding any proposed use of Colorado River groundwater as a potential source of water, the LCRBCPP may alter groundwater levels in the limitrophe section. The amount of surface and groundwater use is subject to review by the IBWC. USIBWC-6

Page "3.9-5," Line "3."

Here and throughout the document, insert "1944 Water Treaty" instead of "U.S.-Mexico Water Treaty." USIBWC-7

Page "3.9-7."

Regarding the design flood flow and flow capacity for LCR MSCP reaches 6 and 7, see the general comment previously made and provide the information on these reaches. USIBWC-8

Page "3.9-7," Line "26."

Change to "23.7" in lieu of "23.1." USIBWC-9

Page "3.18-5," Line "36."

Here and throughout the documentation, insert "1944 Water Treaty" instead of "Mexican Treaty." USIBWC-10

Page "4-28," Line "14."

Delete "U.S." and insert "United States." After the words "U.S. Section" insert "(USIBWC)." USIBWC-11

Page "4-28," Line "22."

Insert after "channel" the words "..., and long term operations and maintenance activities." USIBWC-12

Page "4-28," Line "23."

Delete "... 20-foot wide path ..." and insert "100 feet wide path upstream and downstream (72,000 square feet in the United States) of the centerline of the cable ..." Insert "1.1 miles" and delete "1.5 miles." USIBWC-13

Page "4-28," Line "26."

Insert "early 2005" and delete "summer of 2004." Delete "IBWC" and insert "USIBWC." USIBWC-14

Page "4-29," Line "3."

Insert "developed" instead of "finalized." USIBWC-15

Page "4-29," Line "6."

Revise the following statement made because no cultural resources would be affected: "Other impacts could include air quality impacts since the project construction area is located in a PM10 non-attainment area and the project would include a significant amount of construction, and other construction-related impacts on aesthetics, cultural resources, hazards, geology and soils, and water quality." USIBWC-16

Page "4-29," Line "30."

Revise the statement because there would be no cumulative impacts to cultural resources from the LCRBCPP. USIBWC-17

Revise the cumulatively significant impacts statement, based on the following: The results of a cultural resources report by USIBWC strongly suggest that no intact prehistoric cultural resources remain within the levees that bound the Colorado River in the limitrophe section. The report is titled, *A Cultural Resources Overview of the International Boundary Segment of the Lower Colorado River, Yuma, Arizona* (attachment 1). The report was prepared for the USIBWC by Matthew A. Sterner of Statistical Research, Inc. in 1999. According to the report, the majority of the other lands outside of the limitrophe section are under cultivation and have been significantly impacted. The Arizona State Historic Preservation Officer (SHPO) and tribes were provided the report (attachment 2) and no comments were received from them. However, the SHPO hand wrote on the cover memorandum (attachment 3) from the Corps accompanying it, that it is an excellent overview report. The Corps consulted for the USIBWC (attachment 4) with the SHPO on the LCRBCPP. The USIBWC considers the report finalized. Later, the SHPO provided comments (attachment 5) on the Morelos Diversion Dam component of the LCRBCPP, and the SHPO notes that no comments were received from the tribes, pursuant with the consultation conducted by the Corps for the USIBWC.

Page "4-34," Line "19."

Delete "... 1.574 acre-feet ..." and insert "... 1.574 million acre-feet ..." USIBWC-18

Page "4-34," Line "20." USIBWC-19

Delete "and the IBWC project."

Page "10-3," Line "21."

Use of the acronym IBWC is generally used in the environmental documentation in the proper context. However, note that the International Boundary and Water Commission, United States and Mexico (IBWC), is a bilateral organization between the respective State Departments of the United States and Mexico. The IBWC is composed of a United States Section and a Mexican Section, headquartered in El Paso, Texas and Ciudad Juarez, Chihuahua, respectively. The United States Section, IBWC (USIBWC), is the federal agency in the United States. USIBWC-20

Review Comments of the United States Section, International Boundary and Water Commission, Environmental Management Division, on the Draft Habitat Conservation Plan associated with the Lower Colorado River Multi-Species Conservation Program, Volume II

General Comment:

According to the Draft Habitat Conservation Plan, specifically on page "1-9," Line "23," the reach 7 is defined as being from the Northerly International Boundary (NIB) located at river mile 23.1 to the Southerly International Boundary located at river mile 0. However, the USIBWC defines that international boundary segment of the Colorado River as being 23.7 miles long. Change to "23.7" in lieu of "23.1." USIBWC-21

Specific Comments:

Page "3-4," Line "41."

For clarification, insert "Morelos Diversion Dam" instead of "Morelos Dam." USIBWC-22

Page "3-8," Line "40."

State whether the reported "3,700 acres of woody vegetation" is the amount of vegetation on both the United States side and the Mexican side of the international boundary or the amount on the United States side only. USIBWC-23

Page "9-2," Line "15."

USIBWC-24

The stated "... historic, predam conditions of approximately 120,000 cfs." seems low.

Review Comments of the United States Section, International Boundary and Water Commission, Environmental Management Division, on the Biological Assessment associated with the Lower Colorado River Multi-Species Conservation Program, Volume III

Specific Comments:

Page "2-11," Line "8."

USIBWC-25

Insert "1944 Water Treaty" instead of "Mexican Water Treaty." Make that change throughout the environmental documentation.

Page "2-19," Line "14."

USIBWC-26

Insert "1.1 miles" and delete "0.5 miles," regarding the distance between the Northerly International Boundary (NIB) and Morelos Diversion Dam.

Page "2-19," Line "33."

USIBWC-27

Insert "IBWC Minute No. 242" instead of "Minute 242."

Page "2-20," Line "1."

USIBWC-28

Insert "USIBWC" and delete "IBWC."

Page "2-20," Line "27."

USIBWC-29

Please explain the stated "... this reach of the river between Pilot Knob and Morelos Dam currently has a flow capacity of about 18,000 cfs (Section 2.2.3.1)." because it seems very low. Is the stated flow capacity for the cross section from levee to levee, bank to bank or pilot channel?

Page "2-46," Line "42."

USIBWC-30

Please explain the statement "Under the CRFPA, a protective floodway was established to accommodate 100-year floodflows or 40,000 cfs, whichever is greater." because it seems contradictory. The 100-year floodflow is approximately 47,000 cfs at the NIB. The levee design capacity upstream from Morelos Diversion Dam to Pilot Knob Wasteway Outfall was

originally constructed with a 140,000 cfs flood capacity. Identify the upstream and downstream location of the Colorado River Flood Protection Act. USIBWC-30 con't

Page "2-49," Line "40."

Clarify the statement "... maintenance of the existing minimum flow capacities of the Colorado River channel ..." because it could mean the Morelos Diversion Dam experiencing up to the 73,000 cfs maximum controlled release from Hoover Dam, or it could mean the estimated pilot channel capacity. USIBWC-31

Page "2-49," Line "42."

Clarify the statement "... and the current levee capacity ..." because it likely means from levee to levee. USIBWC-32

"Table 2-25."

Clarify the column heading regarding "levee to levee" in column five. Elaborate on what the "Floodway Boundary" is of column four. For example, is that "bank to bank" or "levee to high terrace?" USIBWC-33

"Table 2-5," "Page 2 of 2."

The information in the table on the limitrophe section should include multiple reaches for estimated levee capacity rather than one. Under existing conditions of the Colorado river, from the NIB to about five miles downstream of Morelos Diversion Dam, the levee to levee capacity differs substantially from the reach(s) downstream of that transition area and the estimated levee capacity doubles. The dam serves as a grade control structure. The stated information for the river reach from the Pilot Knob Wasteway Outfall to Morelos Diversion Dam regarding the estimated channel capacity is a little inconsistent with Page "2-20," Line "27." USIBWC-34

Page "2-72," Line "7."

Insert "USIBWC" and delete "IBWC." USIBWC-35

Page "2-72," Line "8."

State that the USIBWC Lower Colorado River Boundary and Capacity Preservation Project Environmental Impact Statement study area is from the NIB to Southerly International Boundary (SIB). Line "8" makes it seem that the USIBWC study area is from Morelos Diversion Dam to SIB. Insert after "SIB" the words "and long term operations and maintenance activities." USIBWC-36

Review Comments of the United States Section, International Boundary and Water Commission, Environmental Management Division, on Appendices, associated with the Lower Colorado River Multi-Species Conservation Program, Volume IV

Specific Comments:

"Appendix O Major facilities," Page "O-9," Line "2." USIBWC-37

Insert after the stated "expenses," the following: "Mexico is also responsible for removal/clearing of sediment/vegetation immediately upstream and downstream of the dam pursuant to IBWC Minute No. 197 of the 1944 Water Treaty. Minute No. 197 provides for international hydrographic, operational and maintenance activities administered by the IBWC. The international boundary is marked on the structure under the terms of the 1944 Water Treaty."

"Appendix R History of River Work," Page "R-9," Line "11." USIBWC-38

Regarding expected dredging of the river channel between the Northerly International Boundary and Cocopah Bend, does your stated "... to maintain a low flow capacity in the river channel of 15,000 to 20,000 cfs." mean dredging from "bank to bank" or "levee to levee"? Please provide the basis for the stated "15,000 to 20,000 cfs." The low flow capacity in the river channel must be agreed to between the United States Section and the Mexican Section of the International Boundary and Water Commission before this number is published.

"Appendix T Acronyms and Abbreviations," Page "T-4." USIBWC-39

Insert "United States Section, International Boundary and Water Commission (USIBWC).

8

A Cultural Resources Overview of the International Boundary Segment of the Lower Colorado River, Yuma County, Arizona

by Matthew A. Sterner

with contributions by

Matt C. Bischoff
Joseph A. Ezzo
Joshua M. Protas
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Joan S. Schneider
Robert M. Wegener
Stephen L. Williams

Draft report prepared for the
U.S. Army Corps of Engineers
Los Angeles District
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Technical Report 99-51
Statistical Research, Inc.
Tucson, Arizona

1999

CONTENTS

List of Figures vii
List of Tables ix
Acknowledgments xi

Chapter 1: Introduction 1
Project Description 1
Objectives of the Overview 3
Report Organization 3

Chapter 2: Environmental and Cultural Overview 5
Environmental Setting 5

Chapter 3: Prehistoric Overview of the Lower Colorado River Region 7
The Prehistory of the Region: A Brief Chronological Overview 8
Earliest Inhabitants 8
River Patayan 10
Yuman Indians 12
An Essay on the Archaic 13
Archaeological Visibility 13
The Paleoenvironmental Context 14
Hunter-Gatherer Lifestyles 16
Models of Archaic Hunter-Gatherer Systems 16
The Lifeways of the Colorado River Delta Archaic 18
An Essay on Milling-Implement Quarry and Production Sites 20
Cultural Context 20
The Milling-Implement "Industry" 21
Milling-Implement Quarries 22
Understanding Site Location 23
An Essay on the Landscapes and Cosmology of Yuman-Speaking Peoples 26
The Cosmology of the Yuman Landscape 26
The *Keruk* Ceremony as Landscape and Cosmology 29
Common Cosmological Elements with Other Cultures 31
Research Themes for Prehistoric Resources within the Lower Colorado River Region 32
Archaic Lifeways 32
Research Questions 32
Data Requirements 33
Technology 33
Research Questions 33
Data Requirements 33
Ceremonial Behavior 33
Research Questions 34
Data Requirements 34

Chapter 4: History of the Region, from the Contact Period to the Twentieth Century,
by Matt C. Bischoff, Joshua M. Protas, and Matthew A. Sterner 35
Arrival of the Spanish 35
The Mission System 37
The Opening of the Region 39
The Lower Colorado Region in the Nineteenth Century 41
Anglo-American Arrival at the Yuma Crossing 41
Ferry Service at the Yuma Crossing 43
Securing Peace with the Quechan 46
Early Anglo Settlement 49
Advent of the Steamboat 49
Impacts of the Civil War 53
Arrival of the Railroad 54
The Impact of Development on Native-American Communities 54
Early Irrigation Efforts 57
Lerdo Colony 57
Algodones Land Grant 57
First Irrigation Companies 59
The Lower Colorado Region in the Twentieth Century 59
The Growth of Modern Yuma 59
Yuma Valley Communities 61
Agriculture in the Yuma Valley 62
The Newlands/Reclamation Act 62
The Yuma Irrigation Project 63
Laguna Dam 63
Levees 65
Yuma Valley Railroad 68
Irrigating the Yuma Valley 69
Other Areas Served by the Yuma Project 70
Labor 70
Local Water Users Associations 70
Assessing the Success of the Yuma Irrigation Project 71
The Great Depression 71
The New Deal Years 72
The International Boundary and Water Commission 74
Morelos Dam 74
Military Presence in the Lower Colorado River Valley 75
World War I 75
World War II 75
Desert Training Center 75
Marine Corps Air Station Yuma 76
Research Themes for Historical-Period Resources within the Lower Colorado River Region 76
Transportation 76
Research Questions 77
Data Requirements 77
Historical-Period Land Use 77
Research Questions 78
Data Requirements 78

Military Use of the Area 78
Research Questions 78
Data Requirements 79
Yuma Irrigation Project 79
Research Questions 79
Data Requirements 79

Chapter 5: Results of the Archival Research 81
Previous Research in the Lower Colorado River Region 81
Previous Investigations in the APE 83
Results of the Site-File Research 85

Chapter 6: Geoarchaeology of the Lower Colorado River International Boundary Section,
by Stephen L. Williams, Robert M. Wegener, and Matthew Sterner 89
Fluvial Facies Model 89
Active and Abandoned Channels 90
Crevasse Channels and Crevasse Splays 92
Levees 92
Floodplain Deposits 93
Historic Colorado River Channels 93
Site Modeling along the Lower Colorado River 93
Trenching Program Methods 96
Results of the Trenching Program 96
General Site Formation and Preservation Principles 100
Site Preservation Potential within the APE 101
Conclusions 102

Chapter 7: Conclusions and Recommendations 103
Management Recommendations 103

References Cited 105

LIST OF FIGURES

Figure 1. The international boundary segment of the Colorado River 2
Figure 2. Prehistoric cultural traditions of the Southwest (from Stone 1991:62) 11
Figure 3. The Colorado delta at the end of the Pleistocene, with the locations of pack rat samples shown 15
Figure 4. Mesquite pods 22
Figure 5. Bedrock quarry near Palo Verde Peak 23
Figure 6. Close-up of another outcrop near Palo Verde Peak 24
Figure 7. Production workshop at a quarry near Palo Verde Peak 24
Figure 8. Metate-production workshop in the Bullhead City area studied by Huckell (1985) and Gieb (1986) 25
Figure 9. Production sequence for stone pestles 25
Figure 10. Production sequence for metates 26
Figure 11. Quarry pit at an outcrop at one of the milling-implement quarries on the lower Colorado River 27
Figure 12. Map of known milling-implement quarries in the lower Colorado–lower Gila River region 28
Figure 13. Map of the lower Colorado River showing the north-south (*keruk*) trail 30
Figure 14. Routes of the Coronado and Alarcon expeditions 36
Figure 15. Map of Kino's travels in the Pimería Alta 38
Figure 16. Map of the Algodones Land Grant 43
Figure 17. Whipple's 1849 map of the Yuma Crossing, showing the "Whipple Strip" 45
Figure 18. Cocopah men at the turn of the twentieth century wearing European clothing and playing an introduced card game 48
Figure 19. Map of the Yuma Crossing, 1853 50
Figure 20. Steamboat landings on the Colorado 52
Figure 21. Lower Colorado River showing the Lerdo Colony and the proposed Sonora Canal, 1893 58
Figure 22. Topographic map of the lower Colorado River in 1903, illustrating the nature of the region prior to the construction of the Yuma Irrigation Project 64
Figure 23. Features of the Yuma Irrigation Project completed in the Yuma Valley as of December 31, 1915 66

Figure 24. The Yuma Irrigation Project, 1949, showing the Valley Levee, Valley Railroad, and various other irrigation features in the Yuma Valley 67

Figure 25. War Department map of the Yuma area in 1941 73

Figure 26. Known sites within the APE 87

Figure 27. Summary facies model for a meandering river 90

Figure 28. Documented channel meanders for the Colorado River before 1915 94

Figure 29. Documented channel meanders for the Colorado River after 1915 95

Figure 30. Location of backhoe trenches excavated during the modeling phase 98

LIST OF TABLES

Table 1. Annual Cycle of Plants and Animals 18
Table 2. Historical-Period Sites Recorded within the APE 86
Table 3a. Fluvial Facies Components 90
Table 3b. Lithofacies Codes 90
Table 4. Location, Orientation, Length, and Depth of Geomorphic Test Trenches 97
Table 5. Setting, Soils, Lithofacies, and Interpreted Facies for each Geomorphic Test Trench 99

ACKNOWLEDGMENTS

This report represents the results of the combined efforts of many individuals and I would like to take this opportunity to thank everyone who helped make this report a reality. Foremost, I would like to thank all of the contributors, each of whom brought a unique knowledge and expertise to this document. But no report can be produced in a vacuum and special thanks are extended to SRI's production staff, Lynne Yamaguchi, Cindy Elsner, Karen Barber, and Chester Schmidt. I would also like to acknowledge the efforts of Dr. Teresita Majewski, who edited the draft document.

Carol Telles, archaeologist with the Bureau of Reclamation, Yuma Area Office (YAO), assisted by providing access to her office's vast collection of archival material. Ms. Telles also assisted by contacting other specialists in her office who assisted further with the research. Mr. Jeff Sanderson, in the Mapping Department of the YAO, provided access to the vast map collection. Carol Brooks, archivist with the Arizona Historical Society, Yuma, helped in locating pertinent information from the society's collections. Karen Collins, Imperial County Archaeological Information Center, Ocotillo, California, and Sharon Urban, Arizona State Museum Site File Office, assisted in the record search phase of the project, as did Boma Johnson, archaeologist with the Bureau of Land Management, Yuma. Mr. Al Goff, with the United States International Boundary Water Commission, provided background information and logistical assistance during the modeling portion of the project. I must also acknowledge the fine management of the project by U.S. Army Corps of Engineers archaeologist Pam Maxwell.

Completion of a document such as this is never the work of a single, or even just a few, individuals. I want to thank everyone involved for pulling together to bring this report to a successful completion. In the event I have forgotten to thank any single individual for assisting in the process, my humblest apology.

—Matthew A. Sterner

CHAPTER 1

Introduction

The importance of the lower Colorado River to the development of cultural trends in the southwestern United States cannot be understated, particularly that portion of the river in the vicinity of the present-day city of Yuma. As a focal point of human activity from prehistoric times forward, this area has profoundly impacted the history of Arizona, California, and the Greater Southwest. In prehistoric times, the Colorado River area served as an the lifeblood of the native population, teeming with the resources that sustained life. During later prehistoric times, the Colorado River floodplain was an agricultural "oasis" to the indigenous groups who capitalized on the nutrient-rich soils deposited annually. By the time of the Spanish explorers, the Colorado River represented a major transportation route, a historical theme that subsequently defined the character of the river and its regional importance. In recent times, the flow of the Colorado has been harnessed through a series of dams, allowing the fertile lower Colorado River valley to be transformed into one of the leading agricultural producers in the region.

Project Description

The U.S. Army Corps of Engineers, Los Angeles District (USACE) has contracted with Statistical Research, Inc. (SRI), to prepare a cultural resources overview for a 24-mile (38.4-km) section of the lower Colorado River known as the international boundary segment (Figure 1). This work constitutes a portion of an Environmental Impact Statement (EIS) to be prepared by USACE for the United States Section, International Boundary and Water Commission (IBWC). The EIS will address the impacts in the United States of alternatives for a long-term boundary preservation and carrying capacity improvements project that is currently under consideration by the United States and Mexico for the international boundary segment of the Colorado River.

The current study area encompasses the Colorado River channel and floodway in the United States within the 24-mile international boundary segment, extending from Morelos Dam (T8S R24W, Section 28, USGS Yuma East 7.5-minute quadrangle) to the south end of the Southerly International Boundary (T8S R22W, Section 10, USGS Gadsden 7.5-minute quadrangle). The area of potential effect (APE) for the current undertaking includes the main Colorado River channel, as well as the river floodplain to the levee toe on the U.S. side. For purposes of archival research, an area extending beyond the levee, approximately 2.5–3 miles east of the river, will serve as the study area.

Conducting an archival overview formed only a portion of our responsibilities within the scope proposed for this project. USACE envisioned incorporating geoarchaeological testing in an effort to develop a predictive model for identifying cultural resources in the area that falls between the Colorado River channel levees. This task was accomplished during a week of backhoe trench excavation, the results of which are presented in Chapter 6.

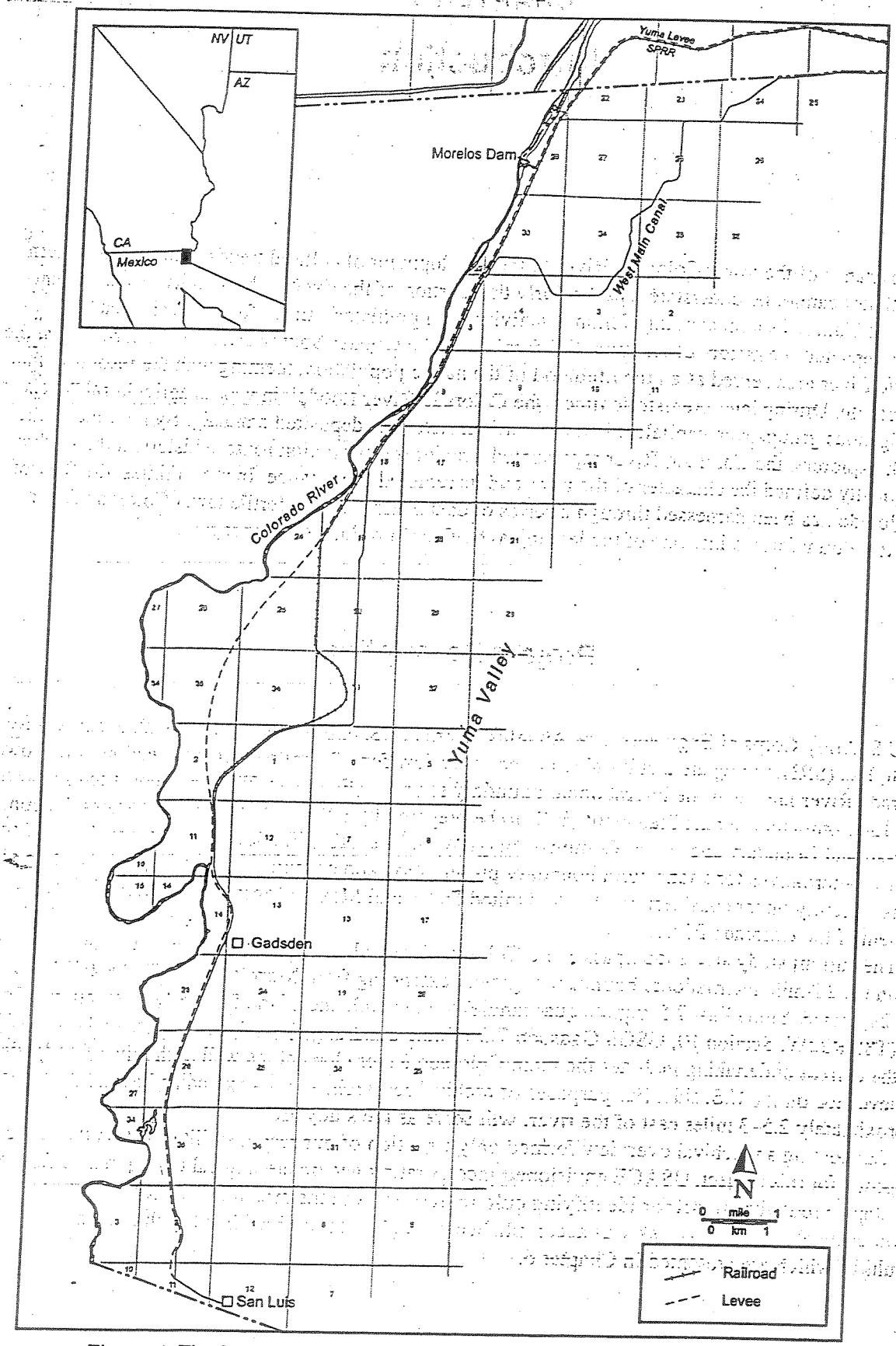

Figure 1. The international boundary segment of the Colorado River.

Objectives of the Overview

The following Class I cultural resources overview is intended to provide USACE and the IBWC with baseline information concerning identified and potential cultural resources within the designated project area. A Class I cultural resources inventory report is primarily restricted to a literature and records search, collating information on previously identified cultural resources within the project area. Although no field investigation of cultural resources is required, it is necessary to contact and/or visit a number of agencies that may contain information germane to the project or the project area. For the current undertaking, these include the Arizona State Museum, Site File Room, Tucson, Arizona; Arizona State University, Anthropology Laboratory, Tempe, Arizona; the Bureau of Land Management, Yuma Area Office, Yuma, Arizona; the Southeast Information Center, Imperial Valley College Desert Museum, Ocotillo, California; the Bureau of Land Management, Desert District Office, Riverside, California; and the Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nevada. Although visits to each of the locations mentioned above were not possible, at a minimum, each was consulted regarding cultural resources within the project area.

Report Organization

The following overview for the international boundary segment of the lower Colorado River is presented in seven chapters. Following this brief introduction, Chapter 2 will present an environmental overview of the region, addressing such topics as climate, vegetation, and fauna. Chapters 3 and 4 present the results of the prehistoric and historical-period research, each presenting a chronological overview in addition to research themes for the respective discussions. Following this discussion, we present the results of the site-file investigation, identifying known cultural resources within the APE. Chapter 6 discusses the predictive modeling component of the scope, with separate discussions for the methods, results, and the presentation of the predictive model. Finally, Chapter 7 summarizes the results of the project and presents some management recommendations regarding cultural resources along this section of the river.

CHAPTER 2

Environmental and Cultural Overview

Environmental Setting

The current study area encompasses the Colorado River channel and floodway in the United States in the 24-mile international boundary segment. Morelos Diversion Dam forms the northern end of the APE, which includes the main Colorado River channel and the river floodplain to the levee toe on the U.S. side, with the APE terminating at River Mile 23.7 (River Kilometer 38.2), also defined as the Southerly International Boundary. The area is characterized by alluvial valleys (along the river) with gradual rises to generally barren mesas. Beyond the mesas are low, rugged, serrated mountain ranges. The floodplain is generally wide; the river's terraces are set well back from the Colorado River. During the 1800s, the Colorado River had a highly variable flow, with a fast current during summers and low water levels during winters. High silt content led to fluctuating sand bars that continually frustrated navigation along the river. Today, the flow rate of the river is relatively constant—because of the construction of numerous dams along the length of the river that regulate its flow.

The soils of the lower Colorado River are deposits of sand, silt, and gravel. The soils in the study area are generally considered part of the Gilman-Vint-Brios Association, with soils composed of mixed alluvium and sandy loam, at times more than 5 feet deep. These soils are considered particularly suitable as pasture lands and for irrigated crops (Chamberlin and Richardson 1974:3–4). The climate along the lower Colorado River is classified as hyperthermic (very hot), with an annual precipitation of approximately 3 inches (Swanson and Altschul 1991:18). The meager rainfall limits vegetation to cacti, annual grasses, desert scrub, and creosote (Chamberlin and Richardson 1974:2).

Vegetation along the Colorado River's channel has always been lush. The first land surveyors working in the area during the 1850s reported that the banks of the Colorado River were thick with willow, cottonwood, and mesquite (Pool 1855). By the end of the nineteenth century, the area was overtaken with arrow weed after steamboat crews removed much of the hardwood along the riverbanks (Swanson and Altschul 1991:18). During the twentieth century, the natural environment of the Colorado and Gila River floodplains has been significantly impacted by agricultural development, as exhibited by the construction of dams, irrigation systems, and other systems for flood control. The majority of the study area has been modified in some way for agricultural or habitation purposes. The remaining areas in proximity to the main stem of the Colorado that have not been otherwise modified or impacted by human activity remain riparian. The surrounding mountainous areas are dominated by creosote bush *(Larrea tridentata)*, with less-frequent occurrences of jumping cholla *(Opuntia fulgida)*, prickly pear *(Opuntia polyacantha)*, screwbean mesquite *(Prosopis pubescens)*, honey mesquite *(Prosopis glandulosa)*, and various shrubs, reeds, and grasses.

Fauna in the area consists predominantly of small mammals, such as desert cottontail rabbit *(Sylvilagus audubonii)* and round-tailed ground squirrel. Larger mammals present include coyote *(Canis latrans)*, Sonoran pronghorn antelope *(Antilocapra americana sonorensis)*, and mule deer *(Odocoileus hemionus)*. Typical avifauna indigenous to the region include the red-tailed hawk *(Buteo jamaicensis)*,

Gambel's quail *(Callipepla gambelii)*, and mourning dove *(Zenaida macroura)* (Phillips et al. 1964). The arid climate associated with the Sonoran Desert is particularly conducive to reptiles, with amphibians prolific in riparian zones. The zebra-tailed lizard *(Callisaurus diaconoides)*, desert spiny lizard *(Seeloporus magister)*, and the desert horned lizard *(Phrynosoma platyrhinos)* could all be expected in the area.

CHAPTER 3

Prehistoric Overview of the Lower Colorado River Region

Joseph Ezzo, Jane Rosenthal, Joan Schneider, and Matthew Sterner

Archaeologically speaking, the lower Colorado River valley is perhaps one of the least understood regions of the country during the prehistoric period. After 50 years of archaeological research in the region, a comprehensive understanding of the prehistory of the area remains elusive. While logic would dictate that the rich environment surrounding the river played host to scores of prehistoric people, no significant habitation sites have yet been identified. Consequently, even the rudiments of culture history remain to be worked out. When did people arrive in the area? What did they live on and what manner of subsistence model supported them? Although our knowledge of the region's culture history remains incomplete, the lower Colorado River hosts some of the most spectacular and unique cultural resources in the world.

We have adopted a somewhat unconventional approach for our presentation of the prehistory of the lower Colorado region. Numerous overviews of the prehistory of the region have been produced in the last decade by SRI, including Altschul (1994), Ezzo (1994), Ezzo and Altschul (1993d), Huber and Ezzo (1995), Sterner (1992), Sterner and Bischoff (1997), and Swanson and Altschul (1991). Rather than present yet another standard chronology of the prehistoric period, we chose to challenge the reader by presenting three essays highlighting specific issues that reflect "cutting edge" research for the region. First, however, we present an abbreviated cultural chronology of the region so that each of the discussions presented below can be viewed within the prehistoric context for the lower Colorado River region.

Following the cultural chronology, we begin by presenting a discussion of early adaptive strategies during the Archaic period. Emerging adaptive strategies allowed prehistoric inhabitants to shift from a hunter-gatherer to a more sedentary paradigm, with increased dependence on the resources of the river. This discussion is presented by Dr. Jane Rosenthal.

Following this discussion, attention shifts to a period during prehistory when sedentary lifestyle along the river was firmly ensconced, a trend reflected in the technology of the period. This discussion, presented by Dr. Joan Schneider, focuses on the technological changes and the appearance of milling implements that heralded this change to a more sedentary subsistence strategy.

One of the most curious and unique aspects of the prehistory of the lower Colorado River valley surrounds the proliferation of representational art, predominantly in the form of petroglyphs and geoglyphs. Scholars continually debate the religious and cosmological significance of these figures and images, searching for insight into the life, religion, even social practices of the prehistoric inhabitants of the lower Colorado region. Dr. Joseph Ezzo has spent years studying these manifestations along the lower Colorado and presents an enlightening discussion into the history and significance of prehistoric belief systems.

The Prehistory of the Region: A Brief Chronological Overview

The Colorado River valley has probably hosted human inhabitants since very early times. With its considerable resources surrounded by exceedingly harsh country, it is hard to believe that migrants from the earliest settlements in southern California or the Great Basin would not have been drawn to the Colorado River valley. The occupation of Ventana Cave, to the southeast of the Colorado River, began at approximately 9000 B.C. (Haury 1950). Beyond speculation, however, evidence for the earliest periods of occupation is scarce. No stratified deposits yielding remains datable by such chronometric techniques as radiocarbon and archaeomagnetic dating have been excavated, and few have even been identified (Stone 1991:53).

Earliest Inhabitants

The earliest culture in western Arizona is termed the Malpais phase of the San Dieguito Complex (Hayden 1976). The word "Malpais" was first coined by M. J. Rogers in 1939, and was revived by Hayden in 1976 (Effland et al. 1988). It refers to a very early phase of human use of the region, and is characterized by a simple flake-core-chopper technology usually associated with old, well-developed desert pavements. Dating of the Malpais occupation is based in part on the age of the Malpais Pluvial and subsequent Malpais Altithermal periods in the Southwest. Hayden (1976) believes that an altithermal period occurred between 18,000 and 16,000 B.C. Because there are no diagnostic artifacts for this phase, and no sites that have been dated through absolute means, the Malpais phase is extremely controversial. Most archaeologists are not swayed by Hayden's arguments, and place the first occupation in the area around 12,000–11,000 B.C. (Brown and Stone 1982; Effland and Green 1983; Hoffman 1985; McGuire and Schiffer 1982; Van Devender 1973).

The earliest accepted period of human occupation in western Arizona is associated with the San Dieguito complex (Rogers 1939, 1966). Rogers (1939) originally divided the San Dieguito complex into three phases; Malpais, Playa I, and Playa II, although he later renamed these phases San Dieguito I, II, and III (Rogers 1958). The San Dieguito tool assemblage is basically similar to that attributed to the earlier Malpais, consisting of a variety of percussion-flaked choppers, scrapers, and hammer stones. According to Hayden (1976), San Dieguito I lithics exhibit less patination and a more deliberate preparation of flakes and cores. The technology possibly reflects wood-working, in addition to butchering, activities (Effland et al. 1988:3). The phase is best represented at Ventana Cave, located about 150 km east of Yuma, Arizona. San Dieguito I remains recovered from the basal levels of the excavation were radiocarbon dated to 9350 ± 1200 B.C. (Haury 1975). The early San Dieguito occupants of the area have been interpreted as primarily hunters. This characterization is made in spite of the fact that projectile points are extremely rare in the area. The argument usually offered to account for the lack of projectile points is that these tools were being made out of wood, which subsequently has decayed. Hayden (1976) also suggests that the early residents were using shellfish from the Gulf of California. The use of plant resources is still an open question. No ground stone artifacts, which are the basic indicators of plant use, have been dated to the period.

San Dieguito II components include many of the same tool types as the previous phase. Added to the cultural assemblage at this time were elongated, leaf-shaped projectile points, finely worked bifaces, and a wide variety of scrapers. San Dieguito III continues this gradual progression (the same tool and feature types), with the addition of smaller, pressure-flaked projectile points and bifaces. Features common to all San Dieguito phases are sleeping circles, trails, trail shrines, rock rings, and intaglios. Assignment of features to any one of the phases is based almost exclusively on the amount of weathering and the degree of rock varnish.

A major problem with the phase assignments for the San Dieguito complex is that at no site have all three phases been found together. In addition, only two stratified sites, the C. W. Harris site near San Diego and Ventana Cave in Arizona, have yielded datable San Dieguito components. Radiocarbon dates from the C. W. Harris site indicate a range of 2000–6000 B.C. for San Dieguito III materials (Warren 1967:179). Stratigraphic evidence and radiocarbon dates from Ventana Cave indicate a pre-9000 B.C. date for San Dieguito I (Haury 1975). Many investigators, however, have questioned whether the phases are justifiable (e.g., McGuire and Schiffer 1982; Stone 1986; Warren 1967). They point out that San Dieguito materials have wide spatial and temporal distributions that merge into complexes defined in surrounding regions. Further, the tool-kit patterns that Rogers interpreted as indicating temporal change may better be explained as functional shifts within one culture.

The relationship between the Western Pluvial Lakes Tradition, the San Dieguito complex, and the better-known Paleoindian Fluted Point traditions of Folsom and Clovis is unclear. The latter traditions are believed to be older, with perhaps a greater emphasis on hunting. This position, however, is based more on archaeologists' intuition than on evidence. Fluted points are found on fossil lake shores with ovate points and other artifacts of the Western Pluvial Lakes Tradition. Thus, it is quite possible that there is a functional, rather than temporal, relationship between the two traditions.

At present, not enough evidence exists to characterize all but the most rudimentary facets of early desert culture. Evidence indicates that the economy was a mixture of hunting and gathering, with perhaps a stronger overall emphasis on hunting (especially big-game hunting) than was true of later periods. These early traditions seem to have disappeared ca. 7000 B.C., although Cordell (1984) argues that the period may have extended as late as 5500 B.C. The gradual desiccation associated with the early Holocene probably eliminated or greatly restricted the range of many large game animals. Subsistence patterns shifted, with a greater emphasis on plant foods and smaller animals.

The nature and the dating of the Archaic occupation of the western deserts has been a source of debate since Rogers (1939) first defined the Amargosa Tradition, based on work conducted primarily in southern California on surface sites located near playas, stream channels, and springs. The tradition was redefined by Haury (1975), and expanded upon by Rogers (1958, 1966) and Irwin-Williams (1979). According to Haury's (1975) formulation, the Amargosa Tradition is divided into three phases, Amargosa I, II, and III.

Amargosa I (7500–5000 B.C.) assemblages are distinguished by crudely made, basally notched, stemmed projectile points. Grinding implements are present, though rare, and consist of thin, flat schist slabs. Hayden (1976) describes an additional tool, called a gyratory crusher (presumably used to process mesquite pods), as part of this complex. The Amargosa II phase (5000–2000 B.C.) witnessed the introduction of metates and mortars. Metates were generally shallow basin types on which cobble manos were used. Pinto- and Gypsum-style projectile points appear at this time. During the Amargosa III phase (2000 B.C.–A.D. 1), there appears to have been an elaboration of projectile-point styles and other bifacially produced tools. Hayden (1976) also claims that plain brown ware ceramics first appeared late during Amargosa III.

North of the area encompassed by the Amargosa Tradition, in the Mojave Desert, Archaic cultures are associated with the Pinto Basin complex (Warren 1984). Although there is no doubt that a correlation exists between changing climatic conditions and the appearance of assemblages associated with the Pinto Basin complex (5000–2000 B.C.), there is some question about cause and effect. The extent and consistency of climatic change is difficult to assess. Further, it is quite likely that the actual consequences in any one area were conditioned in part by microclimatic and topographic features. Warren (1984:414) argues that the Pinto Basin complex evolved from the Lake Mojave complex and represents a small population of highly mobile hunter-gatherers who lacked a developed milling technology. As the rivers and lakes continued to dry up, these groups became clustered at the few locations where dependable water sources were still available. As climatic conditions oscillated between moister and drier conditions over the next several thousand years, these desert groups expanded and contracted accordingly. The Archaic

sequence for the western deserts is poorly understood because there are almost no excavated, stratified sites and dates are lacking. Given this situation, it is difficult to separate temporal and cultural variation in artifact assemblages from functional differences.

River Patayan

The introduction of ceramics is often taken as the hallmark of a new cultural tradition. Ceramics have traditionally been associated with agriculture and a shift from a mobile subsistence strategy to a more sedentary way of life. Although these long-held views have been challenged in recent years, the introduction of ceramics in large numbers is still viewed as signaling a new culture period.

Along the lower Colorado River, the Ceramic period has stirred considerable debate among archaeologists. On the surface, many of the issues discussed seem semantic; different investigators use different names for the same phenomenon. On closer examination, however, the debate over terminology masks fundamental disagreements about the nature of cultural development.

Rogers (1945) viewed the Ceramic-period cultures along the lower Colorado River as immigrants from either southern California (Yuman in origin) or the western Papagueria-Sonora region (non-Yuman). He explicitly denied a Hohokam base for these cultures. Schroeder (1952) took exception to Rogers's view, arguing that Lower Colorado Buff Ware did not originate in the Colorado River's delta region. He claimed that red-slipped Patayan ceramics and Hohokam Red Wares were strikingly similar and, thus, that Lower Colorado Buff Wares resulted from contact with the Hohokam ca. A.D. 1150. Using data from the Bouse site, Harner (1958) argues that the Patayan red wares started prior to this date. In his reevaluation of the evidence, Waters (1982) arrived at the same conclusions as Rogers. Although archaeologists have tended to favor Rogers's view over Schroeder's, this should not be taken as evidence of general consensus. Given the small number of dated components from the lower Colorado River region, there are few data upon which to base well-founded arguments about the Ceramic period.

Rogers defined three phases for the Ceramic period, which he termed Yuman I, II, and III. Considerable debate between Rogers and Harold Colton, of the Museum of Northern Arizona, was caused by his use of the term "Yuman." Colton (1939, 1945) argues that it was inappropriate to name a prehistoric culture after an ethnographic culture, and proposed use of the term "Patayan." Schroeder (1957, 1979) proposed the term "Hakataya" to refer all archaeological remains in the western deserts. Although the issue has never been formally resolved, most recent investigators (e.g., McGuire and Schiffer 1982) substitute the term "Patayan" for Rogers's "Yuman."

Groups known archaeologically as "Patayan" occupied the lower Colorado River and Gila River valleys perhaps as early as A.D. 700. The groups apparently lived in a manner similar to ethnohistorically recorded River Yuman groups, but were culturally distinct from the Mogollon, Anasazi, and Hohokam cultures of the Southwest (Figure 2). The Patayan area encompassed the deserts east and west of the lower Colorado River, with the Laquish Branch situated along the southern reaches of the Colorado River and the Cerbat Branch located along the Colorado River to the north of the Bill Williams River (Stone 1991:61).

The Patayan period is normally discussed in three stages. The earliest stage, Patayan I, extended from approximately A.D. 700 to 1000. These people were apparently avid traders and travelers; numerous sites dating to the period exhibit shell, steatite, turtle-shell rattles, and other trade items with origins in California. Patayan I ceramic types were distributed south of the Bill Williams confluence, along the lower Gila River, in the adjacent desert areas, and along the eastern shore of Lake Cahuilla (Stone 1991:63). Major types include Black Mesa Buff, Colorado Beige, and Colorado Red, and are typically defined by rim notching, lug and loop handles, the "Colorado shoulder," incised decoration, burnishing, and red clay slip (Waters 1982:282).

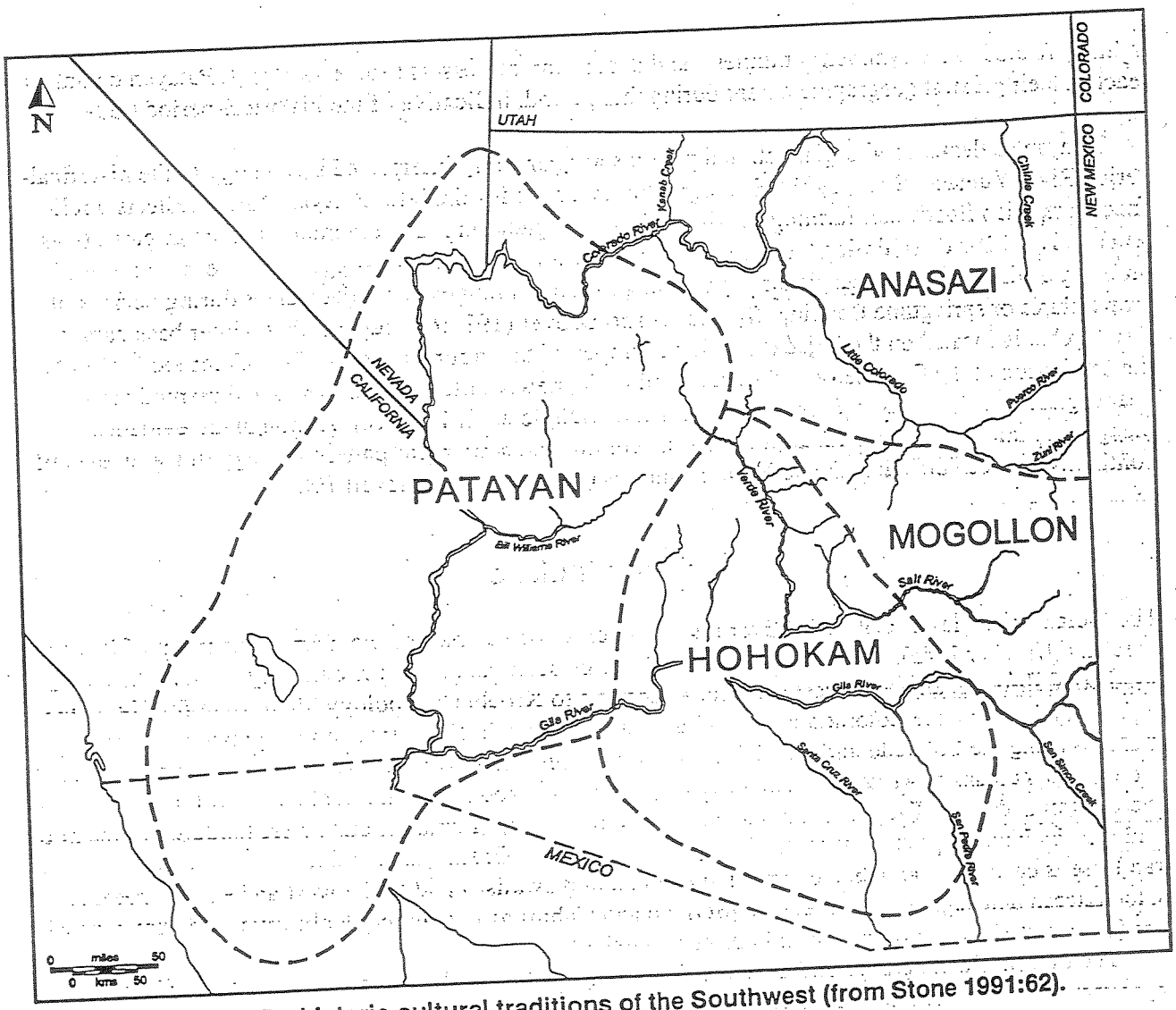

Figure 2. Prehistoric cultural traditions of the Southwest (from Stone 1991:62).

The Patayan II period, spanning A.D. 1000–1500, saw the expansion of ceramic types up the lower Gila River and into the California desert. This second phase of the Patayan period was characterized by five major ceramic types: Tumco Buff, Parker Buff, and Topoc Buff along the Colorado River; Palomas Buff along the Gila River; and Salton Buff at Lake Cahuilla. The "Colorado shoulder," incised decoration, and certain vessel forms were discarded during this period in favor of new vessel forms, recurved rims, and plaster finishes (Stone 1991:63).

The nature of relations between the various ceramic-manufacturing centers, which may correspond to social units, is unclear. Furthermore, the extent of outside cultural influences is problematic, although it is clear that Patayan groups knew of, and interacted with, Hohokam groups to the east. Recent excavations at the Hohokam village of Las Colinas in Phoenix revealed a large quantity (n = 6,080) of lower Colorado River buff ware sherds. These sherds were not distributed evenly throughout the site, but were concentrated in one small section on the edge of the village, suggesting that lowland Patayan groups actually lived at the site.

The Patayan III period encompassed the protohistoric period, as well as the historical period, after A.D. 1500. The manufacture of Tumco Buff and Salton Buff ceased, but a new type identified as Colorado Buff was produced primarily in the northern regions. Technical refinements appeared in the ceramic

industry related to the symmetry, thinness, and decoration of vessels (Stone 1991:64). Patayan ceramics reached their greatest geographic extent during this period, indicative of the historical-period trade networks.

Patayan settlement and organizational patterns are generally interpreted by analogy to the historical-period River Yumans (Stone 1991). Ethnographic evidence for the later Patayan culture reflects a reliance on riparian floodwater farming, fishing, wild-plant gathering, and the hunting of small game (Castetter and Bell 1951). Hydrologic conditions of the Colorado River also suggest that the river groups probably utilized the resources of the surrounding mountain ranges and bajada areas during periods of crop failures or springtime flooding. Swarthout and Drover (1981:66) suggest that winter base camps were probably located on the bajadas and lower slopes of the mountains east of the Colorado River. At the conclusion of the flood season, they returned to the newly silted river bottoms and planted corn, beans, grasses, calabashes, squash and watermelons (Doyle et al. 1984:10). Although the evidence is meager, archaeological finds regarding material culture and settlement patterning suggest some level of continuity between the Patayan and Yuman cultures (Colton 1945; Huckell 1986).

Yuman Indians

The Indians of the lower Colorado River region are classified as part of the Yuman subgroup of Hokan speakers (Kroeber 1943). Yuman speakers inhabit large sections of what is currently western Arizona, southern California, and northwest Mexico. According to Kroeber's typology, there were four branches of Yuman speakers: the Colorado River–delta groups (Cocopah, Kohuana, and Halyikwamai), the River Yumans along the Colorado and Gila Rivers (Yuma or Quechan, Mohave, Halchidhoma, and Maricopa), the Upland Yumans of western Arizona (Yavapai, Walapai, and Havasupai), and the western Yumans of the California deserts (Diegueno, Kamia, Kailiwa, and Paipai). Yuman groups were bordered to the north and west by Numic speakers, who originally came out of the Great Basin and into the Mojave and Sonoran Deserts ca. A.D. 1100 (Chemehuevi, Panamint, and Kawaiisu) and to the west and east by speakers of Uto-Aztecan languages (Takic speakers [Serrano and Cahuilla] in southern California, and Piman speakers [Pima and Papago] in Arizona and northern Mexico).

The Colorado delta groups and the River Yumans are of central concern to this project. Ethnographic accounts of these groups have centered on three main tribes: the Mojave, Quechan, and Cocopah. All three tribes share many characteristics, with differences being more of degree than kind. Yuman subsistence along the river tended to be a combination of hunting, gathering, fishing, and agriculture. Agriculture was relied on more by the Mojave than the other groups. According to Castetter and Bell (1951), approximately 50 percent of the Mojave diet was derived from agricultural products, compared to 30 percent for the Cocopah, with the Quechan somewhere in between. Cultivated crops included corn, squash, melons, beans, and grasses. All agriculture relied on floodwater techniques, in which seeds were planted in the newly deposited sediments after the river receded. Only one crop per year was planted and fields tended to be small (2–3 acres).

No irrigation works or other land modifications have been identified in the lower Colorado River region. It appears that agricultural strategies were designed to optimize the use of floodwaters to bring the necessary moisture to fields (Shelley and Altschul 1989). River Yumans used more than 75 wild-plant foods as food sources, with the most important being mesquite and screwbean (Castetter and Bell 1951). The primary source of dietary protein came from fish caught in the Colorado River. Among the more important species were the humpbacked sucker and squawfish (Colorado salmon). Regularly hunted game included small mammals, such as rabbits, squirrels, and pack rats. Larger game that figured in the diet included deer and bighorn sheep, which were probably hunted with less frequency and were less abundant than small game; their meat was highly regarded by River Yumans, particularly during winter, when reliable sources of dietary fat were in especially short supply.

An Essay on the Archaic

The Archaic in the American Southwest refers to both a time period and an adaptation (Cordell 1984). When the Pleistocene ended (approximately 10,000 years ago) vegetation changed, the megafauna that roamed western grasslands became extinct, and the highly mobile hunting adaptation of Paleoindians disappeared. A migratory hunting and gathering economic system with increasingly intensive gathering evolved and persisted until village horticultural life was established during the Formative period (ca. 3000 B.P.). Willey and Phillips (1958:107) suggest that this hunting and gathering adaptation took place in environmental conditions approximating those of today and they term the period, the Archaic. Huckell (1996:7) argues the Archaic begins by 8000 B.P. when the first ground stone milling implements appear. The advent of this new technology suggests a shift to a broader diet with greater reliance on plant seeds. The Archaic ends in the southern portion of Arizona with the arrival of ceramics between 1500 and 1800 B.P. (Huckell 1996:8). Julian Hayden (1998:31) defines this emergent shift as follows:

> The newcomers, migrating southward in the wake of climatic change, belonged to the Amargosa Complex, . . . [they] wandered about the Sierra and to the sea in search of food and concentrated their camps near the tinajas, using horseshoe shaped windbreaks of stone or brush. They had . . . darts or spears tipped with stone points, . . . and introduced tools for grinding seeds, the metate, mano, and mortars.

Numerous terms have been applied to the cultures, traditions, and tool complexes of the lower Colorado River Archaic. During the 1930s, Malcolm Rogers (1939) described trails, desert clearings, stone circles several courses high, and large (often volcanic) stone tools that he found throughout the lower Colorado River valley. He attributed these features to the region's first inhabitants, highly mobile hunter-gatherers who he termed the San Dieguito tradition (Rogers 1939). This tradition was followed by less mobile, more focused hunter-gatherers, the Amargosa (Rogers 1945). Although other terms—Pinto and Gypsum (Warren and Crabtree 1986), Desert Culture (Jennings and Norbeck 1955) or Picosa (Irwin-Williams 1967, 1979)—have been used to describe lower Colorado River and Desert cultures, Amargosa emphasizes the links between the Archaic and more recent Sonoran Desert people.

Archaeological Visibility

The Archaic archaeological record along the lower Colorado River and adjacent deserts, particularly for the early and middle Holocene, is sparse. This has led researchers such as Malcolm Rogers (1939) and Julian Hayden (1982:585) to suggest that during much of the Archaic (the early and middle Holocene), high temperatures and aridity led to the region's abandonment. Alternative explanations can be presented for the paucity of sites. Certainly the apparent absence of sites along the lower Colorado River and its tributaries is attributable partly to annual flooding. Floods cut new channels that remove archaeological evidence and also deposited overbank sediments that covered and buried resources.

Schaefer (1994) reviewed the archaeological record in the Colorado desert west of the project area and noted that few sites have been found. He proposed that because the Archaic tool inventory is generalized, sites may have been accidently assigned to Paleoindian, San Dieguito, or even Patayan traditions. Unless a temporally diagnostic point or pestle is present, how can we recognize Archaic resources? During the Archaic, flaked stone artifacts change slowly from core tool, biface, and blade production to flake-core systems. The resulting flake tools (scrapers, knives, perforators, and the like) have no particular attribute that is unique or exclusive in time or space. Even Pinto and Elko point types persist for several thousand years. Likewise, most ground stone is utilitarian and is often not temporally specific.

Because technological change was gradual, it is difficult to place new techniques chronologically until an entire tool inventory demonstrates the tool manufacture system. Many desert sites consist simply of ground and flaked stone quarries where only the milling stone blanks and preforms, tested cobbles and rocks, and initial core reduction flakes are present. These too are exceedingly difficult to assign to a cultural tradition.

Since we can rarely date sites in the absence of temporally diagnostic artifacts, alternative methods of archaeological dating have been proposed. In the Colorado River region, desert varnish (a black or brown, lacquerlike surface deposit) can occur on pavements, outcrops, or artifacts and has been proposed as a means of dating or isolating Archaic components at surface sites. Varnish is composed of fine aeolian deposited clays that slowly accumulate on surfaces (Hayden 1982:582). Researchers have argued that varnish (as well as ground stains and caliche) requires many centuries to develop and have used the surface manifestation to date artifacts, structures, and trails. But this approach has failed to gain universal acceptance because varnish, patina, and caliche do not develop uniformly. Additionally, factors of exposure and microclimate affect the rate of varnish development. Ongoing debate concerning the validity of directly dating rock varnish layers has revealed methodological problems.

With the paucity of temporally diagnostic artifacts and the questionable veracity and reliability of geochemical methods, where do we turn to help us identify and date Archaic period sites? Desert and river sites often occur on erosional terraces or bajadas with desert pavement surfaces, with prehistoric artifacts and modern refuse side by side. Few diagnostic artifacts are present, and separating Archaic period camps, trails, cleared circles, shrines, geoglyphs (i.e., rock alignments, ground figures), or even tool and debris scatters by their surface alteration is problematic. A partial solution to this problem is to develop a model of the Archaic subsistence and settlement system. This model can then help us understand where Archaic sites might be found.

The Paleoenvironmental Context

Although the Archaic period begins around the Pleistocene-Holocene boundary (10,000 years ago), the environmental changes we use to distinguish the postglacial, climatic regime did not occur simultaneously throughout the Southwest. In the Colorado River delta, for example, the Pleistocene-Holocene boundary may be indistinguishable. For much of the Quaternary, this region has been the core North American desert (Cole 1986:399). Wetter and cooler terminal Pleistocene conditions can be recognized only because late Pleistocene fossil pack rat middens incorporate Mojave Desert plant species, which are more adapted to cool climates. At lower elevations, Sonoran Desert scrub was already well established between 11,000 and 8500 B.P. Pack rat middens from Picacho Peak and the Whipple Mountains, along the western perimeter of the lower Colorado valley, have essentially modern flora. The transition zone between the Mojave and Sonoran desert communities was in its current position 9,000 years ago (Van Devender 1990:153), while the mouth of the Colorado River was over 150 km south of Yuma (Figure 3).

The early Holocene (11,000–8500 B.P.) had a climatic regime with slightly more winter rainfall. To the east, in the Tinajas Altas Range, for example, a modern riparian community covered the mountain's southern slopes. From 10,000 to 8,500 years ago, the rainfall pattern slowly shifted from a winter-dominant to a biseasonal system and a relict lower Sonoran Desert shrub community spread northward. The overall density and variety of plant and animals species decreased rapidly and the delta region may have been even more barren than it is currently (Van Devender 1990:158–161).

In the middle Holocene (8500–4000 B.P.), the winter rainfall regime disappeared entirely. Essentially, the modern climate of hot summers was established, although as Van Devender (1990:161) notes, rainfall may have been slightly elevated. Evidence for substantially more severe aridity also is absent from the California Desert to the west (Schaefer 1994:64–65). A warmer, wetter, Colorado delta region during the middle Holocene contrasts with the Great Basin, where pollen and soil studies indicate that a

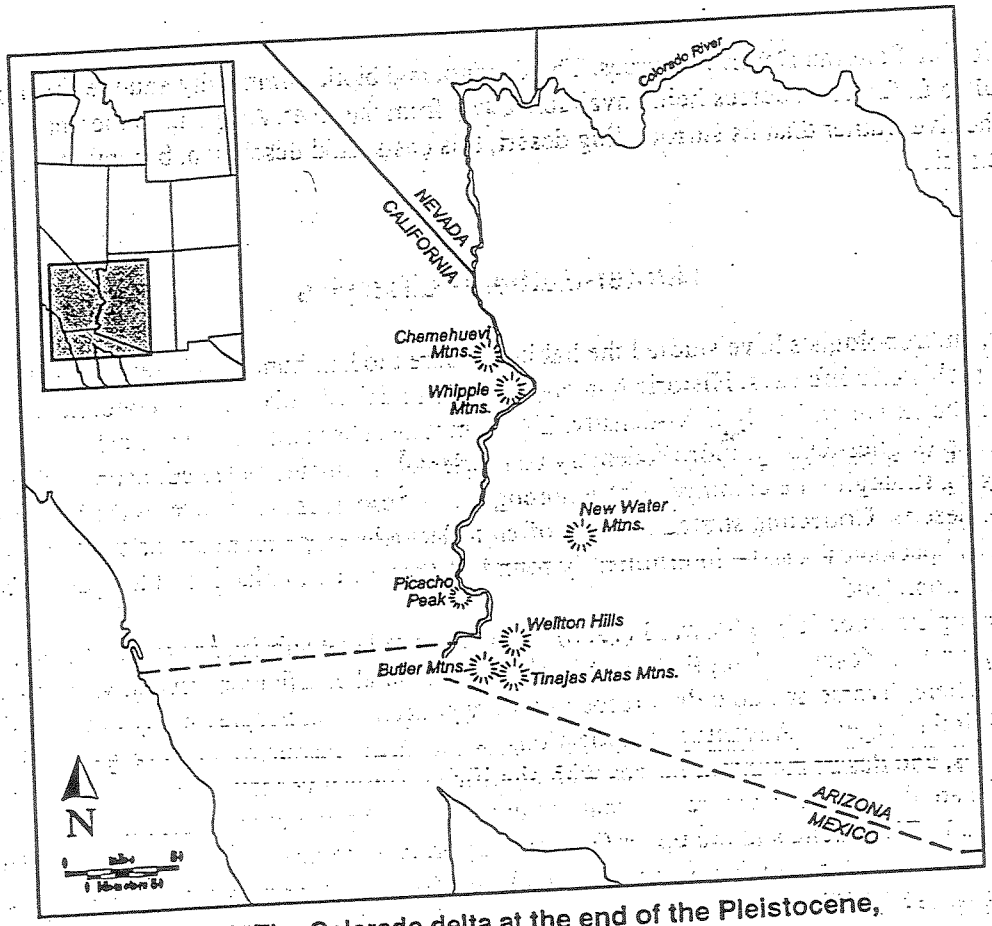

Figure 3. The Colorado delta at the end of the Pleistocene, with the locations of pack rat samples shown

generally higher overall temperature existed until 4000 B.P., with less effective moisture from 10,600 to 5100 B.P. (Grayson 1993; Mehringer 1986). The Great Basin's hot and dry conditions apparently correlate with the classic Holocene paleoenvironmental reconstruction by geographer Ernst Antevs, which he termed the "Altithermal." Grayson (1993:216) argues, that the intensity and temporal placement of hot and dry Holocene conditions varies. Noting that the southern Great Basin has very few middle Holocene sites, he postulates that sparse grass cover, the disappearance of lakeshore communities, and a general absence of piñon meant the resource base was considerably reduced (Grayson 1993:208–216).

Pollen and sedimentation studies from the southern Southwest indicate that xeric conditions (mirroring current conditions) have been present since 4000 B.P. (Huckell 1990:92). This means the Colorado River delta had, on average, just 100 mm rainfall annually, with 30 to 60 percent falling in the summer. The late Holocene probably displayed the short-term fluctuations in temperature and rainfall that currently characterize the Sonoran Desert. The river channel and permanent streams supported deciduous trees such as cottonwood, black willow, mesquite, and sycamore, while the nearby floodplain had willow or arrow weed. Tules and rushes were present in the lower delta marshes, with river islands and brackish areas supporting patches of salt grass. The tidal sector had extensive acreage of wild rice and other salt bushes. This greenbelt rapidly gave way to an open desert scrub dominated by creosote bush, white bursage, and big galleta grass as distance from the riparian corridor increased.

In summary, the Colorado delta environment shifted during the Archaic period. The plant and animal communities lost both their Mojave Desert flora, as well as their winter-rain-dependent plants. Still, Amargosa people needed to make fewer adjustments to these climatic and biotic changes than other

groups exploiting Sonoran Desert resources. The depauperate biotic community and the shifting rainfall pattern resulted in fewer resources being available away from the river. Adapting to the unpredictable bounty of the river rather than its surrounding desert, this oasis amid desolation, became the hallmark of the Archaic period.

Hunter-Gatherer Lifestyles

Historically, anthropologists have studied the habits of more modern hunter-gatherers for insight into interpreting prehistoric lifeways. Historic hunter-gatherers practiced quite varied economic adaptions ranging from the extended family (low-density, highly mobile subsistence strategies called foraging) to the larger group (higher-density, more sedentary task-oriented strategies called collecting) (Binford 1980). Foraging strategies are common where homogeneous resources spread across the landscape, in rain forest or deserts. Collecting strategies more often reflect a heterogenous environment where a variety of resource "packages" can be intermittently found. Rivers, coasts, uplands and temperate forests are the collector's homeland.

Anthropologists since Julian Steward (1938) have suggested that subsistence and settlement patterns in America's western deserts reflect the region's plant and animal distribution, diversity, sparsity, and seasonality. Where diverse and abundant resources were concentrated, people rapidly developed technologies to exploit the largesse. Advantageous locations, where many resources could be gathered, included rivers, wetlands, and desert mountain ranges with significant vertical vegetation change ("desert islands"). These are the locations where substantial hunter-gatherer populations resided.

The Colorado River delta and the upper Gulf of California is the largest contiguous area of true desert in North America and mountains occupy the smallest portion of its terrain of any Sonoran Desert area (Spaulding et al. 1983:262). If hunter-gatherers, for example, wished to obtain acorns or pine nuts they had to travel a considerable distance. Thus, while the riverbanks had diverse resources, the surrounding desert provided a homogeneous, sparsely covered, landscape with precious few exploitable resources. As a result, the Colorado River delta region must be considered a less advantageous environment for Archaic hunter-gatherers than other Sonoran Desert river systems.

Models of Archaic Hunter-Gatherer Systems

Anthropologists and archaeologists have presented several models of how Archaic hunter-gatherers lived, all of which support the premise that hunter-gatherers used the Colorado River. How intensive were the occupations and how long did they last?

Reid and Whittlesey (1997:43–44) suggest that Archaic people were mobile hunter-gatherers who, following the disappearance of mammoths, camels, and horses, adapted to hunting smaller game (deer, pronghorn, rabbits, and hares). But his subsistence shift required new and different technologies: smaller animals required people to invent special dart points, snares, and nets; they represented much less food value per animal captured; and rabbits and hares (a small game staple in the lower Colorado region) are cyclically productive, with large numbers in some years and few in others. Varied greens and fruits were collected more intensively to supplement the animal diet. Over time, grass seeds, pods, and nuts joined were incorporated into the diet, and with these foods came new preparation techniques. Milling equipment was invented that became more and more effective.

Mobility was the key to an effective subsistence strategy, and Archaic people followed the gradual maturation of plants. To effectively extend the quantity of plants they gathered, the Amargosa traveled from the desert rivers to the mountains (Reid and Whittlesey 1997:54). Their diet gradually broadened; pollens, reptiles, even insects were eaten. Groups settled into a territory and intensively sought many

different plants and animals. When we apply Reid and Whittlesey's framework to the Colorado River delta, we envision a dispersed hunting and gathering lifestyle slowly being replaced by increasingly restricted, seasonal movement. Spring and summer was spent taking advantage of the flooding river, then in fall and winter, when water and resources were few, people traveled to upland areas to hunt and to collect seeds and nuts. These uplands may have included the Sierra Cocopah and Juarez ranges in northern Baja California, and the California Peninsular Range west of the Salton trough.

Shackley (1996) geographically extends the hunter-gatherer mobility model beyond Reid and Whittlesey's presentation. Shackley argues, based upon the varied stone tool materials found at Archaic sites, that long distance foraging was typical of Archaic times. His model has groups migrating annually from the area of Ventana Cave to the Colorado Plateau. Special task groups might have even been sent far afield, particularly during droughts, to procure resources. Shackley's model suggests that people visited the plateau in late spring, summer, and early fall, a generally bountiful time along the river when fish and (particularly) mesquite are readily available. One possible travel route to the plateau was along the Bill Williams River, a route covering several hundred miles.

Pendleton (1986) proposed another model for Archaic hunter-gatherers. Using ethnographic analogies, derived from Colorado River Yuman groups (Mojave, Quechan, and Cocopah), she argues that a river-focused logistical (collecting) strategy characterized the Archaic. She notes that historically, the predominantly agrarian Colorado River tribes were part-time collectors and regularly dispatched task groups to harvest wild plants. She concludes (1986:224) that during the Archaic:

> Logistically organized collector groups . . . established relatively permanent residential base camps near the Colorado floodplain . . . activity in the Basin [Picacho included] lithic resource procurement (quarrying), mesquite procurement, and minor emphasis on acquisition of various other food sources.

A river-focused collector strategy best explains the low-density distribution and limited artifact quantities at sites in the Picacho Basin (near the river north of Yuma). Generally, sites away from the river were highly specialized (quarries rather than food procurement locales), with most sites located within 10 km of the river. Small camps lacked hearths and exotic lithic material, indicating to Pendleton that local stone procurement and restricted overnight camping was the norm. She reconstructs a landscape with large camps, eventually evolving into villages, located along the river or on adjacent terraces. People traveled to desert procurement areas in task groups to quarry and reduce lithic raw materials for transport. Occasionally, mesquite or cactus was collected, processed, and carried home. In essence, the desert became an extension of the village's territory.

Another hunter-gatherer model is Huckell's (1990) reconstruction of foraging and farming in the Late Archaic. Although his model was developed for southeastern Arizona, it has several useful points that are relevant to the lower Colorado River region. Huckell argues that the one predictable aspect of desert resource productivity is its unpredictability. If people relied on residential mobility to obtain desert foods, they would eventually be faced with resource acquisition problems. Plant or animal food productivity was cyclical; a boom or bust situation. If rains did not arrive, or came at the wrong time during the seasonal round, no water would be available at traditional springs or tanks. When shortages occurred, Huckell suggests that the ability to store food would have given hunter-gatherers a distinct adaptive advantage and would have permitted people to more intensively use the low desert. He suggests that, over time, this resulted in two profound behavioral changes. First, Archaic people deliberately selected wild foods that could be processed and stored. Second, they chose campsites where varied resources could be found. At these locations, they constructed facilities (cists, granaries) and cached their tools (baskets, pots, milling implements).

All these hunter-gatherer subsistence and settlement models imply that most Archaic period archaeological sites will be found either near the river, along drainages that flow to the river, or in somewhat

distant mountain ranges. Travel to and from these locales would be fairly rapid as few resources existed in between that could be rapidly prepared or transported. Using known pathways (trails that linked springs or tanks and resource areas) was important because crossing the desert without problems, and avoiding dangerous routes with no water, may have been as important as exploiting its plant and animal resources efficiently.

The Lifeways of the Colorado River Delta Archaic

My review of the paleoenvironmental context and hunting-gathering models suggests that the unique landscape of the Colorado River delta must be carefully evaluated before reconstructing how people used the region during the Archaic. First, we must realize that this region has always been desert. Even in the late Pleistocene and Holocene, when water filled Mojave Desert sinks and trees covered the lower slopes of the Tinajas Altas mountain, the delta region had a sparse cover, with few economically useful plants or animals. At times it may have been slightly drier or wetter, slightly cooler or hotter, or stormier in summer or in winter, yet it always has been a barren terrain with only the ribbon of a river to interrupt the desert's hostility.

To understand how hunter-gatherers may have adapted to the delta resources, we first need to identify what plant and animals were commonly available. Connie Stone (1991) provides a summary table that highlights seasonal resources for the lower Colorado River region. Her presentation has been augmented with additional information from Castetter and Bell (1951) and expanded to include resources from the Sierra Cocopah. Table 1 illustrates that three months of the year afforded few resources, in particular March, April, and December. Moving away from the river to hunt and gather or using stored foods may have been necessary to survive these months. Additionally, we see that fresh greens and fish

Table 1. Annual Cycle of Plants and Animals

Month	Wild Plants	Animals
January	wild tuber, stored flour	rabbits, pack rats, birds, fish
February	wild tubers, stored flour	rabbits, pack rats, birds, shellfish?
March	few available	rabbits, pack rats, birds
April	agave, pollens	game is scarce
May	wild rice	fish returning
June	tule roots, tansy mustard	rabbits, birds, fish
July	greens, mesquite beans	rabbits, fish
August	mesquite and screwbeans	rabbits, fish
September	screwbeans, panic grass	rabbits, fish
October	ironwood pods, piñon, acorn	rabbits, fewer fish
November	quailbush, saltbush, greens	rabbits, fewer fish
December	few available	ducks, quail

Note: After Castetter and Bell (1951) and Stone (1991).

resources (as well as the proliferation of certain seeds) was dependent on the magnitude of the river flood. Longer and more extensive flooding episodes increased the duration and the quantity of fish, greens, and some seeds. Two factors, then, acted as significant constraints on the hunting-gathering subsistence system: months when plants were scarce, and low-water-flow years.

When Archaic hunter-gatherers entered the Colorado delta region in the early Holocene, they crossed an expanse of saltbush and creosote terrain. They traveled from water hole to water hole or followed drainages like the Hardy River. Or they journeyed north from the Sea of Cortez, where they fished and ate mollusks, beyond the tidal bore to the freshwater land along the river. Here they could have dug wild onions, gathered saltbush seeds or mesquite bean pods, or caught fish. Many of these resources, however, needed to be specially processed before they could be eaten. It is not surprising that few sites recording the presence of early Archaic people have been found along the Colorado River. The tools and knowledge of how to use resources needed to be developed before there was a reason for the Amargosa to prolong their visits to the river.

In his hunter-gatherer model for the Great Basin, Grayson (1993) proposes that people first had to recognize the availability of eatable plant products before they could invent tools and develop ways to process these resources. The same is true in the Colorado delta. The river's plant resources, particularly its saltbush, wild rice, mesquite, and screwbeans require careful, sometimes complex, preparation. Grinding seeds is a time-consuming process, and the implements used in their preparation cannot be easily transported. Either a rock outcrop, a stored tool, or a small, portable stone or wood processing tool was needed to produce a palatable food. First the tool itself had to be made by percussion flaking and then laboriously pecked and abraded to its final form (Schneider 1993). Then they needed to arch, pit-bake, and grind the seeds or pods, once or even twice. After grinding, the flour had to be cooked, in a basket or wood bowl with heat stones, or formed into a cake and baked.

Inevitably, people had to make decisions about how much time to spend fabricating tools and processing plants. Since few early Holocene sites exist (and most lack milling implements), it seems that at first people chose to be mobile and carry portable equipment. They processed seeds where they found them and hunted the scant game. These foragers may well have congregated at the delta during the winter months, collecting shellfish and fish. They then may have spent early spring in the delta harvesting wild rice before continuing northward (following the Gila or Bill Williams River) into the highlands for the summer. As fall arrived they retraced their steps along nearly dry creek beds gathering fruits, berries, nuts, pods, and seeds as they returned to the coast.

By the middle Holocene, milling implements such as basin metates, manos, pestles, mortars, and possibly even gyratory crushers were developed. These tools are too heavy to transport and operate most effectively when processing larger quantities of seeds and pods. It is during the Middle Holocene then, that decisions may have been made to travel less and to live more permanently along the river. By combining wild rice gathering in spring, fishing, mesquite harvesting, and arrowroot digging in summer, screwbean or saltbush collecting in early fall, and fowling in winter, a stable subsistence structure could have been created (see Table 1). But all these activities imply storing resources (processed meal and possibly dried fish) for future consumption.

While a more stable existence along the river clearly provided some advantages, a less mobile subsistence strategy might have eliminated many desirable foods (such as cactus fruits, agave, or piñon) from the diet. A probable solution to this adaptive shift likely involved sending small groups to collect valued products. This task-group strategy was feasible and probably desirable. In historic times, Quechan, Cocopah, and Chemehuevi people harvested wild plants in the western desert ranges. This tradition most likely extends back in time, mimicking similar Amargosa practices developed to obtain their piñons, acorns, or agaves. Because Amargosa trails often parallel the river, on the Pleistocene terraces, seasonal movement may have been mostly linear from the delta, upriver and back. The eastern or western territories that once were visited annually became places to seek food only when the river's usual harvest failed.

Adaptation to more permanent settlements along the Colorado River probably were almost certainly in place by the Late Holocene. By this time, other groups were moving into the surrounding uplands and the plateau, consuming resources previously available to all desert dwellers. For those groups settled along the river, the exchange river of products for upland foods became more efficient than procuring and transporting resources themselves. By developing kin ties away from the Colorado, Desert and Gran Desierto families could annually visit piñon or acorn groves, or hunt desert bighorn and pronghorn. By the late Holocene, trails cross the desert terraces with the Yuma mesa serving as a link between the river and distant villages. Camps with rock-walled windbreaks could have been established at desert tanks and springs, to aid the regular traveler.

As we look at the Colorado delta region we realize why so little is known about the Archaic. People lived lightly on the land in the desert surrounding their home, the river itself. By developing the tools and techniques necessary to intensively exploit many different river plant and animal products, the Archaic hunter-gatherers may very well have isolated themselves from their surrounding desert, which became a region of mystery where they seldom ventured. Julian Hayden (1998:12), writing about the Sierra Pinacate region (southeast of the delta), tells us of the contrasting world view between river people and the few desert dwellers:

> The Pinacateños guarded their mountain jealously against intruders, perhaps because the limited supplies of water and foodstuffs, seeds and game, would support only a certain number of Indians, and this may have contributed to the aura of mystery which has enveloped the mountain . . . tales are told among the people of northwestern Sonora of giants, men and animals, the bottomless pits, the endless tunnels, the hostile Indians, the smoking caverns and the ever-present dangers to be found . . . tales were told, that the mountain was the home of magic and power; the figures and patterns in the black desert pavements may have been expressions of the powers of the mountain. . . . .

An Essay on Milling-Implement Quarry and Production Sites

Before the advent of twentieth-century water-containment projects (dams and levees) along the Colorado River, annual floods caused regular, major reshaping of the landscape within the floodplain. On a less-regular basis, more than one flood event occurred within a single year. At least two types of extremely rapid geomorphological processes regularly washed away, cleared, and changed landscapes in the region: scouring the central portions of the floodplain during the initial stages of the floods and depositing heavy loads of silt as the floods waned and the river receded (Castetter and Bell 1951; Kniffen 1931; La Rue 1916; McKibben 1991; Sykes 1937).

Today, the flow of the lower portions of the Colorado River has been regularized and reduced by upstream dams and restricted by levees in the project area. Because of the divergence of the river and the withholding of natural flow, the extremely rich natural environment and the abundance of flora and fauna that once existed has been minimized and, in some areas, totally eradicated (Castetter and Bell 1951; Rea 1983).

Cultural Context

During the chronological period referred to as the River Patayan, the indigenous peoples of the lower Colorado River region lived in a relatively sedentary manner, exploiting the abundant wild resources of

the river and the floodplain. They could be best described as floodplain horticulturalists, using native and introduced crops that were grown on the rich silts laid down by annual floods. Ethnohistorically, two groups inhabited the area most germane to the current discussion. The Quechan (Yuma) lived in the area of the junction of the Gila River with the Colorado, while the Cocopah lived from below the junction of the Gila River with the Colorado to the delta. Both groups reportedly relied heavily on wild plants, fish, and land fauna of the area. Mesquite (*Prosopis* spp.) was an abundant and especially reliable resource. At the time of European contact, pumpkins, squash, beans, and maize were also being cultivated in the region. Wild resources, however, continued to make up a significant portion of the diet (Castetter and Bell 1951:56–57; Rea 1983). People lived in scattered small groupings among cultivated plots, often on slightly elevated portions of the floodplain. When floods occurred, the population retreated to the higher terraces along the river until the waters receded sufficiently to reenter the floodplain and reestablish dwellings and fields.

Although relatively dense human populations were found by the time of European contact (Forbes 1965), there is little doubt that the size of the prehistoric population of the lower Colorado River region was the same or greater. Little, however, is known about the prehistory of the region because of the almost total absence of archaeological materials within the floodplain. The remnants of early activities have been either washed away by flood waters of the Colorado River or buried deeply under silt deposits. As far as is known, no substantial residential sites have been found or studied in the project area or elsewhere along the lower portions of the river floodplain.

The existing archaeology of the region is found on the terraces above the floodplain of the lower Colorado River. More common site types include petroglyphs, intaglios, trails, a variety of rock constructions (cairns, alignments, rock circles, "hunting blinds," and other forms), and the remains of stone working. Of the latter, the most prominent are milling-implement quarries and their associated production "workshops."

The Milling-Implement "Industry"

The everyday lifeways of the indigenous peoples of the region included processing a variety of food (and other materials). That this was essential to survival cannot be overstated, although these common and repetitive tasks are not well reported in the ethnographic or historical literature. Ethnographic and historical accounts describe the milling implements used in this region (Bee 1983; Ceremony 1868; Drunker 1941; Forde 1931; Gifford 1931, 1933; Heintzelman 1857; Kelly 1977; Spier 1933; Stewart 1968; de Williams 1983); every household had at least one set of a characteristically shaped, lower milling stone (metate) and a long, two-handed hand stone (mano), a wooden mortar (usually of mesquite or ironwood), and a long stone pestle.

A problematic situation concerns the fact that although tremendous quantities (e.g., an estimate of 46,000 stone pestles at Antelope Hill alone [Schneider 1998]) of milling implements were produced (Huckell 1986; Schneider 1993, 1998), relatively few used implements have been found at habitation sites because of the geomorphological processes that have been active over time within the Colorado and Gila River drainages.

The extensive archaeological remains of milling-implement procurement and production activities, however, support the idea that special processing equipment was a universal necessity. Evidence of the great intensity of milling-implement production lies mostly on terraces lining the rivers, at geological outcrops close to the floodplains, and occasionally on what would have been islands within the floodplains of the Colorado and Gila Rivers.

Schneider hypothesizes that mesquite (*Prosopis pubescens* [screwbean mesquite] and *Prosopis juliflora* [honey mesquite]) was the staple food plant of the lower Colorado River region during prehistory and that the design of the milling implements of this region (both the type of stone selected and the

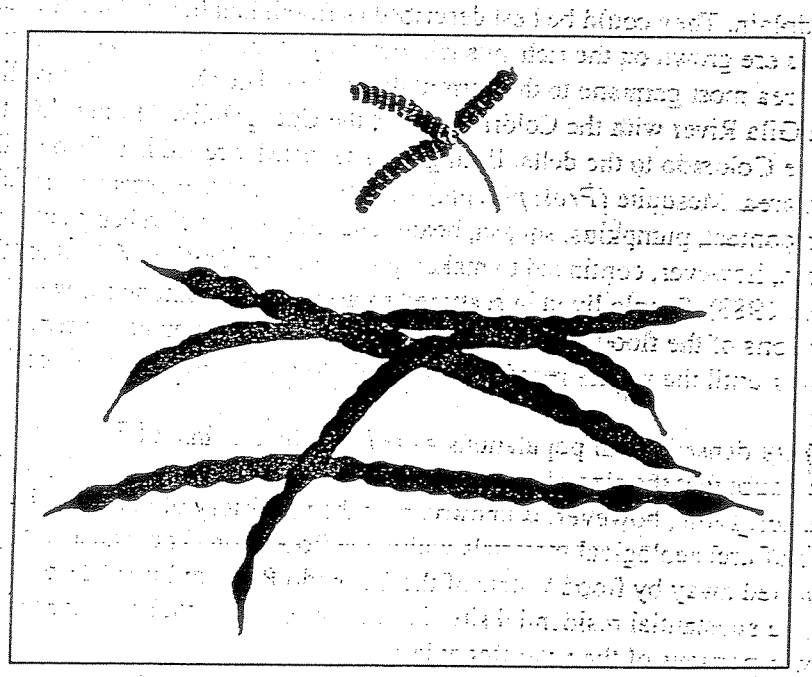

Figure 4. Mesquite pods. Top: *Prosopis pubescens* (screwbean mesquite); bottom: *Prosopis juliflora* (honey mesquite).

shapes and sizes of the implements) was developed in response to the need for efficient processing of this dietary element (Schneider 1993, 1996, 1998, n.d.). This view is supported by a number of other investigators who emphasize the importance of mesquite in aboriginal subsistence (Castetter and Bell 1951; Fowler 1995; Schroth 1987). The mesquite groves (bosques) in the floodplain of the lower Colorado were extensive, reliable, and the resource was high in protein and sugars (Figure 4). Processing mesquite beans required pulverizing the pods and grinding both the pods and the seeds. Later, the same processing tools used for mesquite were used for wheat, corn, as well as other substances.

Milling-Implement Quarries

Along the terraces of the lower Colorado River, at least two source types of stone used in the manufacture of prehistoric milling implements have been identified: andesite and other extrusive volcanics (Schneider 1993:175–194, 1994:101–117, n.d.) and secondary deposits of isolated boulders within desert pavement areas (Ezzo and Altschul 1993; Gieb 1986; Green 1990; Huckell 1986; Lerch 1990; Pendleton 1986; Schneider 1993:18, 40–43). Other areas in the region have also been identified as milling-implement quarry and production sites: Antelope Hill on the Gila River (Schneider 1993; Schneider et al. 1995); Texas Hill on the Gila River (Schneider et al. n.d.); Laguna Salada (field notes and photographs of Morlin Childers); and further away, Elephant Mountain on the Mojave River (Schneider 1993; Schneider et al. 1995); northern Death Valley alluvial fan surfaces (Antanitis et al. 1995); and several Hohokam settlement areas (Hoffman and Doyel 1985).

Schneider believes that certain characteristics of stone were being sought by indigenous peoples and that, where stone with these advantageous characteristics was identified, it was exploited for milling implements. She developed production trajectories for both stone pestles and lower millstones (metates). The shared characteristic of all stone used for milling-implement production was the existence of relatively large phenocrysts, or large angular grains within a finer-grained ground mass or matrix. Since a good deal of energy was expended on production, and the tools were shown to have traveled some

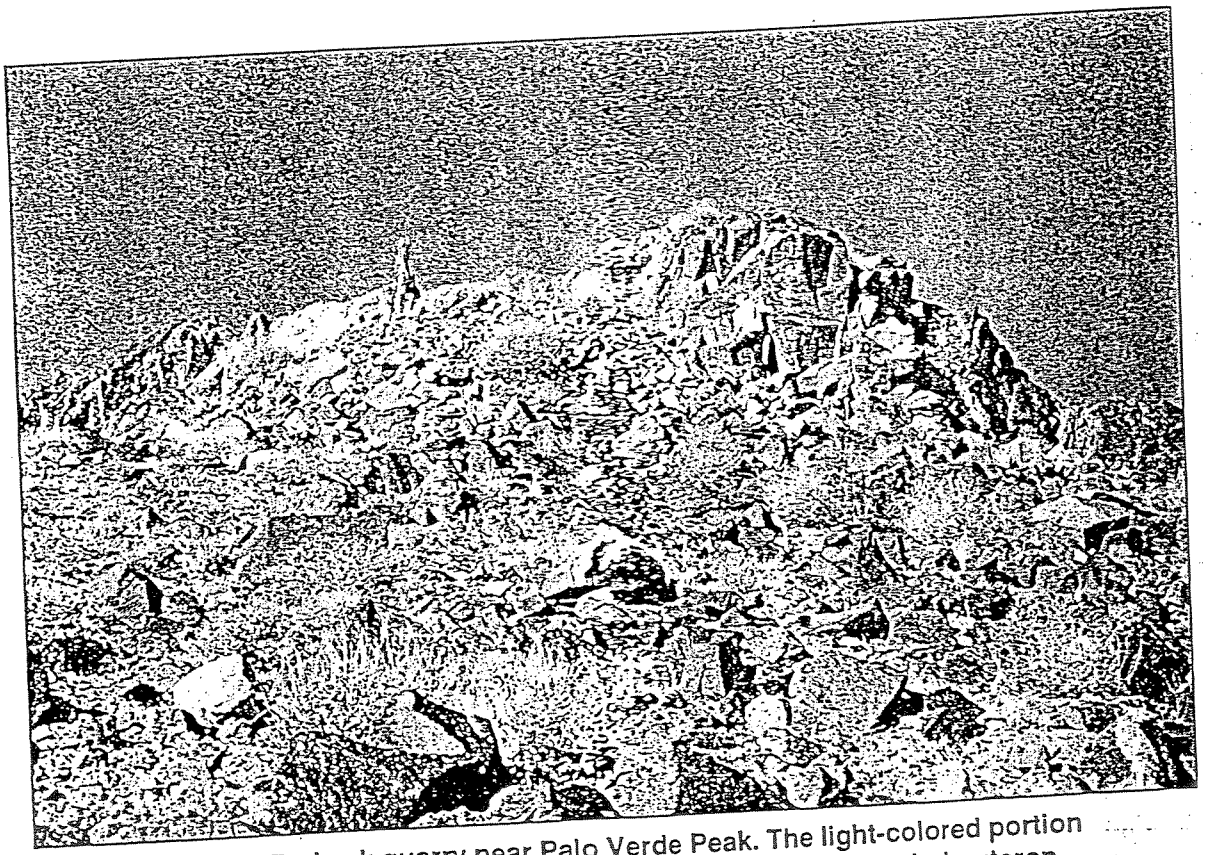

Figure 5. Bedrock quarry near Palo Verde Peak. The light-colored portion of the crest of the hill (to the left of the figure) is the quarried outcrop. Note the large blocks of stone and debris on the slope below the outcrop.

distance from the source of stone (Schneider 1993, 1998, n.d.; Schneider et al. n.d.), it was expected that they could be used for a relatively long time and not require constant resurfacing to maintain abrasiveness. Stone of this character included andesite, rhyolite, basalt, and sandstone. The exact requirements were found at a number of large rock outcrops where production was intensive (Figures 5–7). Huckell (1986) showed that in the isolated boulder fields along the eastern side of the lower Colorado River that he studied, individual boulders were tested for quality before extensive work took place (Figure 8).

At both types of quarries (bedrock and isolated boulders), however, the approach to the reduction of large pieces of stone to form milling tools was very similar (Figures 9 and 10). In the case of bedrock outcrops, there is substantial evidence (Schneider et al. n.d.) that indigenous peoples not only extracted rock from outcrops using only stone and wood or bone tools, but that, in some cases, excavation of superior stone took place (Figure 11).

Understanding Site Location

It is expected that where bedrock and/or large isolated boulders exist that have these advantageous characteristics, there will be archaeological evidence of the exploitation of stone and production of milling implements in the form of battered hammer stones, broken and discarded attempts at manufacture, and quantities of debitage. In that the milling tools were heavy and cumbersome to carry (Schneider 1993, Appendixes C and D), it is assumed that most milling-implement production areas are near the floodplain where people lived, where resources were available, and where plant processing took place. Our knowledge, to date, agrees with this assumption (Figure 12). Within the project area, there will be a strong

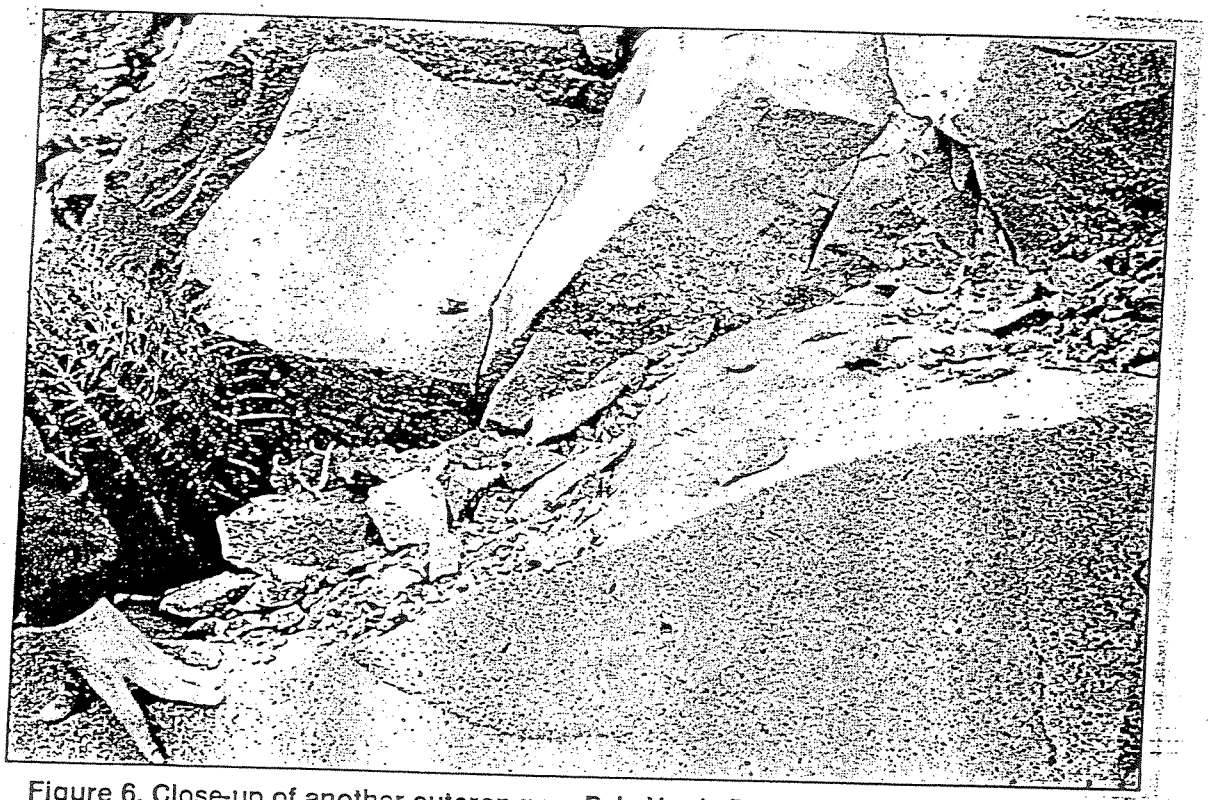

Figure 6. Close-up of another outcrop near Palo Verde Peak. Note the flake scars on large blocks of stone within the outcrop, indicating efforts to extract the blocks.

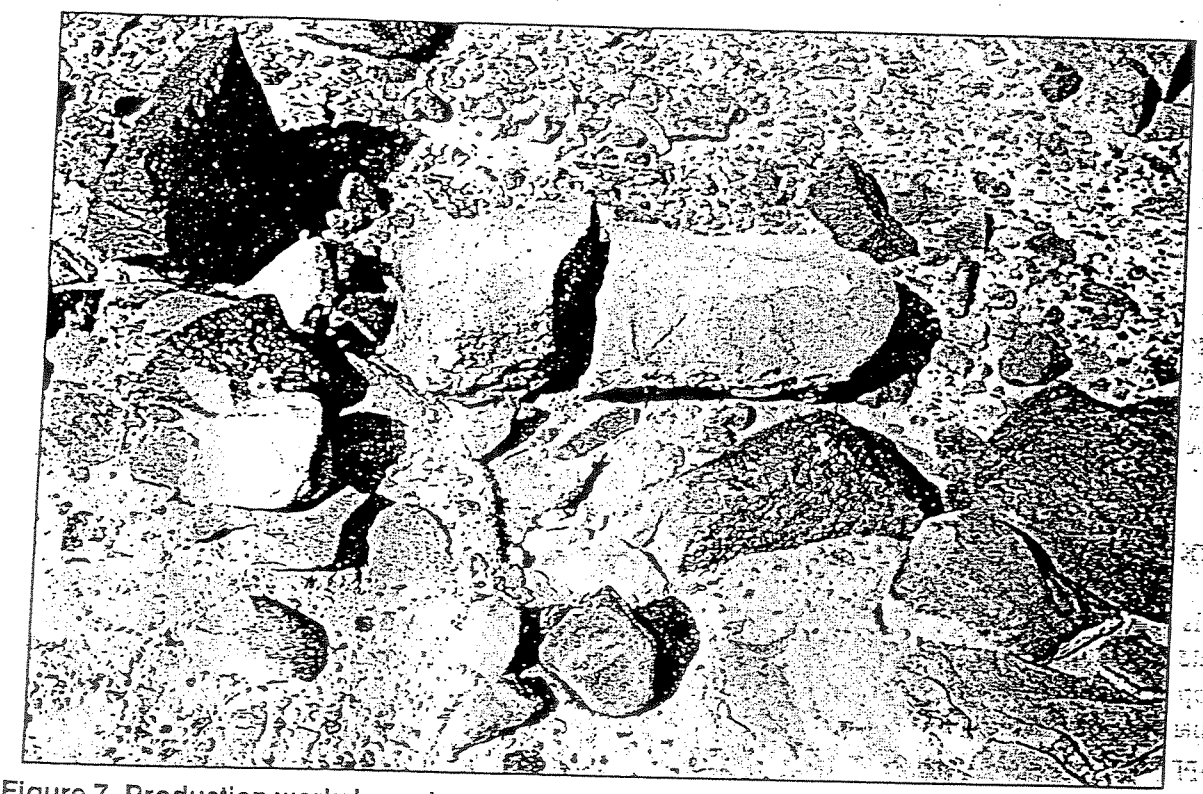

Figure 7. Production workshop at a quarry near Palo Verde Peak. Archaeological materials include a pestle preform broken during manufacture, percussion flakes, and at least three hammer stones (in foreground). The trowel at the upper right provides scale.

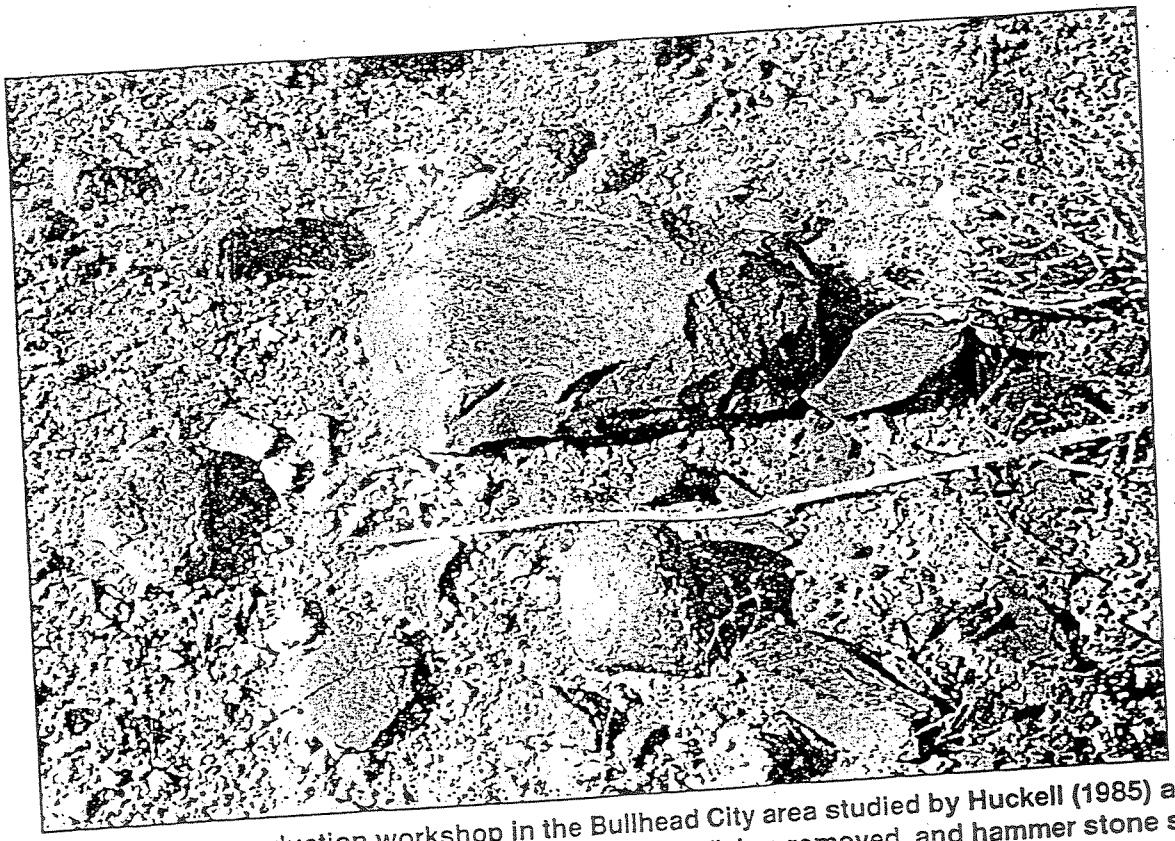

Figure 8. Metate-production workshop in the Bullhead City area studied by Huckell (1985) and Gieb (1986). Note the isolated large boulder, percussion flakes removed, and hammer stone spall.

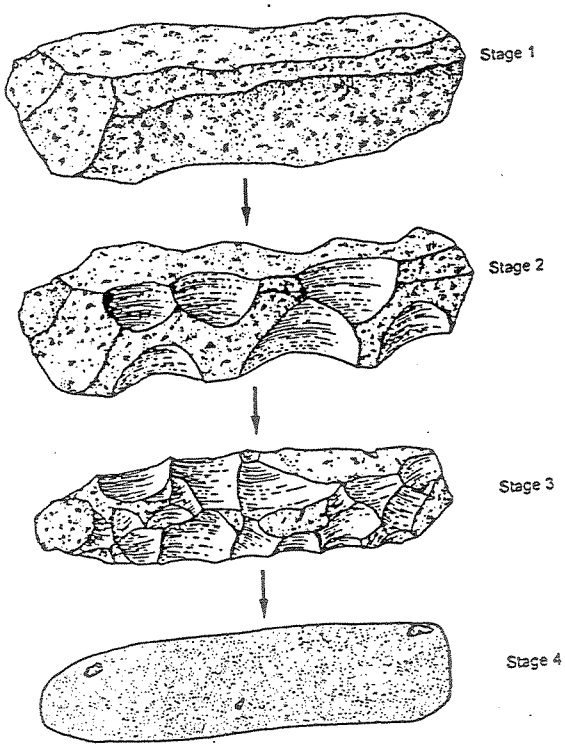

Figure 9. Production sequence for stone pestles (from Schneider 1993): Stage 1, block selected; Stage 2, initial shaping (large flakes); Stage 3, intermediate shaping (smaller flakes); Stage 4, final shaping and removal of flake scars by pecking.

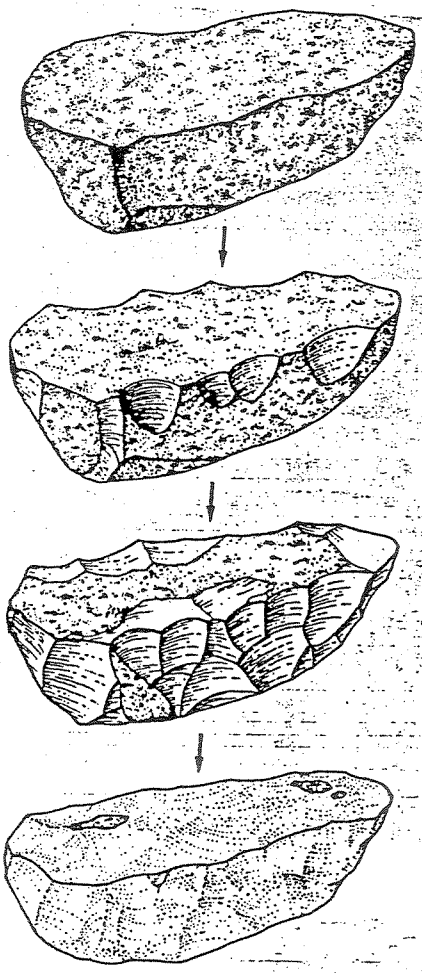

Figure 10. Production sequence for metates (from Schneider 1993): Stage 1, block selected; Stage 2, initial shaping (large flakes); Stage 3, intermediate shaping (smaller flakes); Stage 4, final shaping and preparation of the grinding surface by removal of cortex by pecking.

association with the Colorado River floodplain and delta. When considering this association, it is important to remember the documented (and undocumented) changing course of the river over time as well as the reconfiguration of the delta region. What might be farther-than-expected in modern times may have been closer to the river channel in the past (Kniffen 1931; La Rue 1916; Sykes 1937).

An Essay on the Landscapes and Cosmology of Yuman-Speaking Peoples

The Cosmology of the Yuman Landscape

The Yuman-speaking peoples and their ancestors imbued the landscape of the lower Colorado River with cosmological significance. To these peoples, the landscape is a product of the gods, a living, physiographic record of their triumphs and conflicts. In this rugged and unforgiving land dissected by the life-giving Colorado River, the Yuman-speaking peoples transformed the landscape into a representation of

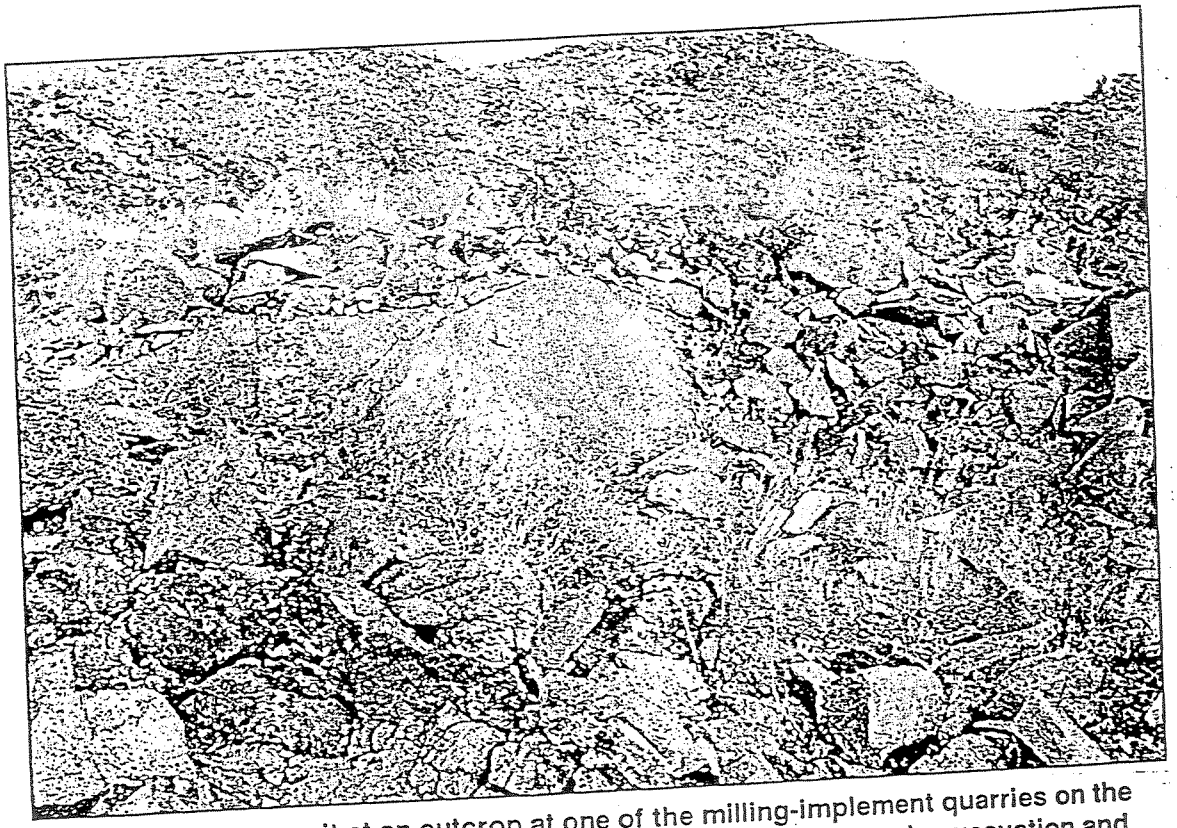

Figure 11. Quarry pit at an outcrop at one of the milling-implement quarries on the lower Colorado River. Although difficult to see in the photograph, excavation and removal of the blocks of stone has occurred just to the left of the varnished portion of the bedrock in the center of the photograph. Debris from quarrying litters the surface.

their existence and their purpose for having been brought into the world. Baksh (1994) found that any number of hills overlooking the lower Colorado are viewed to have been formed by actions of good and evil deities as they battled along the river during the distant past (see example below). In addition, many unaltered or unmodified landforms are considered to possess cosmological significance. Newberry Mountain near Needles, California, for example, is known as Avikwaame, the place of creation; it was out of this mountain that the first human (the first Yuman-speaking peoples) emerged. As Lorey Cachora (1994:14) of the Quechan Indian Tribe has stated, "the Quechan historical record begins at a mountain and proceeds along the banks of the mighty Colorado River." Conspicuous landmarks such as Pilot Knob are considered to be places where spirits dwell; there are symbolic entrances to these landforms, and if a person wishes to communicate with the spirit world, such places are prime localities for this activity. The waters of the Colorado River are likewise sacred, considered to be the silvery blood that flowed from the body of the feared and monstrous Sky Rattlesnake after it was slain by the creator-god Kumastamho (sometimes referred to as Kwikumat [see Ezzo 1994a; Johnson 1985; Schaefer 1985b; Woods 1986]).

The people themselves have also modified the landscape in cosmological terms. More obvious examples include intentional alterations in the form of geoglyph (intaglio) construction and petroglyph execution, as well as unintentional modifications such as those shapes depressed into the ground as the result of repeated activities, such as ceremonial dancing. Many of the geoglyph sites represent the actual location of mythological events involving deities. Two of Baksh's (1994:23) Yuman informants, Weldon Johnson of the Aha Makav Culture Society, Fort Mohave Indian Tribe, and Lorey Cachora, described one site as follows:

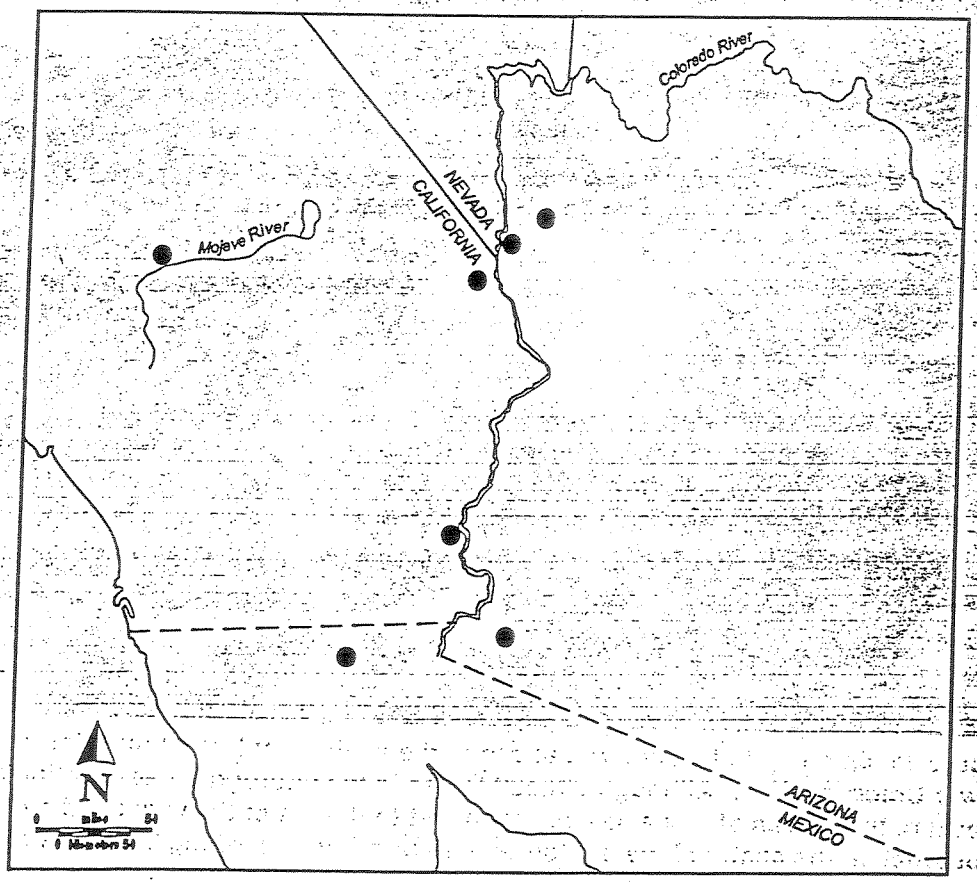

Figure 12. Map of known milling-implement quarries in the lower Colorado–lower Gila River region. Each dot represents one quarry or a group of quarries.

In looking at the archaeological field sketch, Mr. Johnson observed that there was originally more to the site than was illustrated, but that another associated figure may have been recently disturbed and not readily apparent. The other figure was a human's upper body with head and arms. This figure represented a giant who had staggered before falling off the edge of the terrace; the bottom half of his body cannot be seen because it had fallen into the river. The snake-like figure, which is still in decent condition, is not a snake, but the path where the giant staggered on the way to the river. . . .

The concept of a giant falling or being dragged into the Colorado River may have been widely shared in Yuman mythology. Mr. Cachora related a myth about a giant boy who had been pulled into the river by a giant octopus. The giant boy was evil and his aunt or grandmother had asked the octopus to come and get him. The boy was dragged downstream and tried to escape, creating a place called Table Mountain when he slammed down his hand or knee when rising from the river, but was eventually drowned. Mr. Cachora explained that an intaglio of a human stick figure exists somewhere along the river bank where the giant boy was pulled into the river. The figure is missing part of a leg which had been pulled in the river by the octopus.

Another version of the legend tells of Ka-tarr (sometimes referred to as Blind Old Man [see Woods 1986]), the evil twin brother of Kumastamho, who had journey up the river and was bringing misfortune to the people living along the river. The people implored Kumastamho to put a stop to this, and he

responded by sending a giant octopus up the river who engaged Ka-tarr in battle. In the process the octopus tore off one of Ka-tarr's arms (and, in some versions, his head as well) before dragging him into the river. Ka-tarr's struggle can be seen in the formation of several mountains along the river. He is frequently depicted, as at Pilot Knob, as a one-armed stick figure (Ezzo and Altschul 1993d; Johnson 1985).

Landscapes are also altered in very subtle ways. Shrines consisting of two or three rocks stacked on top of each others, or a linear arrangement of a few stones used to mark a trail or a sacred place along a trail, are frequently encountered along the lower Colorado River. These subtle modifications generally blend in well with the surrounding landscape, making their identification difficult to the untrained eye. It appears that the Yuman-speaking peoples were attempting to maintain the harmony of the landscape while marking significant localities (Cachora 1994).

As discussed above, it has been inferred that the anthropomorphic and zoomorphic figures depicted in petroglyphs and geoglyphs represent key actors in the myths of the Cocopah, Quechan, and Mohave. Furthermore, it has been interpreted that certain motifs, such as spirals, represent sacred places in the creation myth; however, the sites where intaglios occur have been abandoned and apparently not used since the late nineteenth century. It was at this time that the Yuman-speaking peoples living along the lower Colorado River were confined to reservations and not permitted to travel freely along the river. Such travel was crucial to the maintenance of the elaborate ceremonial system that existed; this disruption resulted in the termination of certain rituals as they were traditionally practiced. Sacred space for the Yumans existed all along the river, and eventually knowledge of sacred areas was lost or transformed.

The *Keruk* Ceremony as Landscape and Cosmology

One of the most important ceremonies to Yuman-speaking people was the *keruk*, or mourning ceremony, which lasted for two weeks and required extensive travel along the lower Colorado River. The *keruk* trail, actually an elaborate network of trails (may of which are still visible today), extends from Pilot Knob, west of Yuma, Arizona, to Newberry Mountain, a distance of approximately 170 miles (Figure 13). In recent years, the work of a number of individuals (Altschul and Ezzo 1994; Baksh 1994; Cachora 1994; Ezzo 1994a; Ezzo and Altschul 1993d; Johnson 1985, 1992; Schaefer 1985a, 1985b; White 1994; Woods 1986) through archaeological survey, discussions with Native American informants, and ethnographic descriptions from the late nineteenth and early twentieth century by Trippel (1889), Kroeber (1920, 1948, 1951), Strong (1929), Forde (1931), and Spier (1933, 1935) as well as more recent work by Forbes (1965), Stewart (1969, 1983), Halpern (1980), and Bee (1981, 1983), have pieced this information together.

The *keruk* ceremony was an annual event that lasted for two weeks and included elaborate dance rituals such as reenactments of the Yuman creation as well as a pilgrimage that began at Pilot Knob and culminated at Newberry Mountain, known as *Avikwaame* (the place of creation), with stops at least three places along the way: Picacho Mountain; Black Point, north of Blythe, California; and the Riverside Mountains near Parker, Arizona. Each of these stops is a prominent marker on the physical landscape often containing a variety of intaglios, dance circles, sleeping circles, and trails and associated markers. It is appropriate to note that there are two types of intaglios: those deliberately constructed most likely in a single episode (such as human and animal forms) and those that were formed as the result of recurrent use (such as trails and dance circles).

The *keruk* ceremony commemorated all who died in the past year; in effect it sought to free the souls of the deceased so that they could begin their elaborate journey in the afterlife. Lorey Cachora (personal communication 1994) states that Quechan life consists of seven levels, the second of which is this life on earth. Of the five levels of the afterlife, he said very little, except that the seventh and final level was virtually impossible to achieve. The *keruk* was also a time for the living to commune with ancestor spirits and with the gods, who were thought to live in prominent landforms such as mountains or other

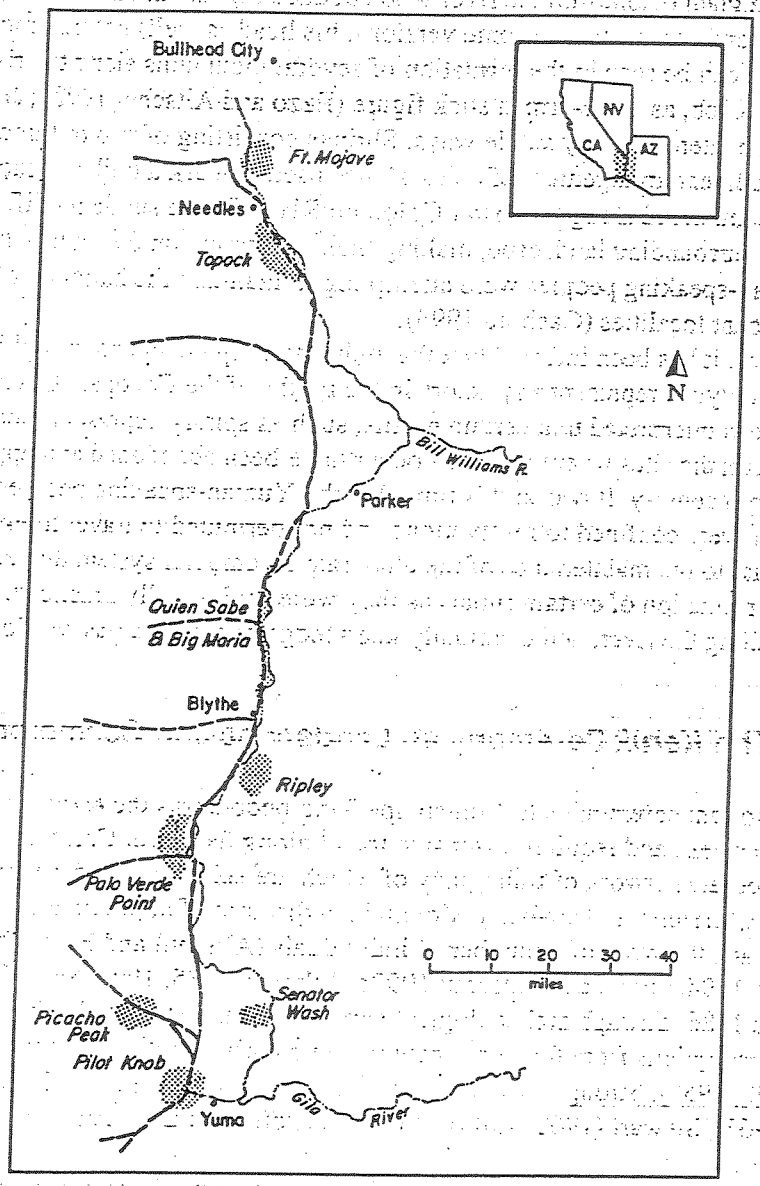

Figure 13. Map of the lower Colorado River showing the north-south (*keruk*) trail.

large rock outcrops (such as Pilot Knob). This was often achieved by scraping a circle on the ground surface, standing inside it, and shattering white quartz around it. The shattering of the quartz was thought to release spirits, with which one could then communicate. This was generally done at the base of the landform in which the spirits were thought to dwell.

Larger circular intaglios, often close to arrow-shaped rock alignments and located at the base of these landforms, were thought to provide a doorway into the mountain so that one can use this methods to communicate with spirits. This communication was undertaken to obtain knowledge of how to deal with the problems of this earth. Often people slept within these circles, as dreaming was considered an important medium for communicating with spirits. According to Cachora (1994), the act of dreaming returned people to the time of the creation, and people had the ability to learn through dreams.

If one ascends to the summit of Pilot Knob, which rises more than 600 feet over the surrounding Algodones Dunes, one can see Picacho Mountain, the second node on the keruk trail. This scenario

continues at each of the nodes extending to the north (visibility to both the adjacent southern and northern nodes), Black Point, the Riverside Mountains, and Newberry Mountain, the northernmost node of the chain. One interesting aspect of these landforms is that they are not all particularly great in elevation. Black Point, for example, is little more than a ridge top, yet is located at the edge of the Colorado River floodplain (which is several miles wide at this location) and therefore visible for a remarkable distance from the north and south.

As for the trails that make up the *keruk* trail, there are several key passes in mountains or hills, each of these considered sacred. Passes are viewed as stairways of sorts to the heavens; almost invariably these passes are marked very subtly, perhaps with a rock cairn, or a small cobble mound, or a short linear rock alignment. Sometimes they are marked with nothing more than two or three rocks stacked on top of one another. As Cachora (1994:13) states, "These sites are both physical features and spiritual cornerstones. They are often indistinguishable from the land by the untrained eye or those unfamiliar with regional Native American culture." Natural rock mounds are likewise considered sacred, regardless of their size, and such mounds are often culturally enhanced by the construction of a smaller mound next to them; this dual presentation, a larger and smaller mound side by side, is symbolic of *Avikwaame*. There are representations of this at Pilot Knob, Picacho Mountain, and Black Point.

The cosmological landscape of the *keruk* trail function both as center and edge of the regional landscape. In addition to embodying the most critical ritual of the Yuman peoples, it served to demarcate territory both for the Yumans and their neighbors. Since the *keruk* trail crossed through the domains of a number of separate Yuman groups, whose relationships with one another were often adversarial, various sites along the trail (particularly those containing rock art or intaglios) may also have represented boundaries between Yuman groups. Obviously, territorial boundaries changed through time, but the *keruk* trail and its sacred localities served as a cosmological overlay that bound separate but related peoples together at one level of existence. Its presence, then, must be viewed as both a physical and symbolic representation of Yuman cosmological expression.

Common Cosmological Elements with Other Cultures

Because so much sacred knowledge of the lower Colorado River landscape has been lost, interpretations of intaglios, petroglyphs, and more subtle alterations of the landscape are limited. One approach, however, that might be useful in future undertakings will be to attempt to link some of the symbols present to the cosmology of other traditional cultures. Although there are many caveats that must considered in such an approach, one promising aspect concerns the presence of common elements shared by many of these Colorado River cultures. Narby's (1998) investigation of the possible relationship between DNA and shamanistic knowledge is a recent (and somewhat daring) exploration along such lines.

The concept of twin deities is extremely important to the cosmology of Yuman-speaking peoples. Kumastamho and Ka-tarr, the twin deities representing good and evil, are depicted together in several places along the lower Colorado River, including Pilot Knob and Black Point, two of the most concentrated areas of sacred symbols along the river (Ezzo 1994a, Ezzo and Altschul 1993d). They are often portrayed as stick figures lying close to each other, with Kumastamho being the larger. Occasionally Katarr, as mentioned above, is depicted missing an arm and perhaps his head also. More significantly, the concept of twins is extremely widespread throughout the cosmologies of traditional peoples in many parts of the word. As Narby (1998) notes, twin creators—one good, one evil—are endemic in traditional myths through North and South America.

Several other common elements occur in Yuman cosmology, including the serpent motif. The importance of serpents in relation to the creation myth is virtually universal, with prominent myths found throughout the Americas, Australia, and Asia Minor (Narby 1998). Spirals and other designs depicting the world within the universe and/or the world as it was being created represent other common motifs.

Finally, the use of quartz crystals as sacred objects that allow one to communicate with the spirit world is endemic to the Americas (Eliade 1972; Reichel-Domatoff 1979).

Research Themes for Prehistoric Resources within the Lower Colorado River Region

The dearth of identified prehistoric resources within the lower Colorado River corridor is striking. This phenomenon has been attributed (by several authors) to the immense hydrologic energy of the Colorado River—its ability to remove sites through the process of scouring or bury them through the process of deposition. But does this mean that there is no archaeological research potential within the lower Colorado River valley? It has been indicated that the likelihood that cultural resources did not exist along the river during prehistoric times is exceedingly remote. The abundance of food resources associated with the riparian corridor almost certainly could not have been ignored by prehistoric inhabitants of the region.

Currently, we extrapolate prehistoric lifeways from information gleaned from sites away from the river. Our interpretations of the prehistoric composition of groups exploiting the resources of the lower Colorado River are, therefore, somewhat subjective. One of the major goals of archaeological research for the area in the coming years should be identifying sites (or site remnants) that may remain in the floodplain. This, though, as has been mentioned numerous times in the preceding discussion, is a problematic endeavor. Until such time as enough physical evidence of floodplain habitation can be collected, we will continue to pursue research questions based largely on information that is currently available. We have identified three research themes that we feel are significant to the current knowledge base of prehistoric life in the lower Colorado River valley: Archaic lifeways, prehistoric technology, and prehistoric ceremonial behavior.

Archaic Lifeways

Where in the Colorado River delta will we find the structures and artifacts telling us of the Amargosa people? Across the floodplain and buried by sediments may lie camps where Amargosa people lived, or task areas where they processed mesquite and screwbeans. These sites would have larger milling implements, flaked stone tools, or even rock rings that supported brush shelters. Other activities areas and camps could be found along sloughs, or where arroyos feed the great river. As the river meanders and cuts new channels, oxbow lakes are created. Several ancient lakes, now filled with sediments, can be seen in the delta. Here, where Archaic hunter-gatherers once may have hunted water fowl or harvested wild onion, camp sites would occur. Pathways to and from the river, drainages connecting to the New River across the dunes, also would have small sites where people stopped on their journeys to the Sierra Cocopah and beyond. The Yuma mesa, above the floodplain, was a pathway, north to south, and led people east. Here too, Archaic camps, trails, shrines, and rock circles will document the near-river activities.

Research Questions

1. What level of sedentism was incorporated in the Archaic lifestyle? Did these levels change through time?

2. What degree of the Archaic seasonal round was spent in the immediate vicinity of the river? What were the most desirable resources during the Archaic?
3. If Archaic-period existence in the lower Colorado River region reflected a low degree of sedentism, what configuration will Archaic sites assume?

Data Requirements

Certainly the primary element in the equation of better defining the Archaic occupation of the area is to identify Archaic-period archaeological contexts within the Colorado River corridor. Until such time that these resources can be identified, one of the most important clues into prehistory during the Archaic comes through paleoenvironmental reconstruction. Through adequately defining the environment during the Archaic, we gain insight into resource exploitation and subsistence strategies.

Technology

The shift from a more traditional hunter-gatherer model of land use during the prehistoric period to one based more on floodwater agriculture is reflected in technological changes in the processing of exploited resources. The introduction and evolution of a milling-implement industry suggests a dramatic shift in aboriginal subsistence patterns for the lower Colorado River region. This technological "revolution" suggests a shift of cultural patterns on many levels—movement away from the traditional seasonal round, a more sedentary lifestyle suggesting the amalgamation of greater numbers of individuals in increasingly confined space, and changing emphasis on exploited resources, to name a few.

Research Questions

1. How best can we demonstrate changes in traditionally exploited resources with the introduction of the milling-implement industry?
2. Is there evidence of diminished use or activity at milling-implement procurement sites as distance from the river increases? Do these patterns change through time?
3. To what level were nonadvantageous source materials used in the production of milling implements? Is this a factor of proximity to the river?

Data Requirements

The identification of floodplain-based cultural resources will provide the greatest insight into changes that occurred as prehistoric groups adopted an increasingly sedentary lifestyle. Short of this, increased research into a reconstruction of the paleoenvironment during the Patayan period will address issues of increased milling implement use throughout the lower Colorado region.

Ceremonial Behavior

The development of a historic context that focuses on ceremonial behavior stems from two sources: the repeated motif of ceremonial sites highlighting the landscape away from the Colorado River floodplain, and the interest we have developed in understanding the nature of ceremonial activity and the relation-

ship of ceremonial sites to ethnographic accounts of ritual activity along the lower Colorado River (Ezzo and Altschul 1993d). In our treatment of ceremonialism, we acknowledged that archaeologists will often assign a scared or ceremonial function to a site or a feature when they are unable to develop an adequate economic or technological function for it.

Ceremonialism has long been a critical focus in the lives of Yuman-speaking peoples (Forbes 1965; Kroeber 1925; Strong 1929). This is most evident today in comments made by informants regarding the nature of intaglios and petroglyphs (see Ezzo 1994a). Much of the behavior associated with ceremonial sites concerns re-enactments of the creation, of the journey of life, while others depict cosmological events. The location of the event-based sites is thought to coincide with where the original events occurred (Lorey Cachora, personal communication 1994). It has been noted that certain trails have sacred/ceremonial significance as well (see Ezzo 1994a:Chapter 10).

Research Questions

Pertinent research questions concerning the historic context of ceremonial behavior include:

1. Can we infer the performance of the *keruk* or any activity related to the *keruk* in the study area?
2. How do various feature types (circular paths, abstract forms, anthropomorphic and zoomorphic forms, linear paths, rock mounds) relate in terms of ceremonial behavior?
3. What types of features are associated with ceremonial intaglios? Is there evidence for the use of milky quartz and cobble pavements, as seen at Pilot Knob and Big Maria Terrace?
4. Are there sites that contain domestic and ceremonial features? What is the range of activities evident at such sites?
5. How do trails relate to ceremonial features in the project area?

Data Requirements

Cultural properties likely to yield significant information regarding this historic context include all sites with intaglios and/or rock art. Critical observations on intaglios include determining the construction of the intaglio (scraped out of the desert pavement versus tamped into the pavement), the forms of the intaglio (anthropomorphic, zoomorphic, circular, abstract, etc.), stylistic variation between intaglios of the same types, directional orientation of the intaglio, the geomorphic landform on which the intaglio is located, and features associated with the intaglio. Observations on rock art are similar, with attention paid to the method of committing the glyphs onto the rock (etched, incised, pecked, etc.).

CHAPTER 4

History of the Region, from the Contact Period to the Twentieth Century

Matt C. Bischoff, Joshua M. Protas, and Matthew A. Sterner

Unlike the prehistory of the lower Colorado River region, much is known about its rich and colorful history. The area has been governed by three sovereign nations, Spain, Mexico, and the United States, and still retains much of its Hispanic culture and nature. Understandably, the region's history has been molded and influenced by the Colorado River. The river has served as a transportation conduit, a geographic feature, and the single defining influence in the region's evolving role as an agricultural producer. In this chapter, we present a brief historical overview of the area, focusing on salient topics and issues that shaped the character region.

Arrival of the Spanish

The first Spaniards to explore the lower reaches of the Colorado River were members of the Coronado expedition, just 19 years following the conquest of Mexico. Rumors had circulated throughout New Spain for many years telling of seven cities to the north whose wealth was measured in the golden, jeweled walls of the houses and the gold chalices from which its inhabitants drank. The rumors surrounding these famed cities reached a fever pitch when, in April 1536, Cabeza de Vaca and three men (one a reputed Moorish slave named Esteban) staggered into New Spain. Having been shipwrecked on the east coast of Texas, they made their way overland through the northern territories and reputedly encountered the famed seven cities during their journey.

These reports proved sufficient evidence for the first Spanish viceroy, Antonio de Mendoza, to organize an expedition to search for the famed "Seven Cities of Cibola." Under the command of Francisco Vasquez de Coronado, an expeditionary force consisting of 225 horsemen, 62 foot soldiers, 5 Franciscan friars, and 700 Indian allies departed from Compostela, Nueva Espana, in May 1540, for what would later become the American Southwest. A significantly reduced force finally reached the location reputed to be the famed cities in July of that year, but encountered no more than subsistence-level Indian villages at Zuni. Coronado dispatched scouting parties to search further for the rumored seven cities, but these efforts also proved disappointing (Fontana 1994:25).

In order to supply the overland expedition, Coronado sent out a seaborne party under the command of Captain Hernando de Alarcon to embark from the west coast of New Spain in two ships, the *San Pedro* and the *Santa Catalina*. Sailing north to Culiacan, Alarcon gained a third vessel, the *San Gabriel*. Geographic knowledge of the area, in part provided by Cabeza de Vaca, indicated that the western coast of New Spain ran roughly north-south. By paralleling the northerly march of Coronado's overland force, Alarcon planned to track their movements and position his ships to resupply Coronado by sea (Figure 14). However, it soon became apparent to Alarcon that he was sailing north by west rather than due north, situating him ever farther from Coronado and his troops.

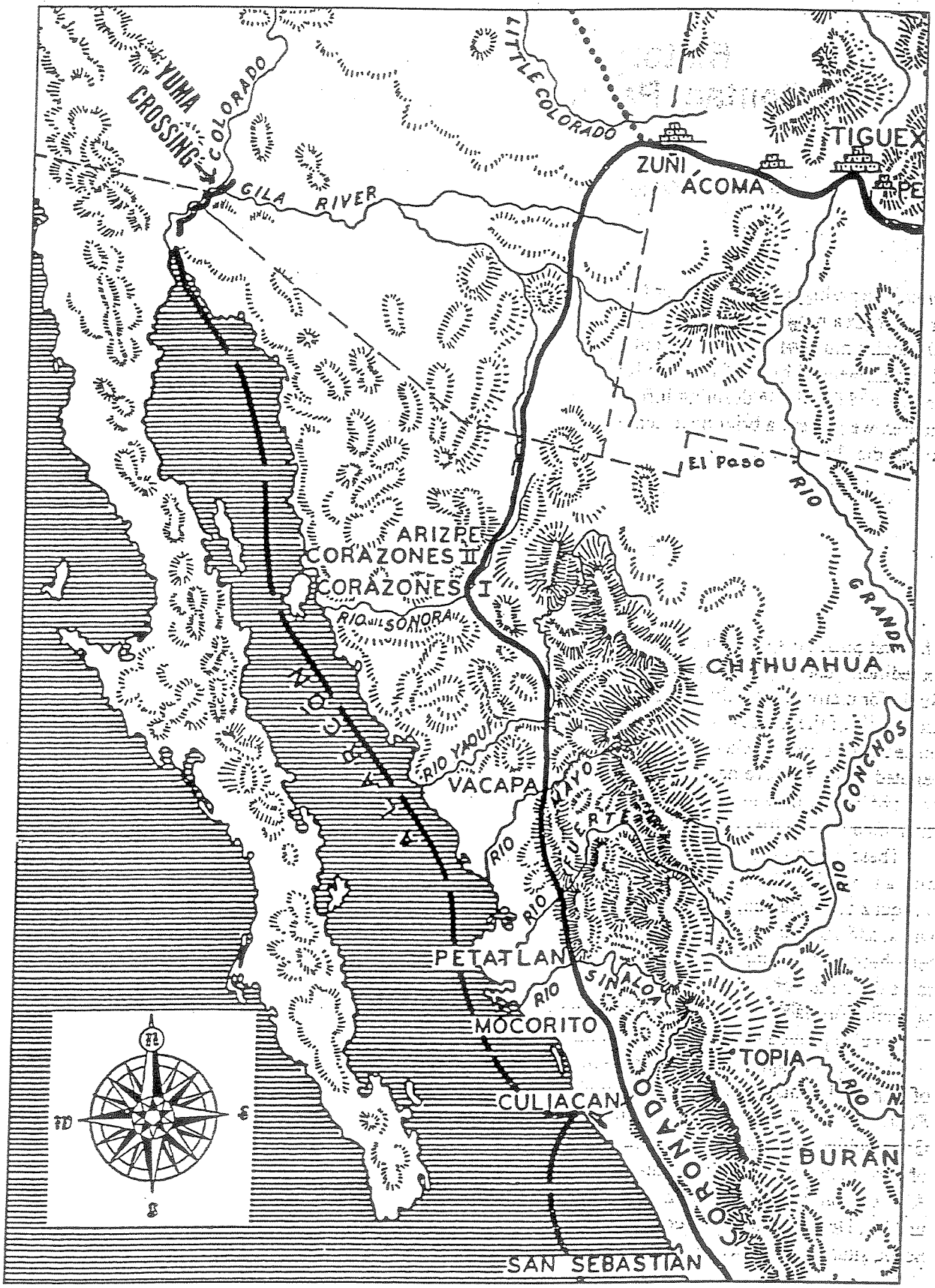

Figure 14. Routes of the Coronado and Alarcon expeditions (adapted from Martin 1954).

For three months Alarcon followed the coast of New Spain, porting frequently to gather news of Coronado's location. With no word from the expeditionary force, he continued until he reached the mouth of the Colorado River, naming his discovery Rio de Buena Guia (River of Good Guidance). Alarcon attempted to navigate the Colorado River, but found that his large ships could make little headway against the strong current of the river. Undaunted and single-minded in pursuit of his mission, he outfitted two smaller ships to investigate upriver.

The first natives to encounter Alarcon's party were reportedly the Cocopah (Martin 1954:19). In his diary, Alarcon describes the natives as tall and powerful men, many of whom had painted their faces, some with designs, while others had plain black paint. He reported that they wore no clothing other than a girdle around their waists, with a feather tail and an elaborate hat of feathers. "Some have their noses pierced," he added, "and from them hang pendants or shells. . . . Their bodies are branded by fire; their hair is banged in front but in the back it hangs down to the waist. The women go around naked except that, tied in front and behind, they wear large bunches of feathers, colored and glued." (Martin 1954:19)

Captain Alarcon established friendly relations with all of the Indians he encountered, and eventually worked his way upriver until he reached the confluence of the Colorado and Gila Rivers, establishing him as the first European ever to set eyes on the Yuma Crossing. There, Alarcon encountered the Yuma (Quechan), who used reed rafts to ferry themselves across the Colorado River. He lingered at the Yuma Crossing for two months and erected a huge wooden cross to alert Coronado's force of his presence. As his patience and supplies diminished, however, he finally left the Quechan and headed down river to his anchored fleet. Shortly after Alarcon's departure, a group from Coronado's expeditionary party led by Melchior Diaz reached the Yuma Crossing, only to find the messages buried by Alarcon at the foot of the cross.

Coronado found no great cities of gold in the northern territories, and Spanish interest in the area quickly faded. Although in the 1580s the Spaniards resumed exploration of the region that would be known as the Southwest, the next group of Europeans to visit the Yuma area came after Philip II commissioned Don Juan de Oñate to conquer and settle New Mexico in 1595. Oñate had established a colony north of present-day Santa Fe by 1598 and soon began sending expeditions to explore the lands to the west. Oñate himself went on one such expedition to search for the South Sea and its rumored pearl fisheries and harbor. The members of the expedition passed through the Yuma Crossing on their way to the Gulf of California, which they reached in January 1605. Soon after his return to New Mexico, however, Oñate was replaced as governor and the route to the sea was abandoned.

The Mission System

No other Europeans ventured into the lower Colorado region area for almost 100 years. To the east, the Spanish concentrated their efforts in settling the New Mexico area, which led to the revolt of the Pueblo Indians during 1680. The Spanish were only temporarily displaced, however, and resecured the area in 1692. The Spanish determined that a stronger foothold would be secured if native peoples could be Christianized. The Jesuits were given the task of expanding the Spanish frontier west of New Mexico into the vast territory known as the Pimería Alta. This area roughly encompassed what is now northern Sonora and southern Arizona. The best-known and most-effective missionary to explore the Pimería Alta was Father Eusebio Francisco Kino, who arrived in the area in 1687.

Father Kino established a base in Sonora and instituted a chain of auxiliary missions extending to the north. Kino rarely remained in one place long, and personally explored much of the land within the Pimería Alta and westward. During 1699, Kino explored the Gila River; during the following year he led an expedition of 10 Indians and 60 pack animals to the Gulf of California (Figure 15). His main objective was to establish a suitable land route from the Pimería Alta to the newly established Jesuit missions in Baja California. Like most of his predecessors who had traveled through the area, Kino named the

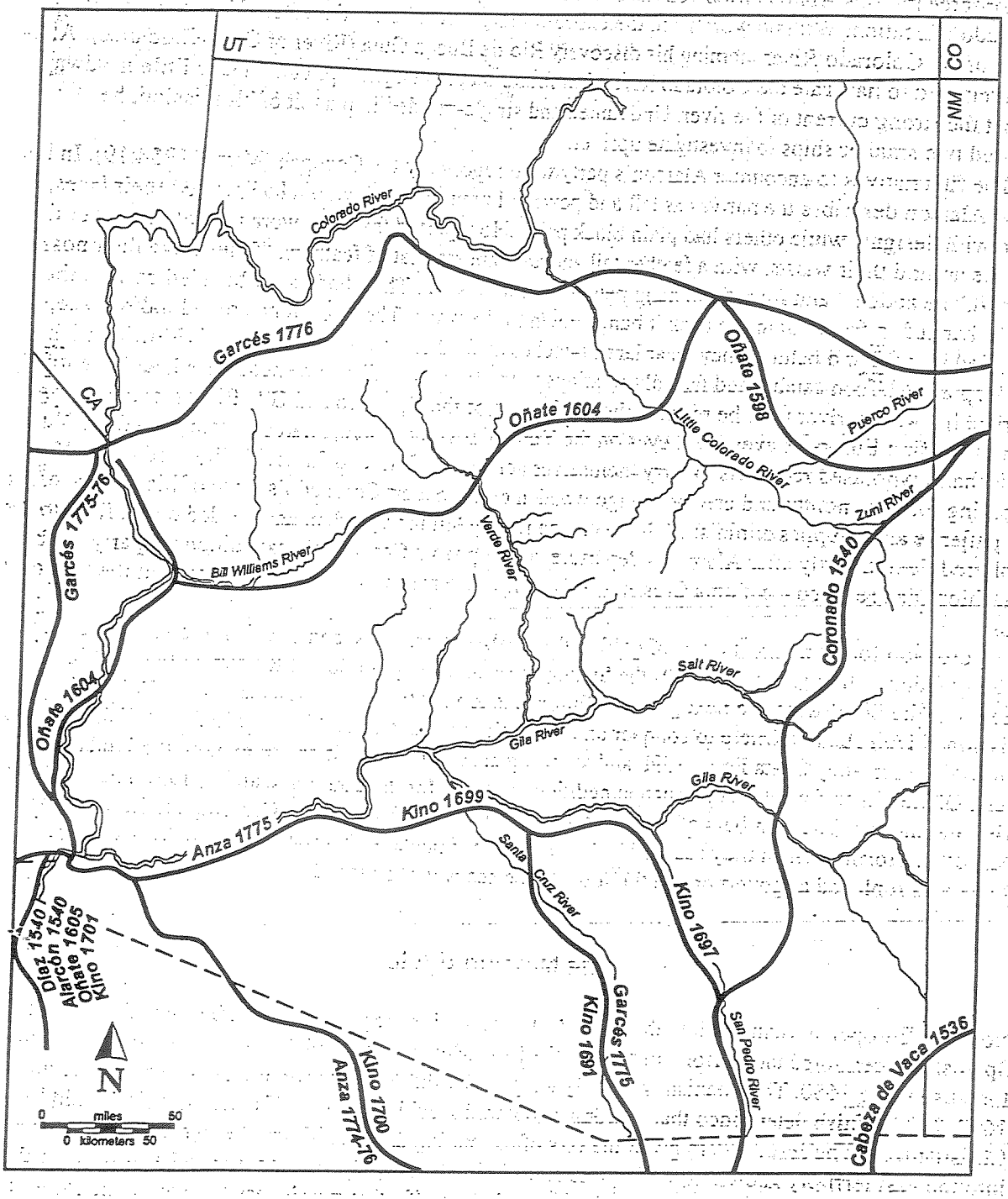

Figure 15. Map of Kino's travels in the Pimería Alta (adapted from Walker and Bufkin 1979).

various villages and tribes that he encountered along his journey, including San Pedro, on the Gila River near Yuma, and San Dionisio, located at the confluence of the Gila and Colorado Rivers. Kino noted that the rancheria at San Dionisio contained more than 1,000 inhabitants (Doyle et al. 1984:20–21).

Kino's detailed maps and observations from his explorations provided much new information about the geography of the area. However, after Kino's opening of the Pimería Alta, the Yuma Crossing remained at the northern edge of the Spanish frontier and was not visited again by Europeans for several

decades. During 1767, the Jesuits were expelled from Mexico and their missionization efforts were turned over to the Franciscans. In response to the perceived threat of Russian expansion from Alaska, missionary work was soon resumed in California. By 1770, the settlements of San Diego and Monterey had been established in California, and the Spaniards were eager to find an overland route to connect them with the outposts located in the Pimería Alta (Doyle et al. 1984:21).

The Opening of the Region

The first organized expedition to find an overland route to California was led by Juan Bautista de Anza, Captain of the Tubac presidio, and Father Francisco Garcés, a missionary from San Xavier del Bac who earlier had traveled along the Gila and Colorado Rivers between 1768 and 1771. The expedition departed Tubac in January 1774 with 34 men, including Anza, Fathers Garcés and Juan Diaz, an O'odham interpreter, servants, soldiers, muleteers, and a carpenter (Fontana 1994:159). The expedition had originally planned to follow the Gila Trail, well known to Garcés, but was soon set upon by an Apache raiding party that took many of the expedition's horses and pack mules. Anza decided to forgo the Gila Trail and follow a more southerly route in hopes of replenishing his supplies at the missions. Though the hazards of the southern route were well known and documented by Kino (one long stretch was known as the Camino del Diablo), this passage was shorter and offered the hope of fresh provisions.

Although they never replaced their lost horses, Anza's expeditionary force somehow reached the confluence of the Colorado and Gila Rivers. The large Indian village that Kino had named San Dionisio was gone, as was his *visita*. It is unclear whether the Quechan were making their home at the Yuma Crossing, but they arrived on the scene quickly with the appearance of the Spaniards. The Quechan chief, Olley-quotequiebe, baptized as Salvador Palma, was impressed by Anza and his party and assisted the Spaniards in crossing the river. Once across the river, the Spaniards climbed the hill due west of the Yuma Crossing to survey the grandeur of the scene. They named this point de la Concepción, the location where Garcés would establish a mission six years later.

The success of this expedition and renewed concerns about Russian and English expansion into Alta California prompted plans for an overland journey to bring new colonists to the Spanish settlements in the region. In 1775, Anza was ordered to organize a large party of colonists and escort them to Monterey, California. The expedition that left San Miguel de Horcasitas, Sonora, for California included 240 people, 140 pack mules, 340 saddle animals, and 302 cattle, in addition to the various other commodities needed for a journey of some 1,500 miles across desert and mountainous terrain (Fontana 1994:164).

Palma and the Quechan again welcomed Anza and helped the expedition cross the Colorado with no loss of person or property. Before continuing on to California, the expedition left fathers Garcés and Eixarch at the Quechan villages along the Colorado. Padre Eixarch enlisted the help of Quechan men and constructed a tiny cabin on top of Concepción. Garcés parted ways with Eixarch, his six servants, and interpreters (who stayed at the Yuma Crossing to minister to the Indians) and departed in search of a more northerly route between Santa Fe and the coast (Martin 1954:56). After safely bringing the colonists to Monterey, Anza led a smaller group to explore the San Francisco Bay area. Anza again passed through the Yuma Crossing on his return trip to Sonora and brought back Father Eixarch. Father Garcés returned later to the Yuma Crossing and then went on to the mission at San Xavier del Bac (Fontana 1994:164).

In 1779, Teodoro de Croix was appointed the new commandante-general of the interior provinces of New Spain. De Croix's predecessor, Viceroy Bucareli, had recognized the strategic importance of the Yuma Crossing, and for years had urged that a strong force be established there on a permanent basis. Bucareli had been particularly impressed by his meeting with Chief Palma of the Quechan, who had

earlier accompanied Anza on a trip to Mexico City. Bucareli supported establishing missions and a colony on the Colorado River to secure a Spanish presence in the region (Officer 1987:55). De Croix, however, did not heed the advice of Bucareli, and dispatched fathers Garcés and Diaz with a force of only 12 ragged, poorly equipped soldiers to establish a firmer hold over the Yuma Crossing. Although Garcés was welcomed and accepted by Palma and the Quechan, this was a significant affront to the sensibilities of the Quechan. Palma, during his visit to Mexico City with Anza, had received guarantees from the viceroy himself that the Yuma Crossing would serve as the site of a large Spanish mission and presidio. Nonetheless, Garcés and Diaz were cordially accepted and began the construction of a small log-and-mud hut on the west side of the Colorado River that would serve as Mission La Purisima Concepción (later the site of Fort Yuma). Several other single-room structures were built to house the padres, the soldiers, and their families, and a small guardhouse was constructed. Diaz then proceeded north, and constructed a small building to serve as Mission San Pedro y San Pablo de Bicuner, in the vicinity of what is now Laguna Dam (Porretta 1977; Yates 1972).

The great promises of the Spanish to the Quechan had turned out to be hollow: no grandiose mission had materialized, no presidio had been built, and only a few ragged Spanish soldiers had arrived. The Quechan were growing increasingly impatient with the promises of the Spanish and relations continued to deteriorate. The soldiers who were forced to live among the Quechan grew openly contemptuous of them and flagrantly mocked Indian rights and customs. They seized the most fertile lands for themselves and turned Spanish horses out to graze on the Indians' crops. In addition, the Spanish crowded the Quechan out of the mission building itself during mass, forcing them to stand in the sun without even the protection of the ramada (Martin 1954:64–65).

Quechan ill will toward the Spaniards was on the rise when Spanish soldiers finally arrived in 1781. A total of 40 troopers (with their families and children) and 40 families of colonists (who were continuing on to California) arrived under the command of Captain Rivera y Moncado, who was to act as commandante. Moncado's overt contempt for the "savage" Quechan culminated in his policy of whippings for any opposition to the authority of the Spanish. On July 17, 1781, just one month after the arrival of the Spanish troops, the Quechan had endured enough; Palma and his warriors burned the Bicuner and Concepción missions and massacred more than 100 Spaniards, including the four priests and the recently arrived troops. The surviving men, women, and children were taken captive (Martin 1954:65).

News of the Yuma Crossing massacre quickly reached the missions to the east and, finally, Mexico City. This time de Croix acted swiftly, ordering Lieutenant Colonel Don Pedro Fages and 100 men to return to the Yuma Crossing, capture and kill the warring chiefs, recover the remains of the slain padres, and bargain for the return of the captured Spaniards. After several skirmishes with the Quechan, Fages successfully obtained the release of some of the hostages, but did not succeed in capturing or killing any of the Quechan chiefs or in resecuring the Yuma Crossing, which remained in the hands of Palma and the Quechan. Spanish officials later placed the blame for the Yuma Crossing massacre on Anza and Garcés, who they claimed had overstated the friendliness of the Quechan and the value of the Yuma Crossing area for settlement. The officials' negative assessment of the area and its inhabitants was used to justify the decision not to reestablish the destroyed missions. Others have argued, however, that responsibility for the tragic incident at the Yuma Crossing should fall upon Teodora de Croix, who failed to adequately provide for the establishment and protection of the missions. No matter who was to blame, the 1781 massacre effectively closed the Yuma Crossing as a Spanish transportation route (Chapman 1921:338–339; Santiago 1998:168–170).

In later years, the Spaniards attempted to find another overland route between the Pimería Alta and California, but with little success. In 1785, an expedition was led by Fages to find a route from Baja California to Sonora by crossing the Colorado River below the Yuma Crossing. This effort was quickly stopped in 1786 when Viceroy Bernardo de Galvez ordered that contact with the tribes of the Colorado River area be discontinued in order to concentrate all of the Spanish forces in their campaign against the Apache. Ten years later, renewed interests in an overland route inspired Jose Joaquin de Arillaga, the

lieutenant governor of California, to lead an expedition to the mouth of the Colorado River from Baja California, where several Dominican missions had been established. However, after skirmishes with Kamia Indian groups further northwest, the expedition decided to return to California. In the report of his trip, Arillaga noted the continued hostility of the Indians along the Colorado and recommended that, if a road between Sonora and California were to be maintained, a presidio at the mouth of the Colorado should be established to provide protection to travelers. Arillaga's recommendation was never followed; his expedition appears to have been the last serious attempt by the Spaniards to establish a route through the region (Forbes 1965:233; Santiago 1998:174).

For the remainder of the Spanish period, land connections between Sonora and California were maintained over the Mojave Trail, some 130 miles to the north of the Yuma Crossing (Swanson and Altschul 1991:27). The Mojave Trail remained popular long after the end of Spanish rule in 1821 and continued to be among the most frequently used overland routes throughout the period of Mexican rule. Interest in reopening the Yuma Crossing resurfaced, however, during the 1820s. Jose Figueroa, appointed as military commander of Sonora in 1824, was charged with examining the mines of northern Sonora and reestablishing the more southerly land route to California. During an expedition to the Colorado River in 1825, Figueroa met with the Quechan and reported that the tribe asked to establish relations with the Mexicans. Following this favorable response, Lieutenant Romulado Pacheco led a small party consisting of five soldiers and thirty Indians to the area around the Yuma Crossing and spent a month establishing a post among the Quechan during the winter of 1826. This post was apparently planned as a military garrison to secure the Yuma route. The location of the post is unknown, but references to the site of the former Mission La Concepción in the party's correspondence suggest that Pacheco's post was possibly on the same location. It is also unclear whether Pacheco ever built any structures for the post during his brief stay. Shortly after his arrival, a wave of Indian unrest in southern California and Sonora contributed to worsening relations with the Quechan, and Pacheco left the area. Mexican plans for maintaining the land route through the Yuma Crossing were soon forgotten (Forbes 1965:246–249).

The next group of non-Indians to return to the Yuma Crossing area were Anglo-Americans on the front line of the push westward. Accounts suggest that as early as the 1820s, several parties of trappers traveled down the Gila River and along the Colorado River in search of beaver pelts (Doyle et al. 1984:27–28; Swanson and Altschul 1991:27). Among those reported to have passed through the area of the Yuma Crossing at this time were Sylvester Pattie, James Ohio Pattie, and Pauline Weaver (Robertson 1942:26). The trappers exploited the resources of the Gila and Colorado Rivers to exhaustion, and some continued west into California. Although "misunderstandings" were often common between the trappers and Mexican authorities, who feared the intrusion of the Anglos, few violent encounters occurred. By the time of the Mexican-American War of 1846–1848, an Anglo-American presence in the area had been established.

The Lower Colorado Region in the Nineteenth Century

Anglo-American Arrival at the Yuma Crossing

The next recorded Anglo-American entry into the Yuma area was made by Christopher (Kit) Carson, who first crossed the Colorado River at the Gila River in October 1846. Carson was acting as a dispatcher, carrying the communications of John Charles Fremont from California to Washington. The shortest, fastest route at that time led through Mexican territory (via the Gila Trail), crossing the Colorado River at the Yuma Crossing. However, Carson did not complete his trip to Washington. By late November he

returned to the Yuma Crossing, leading Colonel Stephen Watts Kearney and the "Army of the West" to San Diego.

The Gila Trail, which followed the Gila River to the Colorado River at the Yuma Crossing, proved to be one of the primary travel routes for American troops fighting in the Mexican-American War. Although the terrain was rugged and desolate, it was by far the quickest route between the settlements of Oklahoma, New Mexico, and California. It was over this route that Carson led Col. Kearney and his troops in 1846. Kearney's support troops, a force called the Mormon Battalion (led by Lt. Col. Philip St. George Cooke), found the rigors of the Gila Trail unsuitable for the heavy and cumbersome wagons that they were forced to draw and forged a new wagon route as they traveled. The Gila Trail was later incorporated into the Southern Overland Trail to California (Walker and Bufkin 1979:40). American troops came to the Yuma Crossing again in 1848, when the U.S. First Dragoons were called from Monterey, Mexico, to perform garrison duty in California. The troops used a rope ferry to cross the Colorado (Doyle et al. 1984:38).

The end of the Mexican-American War was marked by the signing of the Treaty of Guadalupe Hidalgo, in which the Gila River and the Yuma Crossing figured prominently. The Republic of Mexico ceded control of the territory today encompassing Texas, California, New Mexico, and part of Arizona (north of the Gila River) for $18,250,000 in cash payments and claims assumed by the U.S. government (Sheridan 1995:52). In addition, an area on the south side of the Gila River at Yuma (known as the Whipple Strip) that included the Yuma Crossing was acquired by the United States at this time. The work of the United States–Mexico Boundary Commission, established in 1849, is far too complex a story to present within this overview. In sum, the California-Mexico border was surveyed from west to east and continued up to the Gila River. The boundary designation crossed the Colorado River, incorporating the Yuma Crossing into what is now California, and followed the Gila River east. Not long after the boundary survey was undertaken, the U.S. government sought to acquire additional land suitable for a southern transcontinental railroad route. The Gadsden Purchase, ratified by Congress in June 1854, obtained for this purpose nearly 30,000 square miles of what is now southern Arizona from Mexico for the sum of $10,000,000 (Sheridan 1995:56). During the late 1840s and early 1850s, however, the legal status of much of the newly acquired area remained uncertain, with land claims and disputes arising not only between the United States and Mexico, but also between California and the Territory of New Mexico.

One such land dispute affecting much of the Yuma Valley involved a large tract of land granted to Don Fernando Rodriguez in 1838 by the Treasury General of the state of Sonora (Figure 16). Although no action was taken on this claim when the area came into the possession of the United States (with the Gadsden Purchase), the Algodones Land Grant Company filed suit in the 1890s for the recovery of the lands granted to Rodriguez. The case was heard by a special court of private land claims in Santa Fe, which ruled that the grantee's claim had been legally transferred to the Algodones Land Grant Company. During the time that this claim was in the courts, representatives of the Algodones Land Grant Company sold parcels of land in the Yuma Valley to squatters and new settlers, and private development companies began constructing canals in the hopes of encouraging additional settlement and development of the area. However, in 1898, after an earlier unsuccessful appeal attempt by the U.S. government to regain title to the land in question, the U.S. Supreme Court reversed the earlier court decision on the grounds that the power of the state of Sonora to grant lands had ceased in 1836. At that time, Mexico was divided into states and the power to grant lands lay only with the federal government of Mexico (Robertson 1942:110–111). This ruling denying the claim of the Algodones Land Grant Company had far reaching consequences for the project area in subsequent years. Soon after the denial of the claim, the former grant holdings were reopened to public entry and, in the early twentieth century, many new arrivals settled this area and put much of the land under cultivation (Reclamation 1940:65).

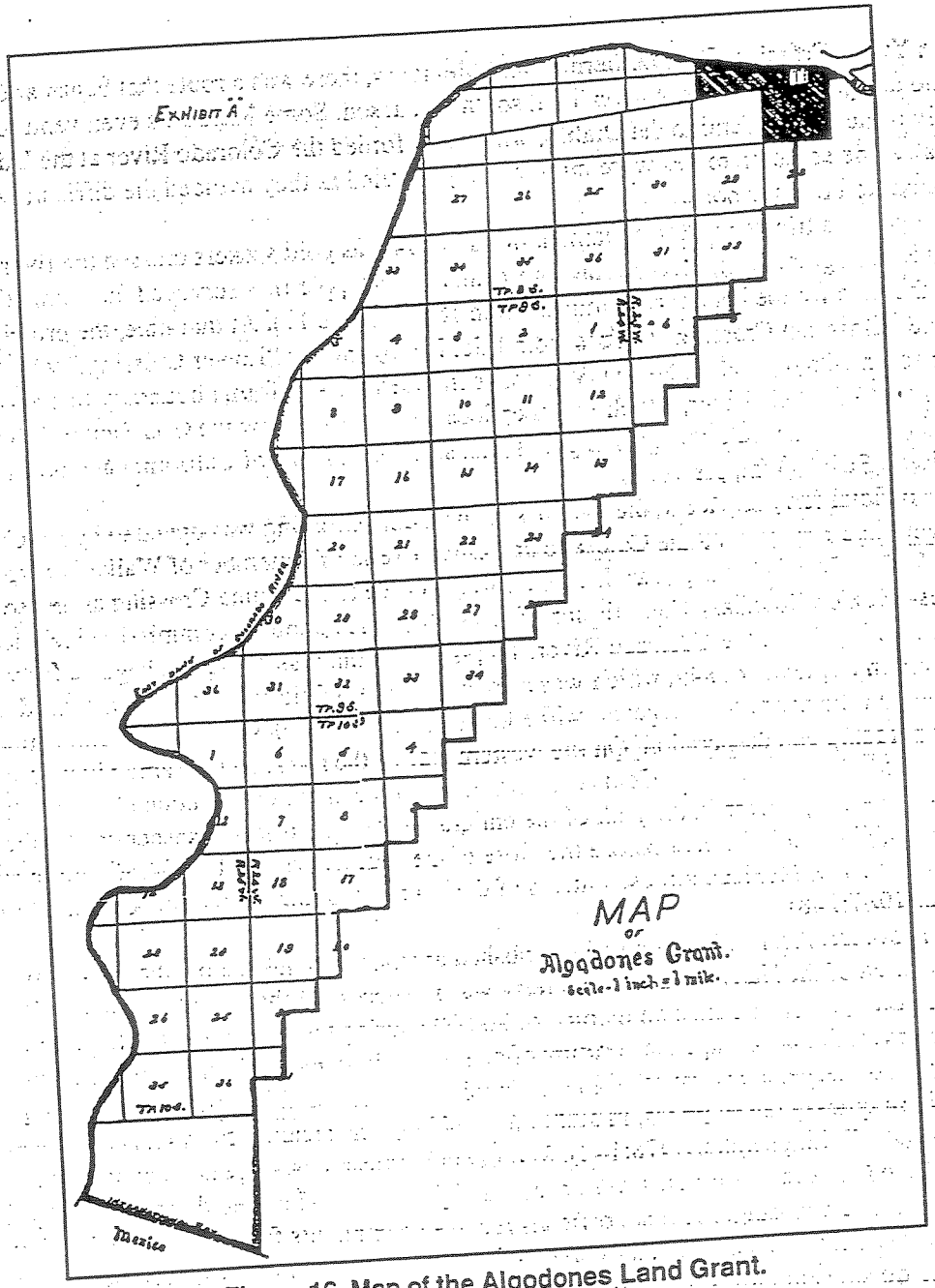

Figure 16. Map of the Algodones Land Grant.

Ferry Service at the Yuma Crossing

The U.S. victory in the Mexican-American war and the discovery of gold in California in 1848 marked the beginning of a period of great change in the Yuma Crossing area. With the onset of the Gold Rush, thousands of emigrants flocked to California with dreams of striking it rich. Since sea passage from New York to San Francisco was long, arduous, and convenient only to those located along the Atlantic coast, the vast majority of the gold seekers used one of the few overland routes. The Humbolt, or Central, route led to the northern reaches of California ending in the Sacramento area. The Spanish Trail and Cooke's Wagon Trail began at Santa Fe and followed more southerly routes, the latter crossing the Colorado

River at the Yuma Crossing. For Southerners and Mexicans, there was a route that began at Chihuahua or San Antonio and joined Cooke's Wagon Trail south of Tucson. Some Mexicans even ventured along Kino's early route on the Camino del Diablo, which also forded the Colorado River at the Yuma Crossing. Generally, the southern routes were more heavily traveled as they avoided the difficult winter weather encountered to the north.

What began as a trickle in 1848 became a flood in 1849, as gold seekers crossed the river in record numbers. U.S. topographic engineer Lieutenant Amiel W. Whipple first surveyed the Yuma Crossing as he mapped the area for the boundary commission in 1849 (Figure 17). At that time, the principal crossings were the "Emigrant Crossing" (across from Pilot Knob) and the "Lower Crossing," which was situated further south (Doyle et al. 1984:43). Whipple continued the California boundary line east across the Colorado River to the Gila River, which was then located in what is now the Gila Slough (Swanson and Altschul 1991:28). As a result, the Crossing was first surveyed as part of California and became known as the "Whipple Strip" (Whipple 1849).

The first official ferry service at the narrows of the Yuma Crossing was operated by Lt. Cave Johnson Couts, who had first crossed the Colorado at Yuma in 1848 as a member of Walker's dragoons (Martin 1954:130). The following year, Lt. Couts was ordered to the Yuma Crossing as an escort for the United States–Mexico Boundary Commission. The needs of the boundary commission included frequent excursions on both sides of the Colorado River. To assist the commission, Couts began a ferry across the Colorado River in September 1849, which was also open to the public for a fee. Couts placed the operation of the ferry in the hands of a sergeant, while he dealt with the endless stream of "forty-niners" and their tales of hardship and desperation. On the western side of the river, on the same hill where Garcés had established Mision Concepción, Couts established a camp called Fort Calhoun (Martin 1954:131). The camp, however, lay square in the path of the emigrant trails. Ultimately exasperated by the disagreeable forty-niners, Couts left the area before the close of the year (Doyle et al. 1984:56). For a short time during December 1849, Mexican representatives of the boundary commission took over the ferry operations (Officer 1987:248).

By early 1850, Dr. Abel B. Lincoln had established another ferry just below the Gila confluence, presumably in the area of the Narrows. Lincoln's ferry was so successful that, in a letter sent to his parents during April of that year, he boasted an income of $60,000 during the first three-month period. Lincoln's gold mine, however, did not escape the scrutiny of one particularly nasty character named John Glanton, who, with a gang of desperadoes, muscled in on Lincoln's business and placed himself in the position of manager. Glanton quickly raised prices, in addition to robbing and stealing from innocent travelers (Doyle et al. 1984:57; Lingenfelter 1978:1–2). Reports in Mexican newspapers noted that Sonorans returning from the California goldfields were charged higher fares and suffered harassment by the ferry operators at the Yuma Crossing. Mexican officials received complaints from travelers who claimed that the Americans at the ferry had attempted to take their arms and other valuables, in some cases going onto Mexican soil to do so. Little was done at this time, however, to stop the abuses suffered by Mexicans at the Yuma Crossing (Officer 1987:248).

After noticing the lucrative nature of Lincoln's ferry, the Quechan decided to begin their own rope-ferry operation in the spring of 1850. The Indian ferry was run by an Anglo-American renegade named Callaghan (Martin 1954:145). Glanton would not stand for the competition and shot and killed Callaghan, which led to a Quechan retaliation. On April 23, 1850, a group of Indians killed Glanton, Lincoln, and all but three of his operating party (Doyle et al. 1984:57). These three men escaped to San Diego and reported the "unjustified and savage" attack upon their party by the Quechan, fueling the flames with stories of thousands of dollars in silver and gold stolen by the Indians. California newspapers carried long reports of the massacre at the Yuma Crossing, and *Alta California*, a San Francisco newspaper (Martin 1954:149–150), ran a special dispatch that described public reaction to the news:

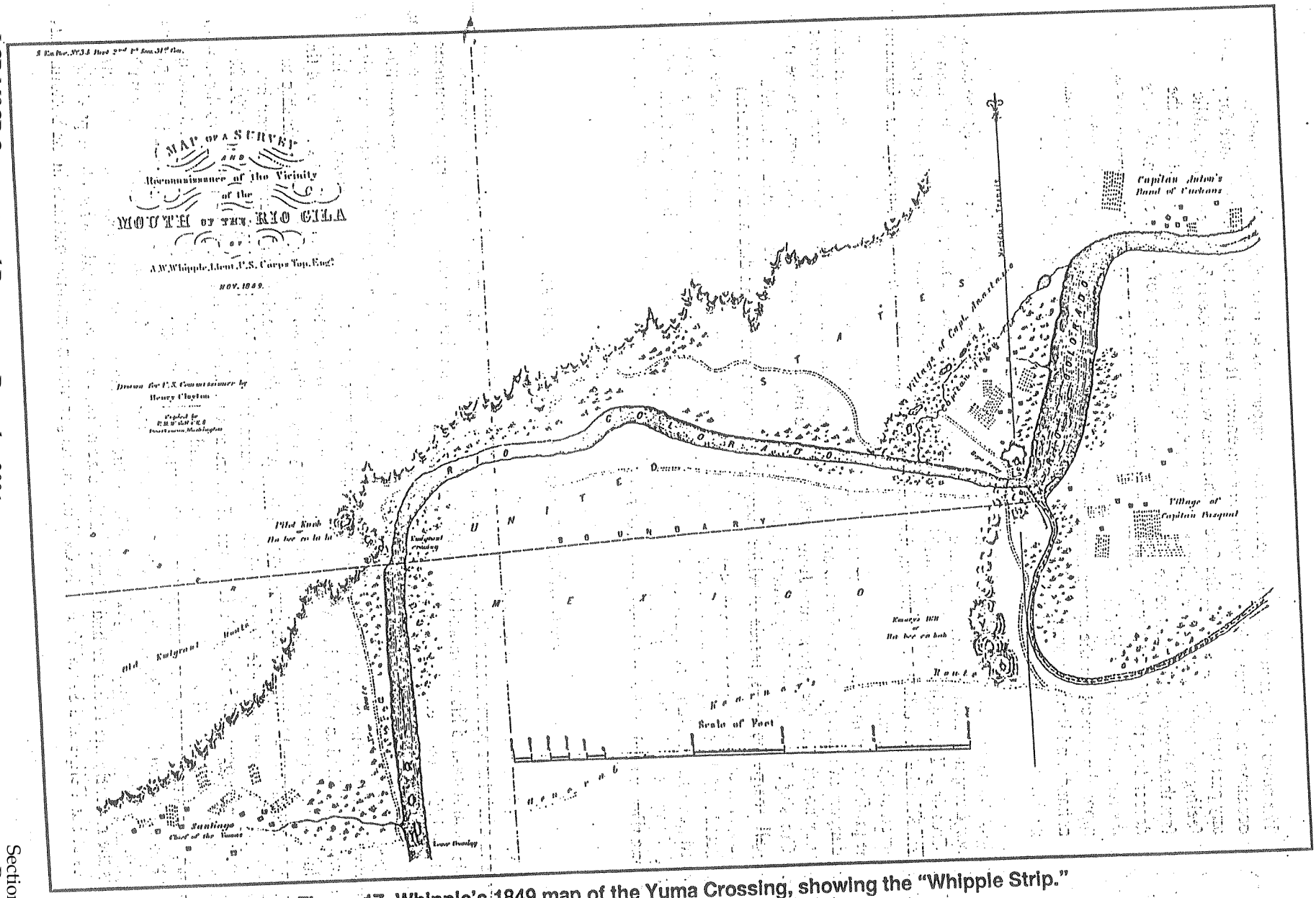

Figure 17. Whipple's 1849 map of the Yuma Crossing, showing the "Whipple Strip."

> The news of the murder of Glanton and his companions as it reached the settlements, occasioned as it may supposed, no little excitement. It was not, however, so much for any particular sympathy for the fate of the men who have been slaughtered that public feeling was aroused, for their character was pretty well understood, but it was from the fact that there was known to be at this time several companies of American immigrants descending the Gila and it was thought doubtful as to the treatment they might receive at the hands of the Indians, these last having just had a lap of American blood. Furthermore, the season for the spring immigration from the states by the lower routes was near at hand, and it was thought highly important that something should be done by [the] government for its protection at the Crossing of the Colorado.

Public outcry demanded that some action be taken to regain control of the Crossing. At the order of Governor Burnett, Quartermaster Gen. Joseph C. Morehead assembled a militia force and led them to the Yuma Crossing. The militia failed to control the Quechan and suffered minor casualties in an initial skirmish. Morehead's efforts were thoroughly ineffective and after a month of camping at the Crossing, he returned to California.

The profits to be made from the ferry service at the Yuma Crossing attracted entrepreneurs in spite of the dangers of the region. The first to arrive was a group from San Francisco, led by George Alonzo Johnson, who came to the area during June 1850 with the intention of re-establishing ferry service at the Yuma Crossing. Johnson and his partners ignored Quechan warnings and constructed a stockade of 9-foot-tall, sharpened pikes, inside of which they constructed shelters and dug a saw pit (Martin 1954:155). For unknown reasons, the Quechan did not disturb the new frontiersman, who by August had constructed a 35-foot-long scow from cottonwood trees growing near the river. Johnson's ferry service operated quite successfully, so much so that Johnson began establishing land claims for himself and his friends along the river. Despite his claims, many years would pass before any real settlement began at the Crossing (Doyle et al. 1984:4; Lingenfelter 1978:2).

Securing Peace with the Quechan

In the wake of the militia disaster, U.S. military authorities sent Maj. Samuel Peter Heintzelman with orders to establish a permanent military outpost at the confluence of the Gila and Colorado Rivers. Heintzelman stationed his command below the ferry crossing, calling the location Camp Independence. By March 1851, however, the troops had moved to the site of the old Mission Concepción and named the new camp Fort Yuma (Lingenfelter 1978:2; Martin 1954:157). Not one to be dependent on nonmilitary resources, Heintzelman established his own ferry service in direct competition with the operation already in place. Whether Johnson felt it prudent not to tangle with the U.S. military or was moving on to larger ventures, he decided to sell his interest in the operation and return to San Francisco. All but two of the remaining partners also sold their interests in the ferry line at this time, leaving the proprietorship to Louis J. F. Jaeger and William Ankrim. Shortly thereafter, Ankrim sold out to Jaeger and went into business driving cattle from Mexico to California (Martin 1954:157; Swanson and Altschul 1991:28).

Louis Jaeger operated Johnson's ferry for 27 years and became known as "Don Diego" to those who used his ferry. Jaeger's ferry operation quickly overshadowed the military operation and remained quite profitable until the arrival of the railroad in 1877. Although the flood of immigrants heading west for the Gold Rush declined in the 1850s, the steady Mexican migration into California provided Jaeger with plenty of business. In addition, Jaeger profited from the numerous cattle and sheep herds that he ferried across the river. By the 1860s he had increased the size of his own cattle herds, which he kept at his ranches at San Felipe and Santa Ysabel in California. Jaeger also maintained pastures in the bottomlands

around Yuma for his cattle. He used these stocks to supply beef and dairy products to the military at Fort Yuma (Hargett 1983:341–347).

Lack of supplies and near starvation forced Major Heintzelman and most of his men to leave Fort Yuma to return to California during June 1851. Lieutenant J. W. Sweeney remained with a small group of men to guard the government property that was left behind. Sweeney moved back to Camp Independence along the river bottom for this purpose, but abandoned the camp altogether in December when he encountered Quechan hostilities. Jaeger also left the Yuma Crossing for a short time as a result of injuries he sustained during an attack by the Quechan. The Yuma Crossing was thus temporarily without a military guard and ferry service (Martin 1954:168–169; Swanson and Altschul 1991:31).

Heintzelman returned to the Yuma Crossing in February 1852 with plentiful provisions and an enlarged military force. He was accompanied by Jaeger, who brought new supplies from San Diego to rebuild his ferry operation (Martin 1954:169). After reestablishing Fort Yuma, Heintzelman set about asserting his presence with the Quechan. During the previous year there had been no major flood event, and the Quechan, who practiced floodplain farming, reaped a small harvest in 1852. Heintzelman took advantage of the food shortage and the Quechan's ongoing conflicts with the Cocopah and tribes to the east. He ordered his troops to burn the limited crops and destroy the shelters at the Quechan rancherias in the area of the Yuma Crossing. These efforts deprived the Quechan of vital resources, and by the end of 1852, their resistance to the Anglo control of the Yuma Crossing area ended. It is unclear if there was any type of official treaty or agreement to end the hostilities and sanction the Anglo occupation of traditional Quechan lands (Bee 1981:18).

After his military defeat of the Quechan, Major Heintzelman interfered with the political and social structure of the tribe to ensure their peaceful coexistence with the nascent Anglo settlement. He deposed two of the Quechan leaders for their role in the earlier hostilities and selected a man named Pasqual to take over as the new principal tribal chief. Heintzelman's action established a pattern that significantly changed the traditional Quechan political process, in which tribal chiefs were chosen according to the criteria of dream power, benevolence, bravery, and eloquence. The new hegemonic order required that the primary quality to be exhibited by a chief was his ability to carry out the wishes of the American officials. Apparently Heintzelman's strategy succeeded in subduing the Quechan; there were no more reports of tribal hostilities toward Anglo settlers and the Americans enjoyed unrestricted access to the Yuma Crossing (Bee 1981:18).

The Quechan remained in the area and adapted to the presence of Fort Yuma and the nearby settlements. While some Quechan came to the fort to beg from troops or work menial, low-paying jobs during the 1850s, most of the tribe continued to farm the river bottomlands and maintained their traditional ways. However, as the Euroamerican settlements at the Crossing grew during the 1860s and 1880s, an increasing number of Quechan were drawn to town and found work as janitors, steamer deckhands, servants, and woodchoppers. The Quechan participation in the market economy had a negative impact for some. Members of Yuma's upper class complained of Quechan involvement in gambling, prostitution, and panhandling (Bee 1981:19). Embarrassment was also expressed about the minimal clothing worn in town by many Quechan, and efforts were made to encourage the adoption of a more modest wardrobe (Figure 18). One early Yuma resident remembered an enterprising merchant who bought a large supply of pants from soldiers and miners. He then encouraged the town council to pass an ordinance requiring that trousers be worn at the train depot. The merchant quickly sold his stock of pants at a profit to the Quechan, who apparently were fascinated by the trains and frequently came to see their arrival (Gordon 1990:73).

As time went on and the Quechan peacefully coexisted with the American settlers, the government decided that Fort Yuma was no longer necessary to protect the Yuma Crossing area. However, by the 1880s, local residents and entrepreneurs envied the lush bottomlands farmed by the Quechan and requested that government officials look into setting aside land for a Quechan reservation. After some initial debates over its location, president Chester Arthur finally issued an executive order on March 8,

Figure 18. Cocopah men at the turn of the twentieth century wearing European clothing and playing an introduced card game (from de Williams 1974:31).

1884, that established the Fort Yuma Reservation, consisting of over 45,000 acres located on the west side of the Colorado River, extending north and west of Fort Yuma. Although a sizeable area, the reservation boundaries encompassed only a small portion of the land previously controlled by the tribe. In addition, not all of the reservation was suitable for agriculture, the land closest to the river was fertile, but the soil in other areas was extremely alkaline. Government officials tried to persuade the Quechan to move from their outlying settlements to this new reservation, which was recognized as their only legitimate territory. The creation of the reservation supported the dual government objectives of gaining control of land for use by Anglo farmers, miners, land speculators, and railroad companies, and helping to assimilate the Quechan into mainstream American culture (Bee 1981:19–20).

The peaceful relations with the Quechan following Heintzelman's campaign sparked a wave of Anglo settlement and development of the Yuma Crossing area. In addition, the advent of steamboat travel on the Colorado River during the early 1850s facilitated the transportation of supplies from California to points in the interior West, replacing the less efficient and more expensive overland supply routes. The success of this new supply line enabled the expansion of military bases throughout the Southwest, especially in the years immediately following the Civil War (Swanson and Altschul 1991:31). Thus, with security provided by the military forces stationed at Fort Yuma and supplies brought to the area by steamboat, farmers, miners, ranchers, and merchants began settling the Yuma Crossing area by the late 1850s.

Early Anglo Settlement

Ownership of the Whipple Strip was a never-ending source of contention, first between the United States and Mexico and then, following the purchase, between California and New Mexico Territory. This uncertainty impeded settlement of the area until the advent of steamboats during the 1850s. As early as 1850, George Johnson drew up a map of land claims along the Colorado River in the vicinity of the Narrows, but there is no indication that anyone other than ferryman Louis Jaeger actually established themselves in the area by that early date (Land Claims 1850). Jaeger apparently lived downstream from the Narrows, on the California side of the Colorado River. From a military map of the area drawn in 1853 (Figure 19) it appears that no structures existed between the military camp and Jaeger's ferry (Swanson and Altschul 1991:31).

The first house on the Whipple Strip was built in 1853 by Mrs. Sarah Bowman, the mess cook at Fort Yuma. Some sources indicate that Mrs. Bowman operated a brothel at this location (Sterner 1990:27), although this has never been conclusively demonstrated. She later sold her house to the camp's sutler, George F. Hooper, who operated a mercantile named Hooper and Hinton (Sterner 1990:29). This store became the center of a small community consisting of a few adobe buildings that later became known as Arizona City (Lingenfelter 1978:15).

By the late 1850s, several small communities, which would later constitute the town of Yuma, began emerging in the area of the Yuma Crossing. Arizona City took shape in the area of the Hooper and Hinton store, while Colorado City, which was laid out by Charles Poston in 1854 (Martin 1954:178–180), also developed into some sort of a community. It is unclear whether Colorado City later became Arizona City or whether the two settlements were independent and contemporary (Doyle et al. 1984:94). In addition to these communities, Jaeger established his own settlement on the California side of the Colorado River in the immediate vicinity of his ferry. For awhile, "Jaeger City" claimed a hotel, two stores, two blacksmiths, the Overland Mail office, and several other buildings (Lingenfelter 1978:15).

The growth of the Yuma Crossing settlements was supported by the establishment of formal stagecoach service during the late 1850s, which greatly improved communication and transportation to the area. Leach's Federal Wagon Road was opened between Yuma and El Paso in 1858, and the establishment of the Yuma Crossing stop on the Butterfield Overland Mail Route in that same year brought travelers to the area on their way between St. Louis and San Francisco. The Civil War temporarily closed the stage routes passing through the Yuma Crossing, but after the war, stage service to California resumed before being permanently discontinued in the 1870s (Doyle et al. 1984:72).

Advent of the Steamboat

The need to supply Fort Yuma reliably and cost-effectively led directly to the introduction of steamboats on the Colorado River. As the transport via the overland route from San Diego proved to be prohibitively expensive, government officials investigated the feasibility of supplying the fort by sea. In 1850 Lieutenant George Horatio Derby was charged with traveling up the mouth of the Colorado to determine the navigability of the river. With a cargo of 10,000 rations, Derby set sail on board the tiny schooner *Invincible*, commanded by Captain Alfred H. Wilcox. Derby had with him the latest maps of the lower Colorado region prepared in 1826 by British naval Lieutenant R. W. H. Hardy, which mistakenly placed the confluence of the Gila only 25 miles above the mouth of the Colorado—it was in reality another 120 miles further upriver. By the time Derby reached this point and discovered the errors of Hardy's maps, the ship began experiencing difficulties and Captain Wilcox decided not to travel further upriver. Although the *Invincible* failed to reach its destination at Fort Yuma, Derby realized that the Colorado could be navigated by steamboat and offered his recommendations about the type of boat best suited for the task (Lingenfelter 1978:5,8).

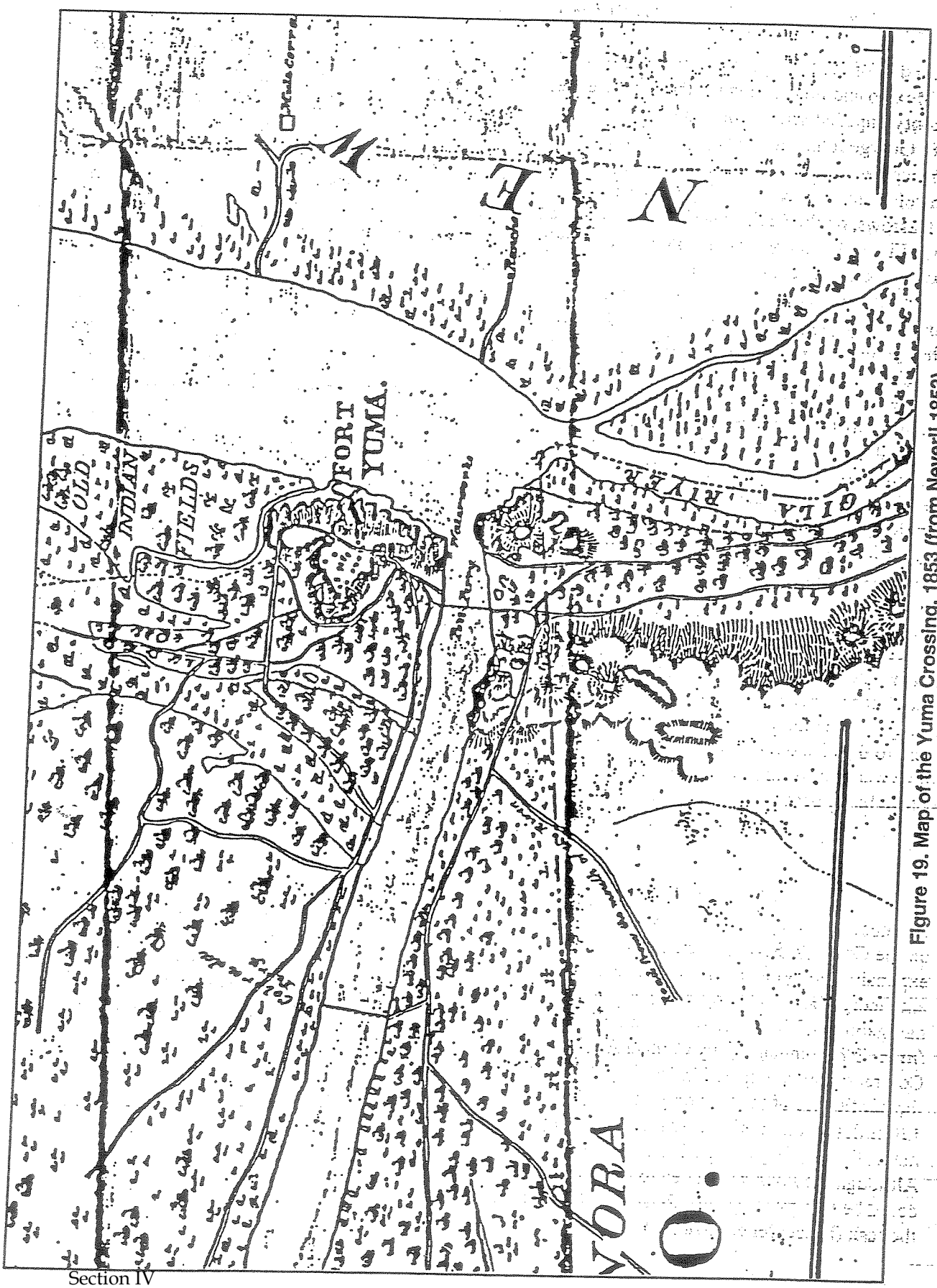

Figure 19. Map of the Yuma Crossing, 1853 (from Neyerll 1853).

Derby's discovery opened up the possibility for a more efficient way to supply the fort and soon led to a new era for the Yuma Crossing. His advice, however, was not immediately followed. George Johnson and Ben Hartshorne, former partners in one of the early Yuma ferry ventures, accepted a contract to supply Fort Yuma and unwisely decided to transport the cargo on two large flatboats using poles to propel them upriver. After the failure of this effort in the winter of 1852, the army issued a new supply contract, this time to Captain James Turnbull, who proposed to deliver supplies to Fort Yuma from the mouth of the river by steamboat, as Derby had earlier suggested. Turnbull purchased a small steam tug in San Francisco, disassembled it, and had it shipped with supplies for the fort on board the schooner *Capacity*. After reassembling the boat, Turnbull pointed the *Uncle Sam* upriver on November 18, 1852, and began the journey to the Yuma Crossing. The *Uncle Sam* finally arrived at the landing at Fort Yuma in early December (Lingenfelter 1978:9–11).

The success of the first steamer was so great that Turnbull went back to San Francisco to purchase a more powerful engine for his boat. But upon his return to the Yuma Crossing, Turnbull learned that the *Uncle Sam* had sunk, and he soon gave up his plans to continue in the steamboat business. George Johnson, on the other hand, was finally convinced of the potential of the steamboat, and, with partners Ben Hartshorne and Captain Alfred H. Wilcox, secured a new supply contract for Fort Yuma. Johnson purchased a steamer that was larger and more powerful than the *Uncle Sam*, which he dubbed the *General Jessup* (in honor of the U.S. quartermaster general who awarded him the contract). The boat arrived at Fort Yuma with its first cargo on January 18, 1854 (Lingenfelter 1978:11).

The *General Jessup* was an immediate financial success and the partners soon had more business than they could handle. A shipyard was erected across the river from Fort Yuma, where boats and barges were constructed to meet the rising demand for river transportation. A dry dock and shipyard were also in operation at Port Isabel, at the mouth of the river. Johnson established an elaborate network of piers, docks, and wood yards to facilitate movement of materials up the river. These landings were spaced about 30 miles apart (one day's voyage) and enabled the steamers to refuel while docking for the night. During the 1860s and 1870s, another wood yard was set up at Hualapai Smith's and a new landing was established to serve the Colonia Lerdo located on the mesa just east of the river (Lingenfelter 1978:60). Of these stops, all but one were located on Mexico soil; Pedrick's was just north of the boundary line between Sonora and Arizona and was the last stop passed going upriver before Fort Yuma. Because of difficult stretches of river encountered between Pilot Knob and Fort Yuma, passengers frequently debarked at Ogden's Landing and proceeded north along a road connecting the landing with the Yuma ferry crossing (Figure 20) (Sykes 1937:31).

Although most of the wood yards were in Mexico, the owners were all Americans. They hired Cocopah and Quechan Indians to cut and haul the wood to the yards and then sold it to the passing steamers for a handsome profit (Lingenfelter 1978:12). One early riverboat passenger recalled the captain of the boat pulling into one of these yards to refuel. After he blew the whistle, Indians came running to greet the boat with armloads of wood, which was purchased for $2 per cord (Gordon 1990:30). No doubt the collection of wood for fuel had a marked impact on the vegetation in the vicinity of the river during the heyday of steamboating along the Colorado.

The increasing steamboat traffic also had a profound effect on the Cocopah and Quechan tribes, whose traditional territories were traversed by the lower Colorado River. The thriving river trade brought members of these tribes in closer contact with non-Indians and exposed them to new wares, foods, and clothing. As the lure of the Euroamerican settlements at the Yuma Crossing grew between the 1860s and 1880s, some Quechan and Cocopah men found work as woodcutters or as deckhands aboard the steamboats. The Indians aided the boat captains with their knowledge of the complicated and changing courses of the river. Despite their navigation skills, the Cocopah and Quechan deckhands received but a fraction of the pay received by other crew members. The monthly salaries of a typical steamboat crew at this time were $200 for the captain, $160 to $200 for the engineer, $75 each for the first mate, fireman, and cook, $40 for the assistant fireman, $25 for the steward, $35 for Yankee deckhands, $25 for Sonoran and

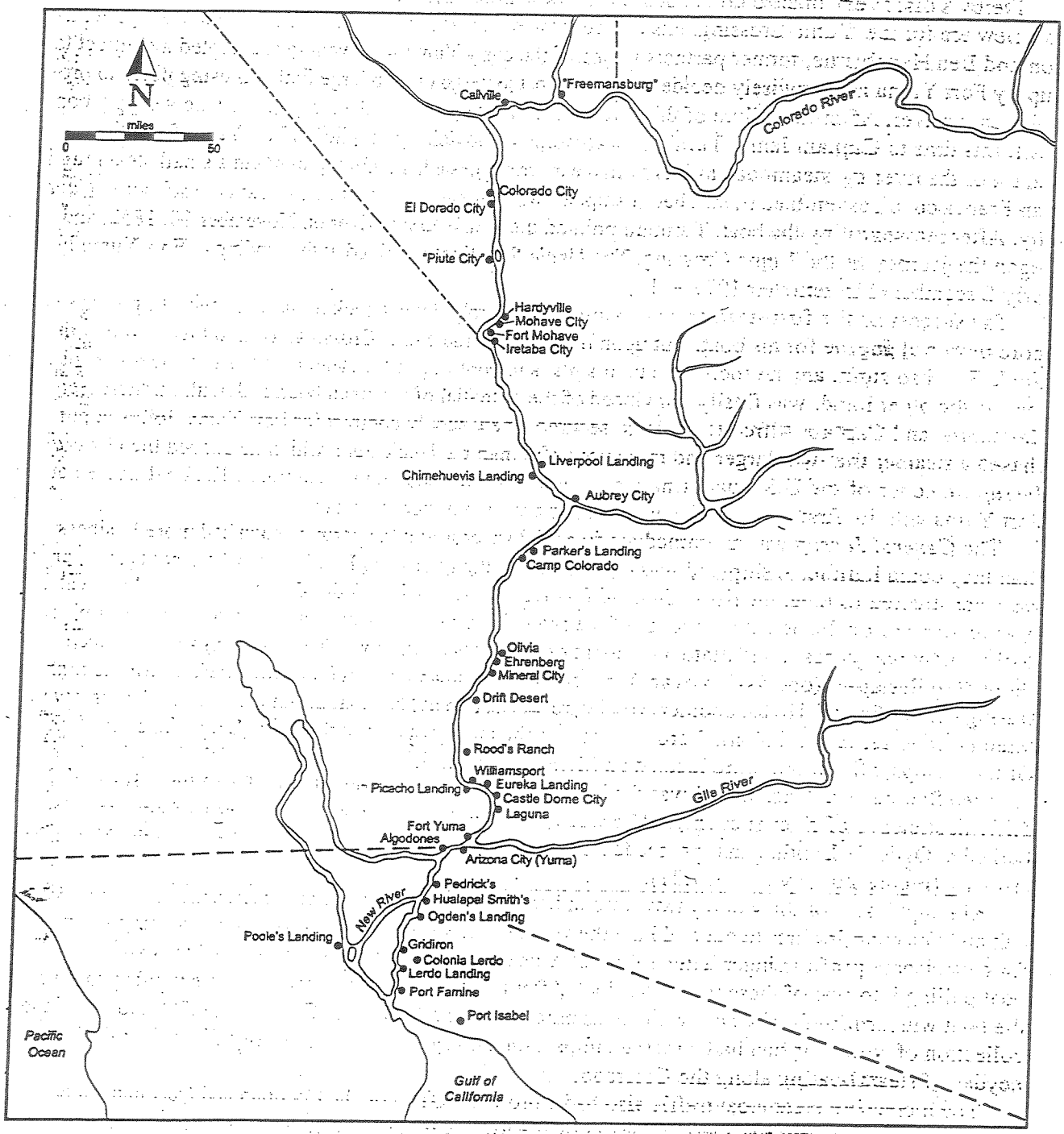

Figure 20. Steamboat landings on the Colorado (adapted from Lingenfelter 1978:34).

Kanaka deckhands, and $15 for Cocopah, Quechan, and Mohave deckhands (Lingenfelter 1978:51). Although earning relatively meager wages, the Cocopah and Quechan men employed in the steamer industry were brought more fully into the market economy. As these individuals began to frequent the fort and the growing town in the late nineteenth century, they spent less time engaged in traditional subsistence practices and cultural activities (Bee 1981:19; de Williams 1974:37–38).

Impacts of the Civil War

Prior to the start of the Civil War, Fort Yuma served as the center of the federal military presence along the Colorado River. As union troops were transferred to assist with the war efforts, Fort Yuma was temporarily abandoned for a time between 1861 and 1862 when the garrison stationed there was recalled to California (Swanson and Altschul 1989:51). In the spring of 1862, an expedition of Confederate forces ventured into the New Mexico territory as far west as Tucson before being pushed back to Texas. This event, and the discovery of strong sympathies among the residents of the southern portions of California and the New Mexico territory, alarmed federal authorities and caused them to focus new attention on the region. As a means to split up a potential block of Southern sympathizers, the federal government separated the Arizona territory from New Mexico in 1863 (Walker and Bufkin 1979:25).

Federal troops were again stationed at Fort Yuma and established the Yuma Quartermaster's Depot in 1864 on a portion of the Fort Yuma Military Reserve on the southern side of the Colorado River. The depot was officially established on January 22, 1867 and was separated from the operations of Fort Yuma the following year (Kerckhoff 1976:7). The depot served to store military supplies arriving by steamboat or overland from California before being shipped to their final destinations. After the conclusion of the Civil War, a number of new military facilities were established throughout the Southwest and the Yuma Quartermaster's Depot played a central role in supplying these outposts. A total of 14 camps and forts received supplies from Yuma, including Fort Yuma, Fort Mojave, Fort Whipple, Camp Lincoln/Fort Verde, Fort Goodwin, Fort Breckenridge, Fort Bowie, and Camp Lowell (Walker and Bufkin 1979:26). Many of these installations were also linked by telegraph lines from Yuma as early as 1873 (Sterner and Bischoff 1997:26).

The Yuma Quartermaster's Depot was served by a fleet of steamboats and barges belonging to the Colorado Steam Navigation Company. Inland military posts not served by the steamers received their supplies by mule trains, which set out under military escort from the depot. As many as 900 mules were kept at the depot at one time to serve the military freighting needs (Hinton 1854:249). Privately operated wagon trains also used Yuma as a staging area for distributing supplies throughout the territory (Swanson and Altschul 1989:55). A few Yuma-area farmers learned from the local Native Americans how to plant and cultivate a wild grass that grew on the lowlands that were inundated by the Spring floods of the Colorado and Gila Rivers. The farmers sold this as hay for as much as $60 per ton to the teamsters, who often stocked up on supplies in Yuma for their return trip and then cached sacks of grain at feeding and watering stations spaced roughly a day's journey apart along their routes. Prominent Yuma-area settlers who raised and sold hay to supply these mule teams included Jose Maria Redondo and James M. Barney. The mule trains and network of way stations continued to serve the inland military posts and points of commerce until the arrival of the railroad made them unnecessary (Gordon 1990:55).

The Civil War and the related military activity in Arizona led to a dramatic rise in the population around Fort Yuma. In 1860, there were only 85 people reported in the Yuma Crossing area; by 1870, the population had soared to 1,144, making Arizona City (the 1862 flood of the Colorado River virtually wiped out both Jaeger City and Colorado City; Arizona City, which was situated on slightly higher ground, survived to form the core of what would later become the town of Yuma in 1873) the second largest settlement in the Arizona territory (Doyle et al. 1984:94).

The population and importance of Arizona City continued to grow during the decade following the Civil War. In 1871 the Territorial Legislature made Arizona City the new seat of Yuma County, replacing La Paz (which had experienced a sharp decline in population as a result of the exhaustion of the area's mineral resources and a change of course in the Colorado River that left the town high and dry [Walker and Bufkin 1979:31]). During this same year Arizona City established its first newspaper, the *Yuma Sentinel*. The name of the town was officially changed to Yuma in 1873. The Arizona Territorial Prison was built in Yuma between 1875 and 1876 on a prominent hill on the south side of the Yuma

Crossing. The prison remained in use until 1909, when it was relocated to its current location in Florence, Arizona.

The structure of the community changed dramatically in 1877 with the arrival of the Southern Pacific Railroad. With the development of fast, reliable overland transportation, the need for steamers from California, and the depot itself, were sharply curtailed. The Yuma Crossing became less vital to the U.S. military, which was quick to transfer operations to the railroad industry. The decline of the Quartermaster's Depot was swift, and it was virtually abandoned by 1880. The military formally abandoned the depot in 1883, after which time the grounds were transferred to the U.S. Department of the Interior (Swanson and Altschul 1991:55).

Arrival of the Railroad

Recognizing the increasing need for transportation service into and across the Arizona Territory during the 1860s and 1870s, the Southern Pacific Railroad provided a more reliable and efficient link between Arizona and California with the construction of a new southern line that passed through Yuma. By June 1877, construction crews of the Southern Pacific Railroad had reached the California side of the Yuma Crossing. The line was finally extended across the Colorado River by September, after some intense wrangling with local military authorities. An early wooden swing-span bridge (constructed to span the 600 feet across the Colorado River at a cost of $200,000) served as the earliest rail bridge, but was destroyed in 1884. The bridge was rebuilt, destroyed by fire the next year, and finally replaced with a steel structure in 1895. The present-day railroad bridge across the Colorado River, located approximately 1,000 feet upstream from the original location, was completed in 1926. The 1895 steel bridge, which crossed at Madison Avenue, has been removed and only the concrete platform for the swing-span bearing remains at its original location (Stone 1988:6).

Soon after the completion of the first bridge across the Colorado, the Southern Pacific advanced rail service across Arizona, reaching Tucson in 1880 and extending across New Mexico to a junction with the Texas Pacific railroad near El Paso in 1881. By this time, Yuma had become well connected with the markets and populations of California and the east and the community flourished. To serve the influx of passenger traffic and commerce passing through Yuma by rail, the Southern Pacific constructed a new complex immediately east of the tracks on the Arizona side of the bridge that featured rail spurs, warehouses, a water reservoir, and a large hotel and train depot building (Stone 1988:6). The activity resulting from the railroad also led to a significant increase in the town population and the expansion of the downtown area (Sterner 1990:15–17). In 1881, businesses in Yuma included two hotels, one restaurant, four general merchandise stores, four grocery and variety stores, two drug stores, one stationary shop, three butcher shops, two blacksmith shops, one saddle and harness shop, four barber shops, four Chinese washhouses, three attorneys, two telegraph offices, and eleven saloons (Robertson 1942:101).

The Impact of Development on Native-American Communities

The establishment a permanent military post at Fort Yuma in 1852, the commerce brought by the arrival of first the steamboat and later the railroad, and the growth of the neighboring community of Yuma engendered significant changes in the settlement patterns and cultural autonomy of the Quechan Indians during the mid-nineteenth century. These changes brought the Quechan in closer contact with Euroamerican society and its market economy and signaled the beginning of the end of their traditional way of life. They began wearing Euroamerican clothes, eating Euroamerican food, and their seasonal rounds were curtailed (Hogan 1998:24). This situation worsened as some Quechan accepted low-paying jobs in town or on steamboats and devoted less time to their traditional farming practices. In addition, the desire of

some Yuma settlers and commercial interests for the fertile lands farmed by the Quechan led to the creation of the Fort Yuma Reservation in 1884.

As mentioned earlier, although the 45,000 acres of land set aside for the Quechan at this time was sizeable, it was only a small portion of the territory that the tribe had previously controlled. Further, the reservation boundaries ignored the traditional settlement locations of the Quechan, resulting in internal conflicts. Prior to the establishment of the reservation, the Quechan recognized themselves as a single tribal group geographically separated into a series of settlements or rancherias. Bee (1983:87) has identified the location of six rancherias believed to have been in existence in the region in the late nineteenth century: North Dwellers, near Indian Hill; Xuksil, near Pilot Knob; the Sunflower Eaters, about 15 miles northeast of Indian Hill; Somerton Group, near the present-day town of Somerton; Townsend Group, about 6½ miles east of Indian Hill; and Blythe Group, which earlier lived near the present-day city of Blythe, California (had recently relocated about 3 miles northeast of Pilot Knob). However, the seasonal migrations of extended family groups has presented difficulties in determining the exact locations of rancherias and the movement patterns of the people. Because the Fort Yuma Reservation encompassed the traditional territory of the Blythe Group and the North Dwellers, federal officials tried to convince the inhabitants of the four outlying rancherias to move to the reservation. The creation of the reservation served to gain control of prime land previously occupied by the Quechan and to help assimilate tribal members into the mainstream American culture (Bee 1989:57). To help in this latter goal, the government established a boarding school in 1886 and awarded the contract for school staffing and administration to the Catholic church. The school, which required the attendance of children from all of the Quechan rancherias, contributed significantly to the loss of traditional ways among the tribe's younger generation.

During the early 1890s, federal officials began making plans to allot the land on the Fort Yuma Reservation. This process, which was authorized by the 1887 General Allotment or Dawes Act, was intended to divide reservations into individual plots and give Indians more incentive to farm their lands. The allotment issue stirred up controversies within the tribe, but in 1893 the Quechan were persuaded to sign an agreement limiting individual holdings to five acres and free irrigation water from a series of ditches and canals to be constructed by the government. The remainder of the reservation land was to be sold at public auction, the proceeds of which would go to help finance the development of the Quechan allotments (Bee 1989:61–64). The Quechan have vigorously challenged the legality of this agreement, and after lengthy negotiations with Department of the Interior officials, 25,000 acres of the original 1884 reservation were restored to the tribe in 1978. Prior to this decision, however, the reservation was allotted in 1912, with each individual receiving 10 acres instead of the 5 stated in the original 1893 agreement (Bee 1983:95).

By the time of this allotment, the Quechan had experienced great changes. The damming of the Colorado upstream from the reservation reduced the annual, rejuvenating floods, making traditional floodplain farming techniques impractical. The Quechan children continued attending the reservation boarding school and were influenced by its curriculum of assimilation. The Quechan population had declined significantly as a result of European diseases and increased warfare. Although there is some question as to accuracy of these figures, the estimated decline from 4,000 Quechan at the time of their first contact with Europeans to 834 in 1910 leaves little doubt as to the dramatic reduction of the tribal population. By this time, most of the Quechan had abandoned the outlying rancherias and had moved onto land within the reservation. Only one small group of Quechan "homesteaders" remained outside the reservation boundaries, in the area of Somerton (Bee 1983:95–96).

The allotment issue and the consolidation of the six rancheria groups onto the reservation led to internal political struggles and factionalization among the Quechan. By the 1920s and 1930s, conditions for the tribe continued to worsen. Farming was no longer a profitable enterprise, and many Quechan had become wage earners in Yuma working unskilled job, further distancing them from their cultural traditions. In 1936, the tribe voted for a tribal constitution and elected a seven member tribal council. In later

years, this council devoted its support to various antipoverty and community development programs (Bee 1983:95–96).

The Cocopah, whose territory during most of the historical period was located in the southernmost part of the Colorado River delta, were also exposed to the waves of Euroamerican exploration and settlement. Like the Quechan, it appears that the Cocopah population declined as a result of diseases passed on by the newcomers to the region (de Williams 1983:104). Traditionally the Cocopah cultivated crops around the annual spring flooding of the Colorado and migrated seasonally to gather supplemental foodstuffs (de Williams 1974:34, 62). However, in the last half of the nineteenth century, many Cocopah men became very active in the growing steamboat trade along the Colorado River, serving as deckhands or supplying the steamers with wood for fuel. As such activity brought the them into closer contact with the Euroamericans, the Cocopah developed an affinity for the goods and practices to which they were introduced and became participants in the market economy. When the steamboat industry went into decline following the arrival of the Southern Pacific Railroad, many Cocopah, who had abandoned their traditional farming activities to work for the steamboats, were hard-pressed to support themselves (de Williams 1974:38).

This situation led some Cocopah groups to leave the lower Colorado delta area early in the twentieth century in search of new employment opportunities, while other groups remained behind in their traditional territories. At this time, members of the Wi Ahwir and the Hwanyak Cocopah groups settled in the vicinity of Somerton, Arizona. Other groups migrated to locations in Baja California and Sonora, Mexico, resulting in the current binational nature of the tribe. The development of irrigation in the Yuma Valley and the need for agricultural day laborers likely attracted the Cocopah to the Somerton area around 1910.

In 1917 the United Stated government gave legal title to the Cocopah in Arizona for three small parcels of land in the Yuma Valley (Cocopah West Reservation, Cocopah East Reservation, and Cocopah Lots Five and Six), totaling approximately 1,800 acres, that continue to serve as the tribal reservation holdings in the United States. After a lengthy fight for land rights, the Cocopah in Mexico received by presidential decree the communal rights to 143,000 hectares of desert land, including the Cucapa Mountains. In the early 1980s, the Mexican Cocopah were awaiting another decree that would expand their holdings to include irrigable farmland near the Hardy River in Baja California. By the 1960s, the Arizona Cocopah began to organize, sponsoring housing, education, and health programs on the reservation (de Williams 1983:102).

Although by the 1980s the Cocopah went through a period of reviving their traditional crafts and maintained their identity as an ethnic group, many elements of their material culture disappeared. Most dramatically, the Cocopah, who have traditionally been a river people, no longer live on the river. Management of the Colorado River in the twentieth century has severely altered its course and flow and have precluded many of the traditional Cocopah practices that depended on the river and its resources. The section of the Colorado that flows past the one small portion of the American Cocopah reservation on the river is used by the U.S. government for agricultural drainage. Thus the Cocopah, whose lives once centered around the Colorado River, have experienced significant cultural changes in the twentieth century as a result of changes made to the river by Euroamericans (de Williams 1983:103).

As the discussion to this point has attempted to demonstrate, the history of the lower Colorado region is exceptionally rich, with the imprint of three cultures contributing to its social and cultural complexion. The small town of Yuma was attracting new settlers to the region, which seemed poised to become one of the leading agricultural centers in the southwestern United States.

Early Irrigation Efforts

Irrigation has been practiced along the lower Colorado River for centuries. Sources claim that prior to the arrival of Europeans, Native Americans had practiced irrigation agriculture in the valley between Yuma and the Gulf of California for over 1,000 years (Robertson 1942:104). As early as the sixteenth century, Spanish missionaries in Yuma noted that the Quechan were engaged in irrigation farming. Among Euro-americans, several early irrigation efforts were made, although large-scale irrigation in the Yuma area did not take place until the early twentieth century.

Euroamerican irrigation in the Yuma area appears to have begun in the 1870s, with the efforts of Jose Redondo of Yuma. Redondo and his brother established the Hacienda de San Ysidro Ranch, which was located in the valley between the Colorado and Gila Rivers. Although the Redondos had attempted to irrigate their land beginning in the late 1860s, it was not until the 1870s that they realized any success. By 1874, their ranch contained a system of canals and ditches which allowed them to irrigate alfalfa, wheat, barley, and oats (Swanson and Altschul 1991:62).

In 1876, a team of engineers examined routes for a possible canal from the Colorado River to the Imperial Valley of California. The surveyors, however, found that the only feasible route for the canal would be through Mexican territory. The U.S. Congress refused to grant any land for irrigation purposes if part of the system was to be placed on Mexican soil (Robertson 1942:106). Several decades would pass before irrigation water in any considerable amount would be brought to the Imperial Valley as well as the Yuma area.

Lerdo Colony

Another early attempt at irrigation came in the late 1870s with the establishment of an experimental farm, 70 miles south of Yuma, on the east side of the Colorado River. The Lerdo Colony, as the farm became known, was located partially on Mexican soil. Agreements were made with the Mexican government that permitted the colony to farm the land. A tract of land approximately 15 miles wide was cultivated as a part of the experiment, beginning with several thousand fruit trees. The colony's land itself was divided among the individual settlers, and when they were not working their own parcels, the farmers were expected to assist in the construction of a large canal. The canal was planned to run from the Colorado River near Pilot Knob, through the settlement, and terminate at the Gulf of California (Figure 21). Because of actions on the part of several unscrupulous colony officials, however, the canal was never built (Robertson 1942:109). The duration of the colony's existence is not currently known, although it is expected not to have survived to the turn-of-the-century.

Algodones Land Grant

The majority of the Yuma Valley was included in a Mexican land grant known as Algodones. The legal nature of the land was in question for years following the Mexican War and ended in a court decision in 1893. At that time, the U.S. government attempted to acquire title to the land. The grant's claim was upheld, however, by U.S. courts in 1893 and again in 1896. In 1898, the U.S. government, after appeals, finally acquired title to the land. During the period of litigation, private companies had been constructing canals throughout the area, in an attempt to develop and settle the land. During the same period squatters had settled throughout the area, and were sold land in the Yuma Valley by representatives of the land grant. Small tracts of land were sold and water was delivered from pumps in the Colorado River. In 1901, the entire area was reopened to entry, and many more settlers moved in (Reclamation 1940:65).

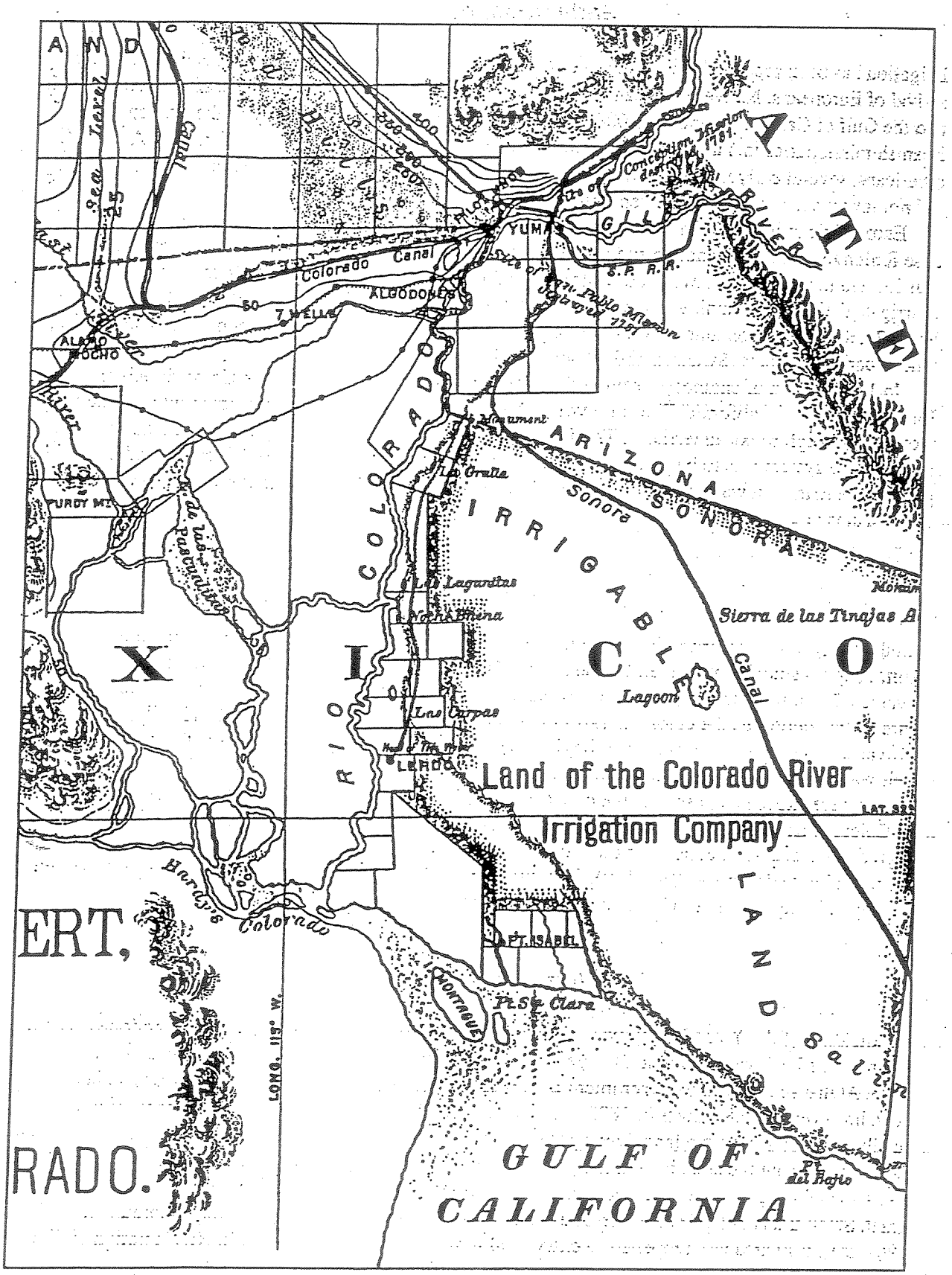

Figure 21. Lower Colorado River showing the Lerdo Colony and the proposed Sonora Canal, 1893 (from Hart 1893).

First Irrigation Companies

Settlers arriving in the Yuma area in the late 1800s realized the potential of the lower Colorado River, and the rich soils of its floodplain. By the 1880s, several irrigation features existed along the lower reaches of both the Colorado and Gila Rivers. Following a major flood in 1891, more-substantial irrigation features were constructed, including a large pump by the Yuma Water and Light Company. Operated by Hiram Blaisdell, the pump provided water for domestic as well as irrigation uses, drawing Colorado River water from a point just east of the Southern Pacific Hotel and Train Depot in Yuma. With the help of this pump, Blaisdell grew the first citrus in the Yuma area. By 1893, the Colorado River Irrigation Company was also established to better exploit the river. This company succeeded in irrigating an area 22 miles long and 6 miles wide, located immediately south of Yuma. The formation of other companies soon followed, including the Cocopah Fruit Company in 1893, and the Irrigation Land and Improvement Company in 1900. The latter company began acquiring smaller companies, consolidating nearly 60 miles of canals and laterals as well as irrigating over 50,000 acres of land. This irrigation was accomplished via a diversion point roughly 3.5 miles southwest of Yuma. By 1900, the Irrigation Land and Improvement Company purchased the Colorado Canal and Levee Company as well as the Eureka Canal Company. This combined company constructed miles of canals in the north Yuma Valley in the first few years of the twentieth century. Shortly thereafter, the company was absorbed into the Reclamation Service under the Yuma Project (see below) (Swanson and Altschul 1991:62).

Attempts to irrigate the Imperial Valley continued under the plan and direction of engineer Charles R. Rockwood, culminating in the formation of the California Development Company in 1899. By 1900, work commenced on a canal system that would bring water from the Colorado River to the Imperial Valley, and by 1901 the first water was delivered (Robertson 1942:112). Some of the early irrigators attempted to subdivide the land and sell it to prospective settlers. Truly large-scale irrigation of the Imperial Valley, however, began in the 1930s following the completion of the All American Canal.

The Lower Colorado Region in the Twentieth Century

The Growth of Modern Yuma

The arrival of the railroad brought notice that Yuma was a growing town. The prosperity, however, did not last long. The Colorado River flooded in 1891, destroying all of the buildings east of Main Street. All of the stores but one, all restaurants except two, and all saloons except that at the Southern Pacific Hotel were destroyed. The reconstruction that followed the 1891 flood began to define what can be called modern Yuma. Although adobe block remained the building material of choice, the wealthier businessmen recognized the attendant dangers of using adobe near water and rebuilt structures of brick and concrete (Laird 1986).

As the town of Yuma approached the new century, the social makeup and dynamics of the community began to change. The steamboat trade and the recent arrival of the railroad helped Yuma to become the largest town on the Colorado River and the third largest in the Arizona territory. At this time almost, two thirds of the town's 1,200 residents were Sonorans (Lingenfelter 1978:60–61). This situation reflected the significant role Hispanics played in settling the Yuma Crossing area and the mining communities further upriver and to the east. Yet despite the large number of residents, Hispanics never really established a cultural dominance in Yuma, with the affairs of the community controlled largely by the Anglo minority (Officer 1987:310; Westover 1966:81–84). The attitudes toward Hispanics held by many Anglo-American settlers are informative about the racial lines that divided Yuma society at this time. Historian James Officer has documented cases of discrimination and harassment suffered by Hispanics in

the Yuma Crossing area dating back to the ferry operations of the early 1850s (1987:248). Many newcomers to the region considered themselves socially and intellectually superior to the Hispanic residents they encountered (Officer 1987:310–311). Such attitudes surely influenced social relations and shaped the development of the Yuma community during the late nineteenth century.

As discussed earlier, Anglos viewed and treated Native Americans with even greater disregard than they did Hispanics. After Major Heintzelman's campaign to subdue the Quechan unrest in the 1850s, Hispanics and Anglos came to settle the Yuma Crossing area and took for themselves land and resources previously controlled by the Quechan. As Yuma grew in size and prosperity toward the end of the nineteenth century, some Quechan were drawn to town and took menial, low-paying jobs—the only employment opportunities available to them. When the town population numbered 1,200 residents, about 500 Quechan were said to have lived on the outskirts (Lingenfelter 1978:60). The Quechan who worked in or frequented town were treated as inferiors and were criticized by the Anglo "gentility" in the newspapers for their drunken behavior and dress (Bee 1989:55). By the early 1880s, envious Anglo citizens and business interests requested the establishment of a reservation so that the fertile bottomlands occupied by the Quechan could be opened up for themselves (Bee 1981:19). The beginning of the twentieth century saw the coming of new waves of Anglo-American settlers who brought with them vast amounts of capital and visions for transforming the lower Colorado region. The resulting changes altered the demographic makeup of the community and perpetuated the marginalization experienced by the Native Americans and Hispanics in the Yuma area.

Yuma continued to grow at a remarkable pace in the early twentieth century. Expanding well beyond the downtown area, residences appeared around the town periphery and the population grew to 3,000 residents by 1908. Naturally, the increasing population required a larger food base. In response, the Yuma Reclamation Project, begun in 1904, resulted in the construction of Laguna Dam, located 10 miles northeast of the city. The main function of the dam was to harness the waters of the Colorado River for use in irrigating the rich bottomlands to the north and south of the city. When completed, the dam was almost 1 mile long, and raised the water level 10 feet from its natural elevation. The cost of the project up to 1910, including dam, levees, and some canals, was $4,120,000, or about 15 dollars for each acre expected to be irrigated (Robertson 1942:120).

Yuma experienced its greatest growth between 1900 and 1920. People came to the city and surrounding area soon after the Yuma Reclamation Project became a reality. Investment in irrigation and agricultural activities were strongly encouraged when water from the Colorado and Gila Rivers became obtainable at reasonable rates. With the increased population, the city began a phase of extensive construction, including schools, a courthouse, and several civic projects. Automobiles arrived in Yuma during 1913, and two years later a road bridge was constructed across the Colorado River to join Arizona and California.

During 1916, the Colorado River flooded again. Most low-lying areas of Yuma, including downtown, were devastated. Whereas many of the wealthier businessmen had constructed their establishments of brick and concrete to withstand such floods, many of the adobe and timber structures were washed away. Yuma, once again, began to rebuild. This time the devastation was motive enough to prompt the city council to decree that adobe construction would no longer be an acceptable practice in the downtown area (Laird 1986). The 1916 flood was of little deterrence to the redevelopment and continuing prosperity of Yuma. By 1920, the city was well established and the population had increased to 5,000 residents. The foundation for development that would characterize Yuma throughout the 1930s, and well into the 1940s, had been laid.

Yuma Valley Communities

When the dispute about the Algodones Land Grant was finally resolved in 1898, the land formerly included within the grant claim was reopened for public entry. The early years of the twentieth century witnessed the settlement of this area and the establishment of new communities centered around agriculture, made possible by the irrigation features developed as part of the Yuma Project of the U.S. Reclamation Service.

Although there were some people reported in the Somerton area as early as 1895, the first post office for the community was not established until 1898. Somerton was made an official town site in 1909 and this event was celebrated with the opening of the first store. The town experienced rapid growth in 1917 with the construction of the Warrenrite road from Yuma (the first paved road in the Yuma Valley) and the introduction of cotton in the lower Yuma Valley. By 1920, Somerton had a population of over 1,500 residents and had become a center for cotton ginning and buyers. The town was wired with electricity, featured two banks, two lumber yards, farm implement stores, blacksmith services, several commercial companies, a theater, hotels, a doctor, and a dental surgeon. Many of the laborers who worked the cotton fields were Mexican immigrants who fled the hardships resulting from the Mexican Revolution of 1910. Many of these field workers and their families settled on the fringes of the town in labor housing camps, such as Burro Town (Arizona Historical Society, Century House–Somerton Ephemera Folder).

With the crash in cotton prices between 1920–1922, Somerton's growth slowed considerably and the community never reached its anticipated prosperity. By the 1930s, other crops such as cantaloupes, alfalfa, and citrus were introduced to the area, but the town was no longer a booming agricultural center. Agriculture continues to be the main industry around Somerton, and the majority of the town's residents depend on it for their livelihood (Arizona Historical Society, Century House–Somerton Ephemera Folder; Woznicki 1995:180).

Another town established in the early twentieth century in the Yuma Valley was Gadsden, Arizona. Located 19 miles south of Yuma and 4 miles north of the international boundary, the town site was selected in 1915 by the partners in the investing real estate company because of the rich surrounding farmlands and the proximity of the Yuma Valley Railroad (owned and operated by the U.S. Reclamation Service). Gadsden also grew quickly in its early years as a result of the thriving cotton industry. The town featured an array of businesses and institutions, including a department store, pool hall, restaurant, barbershop, bar, drugstore, butcher shop, mercantile store, bank, theater, school, two churches, and two service stations. The businesses prospered as farmers brought their cotton to town and waited for it to be ginned in one of the five gins in the community. In 1919, the *Gadsden Clarion*, the town's first newspaper, began circulation. Like Somerton, however, the town of Gadsden went into a period of decline when cotton prices dropped. Town businesses closed as many people traveled to the larger communities of Somerton or Yuma to do their shopping (Arizona Historical Society, Century House–Gadsden Ephemera Folder).

The Colorado River has played an important part in the history of the communities of Gadsden and Somerton. While the river created the fertile bottomlands that made agriculture possible in the Yuma Valley, the threat of floods presented a constant menace to the communities located along its banks. The subsequent damming of the Colorado upstream and the construction of levies and drainage features have protected these towns from the dangers of flooding and have facilitated the irrigation of crops in the Yuma Valley (Arizona Historical Society, Century House–Gadsden Ephemera Folder).

One town that has developed more recently in the Yuma Valley is San Luis, Arizona. Located directly across from San Luis, Sonora, this small community grew up largely as a border town, providing services and access to its much larger Mexican namesake. The oldest store in San Luis dates back to 1954. In light of the recent NAFTA policies and the resulting heightened trade between the United States and Mexico, the twin border communities are anticipating a significant economic and population boom in the

years to come (Arizona Historical Society, Century House–San Luis Ephemera Folder; Woznicki 1995:190).

Agriculture in the Yuma Valley

At the beginning of the twentieth century, most of the settlers arriving in the Yuma area settled to the south and southwest of the town. The soil in this area was viewed as the best for irrigation and farming purposes. As more settlers arrived, the need for irrigated lands increased. Several plans were made to carry water from the Colorado River to these populated areas. Most of the proposed diversion features, however, would have to travel through Mexican territory en route to their final destinations. Under one venture, an agreement was worked out with Mexico, whereby the canals could be constructed, and one-half of the water would go to American farmers and the other half to Mexican farmers. Many of these Mexican farmers were actually Americans who had settled in that portion of Sonora previously and had begun farming the land (Robertson 1942:114–115). The venture proved to be unprofitable for the canal owners soon after its inception, however.

In the Yuma Valley, several private companies were formed to irrigate and develop the area, including the Yuma Valley Union Land and Water Company, the Greene Land and Cattle Company, and the Colorado Valley Pumping and Irrigating Company. The latter company was one of the only truly successful efforts. The company constructed a steam pumping plant close to Yuma that irrigated approximately 2,500 acres in the upper Yuma Valley (Reclamation 1912). In addition to numerous canals, these companies also constructed small levees to hold the Colorado River in check. The early attempts at irrigation, however, were hampered by the presence of silt in the canals as well as the violent flooding of the Colorado River (Pfaff et al. 1992:46). To overcome these problems, and truly exploit the farming potential of the Yuma area, the federal government would have to take a leading role.

The Newlands/Reclamation Act

On June 17, 1902, the U.S. Congress passed the Newlands, or Reclamation, Act. Named for Senator Francis Newlands of Nevada, the man largely responsible for its conception and passage, the act radically altered large portions of the arid west. The act sought to reclaim, through irrigation, marginal lands that would otherwise be unfit for cultivation or habitation. The idea behind reclamation of marginal lands was stated (Pfaff et al. 1992:28) succinctly by President Theodore Roosevelt in 1902:

> The object of the government is to dispose of the land to settlers who will build homes upon it. To accomplish this the water must be brought within their reach. . . . Our people as a whole will profit, for successful home making is but another name for the upbuilding of the nations.

The government realized that the massive amounts of money required to successfully irrigate these lands could not be borne by individual settlers. Under the authority of the Reclamation Act, the government decided to fund irrigation projects, particularly in the arid West. Although they had made previous attempts to assist in irrigation, most of these attempts were project specific, no comprehensive program had been implemented. The Reclamation Act created the Reclamation Service, which was charged with assisting in the development (through irrigation and agricultural programs) of the arid West. Initially, the Reclamation Service was under the auspices of the U.S. Geological Survey, but eventually became an independent bureau. Under the Act, the Reclamation Service was charged with opening land to settlement. In theory, the Reclamation Service would be repaid for the cost of the project by those who ulti-

mately benefitted from it. Repayment would be made over time by individual settlers or agriculturalists as well as by independent water districts through the sale of the water. The Reclamation Act contained several other provisions, most important of which was the establishment of a fund, dedicated for further reclamation projects. The fund received repayment monies from the sale of land and water, in addition to federal sources, allowing for ongoing large-scale irrigation projects.

The Yuma Irrigation Project

The lower Colorado region was one of the first to receive Reclamation dollars, in the form of the Yuma Irrigation Project (YIP). The project was conceived in 1902, with land surveys beginning immediately thereafter. The project was finally authorized by the Secretary of the Interior on May 10, 1904. Prior to construction, the Reclamation Service withdrew public land in the areas along the Gila and Colorado Rivers where irrigation was most feasible. Over 250 private water users were located in the Yuma Valley prior to the withdrawal, most of whom were situated close to Yuma (Pfaff et al. 1992:85). The southern Yuma Valley was relatively unclaimed and unsettled at this time (Figure 22).

The force behind the YIP, the Reclamation Act, permitted individuals to acquire land with certain stipulations. The stipulations limited available acreage for each settler and requirements for the eventual repayment for the water. A prospective settler was charged $6.50 for a homestead filing fee, followed by $85.00 per acre for the YIP water. Settlers were required to live on their land, and were allowed six months after filing their claim to occupy the property. The first YIP water was delivered in 1910 in the Reservation Division. The Valley Division received project water following the completion of the siphon in 1912. By 1913, the Yuma Valley's farm population had grown from 1,500 to approximately 3,500 farms, cultivating some 11,200 (Pfaff et al. 1992). Many of the landowners in the Yuma area were absentee farmers who leased their land to tenants.

Reclamation utilized what became known as the unit system for distributing water to individual settlers. Settlers were limited to water for 160 acres of land, if the land was already privately owned; water for 40 acres if a special homestead dispensation was obtained; and water for 20 acres of land on the Indian Reservation. The unit system was designed to prevent the accumulation of water rights by a few landowners. According to the plan, water was distributed to settlers via main canals and laterals, but it was the settlers' responsibility to construct their own sublaterals to carry the water to their fields.

The Reclamation Service's first operations involved the construction of several levees along the Colorado to better control the river. But the Reclamation Service quickly learned the pitfalls of trying to tame a river as powerful as the Colorado. During 1905, the Colorado River changed courses rather unexpectedly one of the preliminary irrigation diversions was completed. The river broke through the diversion as well as a levee, following an easy path all the way to the Salton Sea. The river almost changed courses forever because of this accident, but was finally brought back to its regular channel in 1907 through the efforts of the Reclamation Service. Following another major course change in 1909, it became clear to Reclamation that a system of levees would be required.

Laguna Dam

The first major attempt to harness the Colorado River construction, and integral to the success of the YIP, was the construction of Laguna Dam, located 9 miles upstream of town. But the construction of a major dam along the Colorado River presented significant challenges. Because of the lack of bedrock upon which to build, Laguna's design was unique among American dams and was actually modeled after one found in India. Construction of the dam began in 1905 by a private contractor. Contract difficulties ensued, however, and the completion of the project was assumed by Reclamation in 1907. Following dam completion in 1909, harnessed water was soon diverted for irrigation purposes.

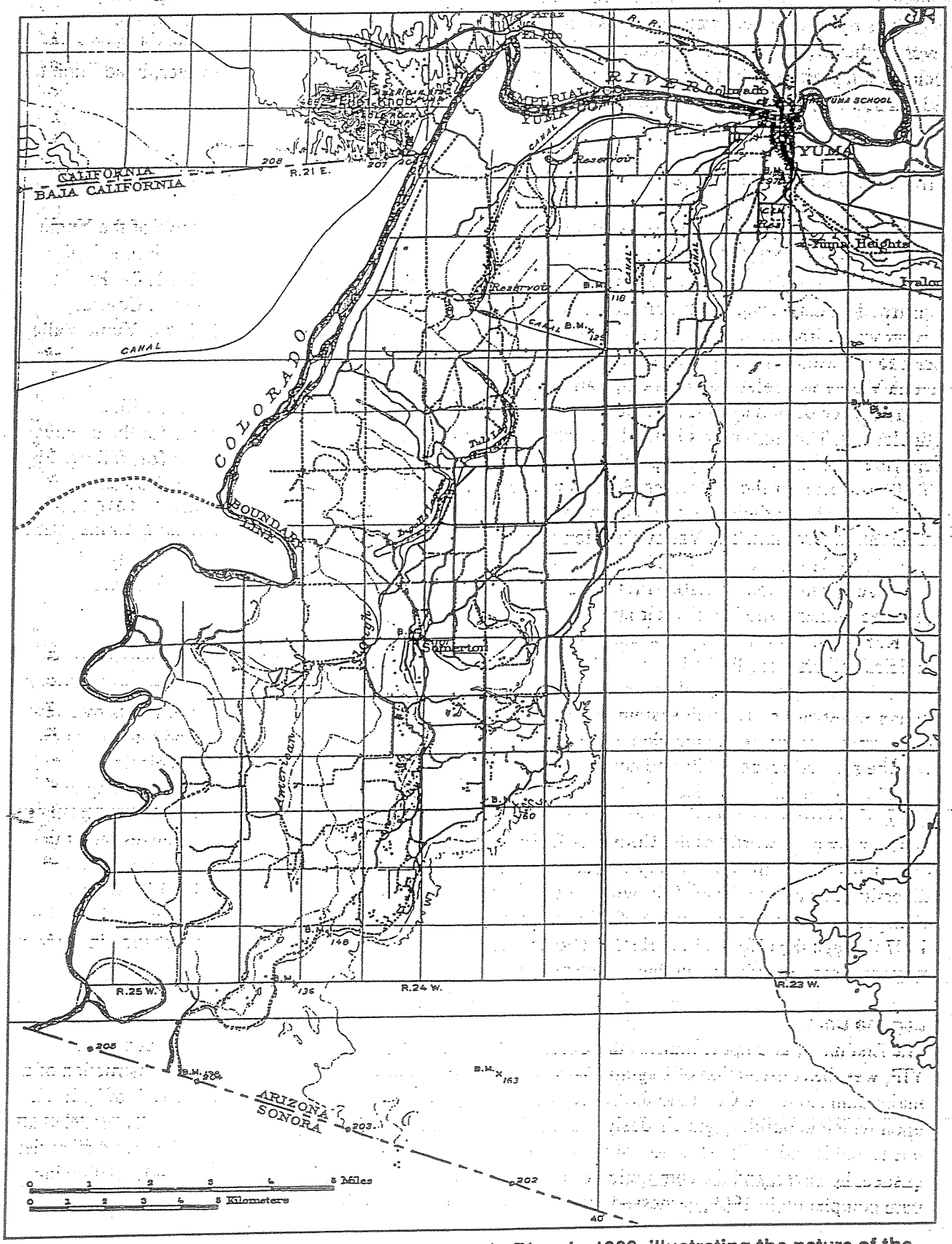

Figure 22. Topographic map of the lower Colorado River in 1903, illustrating the nature of the region prior to the construction of the Yuma Irrigation Project.

During the construction of Laguna Dam, the Reclamation Service began work on the remainder of the proposed YIP features. A small irrigation infrastructure was already in place when the Reclamation Service arrived in the Yuma area, constructed predominantly by small, private irrigation companies that were cultivating small parcels of land. Some of the irrigation features constructed by these companies (most of which were acquired by the Reclamation Service) were used to supply irrigation water while the Yuma Project was under construction. The pumping plant built by the Colorado Valley Pumping and Irrigating Company, for example, was utilized until the completion of a Reclamation-built siphon under the Colorado River. For the most part, however, most of the canals built by the private companies were not used by Reclamation. In at least one case, a private irrigation company, the Irrigation Land and Improvement Company (ILIC), resisted Reclamation offers to purchase their land. Reclamation responded by constructing a canal across the company's property. The ILIC, in turn, responded by taking Reclamation to court, and the case wound up in the Supreme Court. A settlement was eventually reached and Reclamation was able to continue its construction efforts.

When completed, the YIP provided irrigation water to 40 miles of land along the Colorado River, encompassing over 130,000 acres. As originally constructed, the project consisted of one diversion dam, ten primary canals, 218 miles of laterals, one power plant, two pumping plants, and one 930-foot-long siphon (Figure 23) (Pfaff et al. 1992:19). Originally, management of the YIP was divided into three units. Two of these units, the Bard and Reservation Divisions, were located on the California side of the Colorado River. The third, the Yuma Valley Division, was located south and west of the town of Yuma, on the Arizona side of the river. The Yuma Valley Division (generally referred to as the Yuma Valley), is most germane to the current discussion.

Levees

Providing irrigation to agricultural interests in the Yuma Valley served no end if the lands and YIP infrastructure was subjected to the annual, and often severe, flooding that characterized the Colorado River. From the outset, the goal of the YIP was to also provide flood control, of which Laguna Dam was only one part. To this end, a system of levees was constructed downstream of the dam on both sides of the Colorado and Gila Rivers. Although a few levees had been constructed by earlier, private irrigation companies, the Reclamation Service constructed an entirely new system. Construction began in 1905 with 14 miles of levee along the eastern bank of the Colorado River in the Yuma Valley. The Valley Levee, as it came to be called, extended to the Mexican border and was completed by 1911 (Figure 24). Meanwhile, other levees were constructed in other portions of the project. Between 1906 and 1909, levees along both banks of the Gila River were constructed, along with the Reservation Levee between Yuma and Laguna Dam. This latter levee was extended west of Yuma for 3 miles in 1912 (Bischoff et al. 1998:11). The entire levee system was completed by 1919.

Originally, levee embankments varied in height from 4 to 15 feet, extending 3 feet above maximum river level. Initially, levee slopes were protected from river erosion with brush dikes. In some places, steam boats were used to drive spur dikes into the sides of the levees to provide additional protection. The first levees constructed suffered from a number of problems, including the caving of their banks caused by the meandering of the river, crevasses in the levees caused by high-water levels in the river, and the undermining of the levees caused by burrowing animals (Reclamation 1912; IBWC 1948). Eventually, rock riprap (large rocks placed on the sides of the levees to give them added erosional resistance) was found to be a superior material for levee construction and the use of brush was discontinued.

Despite the extensive system of levees throughout the Yuma area, floods continued to inundate extensive areas in the early twentieth century. A large flood in 1916, for example, breached the levee and destroyed numerous canals, laterals, and a substantial portion of the railroad embankment. The river fluctuated widely during this flood, extending over 1 mile from its normal flow at Mile Marker 17 in the Yuma Valley (Reclamation 1916). To combat these overflows, a 900-foot-long spur track was constructed along the Yuma Valley Railroad (see below), between Mileposts 17 and 18. The spur track provided a

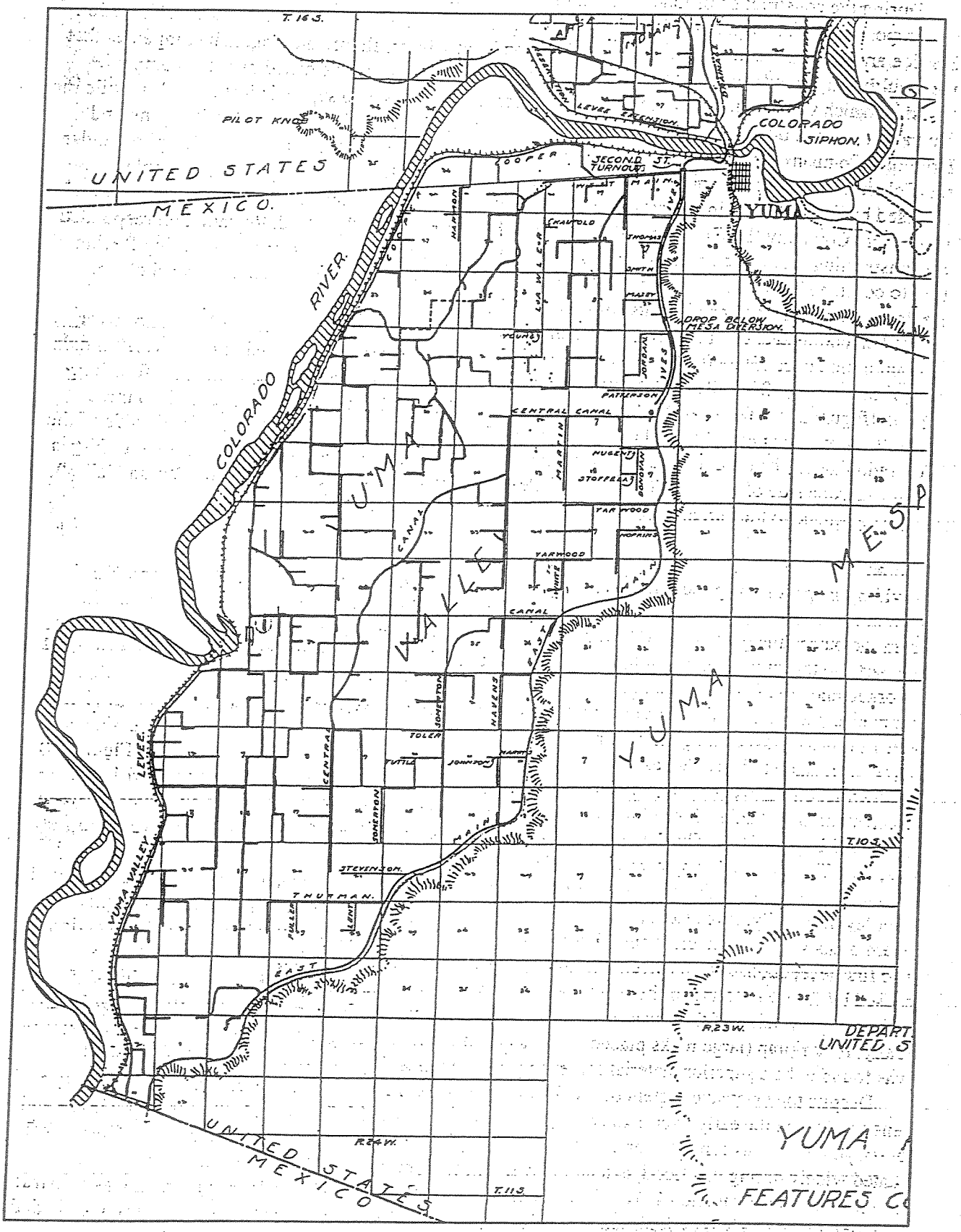

Figure 23. Features of the Yuma Irrigation Project completed in the Yuma Valley as of December 31, 1915.

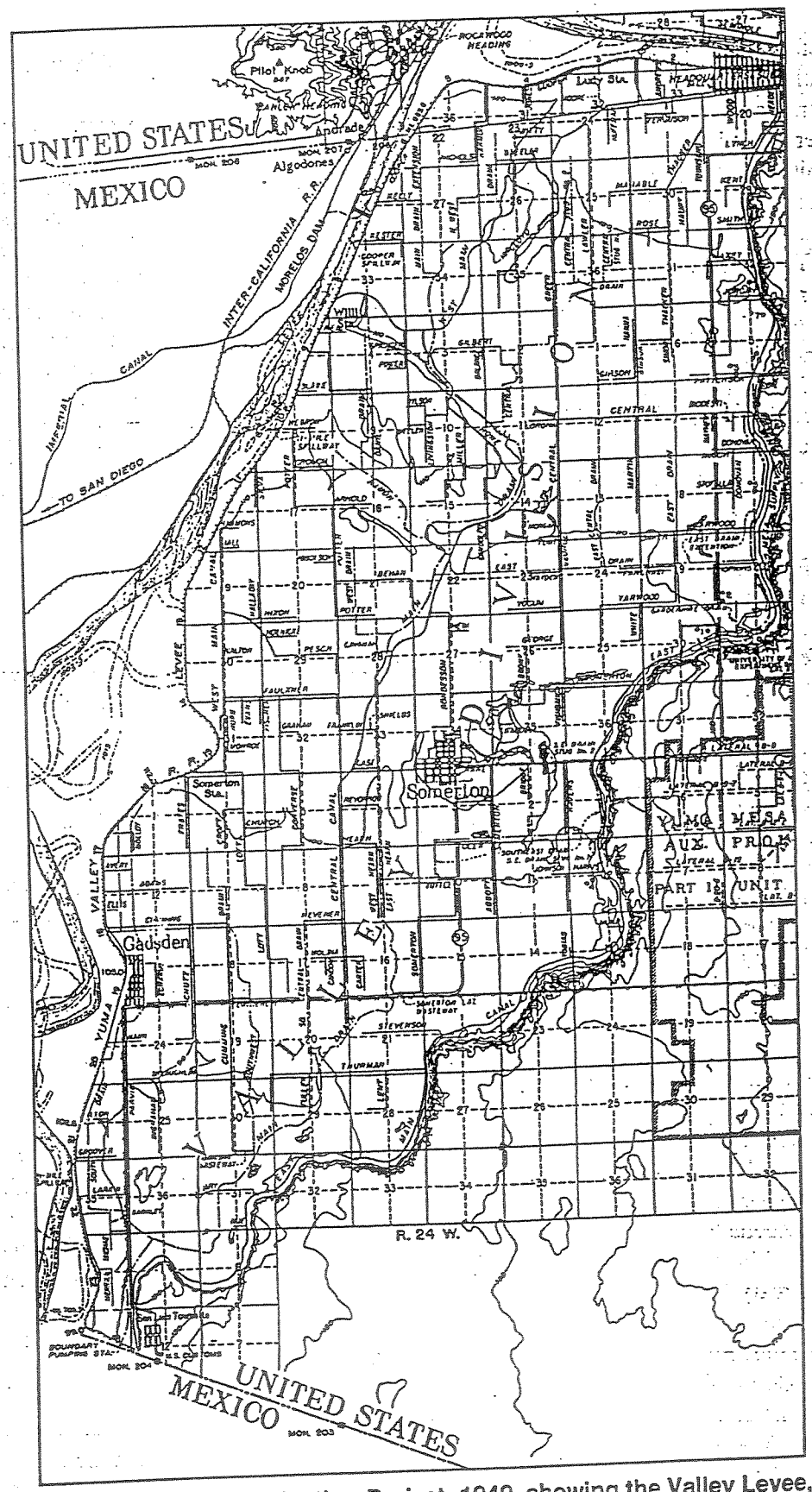

Figure 24. The Yuma Irrigation Project, 1949, showing the Valley Levee, Valley Railroad, and various other irrigation features in the Yuma Valley.

first line of defense against the river and also permitted more work to be conducted on improving the levee in potential breech areas (Reclamation 1922).

A major problem for the YIP throughout the Yuma Valley was seepage. Apparently, water from the Colorado River seeped through the relatively pervious levees and infiltrated the farm lands of the valley. To alleviate this problem, the Reclamation Service constructed a series of drains throughout the valley. The drains captured the water and channeled it south to the border where it was redeposited into the Colorado River. The Main Drain served as the keystone of this drainage project, extending through the middle of the Yuma Valley to the international boundary. Pumps were constructed at key locations to carry the water over the levee and back into the river. The drains solved the seepage problems and greatly contributed to the success of farming in the Yuma Valley (Wells n.d.). During the construction of these drains and pumps an extensive, although temporary, camp was established in Somerton in 1916 (Reclamation 1916). The exact location or duration of the camp is not currently known.

Another problem facing Reclamation Service engineers following the completion of the YIP was the rise of the water table. Because of the large amount of water diverted from the Colorado River into the Yuma Valley, the water table had risen considerably by 1916. The construction of the drain system described above was also designed to help alleviate the problem.

Yuma Valley Railroad

As mentioned above, the original levees constructed to protect the Main Canals in the valley proved to be inadequate. The Reclamation Service had learned that only by using riprap would the levees truly serve as protective features. In order to deliver this material to all portions of the levee, a railroad would be required. Storey (1990:9–10) relates how Reclamation engineer, F. W. Hanna, expressed the need:

> The existence of a railroad on the Reservation levee has made it possible to develop this method of protection, and large quantities of rock have been dropped on the river side of this levee in such a manner that the rock falls into the stream when the cutting bank reaches the levee. Banks that were receding at the rate of several hundred feet per week have been entirely checked by this method, in some cases where the water was 30 feet deep. The Project Engineer states that it is proposed to continue this method of protection as a portion of the Annual Maintenance until the levee is completed. If the levees on the Arizona side of the river are to be protected in this manner it will be necessary to built railroads along them and to haul large quantities of rock for considerable distances.

The Reclamation Service originally hoped to entice the Southern Pacific to build this proposed new line. In the 1910s, the Southern Pacific had constructed its Laguna Branch, which provided transportation for construction activities as well as access to the various levees in the Bard and Reservation units in California. To lure the Southern Pacific, Reclamation claimed that the railroad would "aid materially in the development of Yuma Valley," as well as offer a means by which to transport troops rapidly to the border, should the need arise (Storey 1990:10). The Southern Pacific, however, did not want to construct the line, as the Laguna Branch had proved unprofitable. The Reclamation Service itself began construction on the railroad in 1914. Despite a few labor problems, the line was completed to the international boundary in February 1915 (see Figure 24).

Once completed, the railroad was 23.5 miles long, running from the Reclamation Service's yards adjacent to the Yuma Project Office in Yuma, to the border with Mexico. Nine stations were constructed along the new line: Ludy, Steam, Willets, Spillway, Somerton, Gadsden, Boundary Line, Andrade, and Schlecht. Reclamation constructed a depot at the new town of Gadsden, and section houses at Mileposts 6, 11, 16, and 23. The section houses served the railroad maintenance workers and were modest one and two-room structures. The maintenance workers were responsible for approximately 6 miles of track each, and performed various tasks associated with levee and railroad maintenance, including catching gophers,

removing vegetation, tightening loose bolts, driving spikes, and reporting broken rails (Pfaff et al. 1992:61; Storey 1990:48).

In addition to providing rapid maintenance to levees, Reclamation also used the railroad to entice new settlement. To this end, the railroad began carrying passenger and freight traffic in 1915. Lots were sold in the new town of Gadsden, which was a development of the Arizona-Mexican Land Company. Although the railroad connected with the Southern Pacific in Yuma, however, carrying passenger traffic proved to be unprofitable and was discontinued in 1923. Freight continued to be carried by the railroad, including wood, seed, cotton, lumber, groceries, rock, sand, and winter produce. Once again proving unprofitable, however, freight service was discontinued in 1929. The completion of Boulder and Parker Dams in the late 1930s greatly diminished the need for flood control and bank protection in the Yuma area. As a result, the railroad saw decreased use as a transporter of rock. In 1934, the Southern Pacific Railroad began operating a freight line from Yuma to Somerton Siding. Somerton expanded to include spurs and additional sidings as a result of this new activity. The contract was extended, and as late as 1976, Southern Pacific still carried freight on the Yuma Valley Railroad between Yuma and Somerton (Storey 1990).

By 1950, levee work was carried out via a second berm along the levee upon which maintenance trucks could be driven. In the same year, Reclamation removed the segment of the railroad from Mile-post 17.5 to the border with Mexico. The remaining portion of the railroad at that time was, and still is utilized by the Southern Pacific, along with late comers Yuma County Live Steamers Association, and the Yuma Valley Railroad, Inc. (a private company).

Irrigating the Yuma Valley

By 1911, water was being supplied to 285 farmers (with an average holding of 70 acres each) in the Yuma Valley. Reclamation estimates of crop production in the Yuma Valley were approximately $55 per acre, compared to only $35 per acre in the Reservation Division. By this time the most common and profitable crop was alfalfa (Reclamation 1911). By contrast, the two most common crops grown at the outset of the Yuma Project were barley and corn. By 1911, total irrigable land area in the Yuma Valley was estimated at 55,000 acres (Reclamation 1910).

Shortly after the completion of Laguna Dam, construction began on the Yuma Main Canal. Water was drawn from the Laguna Dam reservoir and carried south, along the California side of the river, via the canal. The water was then transported under the Colorado River by the Colorado River Siphon (completed in 1912) and from there was carried via canals to Reclamation Service customers. By the completion of the siphon, the Yuma valley incorporated approximately 55,000 acres, 5,000 of which were not irrigable. To reach the valley, water was carried from the siphon through two primary canals, the East and West Main Canals. The East Main Canal, completed in 1912, extended south from Yuma at Second Street, then traveled along the east side of the Yuma Valley. The West Main Canal bifurcated from the East Main at Second Street, where it traveled west for 2½ miles and then south along the west end of the Yuma Valley to the international border. Construction of the West Main Canal began in 1913 and completed in 1915 (Pfaff et al. 1992:18).

A variety of other water conveyance features were constructed in the years immediately following the completion of the East and West Main Canals and the Colorado River Siphon. These included additional canals, laterals, turnouts, checks, levees, drains, bridges, among others. Taken together, this system of features made large-scale irrigation possible throughout the Yuma Valley. In addition to the completion of new water-conveyance features, the Reclamation Service replaced many of the wood features, those in place before the Reclamation Service began YIP, with concrete ones (Pfaff et al. 1992:66). Although irrigation had been done in the Yuma Valley on a small scale for years, the first gravity-fed

water, made possible by Reclamation's siphon, was delivered to the area in 1912. By 1915, there was a total of 40.3 miles of canals completed throughout the Yuma Valley.

From the beginning of the East Main Canal in Yuma, traveling south, the following named canals were constructed: Header, or Ives ditch; Central Canal; Donovan Canal; Yarwood Canal; Hopkins Canal; Somerton Canal; Havens Canal; Harris Canal; Stevenson Canal; and Thurman Canal [Reclamation 1912:76]. Fewer canals were constructed along the West Main Canal (traveling south from its point of origin): Lawlor Canal and Cooper Canal (Reclamation 1912:77). In addition to the named canals, three concrete bridges, 180 wood bridges, numerous checks, turnouts and road culverts, and 140 farm turnouts and culverts were constructed throughout the Yuma Valley portion of the YIP.

Other Areas Served by the Yuma Project

In addition to the Yuma Valley, other areas were brought under cultivation by the YIP. The Reservation Division was watered by the Reservation Main Canal, which branched off of the Yuma Main Canal at the Indian Heading, northwest of Yuma. Lands within the Gila River Valley, immediately east of Yuma, were also brought under cultivation at this time. These lands were irrigated from the North Gila East Main Canal, also known as the Arizona Main Canal. The North Gila West Main Canal (known as the Levee Canal) also supplied water to the Gila Valley. This area was turned over to the North Gila Valley Irrigation District by the Reclamation Service in 1918, at which time it was no longer considered part of the Yuma Project afterwards (Pfaff et al. 1992:66–67). Irrigation of the Yuma Mesa was envisioned as part of the original Yuma Project. Located within the Valley Division east of Yuma, the mesa included approximately 40,000 acres of potentially irrigable lands. In order to bring this area under cultivation, however, a separate project, known as the Yuma Auxiliary Project (YAP) was initiated, and finally authorized, in 1917. Water was carried to the mesa via the East Main Canal and then the B Lift Pumping Plant at the foot of the mesa east of Somerton. By 1922 the pumping plant was completed and water was supplied to farmers who had purchased lots on the mesa (Pfaff et al. 1992:74–78).

Labor

The YIP was constructed predominantly by Hispanics and Native Americans, with "skilled" positions (carpentry, engineering, pipefitting, etc.) filled almost exclusively by whites (Robertson 1942). Once the majority of YIP features were completed, only a handful of laborers were retained to maintain the system. These employees consisted of gate tenders, zanjeros, pump operators, maintenance foremen, and gopher catchers. Since silt accumulation was a perennial problem, much of the system maintenance crew was utilized to keep the various conveyance features clean. While working on the canal system throughout the Yuma Valley, these laborers generally lived in temporary camps run by the Reclamation Service, managed by a foreman. In addition, numerous corrals were constructed throughout the Yuma Valley to house the large numbers of animals used in construction and maintenance activities (Reclamation 1910).

Local Water Users Associations

As mentioned above, the original intent of the Reclamation Act included repayment to the government for the cost of the irrigation projects. The total cost of the YIP consisted of $2 million for Laguna Dam and approximately $3 million for the power plant, canals, laterals, and siphon. For the Yuma Valley portion of the YIP, the Yuma County Water Users' Association (YCWUA) was established in 1903. The association was a local, private agency that agreed to repay the U.S. government for the cost of the proj-

ect through the sale of irrigated acreage. Settlers in the Yuma Valley area who desired water rights were required to join the YCWUA. The Reclamation Service worked side by side with the YCWUA in the development of the region's agriculture, the two sharing office space at Reclamation headquarters in Yuma (Swanson and Altschul 1991:77).

Additional associations were formed in the project's other divisions. The Bard District and Indian Unit both operated within the Reservation Division. The North Gila Valley Irrigation District was also formed, and eventually became part of the Gila Project. In order to repay the government, the YCWUA was charged $.50 per acre-foot of water beginning in 1913, the same charged to water users in the Gila Valley. Those in the Reservation Division were charged $1.00 per acre foot (Reclamation 1913; YCWUA 1962).

Reclamation retained ownership of the irrigation features constructed, while the local water users associations took over their operation and maintenance. In 1931, the YCWUA took over the task of collecting repayments from individual farmers. During the Great Depression, however, the YCWUA was unable to meet its financial commitments and Reclamation assumed operation of the project. Following World War II, when land and crop values rose again, plans were made for the YCWUA to reassume maintenance and operation of the project, which it did in 1951. By this time, the association consisted of 1,200 members cultivating 51,936 acres (Reclamation 1957). By 1962, the organization had assumed responsibility for not only all the irrigation features within the Yuma Valley, but also the Siphon Drop Power Plant, the Yuma Main Canal, the Colorado River Siphon, the All American Canal, and the California Check and Wasteway (Reclamation 1967a). The YCWUA also made its final payment to Reclamation at this time (YCWUA 1962).

Assessing the Success of the Yuma Irrigation Project

The YIP succeeded in transforming the Yuma area, particularly the Yuma Valley, from arid desert into one of the most productive farming areas in the southwestern United States. Following its completion, irrigation works stretched across the entire valley and countless farms soon sprouted up. The most dominant crops grown in the Yuma Valley through the 1920s consisted of cotton, alfalfa, and vegetables. From a population of only 1,200 people in 1880, the town of Yuma grew to 6,000 in 1912. Yuma became an agricultural center as a result of the project, and remains an important provider of a wide variety of crops today (Swanson and Altschul 1991:77; YCWUA 1962).

Several towns emerged in the Yuma Valley with the completion of the YIP. As has been mentioned, Somerton, with four gins, a bank, and several stores, became a center for cotton farming. The town site of Gadsden was opened in 1915, when the Yuma Valley Railroad reached the area. Apparently, numerous settlers came to the area to buy lots and land.

Prospects looked bright for Yuma following the completion of the YIP, particularly in the Yuma Valley, which was viewed as one of the most productive of the YIP regions. Boosters bragged of Yuma's unlimited farming and ranching potential (MacNichol 1912), enticing settlers with advertisements that read: "When the Colorado is understood and utilized as successfully as is the greater and better known river of Egypt, it will be recognized as the American Nile, the creator of a new country for the irrigator, and mother of an Occidental Egypt."

The Great Depression

Despite the claims of the boosters, the Yuma area was hard hit during the Great Depression of the 1930s. In actuality, economic conditions had actually begun to deteriorate in the late 1920s, with Reclamation and the U.S. Congress receiving frequent petition for deferments on allocated water repayments. During

the 1930s, conditions worsened, and many banks in Yuma failed. Crop prices dropped as the depression worsened and many settlers lost their farms as land was sold at depressed prices. (Yuma Valley farmland values dropped from a high of roughly $400 to $25 per acre.) Nevertheless, land under cultivation continued to expand. By the late 1940s, total acreage under cultivation had reached 58,000, a figure that largely remains the same today (Pfaff et al. 1992:91; YCWUA 1962).

The local water users associations took advantage of funding made available from the various recovery acts under the federal government's New Deal. As early as 1934, the Valley Division acquired workers through the Emergency Relief Administration, who were used to clear brush and weeds from various canals and laterals. The Civilian Conservation Corps (CCC) also had a presence in the Yuma area, forming several camps (including BR-13 and BR-74) (Figure 25). Men from these camps performed a variety of tasks on the various irrigation systems throughout the Yuma area, including general maintenance on canals and ditches, laying riprap, building roads, landscaping, weed and pest eradication, and leveling spoil banks. In addition, the CCC performed the very necessary task of upgrading many of the irrigations system's components. Because the vast majority of the turnouts, checks, and culverts had originally been constructed with wood, many of these features had to be replaced in the 1930s. At this time, these features were replaced with concrete, which contributed greatly to their longevity (Pfaff et al. 1992; Reclamation 1940).

During the 1930s, the YIP witnessed substantial change. By the late 1930s, it became apparent that water diverted from Laguna Dam was insufficient to supply the needs of both the Yuma (Arizona) and Imperial (California)Valleys. As a result, Imperial Dam was completed in 1938. Imperial Dam largely replaced Laguna Dam as the primary water catchment feature for the YIP. The All American Canal (completed in 1940) was constructed to bring water from the new dam to the Imperial Valley. The construction of the canal also brought a measure of economic activity back to Yuma during the Depression. The canal was soon thereafter utilized to provide water to lands within the Yuma Project also, replacing several sections of the project's original canals. Water was diverted from the All American Canal to the Valley Division at a turnout for the Siphon Drop Power plant, which had been constructed in 1926. The East and West Main Canals, however, continued to carry the water to the Yuma Valley (see Figure 24) (Pfaff et al. 1992:104–105).

The New Deal Years

By 1940, 41 percent of farm owners in the Valley Division did not live on their land, but leased it to others. The economic emphasis of farming had changed as well, with a dramatic shift in crop choice among farmers. Cotton had declined as the preeminent cash crop in the area and was replaced by a variety of winter vegetables (Reclamation 1940:66). By 1945, no cotton was grown in the project area, and dominant crops consisted of flax, alfalfa, barley, lettuce, cantaloupes, carrots, and grapefruits (Reclamation 1945:41).

Other public works programs helped the region regain its economic strength. One of these was the Bracero program that was initiated in the early 1940s as young American men went off to war. The program basically consisted of bringing Mexicans into the United States, under a temporary permit, in order to pick crops. During the war, many small towns that had experienced decline during the Great Depression sprang back to life as a result of the Bracero program. The program also changed the ethnic makeup of many of the towns, as more Hispanics arrived in the area.

Throughout the existence of the Yuma Project, each of its various components and subcomponents had to be maintained and rehabilitated. This work continues today. In 1940, a major earthquake hit the Yuma area, destroying countless irrigation features. The reconstruction work replaced the earlier wood features with more permanent concrete structures. During 1945, groups of German prisoners of war were used to assist in clearing canals and laterals of weeds and brush. Another major period of upgrading

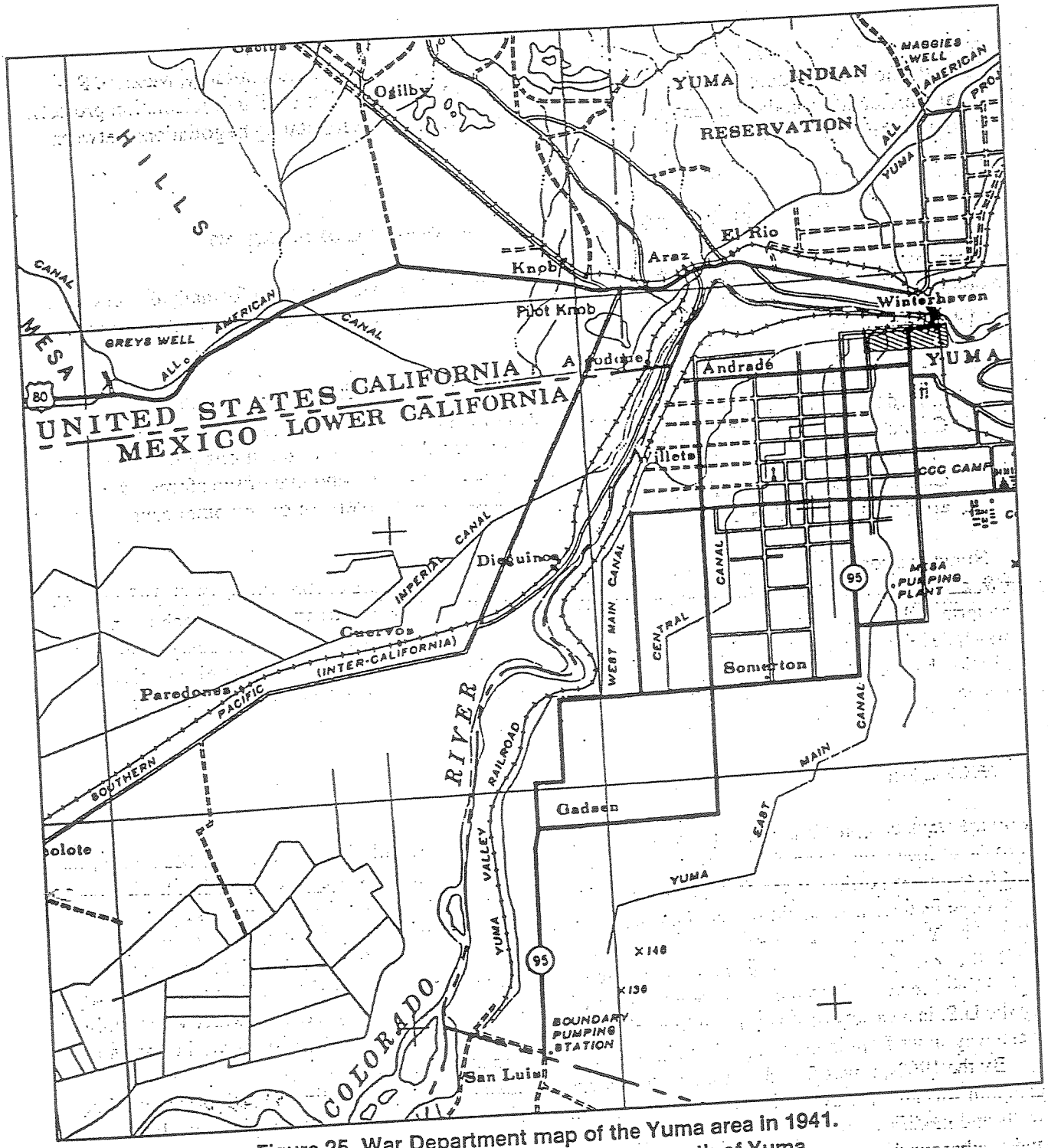

Figure 25. War Department map of the Yuma area in 1941. Note the location of the CCC camps south of Yuma.

occurred following the passage of the Rehabilitation and Betterment Act of 1949, which allowed for the replacement of many of the original YIP components.

While the YIP figures prominently in the development and history of the lower Colorado River region, especially in the area around Yuma, other water issues have affected and shaped the character of the area. The Reclamation Service's management of the Colorado River had profound implications for

other interested parties who also benefitted from the life force of the river, most notably, Mexico. Restricting the flow of the Colorado to supply the needs of the YIP (and other similar Reclamation projects) had real ramifications on the amount of water that reached Mexico, necessitating negotiations between the two governments.

The International Boundary and Water Commission

The IBWC was established in 1889, when the United States and Mexico began to formally discuss issues emanating from the common use of the Colorado River. The IBWC (1954) was empowered with exclusive jurisdiction over

> all differences or questions that may arise on that portion of the frontier between the United States of America and the United States of Mexico where the Rio Grande and the Colorado Rivers form the boundary line, whether such differences or questions grow out of alterations or changes in the bed of the aforesaid Rio Grande and that of the aforesaid Colorado River, or of works that may be constructed in said rivers, or of any other cause affecting the boundary line.

Numerous conventions and acts were implemented in over the years (1905, 1906, 1933, 1935, 1940, 1949, and 1950), culminating in the Water Treaty of 1944. Basically, the treaty ensured each country a long term and specific program of flood control, equitable distribution of water, water conservation and storage, development of hydroelectric power, stabilization of river boundaries, and the elimination of sanitation hazards. As a part of the 1944 treaty, Mexico agreed to construct a diversion dam at its own expense.

Morelos Dam

Morelos Dam, completed in 1950, allowed for the diversion of Colorado River water into Mexico for the purpose of irrigation. According to terms stipulated in the International Water Treaty of 1944, Mexico was to assume a portion of the costs of construction, operation, and maintenance of levees and other protective features that would protect U.S. lands from floods resulting from the construction of Morelos Dam. The Yuma Levee was reconstructed in 1949 for this reason, in addition to the Reservation Levee in 1951, the cost of which was to be partially borne by Mexico (Reclamation 1954:iii). The treaty also stipulated that Mexico was to receive at least 1,500,000 acre-feet of water per year. This water was supplied by the U.S. in a variety of ways, including release from upstream storage reservoirs, as well as drain and wasteway flows from irrigation projects in the U.S. (Reclamation 1967b).

By the 1960s, it was found that the water reaching Mexico was highly saline. A salinity alleviation program was initiated by Reclamation in 1963, which included the construction of numerous drainage wells and modifications to existing conveyance features. This program was not satisfactory to Mexico, and a subsequent agreement was reached between the two countries in 1965. The agreement stipulated the construction of a bypass channel from the Wellton-Mohawk area to below Morelos Dam. The bypass channel became a part of the Main Outlet Drain Extension (MODE), completed in November 1965, and referred to thereafter as the Bypass Drain. The MODE extended the Main Outlet Drain (MOD) which drained the Gila Project area. All together, the MOD, MODE, and Bypass Drain drained the area between the south Gila Valley and the western Yuma Valley. The drain system also provided water to Mexico, terminating in the Gulf of California (Reclamation 1967b).

Military Presence in the Lower Colorado River Valley

While water and water issues played a paramount role in the development of the lower Colorado region in the twentieth century, we would be remiss to not mention another major developmental factor in the history of the region, namely, the military. We have discussed the importance of the military presence in the region beginning with the Spanish *entrada* in the sixteenth century, but the twentieth century saw the establishment of several important training areas and military installations that played and continue to play an important role in the development of the region.

World War I

A variety of military units were stationed at Yuma throughout the early twentieth century, both regular Army as well as state militia. During the unrest related to Pancho Villa in 1916, detachments from the Arizona National Guard reportedly patrolled the international border, although little is known regarding where these units were based. Elements of the Arizona National Guard that were utilized in the Spanish American War, World War I, and World War II were stationed in Yuma at various periods in the early twentieth century. At the outbreak of World War I, detachments from both the 14th and 35th U.S. Infantry were stationed in Yuma. For the most part, the units were located in town, often performing guard duty on the bridge across the Colorado River. There is no evidence to indicate that these units operated in the largely agricultural Yuma Valley.

Beginning in 1928, Yuma became an increasingly important site for aviation. In that year, Colonel Benjamin Fly persuaded the federal government to establish an airfield outside of the small town of Yuma. The government leased 640 acres of land and the facility became known as Fly Field. The field was utilized over the next decade, but remained a small facility until World War II.

World War II

During World War II, Yuma's population increased from 5,000 people (prior to the war) to over 50,000 in 1942. Two reasons for the increase was the presence of the Desert Training Center, with camps and facilities to the east and west of Yuma, and the establishment of the Marine Air Corps Station, Yuma. A prisoner of war camp was also established near the town of Somerton, housing both Italian and German prisoners of war. But this frenzy of military activity lasted only minimally beyond the end of the war and the population of Yuma shrunk back to approximately 8,000 people by 1950 (*Yuma Daily Sun*, 13 August 1995)

Desert Training Center

During the opening days of World War II, the German Army's Afrika Korps was driving across North Africa with impunity. The Headquarters, Army Ground Forces, sought a location at which to train American soldiers for desert combat and in early 1942, Gen. George S. Patton was ordered to find a suitable location. The deserts of Arizona and California were selected and eventually converted into an 18,000-square-mile training facility called the Desert Training Center (DTC). Following the defeat of the German units in North Africa in 1943, the DTC was maintained, although changed in name to the California-Arizona Maneuver Area (C-AMA). At its height, the DTC/C-AMA could support 11 division-sized (15,000 troops) camps, along with numerous support facilities such as airfields, temporary campsites, railroad sidings, depots, training areas, ranges, hospitals, and maneuver areas. All manner of units were trained including armor, infantry, air, artillery, ordnance, supply, medical, among others (Bischoff 1999).

Two divisional camps existed in close proximity to Yuma. Camp Laguna was located 25 miles upstream of Yuma, on the Arizona side of the river, and Camp Pilot Knob was located a few miles west of town, north of Pilot Knob. Large-scale maneuvers were an integral part of this training, often covering an incredible expanse of territory. In addition, small unit training was undertaken close to the camps and included infiltration courses, rifle ranges, tank exercises, and bivouacking. The construction of pontoon bridges was also practiced on the Colorado River near Pilot Knob (Bischoff 1999).

The troops training in the nearby desert descended upon Yuma, often taxing the small town's resources. All of this activity created a dramatic increase in both vehicular and railroad traffic through the city, often congesting the minimally developed infrastructure of the small town.

Marine Corps Air Station Yuma

In 1941, the federal government began constructing more permanent facilities at Fly Field, and by 1943, it became Yuma Army Air Base. The base was used primarily as a training school for pilots in AT-6s, T-17s, and B-17s. Following the end of the war, the facility was used by a variety of agencies including Reclamation. By 1951, however, the facility was reactivated by the Air Force and was named Yuma Air Base, then Vincent Air Force Base in 1956. In 1959 the facility was turned over to the Navy when it became a Marine Corps Auxiliary Air Station, and finally, Marine Corps Air Station. The base's main mission remained training, which continues today (*Yuma Daily Sun,* 14 April 1994).

Research Themes for Historical-Period Resources within the Lower Colorado River Region

As mentioned above, one of the primary goals of a Class I cultural-resources inventory is to identify known cultural resources within the APE. The following discussion of the historical-period contexts for research in the project area focuses on broad cultural and chronological trends. Combining the information gathered from an understanding of the cultural history and previous archaeological research, we can begin to establish patterns of historical-period land use and cultural trends. It is from these patterns of activity and use that we can begin to formulate research questions relevant to the known and potential cultural resources in the region.

For resources associated with the historic period, a very different set of research domains structures our orientation from those associated with prehistoric or ethnohistoric resources. Research themes important to the study of the lower Colorado River valley reflect important topics that occurred and developed in the Yuma area during the past 450 years. We have defined four historical-period research themes that are of particular significance for Yuma and the lower Colorado River valley: transportation, historical-period land use, military use of the area, and the Yuma Irrigation Project. These research issues are basic to an understanding of the use of the region during the historical period.

Transportation

The movement of Europeans and Euroamericans through the lower Colorado River valley, particularly the area around the Yuma Crossing, is clearly an issue of historical significance. Modes of transportation, patterns of resource procurement and transportation, the availability of transportation routes, and changes in transportation routes through time are all integral themes within this historical context.

A number of historical-period transportation routes have previously been identified within the current project area. Most notably, the location of the Yuma Crossing has defined the character of the area

from the ethnohistoric period onward (Stone 1983, 1988; Swanson and Altschul 1991). Subsequent use of the Yuma Crossing by explorers, frontier settlers, gold miners, the railroad, and the military have substantively defined and affected the development of the region (Stone 1983, 1988; Swanson and Altschul 1991).

In addition to land-use patterns defined by the transportation theme, water-use patterns must not be overlooked. The formative nature of the Colorado River—in the development of transportation, resource procurement, and resource distribution patterns—that shaped the American Southwest during the historical period must be taken into account when discussing the importance of the lower Colorado River valley (Swanson and Altschul 1991).

Research Questions

1. How did transportation patterns differ between Native American and European-Euroamerican groups in the area? Are these patterns linked solely to technological advance, or can basic similarities between the two systems be drawn?
2. Did technological advances in transportation affect the region to differing degrees? How did the development of steamship transportation affect overland transportation? Subsequently, how did the development of rail transportation affect both steamship and overland transportation routes? Although a decidedly remote possibility, could cultural resources associated with steamship transportation remain submerged in the Colorado River or buried under silt along its abandoned channels? Could there be remaining traces of the woodyards or landings that served to supply the steamships and facilitate travel upriver?
3. How did the developing transportation infrastructure affect the local and regional economies? Did the influx of railroad workers significantly affect the development of Yuma and the lower Colorado River valley region?
4. How did technological advances in transportation effect the social, economic, and political character of the Yuma community? In what ways did these technological advances contribute to changes in the land use patterns in the area?
5. What effect did the advances in railroad transportation have on the natural resources in the Yuma Crossing area? How did demands and consumptive patterns change as a result?

Data Requirements

Data required to answer these questions can best be obtained through the identification of transportation-related archaeological sites and the performance of archival research. With the identification of historical-period resources related to transportation (Stone 1988), the identification of additional sites (both terrestrial and underwater) will continue to provide valuable information on the importance of the Yuma Crossing in the development of local, regional, national, and international transportation systems. A review of contemporary accounts of the steamboat industry, including information about operations, routes, accidents, and business records, may reveal information about possible cultural resources associated with steamboat transportation that remain in the vicinity of the Colorado River.

Historical-Period Land Use

As discussed above, one of the chief areas of interest is the development and growth of large-scale irrigation technologies, and the affects of irrigation agriculture on local and regional economies. This

encompasses not only the technological feat of controlling the Colorado River and distributing its water to distant places, and the surviving features themselves, but also the activities of the laborers involved in constructing these hydraulic features.

Research Questions

1. Are remains of workers' encampments associated with construction of the All American Canal, the Gila Main Gravity Canal, and all of the other features associated with the historic Yuma Irrigation Project (YIP) extant? If so, what can they reveal about the working and living conditions under which the construction was performed?
2. What economic and social impacts were engendered by the construction of these irrigation systems at the local, regional, and national levels?
3. How did the construction of irrigation features effect the growth of communities in the Yuma Valley? Are there remaining cultural resources that contain information about the agricultural boom and community development that took place in this region during the early twentieth century? Are there extant remains of historic encampments associated with workers employed in the agricultural industry that resulted from the construction of irrigation features in the Yuma Valley?

Data Requirements

Although some (Pfaff et al. 1992) have suggested that the archaeological remains of canal workers' encampments have been obliterated, it is unclear whether any still remain features associated with the YIP or later additions, such as the All American and Gila Gravity Main Canals. If extant, they might provide useful data. A survey and compilation of economic and social data from historical-period sources can also provide the data necessary to assess the impact of major irrigation works in the project area.

Military Use of the Area

Military use of the area defined much of the history of the region, from the arrival of the first Spanish explorers. Strategic control of the Yuma Crossing was clearly viewed as a top priority since the first Europeans arrived in the region. With the arrival of the first Euroamericans, and the development of the Quartermaster's Depot at the Yuma Crossing (Swanson and Altschul 1991), the military significance of the region was firmly established. Use of the area west of the Colorado River, around Pilot Knob, during World War II to train American troops and test equipment for combat in North Africa continued the military presence in the region (Ezzo and Altschul 1993).

Research Questions

1. Because the Yuma Quartermaster's Depot served as a distribution center for a string of early Euroamerican forts along the Colorado River, does evidence of activity associated with the Depot extend beyond the confines of the Yuma Crossing area?
2. Is there evidence of World War II military activities in the area surrounding Pilot Knob? Did the activities include the use of land and resources in, or adjacent to, the Colorado River? If so, are any impacts from these activities extant?

Data Requirements

Data required to answer these questions can best be obtained through the identification of military-related archaeological sites and additional archival research. The identification of historical-period resources related to military use of the region (Swanson and Altschul 1991) has shed light on early military use in the area of the Yuma Crossing, but additional military sites dating to the period remain elusive. The identification of additional sites will continue to provide valuable information on the importance of the Quartermaster's Depot to the development of military history in the Southwest. Additionally, the area around Pilot Knob is a known location for military maneuvers during the World War II era, although the identification of specific sites associated with this have not been adequately explored. Emphasis on identifying sites of that era will expand our baseline knowledge regarding military use of the region.

Additionally, military records should be examined to determine whether units conducted operations within the project area. Newspaper articles, oral histories, and manuscript collections, all on file at the Arizona Historical Society, Yuma, should also be consulted for information on military activities in the current project area.

Yuma Irrigation Project

The YIP played such a critical role in the development of the region that it forms one of the central research themes for the area. Not only did the efforts of Reclamation forever change the physical nature of the region, but they deeply affected settlement patterns, acculturation, and technological advances in agriculture and agribusiness.

Research Questions

1. What evidence remains for the pre-Reclamation irrigation efforts? Were all of the improvements superseded by Reclamation construction, or were some incorporated into the new system? Can these features be differentiated from YIP features?
2. How did pre-YIP irrigation efforts differ from attempts in other parts of the country? Comparisons between different attempts at irrigation in the pre-Reclamation era will be illuminating. Did farmers in the Yuma Valley, for example, face unique circumstances than other parts of the country? If so, how did they overcome these circumstances?
3. What kind of construction techniques were used in building the YIP? Were these standard techniques, or were innovative methods used? Being one of the first Reclamation projects, how did the YIP affect construction of subsequent projects? How did these techniques change over time?
4. How did the Yuma Valley Railroad compare to those constructed by other companies such as the Southern Pacific? Did construction techniques differ between the two? Aside from the railroad grade itself, what other resources remain from the railroad? An aspect of the railroad that has been neglected in the past is labor. What was the ethnic makeup of the railroad employees? How did this change after the railroad was completed and the employees were maintenance-related only?

Data Requirements

Surveys of the lower Colorado River area in conjunction with archival research will aid in determining whether pre-YIP resources exist in the project area. Archival research should be undertaken at the Yuma Area Office of the Bureau of Reclamation. Project histories should be reviewed along with maps and

aerial photographs. Once a resource is found to be potentially pre-YIP, these archival resources can be consulted for confirmation.

Reclamation project histories for other regions should be consulted and compared against those for YIP. Often, a great deal of information on early irrigation efforts is included in these official, Reclamation reports. Other secondary sources, such as newspaper articles and files at the Arizona Historical Society, Yuma, can also be reviewed to obtain information on how irrigation efforts differed in the lower Colorado River valley from those in other parts of the country.

More-complete surveys of the Yuma Valley area should be completed to locate railroad-related features and sites. Archival research specific to the Yuma Valley Railroad should also be completed. The vast majority of this information will be housed at YAO. Contracts, construction reports, project histories, and maps, will all be useful sources of information on the railroad. Materials on file at the Arizona Historical Society, Yuma, including newspaper articles and private manuscript collections will also prove useful when tracing the history of the railroad. Oral histories may also prove valuable for further information on the construction and maintenance of the railroad.

CHAPTER 5

Results of the Archival Research

This chapter presents the results of the site-file investigation. It identifies the nature, type, and frequency of archaeological resources currently known to exist within the APE. The current study area encompasses the Colorado River channel and floodway in the United States within the 24-mile international boundary segment, extending from Morelos Dam (T8S R24W, Section 28, USGS Yuma East 7.5-minute quadrangle) to the south end of the Southerly International Boundary (T8S R22W, Section 10, USGS Gadsden 7.5-minute quadrangle). The APE for the current undertaking includes the main Colorado River channel as well as the river floodplain to the levee toe on the U.S. side. For purposes of archival research, an area extending beyond the levee, approximately 2.5 miles east of the river, will serve as the study area.

The vast majority of the archival research performed for this overview was conducted at the Bureau of Reclamation, Yuma Area Office. Annual project histories, completed by Reclamation, were reviewed for information on pre- and post-YIP activities in the project area. In addition, contract files were reviewed for information on specific projects that may have affected the project area. Maps were also reviewed for the current project area, ranging from ownership to construction maps. These maps were valuable in tracing the changes wrought upon the landscape of the current project area. The IBWC office in Yuma was also visited for archival materials. Resources obtained there consisted of official IBWC reports as well as aerial photographs. The Imperial County Archaeological Information Center was consulted for information on archaeological research performed in the project area, and relevant reports and site forms were copied. The Bureau of Land Management in Yuma was also consulted for similar information. The Arizona Historical Society in Yuma was visited, and resources reviewed and/or collected there included maps, letters, photographs, oral history transcripts, and newspaper articles.

Site-file searches were conducted during December 1998 and January 1999. Four repositories were visited or contacted in an effort to identify all cultural resources recorded within the proposed APE. Repositories visited for the current study included: Site File Room, Arizona State Museum, Tucson (contact: Sharon Urban); Anthropology Laboratory, Arizona State University, Tempe (contact: Michael Barton); and the Bureau of Land Management, Yuma Area Office, Yuma (contact: Boma Johnson). One additional repository, Southeast Information Center, Imperial Valley College Desert Museum, Ocotillo (contact: Karen Collins), was also contacted by telephone. In addition, SRI contacted two other sources for information on cultural resources located within the APE. These included the Bureau of Indian Affairs, Phoenix (contacts: Garry Cantley and Amy Heuslin), the Bureau of Land Management, Desert District Office, Riverside (contact: Rolla Queen).

Previous Research in the Lower Colorado River Region

Archaeological research in the Southwest has generally focused on cultural groups that exhibited a rich material culture, namely the Anasazi, Mogollon, and Hohokam. One of the founders of the Museum of Northern Arizona, Harold Colton, wrote in 1945 that "upon comparing the archaeology of the valley of

the Colorado River, between Lake Mead and the Gulf of California, to the rest of the Southwest, we are impressed with how little is known" (Colton 1945:114). Because much of the material culture of the groups that inhabited the lower Colorado River valley has been displaced or destroyed by annual flooding, the archaeological allure of the area has been overshadowed by areas that contained groups whose material culture remained rich and well preserved. Colton also observed that the artifacts that remain suggest a strong bond to native lifeways documented during the area's historical period (Colton 1945:116).

The rush to harness the waters of the lower Colorado River exacerbated the difficulties archaeologists faced in investigating the area. The 1908 construction of the Laguna Dam—just 10 miles northeast of Yuma—significantly altered the terrain, topography, and integrity of this portion of the river valley. The dam was constructed during a period when cultural resource management was of little or no concern to those who desired water for the irrigation of prime farmland. It was not until 1935, when the Historic Sites Act was enacted, that the National Park Service (NPS) was granted permission to "make surveys and investigate archaeological and historical sites on lands outside the National Park system" (Stone 1991:41). After World War II, the NPS established the Inter-Agency Archaeological Salvage program, and archaeological research along the Colorado River increased.

Archaeological investigations were conducted on the middle reaches of the Colorado River as early as the 1930s (Baldwin 1943, 1948; Harrington 1937; Schenk 1937; Tuthill 1949; Wright 1954). In contrast, the lower Colorado River was largely ignored—with the exception of work conducted by Malcolm Rogers. During the 1920s, Rogers began recording sites throughout the western deserts of southern California and Arizona. One of the first sites recorded by Rogers in the region was the Tinajas Altas site (AZ X:12:2 [ASM]), located southeast of Yuma at the end of the Camino del Diablo. Apart from the work of Rogers, however, the lower Colorado River valley received no real attention until the NPS sponsored an investigation of the lower Colorado and lower Gila Rivers, conducted by Albert Schroeder. Although Schroeder's coverage of the area was selective and the exact survey areas and extent of coverage are uncertain, he identified 69 sites within the current Yuma District. Schroeder defined three main areas of prehistoric habitation: the Mojave Valley, the Great Valley, and the Yuma Valley (below the Yuma Crossing). Sites in these areas were generally identified as "villages" or "farm camps," and indicated to Schroeder an association with long-term habitation and floodwater farming (Schroeder 1952). Schroeder recorded assemblages of pottery, hammer stones, and grinding tools, as well as trade items, at the sites he identified. Based on his findings, he presented a revised description of lower Colorado Buff ware that was controversial—because he stressed differences in temper and clay composition rather than standard typological elements, as Rogers had done (Waters 1982).

The next large-scale investigation of the lower Colorado River area occurred during the late 1960s and early 1970s, when the University of Nevada, Las Vegas, conducted a reconnaissance survey of discontinuous areas along the river. The main focus of attention was the portion of the Colorado River south of Needles, California, with particular attention directed at two main areas: Parker Dam to the Cibola Valley, and Laguna Dam to the U.S.-Mexico border (Stone 1991:46). The survey identified approximately 200 sites, including lithic and sherd scatters, flaking stations, stone rings, petroglyphs, and historical-period sites. The cursory, unpublished reports are, unfortunately, inadequate for assessing the overall value of the information gathered (McGuire and Schiffer 1982:458).

Enactment of the National Historic Preservation Act in 1966 began an era of mandated identification and management of archaeological resources on all federal lands. The new laws also required the evaluation of cultural resources and, if necessary, the mitigation of adverse impacts to them caused by federally sponsored projects or other undertakings (Stone 1991:46). This legislation marked the beginning of higher-quality data recovery and analytical techniques that have become the standard of current cultural resource management policies and procedures.

The first detailed discussion of cultural resources along the lower Colorado River, south of Laguna Dam, was published in 1986 by Clyde Woods, who conducted research for the Bureau of Land Manage-

ment (BLM) in that area of Pilot Knob designated as the ACEC, or Area of Critical Environmental Concern (Woods 1986). Woods identified almost 100 sites within the area, predominantly geoglyphs and lithic scatters. As an ethnologist, he stressed the cultural significance of dense lithic scatters in close proximity to geoglyphs as indicative of a close link between economic and ceremonial societal functions. He also presented a detailed assessment of Native American concerns relevant to sacred sites in the Southwest, a valuable tool for archaeologists (who often sublimate the importance of modern cultural concerns for the identification of new archaeological resources).

Previous Investigations in the APE

Early archaeological research along the lower Colorado River and adjacent desert areas undertaken by Malcolm Rogers (1929, 1939, 1945, 1958, 1966), Julian Hayden (1976), and Albert H. Schroeder (1952, 1957, 1979) laid out the basic cultural sequences and phases for the area; these still maintain their currency. Their work also defined the material culture associated with each cultural manifestation.

The majority of recent research conducted in the region since the 1970s has been sponsored by governmental agencies in compliance with federal and state cultural resource laws. Funded by the Bureau of Land Management (BLM), McGuire and Schiffer (1982) synthesized data from previous research projects for southwestern Arizona. These cultural syntheses are also applicable to southeastern California. Several systematic cultural overviews of the Colorado River valley and adjacent mountain and desert landscapes have been undertaken in recent years. Sponsored by Reclamation, Swarthout and Drover (1981) evaluated previous research and provided reviews of the environment and culture history along the Colorado River valley from the Grand Wash Cliffs to the international border. Stone (1991) provides a recent BLM-sponsored overview of past research and current research issues along the lower Colorado River. SRI has sponsored two cultural resources overviews for Reclamation since 1992. The first, completed by Sterner (1992), focused on that portion of the lower Colorado River from Yuma north to Laguna Dam. A second overview (Sterner and Bischoff 1998), completed several years later for Reclamation, picked up where this work left off, providing a cultural resources overview that extended from Yuma to the southerly international border. Additionally, a comprehensive research design for the Lower Colorado Region was compiled by SRI for Reclamation (Altschul 1994).

During 1973, Prescott College Archaeological Survey conducted a pedestrian survey of the Colorado River floodplain from Laguna Dam to Morelos Dam, an area of approximately 2,500 square miles. Although concern for the sensitivity of the area within the Yuma Crossing National Historic Landmark was demonstrated, no cultural materials were identified during the project.

Another survey conducted within the current study area was completed by Eileen Green in 1988, for the Bureau of Reclamation (Green 1988). The Yuma Division Channel Modification and Levee Project was designed to create a 300-foot-wide channel for stabilization of the river environment between Laguna Dam and Prison Hill, and to protect agricultural and residential properties in the North Gila Valley. A pedestrian survey of the 8.1-mile-long main channel combined vehicular survey with physical inspection of 13 dredge-spoil locations. Vegetation in the main channel was described as a dense cover of salt cedar and cottonwood, with scattered mesquite, and ground cover consisting of reeds, grasses and flowering annuals. The survey identified no cultural resources.

The proposed widening of State Route 186 in California required an archaeological survey of 1.6 miles along the highway. The survey, conducted in 1988, was performed by archaeologists from the California Department of Transportation (CALTRANS), District 11 (Corum and Laylander 1988). The section of highway to be widened was located approximately 8 miles southeast of Yuma, within the Fort Yuma Indian Reservation, from the international border to the All American Canal. A study corridor

encompassing the width of the proposed right-of-way (100 feet on either side), plus an additional 100 feet on either side, was examined on foot, by means of parallel transects, spaced 10 meters apart. A great deal of the study area was found to be disturbed from grading, parking lots, and other construction activities. The survey found two previously unrecorded sites (CA-IMP-5890H, -5891H), and one artifact isolate (CA-IMP-5892-I). The two sites were not located within the limits of the proposed widening, and were not evaluated for potential eligibility. The isolate was not collected. One previously recorded site (CA-IMP-3431H), supposedly a portion of an historic road, was not relocated.

Reclamation completed a cultural resources survey of Yuma in 1992 (Pfaff et al. 1992).The Yuma Project Historic Cultural Resources Survey, as the project was called, was initiated as a part of a program to identify and inventory cultural resources under the administration of Reclamation. The survey identified ten historic water control and conveyance structures; several large structural features associated with the Yuma Project, Yuma Auxiliary Project, and Gila Gravity Main Canal; a railroad; bridges; and several standing structures located within the current project area. Several of these historic features and structures were recommended as eligible for listing in the NRHP.

In 1992, Reclamation proposed the construction of bankline structures, along with channel work, in an attempt to improve the flood carrying capacity of the lower portion of the Colorado River. One of the first steps in the preparation of an environmental impact statement was a study undertaken to identify areas of cultural sensitivity (ACS) for local Native Americans that might be affected by the project (White 1992).The study was completed through formal and informal Native American consultation, consultation with professionals knowledgeable with the area, documentary research, and preliminary field inspections. A total of nine ACSs was located during the project, three of which are located within the boundaries of the current project. These three areas consist of two habitation sites, and one resource procurement site. Recommendations made by Reclamation regarding these ACSs include additional intensive cultural resource survey, protecting existing stands of willow and cottonwood trees, discontinue quarrying activities and repair damage at Pilot Knob, and providing a Native American monitor during upcoming construction activities.

Another highway widening project was conducted in 1994 for a 20-mile-long segment of U.S. 95 between San Luis and Yuma. The archaeological survey was completed by Jeffrey Hathaway and Bradford Stone, with Archaeological Research Services (ARS), for the Arizona Department of Transportation, Phoenix (Hathaway and Stone 1994).The survey alignment consisted of a 204-foot-wide corridor centered on the 40–60-foot-wide U.S. 95, an area consisting of approximately 443 acres. Approximately 25 percent (ca. 109 acres) was unsurveyable because of crop cultivation/irrigation, and/or private property access considerations. The survey located five previously identified cultural resource sites, consisting of standing structures and historic irrigation features associated with the Yuma Project irrigation system. Only one of these sites are located within the current study area (AZ X:6:39 [ASM}), a canal drain found to be potentially eligible as a contributing element. The survey also located 11 newly recorded sites, one non-site artifact scatter, and nine isolates. Five of the newly recorded sites fall within the current project area (AZ X:5:19–23 [ASM]), all of which date from the historical period. Only site AZ X:5:21 (ASM), the archaeological remains of a commercial structure in the Gadsden area, was recommended as potentially eligible to the NRHP.

The archaeological monitoring of a natural gas line replacement resulted in the locating of several cultural resources. The monitoring was performed by David Doak, an archaeologist with SWCA, Inc., for El Paso Natural Gas Company. The gas line replacement was located within the City of Yuma, close to several historic properties. Artifacts and features recovered consisted primarily of glass bottles, bottle fragments, cut bone, a lens of burned material, and concentrations of building materials. Although several artifacts and features were uncovered, no sites were recorded. Because the artifacts were not found in context, and no architectural features were encountered, it was determined that no significant archaeological resources were observed. No further archaeological work was recommended (Doak 1994).

An environmental assessment for the Quechan Casino at Fort Yuma was completed by TRC Mariah Associates, Inc., in 1995.The assessment, mandated by National Environmental Policy Act, as amended, was completed for a proposed 30,000-square-foot gaming casino and 424-space parking area north of Yuma, within the Quechan Indian Reservation. A Class III pedestrian survey was conducted over the entire project area, and no cultural resources were located. The study found that no significant impacts would result from the proposed action (TRC Mariah Associates, Inc. 1995).

The proposed construction of a multiuse paved pedestrian/bicycle path along the east bank of the East Main Canal in Yuma required an archaeological survey of the area in 1996. The survey was carried out by ARS for the Arizona Department of Transportation, Phoenix (Stone 1996). The area consisted of approximately 51.5 acres along a 5-mile-long corridor and was subjected to a Class III pedestrian survey, with 100 percent coverage of the ground surface. The survey located seven previously recorded historic archaeological sites, two of which are located within the current project area (AZ X:6:17 and AZ X:6:65 [ASM]). The sites are elements of the East Main Canal and are both potentially eligible for the NRHP.

Since 1990, SRI has undertaken a number of Reclamation-funded surveys in and around the lower Colorado River. Included among these are the milling implement quarry at Antelope Hill (Schneider 1992), the Ripley Intaglio Complex (Holmlund 1993), Pilot Knob (Ezzo and Altschul 1993a), Senator Wash (Ezzo and Altschul 1993b), Palo Verde Point (Ezzo and Altschul 1993c), the Quien Sabe/Big Maria Terrace region (Ezzo 1994b), the Lower Cibola Valley (Ezzo 1994a), and Mittry Lake (McClure 1993). Much of this research has been compiled and synthesized in a recent volume by Ezzo and Altschul (1993d).

A Class III, noncollection cultural resources survey was completed in 1995 by SRI for a proposed Reclamation water storage facility along the lower Colorado River (Huber and Ezzo 1995). Four alternative parcels were surveyed for the water storage facility, totaling 2548 acres. The parcels are designated by Reclamation as the All American Canal East Dam and Reservoir, All American Canal West Dam and Reservoir, the Gila Gravity Main Canal Reservoir, and the Yuma Mesa Regulating Reservoir. All of the parcels are located approximately 7–8 miles north of Yuma. The parcels surveyed were outside of the boundaries of the current project. Three sites, however, extend from the current project area into the All American Canal East Dam and Reservoir parcels (CA-IMP-6824H, -6830H, and -7130H). An additional Class III survey, also completed for Reclamation, was conducted adjacent to the Colorado River within the proposed APE (Sterner and Bischoff 1998). This survey identified three historical-period cultural resources AZ U:6:91 (ASM), AZ U:6:92 (ASM), and AZ U:6:93 (ASM).

Results of the Site-File Research

In all, 21 cultural resources were identified within the APE on the Arizona side of the Colorado River. Table 2 summarizes information on site types and potential eligibility for inclusion in the NRHP by site type. Locations of all sites identified within the APE are depicted on Figure 26.

Of those archaeological features identified within the APE, 13 represent significant or contributing components of the Yuma Irrigation Project (see discussion, Chapter 4). Two of these features, the Boundary Pumping Plant (AZ U:5:7 [ASM]) and the East Main Canal (AZ U:5:9/AZ U:6:63 [ASM]) have been determined to be eligible for listing in the National Register of Historic Places based on their historical significance and unique design and construction (Pfaff et al. 1992). Six of the resources have been determined to be contributing elements to the overall significance of the YIP (eligible under criteria a and c) and are therefore eligible for inclusion in the NRHP. Five YIP resources have been determined to lack the individual significance to be considered eligible for listing to the overall NRHP, bit contribute to the overall significance of the YIP (Pfaff et al. 1992).

Table 2. Historical-Period Sites Recorded within the APE

Site Number	Other Site Designation	Topographic Map(s)	Site Type	Significance	Reference
AZ X:5:5 (ASM)	Y90	Gray's Well	Silva Check (West Main Canal)	contributes to eligibility of YIP under Criteria a & c	Pfaff et al. 1992
AZ X:5:6 (ASM)	Y91	Gray's Well	check (West Main Canal)	not eligible	Pfaff et al. 1992
AZ X:5:7 (ASM)	Y42	Gadsden	Boundary Pumping Plant	eligible	Pfaff et al. 1992
AZ X:5:8/ AZ X:6:65(ASM)	Y56	Gadsden, Yuma West	East Main Canal	eligible	Pfaff et al. 1992
AZ X:5:9/ AZ X:6:63(ASM)	Y57	Gadsden, Yuma West	Yuma Main Canal	contributes to eligibility of YIP under Criteria a & c	Pfaff et al. 1992
AZ X:5:10/ AZ X:6:15 (ASM)	Y59	Gadsden, Gray's Well, Yuma West	Valley Levee	contributes to eligibility of YIP under Criteria a & c	Pfaff et al. 1992
AZ X:5:13 (ASM)	Y94	Gadsden	canal check & waste way (West Main Canal)	noncontributory	Pfaff et al. 1992
AZ X:5:14 (ASM)	Y95	Gadsden	check & culvert (East Main Canal)	contributes to eligibility of YIP under Criteria a & c	Pfaff et al. 1992
AZ X:5:17/ AZ X:6:43(ASM)	Y58	Gadsden, Yuma East, Yuma West	Yuma Valley Railroad	contributes to eligibility of YIP under Criteria a & c	Pfaff et al. 1992
AZ X:5:19 (ASM)	—	Gadsden	foundations	not eligible	Hathaway and Stone 1994
AZ X:5:20 (ASM)	—	Gadsden	gas station	not eligible	Hathaway and Stone 1994
AZ X:5:21 (ASM)	—	Gadsden	foundations and walkway	potentially eligible	Hathaway and Stone 1994
AZ X:5:22 (ASM)	—	Gadsden	walkway	not eligible	Hathaway and Stone 1994
AZ X:5:23 (ASM)	—	Gadsden	residence	not eligible	Hathaway and Stone 1994
AZ X:6:35 (ASM)	Y86	Yuma West	Willits Check (West Main Canal)	noncontributory	Pfaff et al. 1992
AZ X:6:36 (ASM)	Y87	Yuma West	wooden bridge (West Main Canal)	noncontributory	Pfaff et al. 1992
AZ X:6:37 (ASM)	Y88	Yuma West	Daniels Check & Bridge (West Main Canal)	noncontributory	Pfaff et al. 1992
AZ X:6:38 (ASM)	Y89	Yuma West	canal check, waste way, turnout, & residence (West Main Canal)	contributes to eligibility of YIP under Criteria a & c	Pfaff et al. 1992
AZ X:6:91 (ASM)	—	Yuma West	artifact scatter	not eligible	Sterner and Bischoff 1998
AZ X:6:92 (ASM)	—	Yuma West	artifact scatter	not eligible	Sterner and Bischoff 1998
AZ X:6:93 (ASM)	—	Yuma West	artifact scatter	not eligible	Sterner and Bischoff 1998

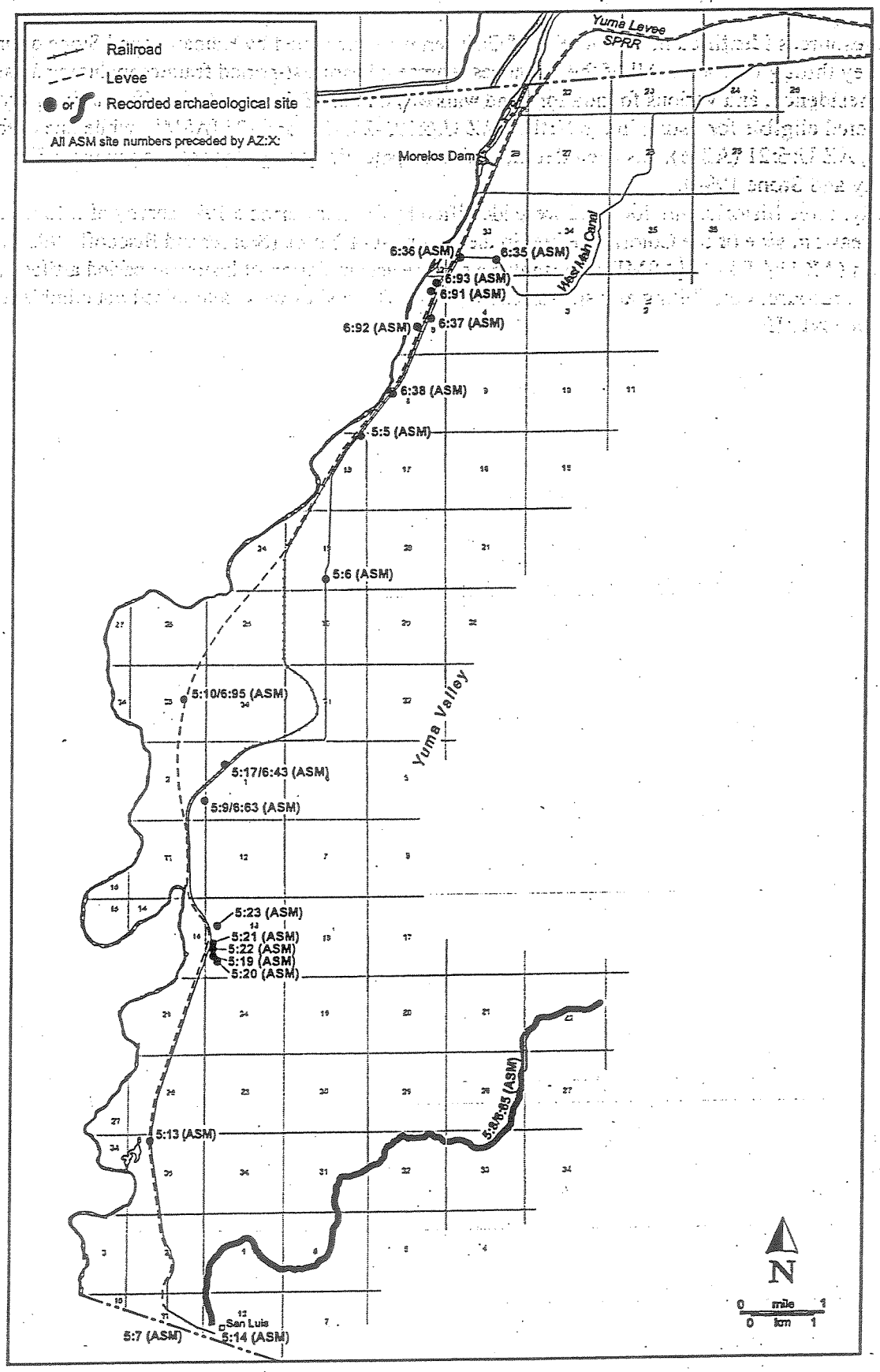

Figure 26. Known sites within the APE.

Five resources identified in the vicinity of Gadsden were identified by Hathaway and Stone during a 1994 survey through the area. All of the resources represent historical-period features including a gas station, a residence, and various foundations and walkways. Four of the sites lack sufficient integrity to be considered eligible for listing in the NRHP (AZ U:6:19, -20, -22, and -23 [ASM]), while one of the resources, AZ U:6:21 (ASM), has been determined to be potentially eligible for listing in the NRHP (Hathaway and Stone 1994).

Finally, three historical-period sites were identified by Sterner during a 1998 survey of 2.15 miles along the eastern side of the Colorado River in the area west of Yuma (Sterner and Bischoff 1998). Each of the sites (AZ U:6:91–93 [ASM]) represented a surface accumulation of historical-period artifacts, with none of the resources exhibiting any subsurface deposits. These sites were determined not eligible for listing in the NRHP.

CHAPTER 6

Geoarchaeology of the Lower Colorado River International Boundary Section

Stephen L. Williams, Robert M. Wegener, and Matthew Sterner

Geoarchaeological investigations were undertaken at the request of USACE and the IBWC. The purpose of this testing was to develop a predictive model for identifying areas within the APE that might contain previously unidentified cultural resources. This work was accomplished by systematically excavating 21 backhoe trenches within the APE, coupled with the detailed examination, recording, and interpretation of the trench exposures. Particular attention was paid to sedimentary structures (e.g., cross-bedding, planar bedding, etc.), sediment textures (e.g., coarse sand, fine sand, silt, clay, etc.), soil attributes, and the relationships between these and the historically documented locations of the lower Colorado River's main channel.

The following discussion starts with a description of the processes and features that typify a meandering river system such as the lower Colorado River. This is followed by a synthesis that documents the locations and actions of historically documented lower Colorado River channels. The geoarchaeological methods applied during the course of this study and their results are then discussed. General principles of site formation and preservation in a riverine setting are presented. These discussions, along with a discussion of the general principles of site formation and preservation, are then used to develop a model that will serve to determine the locations within the APE that may yield cultural resources.

Fluvial Facies Model

There are two faces to the lower Colorado River. During most of the year, the Colorado is a calm river, meandering across its wide valley. During flood episodes, normally peaking from May to July, the Colorado overflows its banks and temporarily forms a broad anastomizing river with shallow subsidiary channels separated by emergent bars. As flood waters recede, sediment is deposited on the floodplain and refills the channels. When normal flow is restored, the river usually reverts back to its normal meandering pattern within the newly created channel. After the Colorado River flows through the narrow pass between Yuma and Pilot Knob it expands its channel onto the Colorado River delta, a broad valley bordered by the 20-m-high bluffs of Yuma and Sonora Mesa to the east and the Cocopah Mountains to the west. In the nineteenth century, this channel was $^1/_8$–$^1/_2$ mile wide and 8–20 feet deep (Ives 1861:9), defined by natural levees stabilized by coarse grass and tule (Sykes 1937:30–31). Presently, after construction of artificial levees between 1907 and 1911 to restrict lateral movement and damning of the river to divert water for agriculture, the Colorado represents a lower discharge version of its former self, residing in a channel too wide for its current flow.

The Colorado River depositional cycle can be characterized by the fine-grained, meandering assemblage, fluvial-facies model of Miall (1996) (Table 3). Sedimentary facies in this model consist of coarser grained, sand-filled channel and crevasse splay deposits, and finer grained overbank and levee deposits. These facies can often be readily identified on topographic maps and aerial photographs, and the events

Table 3a. Fluvial Facies Components

Facies	Lithofacies	Interpretation
Active channel deposits	Fl, St, Sr, Ss	channel fill, point bar deposits
Natural levee deposits	Fl, Sr	overbank flooding
Overbank deposits	Fl, Fm, Fr, Sr	overbank flooding and sheet flow
Abandoned channel deposits	Fl, Fsm, Fm, Fr	fill of abandoned channels

Table 3b. Lithofacies Codes

Lithofacies Codes	Sediment Size	Features and Sedimentary Structures
Fl	sand, silt, clay	fine lamination, very low ripple cross-lamination
Fsm	clay, silt	massive
Fm	clay, silt	massive, dessication cracks
Fr	clay, silt	massive, bioturbated
Sr	sand	small-scale ripple cross-lamination
St	sand	large-scale trough dune cross-beds
Ss	sand	low-angle cross-beds

Note: Modified from Miall (1996:Table 1).

that created them may be found in the historical literature of the Colorado River. The meandering river facies model contains four major elements: active and abandoned channels, crevasse splays and crevasse channels, natural levees, and floodplain deposits (Figure 27).

Active and Abandoned Channels

Active channels are filled primarily by cross-bedded, point bar deposits consisting of medium-to-coarse sands along with the coarsest bed material that tends to be confined to the bottom of channels. The

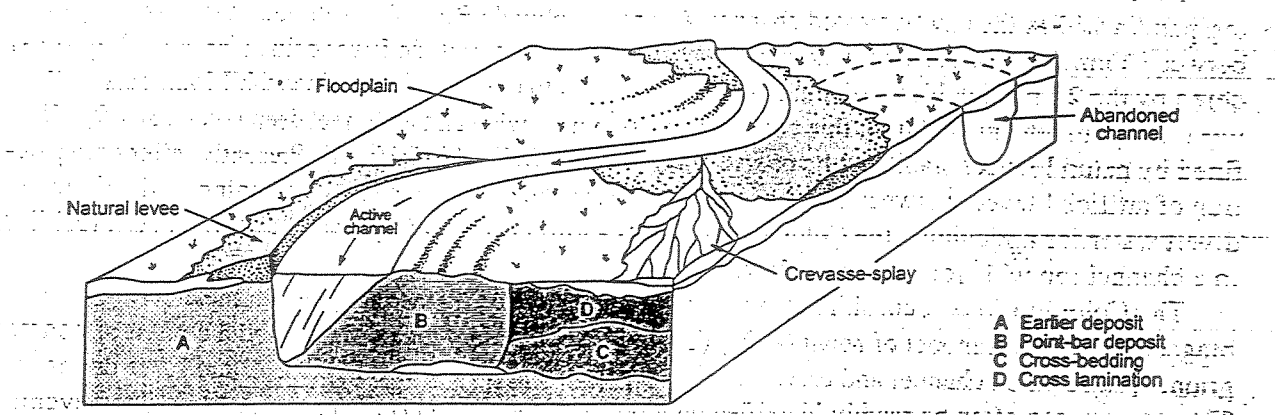

Figure 27. Summary facies model for a meandering river (adapted from Collinson 1978:33).

coarse-bed material ("lag") moves slowly, mostly during floods, and accumulates in the bottoms of deep scours. Such lag is particularly characteristic of meandering channels, resulting primarily from bank erosion. It may include clasts of overbank mud and waterlogged plant debris along with the coarsest bed-load sediment.

A meandering river like the lower Colorado River has an asymmetric channel, sloping gradually from the inner convex to the outer concave bank. The outer bank is steep where the river is deeper and faster moving. The inner slope rises gently to form an emergent wedge of sand, the point bar, where the river's flow is slower. Point bar deposits are partially composed of the coarsest sediment available in a river. If a wide range of grain sizes are available, grain sizes decrease upward in a point bar sequence. Generally, a muddy or very fine-grained layer is present on the top as a thin veneer. If present, this mud drape marks the top of a flood episode. However, the uppermost fine-grained part of a point bar sequence may be eroded before the deposition of the next sequence. Thus, only incomplete sequences are often preserved. A major part of a point bar sequence is deposited during floods, especially when the water starts receding, and the rate of deposition can be very high. In the meandering stream of normal flow, sediment slumped into the channel by outer-bank caving is caught by the current and deposited on the point bar on the next downstream meander. In this manner the river's shape slowly changes as concave banks and point bars slowly migrate laterally across the floodplain (Reineck and Singh 1973:228).

The shape of the Colorado River channel is more drastically altered during flood stages. This modification is a two stage process involving first erosion and then deposition into the newly formed channel. During flood episodes, discharge may be great enough to completely fill the channel to its vegetation stabilized margins and overflow its banks. Sykes (1937:55) observed that during the normal flood event of 1905 the entire region Pilot Knob and the head of tidewater was under water. He could find no dry ground until he reached the escarpment of the Sonoran Mesa south of the international border. During this and other major flood events water probably reached as far as the bluffs 10 km east of the current channel. The shape of the channel also changes as increased discharge promotes downward and lateral erosion of the original channel. For example, the leveed Colorado River at Yuma dramatically increased in depth (by nearly 20 feet) and width (by 100 feet) during a single flood pulse in 1916 (Lane and Borland 1954:1076, Figure 4). These authors also recorded the cross-section profile of the same stretch during a smaller flood episode from May to July 1929. Between mid-May and mid-June the channel depth increased by over 10 feet, only to be refilled by mid-July. The shape of the bottom before and after the flood changed only slightly but would be more dramatic of the river could have migrated laterally instead of cutting downward with the increased discharge. Since the implementation of the artificial levees has restricted this lateral migration, the sediments within the valley (between its leveed banks) are effectively replaced with each major flood. Based upon flow records for the Colorado River at Yuma, before the river's discharge was drastically reduced with the construction of Hoover and other dams upstream after 1935, a major flood event probably occurred once every two years.

Channel meander loops are periodically abandoned during flood events forming abandoned channel segments or oxbow lakes. Channel abandonment and oxbow lake formation take place by the processes of neck cutoff or chute cutoff. Neck cutoffs occur when the concave banks of adjacent channel meanders merge, resulting in the sudden abandonment of an entire meander loop. The new channel quickly plugs each end of the abandoned loop with active channel sediments and an oxbow lake is formed. Once created, an oxbow lake receives suspended sediments (silts and clays) only during overbank flooding episodes. Repeatedly overbank flooding, and the settling of fine-grained sediments within the oxbow, creates a depositional sequence containing channel lag sediments overlain by a thick sequence of flood-deposited silts and clays. Chute cutoffs occur when a river erodes a channel, or chute, into the proximal portion (i.e., the thickest segment furthest away from the main channel) of a point bar surface. As the resultant chute captures the majority of the channel flow, the older channel slowly fills with lag material and forms an oxbow lake.

Oxbow lakes are particularly characteristic of confined, highly sinuous, rivers. Filled with fine-grained, highly cohesive, overbank sediments, oxbow lakes resist erosion. Subsequently, oxbow lake sediments further restrict the river's natural tendency to migrate laterally across its floodplain. Continued deposition is then confined to the active channel which increases its elevation and creates especially large levees (or alluvial ridges) situated above the level of the surrounding floodplain. When a levee is breached in this scenario, water from a large segment of the meander belt funnels into the lowest accessible portions of the floodplain. This process (avulsion) results in the abandonment of the old meander belt and in the formation of a new channel.

Crevasse Channels and Crevasse Splays

Crevasse channels, and their associated crevasse splays, represent breaches through the natural levee of the meandering river channel into the adjacent floodplain during periods of high discharge. Crevasse channels have formed particulary towards the west historically—the most prominent in 1905 when the river breached the intake of a small canal built in 1901 spilling out to the west and north and filling the Salton Trough. Another break was documented by Sykes (1937:39) near the Arizona-Sonora border in 1891, when floodwaters flowed westward to the Alamo and Paredones drainage systems of the lower Imperial Valley in Baja California. Crevasse channel deposits are ribbonlike bodies consisting mainly of trough cross-bedded and ripple cross-laminated sands. The coarsest sediments are equivalent in grain size to the main channel sediments.

While crevasse splays may involve erosion, they are primarily an overbank sedimentary cover similar in shape to a small delta. Depending upon discharge, individual crevasse splays may be a few centimeters to many meters thick and can reach a 100 m or more across (Miall 1996:171, Table 7.1). Thicker sequences are usually indicative of previous erosion. The deposits of crevasse splays typically consist of fine- to medium-grained sands and trough cross-bedding and cross-lamination are particularly common attributes of crevasse splay deposits. Decreased grain size away from the main channel and upward fining distinguish typical splay deposits.

Because the Colorado delta slopes west as well as south, breakouts into the floodplain as crevasse channels were probably always more significant to the west. However, the documented channeled features found far to the east of the current channel may also represent past crevasse channels into the Arizona side of the delta. Although crevasse channels and crevasse splays are a significant feature of meandering rivers, their recognition is determined primarily by their 3-D geometry. Their lithofacies are generally similar to that of active channel and overbank deposits.

Levees

Natural levees are one of the most prominent features of a meandering river floodplain. They are wedge-shaped ridges of clastic sediment that form immediately adjacent to the channel on both banks of meander loops. Levee deposits are fine-grained mantles at the margins of the active channel, formed incrementally as the river overflows its banks during flood episodes. During each flooding, a layer of ripple-laminated and/or horizontally laminated sand, silt, and clay (usually a few decimeters thick) accumulates. These deposits slowly build up a natural embankment. Later root development and rodent activity commonly obscure lamination and abundant vertebrate remains may be present. Because levees are exposed most of the time, they are commonly heavily vegetated, contain abundant plant debris, and often undergo soil formation processes.

Floodplain Deposits

Floodplain fines (fine sands, silts, and clays) are deposited during waning flood stages as thin drapes over high points, abandoned channels, and other low areas. They often consist of very fine sands, silts, and muds carried in suspension and deposited either close to the channel margin or in low points (e.g., oxbow lakes) on the floodplain. Depending on grain size these beds may be planar-bedded to massive and may show dessication cracks. These beds are typically disturbed by root activity making recognition of sedimentary structures difficult in trench profiles. Away from the channel, a few millimeters or centimeters of sediment are normally deposited by a single flood and, although initially laminated, the lamination is soon destroyed by plant roots or soil formation. In arid regions like the lower Colorado River valley, thin beds, nodules, and filaments of evaporite minerals (e.g., gypsum and calcium carbonate) are common constituents of floodplain deposits.

Since construction of upstream dams in the 1930s and 1940s have restricted discharge, overbank flooding episodes have diminished and recent natural levee and floodplain deposits probably have not been significant. Consequently, soil formation processes dominate the modern floodplain.

Historic Colorado River Channels

The channel configuration of the lower Colorado River has been intermittently documented for the last 150 years, with the greatest detail and frequency occurring in the early twentieth century. Figure 28 shows the accumulated pattern of channels for the period 1852–1915, and Figure 29 shows the pattern in the valley after completion of the artificial levees in 1915. Examination of the earlier maps shows the patterns of migration of the river from its current course eastward, onto the Yuma Valley, prior to the construction of levees. These patterns indicate the areas where cultural material would not be expected to be recovered in situ because of the process of channel scouring and backfilling. Evidence of these remnant channels can still be seen on USGS 7.5-minute series topographic maps or aerial photographs as arcuate-shaped features in the Yuma Valley east of the levee. Although the age of these features is unknown but they are probably Late Holocene to recent. Historic abandoned channels can also be seen in the Colorado River floodplain north of the international border both on topographic maps and on the surface.

Sedimentary facies indicative of previous channels include sand-dominated, scour fill, ripple cross lamination, and larger 3-D scale trough dune scale cross-bedding such as that observed in the trench samples taken in the reach of the Fort Yuma Indian Reservation disposal area northwest of Yuma (Huber et al. 1998). We would anticipate finding similar sedimentary features in trenches excavated in the Colorado River delta south of Yuma, but we would expect to recover prehistoric or historic materials only in those areas not affected by known flooding events.

Site Modeling along the Lower Colorado River

A meandering river environment, like the lower Colorado River, is highly dynamic, with different areas of the floodplain characterized by erosion, deposition, and stability through time. As a river migrates laterally and downstream, it is constantly forming a new floodplain by reworking the older floodplain sediments. Normal stream flow is responsible for erosion along the channel banks, deposition in the channel, and the lateral downstream migration of the river. Sediments in areas away from the channel, such as those of the floodplain or inactive terraces, are more permanently stored and may remain stable for long

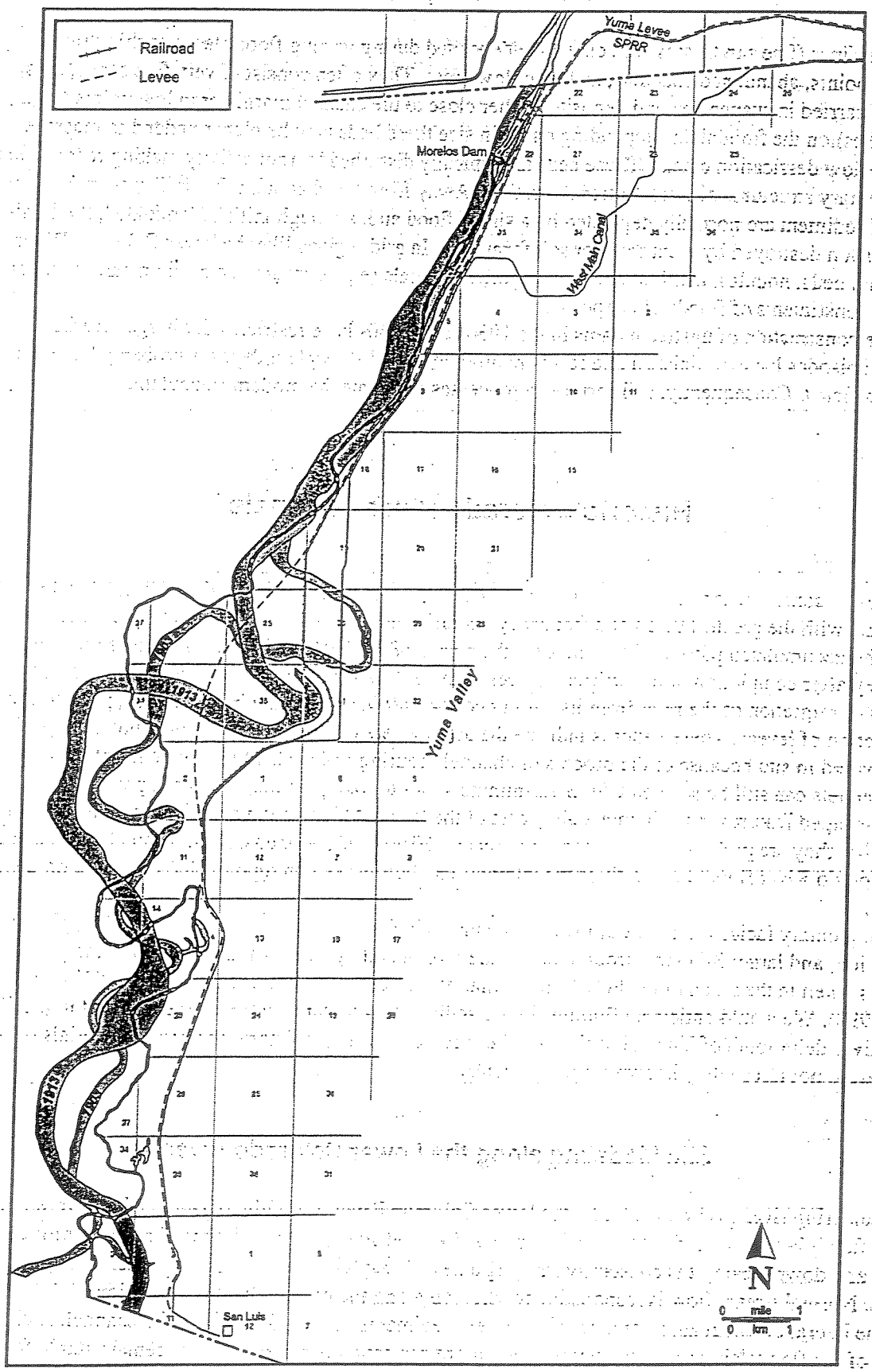

Figure 28. Documented channel meanders for the Colorado River before 1915.

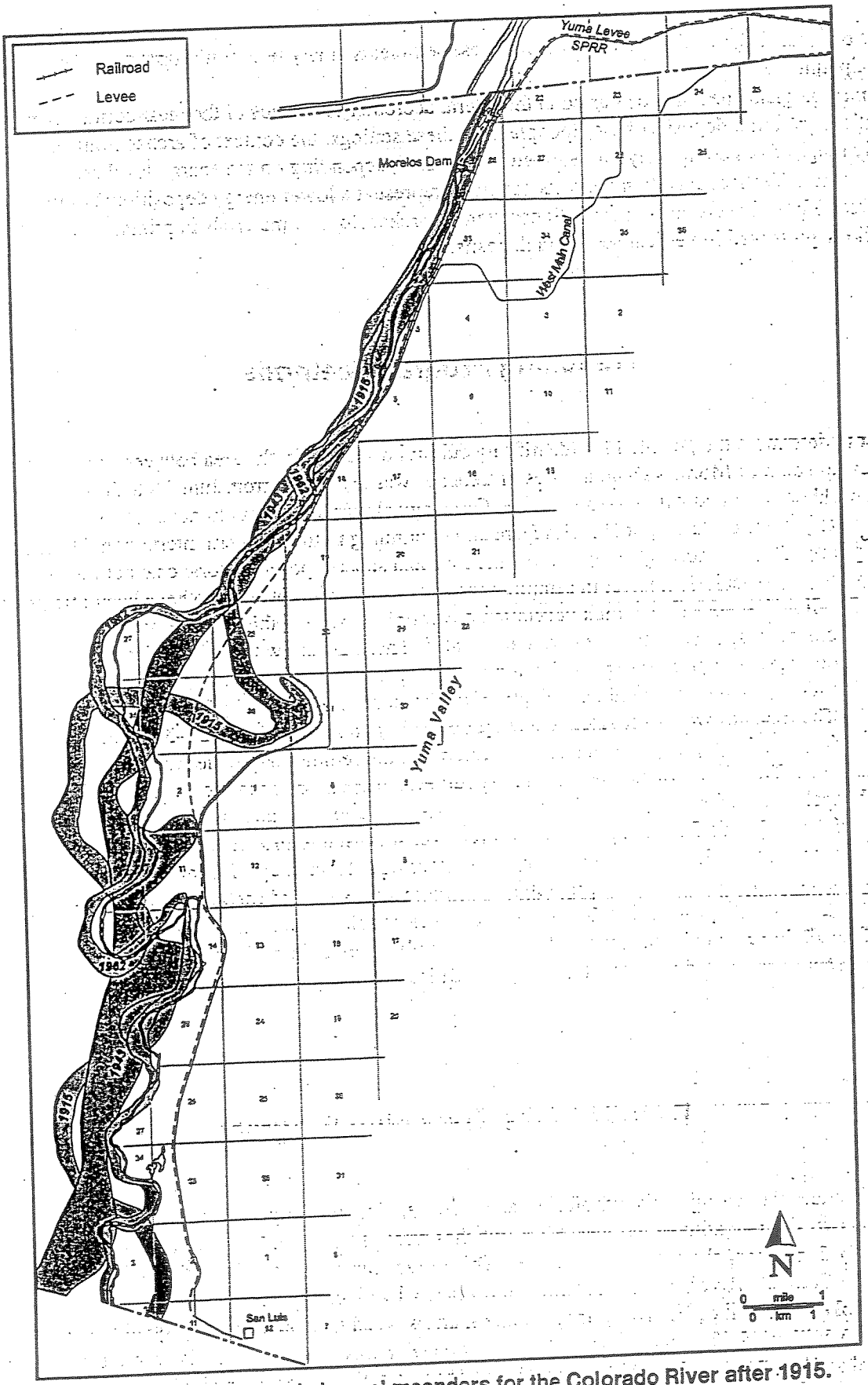

Figure 29. Documented channel meanders for the Colorado River after 1915.

periods of time. However, the river can erode these sediments at any time if it migrates or down-cuts into its floodplain.

Archaeological sites may be buried in the lateral accretion sediments of the meandering channel or in the vertical accretion deposits of the floodplain. In these settings, the context of archaeological sites theoretically ranges from completely undisturbed to modified, depending on the energy level associated with the deposition. Vertical accretion deposits generally represent a lower energy depositional environment compared to lateral accretion deposits. Subsequently, archaeological materials in primary context are more likely preserved in vertical accretion deposits.

Trenching Program Methods

In order to determine the potential for identifying cultural resources in the area between the Colorado River levees south of Morales Dam, a series of trenches was excavated from June 28 to July 1, 1999, using a backhoe equipped with a 2-foot bucket. Our original plan was to cut trenches at a spacing of approximately ½ mile, starting at Morales Dam and continuing to the southern international border. Working from USGS quadrangle maps onto which we had superimposed historic channel meander alignments, we were particularly interest in sampling those areas that did not seem to have been affected by historic flooding. Because of the thick vegetation cover or high water table in some areas and agricultural activity in other areas, only 21 trenches were excavated. These did show the complete diversity of geomorphic elements that would be expected in a meandering river fluvial system.

The location, orientation, length, and depth of the 21 trenches is shown in Table 4 and mapped on Figure 30. The trenches were excavated to a length of 9–21 m and a depth of 120–305 cm. In all cases, they were deep and long enough to enable us to determine the sedimentary facies represented. All of the trenches, except Trench 8 (oriented northwest to southeast, perpendicular to the west bank of an abandoned channel) were oriented within 25 degrees of east-west, approximately perpendicular to the flow direction of the Colorado River. A portable GPS receiver was used to plot the location of all trenches excavated onto a USGS 7.5-minute series map. A standardized form adapted from Birkeland (1999:Appendix 1) was used to record the soil properties and sediment textures of each exposed soil and/or lithofacies. Black-and-white prints and color slides were taken of selected trench profiles. Hand trowels were used to face all documented trench walls. Sediment samples were collected for additional postfield analysis. All trenches excavated were mechanically backfilled and compacted after profile recording was completed.

Results of the Trenching Program

Table 5 provides the setting, soils, lithofacies, and interpreted facies for each trench. Sampling was performed on two separate alluvial terraces. Most trenches were placed on a lower terrace, which lies approximately 5–6 meters above the river channel. This terrace represents the floodplain of the entrenched present-day Colorado River, its flow determined primarily by diversion above Morales Dam. The floodplain is choked with salt cedar (*Tamarisk pentadra*), arrow weed (*Pluchea sericea*), quail bush (*Atriplex lentiformis*), willow (*Salix gooddingii*), and cottonwood (*Populus fremontii*), and is accessible only by occasional roads and areas cleared by cut and burn. The vegetation associations in the areas sampled,

Table 4. Location, Orientation, Length, and Depth of Geomorphic Test Trenches

Trench	Quadrangle Map	Township and Range	Section	Quadrant	UTMs Northing	UTMs Easting	Orientation	Length (m)
1	Yuma West	T8S R24W	32	SE, SE	3618345	712182	295°	15
2	Yuma West	T8S R24W	5	SW, NE	3617601	711740	290°	21
3	Yuma West	T9S R24W	5	SW, NE	3617620	711704	275°	19
4	Yuma West	T9S R24W	5	SW, SE	3616734	711554	295°	9.5
5	Grays Well NE, Calif.-Ariz.	T9S R24W	18	SW, SW	3613475	709705	245°	16
6	Grays Well NE, Calif.-Ariz.	T9S R24W	19	NW, NW	3613026	709377	290°	10
7	Grays Well NE, Calif.-Ariz.	T9S R25W	24	NW, SE	3612493	709020	290°	9
8	Grays Well NE, Calif.-Ariz.	T9S R25W	24	SE, SW	3611723	708459	315°	17
9	Gadsden	T9S R25W	35	NW, NW	3610049	706152	260°	10
10	Gadsden	T10S R25W	23	SW, SW	3602059	706564	270°	10
11	Gadsden	T10S R25W	26	NE, SW	3600871	706783	285°	10
12	Gadsden	T10S R25W	35	NW, SW	3599487	706583	295°	9
13	Gadsden	T10S R25W	35	SW, NW	3599567	706660	272°	10
14	Gadsden	T10S R25W	35	SE, SW	3598745	706957	270°	10
15	Gadsden	T11S R25W	3	NE, NE	3598629	706380	255°	15
16	Gadsden	T11S R25W	3	NE, SE	3597831	706036	270°	9
17	Gadsden	T11S R25W	3	SW, SE	3597316	705880	270°	9
18	Gadsden	T11S R25W	2	SE, SW	3597305	707023	275°	8
19	Gadsden	T11S R25W	2	SE, NW	3597965	707156	260°	10
20	Yuma West	T8S R24W	28	SW, SE	3620286	713038	290°	10
21	Yuma West	T8S R24W	33	SW, SW	3618640	712330	275°	10

based upon the work of Anderson et al. (1984), include the Salt Cedar and *Atriplex* (dominated by quail bush) Association Types. Creosote (*Larrea tridentata*), honey mesquite (*Prosopis glandulosa*), screw-bean mesquite (*Prosopis pubescens*), and burro weed (*Ambrosia dumosa*) were also present. The second terrace—another 5–6 m above the first—probably represents an edge of the nineteenth-century pre-levee floodplain.

Three incipient soil types were represented in the trenches. Incipient desert A horizon aridisols were predominant in areas that have not been cultivated. There soils are generally weakly developed, ranging in depth from 20 to 70 cm. Agricultural soils ranging from 40 to 50 cm deep (with a weakly developed Ap horizon) were observed in five trenches. A single example of an incipient entisol was seen in Trench 18. This soil, 70 cm thick, developed in the clay-rich fill of an abandoned channel. In all trenches the soil zone was indicated by the general lack of sedimentary structures due to the development of soil structure, root disturbance, and invertebrate mixing. Burrows of small ground squirrels (*Ammospermophilus* sp.) and pocket gophers (*Thomomys* sp.) were observed on the surface, but their modification of the sediment structures is minimal.

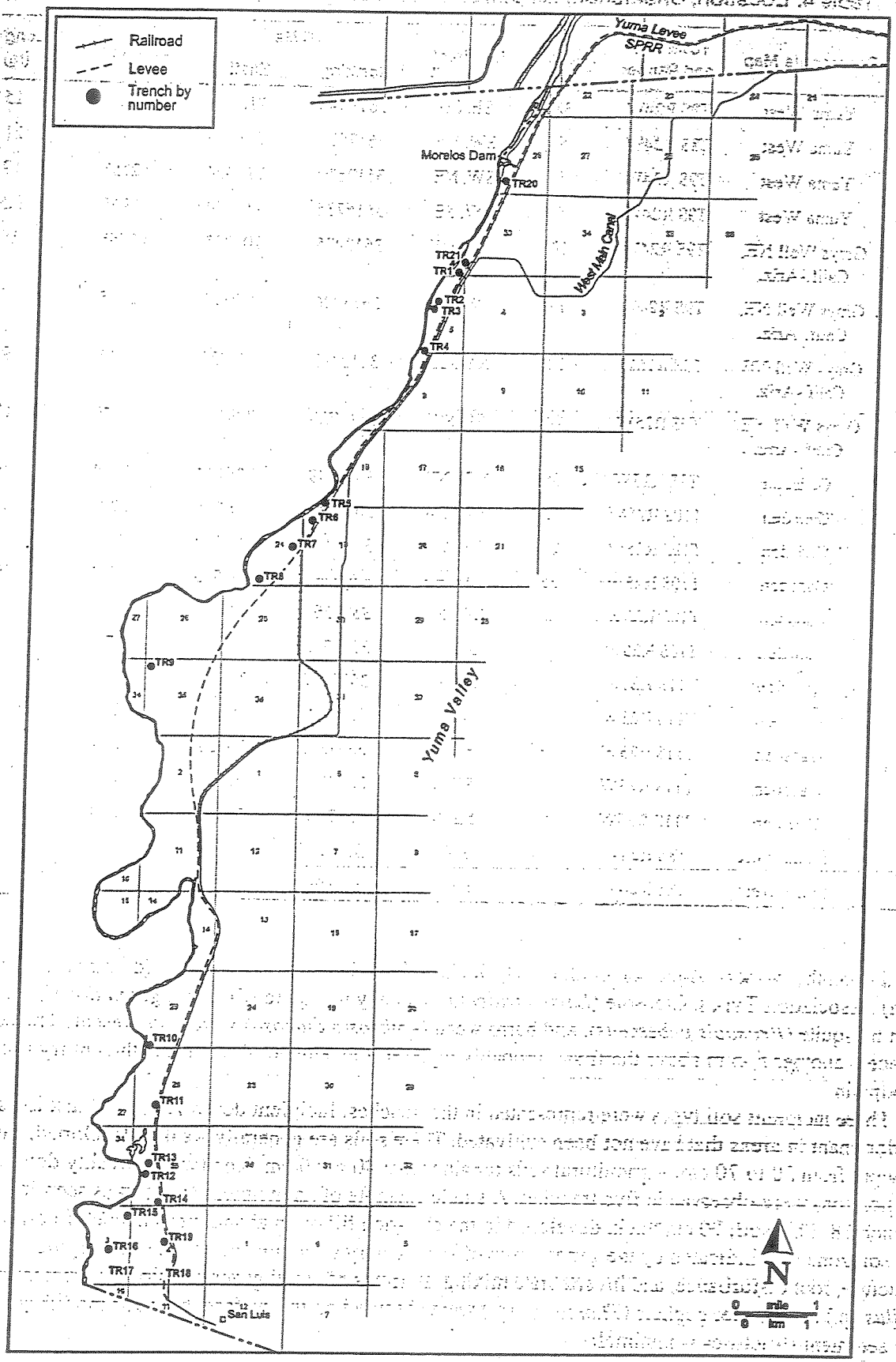

Figure 30. Location of backhoe trenches excavated during the modeling phase.

Table 5. Setting, Soils, Lithofacies, and Interpreted Facies for Each Geomorphic Test Trench

Trench	Terrace	Total Depth (cm)	Nature of Surface	Vegetation Association	Soil Type	Depth of Soil Development (cm)	Grain Size	Lithofacies (see Table 3b)	Fining Upwards Sequence	Facies
1	second	185	cleared	*Atriplex*	Aridisol	70	very fine sand	Fl, Fr, Sr	no	proximal overbank
2	second	290	50% vegetated cover	*Atriplex*/creosote	Aridisol	50	very fine sand	Fl, Sr (climbing)	no	natural levee
3	first	150	80% vegetated	*Atriplex*	Aridisol	65	fine sand	Fl, Sr	no	proximal overbank
4	second	150	30% vegetated	arrow weed	Aridisol	30	fine sand	Fl, Sr, Sd, Ss	no	Point Bar Units 2–3
5	first	290	80% vegetated	salt cedar	Aridisol	40	clay to very fine sand, medium sand	Fl, Sr Sd	yes	Point Bar Units 3–5 Point Bar Unit 2
6	first	160	abandoned field	agricultural	agricultural	40	very fine sand	Fl	yes	proximal overbank
7	first	145	cleared	salt cedar	Aridisol	60	very fine sand	Fl, Sr	no	proximal overbank
8	first	305	abandoned channel	arrow weed	Aridisol	30	fine sand, medium sand, fine to medium sand	Fl, Sr Sd Ss	yes	Point Bar Units 4–5 Point Bar Unit 3 Point Bar Unit 2
9	first	120	burned, cleared	salt cedar	Aridisol	20	very fine sand	Fl, Sr	no	proximal overbank
10	first	120	burned, cleared	salt cedar	Aridisol	50	clay to very fine sand	Fl, Sr	yes	Point Bar Units 4–5
11	first	140	burned, cleared	salt cedar	Aridisol	20	clay silt to very fine sand	Fl, Fsm Fl, Sr	yes	abandoned channel proximal overbank
12	first	140	cleared	*Atriplex*	Aridisol	40	very fine sand	Fl, Sr (climbing)	no	natural levee
13	first	160	fallow field margin	agricultural	agricultural	50	clay to very fine sand	Fl, Sr	yes	Point Bar Units 4–5
14	first	160	fallow field margin	agricultural	agricultural	40	clay to very fine sand, clay to silt	Fl, Sr Fl, fsm	yes	proximal overbank historic channel fill
15	first	140	burned, cleared	salt cedar	Aridisol	30	clay to very fine sand	Fl, Sr	yes	abandoned channel
16	first	120	abandoned field	agricultural	Aridisol	50	very fine sand, clay to silt	Fl, Sr Fl, Fsm	no	Point Bar Units 4–5 historic channel fill
17	first	170	fallow field margin	agricultural	agricultural	40	clay to very fine sand	Fl, Sr	yes	Point Bar Units 4–5
18	first	240	burned, cleared	salt cedar	Entisol	70	clay to silt	Fl, Fsm, Fm	no	abandoned channel
19	first	140	burned, cleared	*Atriplex*	Aridisol	70	clay to fine sand	Fl	yes	proximal overbank
20	second	140	cleared	*Atriplex*	Aridisol	30	silt to medium sand	Fl, Sr	yes	Point Bar Units 3–5
21	first	140	fallow field margin	agricultural	agricultural	40	clay to very fine sand	Fl, Sr	yes	Point Bar Units 4–5

Four lithofacies were observed in the trench sediments representing point bar, natural levee, proximal overbank, and abandoned channel fill deposits. Point bar deposits formed by the lateral accretion in an active channel were observed in seven trenches. Most trenches showed only the upper two or three units of the five-unit point bar sequence and the lower unit, with no channel lag deposits observed. Natural levee deposits were observed in two trenches and proximal overbank deposits in eight trenches. Both of these facies represent deposits formed by vertical accretion onto lower areas in the floodplain above the active channel. Filled abandoned channels were observed in two trenches.

Sediment grain size was predominantly very fine sand, although fine and medium sand was observed at the base or edge of point bar deposits. Silt and clay occurred primarily in thin beds at the top of graded sequences and as laminated-to-massive overbank and channel fill deposits. Small rounded prolate pebbles up to 2 cm long were observed in the cross-bedded sands in Trench 8, representing the highest energy event observed in the survey.

With the exception of Trenches 3, 8, and 18, there appears to be no obvious relation between the facies and the configuration of the channel during any known flooding event. Trench 3 which had sediments suggestive of an overbank deposit, was located on the first terrace just behind the natural levee, the natural environment for floodplain deposition. Trench 8 was cut into the 2.5 m west bank and bottom of a recently abandoned and unfilled channel, the natural setting for the point bar deposit that was observed in the trench. Examination of the flood map mosaic indicates that this channel may represent an oxbow formed by cutoff of the channel formed by the flood event of 1913. Trench 18 represents the fill of a similar abandoned channel, probably the channel meander observed on the 1915 map. This channel has subsequently been isolated and has been filled with fine grained sediment so that no surface evidence of the channel exists today.

The results of the trenching program have served to reemphasize the complexity of a meandering river system. The unpredictable nature of erosion and deposition is well displayed by the difference in depositional history of the two once-active channels in the vicinity of Trenches 8 and 18. Both of these channels were active in the early twentieth century, but the channel identified in Trench 18 has been completely filled, while the channel of Trench 8 remains open, despite the fact that the latter channel lies closer to the current active channel. Although there is extensive modification of the landscape by clearing of vegetation, agricultural activity, surface dumping, and construction of roads and drainage ditches, the only indication of buried cultural material was the presence of historic corroded nails and broken glass in the channel fill of the agricultural channel observed in Trench 14 (Feature 1).

General Site Formation and Preservation Principles

Relatively undisturbed archaeological sites are more likely to occur in the vertical accretion deposits of the floodplain (upper point bars, natural levees, crevasse splays, and oxbow lakes). For archaeological materials to become incorporated into these floodplain features, occupation must have taken place on the lowlands adjacent to the river channel during a period of geomorphic stability. After abandonment, the site would need to be inundated by low energy floodwaters and buried by fine-grained sediments (settling from suspension) during the waning stage of flow. Repeated periods of stability and reoccupation at an aggrading floodplain locale would create a stratified sequence of fine-grained sediment layers, sometimes with interbedded paleosols, or a cumulic soil profile (when the rate of deposition and soil formation are roughly coeval) that contains archaeological debris. Floodplain aggradation would cease if the river down-cut or if the river's flow regime is altered so that the lowlands adjacent to the channel are no longer flooded.

Vertical accretion also occurs along the channel margin on proximal point bar surfaces, natural levees, and crevasse splays. As they did on the floodplain, people likely occupied point bars during periods of stability and resultant sites were subsequently buried during low-energy overbank flooding. As a

result of repeated cycles of point bar stability and overbank deposition, discrete occupation surfaces could be buried. If the intervals of stability were long and punctuated by infrequent episodes of deposition, multiple occupations by different groups would be superimposed on one another. Similar to the upper portions of point bars, natural levees and crevasse splays are incrementally built by vertical accretion during floods and may also contain archaeological materials.

Oxbow lake sediments may also contain archaeological sites. While cultural-use areas are commonly situated on the floodplain next to oxbow lakes, they may also be located in the abandoned oxbow channel floor during periods of low water. Such occupations were probably predicated on the fact that very small ponds remained in the oxbow. Evidence of this occupation could become buried when overbank floodwaters fill the abandoned meander, the recession of floodwaters causing suspended fine-grained sediments to settle from suspension and bury the site. Because of the low energy levels associated with the settling of suspended sediments, sites buried in oxbow lakes are generally well preserved (Waters 1992:142).

Archaeological sites are also found on and in river terraces. Whether a site occurs on the surface or is buried in a terrace deposit depends on the age of the terrace and the nature of the occupation. People that occupied the lower Colorado River valley likely camped on the active floodplain or any of the terraces that flanked it. In general, because terraces represent a chronological set of landforms—that progressively get younger toward the active channel—higher terraces situated further away from the active channel have been available for human occupation for longer periods of time than lower terraces situated closer to the active channel. Consequently, artifact assemblages resting on the surface of higher terraces normally contain a greater mixture of older and younger artifacts than younger and lower terraces. The mixture of temporally discrete assemblages should diminish close to the active channel.

So far, we have presented the positive preservational aspects of site formation on a floodplain. The context of sites on a floodplain, however, may also be partially or completely destroyed by water scouring during overbank flooding. Depending upon the site's location on the floodplain—coupled with the magnitude of the flood—surface or shallowly buried sites may be eroded and destroyed. Eroded site assemblages often exhibit distinctive spatial characteristics. Cobble tools and fire-cracked rock can be reworked into lines, and lighter bone material can be swept from a site (Waters 1992:143). However, small flakes lodged in the plant litter mat may remain in activity clusters. Size grading of artifacts would be another important line of evidence identifying eroded artifact assemblages.

Changes in the riverine environment are recorded in the stratigraphic record, which in turn is composed of sediments deposited during discrete intervals of time separated by periods of erosion, short episodes of nondeposition, and long periods of stability. Subsequently, the archaeological record contained in floodplain sediments often lacks the complete record of human use of a riverine setting. Occupational hiatuses at a specific locality or region are just as likely to be the result of erosion as they are of cultural process. Meaningful interpretations of prehistoric human behavior in riverine settings can only be made after the history of deposition, erosion, and stability are reconstructed.

Site Preservation Potential within the APE

Artificial levees were constructed alongside the lower Colorado River in the APE between 1907 and 1911, but prior to construction of Hoover and other dams upstream. Prior to dam construction, major floods occurred approximately every two years. These flood events essentially scoured the entire area between the levees prior to the dramatic reduction in river discharge following dam construction (see Figure 28). Consequently, the likelihood of identifying prehistoric archaeological materials in relatively undisturbed contexts between the artificial levees is exceptionally low. However, it is possible that historical-period sites and artifacts postdating dam construction exist on or in stabilized point bars, natural levees, or the low-lying terraces that currently flank the modern channel between the levees.

A greater potential exists for preserved prehistoric sites away from the modern channel beyond the artificial levees. Though the area east of the artificial levees has witnessed extensive cultivation, the possibility that prehistoric remains are buried beyond the levees remains. Archaeological remains could occur theoretically anywhere in this area; however, relict floodplain landforms such as large buried point bars, natural terraces and levees, and oxbow lakes were likely occupied prehistorically. Further, the sediments forming these features are generally deposited in low-energy overbank flooding episodes. As such, a greater potential exists for the preservation of relatively undisturbed cultural materials in these settings.

Conclusions

Developing a predictive model to forecast the location of cultural resources is predicated on many factors, the most important of which is the physical landscape. Settlement patterns among prehistoric and, to a lesser extent, historical-period peoples were intimately tied to and determined by their physical surroundings. During prehistory, the land represented life itself, and the an obvious key to survival was the successful adaptation and exploitation of the physical environment. Archaeological interpretation of the relationship of prehistoric peoples to their environment hinges on the ability to define both the nature and extent of environmental exploitation (as determined through the preservation and investigation of material culture) and the environment itself. If one of these key elements is removed from the interpretive equation, our ability to interpret or predict traditional cultural patterns is significantly hampered.

In the case of the lower Colorado River, both of these elements are compromised to some extent. Remnants of the physical exploitation of the environment has been removed through channel meander or buried under floodplain deposits. Additionally, the physical environment, although likely remaining relatively representative, has been heavily modified by agricultural use in the twentieth century.

Does this completely undermine our ability to predict prehistoric and historical-period site locations outside the confines of the levee system that currently channelizes the Colorado River? The answer, for all intents and purposes, is yes . . . and no. We can presume with a high degree of certainty that prehistoric groups used the lower Colorado River valley heavily, but understanding exactly how they interacted with their environment cannot be understood in the absence of cultural or environmental evidence. With the dearth of information currently available and the absence of any remnant topographic indicators, suggesting that the location of cultural resources can be predicted is presumptuous at best and foolhardy at worst.

CHAPTER 7

Conclusions and Recommendations

This report provides background information, historical contexts, and documentation on known cultural resources within a 24-mile (38.4-km) corridor along the lower Colorado River (known as the international boundary segment), from Morelos Dam to the U.S.-Mexico southerly international border. This information will be used during the preparation of an environmental assessment by USACE and the IBWC. Information on recorded sites is the first step in assessing the impact of the proposed dredging activities on cultural resources.

A total of 21 archaeological sites are currently known to exist within the APE. Pedestrian survey of the area has been very light, with no more than 2–4 percent of the APE having been intensively surveyed for the presence of cultural resources. As reported in Chapter 5, only 8 sites have been recommended as eligible, potentially eligible for listing in the NRHP, with several identified as contributing elements to the potentially eligible YIP district.

Management Recommendations

Because of the paucity of survey, assessing the cultural sensitivity of other parts of the APE is somewhat problematic. While it is clear that the overwhelming majority of lands within the current APE are under active cultivation, compromising the effectiveness of pedestrian survey, clusters of historical-period sites have been identified in areas that have not been significantly impacted by agricultural concerns. Sterner identified the remnants of three historical-period sites in the area of Willits Check (Sterner and Bischoff 1998) while Hathaway and Stone (1994) identified five sites near the town of Gadsden, Arizona. Whether these clusters represent relatively dense historical-period use or are representative of archaeological coverage is impossible to determine without additional survey. Similarly, the small number of recorded sites in other areas of the APE cannot be taken as a proxy of limited prehistoric or historical-period use. Apart from these resources, the only other known archaeological resources within the APE are components of the YIP.

Understanding the difficulties of predicting the location of archaeological resources beneath actively cultivated areas, USACE also mandated that SRI implement a limited plan of subsurface testing in areas of the APE that may be impacted under the current, or any future, undertaking. The results of this investigation were presented in Chapter 6 of this document and suggest strongly that no intact prehistoric cultural resources remain within the levees that bound the Colorado River, although limited historical-period resources may exist within this corridor. Outside of the levees, predicting cultural resources is significantly hampered by the environmental and topographic manipulation resulting from a century of agricultural activity.

It should be added that no traditional cultural properties (TCPs) or traditional use areas (TUAs) were identified during the archival research conducted for this undertaking. While none have been officially

recorded with the appropriate state agencies, care should be taken to contact representative Native American groups, who indicate an association with the lands falling within the APE, for information regarding these site types. If significant TCPs or TUAs are identified within impact areas, appropriate treatment plans will need to be devised.

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CESPL-PD-RL

COPY

15 September 1999

MEMORANDUM FOR Mr. Steve Fox, U.S. IBWC, Environmental Management Division, 4171 N. Mesa Street, El Paso, TX 79912

SUBJECT: Cultural Resources Investigation and Native American Coordination, Lower Colorado River Project.

1. A Draft of *A Cultural Resources Overview of the International Boundary Segment of the Lower Colorado River, Yuma County, Arizona* is enclosed for your review and comments. This draft is also being transmitted to BIA (Bill Pyott), Cocopah (Sherry Cordova, Tribal Chair), and SHPO for comments.

2. Please provide comments to me by 1 November 1999.

3. Also enclosed is a list of the Native American Tribes and Groups which should be consulted about the project.

4. Regarding letters to Native Americans, I recommend sending a complete description of the project, and asking for comments only. It is not necessary to go into Traditional Cultural Properties, cultural sites, religious sites with them. If there is such a site within the project area which might be impacted they will let us know.

5. Please let me know if the letters are to be sent by COE or IBWC, and under which letterhead.

6. Please send comments to:

Los Angeles District
Army Corps of Engineers
P.O. Box 532711
ATT: CESPL-PD-RL (Maxwell)
Los Angeles, CA 90053-2325

Phone: (213) 452-3877
FAX: (213) 452-4204
e-mail: pmaxwell@spl.usace.army.mil

7. I look forward to hearing from you.

Pamela Maxwell
Staff Archeologist
Regional Planning Section

Attachment 2

IBWC: Proposed Lower Colorado River Boundary
And Capacity Preservation Project:

Native American Tribes

Tribe	*Name, Title, Address*	*Phone,FAX/e-mail*
Campo Band of Mission Indians	**Mr. Ralph Goff, Chairman**	
Cocopah Indian Community	**Ms. Sherry Cordova, Chair** *Cultural Resources:* Ms. Lisa Wanstall, Director Cocopah Museum County 15 & Avenue G Somerton, Arizona 85350	 (520) 627-1992 (520) 627-2280 fax cocopahmuseum@ aprynet.com
Colorado River Indian Tribes	**Mr. Daniel Eddy, Chair** *Cultural Resources:* Betty Cornelius, Director Colorado Indian Tribes Museum Rt. 1, Box 23-B Parker, Arizona 85344 Weldon Johnson, Archeologist Colorado River Indian Tribes Museum Rt. 1, Box 23-B Parker, Arizona 85344	 (520) 669-9211 (520) 669-6762 fax (520) 669-4044 (520) 669-6762 fax
Fort McDowell Mohave-Apache Indian Community	**Mr. Gilbert Jones, Sr., President** P.O. Box 17779 Fountain Hills, Arizona 85269	 (602) 837-5121 (602) 837-1630 fax
Fort Yuma Quechan Tribe	**Mr. Michael Jackson, Chairman** P.O. Box 11352 Yuma, Arizona 85366	 (619) 572-0213 (619) 572-2102 fax
Gila River Indian Community	**Ms. Mary V. Thomas, Governor** P.O. Box 97 Sacaton, Arizona 85247 *Cultural Resources:* Mr. Barnaby Lewis, Cultural Resource Specialist Department of Land and Water Gila River Indian Community P.O. Box E Sacaton, Arizona 85247	 (520) 562-3311 or (602) 963-4323 (Phoenix) (520) 562-3422 fax (520) 562-3301 (520) 562-4008 fax
Hia-Ced O'odham Alliance	**Ms. Lorraine Marquez Eiler**	

Hopi Tribe	**Mr. Wayne Taylor, Chair** *Cultural Resources:* Mr. Leigh J. Kuwanwisiwma, Director Cultural Preservation Office P.O. Box 123 Kykotsmovi, Arizona 86939	 (520) 734-2441 (520) 734-2331 fax
Salt River Pima-Maricopa Indian Community	**Mr. Ivan Makil, President** *Cultural Resources:* Mr. Ron Chiago Cultural Preservation Officer Ms. Laurene Montero, Staff Archeologist Route 1, Box 216 Scottsdale, Arizona 85256	 (602) 850-8019 (602) 850-7366 fax
Tohono O'odham Nation	**Mr. Edward Manuel, Chair** *Cultural Resources:* Mr. Kenneth Williams, Chairman Cultural Preservation Committee Mr. Peter Steere, Project Manager Cultural Affairs Department Mr. Joseph T. Joaquin, Cultural Affairs Specialist Cultural Affairs Department P.O. Box 837 Sells, Arizona 85634	(520) 383-2221 (520) 383-3379 fax (520) 383-2221 (520) 383-2479 fax (520) 383-4759 (520) 383-5255 fax psteere@toua.net (520) 383-3622 (520) 383-5255 fax pateere@toua.net
Viejas Tribe	**Mr. Anthony Rice, Chairman**	

ARCHEOLOGY FAX COVER SHEET

May 1, 2000

TO: Steve Fox
California USIBWC
FAX NUMBER: (915) 832-~~4167~~ 4193
OFFICE NUMBER: (915) 832-4736

FROM: Pamela Maxwell
OFFICE: Staff Archeologist, Regional Planning Section
FAX NUMBER: (213) 452-~~[illegible]~~ 4204
OFFICE NUMBER: (213) 452-3877
e-mail: pmaxwell@spl.usace.army.mil

Steve: Response from SHPO on Technical Report for Lower Colorado. Please not the bottom right corner requesting that IBWC notify SHPO that Corps of Engineers will be doing Section 106.

Would appreciate letter notifying SHPO that Los Angeles District Corps of Engineers will be taking full responsibility for Section 106 consultation for this undertaking. Thanks!

Pam

Pamela Maxwell
Staff Archeologist
Regional Planning Section

Number of Pages, including cover 2

Attachment 3

PROJ.# SHPO-2000-687 (552)

RECEIVED
MAR 9 2000
3/9/00
ARIZONA STATE PARKS BOARD

CESPL-PD-RL March 7, 2000

MEMORANDUM FOR Mr. James Garrison, State Historic Preservation Officer, 1300 W. Washington, Phoenix, AZ 85007.

SUBJECT: IBWC International Boundary Segment of the Lower Colorado River.

1. The enclosed letter was sent to your office 9/15/99 with a copy of a draft of *A Cultural Resources Overview of the International Boundary Segment of the Lower Colorado River, Yuma County, Arizona* for your review and comment.

2. Also enclosed with that letter was a list of Native American Tribes and Groups compiled by the Corps for notification and requests for comment can be sent.

3. As we did not receive comment, and your office indicates they did not receive the initial package, please consider this submittal initiation of the Section 106 process.

4. Any questions regarding the project may be referred to Pamela Maxwell, staff archeologist, at (213) 452-3877.

Excellent overview. We look forward to further Section 106 consultation on this undertaking. Please be advised that the IBWC needs to initiate S.106 consultation with us and notify us of the steps in the 106 process that they are delegating to the Corps. Thank you
Alan L. Stanard 3/29/00

Pamela Maxwell
Staff Archeologist
(213) 452-3877
(213) 452-4204 (FAX)
pmaxwell@spl.usace.army.mil (e-mail)

MAY 1 9 2000

Mr. James Garrison
State Historic Preservation Officer
1300 W. Washington
Phoenix, AZ 85007

Dear Mr. Garrison:

Please initiate Section 106 consultation with the United States Section, International Boundary and Water Commission (USIBWC), through Ms. Pamela Maxwell, Staff Archaeologist, U.S. Army Corps of Engineers, Los Angeles District for the Section 106 processes on the proposed undertaking described in the report entitled "A Cultural Resources Overview of the International Boundary Segment of the Lower Colorado River, Yuma, County, Arizona." The report was provided to you on September 15, 1999 by the USIBWC's delegated point of contact Ms. Maxwell for the USIBWC. Conduct the consultation with Ms. Maxwell, whose address is shown below, and please send a courtesy copy of all correspondence to Mr. Steve Fox, Environmental Protection Specialist, at the address shown on this letterhead.

Should you have questions, please contact me at (915) 832-4740, or contact Mr. Fox at (915) 832-4736.

Sincerely,

Sylvia A. Waggoner
Division Engineer
Environmental Management Division

cc: Pamela Maxwell, U.S. Army Corps of Engineers, Los Angeles District, P.O. Box 532711, ATTN: CESPL-PD-RL (Maxwell), Los Angeles, CA 90053-2325

Attachment 4.

"Managing and conserving natural, cultural, and recreational resources"

In reply refer to **SHPO-2000-637**

No Adverse Effect

Arizona State Parks

Jane Dee Hull
Governor

State Parks
Board Members

Chair
Walter D. Armer, Jr.
Benson

Vice-Chair
Suzanne Pfister
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Elizabeth J. Stewart
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Vernon Roudebush
Safford

Michael E. Anable
State Land
Commissioner

Kenneth E. Travous
Executive Director

Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

Tel & TTY: 602.542.4174
www.pr.state.az.us

800.285.3703
from (520) area code

General Fax:
602.542.4180

Director's Office Fax:
602.542.4188

October 15, 2001

Sylvia A. Waggoner, Division Engineer
Environmental Management Division
International Boundary and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso TX 79902

RE: Channel Capacity Restoration Project; IBWC
SHPO-2000-637 (7784)

Dear Ms. Waggoner:

Thank you for consulting with our office about the Morelos Dam channel capacity restoration project near the U.S.-Mexico international border in Yuma County, AZ, and for providing copies of the supporting cultural resources overview and the restoration plans. William Collins, Historian and Deputy State Historic Preservation Officer and I have reviewed the documentation submitted. We regret the amount of time taken for review and appreciate your willingness to consider our comments.

Based on the historic context of water-use patterns within the Lower Colorado River Region identified in the study (p. 77), it is our opinion that the Morelos Dam would be eligible for inclusion on the National Register of Historic Places.

Pamela Maxwell (USACE) informed us that as of October 15, 2001, no tribes have responded regarding the presence of traditional cultural places within the area of potential effects.

The description of the proposed restoration project appears to meet Secretary of Interior Standards; therefore, we believe a finding of No Adverse Effect is warranted for the project.

We appreciate your continued cooperation with our office in considering the potential effects of federal undertakings. If you have any questions or concerns, please contact Dr. Collins at (602) 542-7159 or me at (602) 542-7142.

Sincerely,

Jo Anne Miller

Jo Anne Miller
Compliance Specialist/Archaeologist
State Historic Preservation Office

Cc: Pamela Maxwell, USACE, Los Angeles, CA

Attachment 3

STATE AGENCIES

Comment Letters

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • AZGFD.COM

GOVERNOR
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DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

August 17, 2004

Mr. Steve Spangle
U.S. Fish and Wildlife Service
2321 W. Royal Palm Road Ste 103
Phoenix, Arizona 85021

Re: Comments Regarding Final Draft Documents of the Lower Colorado River Multi-Species Conservation Program (DES 04 32)

Dear Mr. Spangle:

AGFD-1

As you know, the Arizona Game and Fish Department (Department) has been actively involved in the Lower Colorado River Multi-Species Program (MSCP) since its inception almost a decade ago. As an applicant and active member of the Steering Committee, we are pleased to see the near completion of the MSCP documents. The MSCP brings together federal and non-federal parties in a collaborative effort to develop science-based conservation strategies for fish and wildlife resources along the Lower Colorado River. The Department supports the overall goals of the MSCP, which are to conserve habitats and work toward recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed; accommodate present and future water diversions, power production, and other uses to allow sustained economic growth for the States of Arizona, California, and Nevada; and provide long-term assurance for Endangered Species Act compliance to conduct water and other related activities on the Lower Colorado River.

AGFD-2

The Department believes that the implementation of the conservation measures described in Alternative 1 and issuance of a Section 10(a)(1)(b) permit to the non-federal applicants meets the objectives previously mentioned. We also believe this coordinated and comprehensive habitat and species conservation strategy will best meet these objectives over the long term.

AGFD-3

Since these documents have been through several administrative reviews, the Department believes our comments concerning the MSCP have been addressed. However, Alternative 4 focuses on off-river habitat conservation measures, and in our opinion, merits some additional consideration. For example, the conservation areas described in Alternative 4 could be used in conjunction with the on-river areas described in Alternative 1.

AN EQUAL OPPORTUNITY REASONABLE ACCOMMODATIONS AGENCY

Mr. Steve Spangle
August 17, 2004
2

The Department's page-specific comments are included as an attachment to this letter. We look forward to continuing to work with the U.S. Fish and Wildlife Service and other MSCP Steering Committee members as this process nears completion, and as implementation of the Habitat Conservation Plan begins. If you have any questions regarding these comments, please contact Charles Paradzick, Aquatic Habitat Specialist, at (602) 789-3608. AGFD-4

Sincerely,

(for) Duane L. Shroufe
Director

DLS:cep

cc: Bob Broscheid, Habitat Branch Chief
Larry Voyles, Regional Supervisor, Region IV, Yuma
Bob Posey, Regional Supervisor, Region III, Kingman
Charles Paradzick, Aquatic Habitat Specialist

Attachment

Arizona Game and Fish Department
Comments regarding the Draft MSCP Documents

August 17, 2004

Habitat Conservation Plan - Volume II

General Comments			AGFD-5
5-36 5-76 5-91		Ultimately, the goal of the MSCP is to create habitats that support diverse and abundant flora and fauna, mitigate for any impacts, maintain current species population levels, and provide opportunities for species population increase. To that end, consider within the adaptive management sections to test the assumption that salt cedar should always be removed or controlled in created habitats. In some cases, under or mid-story structure (foliage volume) could be enhanced for some target species (i.e., willow flycatcher). By allowing salt cedar to establish, it could reduce costs associated with high stem density planting required for suitable willow flycatcher nesting, create longer lasting habitat (due to lower height of mature tamarisk trees compared to cottonwood and willow), and due to its longer flowering season diversify and increase insect abundance over the breeding season - a conservation goal of the Plan. This concept does not need to be fully described and fleshed out, rather a bullet or note in the sections identified that support future research on the concept would give managers flexibility site design and maintenance.	
5-93	Table 5-13	Changed Circumstances – Insufficient water for restoration actions. As described in the table, restoration water (assumed purchased or leased for restoration) could be reduced during shortages and available water (at a reduced amount) would be distributed among sites in consultation with the USFWS. This remedial measure could have a direct effect on habitat quality (e.g., decrease within-patch moisture) and long-term impacts (e.g., decreasing restoration success of some areas). In the worst case, a restoration site or revegetation action could fail and have to be recreated or replaced adding cost to the program and delaying offsetting mitigation actions. Thus, the parties should consider an agreement to give restoration water senior priority among users on the river (up to the ~57, 400 af), as this would protect all users from failure of mitigation efforts and provide assurance that water will be available to meet the HCP and coverage requirements.	AGFD-6

Mr. Steve Spangle
August 17, 2004
2

5-67 5-79	31 44	Project activities related to relict leopard frog should be coordinated through the Relict Leopard Frog Conservation Team: add reference within text: "Conservation activities will be coordinated though the Relict Leopard Frog Conservation Team and be consistent with the Conservation Strategy (Relict Leopard Frog Conservation Team *in prep*). (see citation in lit cited below)	AGFD-7

Specific Comments

Page	Line	Comment	
2-16	15	Existing wells determined to be pumping Colorado River water - explain the process for determination of quantity of water (B. Werner indicated a ongoing USGS Study to quantify, and a cap on amount withdrawn).	AGFD-8
2-17	11-23	Clarify the actions and locations of the actions that are covered under the HCP. Our interpretation of this paragraph is that only those actions that occur below the top of the conservation pool of Lake Mead would be covered in the HCP. Actions that may influence water input into Lake Mead but occur upstream on the Virgin or Muddy River are not included.	AGFD-9
3-6	8	Salt cedar does not actively displace native vegetation, rather plant species composition shifts in response to alterations to the physical environment (i.e., decrease flooding, lower groundwater table). Suggest change to: "*The substantial changes to the hydrology of the Colorado River favored salt cedar establishment, while limiting recruitment and persistence of cottonwood-willow communities.*"	AGFD-10
3-11	22	Same note as 3-6: suggest change to: ....*Tamarix that have increased in abundance over the last 50 years, while the extent of native riparian vegetation has declined.*"	AGFD-11
3-11	40	Lack of flooding to remove salts is the ultimate cause of salinization of soil. Also, restoration plans later in the document acknowledge the need in some areas to flush soils to decrease salinity. Suggest deleting sentence; "~~Once established saltcedar~~..."	AGFD-12
3-14	7	"remaining" should be "*remain*"	AGFD-13
Table 4-2	4th column	Add units – Elevation "*(ft)*"	AGFD-14
5-19	34	Conservation Area Site Selection – consider a bullet that allows managers to assess site selection from a landscape ecological perspective: Wiens (2002) describes this as "consider the ecological consequences of where things are located in space, where they are relative to other things, and how these relationships and their consequences are contingent on the characteristics of the surrounding landscape mosaic at multiple scales in time and space" Suggest text:	AGFD-15

Mr. Steve Spangle
August 17, 2004
3

		• *"site location and objectives will we evaluated in context of landscape ecology, which considers the site's relationship with existing habitat and target species at multiple spatial and temporal scales"*	AGFD-15
5-24	41	Change June 30 to "*August 30*". Flycatcher can nest through August, and fledges may be present through September (this change would parallel text on p. 5-37, line 3).	AGFD-16
5-33	1	Insert text ..."reproductive success of the southwestern willow flycatcher *(following criteria in the Recovery Plan; USFWS 2002b)*."	AGFD-17
5-51	3	Change red to "*yellow*"	AGFD-18
5-76	29	Add text: ...."maintained (e.g., control of salt cedar) *where appropriate*, irrigation to maintain"... - See general comments.	AGFD-19

Programmatic Environmental Impact Statement - Volume I

General Comments (See comments for HCP above – EIS page numbers identified below)			
Table 2.1-9 (2-56) 2-59	Last row (21-22) 4	Tamarisk management (No change needed – wording captures recommendation) Change "would" to "*could*"	AGFD-20
2-70		Water allocation and priority – see HCP Comment	AGFD-21
2-84 2-89	17 10	Relict Leopard Frog Include reference to Conservation Team and Strategy and identify amount of funds provided (*$10,000/yr for 10 yrs*) Include Reference to Team	AGFD-22

Specific Comments			
Page	**Line**	**Comment**	
2-63	25	Landscape Ecological perspective (See 5-19 HCP comments above) consider adding a similar bullet	AGFD-23
3.4-43	20	"2.4.1.2" - Check water allocation reference; should this reference the section on page 2-70?	AGFD-24
3.9-8	13	Resulting - change to "*resulted*"	AGFD-25
3.9-9	35	Can the ppm units also be listed as mg/L to coincide with the footnote – would put the ppm concentration in context.	AGFD-26
3.9-16	5	Change "2.1.1.7" to "*2.1.1.4*"	AGFD-27
3.9-18	3	Change "success" to "*failure*" to clarify that high selenium concentrations harm reproduction in birds and fish.	AGFD-28

The Department has no comments concerning Volume III (Biological Assessment) or Volume IV (Appendices) AGFD-29

Literature Cited

Wiens, J.A. 2002. Riverine landscapes: taking landscape ecology into the water. Freshwater biology. 47:501-515.

Relict Leopard Frog Conservation Team. *in prep*(2004). Conservation Agreement and Rangewide Conservation Assessment and Strategy for the Relict Leopard Frog (*Rana onca*).

State of California - The Resources Agency ARNOLD SCHWARZENEGGER, Governor
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
Eastern Sierra Inland Deserts Region - R6
4665 Lampson Avenue, Suite J
Los Alamitos, CA 90720

August 18, 2004

Mr. Steve Spangle
U.S. Fish and Wildlife Service
2321 W. Royal Palm Rd., Ste.103
Phoenix, AZ 85021

Re: Lower Colorado River Multi-Species Conservation Program Draft Programmatic Environmental Impact Statement/Environmental Impact Report (No. 1999081029), Draft Habitat Conservation Plan, and Biological Assessment

Dear Mr. Spangle:

The Department of Fish and Game (Department) appreciates this opportunity to comment on the above-referenced documents, and provides comments on fish and wildlife resources that may be affected by the implementation of the covered activities and conservation plan proposed as part of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP). The overall goal of the LCR MSCP includes three primary components: 1) conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species listings under the Federal Endangered Species Act of 1973 (ESA); 2) accommodate current water diversions and power production and optimize opportunities for future water and power development, to the extent consistent with law; and 3) provide the basis of "take" authorization (legal compliance) pursuant to ESA. The LCR MSCP would be in effect for a period of 50 years. The planning area for the LCR MSCP is the historic floodplain from Lake Mead to the Southerly International Boundary between the United States and Mexico (near San Luis, Arizona) and areas with elevations up to and including the full pool elevations of Lake Mead, Lake Mohave, and Lake Havasu. Within the state of California, portions of Riverside, San Bernardino, and Imperial counties are included in the project area.

Within California, the Department has jurisdiction over the conservation, protection and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Fish and Game Code Section 1802). Also, the Department is a Trustee Agency under the California Environmental Quality Act (CEQA) Guidelines,, responsible for ensuring that fish and wildlife resources of the State are addressed pursuant to CEQA (Cal. Code of Regs., tit. 14, § 15386). In these capacities, the Department provides the following comments on the above-referenced documents.

RECEIVED
AUG 19 2004
U.S. FISH & WILDLIFE SERVICE
ES FIELD OFFICE-PHOENIX, AZ

Conserving California's Wildlife Since 1870

To date, the Department has provided comments on most documents associated with the LCR MSCP. Through this correspondence, the Department has identified several issues that in the Department's view should be addressed in more detail in subsequent drafts of the LCR MSCP documents. The Department incorporates, by reference, the following correspondence: 1) Comments in Response to the Notice of Preparation (NOP) for the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Draft Environmental Impact Report (DEIR) (August 28, 2000); 2) Comments in Response to the Draft Suggested Rewrite for Indirect Effects Analysis dated July 11, 2002 (August 8, 2002); 3) Comments in Response to the Addendum to the 2nd Draft Conservation Plan and Impact Assessment, 3rd Draft Impact Summary Table, Chapter 5 Adaptive Management Plan and Chapter 6 Monitoring and Research (October 30, 2002); 4) Draft Final Report on A Review of the Second Administrative Draft "Conservation Plan For the Lower Colorado River Multi-Species Conservation Program" (December 17, 2002); 5) Draft California Department of Fish and Game recommended mitigation concept for minimizing and fully mitigating impacts to covered species dependent on mesquite and mesquite mixed land cover types; 6) CDFG comments on the May 22, 2003 preliminary Draft LCR MSCP HCP (June 23, 2003) 7) Comments in Response to the Notice of Preparation of a Draft EIS/EIR for the Lower Colorado River Multi-Species Conservation Program (SCH # 1999061029) (November 26, 2003). Copies of these documents can be obtained by contacting the Department's Blythe Field Office at (760) 922-6508. We have reiterated some, but not all of our previous comments in this letter. CDFG-1

<u>Draft Programmatic Environmental Impact Statement/Environmental Impact Report</u>

Page 1-5, section 1.1.4 (Use of the EIS/EIR) CDFG-2

The Department recommends including the covered activities as part of the action and analyzing the effects of those activities in this EIS/EIR. This analysis should include a comprehensive assessment of all environmental resources that could be affected by the covered activities.

Page 1-7, section 1.2.2 (Actions for Which ESA Coverage is Requested) CDFG-3

The covered activities should be described in greater detail to allow for a comprehensive evaluation of effects to the environment.

Page 1-16, sections 1.2.3 (Purpose of the EIS/EIR) and 1.2.4 (Scope of the EIS/EIR) CDFG-4

Please see comments for Page 1-5, section 1.1.4.

Page 1-19, section 1.4.1.3 (Cooperating, Responsible, and Trustee Agency Actions) CDFG-5

As stated in various sections of the Draft Programmatic Environmental Impact Statement/Environmental Impact Report, Draft Habitat

Conservation Plan, and Biological Assessment, the covered activities and conservation plan will cause "take" of State-listed threatened, endangered, and candidate species (e.g., entrainment at points of diversion, stranding of fish and desiccation of fish eggs, reduced survivorship and recruitment due to degraded or loss of requisite habitat conditions, increased competition, higher rates of predation/nest parasitism, direct destruction of nest and eggs, etc.). As a result, a CESA permit may need to be obtained from the Department. In addition, compliance with Fish and Game Code section 1600 et seq. may be required for covered activities and the conservation plan, as applicable. For issuance of a CESA permit and a streambed alteration agreement under Fish and Game Code section 1600 et seq., the Department would be acting as a responsible agency. CDFG-5 con't

Page 1-20, section 1.4.2 (Future Permits and Approvals Required to Implement Specific LCR MSCP Projects) CDFG-6

Please see previous comments for Page 1-19, section 1.4.1.3.

Page 2-3, section 2.1 (Alternatives Carried Forward for Detailed Analysis) CDFG-7

Because the Department believes that the covered activities should be considered as part of the proposed action, the range of alternatives considered in the EIS/EIR should focus on different strategies for implementing the covered activities, not merely for the Conservation Plan.

Page 2-6, Table 2.1-2

The Department believes that the habitat-models most likely underestimate the extent of covered species habitat, thereby underestimating the extent of the impacts (see our comment on draft HCP, Page 3-19, Section 3.4.1.1). The Department recommends re-evaluating the adequacy of the habitat models and adding a monitoring component to the LCR MSCP in order to evaluate deviations from the hydrology model to ensure that unanticipated impacts will be mitigated. The LCR MSCP should identify and commit to a conflict resolution process in the event of disagreement between the agencies regarding the quantification of unforeseen impacts. CDFG-8a

The Department believes that impacts noted as superscript d are significant, and should therefore be accounted for in delineating covered species impacts. The conservation plan should afford additional compensatory acreage to ensure that these impacts are mitigated. CDFG-8b

Pages 2-75 - 86, section 2.1.1.5 (General Species Conservation Measures) CDFG-9

The Department recommends that most, if not all, created habitat be established and managed on agricultural lands. As noted throughout the EIS/EIR there are several advantages to converting agriculture land to created habitat.

AMM1 – The Department recommends that the conservation plan should strive to minimize and avoid impacts to all California special status species in all land cover types, not just the covered species. Many of the covered and other special status species, such as, but not limited, to the Crissal thrasher, loggerhead shrike, and the fully protected ringtail cat use salt cedar land cover as habitat. CDFG-10

AMM3 – This measure needs to also apply to all special status bird species and birds protected under the Migratory Bird Treaty Act, birds in Fish and Game Code section 3505, and the incidental take of unlisted raptors or the destruction of their nests or eggs (Fish and Game Code, § 3503.5). This measure also needs to define the bird breeding season. The Department recommends that pre-activity surveys be conducted. CDFG-11

Please clarify why this measure also applies to covered activities operation, maintenance, and replacement (OM&R) of drains and canals, when the covered activities are not part of the proposed action being analyzed in this EIS/EIR. This is confusing, as it leads the reader to believe that the covered activities are of part of the action covered in this EIS/EIR. CDFG-12

As noted in our Page 1-19, section 1.4.1.3 comments, these activities will result in "take" of state listed species, and may require the issuance of a CESA permit. CDFG-13

AMM5 and AMM6 – Please see comments in AMM3. CDFG-14

MRM1 – Except for the southwestern willow flycatcher, the distribution and status of the other covered species is not well known. The Department recommends that surveys and studies be implemented to better understand the distribution and status of all other covered species. CDFG-15

MRM3 – Please provide details on the criteria that will be used to determine when this MRM will be implemented. CDFG-16

Species-Specific Conservation Measures for Covered Species – The Department does not agree that restoration and creation of a few choice habitats will necessarily benefit numerous species and that these created habitats will benefit and mitigate impacts to all covered species. The extent to which neotropical migrant stream/riparian species will benefit is uncertain, and, to our knowledge no data exist demonstrating that stream or cottonwood-willow restoration efforts will increase stream or riparian invertebrate production, or the rates of ecological adjustment of restored systems. The amount of conservation and the types of conservation measures should be based on an understanding of the complex nature of ecosystems and the niche required. CDFG-17

The conservation plan needs to develop specific criteria that will be used to measure the amount of species habitat created. In addition, we suggest that you define the term "habitat." CDFG-18

Water diversions at storage reservoirs and diversion reservoirs are included as California covered activities. The Department believes that installation of fish screens may be necessary to minimize and fully mitigate impacts, pursuant to Fish and Game Code, Section 2081, to covered fish species resulting from entrainment at some diversion points. Requirements and conditions of the Department's Statewide Fish Screening Policy (June 2001) and the Department's Fish Screening Criteria should be taken into account. Those documents are available on the Department's website, as follows: CDFG-19

Statewide Fish Screening Policy is located at
http://www.iep.ca.gov/cvffrt/DFGpolicy.htm

Fish Screening Criteria is located at
http://www.iep.ca.gov/cvffrt/DFGCriteria2.htm

As noted in various sections of the Draft EIS/EIR and Draft HCP, rates of entrainment of covered fish species will increase at points of diversion with implementation of augmentation measures. As such, the Department believes that it is appropriate to initiate discussions with California water diverters on the issue of fish screen installation, pursuant to Fish and Game Code, Sections 5980 and 5981.

To obtain Incidental Take Authorization from the Department, pursuant to Fish and Game Code, Section 2081, impacts to state-listed species must be minimized and fully mitigated, and meet all other CESA requirements. CDFG-20

DETO2 – Please add minimization and avoidance measures. Please see our comments for AMM3. CDFG-21

Page 2-86 – 88, section 2.1.1.6 (Timing of the Implementation of Conservation Measures) CDFG-22

We are concerned that the timing of implementing the conservation measures does not fully consider the time that will be needed to establish fully functioning covered species habitat. This aspect is critically important considering that impacts to covered species may occur prior to or concurrently with implementation of conservation measures. The conservation measures should be implemented before the impacts occur, to ensure that fully functioning habitat is created.

Page 3.0-1, section 3.0 (Affected Environment and Environmental Consequences) CDFG-23

In the Department's view, the covered activities should be considered as part of the proposed action. As such, the covered activities should be analyzed in this chapter to evaluate impacts to all environmental resources that may be affected by these activities.

Page 3.4-1, section 3.4 (Biological Resources) CDFG-24

This section needs to make clear that the identified impacts are impacts to only the covered species habitat (delineated from the species habitat models and the impact analysis), and not to all riparian and marsh cover types and associated resources. The extent of riparian (> 70,000 acres) and marsh (> 8,000 acres) cover types that will be affected by covered activities is substantially greater than the impacts identified here. If the intended purpose of this document was to analyze the effects of the covered activities on all environmental resources this needs to be clearly stated, and the analysis needs to be updated so that all resources are addressed. .

The term "habitat" as it is used in this section is misapplied throughout the document. The document improperly uses "habitat" and "land cover type" interchangeably. A clear distinction needs to be maintained between species habitat and land cover type. See our comment below on the Draft HCP, Page 3-19, Section 3.4, for the Department's recommended definition of "habitat." "Land cover type" can be defined as the dominant feature of land surface discernable from aerial photographs, defined by vegetation, water, or human uses. CDFG-25

Page 3.4-29 - 41, section 3.4.2.1 (Alternative 1: Proposed Conservation Plan) CDFG-26

The title of this section does not correspond to the action proposed in this EIS/EIR. Please revise the title to read: "Alternative 1: Proposed Conservation Plan and Issuance of an ESA section10 (a)(1)(B) Permit."

The Department recommends that the impact analysis be expanded to include special status species, as well as the covered species. Covered activities should also be addressed here. CDFG-27

The Department believes that the amount of "take" resulting from the covered activities will be greater than that identified and summarized in Table 2.1-2. Please see our previous comments for Page 2-6, Table 2.1-2 and *Species-Specific Conservation Measures for Covered Species*. CDFG-28

The Department does not agree with the following statement, "*Habitat loss would generally occur as small patches scattered along the length of the LCR, which would affect few individuals (of both covered and non-covered species) at any one location and increase the likelihood that displaced* CDFG-29

individuals could survive in nearby similar habitats." There is no basis for this finding given the lack of specificity and detailed information on life history requirements, status, and distribution for many of the covered and non-covered species. CDFG-29 con't

The Department does not agree with the co-lead agencies' assessment that covered activities are "not likely" to have area-wide or regionally significant impacts on covered species. On the contrary, the Department believes that implementing the covered activities will have regionally significant impacts on the geographic distribution of some of the covered species, especially with regard to their continued existence within California. The California side of the LCR lies at the western edge of the elf owl, Arizona Bell's vireo, Gila woodpecker, and other species' geographic range. The continued existence of these species in California is seriously threatened by further loss and/or degradation of suitable breeding habitat along the entire length of the California side of the LCR. Implementation of flow-related activities will adversely affect nesting success and suitability of occupied habitat if groundwater and flow elevations lower sufficiently to remove surface water or moist soil conditions. Moisture in the soils provides the proper humidity, ground cover, solar protection, and supports the diversity and abundance of prey species (e.g., insects). In addition, groundwater and flow reduction will preclude the regeneration, impede the growth or growth rates, and cause a reduction in canopy vegetation volume of existing or future riparian land cover types changing both species composition and structural characteristics within forest stands. This will affect nesting success, suitability of occupied habitat, and/or inhibit the development of replacement habitat. CDFG-30

Covered activities will also have regional effects on nesting southwestern willow flycatchers because a large proportion of their extant habitat along the LCR between Parker Dam and Imperial Dam will be affected. In 2000, there were 13 nesting pairs along this reach of the LCR. The majority, if not all, of these occupied sites will be lost and/or degraded due to the loss of requisite microsite conditions. Of the 1,460 acres of occupied willow flycatcher habitat between Parker and Imperial Dams, 909 acres are located within California (USFWS 2001). CDFG-31

The Department recommends that measures specified in the conservation plan be directed towards offsetting impacts to all other special status species, not just covered species. As drafted, the draft EIS/EIR does not identify the impacts, analyze the impacts, and evaluate the applicability and extent to which the conservation measures will offset those impacts to all other special status species. CDFG-32

Impact BIO-1 – The text in this subsection is unclear, and we recommend it be revised. As presented, the text implies that impacts to all riparian resources from covered activities will be limited to 3,352 acres. It needs to be made clear that the identified impacts are only to covered species habitat (delineated from the species habitat models and the impact analysis), and not to all riparian cover types and associated resources. CDFG-33

Impact BIO-2 – To avoid impacts to burrowing owls, the Department recommends that the LCR MSCP incorporate our 1995 burrowing owl guidelines which tiered from the 1993 burrowing owl consortium document. CDFG-34

Impact BIO-4 - The text in this subsection is unclear, and we recommend it be revised. As presented, the text implies that impacts to all marsh resources from covered activities will be limited to 254 acres. It needs to be made clear that the identified impacts are only to covered species habitat (delineated from the species habitat models and the impact analysis), and not to all marsh cover types and associated resources. CDFG-35

The 254 acres of marsh is actually that which is assumed to be lost. The amount that will be affected is 8,035 acres. The 8,035 acres of affected marsh may be degraded to varying degrees. CDFG-36

Page 7-1, section 7.1.1 (Federal Laws, Regulations, and Executive Orders) CDFG-37
Fish and Wildlife Coordination Act, 16 U.S.C. 661-666.
The federal proponent has not yet initiated consultation with the Department for the activities proposed in the draft EIS/EIR, draft HCP, and Biological Assessment. The Department recommends that this consultation occur, and is willing and ready to discuss impacts which will occur as a result of implementation of the LCR MSCP.

Page 7-10, section 7.1.3 (State of California Laws and Regulations) CDFG-38
Implementation of all LCR MSCP covered activities and conservation measures within California will need to comply with all relevant California Fish and Game Code provisions, including, but not limited to Fish and Game Code section 1600 *et seq.*, section 1900 et seq., and sections 2081, 3503.5, 3511, 4700, and 5515.

<u>Draft Habitat Conservation Plan</u> CDFG-39

Page 2-1 – 20, Chapter 2 (Description of Covered Activities)
The document states that covered activities for reaches 3-6 include all operation, maintenance, and replacement (OM&R) of existing water diversion and conveyance facilities, and electrical generation and transmission facilities. OM&R activities include daily operation of the water diversion, conveyance and delivery systems, electrical power

generation and transmission facilities, and routine maintenance as needed to ensure continued operations, and replacement of facilities or system components as needed to maintain system capacity and capabilities. The conservation plan does not afford conservation measures to mitigate for effects of these activities. These impacts need to be quantified so that appropriate mitigation can be developed to offset these impacts. Applicants applying for a CESA permit must provide detailed information as specified in the California Code of Regulations, Title 14, Section 783.2 (Incidental Take Permit Applications) for these and all other covered activities. CDFG-39 con't

Page 2-11, section 2.3.1.1 (Reach 1)
Please specify the amount of Metropolitan Water District's (MWD) allocation retained in Lake Mead and the amount of Mexican Treaty Obligation (1.5 MAFY) transported through MWD's Colorado River Aqueduct. Are these amounts in addition to or included in the 1.574 MAFY proposed flow reduction below Parker Dam? CDFG-40

Page 3-19, section 3.4 (Status of Covered and Evaluation Species habitats in the LCR MSCP Planning Area)
In this section we suggest that you define the terms "habitat-based approach" and "habitat". Based on the collective available literature, these terms are misapplied throughout the document. We recommend the following definitions: CDFG-41

- Habitat-based Approach (Management) - a management focus that de-emphasizes individual species, focusing instead on maintaining habitat or ecosystem quality, including ecological processes important in maintaining the characteristic biodiversity of an area (Meffe et al. 1994); and CDFG-42

- Habitat - the resources and conditions present in an area that produce occupancy, including survival and reproduction by an organism. Habitat is organism-specific; it relates the presence of a species, population, or individual (animal or plant) to an area's physical and biological characteristics. Habitat implies more than vegetation or vegetation structure; it is the sum of the specific resources that are needed by organisms (Hall et al. 1997). CDFG-43

Page 3-19, section 3.4.1.1 (Species Habitat Models)
The Department does not agree with the approach used to develop the habitat-models used to delineate extent of covered species habitat. The Department believes that the habitat-models most likely underestimate the extent of covered species habitat, therefore, underestimating the extent of the impacts. We offer the following points supporting our position: CDFG-44

- The bulk of relevant scientific literature indicates that species habitat includes more than plant species composition and vegetation structure, therefore, these parameters alone should not be used to gauge the suitability of or estimate the extent of species habitat; CDFG-45

- The term "habitat" as it is used in this document is misapplied. The term "habitat" refers to species-specific requirements and should not be used interchangeably with land cover type. CDFG-46

- The collective available scientific information provides valuable insight into critical ecological processes and factors that influence habitat use patterns and fecundity along the LCR for many of the covered riparian species and include: (1) cooler temperatures, humidity, and presence of hydrologic conditions (e.g. soil moisture availability, surface water, etc); (2) a diversity of vegetation resulting from well-developed herbs, shrubs, and trees and leading to a large number of foraging layers, greater canopy closure, and available nest sites (i.e. structural characteristics); and (3) proximity and ready access to water during the nesting season. Suitable environmental conditions are present in all LCR riparian land cover types and are critical components of species habitat. As an example, the southwestern willow flycatcher historically has been associated with cottonwood/willow land cover. Years of scientific study have shown that the flycatcher makes use of a site not because of the type of trees that are present, but rather because all of the requisite biological components (e.g. soil moisture availability, surface water, forage base, and structural characteristics are present at a site) exist. There is no scientific basis to assume that this is also not the case for many of the other covered species. Critical ecological processes and factors should be fully considered and combined with a comprehensive understanding of covered species habitat requirements to accurately delineate and quantify the extent of species habitat. CDFG-47

- Habitat models assume that for many of the covered riparian species, habitat is limited to extent of cottonwood/willow land cover type. This assumption is not corroborated by the scientific literature. On the contrary, there is much scientific information that confirms extensive use of honey mesquite, salt cedar-honey mesquite, salt cedar-screwbean mesquite, and salt cedar land cover types. CDFG-48

Tables 3-8, 3-10, and 3-11

Backwater delineations are missing in tables 3-8 and 3-10. The amount of existing habitat for the covered fish species, presented in table 3-11, corresponds to only the total river and reservoir acreage. This indicates that existing backwater acreage was not included in delineating the extent of total covered fish habitat. An accurate delineation of all three aquatic CDFG-49

land cover types is necessary to clearly illustrate the complete extent of all existing habitat.

CDFG-50

Page 4-5, sections 4.2.1.3 (Backwater, Marsh, and Riparian Land Cover Area)
Annual median flows do not capture nor accurately predict monthly and seasonal river stage and ground water reductions. An analysis of April flow reductions predicted that implementation of flow-related covered activities would drop river surface elevation by as much as 3 feet. Given that river stage and ground elevation reductions will be greatest in April (Spring), it is reasonable to believe that this may translate to broader biological and ecological implications on species and vegetation communities as this corresponds to the breeding and growing season. The Department believes that the hydrology analysis does not adequately address seasonal flow and ground water reductions and its corresponding effect to biological resources.

CDFG-51

Page 4-7 - 9, sections 4.2.1.4 (Key Assumptions Related to Groundwater Effects on Land Cover Types and Covered Species Habitat)
Groundwater well data collected during the 1992-1994 PVID Pilot Project where a change in point of delivery of approximately 100 KAFY of Colorado River water showed a 1-2 foot reduction in groundwater elevations. The proposed flow reduction below Parker Dam is approximately fifteen times greater than the PVID Pilot Project, but groundwater reductions are expected to be comparable to those observed during the 1992-1994 PVID Pilot Project. These findings do not substantiate the accuracy of the predicted groundwater reductions. There is a lack of corroboration between groundwater reductions predicted by the hydrology analysis and groundwater reductions observed from quantitative well data collected during the 1992-1994 PVID Pilot Project. This issue needs to be addressed.

CDFG-52

The Department disagrees with the assumption that flow-related covered activities will not result in the loss of mesquite and mesquite communities and covered species habitat supported within these cover types. A review of pertinent scientific literature revealed that several key environmental variables, many of which will be affected by flow-related covered activities, influence the recruitment, survivorship, and plant species composition of mesquite and mesquite mixed communities along the lower Colorado River. Depth to groundwater and its spatial correlation of floodplain elevation, periodic flooding, and inundation frequency exert the greatest influence, followed by soil texture and moisture holding capacity, light availability, and site elevation. The Department believes that the impacts to mesquite, mesquite communities, and covered species habitat supported within these cover types will be comparable in scope and magnitude to the range of effects that are expected to occur to cottonwood-willow from flow-related covered activities.

Page 4-11, Table 4-2 CDFG-53

Table 4-2 illustrates annual median flows and river surface elevation for operations under ongoing flow-related activities and with the implementation of future flow-related activities. The analysis of impacts to the change in surface area for river reaches 3, 4, 5 (4.2.3.3) and backwaters (4.2.3.4) states, "*The change in surface area in response to reduced depth under median flows indicates the change in river surface area would be relatively small (i.e. generally less than 1%).*" This statement understates the impacts during times of greatest possible reduction, such as the month of April, when surface elevation may fall as much as 3 feet. Similar tables displaying monthly or seasonal flow and surface elevation changes should be created in order to assess the greatest possible impacts from flow-related activities.

Pages 4-34 and 4-37, Sections 4.5.4.1 and 4.5.6.1 (Effects of Flow-Related Activities) CDFG-54

Sections 4.5.4.1 and 4.5.6.1 state, "*Increased stranding relative to the existing conditions depends on site-specific channel morphology and the relationship of reduced depth in association with ongoing daily flow fluctuation. Change in stranding and desiccation would likely be minimal.*" This statement is unsubstantiated. To date, no surveys have been conducted to quantify razorback sucker and bonytail chub stranding and desiccation rates in the LCR. Given the small population size, their preference to spawn over gravel/cobble substrate, and the increased reduction of this substrate as a result of flow-related activities, it is more likely that stranding and desiccation rates of egg and early larval life stages will increase, especially in months when surface reductions are greatest.

Page 5-68, Section 5.7.24 (Flannelmouth Sucker) CDFG-55a

Section 5.7.24.1 states, "*Implementation of covered activities and LCR MSCP measures could result in the loss of up to 85 acres of flannelmouth sucker habitat, stranding and desiccation losses in the river and backwaters, and entrainment of individuals at diversions.*" Conservation measure FLSU1 then states, "*Of the 360 acres of the LCR MSCP created backwaters, at least 85 acres will be created in reach 3...*" In order for this species to benefit from the proposed conservation measures, a more detailed account of where this habitat will be created is necessary. The 85 acres of created backwater habitat will be of little benefit to flannelmouth suckers if this habitat is created entirely in the southernmost section of reach 3. Similarly, acres of lost razorback sucker and bonytail chub habitat should be quantified and delineated by river reach. In order to achieve maximum benefits from created habitat, habitat should be replaced on a proportional basis in the river reach where the habitat loss occurred. CDFG-55b

CDFG-56

Page 2, superscript e, Table 5-11 (Comparison of Species- Specific Habitat Impacts to Created LCR MSCP Habitat)

The Department does not agree with the following statement, "The effects of the loss of 466 acres of backwater on this species is fully mitigated by both creating 360 acres of backwater that will be managed to provide greater habitat values for this species and by stocking juvenile fish to substantially augment the existing population over the term of the LCR MSCP (Section 5.7.4, "Bonytail", and Section 5.7.6, "Razorback sucker")." The Department does not believe that the proposed compensation acreage, even when combined with the other conservation measures, will adequately address the impacts to the covered fish species.

CDFG-57

Page 9-5, Section 9.4 (Alternative Measures to Avoid the Taking of Razorback Sucker, Bonytail, and Flannelmouth)

The first goal listed in the LCR MSCP states, "*conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed.*" The Department believes to achieve this goal, naturally recruiting populations of razorback sucker and bonytail chub must become established. In order to establish naturally recruiting populations, it is essential to protect the sexually mature adults and improve the likelihood that juveniles reach sexual maturity. Fish screening at diversion points could accomplish both objectives, becoming more important with entrainment rates expected to increase as a result of fish augmentation efforts. The Department believes it is prudent to take a proactive approach to combat potential losses associated with entrainment well before the implementation of fish augmentation occurs.

The Department appreciates the opportunity to comment on the LCR MSCP, and looks forward to working with your staff to ensure that our concerns are considered and addressed as part of this planning effort. If you have any questions regarding this letter please call me at (760) 922-6508.

Sincerely,

Chris Hayes
Senior Environmental Scientist

cc: State Clearinghouse
Ms. Laura Simonek, MWD
Mr. Glen Gould, USBR

Arnold
Schwarzenegger
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Jan Boel
Acting Director

August 19, 2004

Laura Simonek
The Metropolitan Water District of Southern California
700 N. Alameda Street
Los Angeles, CA 90012-2944

Subject: Lower Colorado River Multi-Species Conservation Program
SCH#: 1999061029

Dear Laura Simonek:

The State Clearinghouse submitted the above named Joint Document to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on August 18, 2004, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 1999061029
Project Title Lower Colorado River Multi-Species Conservation Program
Lead Agency Metropolitan Water District of Southern California

Type JD Joint Document

Description The Lower Colorado River Multi-Species Program (LCR MSCP) is a joint federal, non-federal program designed to provide incidental tak coverage for endangered species and provide a comprehensive plan for restoration of sensitive habitat along the Lower Colorado River from Lake Mead to the Southerly International Boundary with Mexico. Metropolitan is the CEQA Lead Agency for the preparation of the joint EIR/EIS. The U.S. Bureau of Reclamation and the U.S. Fish and Wildlife Service act as the NEPA Lead Agencies.

Lead Agency Contact

Name Laura Simonek
Agency The Metropolitan Water District of Southern California
Phone 213-217-6242 **Fax**
email
Address 700 N. Alameda Street
City Los Angeles **State** CA **Zip** 90012-2944

Project Location

County Riverside, San Bernardino, ...
City Blythe, Needles
Region
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways 95
Airports
Railways
Waterways Colorado River
Schools
Land Use

Project Issues Wetland/Riparian; Wildlife; Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Cumulative Effects; Fiscal Impacts; Flood Plain/Flooding; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Recreation/Parks; Soil Erosion/Compaction/Grading; Toxic/Hazardous; Vegetation; Water Quality; Water Supply

Reviewing Agencies Resources Agency; Regional Water Quality Control Board, Region 7; Department of Parks and Recreation; Native American Heritage Commission; Department of Food and Agriculture; Office of Historic Preservation; Department of Fish and Game, Headquarters; Department of Fish and Game, Region 6; Colorado River Board; Caltrans, District 11; Caltrans, District 8; State Water Resources Control Board, Division of Water Rights; State Water Resources Control Board, Division of Water Quality; State Lands Commission

Date Received 06/18/2004 **Start of Review** 06/18/2004 **End of Review** 08/18/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

KENNY C. GUINN
Governor

STATE OF NEVADA

JOHN P. COMEAUX
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
Fax (775) 684-0260
(775) 684-0209

MR OFFICIAL OFFICE COPY		
RECEIVED		
REPLY DATE 8/12/04		
DATE	INITIALS	CODE
8/13		LC 2011
CLASSIFICATION		
PROJECT		
CONTROL NO.		
FOLDER I.D.		
KEYWORD		

August 10, 2004

Mr. Glen Gould
U.S. Bureau of Reclamation
P.O. Box 61470 – LC 2011
Boulder City, Nevada 89406-1470

Re: SAI NV #E2004 -212
Project: EIS EIR – Lower Colorado River Multi-Species Conservation Program

Dear Mr. Gould:

Thank you for the opportunity to review the above referenced project.

The State Clearinghouse, as per Executive Order 12372, has processed the proposal and has no comment. Your proposal is not in conflict with state plans, goals or objectives. If you have any questions, please contact me at (775) 684-0209. NSC-1

Sincerely,

Michael J. Stafford
Nevada State Clearinghouse Coordinator/SPOC

NEVADA STATE CLEARINGHOUSE

Department of Administration
Budget and Planning Division
209 East Musser Street., Room 200
Carson City, Nevada 89701-4298
(775) 684-0209
Fax (775) 684-0260

DATE: June 21, 2004

Governor's Office	Legislative Counsel Bureau	Conservation & Natural Resources - Director's Office
Agency for Nuclear Projects	PUC	State Lands
Energy Office	Transportation (General)	Environmental Protection
Agriculture Department	Transportation (Airspace)	Forestry
Minerals Commission	Office of Traffic Safety	Conservation Districts
UNR Bureau of Mines	UNR Library	State Parks
Economic Development	UNLV Library	Water Resources
Tourism	Historic Preservation	Natural Heritage Program
Fire Marshal	Emergency Management	Wild Horse Commission
Human Resources	Office of the Attorney General	Wildlife Department – Director's Office
Health Division	Washington Office	Region 1 - Fallon
Indian Commission	Nevada Assoc. of Counties	Region 2 - Elko
Colorado River Commission	Nevada League of Cities	Region 3 – Las Vegas
Animal Damage Control	Public Safety	

Nevada SAI # E2004-212
Project: EIS EIR - Lower Colorado River Multi-Species Conservation Program

__ Yes __ No Send more information on this project as it becomes available.

CLEARINGHOUSE NOTES Documents may be viewed at: **http://www.lcrmscp.org/Documents/index.html**
Enclosed, for your review and comment, is a copy of the above-mentioned project. Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than August 10, 2004. Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Michael Stafford, Clearinghouse Coordinator, (775) 684-0209 or mstafford@budget.state.nv.us.

THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

____No comment on this project
_XX_Proposal supported as written
_XX_Additional information below
____Conference desired (See below)
____Conditional support (See below)
____Disapproval (Explain below)

AGENCY COMMENTS:

The Nevada Department of Wildlife has been an active and integral participant in the Lower Colorado MSCP effort for the better part of 8 years. We support the funding and implementation of this MSCP which is vital to the restoaration of endemic, aquatic resources of the Lower Colorado River. NDOW -1

Brad Hardenbrook
Signature

s:\shardat\clear\clear.doc

NDOW #3
Agency

8/12/04
Date

LOCAL AGENCIES

Comment Letters

QUADSTATE
County Government Coalition

State of Arizona
County of Mohave

State of California
County of Imperial
County of Kern
County of San Bernardino

State of Nevada
County of Lincoln

State of Utah
County of Washington

August 17, 2004

Mr. Glen Gould
U.S. Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470

Mr. Steve Spangle
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021

Re: Comments on Lower Colorado River Multi-Species Conservation Program Draft Plan and Environmental Impact Statement

Dear Mr. Gould and Mr. Spangle:

We appreciate the opportunity to comment on the Draft MSCP. Our review indicates that many of our comments made on earlier internal administrative drafts and through local government's participation on the Steering Committee. Quad-1

QuadState County Government Coalition is a consortium of six county governments within the Mojave Desert. The Coalition is organized for the purpose of coordinating actions and activities on a variety of public land and natural resources issues within the 4-State region. Participation in these comments, and the Coalition's representation of local government interests officially are on behalf of three of our member counties: San Bernardino and Imperial Counties, California, and Mohave County, Arizona. These are the counties within our organization whose area borders the Lower Colorado River and who have direct interests in the planning activity and its implementation. We do not and cannot directly represent the interests the other four counties along the river; but we believe that at least in part they would not disagree with the comments contained herein.

Imperial County prepared individual comments on the plan, and I have attached their letter to me as a part of the official record. Their comments concerning the effects on flows into the Imperial Valley and the effect on the level of the Salton Sea are pertinent. We made a similar comment on one of the administrative drafts, but this does appear to be on continuing omission in analysis.

Specific comments:

1. In the Habitat Conservation Plan (HCP) portion, in Chapter 6, Governance, the on-going oversight appears to be vested in a Steering Committee. We agree with the concept. We believe it needs some amplification. First the name needs to covey something more permanent and in authority. <u>We suggest the use of Board of Directors, or Board of Governors.</u> Quad-2

   We agree with the composition as proposed, but would prefer better specificity. In the introductory paragraph the language is broad relative to the JPA: "...among Federal, state, local, and tribal parties..." However in a later paragraph initial membership is Quad-3

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Executive Director
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proposed in "seven participant groups: Federal, Arizona, California, Nevada, Native American, Conservation, and Other Interested Parties." We are not certain where local governments would fit into one of those categories except as an Other. We suggest specific wording as follows: ...and Other Interests of which at least one seat shall be for a representative of local government (county or city). An alternative suggestion would be to broaden the description to eight groups, and specifically insert Local Government after Nevada in the listing. Quad-3 con't

(By our count there are seven county governments (Clark NV, San Bernardino, Riverside and Imperial CA, Mohave, La Paz and Yuma AZ) in the area, and seven incorporated cities (Needles and Blythe CA, Laughlin NV, Bullhead City, Lake Havasu City, Parker, and Yuma AZ) within the area. Obviously they need to come together and decide on the method of their representation, but it is important at this stage of the plan to assure their presence on the continuing governing body. A case could be made that there is a role for two seats: one representing county government, another representing city government.)

2. In Chapter 7 of the HCP relative to costs, we find several factors that need revision or explanation prior to inclusion in the final document. Quad-4

a. Costs are shown as 2003. This should be updated to 2004. Even at 1% inflation (conservative) this adds $6,000,000 to costs, but is probably realistic.

b. Existing habitat maintenance is shown completed in the first 10 years with no further work required. This is probably unrealistic and we suggest at least a modest amount be included for all time periods beyond Year 10. Quad-5

c. Footnote (b) speaks of a $25,000,000 "contribution." As in our comment on the Administrative Draft, we could find no text to indicate the source of the funding—Federal appropriations, State appropriations, deposit by partners, or a combination of all three. Will such "contribution" be part of the JPA? Quad-6

d. Monitoring costs are shown, in round figures, at approximately $5 million per year in the first 15 years, dropping to $4 million in the middle period, and dropping further to $2 million in the last 30 years. We do not believe this is realistic, nor does it place sufficient priority on this activity. It has been our observation that monitoring is one of the tasks that seems to fall off first if funding for implementation becomes scarcer. At this point, while there may be some baselines for some species based on planning inventories, it is doubtful is these exist for all parameters, and even inventory techniques need to be formalized and agreed upon to assure common baselines among those carrying out the studies. We suggest front-end loading to assure interstate and interstate consistency, a larger per year commitment during the plan life, and a significant balloon in the last five years to fully document and assure assessment of the plan during its life. Quad-7

This further becomes a necessity if changes are made as a result of adaptive management decisions. It is likely that new baselines will have to be set. Further, adaptive management cannot be applied unless the fundamental data is gathered regularly and consistently.

3. All of our participants are concerned with maintaining recreation values on the river, through both water quality maintenance and improving the sports value of fishing and Quad-8

other activity in the River. Concerns expressed at the Blythe public hearing bring this aspect to the fore, but the Blythe input and reaction should not be viewed as isolated. Quad-8 con't

One of our concerns involved the maintenance of existing fish populations, even among non-natives, e.g. stripped bass, in the face of the aggressive program to restock listed species in the entire river. In a private conversation at the Henderson hearing, I was assured there was no plan to reduce non-natives with recreational value. This must be made explicit in the final plan. Quad-9

The discussion in Section 3.15 gives a good overview of the recreation activities in and along the river. The discussion gives an overview of the impacts that recreation would have on the MSCP. The text, however, fails to show the beneficial impacts to recreation in any detail that address future recreation activity, including expansion of use by the public. Besides the obvious factors such as maintenance of water quality, the MSCP should improve natural habitats that in turn should increase the number and diversity of species inhabiting the river and upland areas. Further, increasing native natural vegetation should enhance the aesthetics of the river and riparian areas making it more attractive for contemplative river experiences. Quad-10

We, and the authors, have noted that there is at least anecdotal experience from projects on Tribal lands that have resulted in increased recreational use such as picnicking and hiking; that experience should be extrapolated to at least portions of the USBR and FWS lands along the river.

4. We have several issues associated with the land acquisition program associated with implementation. Quad-11

a. Part of the charter associated with the Permanent Steering Committee (using the name of the oversight group used in the text in Chapter 6) must include public discussion and input on the acquisition of lands and water through purchase or lease, to assure full disclosure in advance of consummation. This should be done during the acquisition planning stage, not after purchases have been agreed upon between sellers and acquiring agencies. The purpose of such discussion is not to inhibit but to help direct acquisitions and assure the highest priority parcels are acquired, and to assess, up front, the costs and impacts of such acquisition.

b. Land acquisition costs (transfer of land from private to public ownership) and land use changes (shift of land from agricultural to habitat) are not fully and explicitly assessed in any of the documents. First, there is a loss of income from the land when the land is taken from production. (Not all will be from private lands since there is targeted some conversion of agriculture leases administered by BLM in the Palo Verde Valley.) Then there is the loss to tax base with conversions, even when the land stays in private ownership. Then there is a loss to tax base when land comes off the tax rolls with a transfer to public ownership. Quad-12

There are implications in the text that some of the agricultural production losses could be offset by increases in Tribal land cultivation. While somewhat offsetting in terms of community income, it does not make up the losses to local government. The explicit text in Chapter 4 indicates some 8,132 acres will be converted. This is significant. Since the Quad-13

planning is by river reaches, the specific effects to the local governments cannot be fully assessed, but the final document should attempt to portray at least a gross figure. Quad-13 con't

With two counties within the QuadState organization (Mohave and San Bernardino) and all four of the remainder (Clark, Riverside, La Paz, and Yuma) there is no offsetting increase under the Federal Payment in Lieu of Taxes (PILT) Program when land passes to Federal ownership. Since these six counties all have huge public land ownership estates, and PILT is based on population as well an acreage limitation, each presently receives the maximum payment possible, and would receive no added Federal compensation for increases in the Federal estate. Quad-14

5. In the operation of the Permanent Steering Committee we believe that a fundamental purpose and topic for regular review should be the status of listed and covered species in terms of progress to recovery. Too often plans and oversight bodies focus on the input side: land purchased, land converted, fish planted. It seems appropriate to explicitly state that the Committee will view implementation goals from an output characterization as well as looking at the input side. This ties directly to the adaptive management program and principles that the MSCP does embrace. Quad-15

Yours truly,

Gerald E. Hillier
Executive Director

Attachment: Imperial County comment

Please note: The current mailing address for QuadState Coalition is now P.O. Box 55820, Riverside CA 92517. With the change in telephone area codes in Riverside, the phone number is now (951) 683-5725, fax (951) 683-8544.

Cc: Chris Harris (by email) w/o attachment
Phil Lehr (by email) w/o attachment
G. William Lamb (by email) w/o attachment
Mike Hays, Director Land Use Services, San Bernardino County, w/o attachment
Chris Ballard, Director Planning and Zoning, Mohave County, w/o attachment
Jurg Heuberger, Director Planning and Building Department, Imperial County, w/o attachment
Bill Postmus, First District Supervisor, San Bernardino County, w/o attachment
Buster Johnson, Third District Supervisor, Mohave County, w/o attachment
Wally Leimgruber, Fifth District Supervisor, Imperial County, w/o attachment

PLANNING/BUILDING DEPARTMENT
IMPERIAL COUNTY
PLANNING / BUILDING INSPECTION / PLANNING COMMISSION / A.L.U.C.
JURG HEUBERGER, AICP,CEP
PLANNING/BUILDING DIRECTOR

July 13, 2004

Gerald Hillier
Executive Director
QUADSTATE County Govt.
Coalition (QUADSTATE)
P. O. Box 480
San Bernardino, CA 92402

SUBJECT: Response to the Draft EIS/EIR for the Proposed Lower Colorado-Multi-Species Conservation Program (LCR-MSCP)

Dear Mr. Hillier:

The Planning/Building Department received your Memorandum regarding the proposed "Lower Colorado River-Multi-Species Conservation Program (LCR-MSCP)" and the U.S. Department of the Interior/Bureau of Reclamation/Fish & Wildlife Service's "Notice of Availability" dated June 18, 2004, was received by this Department on June 23, 2004, from the Clerk of the Board of Supervisors.

In your latest Memorandum, you have indicated that the County of Imperial will not be required to provide a direct financial contribution to the 50-year Program implementation costs at this time.

The QUADSTATE Coalition represents four Counties and Supervisor Wally Leimgruber is very knowledgeable and involved in the Plan process.

After a review of the Draft EIS/EIR for the LCR-MSCP, the County is submitting the following comments on the document. Other County Departments who may also be reviewing the document could have other comments and will be submitted as a separate response.

(1) The County's General Plan and its various elements were not mentioned in the Program's, References section, pages 8-1 through 8-14, other than a reference on page 8-6 to the "1998. Imperial County Land Use Ordinance. November." As you are aware, the entire west side of the lower Colorado River from Palo Verde to the Winterhaven-Bard area is within Imperial County. The land use designations within the Land Use Element's in this section of the Colorado River, include but are not limited to, Agriculture, Government/Special Public, and Recreation/Open Space. IC-1

939 MAIN STREET, SUITE B-1, EL CENTRO, CA 92243 - 2856 (760) 482-4236 FAX (760) 353-8338
E-MAIL planning@imperialcounty.net plan98@imperialcounty.net (AN EQUAL OPPORTUNITY EMPLOYER)

Once the Program has been approved by the participating entities and the "Implementation Entity" that is to be formed changes the existing land uses within the "COA's – Conservation Opportunity Areas" for future habitat conservation, enhancement, or replacement lands, the County's Land Use Element, Conservation/Open Space Element and the Water Element may also need to be modified to reflect these changes. This may also require changing the existing zoning on the Zoning Map(s) for that area west of the Colorado River. IC-1 con't

(2) On page 1-7, "1.0 Introduction", states that future activities, e.g. the "...development of additional tribal lands for agriculture by BIA and the change in point of diversion of water on the LCR by non-Federal participants. These future activities are not part of the proposed action and are not part of the action analyzed in this EIS/EIR..." In the event there future water transfers occur from Imperial County to other non-Federal entities or Coastal communities, not only will the Imperial County General Plan and its various elements may need to be amended, but also the those water-related policies and projects within the LCR-MSCP. IC-2

Any actions taken when the Program is implemented along the lower Colorado River should be evaluated for its cumulative impacts to the Salton Sea restoration project. IC-3

If the water levels are lowered in the LCR due to implementing actions, the resulting impacts to hydro-electric generation in Imperial County through the IID hydro-electric plants should be cumulatively assessed. For example, in the event that less electrical power is generated and Imperial Irrigation District is forced to purchase higher priced power elsewhere and IID has to increase electrical rates in Imperial County, who pays for this? IC-4

If less water is provided to Imperial County for its needs, the resultant water quality will also suffer due to higher e-coli and greater pollution risks to local County residents. Who will pay for these impacts? IC-5

For future water needs for habitat conservation, enhancement and replacement areas, who will seek authorization and pay for this increased water need? Will the existing participating agencies/entities seek an allocation from the four Counties that are not required to pay at this time? IC-6

(3) On page 1-20, "1.4.2 Future Permits and Approvals Required to Implement Specific LCR MSCP Projects", the statement is made that "...Additionally, the NPS, BLM, BIA, and the Service's NWRs may modify their land management plans to be consistent with the Conservation Plan and may make decisions regarding whether to integrate this plan with other conservation actions on the LCR..." As mentioned previously, the land use activities identified in the County's General Plan and its Land Use Ordinance/Zoning Maps may also be affected and require appropriate revisions for consistency purposes. IC-7

(4) On page 6-6, "6.4 Summary of the Effects of Covered Activities and the LCR MSCP in Addition to Cumulative Effects", it states that "...Covered activities and LCR MSCP Conservation Plan effects include reduction in flow..." If less water is provided to Imperial County for its needs, the resultant water quality will also suffer due to high concentrations of e-coli bacteria and greater pollution risks to local County residents. Who will pay for these potential future health risk impacts? IC-8

(5) On page 9-1, "9.0 Persons and Agencies Contacted", there are no Imperial County representatives and/or planning representatives listed on this page. Other than one meeting that was held with the QUADSTATE representatives on February 21, 2002, no other County contacts appear to have been made in the preparation of the Draft EIS/EIR. IC-9

We look forward to participating in the development and implementation of the LCR-MSCP and the Final EIR/EIS.

If you have any questions, please contact Richard Cabanilla, Planner IV at (760) 482-4236, extension 4313.

Sincerely,

JURG HEUDERGER, AICP, CEP
Planning Director

cc: Wally Leimgruber, Supervisor, Fifth District
Roberta Burns, County Executive Officer
Darrell Gardner, Asst. Planning Director
Stephen L. Birdsall, Ag. Comm/APCO
Tim Jones, Public Works Department
Jesse Silva, IID General Manager
QUADSTATE County Govt. Coalition File
10.105

JH/DG/RC/G.Planning/Clerical/QUADSTATELCR-MSCPMemoResponseLetter

CITY OF HENDERSON
240 Water Street
P. O. Box 95050
Henderson, NV 89009

August 17, 2004

Mr. Glen Gould
U.S. Bureau of Reclamation
P.O. Box 61470-LC-2001
Boulder City, NV 89006-1470

RE: Lower Colorado River Multi-Species Conservation Program

Dear Mr. Gould,

Thank you for the opportunity to review the Lower Colorado River Multi-Species Conservation Program. The City of Henderson Community Development Department has evaluated the draft document and concurs with the implementation of the preferred alternative. Hend-1

The preferred alternative appears to have the least amount of environmental impact and all identified impacts can be mitigated.

Please contact me at 702-267-1537 if you have any questions or need further information.

Sincerely,

Sue Gray, AICP
Senior Planner

Riverfront Development Team
180 W. 1st Street, Suite E
Yuma, AZ 85364

City of YUMA

Tuesday, August 17, 2004

Mr. Glen Gould
US Bureau of Reclamation
PO Box 61470 – LC – 2011
Boulder City, NV 89006-1470

Fax: (702) 293-8023

RE: Comments Regarding the Draft Programmatic Environmental Impact Statement/Environmental Impact Report for the Lower Colorado River Multi-Species Conservation Program, June 18, 2004

Dear Mr. Gould,

Thank you for the opportunity to review this very comprehensive document regarding the proposed Lower Colorado River Multi-Species Conservation Program. In reviewing the document, we would like to offer the following additions/corrections:

Table 2.1-6: Summary of Initially Identified Conservation Areas
Yuma East Wetlands-
Of the 1,305 acres of restoration, this table only identifies 580 acres of Cottonwood/Willow habitat establishment. This is incorrect. The full 1,305 acres will contain Cottonwood/Willow, Honey Mesquite III, Riparian, or Marsh habitat types and should be eligible for habitat creation for the entire 1,305 acres of non-open water areas that are restored. Yuma-1

Section 3.1.1.1, Reach 7, lines 11 and 12, please revise to read:
Agricultural and urban areas at not highly visually sensitive **except for those properties, districts, and Landmark listed on the National Register of Historic Places within Yuma, Arizona and the Fort Yuma-Quechan Indian Reservation (see table 3.5-3).** Yuma-2

Section 3.1.1.4, lines 30 and 31, Please revise to read:
This area is generally in agricultural use or in open space, although urban development is concentrate in Yuma and small towns along I-8. This area is not highly visually sensitive **except for those properties, districts, and Landmark** Yuma-3

listed on the National Register of Historic Places within Yuma, Arizona and the Fort Yuma-Quechan Indian Reservation (see table 3.5-3). Yuma-3 con't

Thank you again for the opportunity to review and comment on this document. We look forward to the implementation of the program so that habitat can be re-established on the Lower Colorado River for the benefit of wildlife and the adjacent communities. Yuma-4

Sincerely,

Matthew Spriggs, AICP
Senior Planner/Redevelopment Specialist
Riverfront Development

cc: Mr. Steve Spangle, US Fish and Wildlife Service
Charles Flynn, Riverfront Development Manager
Kevin Eatherly, CIP Project Manager

TRIBAL

Comment Letters

Fort Mojave Indian Tribe

NORA McDOWELL - Chairperson
SHAN LEWIS - Vice Chairman
DEBBIE JACKSON - Secretary
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8/18 | GM | 2011
CLASSIFICATION
PROJECT IC49-0804
CONTROL NO.
FOLDER I.D.
KEYWORD

August 13, 2004

Glen Gould
US Bureau of Reclamation
PO Box 61470 - LC - 2011
Boulder City, Nevada 89006 - 1470

Dear Mr Gould.

The Fort Mojave Indian Tribe has received a copy of the Draft Environmental Impact Statement for the Lower Colorado River Multi-Species Conservation Program and congratulates the preparers for a generally excellent job on this monumental work. However, we would like to offer comments on the section on socioeconomics - Volume I, Section 3.16. Ft. M-1 Ft. M-2

Section 3.16 bases the value of agriculture on the 1997 Census of Agriculture and the 2000 Census of Population and Housing. The numbers in these censuses are for whole counties and, with the possible exception of Imperial County and Yuma County, do not well represent the value of the land and it's production in the intensely farmed valleys along the Colorado River. The Fort Mojave Tribe has land and farms in Mohave County Arizona, San Bernardino County California and Clark County Nevada. We are very familiar with the value of agriculture is this area and find some of the presented numbers to be understated in the extreme while others are too high.

For example, Table 3.16-1 lists 212 farms for Mohave County with 997,171 acres. If just the Colorado River area were used, the number would be 7 farms and 13,000 acres. The Table lists the average value of Mohave County farmland at $ 247 per acre yet nearly all of the farming is in Mohave Valley where land is valued in excess of $ 5,000 per acre. The Table lists 1,455 farms in San Bernardino County but there are only three farms within a hundred miles of the Colorado River and two of these are on the Fort Mojave Indian Reservation. Ft. M-3

There are also some questionable items in Table 3.16 - 4. Again considering only the Colorado River region, the farm employment loss figures are way too high and we do not understand why they differ from county to county. The Tables lists the value of agricultural products sold as $1,242 per acre in Mohave County, $ 15,624 in San Bernardino County and $ 5,556 in Clark County, this is the same area with the same crops, the same operators and similar values. Ft. M-4

The Fort Mojave Indian Tribe appreciates the opportunity to make these comments. There are MSCP Opportunity Areas on the Reservation and the Tribe may wish to participate but the negotiations would go much smoother if both parties had a similar appreciation for the value of the land. Ft. M-5

Sincerely

John Algots, Director
Department of Physical Resources

cc

Nora McDowell, Chairperson

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August 18, 2004

Sent by facsimile, electronic mail and first class mail

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ggould@lc.usbr.gov

Re: Comments of Quechan Indian Tribe on Draft Programmatic Environmental Impact Statement/Environmental Impact Report; Draft Habitat Conservation Plan; Biologial Assessment; and Appendices for Lower Colorado River Multi-Species Conservation Program (June 18, 2004)

Dear Mr. Gould:

On behalf of the Quechan Indian Tribe ("Tribe"), we are filing these comments on the Draft Programmatic Environmental Impact Statement/Environmental Impact Report ("DEIS"); Draft Habitat Conservation Plan ("Draft HCP"), Biologial Assessment ("BA"), and Appendices for the Lower Colorado River Multi-Species Conservation Program (June 18, 2004). The Tribe recognizes the significant effort that your office has devoted to preparating these documents.

I. The Quechan Tribe's Senior Water Rights

The Tribe's Fort Yuma Reservation is located in southwestern Arizona and southern California near Yuma, Arizona. The Tribe possesses present perfected rights from the mainstem of the Colorado River pursuant to the Decree and supplemental Decrees (1979 and 1984). The amounts, priority dates, and state where the rights are perfected are as follows: MSJM-1

Amount (AFY)	Acreage	Priority Date	State
51,616	7,743	Jan. 9, 1884	California

This water is diverted at Imperial Dam through the Yuma Project Reservation Division - Indian Unit. These water rights are vested property rights that were reserved to meet the present and future needs of the Fort Yuma Reservation. MSJM-1 con't

In addition, a Supreme Court decision issued on June 19, 2000, allows the Tribe to proceed with litigation to claim rights to an additional 9,000 acres of irrigable lands and about 78,000 AFY of water. Proving this claim would increase the water rights for the Fort Yuma Reservation.

II. General Concerns

The HCP, DEIS and BA streamline the environmental review process for 50 years for projects that involve Colorado River water rights, nearly all of which are junior to the Tribe's. At some point, the Tribe will seek economic and other opportunities that require consumptive use of its senior water rights. The federal trust responsibility requires that the HCP, DEIS and BA expressly state that nothing in the documents reviewed and resulting final decisions will interfere with the Tribe's present or future exercise of its senior water rights, or impose on the Tribe an undue burden of conserving threatened and endangered species or species proposed for listing. MSJM-2

Additionally, the Tribe requests that the HCP, DEIS and BA assume that the Tribe will exercise its presently unexercised senior rights, as it does for Arizona, California and Nevada. *See, e.g.*, § 2.2.2 (Arizona's speculative future flow-related covered activities), § 2.3.2 (California's speculative future flow-related covered activities), § 2.4.2 (Nevada's speculative future flow-related covered activities). The HCP, DEIS and BA should include the Tribe's present and future exercise of its senior rights, through flow- and non-flow related activities, in their respective "covered activities" and "foreseeable" activities sections. Similarly, the HCP, DEIS and BA should analyze the effects of implementing the Tribe's present and future covered activities. MSJM-3 MSJM-4

Additionally, the HCP, DEIS and BA should include or otherwise accommodate the Tribe's full use of its senior water rights, whether developed or not, in determining the environmental baseline. If not, the Tribe will bear an unfair burden under the Endangered Species Act when it decides to exercise its senior rights in the future. The HCP acknowledges that flows in Reach 6, which travels along the eastern boundary of the Fort Yuma Reservation, are presently "minimal" and contaminated, and that the native habitat has been serious altered. Draft HCP at 3-8. Although the Tribe is not responsible for the degraded state of Reach 6, it should not have to bear the burden of this degraded baseline when it seeks to use its senior water rights in the future. MSJM-5

III. Draft Environmental Impact Statement

Goals and Objectives for the Conservation Plan (p. 2-2): We suggest that this section include the goal of not interfering with the Tribe's senior water rights, lands, or cultural resources. MSJM-6

Conservation Area Site Selection, Design, and Management (p. 2-70 to 2-75): The Tribe is concerned that the government's use of Colorado River water for the conservation and restoration projects will interfere with the Tribe's senior water rights. MSJM-7

Cultural resources (p. 3.5-5 to 3.5-16): The Tribe is concerned that Reclamation has only initiated a Class I report. First, we query why the report remains incomplete, since the draft was completed in 2000. A complete report is necessary so that the DEIS can fully evaluate impacts. Lithic scatters, lithic and ceramic scatters, rock rings, rock alignments, cleared circles and trails have been recorded in virtually all of the conservation areas. (p. 3.5-12) A proactive, comprehensive analysis of cultural resource impacts is critical since many cultural resources have already been destroyed. We also question Reclamation's decision not to prepare a more intensive Class II or Class III report now, if it presently knows where a particular project will occur. MSJM-8

Finally, the DEIS contains no impact analysis or real mitigation measures, contrary to the requirements of NEPA and federal cultural resource protection laws. Instead, the DEIS merely defers the study of cultural resource impacts to a later unspecified date. "Mitigation" constitutes no more than nonbinding promises to comply with existing law. (p. 3.5-17 to -18) The DEIS vaguely states, "Projects located on tribal lands also might require additional analysis." (p. 3.7-2) MSJM-9

Environmental justice (p. 3.7-5 to -6): The Tribe is concerned about the loss of agricultural jobs, which could disproportionately affect its members and reservation residents. The DEIS should estimate the number of agricultural jobs projected to be lost on the Fort Yuma Reservation. MSJM-10

Hydrology and water quality (Ch. 3.9): The Tribe requests that the planned conservation projects, which will require a water supply of about 57,400 acre-feet of water per year (p. 3.9-16), and the substantial current and future actions sanctioned by the DEIS, HCP and BA, not interfere with the Tribe's senior water rights, or groundwater within the Fort Yuma Reservation boundaries. The Tribe is also concerned about pollution of the Lower Colorado through pesticide releases, and by increasing concentrations of perchlorate, selenium, Chromium 6 and other dissolved salts that result from water evaporation. (p. 3.9-17) MSJM-11

Indian trust assets (Ch. 3.10): The Tribe is concerned with impacts to its members' collection of natural plants; the long-term dedication of tribal land to habitat establishment projects; and interference with tribal water rights. MSJM-12

Cumulative impacts (Ch. 4): We suggest including the Laguna Reservoir Storage Restoration Project in the cumulative impacts discussion. MSJM-13

IV. Draft Habitat Conservation Plan

We are not aware that the Tribe has agreed to the use of its land for the proposed conservation projects, which appear to include the Yuma East Wetlands Pilot Project and Laguna Old Channel Restoration. Nor are we aware that the Tribe has agreed to the proposed annual lease rate of $325/acre. We understand that the Bureau will require the Tribe's full agreement before proceeding with any projects on Fort Yuma Reservation lands. Additionally, we request that the DEIS and HCP how much of these projects will occur within the boundaries of the Fort Yuma Reservation, and explain whether the project will affect river flow, ground water below the Reservation, tribal water rights and cultural resources. Finally, please inform us if any other conservation projects implicate Quechan lands. MSJM-14

Thank you for this opportunity to comment.

Sincerely yours,

MORISSET, SCHLOSSER, JOZWIAK & McGAW

Mason D. Morisset
Attorneys for the Quechan Indian Tribe

cc: Mike Jackson Sr., President, Quechan Indian Tribe

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ORGANIZATIONS

Comment Letters

NATIONAL WILDLIFE FEDERATION®
People and Nature: Our Future Is in the Balance

Western Natural Resource Center

NATIONAL WILDLIFE FEDERATION®
www.nwf.org™

August 18, 2004

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

RECEIVED
AUG 18 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Ms. Laura Simonek
Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, CA 90012
Via Facsimile 213-217-7701

Dear Mr. Spangle, Mr. Gould, and Ms. Simonek:

The following are comments submitted by the National Wildlife Federation (NWF) regarding the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), Biological Assessment (BA), and Habitat Conservation Plan (HCP) for the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), Arizona, Nevada, and California.

The National Wildlife Federation is the nation's largest, not-for-profit, conservation and education organization with more than four million members and supporters. NWF promotes the conservation of natural resources and protection of the earth's environment by working cooperatively with individuals, organizations and 47 state affiliates on local, regional, and national environmental issues.

NWF appreciates the opportunity to comment on the plans for such a biologically important area. We support the concept of Alternative 1: Implementation of the Proposed Conservation Plan and Issuance of Section 10(a)(1)(B) Permit (Proposed Conservation Plan), however, we have concerns that the program will not successfully "...work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed" for the following reasons: reliance on restocking of endangered fish while ignoring the threats to their survival caused by the introduction of non-native species and a severely altered riverine NWF-1

3500 Fifth Avenue, Suite 101, San Diego, California 92103 Tel: 619-296-8353 Fax: 619-296-8355

ecosystem; failure to analyze and mitigate effects to burrowing owls; and the failure to address shortage conditions that may very likely have the effect of decreasing the availability of water necessary to maintain the constructed habitats under this program, as well as yet further decreasing groundwater levels and thus jeopardizing the survival of riparian species covered by this program. The following detailed comments seek to improve specific areas of EIS, BA and HCP and we hope they will be incorporated into the final plans. NWF-1 con't

Take Authorizations

National Wildlife Federation does not necessarily agree with positions taken by Reclamation that section 9 liability does not attach to nondiscretionary actions (the second full paragraph on BA page 2-2). The same applies to this statement on BA page 3-2 and HCP page 2-2: "Because Reclamation's role in water delivery is nondiscretionary and not subject to section 7 consultation, it is Reclamation's position that these activities do not create section 9 responsibility for Reclamation." This is not supported by the ESA. "[T]he taking of a protected species by <u>any</u> person (including a federal agency) violates section 9 of the ESA" unless authorized via a section 7 consultation or section 10 incidental take permit. *Sierra Club v. Babbitt*, 65 F.3d 1502, 1505 (9th Cir. 1995) (emphasis in original). There are no other waivers to section 9. *See also* 16 U.S.C. § 1538; HCP at 1-4. NWF-2

Non-Federal Non-Flow Activities

The BA and HCP must clarify the extent to which stocking of non-native sport fish is a covered activity. In BA Section 6.3, it is considered a cause of cumulative effect (and therefore, not covered). In Section 5.6, it is a covered activity (BA at 5-79 (impacts of stocking on razorback sucker); 5-78 (impacts on bonytail)). For example, Nevada stocks rainbow trout, but is not including the activity in the LCR MSCP (HCP 2-18). The EIS/EIR, however, states that Nevada DOW is seeking coverage for trout stocking (EIS/EIR at 1-15). Please clarify whether Nevada's stocking efforts are covered by the MSCP or elsewhere, and adjust your impacts analysis accordingly. NWF-3

No Determination of Adverse Impact

It appears that these documents do not adequately analyze the effects to designated critical habitat. NWF-4

Reclamation and Conservation Measures

The document should more clearly state that the past conservation measures are only counted for the past actions for which they were developed. NWF-5

Reclamation's Modeling Assumptions

A major flaw in the hydrological model is that it fails to account for the likelihood that climate change will affect the hydrology of, and demand within, the Colorado River basin states. Climate change impacts could reduce inflows by as much as 20 percent.[1] Such reductions in inflow would further exacerbate the trend toward system shortage, with resultant adverse impacts on NWF-6

[1] See L. Nash and P. Gleick, 1991, The sensitivity of streamflow in the Colorado basin to climatic changes, *Journal of Hydrology* 125: 221-241 and L. Nash and P. Gleick, 1993, The Colorado River Basin and Climatic Change: The Sensitivity of Streamflow and Water Supply to Variations in Temperature and Precipitation, Washington, DC: US EPA, EPA230-R-93-009, 121 pp.

habitat and listed species. Another flaw is that the model assumes operation of the Yuma Desalting Plant in 2023 (BA at 5-4). If Reclamation continues with the assumption of operating the Plant, this BA must also consider the effects of such an assumption on listed species and their habitats. Operation of the Plant will have significant environmental impacts on the Colorado River delta, particularly the Cienega de Santa Clara. NWF-6 con't

Take Mitigation

Bonytail and Razorback Sucker

The conservation measures for the bonytail and razorback sucker are insufficient to minimize and mitigate because the measures to stock razorback suckers and bonytails are not targets, but assumptions (HCP at 5-40, 5-45). As stated, the MSCP may cease stocking if there are factors in the reach that are not conducive to the survival of stocked fish. However, as long as the threats of non-natives and the loss of ecosystem function remain, survival is questionable. Should stocking cease, "other management, research, and monitoring needs that would minimize and mitigate incidental take" would be funded. What are these "other" actions, who and when determined, and how will we know they do indeed minimize and mitigate? Mitigation should compensate for lost habitat or individuals; research does not address the impacts (HCP Handbook at 3-23). NWF-7

Burrowing Owl

The LCR MSCP DEIS/DEIR fails to address the impacts to Burrowing Owls. NWF-8

A. The LCR MSCP fails to analyze and mitigate impacts to burrowing owls pursuant to CEQA.

The California Environmental Quality Act (CEQA) declares that it is the policy of the state to "[p]revent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities" (California Public Resources Code, section 21101(c)). In addition, Section 15065 of the CEQA guidelines requires a finding of significant impact if a project has the potential to "reduce the number or restrict the range of a rare or endangered plant or animal."

While burrowing owls are not currently listed as threatened or endangered under the state or federal ESA, these owls are considered to be a state Species of Special Concern under CESA. In fact, California Department of Fish and Game (CDGF) has a Staff Report on Burrowing Owl Mitigation (1995). This report was developed to assist CDFG to analyze, under CEQA, impacts to burrowing owl and develop appropriate mitigation.

Burrowing owls occur in the areas impacted by the LCR MSCP. In fact, the draft version of the MSCP had estimated that up to 795 acres of burrowing owl habitat would be destroyed and 8,132 acres of foraging acres would be lost due to MSCP activities habitat (see Administrative Draft, LCR MSCP Biological Assessment dated September 26, 2003). Given the prevalence of burrowing owls in both canals and agricultural lands, it is likely that these activities will also result in the destruction of owl burrows, including immature owls.

In the most recent draft of the LCR MSCP, the discussion of impacts to burrowing owl is absent. There is no reference to the amount and type of habitat lost or impacted. Instead, there is only a brief discussion that burrowing owls will not be significantly impacted as the lands impacted are *only* agricultural lands (EIS/EIR at 3.4-32). NWF-8 con't

The deletion of the discussion of impacts violates CEQA's requirement that impacts are fully disclosed and discussed. Second, the loss of 795 acres of owl habitat and more than 8,000 acres of foraging habitat should be considered significant and should be mitigated. The state burrowing owl population is on the decline. The population in the lower Colorado River area is the last stronghold of owl populations in California. While CDFG declined to list the owl, in its status review, it did note the heavy reliance of owls on agricultural lands, particularly in the Palo Verde and Imperial Valleys. Thus, the LCR MSCP's dismissal of impacts due to the program's limitation to agricultural lands runs counter to what CDFG has stated are essential lands for the continued survival of the burrowing owl in California (CDFG Evaluation of Petition to List the Western Burrowing Owl, October 2003).

In order to satisfy the requirements of CEQA, the project proponents should reanalyze the impacts of this project on burrowing owls, and make a finding of a significant impact on the burrowing owl. Mitigation should be developed utilizing CDFG's Burrowing Owl Guidelines, including avoiding the destruction of occupied burrows.

B. The LCR MSCP fails to analyze and mitigate the impacts to burrowing owls pursuant to Fish and Game Code sections 3503 and 3503.5. NWF-9

As discussed above, the Administrative Draft of the LCR MSCP discussed impacts to burrowing owl. These impacts included the possible destruction of occupied burrows/nests if ground-disturbing activities occurred during nesting season (Administrative Draft, LCR MSCP Biological Assessment, p. 5-47). California Fish and Game Code prohibits the take, possession or destruction of the nest or egg of any bird of prey, including burrowing owls (Fish and Game Code Section 3503.5). If the LCR MSCP is permitting ground-disturbing activities during owl nesting season, this project's applicants will likely be liable for violating the Fish and Game Code. Therefore, the LCR MSCP must address these possible impacts to burrowing owl by constructing mitigation prohibiting the destruction of nests. These mitigation measures could include surveying prior to ground-disturbing activity.

The Limitrophe (Reach 7)

The LCR MSCP is missing what may be the premier opportunity to conserve species on the Lower Colorado River. This area is the limitrophe reach of the river, known in MSCP terminology as reach 7. This reach of the Colorado contains stands of cottonwood-willow with a much higher density than that found elsewhere on the Lower Colorado, 18% of land cover in the first 10 kilometers below Morelos Dam as compared to 1-2% as a maximum land cover value along the Lower Colorado River between Lees Ferry and Morelos Dam, even in wildlife refuges (Hinojosa-Huerta et al., 2003. Rapid Ecological Assessment of the Limitrophe Zone of the Colorado River, prepared for Environmental Defense). Significantly, these cottonwood and willow trees have established due to recent overbank flooding since 1980, and have been maintained by relatively high groundwater levels. Surface water in reach 7 is a regular feature, NWF-10

providing breeding sites for insects that are food for resident and migrating birds. These conditions have together allowed a healthy native ecosystem to flourish. However, the maintenance of these conditions is not guaranteed, as drought and local groundwater pumping are both likely to deplete the water available to the limitrophe. NWF-10 con't

The LCR MSCP has an opportunity in the limitrophe both to protect habitat whose future is uncertain, as well as to augment this habitat. While the HCP proposes creating cottonwood-willow sites by planting trees and irrigating them, the limitrophe is far better suited to conservation and restoration based on instream flows. Here, a modest baseflow in the river channel, plus occasional floods, would secure the future of this excellent habitat.

The LCR MSCP could contribute significantly to conserving habitat on the Lower Colorado River by adopting an ongoing focused effort by the Cocopah Indian Tribe, and supported by National Wildlife Federation, to create an international conservation area (see DEIS/DEIR at 4-24). This process has been underway for several years, and is paralleled by an effort in Mexico to protect the Colorado River riparian corridor from the northern extent of the boundary of the Biosphere Reserve of the Colorado River Delta and Upper Gulf of California.

We hope that the LCR MSCP can be amended to reflect this opportunity. In addition, we note that the LCR MSCP documents incorrectly characterize both the physical and biological qualities of the limitrophe, reach 7. NWF-11

1. Throughout the LCR MSCP documents, flows in reach 7, the limitrophe, are erroneously characterized. The text itself is contradictory at times, stating that it "has some flow from dam seepage, but the majority of the reach is generally dry" (DEIS/DEIR 3.0-2) and that "much of the flow in the river downstream of Morelos Dam is return flows from upstream irrigation districts" (DEIS/DEIR at 3.9-7). Neither of these statements accurately characterizes the source or quantity of flows in the limitrophe. In general, these flows can be understood to come from a variety of sources, including:
   a. Seepage from Morelos Dam.
   b. Flows that are released at Morelos Dam, including both flood flows (which occurred more than 25% of years 1980-2000) and other flows that Mexico chooses not to divert, such as occasional over-deliveries from the United States.
   c. Irrigation return flows from Mexico.
   d. Wasteways (at 11 miles and 21 miles) in the United States that release several thousand acre-feet annually in non-flood years (Ruth Thayer, Bureau of Reclamation, personal communication 8/6/04).
   e. Groundwater flows from both the United States and Mexico. The quantity of groundwater flow into the Colorado River channel in the limitrophe is unknown; however, a recent study demonstrates that depth to groundwater at the edge of the riparian corridor is no greater than 1-2 meters, and that groundwater levels exceed river elevation, suggesting that the direction of flow is into the river (Zamora-Arroyo, et al., 2001. Regeneration of Native Trees in Response to flood releases from the United States into the delta of the Colorado River, Mexico. J. Arid Environments 49:1).

While most of these inputs are not quantified, the average total flow in the limitrophe in non-flood years is 22,000 acre-feet, and in flood years is 2,120,000 acre-feet (Cohen and Henges-Jeck, 2001. Missing Water: The Uses and Flows of Water in the Colorado River Delta Region, Pacific Institute). NWF-11 con't

2. The importance of reach 7, the limitrophe, for several of the LCR MSCP covered species is neglected: NWF-12

a. The limitrophe is an important stopover site for migrating southwest willow flycatchers in their migration movements before they reach their breeding grounds (Garcia-Hernandez et al., 2001. Willow Flycatcher (*Empidonax traillii*) surveys in the Colorado River delta: implications for management. J. Arid Environments 49:1). It has been well documented, in general for landbirds, that the quality and availability of stopover sites during migration is one of the key factors determining survivorship rates for these species. The description of this bird in Appendix I, "Status of LCR MSCP Covered Species" fails to mention the importance of stopover sites to this migrant (Appendix I at I-7).

b. Other key species of conservation concern in the limitrophe are the Yellow-billed Cuckoo, Arizona Bell's Vireo, and Summer Tanager, all of which were found present in recent surveys of the limitrophe (Hinojosa-Huerta et al., 2003. Rapid Ecological Assessment of the Limitrophe Zone of the Colorado River, prepared for Environmental Defense). Descriptions of these birds in Appendix I, "Status of LCR MSCP Covered Species" fails to mention their presence in the limitrophe (Appendix I at I-49, I-61, and I-69). NWF-13

Conservation Areas and Tribes
The National Wildlife Federation recommends that interested and willing tribes within the MSCP planning area be given priority for conservation area sites. NWF-14

Implementing Agreement Must Be Issued for Comment Before Any Permit Is Issued
As indicated by the MSCP documents, an Implementing Agreement "will be prepared" that "will describe assurances and other commitments," BA at 2-102, and "will specify the legal obligations, roles, and responsibilities of each signatory" (HCP at 7-9). The Implementing Agreement is in the title of the Federal Register notice, but not included in the HCP, BA, EIS or Appendices. It would be helpful to be able to review the implementing agreement along with all the draft documents available at this time for public comment. NWF-15

Thank you for the opportunity to comment. Please do not hesitate to contact me if you have questions.

Sincerely,

Myra Wilensky

Myra Wilensky
Regional Representative

/MKW

6

DEFENDERS OF WILDLIFE • ENVIRONMENTAL DEFENSE
GRAND CANYON WILDLANDS COUNCIL
PACIFIC INSTITUTE • SIERRA CLUB
YUMA AUDUBON SOCIETY

August 18, 2004

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Dear Mr. Spangle, Mr. Gould, and Ms. Simonek:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR), Biological Assessment (BA), and Habitat Conservation Plan (HCP) for the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), Arizona, Nevada, and California.

These draft documents fail to convince the reader that the proposed actions will "conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed." The construction of 8,132 acres of native riparian habitat, and the reactive approach of restocking native fish rather than changing the conditions (e.g., a severely altered hydrograph and the presence of non-native fish) that threaten their survival, will not promote the recovery of listed species. Nor will these limited actions mitigate for the additional impacts caused by the further dewatering of the reaches between Parker and Imperial Dams, representing a loss of more than 28% of 'normal' flows, due to the projected change in point of diversion of as much as 1.574 million acre-feet (MAF) of Colorado River water. Further, the document fails to address the environmental impacts of shortage conditions on the system, which could very likely decrease the availability of water necessary to maintain the constructed habitats, as well as yet further decreasing groundwater levels, jeopardizing the survival of riparian species. DW-1a DW-1b DW-1c

In general, the document misleads and deceives the reader, by comparing the impacts of DW-2

1

the implementation of the LCR MSCP with a "no action" alternative that assumes that the covered activities would still occur. The question should not be whether limited habitat construction is preferable to this false alternative of no such habitat construction, but whether the limited conservation offered by the MSCP would compensate for, much less work toward the recovery of, the additional habitat that will be lost by the additional harms to the river due to the projected loss of an additional 1.574 MAF of water in reaches 4 & 5. An appropriate comparison, to meet the intent of NEPA, would be to inform the reader by comparing the benefits of the proposed action with the losses created by the 'covered actions,' and assessing whether the covered species can withstand these losses. We suspect that these losses far outweigh the potential benefits, but this draft document fails to provide sufficient information to make an informed comparison. **DW-2 con't**

Neither the BA nor the HCP meet Endangered Species Act (ESA) requirements. Until the deficiencies outlined below are remedied, FWS cannot issue an incidental take permit (ITP) or biological opinion (BO). **DW-3**

Reclamation's Biological Assessment is Insufficient **DW-4**

The purpose of section 7 consultation is to insure that the agency action "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat." 16 U.S.C. § 1536(a)(2). A jeopardy determination by FWS means that the action "would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02. The BA does not contain a description of the action, does not contain the correct action area, does not evaluate the full range of impacts to listed species, and does not determine whether or not there is an adverse impact to listed species. Before submittal to FWS, Reclamation must remedy these defects, as described below.

Reclamation Must Better Define the Covered Actions

A biological assessment / request for initiation must contain a description of the action. 50 C.F.R. § 402.14(c)(1). First, the BA must make consistent the parties seeking consultation. The table of contents indicates six federal agencies are seeking ESA section 7 coverage: Reclamation; WAPA; NPS; BIA: FWS; and BLM. However, on pages 1-5 and 2-1, WAPA and BLM are omitted. Page 2-2, chapter 2 "describes the activities of four Federal agencies. . ." This is carried over to the HCP. *See* HCP at 1-6 (stating the BA covers federal actions of Reclamation, NPS and BIA).

WAPA Covered Actions

"WAPA will extend contracts to current customers and offer new contracts to new customers." BA at 2-78. This implies a non-discretionary activity, when in fact WAPA may offer amended contracts to current customers upon expiration. *See* HCP at 1-10 ("Upon termination, the contracts will either be extended or WAPA . . . will offer new contracts"). There would then be some flexibility in the timing and fluctuations of daily releases that could change **DW-5**

for the benefit of the endangered native fishes. **DW-5 con't**

FWS Covered Actions

FWS's issuance of a section 10 permit is not consistently included in the list of covered actions. FWS must clarify if this BA serves for their intra-Service section 7 consultation, and if so, include in the assessment impacts analyses for the take permit. *See e.g.*, "This LCR MSCP BA serves as a written request . . . to initiate formal interagency consultation with the USFWS on actions conducted by Reclamation, the [] WAPA, the NPS, the BIA, and the BLM . . . This LCR MSCP BA also serves the USFWS for their intra-Service section 7 consultation on the issuance of a section 10 permit for the non-Federal covered activities and USFWS actions related to the diversion of water from the LCR." BA at 1-11. Later, though, intra-Service consultation is not among the actions described in Section 2.6. **DW-6**

BLM Covered Actions

Please cite to the previous section 7 consultations to which BLM was a party. BA at 101. Please include those consultations in section 4.6, Consultation History. Please do the same for FWS, BIA, NPS and WAPA. **DW-7**

Reclamation's Covered Actions **DW-8**

Delivery to contract holders

Reclamation states that "[a]nnual water deliveries to entitlement holders are nondiscretionary because such deliveries are required by the Decree and water contracts when water is available." BA at 2-8. *See also* Table 2-4; BA at 3-2. Reclamation further states that consultation with water users during Part 417 reviews is nondiscretionary. Table 2-19. These statements oversimplify and conflict with previous statements.

In a previous BA written for the LSCP MSCP and incorporated in this document, Reclamation stated that the Secretary "may have limited discretion over such conditions as non-use, non-beneficial use, or water conservation." Description and Assessment of Operations, Maintenance, and Sensitive Species of the Lower Colorado River, Final Biological Assessment, August 1996 (1996 BA) at 25. In addition, regarding Part 417, Reclamation "may make annual determinations relating to water conservation measures and delivery, distribution and use of Colorado River water pursuant to 43 CFR Part 417." 1996 BA at 25. The BA goes on to say that the following actions are discretionary: "determination of which contractors will be consulted;" "determination that water orders are, or are not, within that reasonably required for beneficial use;" and "the amount water orders are reduced." 1996 BA at 25-26.[1]

In fact, in 2003, Reclamation exercised its discretion through the Secretary's decision to initiate a Part 417 review of the Imperial Irrigation District's (IID) water order and use, and its subsequent decision to reduce deliveries to IID.

[1] The Department of the Interior reiterated this position during the proceedings in *Imperial Irrigation District v. Norton*, Case No. 03CV0069W (S.D. Cal. April 17, 2003).

Yuma Groundwater Pumping **DW-9**

The BA and EIS/EIR state that the Yuma Area Water Resources Management Group Drainage Project, a Reclamation project, was projected to begin in 2003 but that Reclamation has not yet completed environmental compliance. BA at 2-44-46 and DEIS/DEIR at 4-25-26. If this project did begin last year, please cease any Project activity until environmental compliance is complete, so that Reclamation and the public can assess the impact of lowered groundwater levels on the limitrophe.

Inadvertent Overrun and Payback (IOP) Policy **DW-10**

The BA has extended the IOP policy to Arizona users despite not doing so in the original proposal and its environmental impact statement. BA at 3-6. "The IOP modeling analysis assumed that Arizona's Colorado River agricultural users would not utilize the policy because they have no past record of exceeding their entitlements. Their entitlements appear to be more than adequate to cover the fluctuations in use commonly experienced." Final EIS, Implementation Agreement, IOP Policy and Related Federal Actions (Oct. 2002) at 11-228. This policy was analyzed over a 30-year period where it was assumed the Central Arizona Project would assume any overruns. Given that the baseline and/or future flow model showed shortage cuts to CAP, either the FEIS's assumption or the extension of the policy to Arizona users here is faulty.

Reclamation's Future Actions and Programmatic Coverage **DW-11**

This chapter must address the process for ESA compliance for future actions. In other words, answer whether the federal agencies are seeking programmatic coverage, for which there will be future ESA consultations when the proposals and their impacts can be more defined. *See e.g.*, BA at 2-10 ("In the event that Reclamation proposes to adopt shortage criteria in the future and such criteria are consistent with the information presented in Appendix J, Reclamation will seek ESA compliance for the criteria through the LCR MSCP"); BA at 2-31 ("Specific compliance actions will be undertaken, as appropriate, at any time any specific flow-related actions are proposed for Secretarial approval. Any such compliance will be consistent with, and be incorporated into, the LCR MSCP Conservation Plan, as appropriate"); *cf.* BA at 2-2 ("[A] Federal agency's inclusion of an action in this chapter is . . . a proposal for ESA coverage for the covered actions"); BA at 2-2-2-3 ("Reclamation intends that its actions be covered and included in the LCR MSCP BA as particularly described in the narrative and tabular portions of this chapter . . ."). Reclamation must explicitly state which actions are seeking coverage, and if the coverage is programmatic, describe how and when FWS will reexamine the covered action.

Take Authorizations

Reclamation must delete the reference to section 9 in the second full paragraph on BA page 2-2. The same applies to this statement on BA page 3-2 and HCP page 2-2: "Because Reclamation's role in water delivery is nondiscretionary and not subject to section 7 consultation, it is Reclamation's position that these activities do not create section 9 **DW-12**

responsibility for Reclamation." This is not supported by the ESA. "[T]he taking of a protected species by any person (including a federal agency) violates section 9 of the ESA" unless authorized via a section 7 consultation or section 10 incidental take permit. *Sierra Club v. Babbitt*, 65 F.3d 1502, 1505 (9th Cir. 1995) (emphasis in original). There are no other waivers to section 9. *See also* 16 U.S.C. § 1538; HCP at 1-4. **DW-12 con't**

Non-Federal Non-Flow Activities **DW-13**

The BA and HCP must clarify the extent to which stocking of non-native sport fish is a covered activity. In BA Section 6.3, it is considered a cause of cumulative effect (and therefore, not covered). In Section 5.6, it is a covered activity. *See* 5-79 (impacts of stocking on razorback sucker); 5-78 (impacts on bonytail). For example, Nevada stocks rainbow trout, but is not including the activity in the LCR MSCP. HCP at 2-18. The EIS/EIR, however, states that Nevada DOW is seeking coverage for trout stocking. EIR/EIR at 1-15. Please clarify whether Nevada's stocking efforts are covered by the MSCP or elsewhere, and adjust your impacts analysis accordingly.

Reclamation Must Redefine the Scope of the Consultation, and Analyze Effects Accordingly **DW-14**

Reclamation's request for consultation must contain a "description of the specific area that may be affected by the action." 50 C.F.R. § 402.14(c)(2) (emphasis added). Reclamation refers only to a "planning area" as adopted by the MSCP. *See* BA at 1-8. The planning area "comprises areas up to and including the full-pool elevations of Lakes Mead, Mohave, and Havasu and the historical floodplain of the Colorado River from Lake Mead to the SIB." *Id.* The regulations define 'action area' as "all areas to be affected directly or indirectly by the Federal action and not merely in the immediate area involved in the action." 50 C.F.R. § 402.02. Reclamation's definition incorrectly follows the MSCP "Planning Area" rather than area that may be affected by the covered activities. This definition does not comply with ESA regulations, is based on the location of Conservation Plan activities rather than location of impacts of Covered Activities, and is incorrect.

Reclamation argues that it has complied with this definition of action area, albeit in a roundabout fashion: "The effects of all covered Federal and non-Federal activities, whether discretionary or not, have therefore been described and covered in this LCR MSCP BA . . ." BA at 2-2 (emphasis added); *see also* HCP at 2-2. Unfortunately, this is simply untrue. Reclamation's discussion omits any impacts on U.S.-listed species and habitats which occur outside the Planning Area, including the razorback sucker, southwestern willow flycatcher, totoaba, vaquita, and desert pupfish. **DW-15**

Reclamation attempts to justify this action area by postponing ESA compliance for proposed discretionary actions. *See* BA at 2-1 ("None of the Federal agencies covered by this LCR MSCP Conservation Plan are seeking ESA compliance through the LCR MSCP Conservation Plan for any potential impacts of proposed discretionary actions on species that may be listed pursuant to the ESA in the Republic of Mexico (i.e., outside the borders of the United States). To the extent that any such compliance may be required in the future pursuant to **DW-16**

applicable law, the Federal agencies will address such compliance at the time any discretionary Federal actions are actually proposed."). Reclamation has included actions in this BA because it seeks ESA coverage for that action; therefore, Reclamation must consult on all the impacts of the covered action at the time of the consultation. "[A] Federal agency's inclusion of an action in this chapter is . . . a proposal for ESA coverage for the covered actions." BA at 2-2. If any covered action has impacts in Mexico, this BA must expand the action area to encompass those impacts, regardless of the timing of the action. Until it does so, assertions like these -- the "Conservation Plan provides for conservation of covered species to address all Federal actions along the LCR described in Chapter 2 of the LCR MSCP BA," HCP at 1-6 (emphasis added) -- are untrue. **DW-16 con't**

Reclamation Must Redefine Baseline Because It Is Already Below the Jeopardy Threshold

As a result of Reclamation's failure to correctly define the action area, the environmental baseline and the effects analyses[2], which are based on the action area, are similarly flawed. *See e.g.*, 50 C.F.R. § 402.02 (emphasis added) ("The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process"). **DW-17**

In 1997, FWS found that effects to the bonytail chub, razorback sucker and southwestern willow flycatcher had already exceeded the jeopardy threshold. Biological and Conference Opinion on Lower Colorado River Operations and Maintenance, May 1997 (1997 BO) at 153, 155. However, the FWS failed to issue a legal RPA; a valid reasonable and prudent alternative allows the intended purpose of the proposed action to go forward while avoiding the conditions that would adversely modify critical habitat or jeopardize listed species. 50 C.F.R. §§ 402.02, 402.14(h). FWS stated that the RPA "will improve the baseline so that the status of the bonytail chub, razorback sucker, and southwestern willow flycatcher will improve to a point below the jeopardy threshold in the long-term, within the time frame of the MSCP." 1997 BO at 157. Reclamation, even if it adhered to the RPA, would jeopardize these species past the 5-year timeframe of the BO. **DW-18**

As it turns out, Reclamation did not adhere to the RPA, and several elements had not been completed when Reclamation reinitiated consultation in 2002. Reinitiation of Formal Section 7 Consultation on Lower Colorado River Operations and Maintenance, April 2002 (2002 BO) at 3 ("the requirements of some RPAs and RPMs have been completed"); BA at 4-15 (RPA from 1997 not completed). Looking back, we see a baseline below jeopardy in 1997, the failure to complete the RPA and RPMs, and findings that the environmental baseline as of 2002 had not significantly improved. 2002 BO at 18 ("[t]he end result of the past actions is a continuing **DW-19**

[2] 'Cumulative effects' are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation. 50 C.F.R. § 402.02 (emphasis added). The key unanswered question in Section 6.4 is this: what is the net effect of the covered activities, the LCR MSCP and the future nonfederal activities? *See* BA at 6-6, comparing, but not accumulating, the effects of all these activities.

downward trend of riparian, marsh, and aquatic habitat diversity and quality in the LCR") and 2002 BO at 19 ("[i]n terms of physical habitat, the downward trend for species habitats seen in the 1997 environmental baseline continues to 2002 owing to the indirect effects of past actions and continued suppression and restriction of natural fluvial processes") (emphasis added). It is clear from previous consultations that the environmental baseline of the Lower Colorado River is below the jeopardy threshold, as determined in 1997, and with no significant improvement given the continuation of Reclamation's actions and the failure to adhere to RPAs and RPMs. This is the baseline that must be reflected in the BA. As discussed below, the conservation plan fails to alleviate effects of past, present and future actions that lead to jeopardy, in violation of the ESA. **DW-19 con't**

No Determination of Adverse Impact **DW-20**

This BA must evaluate the effects of the covered activities on listed species and their habitats, including conclusions as to the adverse effect or adverse modification of critical habitat for listed species. 50 C.F.R. § 402.12(a), 402.14(c)(4). These effects are measured relative to the baseline. Throughout the BA, Reclamation fails to analyze impacts of covered activities relative to the baseline (e.g., comparing instead cumulative effects to direct and indirect effects, *see supra*, fn.1).

For example, Lake Mead elevations will fall because of Upper basin depletions in the baseline/no action and proposed actions scenarios. BA at 5-13. What the discussion omits is that reservoir elevations will fall more under the proposed actions, due to the proposed actions (ISG and shortage criteria). In fact, should low inflows continue for a long time, and given that the model doesn't use traces from the dry years of 1990-2002, the proposed actions will have lower elevations before the baseline (2020) because of the proposed shortage criteria. Because both of these actions are discretionary, the characterization of impacts relative to the baseline is important for ESA purposes. **DW-21**

Reclamation has improperly deleted ongoing operations and maintenance activities over the MSCP timeframe from the effects analysis. This is incorrect. These activities are included in chapter 2 of the BA and are covered activities. *See* BA at 2-2-2-3 ("Reclamation intends that its actions be covered and included in the LCR MSCP BA as particularly described in the narrative and tabular portions of this chapter . . ."). These activities have an adverse effect. *See e.g.*, 1997 BO (finding jeopardy due to operations and maintenance activities); 2002 BO (requiring conservation measures as part of the covered action). **DW-22**

As a result, the BA and HCP consider only the impacts from future flow-related actions. *See e.g.*, BA at 5-5/HCP at 4-5 (assessing habitat impacts from drop in elevation due to changes in points of diversion, a future action). Lacking any analysis of ongoing operations and in light of previous jeopardy findings, Reclamation's cursory statement that ongoing operations "may" perpetuate degraded conditions and that quantification of adverse impacts is speculative but of no measurable impact, BA at 4-1, is incorrect and unsupportable. If ongoing operations are to be actions covered by this BA, and they must be, Reclamation must analyze their impacts and ensure that they avoid jeopardy. **DW-23**

Reclamation acknowledges the loss of critical habitat for bonytail and razorback sucker. **DW-24**

BA at 5-39, 5-44. Reclamation must analyze whether there is "destruction or adverse modification" critical habitat. In making this determination, Reclamation (and FWS in any biological opinion) must consider how this loss impacts the recovery of the species. *See Gifford Pinchot Task Force v. Fish and Wildlife Service*, No. 03-35279, slip op. at 10602 (9th Cir. Aug. 5, 2004) (holding that the definition of 'adverse modification' "gives too little protection to designated critical habitat"). **DW-24 con't**

The BA also fails to make any conclusions as to adverse effect as required by the ESA. 50 C.F.R. § 402.12(a). Chapter 5.5 discusses impacts in terms of take and lost habitat, but does not discuss what such take and habitat loss means for the species. Finally, Reclamation states, "any effects resulting from proposed discretionary activities described in the LCR MSCP BA are not significant." BA at 7-1. As with the statement above, there is no analysis to support this conclusion. Given that Reclamation has chosen to pool Federal and non-Federal activities, discretionary and non-discretionary, into the 'Covered Actions,' reasoning that it is difficult to parse out effects from non-discretionary activities from those that are discretionary[3], how did Reclamation parse out the effects of a small subset of the covered activities -- those that are proposed and discretionary -- in order to conclude that they are not significant? **DW-25**

Reclamation cannot double dip on conservation measures **DW-26**

Nearly all of the conservation measures from the Biological Opinion for Interim Surplus Criteria, Secretarial Implementation Agreements, and Conservation Measures on the Lower Colorado River, January 2001 (ISG BO) "will be credited against the LCR MSCP conservation measure requirements." BA at 1-3, 5-2. *See also* HCP at 5-47-48; EIS at 1-18. These conservation measures are part of the proposed action that underwent consultation in 2001, and thus are part of the environmental baseline for this BA. "The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process." 50 C.F.R. § 402.02. As a matter of fact, the 2001 consultation was part of the baseline for the 2002 consultation which the MSCP would supersede. FWS has already assumed that the measures have been implemented, reflected such in the baseline of the 2002 BO, and Reclamation cannot again credit them as mitigation for different covered actions. These include the first conservation measure for the ISC and all four for the 4.4 Plan. *See* ISG BO at 6-9.

If Reclamation will not complete these conservation measures, Reclamation must reinitiate consultation on the ISG. *See* 50 C.F.R. § 402.16; BO at 23 ("conclusions of this BO are based on the full implementation of the project as described in the Description of the Proposed Action section of this document, including all conservation measures identified in the

[3] *See* BA at 2-2/HCP at 2-2 ("The effects of all covered Federal and non-Federal activities, whether discretionary or not, have therefore been described and covered in this LCR MSCP HCP, as well as in the LCR MSCP BA prepared by Reclamation"); BA at 5-2 ("The effects of Federal flow-related activities addressed in the LCR MSCP BA cannot be separated from the effects of non-Federal flow-related activities addressed in the LCR MSCP HCP. Therefore, the impact analysis for flow-related activities encompasses both Federal and non-Federal flow-related activities, and the analysis and results are the same in the LCR MSCP BA and the LCR MSCP HCP").

2002 BA . . . Failure to implement the project as proposed, including any conservation measures, . . . may cause coverage under the incidental take statement of this BO to lapse and may require reinitiation of consultation"). This BA must also discuss the implementation of the 2002 BO's conservation measures. **DW-26 con't**

Reclamation's Modeling Assumptions Are Not Reasoned **DW-27**

The hydrological model is based on a set of assumptions that distort the results used to predict potential environmental impacts. These results understate the magnitude of potential impacts to the environmental resources within the affected area.

These assumptions include:

1. An incorrect starting elevation for Lake Mead, which distorts all of the projections of future elevations, surplus and shortage conditions, and other Mead operations. The model apparently assumes that the elevation of Lake Mead on December 31, 2002 is a reasonable approximation of current conditions. This is obviously false. According to Reclamation records, the elevation of Lake Mead at the end of 2002 was 1152.13', more than 27 feet higher than the projected elevation of Lake Mead at the end of 2004. This is a significant error. The model should use the best available data, and not outdated information that minimizes the potential for shortage.

2. The model's reliance on an incomplete set of historical traces generates an overly optimistic set of projections for water availability in the future. The discussion of these traces (see J-52) indicates that the most recent Colorado River flow data used was from 1991, ignoring 12 full years of records, which include the driest four-year period on record. The incomplete data input into the Index Sequential Model decreases the likelihood of system shortage.

3. The model fails to account for the likelihood that climate change will affect the hydrology of, and demand within, the Colorado River basin states. Climate change impacts could reduce inflows by as much as 20 percent.[4] Such reductions in inflow would further exacerbate the trend toward system shortage, with resultant adverse impacts on habitat and listed species. **DW-28**

4. The model assumes that the ISG will be extended through 2051. Given: (1) MWD's deferral of surplus in 2003 and 2004; (2) the rapidly decreasing elevation of Lake Mead; (3) Arizona's concerns about shortage; and (4) MWD's failure to honor the spirit of its forbearance agreement with Arizona and the good faith demonstrated by the basin states generally, it seems extremely unlikely that the basin states would agree to extend the ISG. **DW-29**

5. The model assumes operation of the Yuma Desalting Plant in 2023. BA at 5-4. Reclamation must rephrase this assumption to remove any reference to operating the Plant; Reclamation may simply assume the bypass has been replaced without specifying how. If Reclamation continues with the assumption of operating the Plant, this BA must also consider the effects **DW-30**

[4] *See* L. Nash and P. Gleick, 1991, The sensitivity of streamflow in the Colorado basin to climatic changes, *Journal of Hydrology* 125: 221-241 and L. Nash and P. Gleick, 1993, The Colorado River Basin and Climatic Change: The Sensitivity of Streamflow and Water Supply to Variations in Temperature and Precipitation, Washington, DC: US EPA, EPA230-R-93-009, 121 pp.

of such an assumption on listed species and their habitats. Operation of the Plant will have significant environmental impacts on the Colorado River delta, particularly the Cienega de Santa Clara. **DW-30 con't**

The HCP Conservation Plan Does Not Meet the Statutory or Regulatory Requirements **DW-31**

The ESA prohibits take of listed species unless allowed by the FWS via an incidental take permit if "any taking otherwise prohibited by section 1538(a)(1)(B) of this title if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." 16 U.S.C. § 1539(a)(1)(B) (emphasis added). In addition to failure to comply with ESA sections 7 and 10 requirements, the LCR MSCP fails to comply with California wildlife laws, including the California ESA and Fish and Game Code.[5]

The Applicants have not specified the impacts of the incidental take **DW-32**

According to the HCP Handbook, HCP boundaries should include all areas within which any permit activities likely to result in take are expected to occur (3-11). The document defines the planning area as "the historic floodplain of the lower Colorado River, from Lake Mead to the SIB ..." (DEIS/EIR at 2-34), though it fails to explain the exclusion of the river below the SIB and fails to explain the exclusion of the Salton Sea basin, which historically was fed by meanders and floods from the Colorado River. The geographic scope should clearly and explicitly explain the decision to exclude historic components of the Colorado River floodplain.

Within Reach 7, the Conservation Plan boundary does not follow the U.S.-Mexico Boundary (see DEIS/EIR Fig. 2.1-7). Does the Conservation Plan boundary follow the current route of the river? Does Reclamation have the authority to determine that this therefore constitutes the legal boundary of the United States? Or does the Conservation Plan intend to undertake activities in Mexico? If the MSCP plans to undertake activities in Mexico, as indicated by the map, why stop at the SIB? **DW-33**

It is not clear from the maps and the narrative, for non-Federal non-flow related activities in particular, whether all such activities are within the planning area, and if not, the mechanism by which actions outside the planning area will achieve ESA compliance. For example, are all 234 miles of canals and 72 miles of drains in Arizona, HCP at 2-7, or the 313 miles of canals and 172 miles of drains in California, HCP at 2-14, within the planning area? Also, it is stated that conservation activities could occur in the tributaries. EIS/EIR at 2-34. Will this occur within the planning area? **DW-34** **DW-35**

The ESA requires the MSCP Conservation Plan specify "the impact which will likely result from such taking." 16 U.S.C. § 1539(a)(2)(A)(i); 50 C.F.R. § 17.22(b)(1)(iii)(A). The HCP Handbook states that the HCP should make explicit how take will be calculated. From the **DW-36**

[5] Furthermore, significance of adverse effect under NEPA is defined by more than intensity and context, *cf.* EIS/EIR at 3.0-1. Until the covered actions and the conservation plan deal with the need to comply with the California ESA and California Fish and Game Code, the MSCP violates state law, triggering significant adverse effects undocumented in the DEIS/EIR. *See* 40 C.F.R. § 1508.27(b)(10).

tables in the documents, it appears that take is considered both in terms of acres of affected habitat and individuals taken (via harm, harass, etc.). Please clarify that take is not calculated merely in terms of affected habitat, as stated in the DEIS/EIR at 3.4-29. The take and associated impacts that must be minimized and mitigated occurs through destruction of habitat and loss of individuals. **DW-36 con't**

The Applicants Have Not Fully Considered Steps to Mitigate Take **DW-37**

The ESA requires that the Conservation Plan specify "steps the applicant will take to minimize and mitigate" impacts resulting from take, 16 U.S.C. § 1539(a)(2)(A)(ii), and the FWS must find that the HCP "will, to the maximum extent practicable, minimize and mitigate the impacts of" any take, *id.* § 1539(a)(2)(B)(ii). For the reasons below, we believe the HCP as written does not meet these standards.

The commitments to fulfill many of the Handbook recommendations for minimization and mitigation are there, but they aren't described with enough specificity to allow FWS to make the determination that the conservation plan will minimize and mitigate, that it is the maximum extent practicable, because the HCP does not detail the when's, how much's, and most importantly, the how's. Many of the conservation measures rely on uncertain actions, such as non-existent Recovery Implementation Programs and inadequate water rights. The HCP also gives minimal service to the conservation opportunities in the limitrophe and Colorado River delta. As a result, the MSCP has not examined the most practicable conservation measures. **DW 38a** **DW-38b**

For example, the HCP acknowledges mitigation for permanent impacts should occur in perpetuity (HCP at 5-11) but leaves it open as to how, saying that there are a variety of options the MSCP may use. The HCP also acknowledges that mitigation must occur prior to adverse impacts (HCP at 4-23) but the timing of conservation measures is unknown (HCP at 4-26). The MSCP will maintain existing habitat for mitigation, but the criteria used to select habitat maintenance activities is unknown, the amount of habitat to be maintained is unknown, and there is no date by which there will be criteria (HCP at 5-8). The MSCP points out that there are 30 conservation areas (HCP at 5-19) totaling 37,500 acres in addition to agricultural land available for habitat creation. This presents an interesting question as to the certainty that habitat creation will minimize and mitigate impacts: by making nearly the entire planning area potentially suitable for habitat restoration, the success of such restoration is questionable, both in terms of actually restoring the habitat and the likelihood of it becoming occupied habitat. As if to acknowledge this, despite all this land availability, the HCP can't say that there will be 8,132 acres on which to restore habitat, mandating against a finding of mitigation. *See* HCP at 5-19 (sufficient land should be available). We also suggest, as does the HCP Handbook, that conservation area site-selection criteria include proximity of the area to the impact. **DW-39**

Bonytail and Razorback Sucker **DW-40**

In particular, the conservation measures for the bonytail and razorback sucker are insufficient to minimize and mitigate, and do not contribute to recovery because they are not actual plans and they are not consistent with past mitigation measures. The bonytail and razorback sucker are severely depleted, *see* Recovery Goals for Four Endangered Fishes of the

Colorado River (2002). There are no self-sustaining populations of bonytail in the wild and little or no recruitment of razorback sucker in the wild. *Id.* A conservation plan that lasts for 50 years and covers a significant portion of the species' range must address essential habitat requirements of native fish populations in order to ensure their long-term survival and recovery. *See* 63 Fed. Reg. 8859, 8861 (Feb. 23, 1998). **DW-40 con't**

The measures to stock razorback suckers and bonytails are not targets, but assumptions. HCP at 5-40, 5-45. There is nothing to guarantee such stocking will occur, and in fact, it probably will not. (This is because the MSCP will cease stocking if there are factors in the reach that are not conducive to the survival of stocked fish -- as long as the threats of non-natives and the loss of ecosystem function remain, survival is questionable.) Should stocking cease, "other management, research, and monitoring needs that would minimize and mitigate incidental take" would be funded. What are these "other" actions, who and when determined, and how will we know they do indeed minimize and mitigate? Mitigation should compensate for lost habitat or individuals; research does not address the impacts. HCP Handbook at 3-23. **DW-41**

Second, coordination with the Lower Colorado River Endangered Fish Recovery Implementation Program does nothing to minimize or mitigate the impacts of take, because there is no such Program. The FWS cannot rely on future actions that are not "reasonably certain to occur" to minimize and mitigate take. *See* 50 C.F.R. § 402.02; *Sierra Club v. Marsh*, 816 F.2d 1376 (9th Cir. 1987). Three, the stocking assumptions, should they occur, are not consistent with other RPAs and conservation measures for these species. For example, in 1997 FWS required 300-600 acres of impoundments for native fish to avoid jeopardizing those fish over a 5-year period. The MSCP, on the other hand, proposes creating the same amount of habitat for to avoid jeopardy over a 50-year period and to contribute to recovery of the fish. **DW-42**

Yellow-Billed Cuckoo

DW-43

Similar to the performance criteria established to meet the foodchain needs of southwestern willow flycatchers (namely, moist soil conditions at appropriate times of the year), we recommend that a similar set of performance criteria be established to meet the foodchain needs of yellow-billed cuckoos, prior to implementation of the Program. Since such performance criteria are not provided for in the draft documents, we assume that sufficient science has not been developed to create such performance criteria. We recommend that an impartial group of scientists be convened, for a two or three day period, to determine appropriate foodchain conditions for the yellow-billed cuckoo, and that these conditions be incorporated into the revised LCR MSCP documents as performance criteria.

Burrowing Owl

DW-44

The LCR MSCP DEIR/DEIS fails to address the impacts to Burrowing Owls.

A. The LCR MSCP fails to analyze and mitigate impacts to burrowing owls pursuant to CEQA.

The California Environmental Quality Act (CEQA) declares that it is the policy of the

state to "[p]revent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities." California Public Resources Code, section 21101(c). In addition, Section 15065 of the CEQA guidelines requires a finding of significant impact if a project has the potential to "reduce the number or restrict the range of a rare or endangered plant or animal." **DW-44 con't**

While burrowing owls are not currently listed as threatened or endangered under the state or federal ESA, these owls are considered to be a state Species of Special Concern under CESA. In fact, CDFG has a Staff Report on Burrowing Owl Mitigation (1995). This report was developed to assist CDFG to analyze, under CEQA, impacts to burrowing owl and develop appropriate mitigation.

Burrowing owls occur in the areas impacted by the LCR MSCP. In fact, the draft version of the MSCP had estimated that up to 729 acres of burrowing owl habitat would be destroyed and 8,132 acres of foraging acres would be lost due to MSCP covered actions and activities. *See* Administrative Draft, LCR MSCP Biological Assessment, Chapter 5.5.15, 5.6.15 (September 26, 2003) [Attachment A]. Given the prevalence of burrowing owls in both canals and agricultural lands, it is also likely that these activities will also result in the destruction of owl burrows, including immature owls.

In the most recent draft of the LCR MSCP, the discussion of impacts to burrowing owl is conspicuously absent. Gone is any reference to amount and type of habitat lost or impacted. Instead, there is only a brief discussion that burrowing owls will not be significantly impacted as the lands impacted are *only* agricultural lands. DEIS/EIR at 3.4-32.

This about-face in the LCR MSCP in its analysis and treatment of burrowing owls is a glaring omission. First, the deletion of the discussion of impacts violates CEQA's requirement that impacts are fully disclosed and discussed. Second, the loss of 795 acres of owl habitat and more than 8,000 acres of foraging habitat – due to the conversion of agricultural lands -- should be considered significant and should be mitigated. The state burrowing owl population is on the decline. The population in the lower Colorado River area is the last stronghold of owl populations in California. Indeed, Defenders has petitioned the state of California to list the owl as state threatened. While CDFG declined to list the owl, in its status review, it did note the heavy reliance of owls on agricultural lands, particularly in the Palo Verde and Imperial Valleys. Thus, the LCR MSCP's dismissal of impacts due to the program's limitation to agricultural lands runs counter to what CDFG has stated are essential lands for the continued survival of the burrowing owl in California. *See* CDFG Evaluation of Petition to List the Western Burrowing Owl (October 2003). [Attachment B.]

In order to satisfy the requirements of CEQA, the project proponents must reanalyze the impacts of this project on the burrowing owl, and make a finding of a significant impact on the burrowing owl. Mitigation should be developed utilizing CDFG's Burrowing Owl Guidelines, including avoiding the destruction of occupied burrows.

B. The LCR MSCP fails to analyze and mitigate the impacts to burrowing owls pursuant to Fish and Game Code sections 3503 and 3503.5. **DW-45**

As discussed above, the Administrative Draft of the LCR MSCP discussed impacts to burrowing owl. These impacts included the possible destruction of occupied burrows/nests if ground-disturbing activities occurred during nesting season. Administrative Draft, LCR MSCP Biological Assessment, p. 5-47. California Fish and Game Code prohibits the take, possession or destruction of the nest or egg of any bird of prey, including burrowing owls. Fish and Game Code Section 3503.5. If the LCR MSCP is permitting ground-disturbing activities during owl nesting season, this project applicants will likely be liable for violating the Fish and Game Code. Therefore, the LCR MSCP must address these possible impacts to burrowing owl by constructing mitigation prohibiting the destruction of nests. These mitigation measures could include surveying prior to ground-disturbing activity.

In addition, as discussed supra at XX, the FWS is prohibited from issuing an incidental take permit for any unlawful activity. If the LCR MSCP will result in the destruction of a burrowing owl nest or egg, it will be in violation of the California Fish and Game code. Until this violation is addressed, the FWS is prohibited from issuing a final incidental take permit. **DW-46**

Sticky Buckwheat & Threecorner Milkvetch **DW-47**

The LCR MSCP proposes species-specific conservation measures for these plants by providing $10,000 per year until 2030 for unfunded conservation measures in the Clark County Multi-Species HCP. HCP at 5-80. How is it possible, given that HCPs must assure funding, that an HCP has unfunded conservation measures? The HCP must articulate the likely mitigation activities that would result from $10,000 going to the rare plant group from the Clark County MSHCP. Also, the Clark County MSHCP cannot use activities from this $10,000 as mitigation in the Clark County MSHCP.

Water Use & Rights **DW-48**

The draft document estimates an annual requirement of approximately 57.4 KAF to establish and maintain the 8,132 acres of LCR MSCP conservation areas (DEIS/EIR at 2-74). Appendix N states "it is assumed that water rights are bought along with private land that is acquired.... It is assumed that half of the lands in public ownership have associated water rights, and that water rights would need to be purchased for habitat creation on the remaining half of public lands." (N-7.) This draft programmatic document fails to provide any assurance that 57.4 KAF of water could be acquired for environmental purposes, nor does it offer any assurance that such water if acquired would be of sufficient priority to guarantee availability during the likely shortage conditions that will recur on the river. During shortage conditions, riparian habitat and listed species will be placed under additional stress, exacerbated by an expected further decline in mean river elevation and resultant drop in associated groundwater levels. Yet it is precisely at these times when habitat and species are placed under additional risk, that the declaration of shortage could decrease the availability of water for habitat maintenance, due both to the priority system and due to political pressure. The LCR MSCP must provide assurances that at least 57.4 KAF of PPR water could be acquired to maintain the habitat it purports will be sufficient for its

purposes. Without such assurances, the created habitat will likely be stranded at the first instance of system shortage, subverting the entire program.[6] **DW-48 con't**

Limitrophe Habitat

The LCR MSCP is missing what may be the premier opportunity to conserve species on the Lower Colorado River, which exists in the limitrophe reach of the river, known in MSCP terminology as reach 7. This reach of the Colorado contains stands of Cottonwood-Willow with a much higher density than that found elsewhere on the Lower Colorado, 18% of land cover in the first 10 kilometers below Morelos Dam as compared to 1-2% as a maximum land cover value along the Lower Colorado River between Lees Ferry and Morelos Dam, even in wildlife refuges (Hinojosa-Huerta et al., 2003. Rapid Ecological Assessment of the Limitrophe Zone of the Colorado River, prepared for Environmental Defense) [Attachment C.]. Significantly, these cottonwood and willow trees have established due to recent overbank flooding since 1980, and have been maintained by relatively high groundwater levels. Surface water in reach 7 is a regular feature, providing breeding sites for insects that are food for resident and migrating birds. These conditions have together allowed a healthy native ecosystem to flourish. However, the maintenance of these conditions is not guaranteed, as drought and local groundwater pumping are both likely to deplete the water available to the limitrophe. **DW-49**

In fact, the documents overlook several such cumulative impacts to this area. The discussion of the IBWC's Lower Colorado River Boundary and Capacity Preservation Project is vague and misleading (DEIS/EIR at 4-28). In reach 7 of the river, the reach that would suffer significant adverse impacts to hydrological and biological resources due to the planned IBWC action, the MSCP would only create 540 acres of new habitat. The IBWC's planned action could destroy several times this quantity of habitat. It is wrong to state that the cumulative impact would be less than significant, based on a qualitative assumption that the MSCP would balance out the impacts of the IBWC action. While the proposed action potentially might offer a marginal improvement, the net impact would still be significantly (and cumulatively) adverse. Reclamation's YAWRMG Drainage Project will also have undisclosed cumulative impacts on this reach. **DW-50**

The LCR MSCP has an opportunity in the limitrophe both to protect habitat whose future is uncertain, as well as to augment this habitat. While the HCP proposes creating cottonwood-willow sites by planting trees and irrigating them, the limitrophe is far better suited to conservation and restoration based on instream flows.[7] Here, a modest baseflow in the river channel, plus occasional floods, would secure the future of this excellent habitat. **DW-51**

The LCR MSCP could contribute significantly to conserving habitat on the Lower Colorado River by adopting a significant ongoing effort to protect and restore the Colorado River limitrophe, specifically a focused effort by the Cocopah Indian Tribe to create an international conservation area (see DEIS/DEIR at 4-24). This process has been underway for several years, **DW-52**

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[6] Other statements in the documents confirm the likelihood that adequate water is not available. *See* DEIS/DEIR at 2-116 (stating that the Lower Colorado River has more water allocated than available).

[7] Contrary to Reclamation's assertions otherwise, there is nothing in the Law of the River to prohibit instream flows, and Reclamation fails to point to any support. *See* DEIS/EIR at 2-116.

and is paralleled by an effort in Mexico to protect the Colorado River riparian corridor from the northern extent of the boundary of the Biosphere Reserve of the Colorado River Delta and Upper Gulf of California. **DW-52 con't**

We hope that the LCR MSCP can be amended to reflect this opportunity. In addition, we note that the LCR MSCP documents incorrectly characterize both the physical and biological qualities of the limitrophe, reach 7.

1. Throughout the LCR MSCP documents, flows in reach 7, the limitrophe, are erroneously characterized. The text itself is contradictory at times, stating that it "has some flow from dam seepage, but the majority of the reach is generally dry" (3.0-2) and that "much of the flow in the river downstream of Morelos Dam is return flows from upstream irrigation districts" (DEIS/DEIR at 3.9-7). Neither of these statements accurately characterizes the source or quantity of flows in the limitrophe. In general, these flows can be understood to come from a variety of sources, including: **DW-53**
   a. Seepage from Morelos Dam.
   b. Flows that are released at Morelos Dam, including both flood flows (which occurred more than 25% of years 1980-2000) and other flows that Mexico chooses not to divert, such as occasional over-deliveries from the United States.
   c. Irrigation return flows from Mexico.
   d. Wasteways (at 11 miles and 21 miles) in the United States that release several thousand acre-feet annually in non-flood years (Ruth Thayer, Bureau of Reclamation, personal communication 8/6/04).
   e. Groundwater flows from both the United States and Mexico. The quantity of groundwater flow into the Colorado River channel in the limitrophe is unknown, however, a recent study demonstrates that depth to groundwater at the edge of the riparian corridor is no greater than 1-2 meters, and that groundwater levels exceed river elevation, suggesting that the direction of flow is into the river (Zamora-Arroyo, et al., 2001. Regeneration of Native Trees in Response to flood releases from the United States into the delta of the Colorado River, Mexico. J. Arid Environments 49:1).

While most of these inputs are not quantified, the average total flow in the limitrophe in non-flood years 22,000 acre-feet, and in flood years is 2,120,000 acre-feet (Cohen and Henges-Jeck, 2001. Missing Water: The Uses and Flows of Water in the Colorado River Delta Region, Pacific Institute).

2. The importance of reach 7, the limitrophe, for several of the LCR MSCP covered species is neglected: **DW-54**
   a. The limitrophe is an important stopover site for migrating southwest willow flycatchers in their migration movements before they reach their breeding grounds (Garcia-Hernandez et al., 2001. Willow Flycatcher (*Empidonax traillii*) surveys in the Colorado River delta: implications for management. J. Arid Environments 49:1). It has been well documented, in general for landbirds, that the quality and availability of stopover sites during migration is one of the key factors determining survivorship rates for these species. The description of this bird in Appendix I, "Status of LCR MSCP Covered Species" fails to mention the importance of stopover sites to this migrant (Appendix I at 1-7).

b. Other key species of conservation concern in the limitrophe are the Yellow-billed Cuckoo, Arizona Bell's Vireo, and Summer Tanager, all of which were found present in recent surveys of the limitrophe (Hinojosa-Huerta et al., 2003. Rapid Ecological Assessment of the Limitrophe Zone of the Colorado River, prepared for Environmental Defense). Descriptions of these birds in Appendix I, "Status of LCR MSCP Covered Species" fail to mention their presence in the limitrophe (Appendix I at I-49, I-61, and I-69). **DW-55**

The applicants must not only demonstrate that the conservation plan is practicable, but that additional mitigation measures are impracticable. *See National Wildlife Federation v. Babbitt*, 128 F.Supp.2d 1274, 1292 (E.D. Cal. 2000); *Sierra Club v. Babbitt*, 15 F.Supp. 2d 1274 (S.D. Ala. 1998). The suite of documents omits any discussion of why additional minimization, mitigation, or recovery measures are or are not practicable for the native fish, for the burrowing owl, or the sticky buckwheat and threecorner milkvetch. The same questions must be asked of the $10,000/year for the humpback chub. Nor is there a finding that conservation activities in the Colorado River delta are impracticable. **DW-56**

The Applicants have not demonstrated that adequate funding will be available **DW-57**

Indeed, the parties have not demonstrated that any funding will be available. The ESA requires the MSCP Conservation Plan specify "the funding that will be available to implement [minimization and mitigation of impacts]" and that the applicant "ensure that adequate funding will be provided [post-public comment]." 16 U.S.C. § 1539(a)(2)(A)(ii), 1539(a)(2)(B)(iii); 50 C.F.R. § 17.22 (b)(1)(iii)(B). The LCR MSCP applicants must ensure funding is available to implement the mitigation measures.

On the contrary, the applicants here say only, "If the permit is granted, the Applicants will ensure sufficient funding to implement the LCR MSCP . . .." HCP at 1-5 (emphasis added). It is admitted in the documents that the percentage of costs borne by each party and the sources of funding from each party have not been agreed upon. *See* HCP at 6-1 (JPA will establish cost-share and funding sources); HCP at 7-9 (parties are considering approaches to assure funding).

In short, although they must "detail the funding" available, 63 Fed. Reg. at 8864, the parties have neither committed to nor even offered funding strategies to assure funding this 50-year program. There are no development fees, mitigation fees (surcharges), contributed funds, state or federal funds, assessment districts, or tax check-off programs (*See e.g.*, HCP Handbook at 3-34). The HCP does not establish the sources of funding, how much any source would or could provide, or whether it is likely to be acquired. FWS cannot rely on speculative funding for an HCP. *National Wildlife Federation v. Babbitt*, 128 F.Supp.2d 1274, 1294-95 (E.D. Cal 2000); *Sierra Club v. Babbitt*, 15 F.Supp.2d 1274, 1282 (S.D. Ala. 1998).

Furthermore, as the HCP acknowledges, when there is permanent loss of habitat, the HCP must provide for protection of habitat in perpetuity. In this case, perpetual funding or an endowment may be necessary, yet is not provided for in the cost estimate. The HCP must establish programs or mechanisms to generate such funds. The HCP must also guarantee

funding for mitigation should habitat destruction occur before the mitigation. **DW-57 con't**

The LCR MSCP violates California's prohibition against take of "fully protected" species **DW-58**

The LCR MSCP does not fit within the state exemption

Under California law, the "take" of a "fully protected species" is prohibited. *See* California Fish and Game Code sections 3511, 4700, 5050 and 5515. Under the LCR MSCP, three species - the razorback sucker, Yuma clapper rail, and black rail –are proposed to be taken under the MSCP.

The regulations implementing the ESA currently state that the FWS can only issue an incidental take permit under specific conditions, including if the taking is incidental to, and the purpose of, the carrying out of an otherwise lawful activity." *See* 50 Fed. Reg. 39681, 39687 (discussion of 50 CFR §17.3). Here, the strict prohibition against the take of a fully protected species under California law makes it clear that an action in California that results in the take of a fully protected species is unlawful. Therefore, the FWS is prohibited from issuing an incidental take permit for the three fully protected species for activities that will result in take of these species in California. *See* Letter to Gerald Zimmerman, LCR MSCP, from Steven Spangle, USFWS (dated March 9, 2004). [Attachment D.]

Currently, there is an opinion from the California Department of Fish and Game (CDFG) that take of these three species is permitted under state law. *See* Letter to Steven Spangle, USFWS, from Michael Valentine, CDFG (dated April 14, 2004) [Attachment E] . However, this letter is based on an erroneous and flawed interpretation of the California statutes implementing the Quantification Settlement Agreement (QSA).

CDFG argues that Fish and Game Code Section 2081.7 permits the take of fully protected species as part of the LCR MSCP. This code section states that take of fully protected species is authorized if it results from "impacts attributable to the implementation of the Quantification Settlement Agreement." Fish and Game Code section 2081.7(a) (emphasis added). The QSA is defined as the draft agreement, dated December 12, 2000, and as it may be amended, including the transfer of conserved water between Imperial Valley and San Diego, as well as "any QSA-related program that delivers water at the intake of the [MWD]'s Colorado River Aqueduct." Section 1(a) of Chapter 617 of the Statutes of 2002.

Thus, the pivotal question is whether the LCR MSCP fits within the scope of the QSA or a QSA-related program that delivers water to MWD's aqueduct. To begin with, the LCR MSCP originated well before the draft 2000 QSA or the final QSA signed in 2003. The MSCP was put together in an attempt to get long-term ESA permits for activities on the Colorado River. Specifically, this permit is intended to be a continuation of the long-standing – and soon-to-be-expired -- biological opinion for activities along the Colorado River associated with delivering water to the lower basin states and Mexico.

An examination of the QSA reveals that this agreement encompasses numerous agreements involving the federal government's allocation of 4.4 million acre feet of water to

California and the four Southern California water agencies, including additional water as a "soft landing" to California over the next 15 years, the allocation of water between the southern California water agencies, a "wheeling" agreement to move water within California, a conservation agreement within California, the IID water transfer documents, funding agreements and court stipulations. Notably absent from the QSA is any discussion or agreement about *how* water will be moved down the Colorado as part of the delivery of water to California. The QSA is not about how water will be moved down the Colorado River, but how California will reduce its use of Colorado River water *within* California. Thus, since the QSA is not about how water is moved down the Colorado River – and its related impacts – then the LCR MSCP is neither part of the QSA or an activity "related" to the QSA.

Assuming *arguendo* that "QSA-related" is read to include the LCR MSCP, the Fish and Game code exemption for take of fully protected species is only for QSA-related activities that deliver water to MWD's aqueduct. The exemption does not include water delivery to any other California delivery point, including Palo Verde Diversion Dam or Imperial Dam, nor does it include non-Federal, non-flow related activities.

Based on a plain-reading of the California statute and an understanding of the QSA, Section 2081.7 of the Fish and Game Code was intended to allow an exemption for the take of fully protected species as it pertained to the execution of the IID water transfer. This provision was never intended to be so sweeping as to exempt all take of fully protected species as it pertains to the operation of the Lower Colorado River.

The LCR MSCP does not fulfill the requirements to be granted an exemption **DW-59**

Assuming that the LCR MSCP is somehow found to be a "QSA-related" activity that could be exempted from the fully protected species take prohibition, the LCR MSCP does not meet the requirements to be granted the exemption. Section 2081.7(a) provides that take of a fully protected species may be permitted as long as the conditions in subdivisions (b), (c) and (d) are fulfilled. Fish and Game Code Section 2081.7(a). These three subdivisions require that (1) the QSA is executed before October 12, 2003; (2) CDFG has determined that agreements have been executed to address environmental impacts at the Salton Sea; and, most relevant to the LCR MSCP, (3) the incidental take requirements of the California Endangered Species Act (CESA) have been met, adaptive management process has been developed and implemented and that this adaptive management process "substantially contributes to the long-term conservation" of the species.[8]

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[8] Under CESA, CDFG may authorize, by permit, the take of endangered species, threatened species, and candidate species if all of the following conditions are met:

(1) The take is incidental to an otherwise lawful activity.

(2) The impacts of the authorized take shall be minimized and fully mitigated. The measures required to meet this obligation shall be roughly proportional in extent to the impact of the authorized taking on the species. Where various measures are available to meet this obligation, the measures required shall maintain the applicant's objectives to the greatest extent possible. All required measures shall be capable of successful implementation. For purposes of this section only, impacts of taking include all impacts on the species that result from any act that would cause the proposed taking.

(3) The permit is consistent with any regulations adopted pursuant to Sections 2112 and 2114.

A review of the LCR MSCP and its accompanying documents reveals that no finding has been made that the MSCP has met any of the above requirements, particularly the CESA incidental take permit requirements. Indeed, any discussion of CESA is noticeably absent from the LCR MSCP. **DW-59 con't**

In order for the take of the three fully protected species to be exempted under state law, the FWS and/or CDFG needs to make a finding that the LCR MSCP meets the exemption requirements of Section 2081.7 of the Fish and Game Code, including that the MSCP satisfies CESA and that the MSCP will "substantially contribute to the long-term conservation of the species." As discussed *supra*, since the LCR MSCP fails to meet the federal ESA's minimal take requirements, this program also fails to meet the stricter "fully mitigate" standard of CESA and "long-term conservation" standard of Section 2081.7.

LCR MSCP fails to address the California Endangered Species Act and the take of state listed threatened and endangered species **DW-60**

The LCR MSCP Draft EIR/EIS provides a laundry list of various state laws that are implicated by the activities covered in the MSCP. Conspicuously absent is any reference to the California Endangered Species Act (CESA). Despite the fact that the LCR MSCP will "take" a number of state listed species, including the Yuma clapper rail, black rail, desert tortoise, razorback sucker, gila woodpecker, and elf owl, there is no discussion of the need to obtain incidental take permits under CESA or the state Natural Community Conservation Planning (NCCP) Act. *See* Chapters 1.4.2 and 7.1.3 of the DEIS/EIR (discussion of future permits and approvals required to implement the LCR MSCP projects fails to include a reference to CESA).

As discussed above, *supra*, in order to issue a federal incidental take permit, the activity being permitted must be lawful. Until CDFG issues take permits under either CESA or the NCCP Act, any activities that result in the take of any California listed species will be illegal. Therefore, the final approval by FWS of the LCR MSCP is linked with the final approval by CDFG of the state take permits. No federal take permit should be issued without the state take permit.

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(4) The applicant shall ensure adequate funding to implement the measures required by paragraph (2), and for monitoring compliance with, and effectiveness of, those measures.

No permit may be issued pursuant to subdivision (b) if issuance of the permit would jeopardize the continued existence of the species. The department shall make this determination based on the best scientific and other information that is reasonably available, and shall include consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (1) known population trends; (2) known threats to the species; and (3) reasonably foreseeable impacts on the species from other related projects and activities.

Cal. Fish and Game Code section 2081(c), (d).

Implementing Agreement Must Be Issued for Comment Before Any Permit Is Issued **DW-61**

An Implementation Agreement (IA) is "an agreement that legally binds the permittee to the requirements and responsibilities of a conservation plan and section 10 permit. It may assign the responsibility for planning, approving, and implementing the mitigation measures under the HCP." Handbook at 8-3. The Agreement is a key piece of the MSCP as it contractually binds the parties to the Conservation Plan and will supersede BA Section 2.8.2 and HCP chapter 8. As such, it must be subject to public notice and comment.

According the HCP Handbook, the implementing agreement (1) must be provided before the Federal Register notice can be published (6-4), (2) should be submitted as part of complete application package and usually included as appendix to HCP, (3) should be included with the complete package so public can understand how implementation of HCP will be managed, (4) should be included when HCP provided for public comment (6-5), and (5) should be reviewed by all signatories to it and be agreed to by all non-federal signatories before sent to the Regional Office as part of the HCP application (6-8). None of these five requirements has been met.

As indicated by the MSCP documents, an Implementing Agreement "will be prepared" that "will describe assurances and other commitments" as well as "changed circumstances," BA at 2-102, and "will specify the legal obligations, roles, and responsibilities of each signatory." HCP at 7-9. The Implementing Agreement is in the title of the Federal Register notice, but not included in the HCP, BA, EIS or Appendices. The complete application package, including the Implementing Agreement, must be available for public notice and comment. 16 U.S.C. § 1539(c). Since the public has not been allowed to comment on the IA, FWS and Reclamation must publish notice of it and reopen the public comment period.

The HCP also states that a JPA <u>will</u> be prepared that will also define the implementation and management of the MSCP, as well as establish the funding assurances required by the ESA. HCP at 6-1. This agreement must also be available for public comment, as it defines key elements - Steering Committee; voting; compliance with ESA permits - to implementation of the LCR MSCP.

"No Surprises"

Reclamation has pooled Federal and non-Federal covered actions, particularly those that are flow-related, in the belief that it is difficult to parse out the effects from federal activities from those that are not, and relatedly, because of uncertainty as to whether activities should seek section 7 or section 10 coverage, *see* BA at 2-2, 3-2. *See also* BA at 5-2 ("The effects of Federal flow-related activities addressed in the LCR MSCP BA cannot be separated from the effects of non-Federal flow-related activities addressed in the LCR MSCP HCP. Therefore, the impact analysis for flow-related activities encompasses both Federal and non-Federal flow-related activities, and the analysis and results are the same in the LCR MSCP BA and the LCR MSCP HCP") and HCP at 2-2 ("The effects of all covered Federal and non-Federal activities, whether discretionary or not, have therefore been described and covered in this LCR MSCP HCP, as well as in the LCR MSCP BA prepared by Reclamation"). **DW-62**

Although their fate and form are entirely uncertain given the court injunction prohibiting issuance of ITPs with No Surprises and the lack of a draft IA, the HCP applicants are seeking assurances. What the documents fails to address is how FWS can provide assurances to the applicants when non-Federal and Federal activities have been combined into one set of covered actions and federal agencies cannot obtain assurances. *See* 50 C.F.R. § 17.22(b)(5). **DW-62 con't**

Any assurances included in an incidental take permit should be based on the nature and duration of the covered actions, the adequacy of the available science, the proposed conservation plan, the adaptive management provisions in the conservation plan, and the contribution of the plan to recovery of the species. In light of the comments and questions above, if No Surprises is appropriate for the LCR MSCP, any assurances, in addition to requiring public notice and comment, must be limited in scope and duration. Furthermore, the LCR MSCP documents must make clear that the FWS cannot approve an ITP containing No Surprises assurances until FWS completes the rulemaking for revocation of ITPs.

Miscellaneous

BA at 1-2; HCP at 1-1	Fix cite for Arizona v. California by deleting "Code [USC]"	**DW63**
BA at 1-10	Table 1-2 missing	**DW-64**
BA at 2-31	Proposed second level shortage is 915 ft msl - is this a typo?	**DW-65**
BA at 2-32	Tables 2-21, 2-22, 2-23 are missing	**DW-66**
BA at 2-49	Table 2-25 is missing	**DW-67**
BA at 5-89	Line 18, delete "Code"	**DW-68**
BA at 2-3	Please note that flood control shares the first priority with river regulation and navigation	**DW-69**
BA at 2-31	Replace proposed second level shortage of 915 ft with 950 ft.	**DW-70**
BA at 4-26	Line 17-18, clarify that the QSA has been executed and adjust reasoning for no deliveries of surplus water accordingly	**DW-71**
BA at 5-14	Line 2, Clarify that effects are from extending the ISG, and the shortage criteria and the future flow-related covered activities	**DW-72**
HCP at 1-1	Figure 1-1, the Colorado River basin includes a portion of the Republic of Mexico	**DW-73**
HCP at Table 5-1	Replace bonytail with razorback sucker in biological goal (this occurs throughout the documents)	**DW-74**
HCP at 5-40	Line 37: replace BOCH with BONY (this appears throughout)	**DW-75**
EIS/EIR at 3.9-9	Please update the most recent salinity control forum review as of 2002, and reflect any changes in the analysis	**DW-76**
App. J.B-1	Replace Tables 2-11a, 2-11b, 2-11c with Tables 2-21, 2-22, 2-23 (assuming these are the intended tables)	**DW-77**

Thank you for accepting the above comments. We look forward to seeing our concerns **DW-78**

addressed and implemented in a revised Draft LCR MSCP documents, including the IA and JPA, issued for public review. If you have any questions, please contact any of us. **DW-78 con't**

Sincerely,

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not present. The creation/restoration of yellow-billed cuckoo habitat with implementation of the LCR MSCP Conservation Plan is expected to result in an increase in the numbers and distribution of yellow-billed cuckoos within the LCR MSCP planning area. Consequently, the number of yellow-billed cuckoos exposed to disturbances from these types of non-flow-related activities is expected to increase in future years.

5.5.14.3 Effects of LCR MSCP Implementation

Activities associated with creating/restoring and maintaining created/restored covered species habitat may result in take of the yellow-billed cuckoo. LCR MSCP habitat creation/restoration–related activities could result in harassment of individuals if they are present at the time activities are implemented, but these activities will avoid removal of habitat to establish habitat for other covered species. Habitat management–related activities, such as periodic removal of trees in patches of created/restored habitat to encourage stand regeneration and operation of equipment to maintain roads, could result in temporary loss of habitat and harassment of individuals. Implementation of the LCR MSCP is expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP. The likelihood for take is expected to increase over the term of the LCR MSCP if the abundance of yellow-billed cuckoo increases in the LCR MSCP planning area as a result of implementing LCR MSCP conservation measures for this species. The level of adverse effects on habitats and individuals will depend on the type and extent of LCR MSCP habitat management activities that are undertaken in species habitat.

Implementation of the LCR MSCP Conservation Plan will create/restore at least 4,050 acres of yellow-billed cuckoo habitat to replace habitat that could be lost as a result of covered activities and will increase the amount of protected new habitat by 2,526 acres. LCR MSCP–created/restored southwestern willow flycatcher habitat patches that are larger than 25 acres (Halterman pers. comm.) and support cottonwood-willow types I-III would provide additional habitat for the yellow-billed cuckoo. In addition, the LCR MSCP Conservation Plan will maintain existing important yellow-billed cuckoo habitat areas in the LCR MSCP planning area.

5.5.15 Burrowing Owl

In the LCR MSCP planning area, burrowing owls typically inhabit agricultural fields with extensive dirt embankments and are sometimes found in sandy, open riparian woodlands or desert washes (Rosenberg et al. 1991). Flow-related activities are not expected to affect the burrowing owl because they will not affect agricultural lands, open riparian woodlands, or desert scrub used by the burrowing owl. Flow-related covered activities, therefore, will not result in take of the burrowing owl.

5.5.15.1 Effects of Federal Non-Flow-Related Covered Activities

Non-flow-related covered activities (e.g., channel maintenance activities, construction and maintenance of roads, construction and maintenance of agricultural-related infrastructure, conversion of land to agriculture) could result in take of the burrowing owl. These activities would include actions that will disturb or remove earthen embankments associated with roads, canals, or other types of infrastructure that provide burrowing owl nesting habitat. This analysis assumes these activities will result in the loss of __ acres of burrowing owl nesting habitat associated with maintenance and removal of infrastructure. The actual amount of habitat that would be removed would be less, but maintenance activities are expected to affect all of the habitat over the 50-year term of the LCR MSCP. [Note to Reviewers: the extent of habitat effects associated with implementation of federal non-flow-related covered activities will be provided in the Draft LCR MSCP BA.] If these activities are conducted during the nesting season, they could result in mortality of individuals if these activities result in collapsing occupied nesting burrows. Operation of equipment and other maintenance- and restoration-related activities could also result in an unquantifiable level of harassment of burrowing owls if owls are present when these activities are undertaken.

Affects of non-flow-related covered activities on burrowing owl foraging habitat is expected to be minimal because the owls prefer to forage in grasslands, agricultural fields, and other open habitats, and the vast majority of lands that would be affected by these activities is unsuitable for the species (i.e., riparian woodland land cover types). In addition, available information about the status and trend of burrowing owl abundance in the LCR MSCP planning area indicates that the availability of agricultural foraging habitat may not be a factor limiting its abundance. For example, it is thought that the burrowing owl may have expanded into the LCR MSCP planning area with the expansion of agriculture because this species was not reported to be in the valley in the early part of the 20th century. The abundance of burrowing owls, while declining elsewhere in its range, appears to be increasing in western Arizona and southeastern California (Haug et al. 1993), including the LCR MSCP planning area. Based on this information, foraging habitat is not likely a factor limiting burrowing owls in the LCR MSCP planning area, and the possible removal of or disturbance to a small amount of foraging habitat associated with non-flow-related activities will not rise to the level of harm (i.e., injury or mortality).

Conversion of nonagricultural land cover types to agricultural land could increase the overall extent of agricultural foraging habitat in the LCR MSCP planning area by over 27,300 acres. Dirt embankments along new access roads, field margins, canals, and drains could also provide suitable nesting habitat.

5.5.15.2 Effects of LCR MSCP Implementation

Activities associated with creating/restoring and maintaining created/restored habitats may result in take of the burrowing owl. Conversion of agricultural land to restore covered species habitat and long-term maintenance-related activities associated with management of LCR MSCP conservation areas could include maintenance or removal of

earthen embankments associated with roads, canals, or other types of infrastructure that may support used by burrowing owls during the nesting and winter seasons. This analysis assumes these activities will result in the loss of 244 acres of burrowing owl nesting habitat associated with maintenance and removal of infrastructure. The actual amount of habitat that would be removed would be less, but maintenance activities are expected to affect all of the habitat over the 50-year term of the LCR MSCP. If these activities are conducted during the nesting season, they could result in mortality of individuals if these activities result in collapsing occupied nesting burrows. Operation of equipment and other maintenance- and restoration-related activities could also result in an unquantifiable level of harassment of burrowing owls if owls are present when these activities are undertaken.

Up to 8,132 acres of foraging habitat could be lost as a result of converting agricultural lands to restore habitats for covered species, representing up to 3% of agricultural lands present in the LCR MSCP planning area. Available information about the status and trend of burrowing owl abundance in the LCR MSCP planning area indicates that the availability of agricultural foraging habitat, however, may not be a factor limiting its abundance. For example, it is thought that the burrowing owl may have expanded into the LCR MSCP planning area with the expansion of agriculture because this species was not reported to be in the LCR MSCP planning area in the early part of the century. The abundance of burrowing owls, while declining elsewhere in its range, appears to be increasing in western Arizona and southeastern California (Haug et al. 1993), including the LCR MSCP planning area. Based on this information, foraging habitat is not likely a factor limiting burrowing owls in the LCR MSCP planning area, and the removal of foraging habitat associated with non-flow-related activities will not rise to the level of harm (i.e., injury or mortality).

The MSCS Conservation Plan includes measures to avoid and minimize the potential for direct take of burrow owls by either avoiding occupied burrows or removing owls from burrows before activities that could affect occupied burrows are implemented.

5.5.16 Elf Owl

5.5.16.1 Effects of Flow-Related Covered Activities

Flow-related activities may result in take of the elf owl. Changes in points of diversion in Reaches 3–5 will lower groundwater levels sufficiently in these reaches to reduce the extent or quality of 161 acres of elf owl habitat (Table 5-3).

5.5.16.2 Effects of Federal Non-Flow-Related Covered Activities

Operation of equipment to implement non-flow-related covered activities (e.g., implementation of channel, settling basin, boat ramp, gage station, and other facility maintenance activities; implementation of marsh restoration projects; conversion of lands to agriculture) could result in take of the elf owl. Noise, artificial lighting, and dust may

young birds are not present. Effects on habitat would be temporary for restoration projects that restore or improve existing California black rail habitat. These activities are expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP. The level of adverse effects on habitats and individuals will depend on the extent of habitat that is restored or maintained in species habitat.

Operation of law enforcement patrol boats to enforce no-wake zone regulations that protect habitat (e.g., the Bill Williams Delta) will also generate boat wakes in the no-wake zones for short periods when other watercraft are being pursued. During the breeding season, boat wakes could swamp nests, potentially resulting in mortality of eggs or nestlings. Because the frequency with which such incidents occur (AGFD estimates 150–200 person-days are expended annually enforcing no-wake zone regulations in the LCR MSCP planning area) and the duration with which patrol boats generate boat wakes in protected habitat (i.e., the period required to stop a boat) are likely low, and therefore a low, unquantifiable, level of take is expected.

5.6.14 Yellow-Billed Cuckoo

Proposed activities related to riparian restoration maintenance and restoration projects along the LCR in the LCR MSCP planning area may result in take of the yellow-billed cuckoo. The likelihood for take is expected to increase over the term of the LCR MSCP if the abundance of yellow-billed cuckoo increases in the LCR MSCP planning area as a result of implementing LCR MSCP conservation measures for this species. Restoration-related activities, such as operation of equipment to remove vegetation, could result in temporary loss of habitat and harassment of individuals if individuals are present and activities are undertaken during the breeding season. Effects on habitat would be permanent for restoration projects that removed habitat to restore land cover types that are not used by the yellow-billed cuckoo. The probability for permanent loss of habitat is considered minimal because riparian restoration maintenance projects undertaken in existing yellow-billed cuckoo habitat will presumably be designed to maintain or improve its habitat, and it is unlikely that state fish and wildlife agencies would remove yellow-billed cuckoo habitat to restore habitat for other species. These activities are expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP.

5.6.15 Burrowing Owl

Proposed activities related to maintenance of water conveyance and supply infrastructure (e.g., canals) and riparian restoration projects may result in take of the burrowing owl. Water conveyance and supply infrastructure and riparian restoration projects could include maintenance or removal of earthen embankments associated with roads, canals, or other types of infrastructure that provide burrowing owl nesting habitat. This analysis assumes these activities will result in the loss of up to 485 acres of burrowing owl nesting habitat associated with maintenance and removal of infrastructure. The actual amount of habitat that would be removed would likely be less, but maintenance activities are projected to affect all of the habitat over the 50-year term of the LCR MSCP. [Note to Reviewers: The estimate of the extent of habitat loss is based on an estimate of Palo

Verde Irrigation District's activities to maintain and replace 400 miles of canals, drains, spill channels, and private drains over the 50-year term. The extent of habitat effects that could be associated with implementation of other nonfederal non-flow-related maintenance and replacement activities is not included in this estimate because data have not been provided by the applicants. The effects of these other nonfederal maintenance and replacement activities will be included in the next draft of the LCR MSCP BA.] If these activities are conducted during the nesting season, they could result in mortality of individuals if these activities result in collapsing occupied nesting burrows. Operation of equipment and other maintenance- and restoration-related activities could also result in an unquantifiable level of harassment of burrowing owls if owls are present when these activities are undertaken.

Riparian restoration projects that convert agricultural lands used by burrowing owls could result in the loss of foraging habitat. The quantity of agricultural lands that could be converted to riparian land cover has not been identified but is expected to represent only a small fraction of the 270,594 acres of agricultural lands present in the LCR MSCP planning area. In addition, available information about the status and trend of burrowing owl abundance in the LCR MSCP planning area indicates that the availability of agricultural foraging habitat may not be a factor limiting its abundance. For example, it is thought that the burrowing owl may have expanded into the LCR MSCP planning area with the expansion of agriculture because this species was not reported to be in the valley in the early part of the 20th century. The abundance of burrowing owls, while declining elsewhere in its range, appears to be increasing in western Arizona and southeastern California (Haug et al. 1993), including the LCR MSCP planning area. Based on this information, foraging habitat is not likely a factor limiting burrowing owls in the LCR MSCP planning area, and the removal of foraging habitat associated with non-flow-related activities will not rise to the level of harm (i.e., injury or mortality).

5.6.16 Elf Owl

Proposed activities related to riparian restoration maintenance and restoration projects in the LCR MSCP planning area may result in take of the elf owl. The likelihood for take is expected to increase over the term of the LCR MSCP if the abundance of elf owl increases in the LCR MSCP planning area as a result of implementing LCR MSCP conservation measures for this species. Restoration-related activities, such as operation of equipment to remove vegetation, could result in temporary loss of habitat and harassment of individuals if individuals are present and activities are undertaken during the breeding season. Effects on habitat would be permanent for restoration projects that removed habitat to restore land cover types that are not used by the elf owl. The probability for permanent loss of habitat is considered minimal because riparian restoration maintenance projects undertaken in existing elf owl habitat will presumably be designed to maintain or improve its habitat, and it is unlikely that state fish and wildlife agencies would remove elf owl habitat to restore habitat for other species. These activities are expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP.

EVALUATION OF PETITION: REQUEST OF THE CENTER FOR BIOLOGICAL DIVERSITY ET AL. TO LIST THE WESTERN BURROWING OWL (*Athene cunicularia hypugaea*) AS A THREATENED OR ENDANGERED SPECIES

October 2003

Introduction

The Center for Biological Diversity, along with the Santa Clara Valley Audubon Society, Defenders of Wildlife, San Bernardino Valley Audubon Society, California State Park Rangers Association, and the Tri-County Conservation League submitted a petition to the Fish and Game Commission on April 8, 2003, seeking action to list the Western Burrowing Owl (*Athene cunicularia hypugaea*) as a threatened or endangered species under the California Endangered Species Act ("CESA"; Fish & Game Code, §2050-2116).

CESA specifically requires the Department to "evaluate the petition on its face and in relation to other relevant information the Department possesses or receives," and to recommend to the Commission whether the petition contains sufficient information to indicate the petitioned action may be warranted (Fish & Game Code, §2073.5(a); *see also* California Code of Regulations, title 14, §670.1, subd. (d)(1)). "Sufficient information" means "that amount of information ... that would lead a reasonable person to conclude the petitioned action may be warranted." (*Natural Resources Defense Council v. Fish and Game Commission* (1994) 28 Cal.App. 4th 1104, 1119.) "May be warranted" means a substantial possibility that listing could occur." (*Id.* at p. 1125.) Therefore, the Department's standard in developing its recommendation is whether there is "sufficient information", meaning enough information that would lead a reasonable person to conclude, that there is a substantial possibility that the requested listing could occur. In accordance with these requirements, this report evaluates the information provided in the petition, as well as other available information, and includes the Department's recommendation as to whether listing may be warranted.

The petition provides an adequate description of life history traits of the WBO, and cites studies that provide more detailed life history information. Life history information is described in the petition under the heading "Ecology of the Western Burrowing Owl" and is summarized below.

Taxonomy

The WBO (*Athene cunicularia hypugaea*) is one of two subspecies of burrowing owl (*Athene cunicularia*) that occur in North America. The other subspecies *A. c. floridana* occurs in Florida and on the Bahama Islands. The

Attachment B

prevent impacts from discing to active burrows, there is now some protection afforded under an Integrated Natural Resource Management Plan (INRMP) for the base. The East Otay Mesa population is located in an area of ongoing disturbance by Border Patrol activities and primarily located in areas zoned for future development. Outside of these locations, there are estimated to be between 5 – 15 breeding pairs in the county. This population estimate was developed from a county-wide effort, collected over the course of five consecutive years and completed in 2002, as part of the San Diego Bird Atlas Project, coordinated by Philip Unitt of the San Diego Natural History Museum.

Wintering burrowing owls are reported each year in San Diego County. These records are usually of single birds or a few individuals. Recent wintering sites include Carlsbad golf course, Batiquitos Lagoon, Whelan Lake, Dennery Canyon, Mission Bay/San Diego River Flood Channel, Rancho Jamul Ecological Reserve, and the Ramona region.

Imperial Valley

Burrowing owl populations in the Imperial Valley have increased with the intensification of agricultural activity, from originally sparse numbers (Garrett and Dunn 1981, DeSante et al. in press). Burrowing owls in this region currently appear to attain some of the highest densities recorded for the species. This population may comprise over 70% of the known breeding owls in California estimated at between 5,600 – 6,571 pairs (DeSante et al. 1996). Research and surveys indicate that in California burrowing owl populations are declining in areas with the greatest urban growth while larger populations occur in areas of intensive agriculture (e.g., Gervais et al. 2003, Rosenberg and Haley 2003),or designated open space.

Coachella Valley

Coachella Valley occurred within DeSante's survey area but a WBO population was missed. Data gathered during the development of a conservation plan for the Coachella Valley indicate an extant population (74 observation records both historic and current see Figure 5). An estimated 10-20 breeding pairs are scattered over the lower end of the valley and on some of the preserves developed by the Coachella Valley Mountain Conservancy (C. Barrows, pers. comm. 2003)(Figure 3).

Southern Desert Range

The Palo Verde Valley, located in eastern Riverside County was outside of the survey area (described in the petition as the eastern 50% of Riverside County), described as similar to the Imperial Valley in agricultural practices (N. Andrew CDFG, pers. comm. 2003), and is the second largest burrowing owl core population area in southern California. It is estimated that 500-1000 pairs of

burrowing owls occupy the Palo Verde Valley at this time (J. Kidd, pers. comm. 2003). The petition references DeSante et al. (1996) and describes this area as the southern desert range and that burrowing owls in this range occur as small, scattered populations, and have historically never been common. The Department agrees with this description in areas of semi-natural habitat. However, the Palo Verde Valley and Bard Valley (Imperial County) to the south are similar to Imperial Valley in regards to agricultural practices and hence have the potential to support higher densities of burrowing owls. In order to further quantify the extent of these populations, a systematic survey of the burrowing owl populations is needed within these valleys. Also, within the southeastern desert area described in the petition, personal communication with Mr. Tom Campbell (Biologist, China NWF, approximately 500,000 acres) indicates that a population of breeding burrowing owls occurs on the base. A comprehensive survey has not been conducted; however anecdotal information from Mr. Campbell indicates that WBO are seen on a fairly regular basis, particularly in the deserts surrounding Ridgecrest.

California Department of Fish and Game Lands

A database query was made regarding all of the Department's lands that either have records of burrowing owls or that have potentially suitable WBO habitat. A total of 64 properties were found to have these attributes.

California Natural Diversity Database

The Department's California Natural Diversity Database records for burrowing owls contain 590 element occurrence records. An element occurrence is defined for burrowing owls as a burrow site. Records that were submitted without identifying a burrow site are not included in the database. The database points are spatially illustrated in Figure 5.

Habitat Necessary for Survival

The petition included a thorough description of the habitat necessary for survival of the WBO. The habitat necessary for survival is described in the petition under the heading "Habitat Requirements".

Suitable habitats for the WBO are identified in the California Wildlife Habitat Relationship (WHR) program (a general listing of habitats within the range of a species, see Figure 4 for WHR WBO range). The WHR indicates "that the species is a yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. The Department agrees with the petition that little of the native perennial grasslands or native prairie habitat within California remains. A recent mapping project conducted by Chico State University (2003) reports that grassland land cover type decreased in the Central Valley from 7,085,483 acres

estimated as occurring during the pre-1900 time period compared to 3,198,301 acres estimated for the present (Table 1). Although this grassland cover type is predominately annual grass and not native prairie, it does provide potential WBO habitat and hence indicates the extent of the land cover change over the last century. However, as noted earlier, all grassland type habitats are not suitable WBO habitat.

The WBO nesting habitat consists of open areas with mammal burrows. The WBO is a habitat generalist and is capable of surviving within urban fringe and intense agricultural production landscapes. The burrow is paramount for habitat suitability, as well as low vegetation cover adjacent to the burrow. WBO uses a variety of arid and semi-arid environments, with well drained, level to gently sloping topography characterized by sparse vegetation and bare ground. Owls readily nest along agricultural water conveyance canals surrounded by crops (Rosenberg and Haley 2003). The WBO also are found nesting along roadsides, adjacent to airport runways, urban parks, golf courses, athletic fields, and railroad beds. The primary habitat characteristics tend to be the presence of burrows for roosting and nesting, and vegetation structure that is relatively short and perches if vertical habitat structure limits visibility.

Burrows are usually provided by ground squirrels (California ground squirrel and round tailed ground squirrel) which the owls reshape to fit their needs. WBO have also been observed to use the following sites for nesting or roosting; badger holes, coyote dens, sand dune cavities under ice plant, drift wood piles, culverts, concrete rubble piles, rock outcrops and stand pipes. WBO can also excavate their own burrows in soft soils adjacent to agricultural irrigation canals (J.A. Gervais, personal observation). Gleason (1978) and Gleason and Johnson (1985) also found that where mammal burrows is scarce, WBO have been found nesting in natural rock and lava cavities.

The WBOs tend to forage close to their burrow during the nesting season, usually staying within a few hundred to a thousand meters (Haug and Oliphant 1990, Sissons et al. 2001, Gervais 2002, Gervais et al. 2003, Rosenberg and Haley 2003). Foraging owls have been detected up to 2.7 km from the nest burrow during other times of the year (Haug and Oliphant 1990). In the Central Valley of California, owls used all available cover types close to the nest burrow and did not indicate any avoidance of specific crop cover types (Gervais et al. 2003). Over 80% of the feeding observations made during a research study in the Central and Imperial Valleys (Gervais et al. 2003, Rosenberg and Haley 2003) were made during the breeding season and occurred within 600 meters of the nest burrow.

Abundance

The petition contains a comprehensive review by county of the abundance of the WBO. Abundance information is described in the petition under the

causing a contraction of WBO breeding range. This research also provides evidence of population connectivity between the Carrizo Plain, the south Bay area, and NAS Lemoore WBO populations. Also, these same studies by Gervais (2002) and Rosenberg and Haley (2003) revealed that the number of breeding pairs of burrowing owls at the Lemoore and the Imperial study sites stayed fairly constant between 1997 and 2000 despite fairly high variation in production and survival rates.

Population Trend Summary

The petition relied on historic and current scientific literature, along with expert opinion, to describe the WBO population in California. In conducting its analysis for this report, the Department carefully reviewed the same information as cited by the petitioners. The Department agrees that the scientific evidence indicates WBO populations have declined in portions of their range when contrasted with historic accounts, though the exact magnitude of the historic decline is not known and has not been quantified. Currently, the best available scientific information from more recent studies indicates a decline of 60% of the breeding groups of burrowing owls known to have existed within the research survey area between the 1980s and the early 1990s (DeSante and Ruhlen 1995). Within the highly developed urban landscapes open space lands such as industrial parks, airports and rail yards, tend to maintain populations of burrowing owls due to the adaptive behavioral characteristics of WBO. Also, due to the lack of WBO surveys in the arid desert environs of California (representing approximately 40% of their range), insufficient data exists to evaluate the extent of their populations where low density populations occur. Therefore, due to the fact that a large extent of the WBO populations occur in core populations (such as the Lemoore, Carrizo, and Imperial Valley study sites)that are stable, the Department at this time does not believe that the declining populations within highly developed portions of their range jeopardize the overall stability of the State population.

Key finding

Factors Affecting the Ability of the Population to Survive and Reproduce

The petition provides sufficient scientific information on factors affecting the ability of the population to survive and reproduce. Though the petition does not actually contain a heading with this title, it is covered under the heading "VIII Nature, Degree, and Immediacy of Threat". The petition states "The burrowing owl is a species in crisis throughout most of its range in California. DeSante and Ruhlen (1995) estimated that at least 50% of the state's owl population was lost in the previous decade in both urban and agricultural areas of the state." Further the petition states that this loss is documented to be at a rate of approximately 8% per year. As stated previously, burrowing owls are believed to be extirpated in 5 counties, nearly extirpated from 6 additional counties as well as from portions of 4 counties.

The apparent main threats to burrowing owls are the loss of suitable habitat due to urban development and eradication of ground squirrels. Most of the extirpated populations identified by DeSante et al. (1997, unpublished data) occur within counties along the coast. These coastal counties have experienced tremendous growth over the last few decades. Urban development is also increasing in the Central Valley, and loss of agricultural and other open landscapes is likely to impact owl populations. Burrowing owls do persist in urban environments but in an unnatural and somewhat unstable condition due to the increased number of threats associated with living adjacent to urban areas (vehicles, pesticides, and domestic animals). However, Millsap and Bear (2000) indicated that lower density development appeared to benefit the owls due to increased prey availability around homes, and reduced mortality from natural causes (Millsap and Bear 2000).

Another identified risk for burrowing owls within developed landscapes is mortality caused by traffic (Konrad and Gilmer 1984, Haug and Oliphant 1997, Clayton and Schmutz 1997, Millsap 2002, D. K. Rosenberg et al., unpublished data). It would appear that burrowing owls nesting along roadsides or parking lots could be at greatest risk, however owls have been observed to forage along roads over 1 km from the nest burrow (J. A. Gervais, personal observation). Very little road kill data is collected so it is difficult to evaluate this subject.

Pesticides are likely to impact burrowing owl populations living in heavily agricultural environments (James and Fox 1987, James et al. 1990). In the Central Valley, however, there was no indication that foraging owls selected fields recently treated for pesticides, although owls did use crops extensively during foraging activities (Gervais et al. 2003). Some owls likely die of pesticide exposure, and some owls carry body burdens of persistent contaminants such as DDE that may impair reproduction or survival (Gervais et al. 2000). An analysis of the potential impacts of pesticide exposure rates on population growth rate suggested negligible effects (Gervais 2002, Gervais and Anthony in press).

The largest populations of burrowing owls remaining in California occur in agricultural environments. In addition to possible pesticide exposure, these owls are potentially vulnerable to land use practices. Discing to control weeds in fallow fields may destroy burrows, and the management of water conveyance structures will determine whether burrows persist through the breeding season (Rosenberg and Haley 2003). Ironically, the high density of owls present in the Imperial Valley is almost certainly due to agricultural development (Rosenberg and Haley 2003). A HCP for the Imperial Valley area has been drafted and includes mitigation measures for burrowing owls and monitoring requirements. Of the three basic canals engineered to deliver water to the Imperial Valley, the secondary canals that branch off of the three main canals provide the primary burrowing owl nesting habitat. The configuration of the secondary canals including the height and slope of the berms apparently provides more suitable habitat than either the larger primary canals or the smaller tertiary canals. The

secondary canals include both concrete lined and earthen construction and are apparently used at similar rates. It appears that canal embankments are more commonly used for nesting than drains because the vegetation is maintained at lower levels in the canals.

Another cause of burrowing owl population decline could potentially be related to the change in agricultural crops. Department staff has observed that burrowing owls appear not to use areas adjacent to orchard or vineyard type crops like they use areas adjacent to row crops. Conversion of row crops to orchard/vineyard crops could reduce burrowing owl habitat suitability.

Although natural predation may be significant in grassland habitats such as the Carrizo Plains (Ronan 2002), predators such as large raptors and coyotes may also benefit owls in more disturbed areas by checking the populations of feral predators such as domestic cats, although there is no data on this question.

Summary

The Department believes the petition and supporting information discussed above, and in the Threats section below, accurately summarize the factors that may negatively affect the ability of WBO populations to survive and reproduce.

Degree and Immediacy of Threats

The petition provides information on the degree and immediacy of threats to the WBO. Threats to the burrowing owl were divided into Urban Development, Threats to core populations in the Imperial Valley and Central Valley, Destruction of Burrowing Rodents, Relocation of Owls, Agricultural Practices, Pesticides, Predation, Disease, Small Population Sizes, and Other Anthropogenic Factors. They are discussed below as presented in the petition.

Urban Development

Urban development is a threat to burrowing owl populations. The petition thoroughly covers this threat. The petition cites DeSante and Ruhlen (1995) that 85 % of the known breeding population of burrowing owls in California is found on agricultural land in the Imperial and Southern Central Valley and that these areas are rapidly urbanizing according to the California Department of Finance population growth statistics (CDF 1993, 1994, 2001). Discussions with Department of Conservation staff confirm the loss of agricultural production lands. Between 1984 and 2000 approximately 3,633 acres have been converted from agriculture to urban development, at a rate of approximately 227 acres per year within the Imperial Valley. The total acres in the Imperial Valley of irrigated agricultural lands in production in the year 2000 were approximately 519,500. The population within Imperial County is recorded at 149,000 for 2000 and it is

projected to grow to 294,200 by the year 2020. The growth increase is high, but the overall population in the County is still low relative to other County populations.

The petition also references documents that address the rapid urbanization of the Central Valley. The petition references the Department of Conservation Farmland Conversion Report (CDOC 1994, 2000) which documented the loss of approximately 74,006 acres of land converted from agriculture to urban and built up uses from 1990 to 1998 within the Central Valley. However, within the southern Central Valley (San Joaquin Valley) which maintains approximately 15.1% of the known breeding population, significant reserve lands have been set aside for other sensitive species such as the kit fox and many are known to support burrowing owl populations. In total, approximately 1,465,000 acres within the Central Valley are reserve lands or are in public ownership. The Department agrees that the threat of land conversion from agriculture to intensive urban development poses a risk to WBO populations. However, at this time the Department does not agree that the stability of the rangewide populations is presently at risk.

The petition documents the extreme development pressure and habitat loss for the burrowing owl in the Bay Area environs. The petition references a Department document (2002) that recorded the loss of 84 pairs of burrowing owls within the Bay Area population over the last three years.

In southern California the petition documents that planned developments in western Riverside and San Bernardino counties threaten many of the remaining significant breeding populations. Department Staff indicate that the burrowing owl has been severely reduced as a breeding species in the five coastal counties of southern California. Staff has documented approximately 30-70 nesting pairs occurring at about 25 sites from Santa Barbara County south to the Mexican border. Wintering populations are reduced from historic levels based on Christmas Bird Count data and field observation in these southern coastal counties. Again, the Department agrees that the loss of WBO habitat to intense urbanization poses a risk to some populations. However, at this time the Department believes that due to the stability and extent of the breeding populations in other portions of their range that there is no present risk to the statewide WBO population indicating that listing may be warranted.

Threats to core populations in the Imperial Valley and Central Valley

The petition emphasizes the risk of having approximately 95% of the known breeding population of burrowing owls within the Imperial Valley (71%) and the Central Valley (24%) (DeSante and Ruhlen 1995). However, due to the low detectability of burrowing owls in large open landscapes (grassland, shrub steppe, and desert scrub) it is difficult to estimate the burrowing owl population outside of the survey area. The habitat within the Imperial Valley represents only

2.5% of the total occupied habitat within the DeSante (1995) survey area and yet this area contains approximately 71% of the known breeding owls. The petition states that the size of the burrowing owl population in the Imperial Valley is a by-product of the agricultural land use and that negative changes in land use practices could significantly effect the breeding population. However, at this time the Department believes that this threat does not pose a present risk to WBO populations indicating that listing may be warranted. Many factors including the extent of the WBO range in California and the diversity of habitats occupied provide security to the stability of the population. Also, the fact that research on WBO in the 1970's within the Imperial Valley documented similar demographic characteristics as resent research (Coulombe 1971, and D. K. Rosenberg et al., unpublished data) indicated that although the management of irrigated agriculture may change over time (three decades) WBO appear to adapt.

Destruction of burrowing Rodents

The petition cites Anderson et al. (2001) who indicate that there is a direct connection between loss of burrowing mammals and the recent and historic declines in burrowing owl populations. The long term control of burrowing rodent populations has been part of various agricultural land management practices intended to minimize the loss of crops and forage for domestic livestock. These control programs have reduced the number of burrows available for use by burrowing owls. The petition cites Gordon (1996) who documented that widespread ground squirrel control programs were begun as early as 1869 and cited Marsh (1987) who documented that more than 9.9 million acres in California were under some form of ground squirrel control during his research in the late 1980's. The petitioners cite research documenting that landowners and managers on grazing, vineyard, and crop production lands operate rodent control programs involving shooting, poisoning with acute toxicants, anticoagulants, fumigants, trapping, and sealing burrows (Butts 1973, Salmon et al. 1982, Rosenberg et al. 1998). The petitioners also noted that burrowing owls have been incidentally poisoned and their burrows destroyed during rodent control programs.

The petition cites research that illustrates how healthy colonies of burrowing rodents are essential for the health of burrowing owl colonies and that periodic elimination of ground squirrels reduces the likelihood that burrowing owls will maintain colonies (DeSante et al. 1996). Overall the Department concurs with the petitioners regarding the necessity to maintain healthy ground squirrel colonies to maintain healthy burrowing owl colonies. However, at this time the Department does not believe rodent control programs pose a risk indicating that listing may be warranted.

Relocation of Owls

The petitioners contend that most relocation of owls is detrimental to

State Regulatory Mechanisms

The petitioners discuss the California Species of Special Concern listing designation, the California Environmental Quality Act, the CDFG Mitigation Guidelines, the California Fish and Game Codes, Natural Community Conservation Plans, and Mitigation Banks. The Department summarizes each of these regulatory actions below.

The petitioners contend that the **Species of Special Concern** designation has provided little practical benefit to the burrowing owl. This designation is intended for use as a management tool and for information; species of special concern have no special legal status. Species with this designation are often covered or discussed in CEQA documents along with state or federally listed species. Strategies to minimize impacts to these species are often included within CEQA documents or CDFG provides comments pursuant to CEQA to add conservation measures concerning species with this designation. While the legal effect of this designation is different from the legal effect of listing pursuant to CESA, species of special concern are considered in most CEQA projects, and consideration/mitigation for these species within the CEQA guidelines have provided for conservation of these species to a greater degree than for species without this designation.

The petitioners discuss the adequacy of **CEQA** at conserving burrowing owl populations and contend that even with all the considerations given under CEQA to mitigating impacts to burrowing owls, mitigation practices do not function adequately to prevent the ultimate decline of the population in certain highly developed landscapes. CEQA declares that it is the policy of the state to "prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities" and requires public agencies to analyze and, in some cases, to mitigate the environmental impacts of projects they approve or carry out. The petition contends that CEQA theoretically has substantive mandates for environmental protection, but references areas in California where despite, the CEQA process to protect burrowing owl habitat, significant declines of occupied burrows have occurred.

The petition discusses the **CDFG Staff Report on Burrowing Owl Mitigation (1995)**. The petitioners discuss the formation of the California Burrowing Owl Consortium (CBOC), and the preparation of their document entitled "Burrowing Owl Survey Protocol and Mitigation Guidelines" in 1993. The Department has been involved with this conservation organization since its inception. The CDFG Staff Report prepared in 1995 utilized much of the information that was developed in the CBOC document. The CDFG Staff Report is intended to assist CDFG staff in reviewing CEQA projects which may impact

burrowing owl habitat. The Staff Report was developed by CDFG Headquarters Staff with input from Regional Staff and the pubic. The Staff Report's cover memo provides as follows:

> "Either the mitigation measures in the staff report may be used or project specific measures may be developed. Alternative project specific measures proposed by the Department divisions/regions or by project sponsors will also be considered. However, such mitigation measures must be submitted to ESD (Environmental Services Division, now part of Habitat Conservation Planning Branch) for review. The review process will focus on the consistency of the proposed measure with Department, Fish and Game Commission, and legislative policy and with laws regarding raptor species."

The petition contends that the Staff Report's use of a 100 meter radius around an active burrow (approximately 6.5 acres) as a threshold where impacts should be considered significant has been used inappropriately in project level mitigation. This threshold was developed by using a combination of intuitive disturbance distances (a few dozen meters) and territory considerations (Plumpton 1992, Desmond 1991). The Staff Report recommends as the second specific mitigation measure the following; "do not disturb occupied burrows during the nesting season...To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5 acres of foraging habitat (approximately 100 meter foraging radius around the burrow) per pair or unpaired bird, should be acquired and permanently protected. The protected lands should be adjacent to occupied burrowing owl habitat and at a location acceptable to the Department."

In summary, the Department recognized the limitations to the Staff Report. However, the use of this Staff Report during CEQA review has helped to conserve numerous burrowing owls and their habitat over the eight years that it has been in use.

The petitioners describe the **California Fish and Game Code** sections that prohibit the take, possession, or destruction of the nest or egg of any bird (Fish & G. Code, § 3503), and that prohibit the take, possession, or destruction of birds of prey or their nest or eggs (Fish & G. Code, § 3503.5.). The petitioners contend that there does not seem to be any enforcement of these codes and it is unknown whether these codes have ever been used to prosecute illegal "taking" of burrowing owls or owl nests and eggs. Also the petitioners contend that these code sections do not provide adequate protection for habitat. During 2001 there were 53 protected species citations issued by the Department, indicating some level of enforcement activity. Since approximately 1994 there have been 86 citations written for 3503 and 3503.5, of which 60 were for 3503.5. The Department believes these sections of the code provide some protection for burrowing owls, although not a level equivalent to that provided by listing under CESA.

RAPID ECOLOGICAL ASSESSMENT OF THE LIMITROPHE ZONE OF THE COLORADO RIVER

PROGRESS REPORT PRESENTED TO ENVIRONMENTAL DEFENSE

September 19, 2003

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1. Background

The Limitrophe Zone of the Colorado River is the 25 km stretch of river between Yuma, Arizona and San Luis, Mexico, that forms the border between Mexico and the United States (Figure 1). This river stretch has been identified as one of the few areas that support significant extensions of native riparian trees in the Lower Colorado Basin. This habitat type has been drastically reduced all along the Lower Colorado River, due to regulation of river flows and lack of overbank flooding, causing dramatic population declines in riparian birds and other wildlife. The Limitrophe, on the other hand, receives pulse-floods from the United States that stimulate the regeneration of native trees. This has triggered interest in implementing a binational natural protected area on the stretch of the river between Morelos Dam and San Luis Rio Colorado, Sonora, with the active participation of the Cocopah Tribe, environmental organizations, universities, and government agencies.

The regeneration and maintenance of native trees along the Limitrophe Zone represents one of the most important conservation opportunities in the Colorado River, as it provides habitat for endangered, threatened, or sensitive species such as Yellow-Billed Cuckoo (*Coccyzus americanus*), Southwestern Willow Flycatcher (*Empidonax traillii extimus*), and Bell's Vireo (*Vireo bellii*). Based on the existing habitat types and casual bird observations, the Limitrophe Zone is probably also a critical stopover site for neotropical migratory landbirds, and habitat for a diversity of mammals, reptiles, and amphibians. Yet, there is scarce information on the vegetation and wildlife in this region, and the pressures and threats are high. Understanding of the general patterns of diversity, abundance, distribution, and habitat use of both breeding and migrant species could help guide the management of this area and provide conservation opportunities for all birds and other wildlife.

2. Project Goals

The goal of this project was to collect critical information on the diversity and status of wildlife species and habitat value of the Limitrophe Zone of the Colorado River through the implementation of a Rapid Ecological Assessment (REA) for wildlife, and on a detailed analysis and mapping of vegetation using remote sensing and ground studies. The REA was carried out

by a binational team of scientists, with fieldwork occurring during July 2003. The fieldwork for wildlife assessment was carried out on the Mexican side due to permits restrictions, but the U.S. and Cocopah region was assessed for vegetation and wildlife habitat.

The information was used to identify the ecological value and the restoration and conservation opportunities in the area by associating the wildlife data with information on vegetative communities, extension of existing habitat types, and water flows in the Limitrophe Zone.

3. Activities and Methodology

The project activities were divided in four major components: vegetation, birds, other sensitive wildlife and hydrology.

3.1 Vegetation

Vegetation mapping was based on a June, 2002, aerial overflight and a June, 2002 ETM+ satellite image. Overlapping aerial photographs of the Limitrophe were obtained at 1,000 m (0.5 m resolution) and 3,000 m (1.5 m resolution). The digital, visible-band color photographs were georeferenced to the ETM+ image, and mosaiced to produce complete aerial coverage of the area between the outer levees for the entire Limitrophe stretch. The following features of the landscape were digitized by visual inspection of the photographs: outer levees; the boundary of the riparian zone inside the levees (there are also agricultural fields within the levees in this river stretch); the active river channel at the time of the photography; areas of emergent vegetation within the river channel; and stands of native trees across the floodplain. These coverages were saved as shape files in ArcInfo and as areas of interest in ERDAS. They were overlaid on a base layer prepared from the ETM+ image. The area corresponding to the riparian corridor was clipped, and the pixels were converted to reflectance-based, NDVI values. These were then distributed into 5 classes using an unsupervised classification program. These classes corresponded to areas of water or bare soil (the lowest NDVI class) and 4 classes of relative vegetation intensity. The classified image was converted to a vector coverage to serve as a basemap for the shape files.

The accuracy of vegetation assignments on the map was tested by ground surveys in the Limitrophe in August, 2002. Vegetation identified by inspection of aerial photographs was located on the ground and scored. Native cottonwood and willow trees over 6 m in height could be easily distinguished from other vegetation types. On the other hand, small trees could not be accurately distinguished from saltcedar bushes, and saltcedar and arrowweed often grew in intermixed patches. Hence, we were able to divide land cover classes into the following units: open water (based on inspection of aerials); emergent marsh area (based on inspection of aerials); bare soil (based on the bare soil + water NDVI class, minus the open water area from the aerials); mature native trees (based on inspection of aerials); and 4 saltcedar-arrowweed classes (based on NDVI values, minus the area of occupied by native trees for the highest NDVI class). The saltcedar-arrowweed classes also contained some immature native trees, mesquites and, along the riverbank, strands of common reed.

Vegetation was also surveyed by ground crews conducting bird counts (see below). Percent cover of bare soil, water and the main perennial tree and shrub species were estimated in 30, 1.5 ha plots placed along the Limitrophe, mainly on the Mexico portion due to restricted access along the U.S. side (Figure 2). Percent cover was not measured but was estimated visually at these sites.

3.2 Birds

The assessment of avian use included three major activities: mist-netting, area searches, and call-response surveys for priority species. These activities provided information on the status and habitat affinities of the breeding species in the Limitrophe Zone. Fieldwork was conducted from July 7 – 10, 2003, with the participation of 6 biologists from Pronatura Sonora and the University of Arizona.

We complemented this information with data from Yellow-billed Cuckoo and Willow Flycatcher surveys conducted since 1999 (García-Hernández et al. 2001, Hinojosa-Huerta et al. 2002), and with information collected by Linden Piest from the Arizona Game and Fish Department. We also incorporated information on noteworthy bird records for the region compiled by Richard Ericsson (Patten et al. 1993, 2001; and Ericsson et al. field notes).

3.2.1 Mist-netting

We operated 4 mist nets (12 m wide, 2.6 m height, 30 mm mesh size) distributed on two 7 ha plots of native riparian vegetation in the Limitrophe Zone, following standard procedures described by Ralph et al. (1996). Nets were operated simultaneously at the two sites for 5 hours (starting at sunrise) during the 4 fieldwork days (a total of 160 net-hours). Captured birds were banded using aluminum USFWS bands and we collected data on species, age, sex, weight, body condition (fat deposition), and breeding status. Criteria for aging and sexing followed Pyle (1997).

3.2.2 Area searches

We evaluated bird populations using the area search method (Ralph et al. 1996) on 30 1.5 ha plots along the Limitrophe Zone (Figure 2). Each plot was surveyed only once. The procedure at each plot consisted of recording all detected birds (song, call, or visual) in a period of 20 min, during which the surveyor traversed through the plot. This methodology allows for the evaluation of breeding populations as well as for migratory birds, while providing quantitative data for habitat analysis. Surveys were conducted starting at sunrise and continuing for 4.5 hours.

3.2.3 Call-response surveys

Call-response surveys were conducted for priority species, which rarity preclude their accurate assessment with other methods. Target species included Southwestern Willow Flycatcher (*Empidonax traillii extimus*), Bell's Vireo (*Vireo bellii*), and Yellow-billed Cuckoo (*Coccyzus americanus*). The procedure consisted of playing the territorial song of the species trying to elicit the response of a breeding male. The localization of the male allows for the opportunity to search for breeding activity and monitor nests, thus allowing for an evaluation of the breeding status of this target species. We used a CD with a sequence of the Willow Flycatcher, Bell's Vireo, and Yellow-billed Cuckoo vocalizations. The CD was played on 2 min-intervals, while traversing 500 m transects. The surveys were conducted at suitable sites, at or nearby the area search plots. A total of 20 transects were completed. Surveys were conducted starting at sunrise and continuing for 4.5 hours.

3.3 Other Sensitive Wildlife

This component focused on priority species or species of concern of mammals, reptiles, and amphibians in the study area. Between 21 and 25 July 2003, we surveyed selected areas along the Río Colorado between Algodones and Ejido Pachuca to obtain an overall impression on the species that would or could be benefited from managing the Limitrophe Zone as a protected area. Possibilities of surveying were hampered by the intensity of illegal activities occurring in the region, and we suspended activities between and around sunset and sunrise, but we were able to invest some reasonable effort in assessing the wildlife of the area. This included trapping small mammals with Sherman traps, operating a small set of reptile pitfall traps, and using a freshwater turtle trap, in addition of surveying the area for tracks and signs. Additionally, observations on other wildlife were gathered while conducting bird surveys. Survey time was not best, as some species might have had very limited activities due to the heat, while other, notably some amphibians, still awaited for some rain.

We surveyed three areas:

-1 km south of Presa Morelos (32°42.063' 114°43.399')

- Ejido Pachuca 1 (32°37.884' 114°47.222')

- Ejido Pachuca 2 (32°37.920' 114°46.987')

These sites are composed of a sandy substrate covered by shrubs (*Pluchea sericea*) and trees (especially *Tamarix ramosissima*, but including also *Salix gooddingii*, *Populus fremontii*, *Prosopis pubescens*, and *Parkinsonia microphylla*). The particular composition varied between areas. Herbs were notably absent, perhaps due to the lack of rains, as yet to fall.

3.4 Hydrology

A floodplain model of the Limitrophe is being developed. For this study, we collected data on historic flows through the Limitrophe and plotted them against carrying capacity of the floodplain between the levees under different scenarios. These scenarios included: design capacity between the levees; capacity as it presently exists, reduced by vegetation growth and

siltation; and capacity of a pilot channel proposed by the International Boundary and Water Commission to delineate the U.S – Mexico border. Flow data was obtained from the International Boundary and Water Commission web site; other information was from Sylvia Waggoner, IBWC, El Paso, Texas (private communication).

4. Results and Discussion

4.1 Vegetation and other Land Cover Classes

A land cover map of the Limitrophe is in Figure 3 and the areas of different landcover classes are in Table 1. A detail of the landcover coverage is in Figure 4, showing marsh, river, tree and shrub layers of the GIS for the Limitrophe. The total area between the levees is approximately 6,200 ha, of which 2,700 ha is floodplain and 3500 ha are agricultural fields within the levees. These fields have special status since they are within the flood zone (they are operated and owned by ejidos and private owners, but do not receive the same protection or compensation from the Federal Government in case of flood damage). We divided the Limitrophe into two stretches based on river geomorphology. The northern stretch, extending for approximately 10 km below Morelos Dam, is very narrow (< 1 km wide) and contains the highest proportion of native tree cover of any stretch of the Lower Colorado River, in either the U.S. or Mexico. Willow and cottonwood trees constitute 18% of the vegetation in this stretch. The southern stretch is much wider and is less heavily vegetated, but still supports significant stands of trees in local areas.

Native trees occur as isolated individuals or, more commonly, in small strands of trees that run parallel to the course of the river (Figure 4). These strands occur immediately beside the current channel, but are also distributed across the floodplain. They appear to represent the high-water mark of previous flow events, where tree seeds were deposited. In total, mature trees (>

6m height) cover 83 ha of the floodplain. Immature trees, which cannot be distinguished from other vegetation on aerial photos, cover an additional area of the floodplain.

Ground surveys of vegetation were conducted during the rapid assessment for birds. Although the plots were not randomly chosen, they do offer a more detailed view of the vegetation structure of the floodplain than is possible with aerial photos alone. In the bird survey plots, willows and cottonwoods covered 19.72% ± 2.96 and 9.72% ± 1.78, of the ground area, adding up to almost 30% of the total cover. Saltcedar had an average cover of 23.75% (± 2.91), while mesquite trees were very rare (only 0.79% of the cover). Surface water was a regular feature, although as a low percentage of ground cover (7.68% ± 2.08). Shrubs other than saltcedar covered 12.55% of the survey plot area, and were dominated by arroweed (*Pluchea sericea*), seep willow (*Baccharis salicifolia*), and saltbush (*Atriplex* spp.). In similar ground surveys on the river stretch below the Limitrophe, native trees made up 8% of ground cover; hence, native trees are over three times more abundant in the Limitrophe than on the rest of the river. By contrast to the present results, native trees have become rare on the U.S. portion of the Lower Colorado River, present at only 1-2 % of land cover even in wildlife refuges where they have been artificially established.

Another noteworthy feature of the vegetation is the presence of marsh habitat within the river (approximately 12 ha). Although small in area, these marshes are important in supporting water birds and have developed due to the continued presence of water in the channel over the past several years. Yuma Clapper Rails have been found in these marshes both within and below the Limitrophe Zone.

4.2 Wildlife

4.2.1 Birds

4.2.1.1 Area Search

A total of 3,096 birds of 64 species were counted during the area searches. The average number of species at each survey plot was 19.93 (± 0.95), and the average number of birds at each plot was 106.75 (± 7.39), for an estimated density of 2,846 birds/40 ha (95% C.I. 2,442 – 3,250).

The bird community in the study area is highly influenced by the adjacent agricultural fields and rural towns. The most abundant species were Mourning Dove (*Zenaida macroura*), Red-winged Blackbird (*Agelaius phoeniceus*), Brown-headed Cowbird (*Molothrus ater*), and White-winged Dove (*Zenaida asiatica*). These species are common throughout the region (Hinojosa-Huerta et al. in press), and the Brown-headed Cowbirds are known to cause significant nest-parasitism impacts on riparian breeding birds (Powell and Steidl 2000).

Nevertheless, the restored native vegetation in the Limitrophe provides enough habitat to maintain a diverse community of breeding birds, many of which are rare or do not breed commonly anywhere else in the region. Common breeding landbirds throughout the region included: Abert's Towhee (*Pipilo aberti*), Verdin (*Auriparus flavipes*), Ladder-backed Woodpecker (*Picoides scalaris*), Cliff Swallow (*Petrochelidon pyrrhonota*), Song Sparrow (*Melospiza melodia*), Common Yellowthroat (*Geothlypis trichas*), and Blue Grosbeak (*Guiraca caerulea*). All of these species are riparian related birds, and the last three species are linked to riparian areas with continuous surface water. Cliff Swallows were nesting in large numbers at Presa Morelos and other hydraulic infrastructure along the nearby channels.

The continuous presence of surface water also provides habitat for many species of waterbirds, many of which are now uncommon or rare throughout the region. During the area searches we detected 129 individuals of 13 species of waterbirds, including Cinnamon Teals (*Anas cyanoptera*; with juveniles), Common Moorhen (*Gallinula chloropus*; also with juveniles), Pied-billed Grebes (*Podilymbus podiceps*), and Green Herons (*Butorides virescens*) .

Some of the species that were common in the Limitrophe, but are rare or absent in other areas of the Lower Colorado and delta included: Lesser Goldfinch (*Carduelis psaltria*), Hooded Oriole (*Icterus cucullatus*), Bullock's Oriole (*I. bullockii*), Ash-throated Flycatcher (*Myiarchus*

cinerascens), Crissal Thrasher (*Toxostoma crissale*), Yellow-breasted Chat (*Icteria virens*), Osprey (*Pandion haliaeetus*) , and Black-chinned Hummingbird (*Archilochus alexandri*). Interesting records that are rare throughout the region during breeding season included an Inca Dove (*Columbina inca*), a Bronzed Cowbird (*Molothrus aenus*), and four Yellow-billed Cuckoos (*Coccyzus americanus*).

4.2.2.2 Distribution and habitat patterns

The percent cover of riparian trees is higher closer to Presa Morelos, and decreases as distance from the dam increases, in particular with willows ($r^2 = 0.53$, $t = 9.51$, $p<0.001$), but also with cottonwoods ($r^2 = 0.24$, $t = 5.24$, $p = 0.0069$). The distribution of species richness and total bird abundance also follow the same pattern, being an increase in the coverage of willows the principal habitat feature determining increases in species richness ($r^2 = 0.32$, $t = 3.60$, $p = 0.0013$) and bird abundance ($r^2 = 0.25$, $t = 3.01$, $p = 0.0056$). The distribution of saltcedar, shrubs, and open water was continuous throughout the Limitrophe Zone.

4.2.2.3 Mist Netting

We banded and processed 21 birds from 11 species. The capture rate was low (0.65 birds per net per day), probably because the high temperatures were limiting the activities of birds, and because it was difficult to conceal the nets at all potential sites, due to safety considerations. Nevertheless, this activity allowed us to document breeding activity of 9 species (by the presence of Hatch Year birds, presence of brood patch, or cloacal protuberance), including Abert's Towhees, Black-chinned Hummingbird, Blue Grosbeak, Cactus Wren, Common Yellowthroat, Common Ground-Dove, House Finch, Ladder-backed Woodpecker, and Verdin.

4.2.2.4 Call-response surveys

We failed to detect responses from Willow Flycatchers and Bell's Vireos. The probability to elicit a response of these two species was probably higher early in the season, however, it is likely that both species are absent or very rare in the Limitrophe Zone. R. Ericsson detected a singing Bell's Vireo male in an agricultural drain about 7 km west of Morelos Dam, in an area

dominated by Palo Verde and Mesquite on July 9 (same day in which we were conducting our surveys). These shows that at least Bell's Vireos in the region were singing and detectable.

We detected 6 singing Yellow-billed Cuckoos along the Limitrophe. All of them were nearby the main stem of the river, and in areas dominated by tall (>5m) willows and cottonwoods. The cuckoos were distributed in the northern half of the study area. Three of them were detected at areas in which the only riparian tree was willow This is the highest number of Yellow-billed Cuckoo detections in the Colorado River in Mexico, and is the fourth consecutive year in which we have detected cuckoos in the Mexican portion of the river. It is likely that Yellow-billed Cuckoos have established again in the river in response to the restoration of native riparian vegetation and a continuous instream flow, and there is probable a modest population.

4.2.2.5 Yuma Clapper Rail Surveys

The Non-Game Department of Arizona Game and Fish, Yuma Office, has conducted Yuma Clapper Rail surveys along the U.S. portion of the Limitrophe Zone since 1981, although not continuously. In the years they surveyed, they detected 3 rails at Hunter's Hole in 2002, 0 in 1999, and 4 in 1997. The maximum number they have detected is 11, in 1983. This suggests that modest instream flows can maintain habitat for Yuma Clapper Rails in the Limitrophe Zone.

4.2.2.6 Linden Piest (Arizona Game and Fish Department) Field Notes

Lin Piest is the Non-Game Specialist at the Yuma Office of Arizona Game and Fish. He has conducted surveys for Willow Flycatchers and Yuma Clapper Rails along the Limitrophe Zone. He provided us with his field notes. Some of the noteworthy information includes two Summer Tanagers close to Presa Morelos on June 22, 2000 and several records of Yellow-billed Cuckoos: 2 on June 1999, 1 on July 2000, 3 on July 2001, and 1 on July 2002.

4.2.2.7 Annotated Checklist

An annotated checklist of the birds of the Limitrophe Zone of the Colorado River was compiled using the data collected during field work plus other sources of information, including

field notes from the authors and from other ornithologists that have visited the area. The checklist is in Appendix I.

4.2.3 Amphibians

We only documented the presence of Woodhouse's toad (*Bufo woodhousii*). The area is within the distribution of several species of amphibians, including the Colorado River toad (*Bufo alvarius*) and lowland leopard frog (*Rana yavapaiensis*) which are considered species of special concern in the U.S. The second of these is on the Mexican list of species at risk. The Colorado River toad has its main habitat in permanent streams, which unfortunately, in the area, are occupied by the bull frog (*Rana catesbeiana*), a voracious, introduced species. It is likely that modification of river conditions along with the introduction of this species as well as alien fish and soft-shelled turtles have caused the extirpation of native amphibians from the area, or, at least, severely impaired their populations (Mellink and Ferreira-Bartrina 2000), including that of the Colorado River toad.

4.2.4 Reptiles

We documented the following species of reptiles:

- Soft-shelled turtle (*Trionyx spinifera*). The soft-shelled turtle, alien to this region, has been a long time resident of the Colorado river delta (Mellink and Ferreira-Bartrina 2000). This was the only turtle recorded in the river.
- Side-blotched lizard (*Uta stansburniana*). Very common in the understory at Pachuca 1.
- Tree lizard (*Urosaurus ornaturs*). This lizard is an arboreal riparian specialist that has become scarce as the riparian corridors of the region have deteriorated. Although not at risk, the species might offer an argument for the protection of the area.
- Desert spiny lizard (*Sceloporus magister*). We captured a male of the subspecies of the eastern side of the Colorado River (*S. m. magister*), and must have colonized the area west of it in recent time. No other individuals of the species were seen.
- Whiptail (*Cnemidophorus tigris*). A few seen at Pachuca 1.

- Bullsnake (*Pituophis melanoleucus*). Likely track and road-kill in Pachuca 1.

By using a freshwater turtle trap we were hoping to find the Sonora mud-turtle (*Kinosternon sonoriensis*), which has been recorded in the U.S. part of the river, but not in the Mexican part. This is a sensitive species. No turtles were caught, nor seen, on the Pachuca stretch of river.

Two species that were historically found along the river but were absent from our sampling are the flat-tailed horned-lizard (*Prhynosoma mccallii*) and the Colorado Desert fringe-toed lizard (*Uma notata*). The patches of open sand are probably too small for these species.

4.2.5 Mammals

We documented:

- Cottontail (*Sylvilagus audubonii*). Common at Pachuca 1 and 2 (individuals, tracks, scats).
- Pygmy pocket gopher (*Thomomys umbrinus*). Mounds at Presa Morelos and an agricultural plot near Pachuca 1.
- Desert pocket mouse (*Chaetodipus penicillatus*). 10 at Pachuca 1 and 2, including 4 juveniles.
- Merriam's kangaroo rat (*Dipodomys merriami*). Two individuals at Pachuca 1 (inactive female, and juvenile male).
- Deer mouse (*Peromyscus maniculatus*). One at Pachuca 2.
- Muskrat (*Ondatra zibheticus*). The species, although on the Mexican list of species at risk, is common throughout the Mexicali Valley (Mellink 1995, Mellink and de la Cerda in press). Due to security reasons, we did not survey the river at a proper time of the day, but three individuals were detected on the mainstem of the river during the bird surveys.
- Beaver (*Castor canadiensis*). This species was common in the area a few years ago (Mellink and Luevano 1998), and we recorded abundant signs of its presence at Pachuca 2 in our visit. Two individuals were detected during the bird surveys.

- Domestic dog. Scats and tracks at Pachuca 1. Adult and pup at Pachuca 2.
- Raccoon (*Procyon lotor*). Abundant tracks in dry mud at Pachuca 2.

Although the area lies within the distribution of the desert kangaroo rat (*Dipodomys deserti*), the patches of sandy habitat were too small for it, and no signs of its presence were found, nor was it trapped. The area is also within the distribution of the Colorado River delta subspecies of cotton rat (*Sigmodon hispidus eremicus*), a sensitive taxon. The area we explored lacked the thick herb cover required by the species.

There are a number of bat species of concern that occupy the general region, some of which could be found specifically in the area, but we could not survey for them, because of security reasons.

4.2.6 Alien Species

Other alien species (not listed in the above sections) that we recorded in the area were crawfish (*Procambarus*) and Asiatic clams (*Corbicula*).

4.3 Historic River Flows and Carrying Capacity

Instantaneous river flows measured at the Southerly International Boundary (south end of the Limitrophe) since 1980 are in Figure 5. Prior to 1980, flows were lower due to excess capacity first in Lake Mead, then in Lake Powell, as these reservoirs were filling. The flows of the early 1980's were exceptional. The peak flows of approximately 800 m^3/sec in 1983 threatened the overflow spillways at Glen Canyon Dam and caused property damage along the river in the U.S., as well as lower in the delta near the junction of the Colorado River and Rio Hardy. These flows also caused property damage in the Limitrophe in Mexico, washing out several ha of agricultural fields and destroying several wells and pumps. As a result, the levees were raised to afford greater protection on both sides of the border. Figure 5 shows the design capacity of the levee system (installed after 1983), and an estimate of its current carrying

capacity, which has been reduced due to vegetation growth and siltation from 1993 releases of water and silt from the Gila River in the United States to the Colorado River. Even at an estimated half-capacity, the levee system appears to be able to convey flows at least double those of 1983. However, Mexico has fields within the levees which are still vulnerable to flooding. Finally, Figure 5 shows the capacity of a proposed pilot channel, which has been proposed to delineate the border between the United States and Mexico. This channel would capture nearly all of the small-event flows that have revegetated the floodplain with native trees.

5. Conclusions

The Limitrophe Zone of the Colorado River contains approximately 2700 ha of riparian habitat along the border between the U.S. and Mexico. Native trees and marsh habitat have regenerated in this river stretch due to the release of excess river flows from the United States to Mexico. In the northern part of the Limitrophe, below Morelos Dam, native trees represent 18% of the vegetation, more than on any other stretch of the Lower Colorado River. This regenerated habitat supports a diverse population of migratory and resident birds. Based on the rapid assessment conducted here, this river stretch is of very high regional importance in supporting terrestrial migratory birds, some of them listed as endangered in both the U.S. and Mexico. The Limitrophe is the narrowest portion of the Lower Colorado River, hence birds are funneled through this section in high density during migration.

The Limitrophe also supports reptiles, mammals and other wildlife. Although the area is now of some value to some species considered sensitive on one or the other side of the river (like beavers), this value could be enhanced by an aggressive management program. Just declaring the area protected will not be of any use. Restoring the area as a flowing river with a healthy riparian corridor should be considered. Eradication of the most aggressive alien species should also be examined, especially that of saltcedar, bullfrog and, perhaps, some of the fish. Reintroduction of Sonoran mud-turtle, garter snake and the native amphibians are all possible management goals. Management of habitat patches suitable for the cotton rat could also be of value.

Resource managers in the U.S. and Mexico are nearing a decision point about the future of the Limitrophe. On the one hand, the Cocopah and others have proposed that the riparian corridor receive some type of protection as a natural area for wildlife. On the other hand, IBWC has proposed to clear vegetation and channelize the river in this section The present study documents the importance of the Limitrophe to wildlife, especially birds, and raises the question of whether altering the floodplain is necessary for flood control. Much more study and consideration is needed before these questions can be resolved. More thorough wildlife studies and a hydrological model including a risk analysis would help decision makers develop a plan for the future of this area.

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Table 1. Area and fractional cover of land cover classes in the Limitrophe of the Colorado River, based on aerial and satellite imagery acquired in June, 2002. The Limitrophe was divided into Upper and Lower sections for this analysis. The upper section is narrower than the lower

Land Cover Class	Area (ha)	%
Upper Limitrophe		
Area between levees	1329	100
Riparian corridor	716	53.9
Agriculture, roads	613	46.1
Water in River	33	4.6 (as % of rip. corridor)
Marshes in River	7.8	1.1 (as % of rip. corridor)
Bare Soil + Water	382	53.4 (as % of rip. corridor)
Terrestrial Vegetation	334	46.6 (as % of rip. corridor)
Shrubs	275	82.3 (as % of vegetation)
Native trees	59	17.7 (as % of vegetation)
Lower Limitrophe		
Area between levees	4869	100
Riparian corridor	2008	41.2
Agriculture, roads	2861	58.5
Water in River	66	3.2 (as % of rip. corridor)
Marshes in River	4	0.2 (as % of rip. corridor)
Bare Soil + Water	1188	59.2 (as % of rip. corridor)
Terrestrial Vegetation	820	40.7 (as % of rip. corridor)
Shrubs	904	97.4 (as % of vegetation)
Native trees	24	2.6 (as % of vegetation)

Notes:

Data were abstracted from GIS coverages of the Limitrophe by Reggie Romo and Pamela Nagler, Environmental Research Laboratory.

The area of native trees was determined by manually digitizing all cottonwood and willow canopies visible on the aerial photomosaic of the Limitrophe (0.5 m resolution). This method only counts trees greater than approximately 6 m height.

Shrubs include mainly saltcedar and arrowweed in approximately a 1:1 ratio, and some willow or cottonwood juvenile trees under 5 m height. A few screwbean mesquite trees were encountered in ground truth plots.

The shrub class was divided into 5 classes based on NDVI values, using an unsupervised classification. The fractional vegetation cover was determined from the mean NDVI value of each river stretch, using the regression equation, $y = (NDVI - 0.066)/0.309$ ($r = 0.81$***).

Based on a paper in prepration, Nagler, Hinojosa, Romo and Glenn, 2003

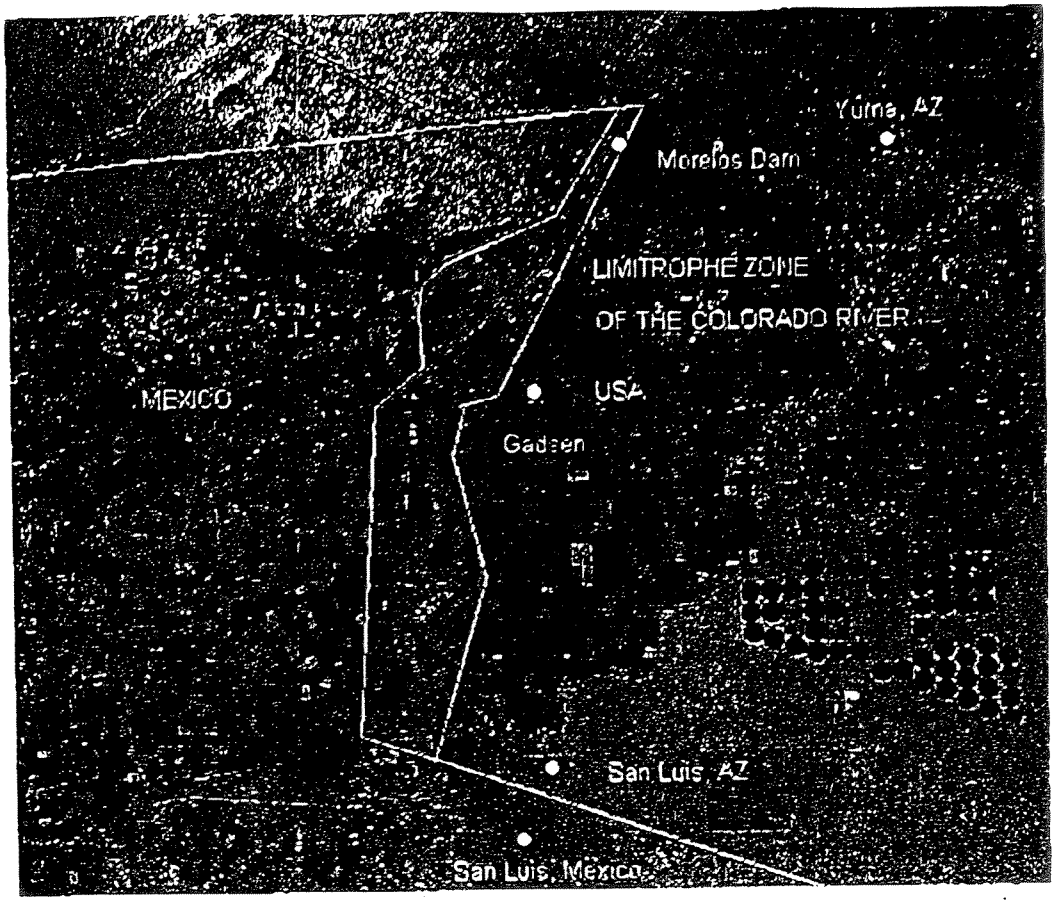


Figure 1. The Limitrophe Region of the Colorado River, from a June, 2002, ETM+ Satellite Image. The U.S. Mexico Border is defined by the river channel in this stretch.

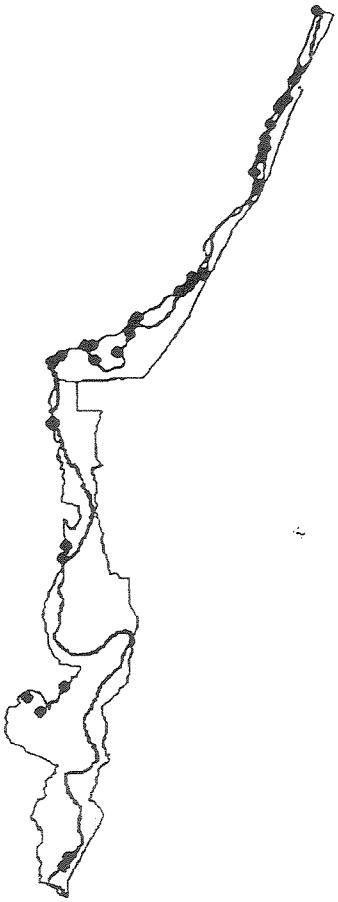
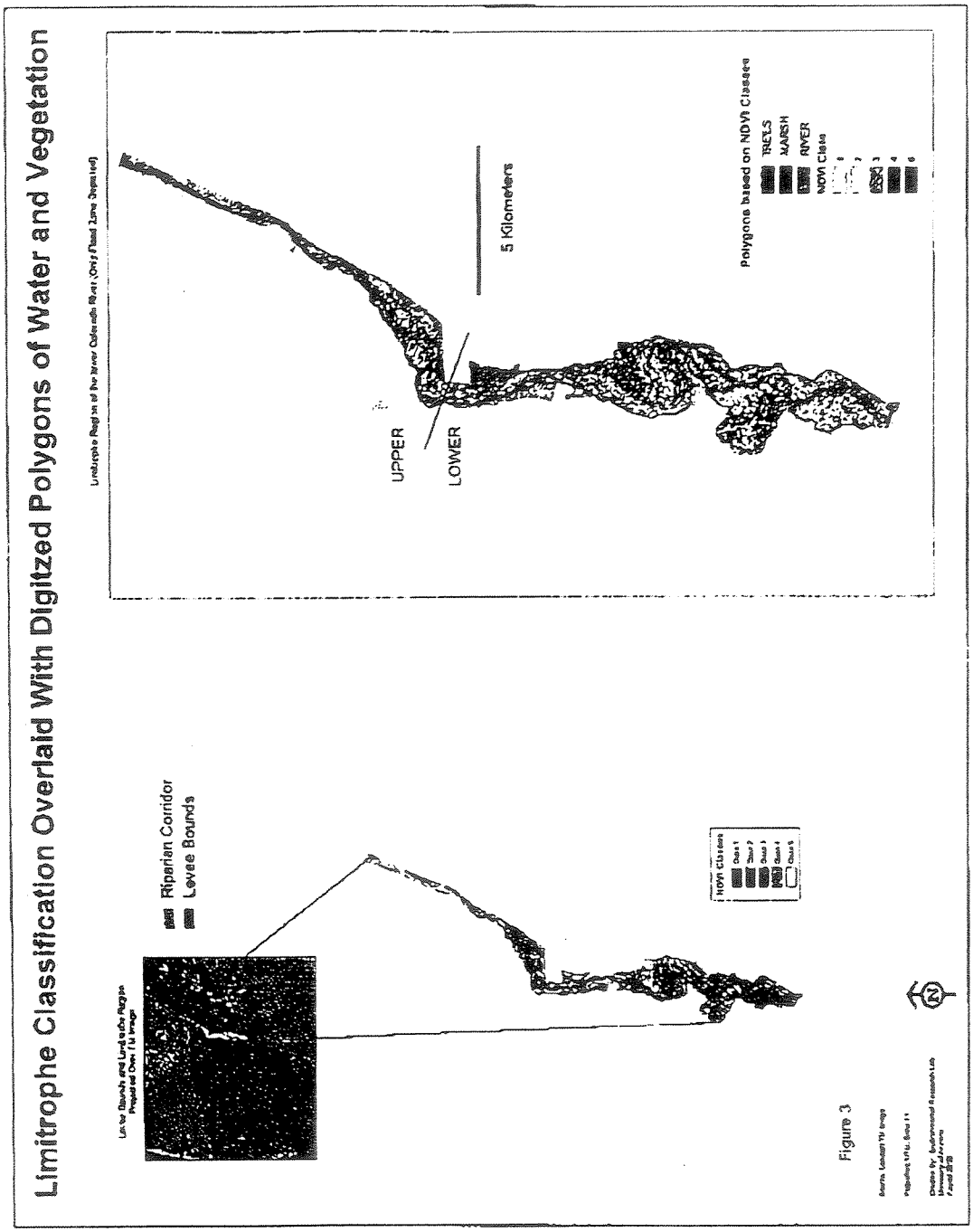


Figure 2. Location of bird and vegetation ground surveys in the Limitrophe.


Limitrophe Classification Overlaid With Digitzed Polygons of Water and Vegetation
Riparian Corridor
Levee Bounds
NDVI Classes
UPPER
LOWER
5 Kilometers
Polygons based on NDVI Classes
TREES
MARSH
RIVER
NDVI Class
Figure 3

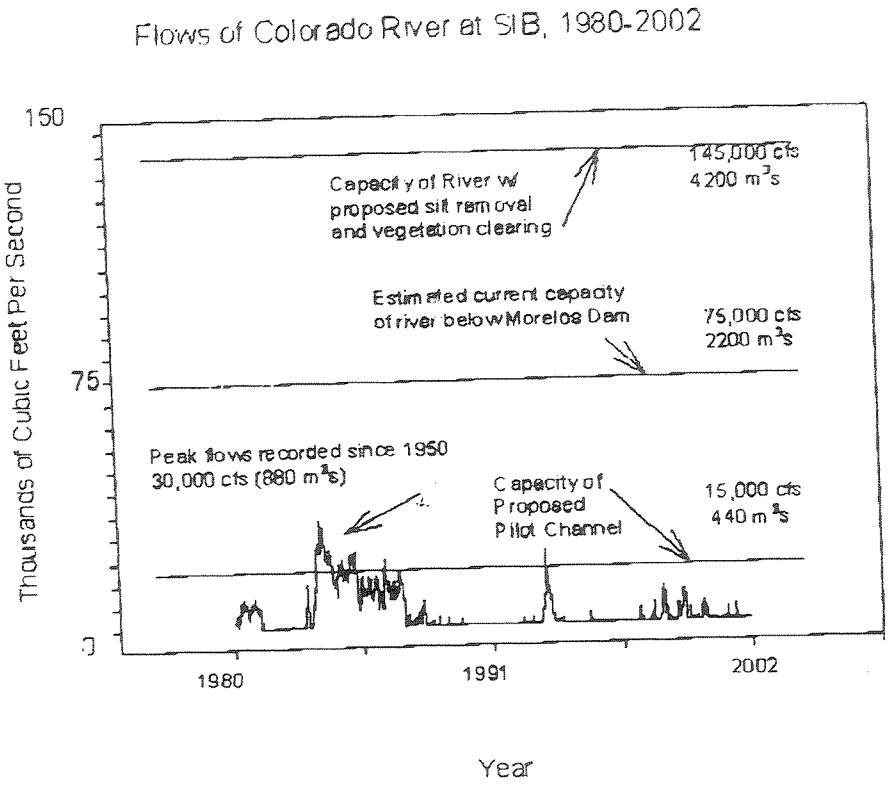


Figure 5. Flows and carrying capacity of the Colorado River through the Limitrophe Region.

24

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In Reply Refer to:
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March 9, 2004

E-mail Transmission

Mr Gerald Zimmerman
Chairman
Lower Colorado River Multi-Species Conservation Program
Colorado River Board of California
770 Fairmont Avenue, Suite 100
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Dear Mr. Zimmerman:

The Fish and Wildlife Service (FWS) appreciates the efforts of the California parties in the development of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Conservation Plan. The enclosed discussion paper is in response to a task assigned to the FWS at the February 26, 2004 Steering Committee meeting concerning recent developments in issuance of incidental take statements and permits for species determined to be Fully Protected under California law. We have discussed this issue with our Ecological Services and Department of the Solicitor offices in California and have the following information to provide to the LCR MSCP. The discussion paper does not represent a final decision by the FWS on how to proceed for LCR MSCP section 10(a)(1)(B) permit issuance, but does present a proposal to address the issue.

Thank you for your continued efforts to conserve endangered species. If there are comments on this letter prior to March 18, 2004, please contact me (602) 242-0210 (x244) or Lesley Fitzpatrick (x236).

Sincerely,

for Steven L. Spangle
Field Supervisor

Enclosure

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
(Attn: Bryan Arroyo) (Luela Roberts)
Lower Colorado River Coordinator, Fish and Wildlife Service, Phoenix, AZ
Regional Director, Lower Colorado Region, Bureau of Reclamation, Boulder City, NV

W:\Lesley Fitzpatrick\MSCP Docs\Fully Protected species.doc

Attachment D

U.S. Fish and Wildlife Service

Arizona Ecological Services Office

Discussion Paper for Lower Colorado River Multi-Species Conservation Program

California Fully Protected Species

March 9, 2004

Under California law, there is no provision to allow any "take" of species recognized as Fully Protected. For the LCR MSCP, the Fully Protected species are the razorback sucker (*Xyrauchen texanus*), black rail (*Laterallus jamaicensis coturniculus*), and Yuma clapper rail (*Rallus longirostris yumanensis*). The razorback sucker and Yuma clapper rail are listed as endangered under the Federal Endangered Species Act (FESA), so the FESA incidental take coverage takes effect upon the signing of the section 10(a)(1)(B) permit or acceptance of the biological opinion by the Federal agencies. The black rail is not a listed species, so the FESA take coverage is deferred until such time as it becomes listed. The Fully Protected prohibitions on "take" are currently in effect for all three species.

The FWS in California has recently been involved in a situation where, in a biological opinion for Bureau of Land Management (BLM), we issued an incidental take statement under FESA for a species listed as Fully Protected under California law. The issuance of this incidental take statement was challenged on the basis that the FWS cannot authorize incidental take where doing so would violate state law. The decision in this case rested on the fact that the biological opinion and incidental take statement was issued to a Federal agency, BLM, which is not subject to state

law. The BLM could receive the incidental take statement, and, since this project was proposed to BLM by an applicant, require the applicant to meet the state law before the Federal incidental take statement would be in effect. Since, under the Fully Protected statute, the applicant cannot obtain a state "take" permit, the Federal incidental take statement could not become effective.

The FWS prevailed in the case discussed above because we were not directly issuing an incidental take authorization to the applicant, but were going through a section 7 consultation with another Federal agency that had control over the proposed action being implemented. The situation differs for issuance of an incidental take permit under section 10(a)(1)(B), where the FWS issues the permit directly to the non-Federal parties.

The FWS can only issue an incidental take permit under specific conditions. In the implementing regulations (FR volume 50, number 189, pages 39681-39691) on page 39687 under the discussion of § 17.3, the following definition is added:
"Incidental taking" means any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

The critical focus of the definition is on "an otherwise lawful activity." A lawful activity is one that is not in violation of any laws. In issuance of all incidental take permits, the FWS has routinely stated that all other applicable permits and approvals must be obtained prior to the activity being implemented and the FESA-authorized incidental take occurs. In the case of the California Fully Protected species, the FWS knows at the time of issuance of the incidental take

permit that the California partners in the LCR MSCP cannot, under state law, obtain a permit to take Fully Protected species. In that, the FWS knows that the action for which incidental take is sought is not "an otherwise lawful activity" and cannot issue the incidental take permit for those species in California.

Based on our internal discussions, the FWS believes that our issuance of incidental take permits under FESA for Fully Protected species in California has a significant risk of legal challenge as a result of the ruling on the section 7 incidental take statement case. With this in mind, the FWS proposes the following actions for the LCR MSCP ESA compliance:

1. The FWS will, if appropriate after evaluation of the Conservation Plan in accordance with regulations for permit issuance, issue the incidental take permit for the LCR MSCP partners stating that for covered actions in Arizona and Nevada the permit will cover the incidental take of the razorback sucker, black rail, and Yuma clapper rail.
2. The FWS will, if appropriate after evaluation of the covered actions and Conservation Plan contained in the Biological Assessment, issue an incidental take statement in the biological opinion for the Federal covered actions to cover the take of razorback sucker, black rail, and Yuma clapper rail by the Federal agencies. This conforms to the situation in the recent BLM case.
3. The FWS will, if appropriate after evaluation of the Conservation Plan in accordance with regulations for permit issuance, issue the incidental take permit for the LCR MSCP partners stating that for covered actions in California, the permit does not cover the incidental take of the razorback sucker, black rail, and Yuma clapper rail.

4. Recognizing that the 400,000 acre-feet of transfer water approved under the Quantification Settlement Agreement has a legislative exemption to the terms of the Fully Protected statute, the FWS will, if appropriate after evaluation of the Conservation Plan in accordance with regulations for permit issuance, issue the incidental take permit to include the take from this project. This take is lawful under California state law.
5. The FWS will, if an incidental take permit is issued to the LCR MSCP, include as a changed circumstance that coverage for the razorback sucker, black rail, and Yuma clapper rail for covered actions in California will be authorized once such take is determined to be legal under California law and all appropriate permits to allow such take have been acquired by the California partners.

A suggestion was made at the February 26, 2004 Steering Committee meeting and on the Program Subcommittee conference call on March 1, 2004 that the language describing the "take" in the HCP document be evaluated and revised to not be in conflict with the definition of "take" under CESA and the Fully Protected statutes. The FWS does not believe this is a viable approach because the definition of "take" under the California law is not always consistently applied. The state Attorney General and the California Department of Fish and Game have differing interpretations of the definition. This uncertainty would likely be a factor in any challenge to the LCR MSCP permit focusing on "take" of Fully Protected species.

The sole reason for the FWS to take this step in the incidental take permit issuance is the prohibition of "take" for the Fully Protected species under California law. We considered other

approaches, including issuance of the permit with the standard disclaimer requiring that the permittees obtain all other permits prior to any take being realized, and determined that our current proposal constitutes the most legally defensible course of action.

We understand this situation is new to all partners and recognize this presents a difficulty for the California partners. The resolution of this issue must come from within California through resolution of the conflicts within the Fully Protected statute. We will be prepared to discuss this paper at the March 18, 2004 Implementation Subcommittee meeting.

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Steven L. Spangle
Field Supervisor
United States Department of the Interior
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4951

Dear Mr. Spangle:

The Department of Fish and Game ("Department") received a copy of your March 9, 2004 letter and discussion paper to Mr. Jerry Zimmerman. As you know, that discussion paper concluded that as a result of a recent ruling in a Section 7 case, the U.S. Fish and Wildlife Service's ("USFWS") issuance of incidental take permits to non-federal entities under FESA for fully protected species in California has a significant risk of legal challenge. The discussion paper states that the California partners in the Lower Colorado River Multi-Species Conservation Program ("LCR MSCP") cannot, under state law, obtain a permit to take fully protected species. As a result, the discussion paper concluded that the USFWS cannot issue an incidental take permit for LCR MSCP activities because the action for which the take is sought is not "an otherwise lawful activity" as required under federal law.

It is the Department's position that, assuming the permit issuance criteria of the California Endangered Species Act are met, the Department may authorize the take of fully protected species under the LCR MSCP.

Under existing law, assuming other permit issuance criteria are met, the Department may authorize the take of fully protected species for impacts attributable to implementation of the Quantification Settlement Agreement ("QSA"). (Fish & G. Code § 2081.7(a).) QSA is defined broadly to mean: ". . . the draft Quantification Settlement Agreement (QSA) . . . as it may be amended, and that shall include as a necessary component the implementation of the Agreement for Transfer of Conserved Water by and between the Imperial Irrigation District and the San Diego County Water Authority, . . . and any QSA-related program that delivers water at the intake of the Metropolitan Water District of Southern California's Colorado River Aqueduct." (Stats. 2002, ch. 617, §1(a).) The legislative language makes it clear that the Department may

Conserving California's Wildlife Since 1870

Attachment E

authorize take of fully protected species for impacts other than those directly attributable to the QSA agreement itself.

There is additional language to support the proposition that the Department can authorize take of fully protected species under the LCR MSCP. Fish and Game Code section 2081.7 states that take of fully protected species may be authorized for impacts on the following:

1. The salinity, elevation, shoreline habitat, or water quality of the Salton Sea;
2. The quantity and quality of water flowing in Imperial Valley drains, rivers, and channels;
3. Agricultural lands in the Imperial Valley; and
4. The quantity and quality of water flowing in the Colorado River, the habitat sustained by those flows, and the collection of that water for delivery to authorized users.

(Fish & G. Code § 2081.7(a), emphasis added.)

The language in subsection 4 above shows the Legislature's intent to allow the Department to authorize take of fully protected species in a large area in and around the Colorado River. The Department is therefore authorized to allow the take of fully protected species for impacts attributable to the QSA, as broadly defined, on the quantity and quality of water flowing in the LCR, and the habitat sustained by those flows. Issuance of permits for take of fully protected species resulting from the collection of Colorado River water for delivery is also authorized. Therefore, take of fully protected species for impacts from covered activities under the LCR MSCP could be authorized under state law.

Additional language supports the concept that the Legislature intended to allow the Department broad discretion to authorize take of fully protected species. In SB 654, the Legislature found:

1. "That it is important to the state to meet its commitment to reduce its use of water from the Colorado River to 4.4 million acre-feet per year. . . .;
2. That "California's Colorado River Water Use Plan is a framework developed to allow California to meet its Colorado River needs from within its basic annual apportionment. . . ."; and
3. "[T]hat species previously designated as fully protected may be taken incidental to activities intended to meet the state's commitment to reduce its use of Colorado River water as long as those activities are found to comply with existing law, including Chapter 1.5 (commencing with section 2050) of Division 3 of the Fish and Game Code."

(Stats. 2002, ch. 613, § 2.)

The above language supports the proposition that for activities intended to meet the State's commitment to reduce its use of water, the Legislature intended to give the Department broad discretion to allow take of fully protected species.

The above language needs to be read together with section 2081.7(a) (which allows the Department to authorize take of fully protected species on a broad range of habitats). When read together, the language from SB 654, along with Fish and Game Code section 2081.7(a), shows that the Department has discretion to authorize the take of fully protected species incidental to activities intended to reduce California's use of Colorado River water, if the impacts from those activities affect the quantity or quality of water flowing in the Colorado River or the habitat sustained by those flows. Issuance of permits for take of fully protected species resulting from the collection of Colorado River water for delivery is also authorized.

In summary, the Department has the authority to authorize take of fully protected species under the LCR MSCP, because existing statutes, as well as non-codified legislative language, show that the Legislature intended to allow the Department broad discretion to authorize the take of fully protected species to help California meet its commitment to reduce its use of Colorado River water, and to allow take in and around the LCR, including activities under the LCR MSCP.

Please call me if you have any questions.

Sincerely,

MICHAEL R. VALENTINE
General Counsel

e

ENVIRONMENTAL DEFENSE
finding the ways that work

August 18, 2004

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

RECEIVED
AUG 19 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Ms. Laura Simonek
Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, CA 90012
Via Facsimile 213-217-7701

Dear Mr. Spangle, Mr. Gould, and Ms. Simonek:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR), Biological Assessment (BA), and Habitat Conservation Plan (HCP) for the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), Arizona, Nevada, and California. In addition to the comments submitted with other non-governmental organizations, Environmental Defense submits these comments to emphasize the critical importance of the limitrophe reach of the Colorado River, and the failure of the LCR MSCP to seize the opportunity to focus restoration efforts there.

The LCR MSCP is missing what may be the premier opportunity to conserve species on the Lower Colorado River, which exists in the limitrophe reach of the river, known in MSCP terminology as reach 7. This reach of the Colorado contains stands of Cottonwood-Willow with a much higher density than that found elsewhere on the Lower Colorado, 18% of land cover in the first 10 kilometers below Morelos Dam as compared to 1-2% as a maximum land cover value along the Lower Colorado River between Lees Ferry and Morelos Dam, even in wildlife refuges (Hinojosa-Huerta et al., 2003. Rapid Ecological Assessment of the Limitrophe Zone of the Colorado River, prepared for Environmental Defense). Significantly, these cottonwood and willow trees Env. D-1

Rocky Mountain Office · 2334 North Broadway · Boulder, CO 80304 · Tel 303 440 4901 · Fax 303 440 8052 · www.environmentaldefense.org
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have established due to recent overbank flooding since 1980, and have been maintained by relatively high groundwater levels. Surface water in reach 7 is a regular feature, providing breeding sites for insects that are food for resident and migrating birds. These conditions have together allowed a healthy native ecosystem to flourish. However, the maintenance of these conditions is not guaranteed, as drought and local groundwater pumping (such as Reclamation's YAWRMG Drainage Project) are both likely to deplete the water available to the limitrophe. Env. D-1 con't

The LCR MSCP has an opportunity in the limitrophe both to protect habitat whose future is uncertain, as well as to augment this habitat. While the HCP proposes creating cottonwood-willow sites by planting trees and irrigating them, the limitrophe is far better suited to conservation and restoration based on instream flows.[1] Here, a modest baseflow in the river channel, plus occasional floods, would secure the future of this excellent habitat.

The LCR MSCP could contribute significantly to conserving habitat on the Lower Colorado River by adopting a significant ongoing effort to protect and restore the Colorado River limitrophe, specifically a focused effort by the Cocopah Indian Tribe to create an international conservation area (see DEIS/DEIR at 4-24). This process has been underway for several years, and is paralleled by an effort in Mexico to protect the Colorado River riparian corridor from the northern extent of the boundary of the Biosphere Reserve of the Colorado River Delta and Upper Gulf of California.

We hope that the LCR MSCP can be amended to reflect this opportunity. In addition, we note that the LCR MSCP documents incorrectly characterize both the physical and biological qualities of the limitrophe, reach 7. Env. D-2

1. Throughout the LCR MSCP documents, flows in reach 7, the limitrophe, are erroneously characterized. The text itself is contradictory at times, stating that it "has some flow from dam seepage, but the majority of the reach is generally dry" (3.0-2) and that "much of the flow in the river downstream of Morelos Dam is return flows from upstream irrigation districts" (DEIS/DEIR at 3.9-7). Neither of these statements accurately characterize the source or quantity of flows in the limitrophe. In general, these flows can be understood to come from a variety of sources, including:
   a. Seepage from Morelos Dam.
   b. Flows that are released at Morelos Dam, including both flood flows (which occurred more than 25% of years 1980-2000) and other flows that Mexico chooses not to divert, such as occasional over-deliveries from the United States.
   c. Irrigation return flows from Mexico.

Env. D-1 con't

[1] Contrary to Reclamation's assertions otherwise, there is nothing in the Law of the River to prohibit instream flows, and Reclamation fails to point to any support. *See* DEIS/EIR at 2-116.

d. Wasteways (at 11 miles and 21 miles) in the United States that release several thousand acre-feet annually in non-flood years (Ruth Thayer, Bureau of Reclamation, personal communication 8/6/04).
e. Groundwater flows from both the United States and Mexico. The quantity of groundwater flow into the Colorado River channel in the limitrophe is unknown, however, a recent study demonstrates that depth to groundwater at the edge of the riparian corridor is no greater than 1-2 meters, and that groundwater levels exceed river elevation, suggesting that the direction of flow is into the river (Zamora-Arroyo, et al., 2001. Regeneration of Native Trees in Response to flood releases from the United States into the delta of the Colorado River, Mexico. J. Arid Environments 49:1).

While most of these inputs are not quantified, the average total flow in the limitrophe in non-flood years 22,000 acre-feet, and in flood years is 2,120,000 acre-feet (Cohen and Henges-Jeck, 2001. Missing Water: The Uses and Flows of Water in the Colorado River Delta Region, Pacific Institute). Env. D-2 con't

2. The importance of reach 7, the limitrophe, for several of the LCR MSCP covered species is neglected: Env. D-3
   a. The limitrophe is an important stopover site for migrating southwest willow flycatchers in their migration movements before they reach their breeding grounds (Garcia-Hernandez et al., 2001. Willow Flycatcher (*Empidonax traillii*) surveys in the Colorado River delta: implications for management. J. Arid Environments 49:1). It has been well documented, in general for landbirds, that the quality and availability of stopover sites during migration is one of the key factors determining survivorship rates for these species. The description of this bird in Appendix I, "Status of LCR MSCP Covered Species" fails to mention the importance of stopover sites to this migrant (Appendix I at I-7).
   b. Other key species of conservation concern in the limitrophe are the Yellow-billed Cuckoo, Arizona Bell's Vireo, and Summer Tanager, all of which were found present in recent surveys of the limitrophe (Hinojosa-Huerta et al., 2003. Rapid Ecological Assessment of the Limitrophe Zone of the Colorado River, prepared for Environmental Defense). Descriptions of these birds in Appendix I, "Status of LCR MSCP Covered Species" fail to mention their presence in the limitrophe (Appendix I at I-49, I-61, and I-69).

We hope that you are able to incorporate a stronger program for restoration of the Colorado River limitrophe in the final LCR MSCP. Please do not hesitate to contact us if you have any questions. Env. D-4

Sincerely,

Jennifer Pitt

INDIVIDUALS

Comment Letters

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Attorneys at Law

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Government Relations Associates **
Hon. Jim Hartdegen
Hon. Joe Lane

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** not members of the bar

TELECOPIED AND MAILED

August 18, 2004

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, Nevada 89006-1470
Fax no.: 702-293-8418

Mr. Steve Spangle
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021
Fax no.: 602-242-2513

Re: Comments on the Draft Environmental Impact Statement for the Lower Colorado River Multi-Species Conservation Program

Gentlemen:

Pursuant to the Federal Register notice issued jointly by your agencies on June 18, 2004, 69 Fed.Reg. 34185-7, I am submitting the following comments on the Draft Environmental Impact Statement which are intended to be cumulative to my oral remarks at the public hearing in Phoenix on July 22, 2004. My comments will be generally aimed at the description of the preferred alternative.

The Draft EIS includes Reach 1, which is an area involving Lake Mead up to the marsh and bosque that has developed where the Colorado River empties into Lake Mead, and Reach 7, which consists of an area below Morelos Dam between the Northern and Southern International Borders with Mexico. Those Reaches should be eliminated from the EIS. Federal courts, in final nonappealable orders, have issued decisions that the Secretary of the Interior has no discretion with regard to capturing water in Lake Mead behind Hoover Dam nor discretion in releasing water from Morelos Dam pursuant to the 1944 Treaty with Mexico. Since there are no discretionary actions with regard to water storage RSLA-1

Mr. Glen Gould
Mr. Steve Spangle
August 18, 2004
Page 2

and water delivery in these areas, the consultation requirements of the Endangered Species Act and the assessment requirements of the National Environmental Policy Act do not apply. Thus, there is nothing to evaluate under NEPA and nothing on which to consult under Section 7 of the Endangered Species Act. Nor is there any Section 10 jurisdiction under the Endangered Species Act. The non-federal entities who benefit from these facilities have no say in water storage at Lake Mead and no say concerning water deliveries to Mexico. Thus, while it may be helpful to study the environment of these areas, they are not properly part of any program to be analyzed in this process because there is no responsibility which must be analyzed or about which consultation should take place. RSLA-1 con't

Additionally, the EIS should evaluate the possibility of issuing one or more permits under Section 10(A)(1)(A) of the Endangered Species Act. This "voluntary" permit may be appropriate as a mechanism for institutionalizing a partnership for conducting mitigation activities should it be determined that the impacts in question are sufficiently within the discretion of the Secretary of the Interior that a Section 10(A)(1)(B) permit is inappropriate. The analysis of the species in question does not change by virtue of considering both types of Section 10 permit. Some possible changes in the location of mitigation activities might take place under the voluntary permit but chances are that sort of adjustment would be slight. In any event, there is absolutely no downside risk in evaluating both types of Section 10 permits in this process. RSLA-2

There really is no "no action" alternative and the Environmental Impact Statement should say so. The true "no action" alternative would be to do nothing, let the current Biological Opinion run out, have various federal officials sued civilly and possibly criminally, and let the courts sort out where the responsibilities are and who is not meeting them. Since no one either wants to take that risk or watch that process unfold, the alternatives are to move forward together or move forward separately. Nevertheless, the EIS should acknowledge that the true "no action" alternative would be to not do anything and let the cards fall where they may. RSLA-3

There have been a variety of reports about various proposals for non-federal participation in the Multi-Species Conservation RSLA-4

Program and a multitude of reported proposals on possible ways to fund the program. It is our understanding at the current time that this matter is still being discussed. Before the Environmental Impact Statement is finalized, sufficient certainty in whatever these relationships are going to be should have been achieved so that any further adjustments in those relationships do not require significant changes in environmental impact that would not have been analyzed in the EIS. Whatever effort that takes, the parties should attempt to achieve reasonable certainty of program details in order to validate the preferred alternative. RSLA-4 con't

Thank you for the opportunity to comment on this important process and Environmental Impact Statement. Please keep us informed about further developments as you proceed to complete the Environmental Impact Statement process. RSLA-5

Sincerely,
ROBERT S. LYNCH & ASSOCIATES

Robert S. Lynch

RSL:psr
cc: IEDA Members
David S. "Sid" Wilson, General Manager, CAWCD
Douglas K. Miller, General Counsel, CAWCD
Robert Walker, General Manager of Power, City of Needles

public comment on Federal Register
of 6/18/04 Vol 69 No 117 - pg 34183
USDOI USFWS - Reclamation INT-DES-
04-32 - Lower Colorado River NOT
the alleged research is NOT
to be necessary at all.

Mr Steve Spangle
Field Supervisor
US Fish + Wildlife Service
2321 West Royal Palm Rd - Suite 103
Phoenix AZ 85021

50214+4315

BS-1

I oppose + object to killing, harassing, injuring desert tortoises, cukoos etc. I note anonymous 20 other species also allowed to be similarly harassed so they end up DEAD! The public has a right to know EXACTLY what is being proposed. It is time to stop the diversion of water since these species have a right to live & I object to taking this water! Such water taking always mean death. Humans have no right to divert water like this when places like Santa Barbaras can desalinate ocean water. Buy the water from Santa Barbara. B Sachau 15 Elm St Florham Pk NJ 07932

Lower Colorado River Multi-Species Conservation Program

Lower Colorado River Multi-Species Conservation Program
Public Hearing Comment Form
July 20, 2004 in Henderson, NV; July 21, 2004 in Blythe, CA; July 22, 2004 in Phoenix, AZ

PLEASE NOTE: Comments must be received no later than Wednesday, August 18, 2004 at 5:00 p.m.
To submit written comments, you may:

1. Submit this completed form this evening
2. Mail your comments to: Glen Gould, Bureau of Reclamation, P.O. Box 61470, LC-2011, Boulder City, NV 89006-1470 or Steve Spangle, U.S. Fish and Wildlife Service, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ, 85021
3. Fax your comments to: Glen Gould, (702) 293-8418; or Steve Spangle, (602) 242-2513

Name: Carey L. Ochs

Address: 5120 Colorado River Rd. Blythe, CA 92225

Comments (comments should focus on the information contained in the documents): My husband & I are land owners, along the Colorado River in Blythe. We are Concerned about the "fifty year" length (timespan) of this projected project & the impact on water sport recreational activities on the river. Why does the stipulated time span of the project need to be for such an extreme length of time? Why not 10 or 15 years, with a re-evaluation time-frame, i.e. progress report, to determine if the changes are even considerably improving. CO-1

Also, as our community grows, the river becomes more & more of a draw to out side visitors. How can we be assured that your requested changes will not impact the river recreational needs – boating, fishing, swimming, etc., that our community is accustomed to? CO-2

Thank You,

Carey L. Ochs

SAT, JUNE 26, 2004

LORRAINE WOODMAN

SAIC

525 ANACAPA ST.

SANTA BARBARA 93101

I RECENTLY RECEIVED FROM YOU A 12 POUND FED-EX BOX CONTAINING A COPY OF THE DRAFT EIR/EIS FOR THE LOWER COLORADO RIVER MULTI SPECIES CONSERVATION PROGRAM (LCR-MSCP).

I APPRECIATE YOU SENDING ME THE ABOVE, EVEN THOUGH I DON'T KNOW WHERE YOU GOT MY NAME AND MAILING ADDRESS; BUT THAT'S OK.

I ADMIT I ATTENDED A SCOPING MEETING ON THE LCR-MSCP HELD IN ONTARIO, CALIF, WAY BACK WHEN. BUT I DON'T REMEMBER PUTTING MY NAME AND ADDRESS ON ANYTHING.

I'M PLOWING MY WAY THROUGH THIS (OVER)

TOME EVEN THOUGH I HAVE LIMITED INTEREST IN THE LCR-MSCP SINCE I'M SO FAR AWAY FROM THE COLORADO RIVER AND HAVE NEVER SPENT MUCH TIME OUT THERE. (THE REASON I ATTENDED THE SCOPING MEETING WAS BECAUSE I HAVE A BACKGROUN IN NATURAL RESOURCE CONSERVATION AND ENVIRONMENTAL PLANNING AND WANTED TO SEE WHAT WAS GOING ON. I ALSO ADMIT THAT THE LCR-MSCP WAS FORGOTTEN.)

GIVEN THE ABOVE, WHEN THE FINAL DRAFT OF THE LCR-MSCP BECOMES AVAILABLE IF YOU WOULD BE GOOD ENOUGH TO LET ME KNOW OF ITS AVAILABILITY INSTEAD OF SENDING ME ANYMORE 12 POUND BOXES (WHICH I IMAGINE WASN'T CHEAP). I CAN THEN DECIDE IF I WANT ONE OR NOT. THANK YOU FOR SENDING ME THE DRAFT. SINCERELY, DB-1

Lonnie Bell, 406 S. SAN MATEO REDLANDS, CA. 92373

August 11, 2004

Mr. Steve Spangle

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

RECEIVED
AUG 11 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Dear Mr. Gould and Mr. Spangle:

Thank you for the opportunity to comment on the biological assessment, habitat conservation plan (HCP) and environmental impact statement (EIS) for the Lower Colorado River Multi-Species Conservation Program (MSCP). The Colorado River is the lifeline for a high proportion of the region s fish and wildlife, which depend on the freshwater resources in this largely arid region. I would like to emphasize the following points:

The geographic scope of the MSCP must include the Colorado River delta and upper Gulf of California. Without encompassing the Colorado River delta, it will be impossible to accomplish Endangered Species Act conservation obligations. Several endangered species have habitat in both the U.S. and Mexico including the razorback sucker, the Southwestern willow flycatcher, the desert pupfish and the Yuma clapper rail. In ignoring the delta s capacity to provide habitat for these species, and others such as the totoaba and vaquita, the MSCP misses a critical opportunity to ensure their viability in both countries. CL-1

The MSCP must commit to the restoration and maintenance of a semblance of historic river ecosystem conditions. To date, the MSCP has focused heavily on hatchery rearing and release of imperiled Colorado River fish. This is important, but only to prevent extinction. The MSCP must expand its efforts to include restoration of a semblance of historic river ecosystem conditions along key river stretches, with a focus on restoration and maintenance of historic river functions. Only then will we be able to move toward species recovery. CL-2

The implementing agreement must be available during the comment period. The implementing agreement presents the rights and responsibilities of all parties to the MSCP, including funding commitments and the acquisition, management and protection of mitigation lands. Until there are mechanisms to assure funding for MSCP implementation, the HCP fails to meet the permit criteria. Furthermore, it is crucial that the implementing agreement be prepared and distributed for public comment prior to approval of the MSCP. CL-3

Sincerely,

Darcia Hurst-matulewicz
2524 130th Street Se
Everett, WA 98208

U.S Fish and Wildlife Service
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021

Dear Mr Spangle:

Please be advised that I strongly support the Multi-species Conservation program for the lower Colorado River in Arizona, Nevada and California. Any program that will conserve the flow of water in this abused and over-used river will be step in the right direction and a protection for the future. JM1-1

Thank you for your attention to the above.

Yours truly,

Jean C. Martin
12345 E. 8th St.,
Tucson, Az. 85748

RECEIVED
AUG 1 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Mr. Glen Gould,
Bureau of Reclamation,
O.I. Box 61470,
LC-2011

Dear Mr. Gould:

Please be advised that I strongly support the Multi.Species Conservation program for the lower Colorado River in Arizona, Nevada and California. Any progra m that will conserve the flow of water in this abused and over used river will be a step in the right direction and a protection for the future. JM2-1

Thank you for your attention to the above,

Yours trulym

Jean C. Martin
12345 E. 8th Street,
Tucson, Az. 85748

RECEIVED
AUG 16 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Mark Belles
9318 Willard Street
Rowlett, Texas 75088

Ms. Laura Simonek
The Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, California 90012

Thank you for the Draft Environmental Impact Report and associated documentation for the Lower Colorado River Multi-Species Conservation Program. Please retain my name on the mailing list for this activity. MB-1

I am troubled by two fundamental aspects of the program. First, the proposal has ignored a vast reach of the Lower Colorado River (as defined by the program as that portion of the Colorado River downstream from Lee Ferry). Why omit that portion of the River from Glen Canyon Dam to Lake Mead? The Law of the River clearly defines this reach of river as being part of the Lower Colorado. MB-2 Furthermore the program documentation has failed to acknowledge the effects of the elephant in the room, namely Lake Powell. All environmental effects downstream of Glen Canyon Dam are affected by Lake Powell. Sedimentation, hydrology, and water temperature are just a few of the significant effects of the Lake. This assessment should include all effects of Lake Powell on the downstream ecosystems. MB-3

Secondly, elimination of dam Removal from consideration of the program is based on very faulty logic, grouped in the Environmental Impact Report as five separate topics noted as follows.

1. Page 2-113, lines 20 through 33 can be summarized as asserting that the culinary and agricultural uses of the water stored in the reservoirs are vital to major metropolitan areas. The obvious conclusion is that dam removal would have a major negative impact to the metropolitan areas and thus cannot be considered. MB-4

   Response – While the reservoirs from Hoover on downstream are used for culinary and agriculture water uses, this is not true for Glen Canyon Dam. Taken with the earlier comment of this letter asserting that consideration of Lake Powell and the reach from Glen Canyon Dam to Lake Mead is appropriate for this program, consideration of dam removal is not a detrimental act for culinary and agricultural water uses across the board. The only beneficial use of water from Lake Powell is a very small take for the city of Page. The water use for Page is very minimal and could easily be accommodated by takes from the unencumbered river. Thus the conclusion for this section that dam removal would be detrimental for culinary and agriculture uses is not correct as it applies to Glen Canyon Dam.

2. Page 2-113, lines 34-39 asserts that dam removal could not be accomplished because a system-wide removal would render the flood control system of levees ineffective and unable to handle the unregulated flows. MB-5

   Response – Again the conclusions as stated are true, but only under the extreme conditions stated. Clearly **system-wide** dam removal would be a catastrophic act from a flood control point of view; however removal of Glen Canyon Dam would have no detrimental effect on flood control.

3. Page 2-114, lines 1-6 asserts that dam removal would significantly impact human habitation downstream of Davis Dam. MB-6

   Response – True for Hoover and downstream impoundments, but not true for removal of Glen Canyon Dam.

4. Page 2-114, lines 7-16 asserts that dam removal would be costly, technically challenging and could have negative environmental conditions due to release of the trapped sediment. Additionally, restoration of the previously inundated areas is cited a potential problem. Also, dam removal is cited as in conflict with of the Law of the River. MB-7

   Response – This section of the argument against dam removal raises several points, none of which apply to Glen Canyon Dam.

   i. The argument that dam removal is technically challenging is not valid. Dam removal is a well established process and presents no substantial technical challenges. Lake Powell would be drawn down gradually and the final draw down could be accomplished by diversion tunnels, possibly using the original diversion tunnels.

   ii. Since no serious cost estimates for dam removal have been accomplished, it is far to premature to assert that cost is a significant issue. MB-8

   iii. Allowing sedimentation to return to its natural state cannot be considered a negative consequence since once the sedimentation rates are retuned to the natural state, this is by definition a restored system.. Clearly restoration of natural aggradation, degradation and hydrology is an appropriate action. Mitigation of the initially high rates of sedimentation associated with flushing out the reservoir and reaching the natural steady-state sedimentation rates would be accomplished by the gradual draw down of the reservoir. MB-9

   iv. Restoration of inundated areas is not an issue. Natural restoration is rapidly progressing at this moment in the areas exposed by the low water levels of Lake Powell due to the current drought. Concerns MB-10

about the long term bathtub ring and re-foliation of the river corridor have been shown by current processes in action at Lake Powell to be unfounded. MB-10 con't

v. With regard to the Law of the River, the conflicts cited are not valid. Nothing in the Law of the River requires power generation. Glen Canyon Dam does not provide flood control and protection or improves navigation, thus these goals of the Law of the River would not be negatively impacted. As for storage and delivery of water and river regulation, historic data shows that the 7.5 maf average over a ten year period would have been achieved without Glen Canyon Dam. It is important to note, especially in today's enduring drought conditions, that seepage and evaporation account for the loss of 800,000 to 1,000,000 af of water annually; water that is desperately needed in today's Lower Colorado River economies. MB-11

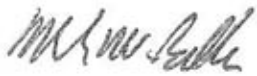
5. Page 2-114, lines 17-23 asserts that dam removal would carry with it a risk of invasion by non-native plant species. No scientific basis for this assertion is presented. In fact, section 3.2.1 (page 3.2, lines28-30) states that, *"Swift, sediment-filled flows scoured the canyons in the LCR, which hindered the establishment of most riparian plant communities."* The highly dynamic characteristics of the freely-flowing Colorado River are thought to have been effective at resisting invasion by non-native plant species. If such a risk exists it would be mitigated by the gradual draw down of the reservoir. MB-12

Each assertion found in Section 2.2.1.2 for eliminating dam removal is successfully rebutted as they apply to Glen Canyon Dam. In conjunction with the comment that consideration of Lake Powell and the river reach from Glen Canyon Dam to Lake Mead should be included in this program; my conclusion is that consideration of the removal of Glen Canyon Dam should be considered by the program. MB-13

It is important to reiterate that seepage and evaporation account for the loss of 800,000 to 1,000,000 af of water annually; water that is desperately needed in today's Lower Colorado River economies. It would be very unwise for the Metropolitan Water District of Southern California to let this water wastage to continue. MB-14

I understand that removal of Glen Canyon Dam is a highly controversial subject and in practical, political terms is highly unlikely to occur. Nonetheless the arguments to exclude this option fro m the program are not valid and without an environmental and cost analysis a fair, informed decision cannot be made. I strongly encourage the team to add this option back into the list of alternatives. MB-15

Thank you for the opportunity to comment.



August 11, 2004

Mr. Steve Spangle

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

RECEIVED
AUG 12 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

I would like to comment on the biological
assessment, habitat conservation plan and environmental
impact statement for the Lower Colorado Multi-
Species Conservation Program.
In an otherwise arid region, the Colorado River is vital to fish and wildlife. To provid
e proper protection, the MSCP must include the delta of the Colorado River and the upper
Gulf of California. The Delta provides habitat for several endangered sp
including (the razorback sucker, the desert pupfish, the Southwestern willow flycatcher a
nd the Yuma clapper rail). By ignoring the delta, we will lose the opportunity to maintai
n habitat for these species. It may also be impossible to achieve obliga

MA-1

The MSCP must provide for restoration and maintenance of the entire river ecosystem as it
existed historically.
So far, efforts have been primarily directed to hatchery rearing of Colorado River fish.
This may help to prevent extinction, but does not address the need to restore a function
ing ecosystem along the river. Without the ecosystem, the species will n

MA-2

Finally, we must have assurance that funding will be in place to suport the MSCP. Without
it, the HCP does not meet permit requirements. Therefore, the implementing agreement mus
t be available during the comment period, so the rights and
responsibilities of all parties to the MSCP, including funding
commitments and the acquisition, management and protection of
mitigation lands are clear.
This is far too important an issue to treat in a less then thorough manner.
Sincerely,

MA-3

Margaret Adam
72425 Cactus
Twentynine Palms, CA 92277

AUG-26-2004 THU 10:02 AM USFWS FAX NO. 6022422513 P. 03/03

August 12, 2004

Mr. Steve Spangle

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

RECEIVED
AUG 12 2004
U.S. FISH & WILDLIFE SERVICES
ES FIELD OFFICE-PHOENIX, AZ

Dear Mr. Gould and Mr. Spangle:

Thank you for the opportunity to comment on the biological assessment, habitat conservation plan (HCP) and environmental impact statement (EIS) for the Lower Colorado River Multi-Species Conservation Program (MSCP). The Colorado River is the lifeline for a high proportion of the region s fish and wildlife, which depend on the freshwater resources in this largely arid region. I would like to emphasize the following points:

The geographic scope of the MSCP must include the Colorado River delta and upper Gulf of California. BF-1

The MSCP must commit to the restoration and maintenance of a semblance of historic river ecosystem conditions. BF-2

It is crucial that the implementing agreement be prepared and distributed for public comm ent prior to approval of the MSCP. BF-3

Sincerely,

Bobbie Flowers
418 W 17th St Apt 22a
New York, NY 10011

AUG-26-2004 THU 10:02 AM USFWS FAX NO. 6022422513 P. 02/03

August 15, 2004

Mr. Glen Gould

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

As someone who has hiked and rafted a number of areas in the lower Colorado River basin, and a planning commissioner in a county (Mendocino) where HCP's are used to strike a bala nce between environmental protection and logging, I would like to commen

The MSCP should include both the Colorado River delta and upper Gulf of California. With out including the Colorado River delta, it will be impossible to achieve the habitat cons ervation required under the ESA, since endangered species like the the S DL-1

The MSCP should promote substantial restoration of historic, pre-development river ecosys tem conditions, and not just on hatchery rearing of threatened/endangered fish. DL-2

Furthermore, the proposed implementing agreement should be available to the public during the MSCP comment period, disclosing funding commitments and the acquisition, management and protection of mitigation lands. DL-3

Sincerely,

Donald Lipmanson
P.O. Box 395
Navarro, CA 95463

August 16, 2004

Mr. Glen Gould

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

I wish to comment on the biological assessment, habitat conservation plan (HCP) and envir onmental impact statement (EIS) for the Lower Colorado River Multi-Species Conservation Program (MSCP). The Colorado River is the lifeline for a high propo rtion of the region s fish and wildlife, which depend on the freshwater resources in this largely arid region.

I believe the geographic scope of the MSCP must include the Colorado River delta and uppe r Gulf of California. Without encompassing the Colorado River delta, it will be impossib le to accomplish Endangered Species Act conservation obligations. Sever | AP-1

I also believe the MSCP must commit to the restoration and maintenance of a semblance of historic river ecosystem conditions. To date, the MSCP has focused heavily on hatchery r earing and release of imperiled Colorado River fish. This is important, | AP-2

The implementing agreement must be available during the comment period. The implementing agreement presents the rights and responsibilities of all parties to the MSCP, including funding commitments and the acquisition, management and protection of m | AP-3

Sincerely,

Ann Pinkerton
5467 Lawton Ave.
Oakland, CA 94618

August 15, 2004

Mr. Glen Gould

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

I am concerned to learn of the loss of habitat for species of native fish and migratory b irds in the Colorado River. It seems to me that in order to protect these species and kee p the river healthy and abundant, the ecosystem must be restored. The ec

In the long run, such efforts will pay off by saving some of the effort that goes into ha tchery rearing.

The geographic scope of the MSCP must include the Colorado River delta and upper Gulf of California. DS-1

The MSCP must commit to the restoration and maintenance of a semblance of historic river ecosystem conditions. DS-2

Also, public imput is crucial, so the implementing agreement should be prepared and distributed for public comment prior to approval of the MSCP. DS-3

Thank you for your time,

Diana Singleton
397 Inverness Dr
La Canada, CA 91011

August 16, 2004

Mr. Glen Gould

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

Thank you for the opportunity to comment on the biological assessment, habitat conservation plan (HCP) and environmental impact statement (EIS) for the Lower Colorado River Multi-Species Conservation Program (MSCP).

The Colorado River is the lifeline for a high proportion of the region s fish and wildlif e, which depend on the freshwater resources in this largely arid region. I would like to emphasize the following points:

* The geographic scope of the MSCP must include the Colorado River delta and upper Gulf o f California. AL-1

Without encompassing the Colorado River delta, it will be impossible to accomplish Endang ered Species Act conservation obligations.

Nature is not based on national boundaries--those are a human invention. Several endanger ed species have habitat in both the U.S. and Mexico including the razorback sucker, the Southwestern willow flycatcher, the desert pupfish and the Yuma clapper

* The MSCP must commit to the restoration and maintenance of a semblance of historic river ecosystem conditions. AL-2

To date, the MSCP has focused heavily on hatchery rearing and release of imperiled Colora do River fish. This is important, but only to prevent extinction.

* The MSCP must expand its efforts to include restoration of a semblance of historic rive r ecosystem conditions along key river stretches, with a focus on restoration and mainten ance of historic river functions. Only then will we be able to move tow AL-3

* The implementing agreement must be available during the comment period. AL-4

The implementing agreement presents the rights and responsibilities of all parties to the MSCP, including funding commitments and the acquisition, management and protection of mitigation lands.

Until there are mechanisms to assure funding for MSCP implementation, the HCP fails to me et the permit criteria. Furthermore, it is crucial that the implementing agreement be pr epared and distributed for public comment prior to approval of the MSCP.

Sincerely,

Alanna Louin
1141 Lighthouse Ave Apt 432
Pacific Grove, CA 93950

August 16, 2004

Mr. Glen Gould

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011
Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

A century ago, the Colorado was a free flowing river with wide fluctuations in water leve ls. In the spring, melting snows and storms would increase the river flows dramatically. These flows would inundate large portions of the broad valleys, moving t

The construction of dams, the filling of reservoirs, the introduction of exotic plants, c hanges in the river channel and the loss of seasonal flooding have drastically changed th e Colorado, resulting in a much different ecosystem. These changes threa

The Multi- Species Conservation Program (MSCP) must expand its efforts to include restora tion and maintenance of historic river ecosystem conditions along key river stretches. CA-1

Thank you for your consideration.

Christel Allacher
8283 South Carr Court
Littleton, CO 80128

August 15, 2004

Mr. Glen Gould

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
Via Facsimile 602-242-2513

Mr. Glen Gould
Bureau of Reclamation
P.O. Box 61470, LC-2011

Dear Sir:
I am writing to express my support for the MSCP proposal for the lower Colorado River a rea. Thank you for the opportunity to express my view and I hope you will support my requ est. TW1-1

Sincerely, Terry Woods

Boulder City, NV 89006-1470
Via Facsimile 702-293-8418

Dear Mr. Gould and Mr. Spangle:

Thank you for the opportunity to comment on the biological assessment, habitat conservation plan (HCP) and environmental impact statement (EIS) for the Lower Colorado River Multi-Species Conservation Program (MSCP). The Colorado River is the lifeline for a high proportion of the region s fish and wildlife, which depend on the freshwater resources in this largely arid region. I would like to emphasize the following points:

The geographic scope of the MSCP must include the Colorado River delta and upper Gulf of California. Without encompassing the Colorado River delta, it will be impossible to accomplish Endangered Species Act conservation obligations. Several endangered species have habitat in both the U.S. and Mexico including the razorback sucker, the Southwestern willow flycatcher, the desert pupfish and the Yuma clapper rail. In ignoring the delta s capacity to provide habitat for these species, and others such as the totoaba and vaquita, the MSCP misses a critical opportunity to ensure their viability in both countries. TW2-1

The MSCP must commit to the restoration and maintenance of a semblance of historic river ecosystem conditions. To date, the MSCP has focused heavily on hatchery rearing and release of imperiled Colorado River fish. This is important, but only to prevent extinction. The MSCP must expand its efforts to include restoration of a semblance of historic river ecosystem conditions along key river stretches, with a focus on restoration and maintenance of historic river functions. Only then will we be able to move toward species recovery. TW2-2

The implementing agreement must be available during the comment period. The implementing agreement presents the rights and responsibilities of all parties to the MSCP, including funding commitments and the acquisition, management and protection of mitigation lands. Until there are mechanisms to assure funding for MSCP implementation, the HCP fails to meet the permit criteria. Furthermore, it is crucial that the implementing agreement be prepared and distributed for public comment prior to approval of the MSCP. TW2-3

Sincerely,

Terry Woods
7300 Us 158 Apt 410
Stokesdale, NC 27357-9

PUBLIC HEARINGS

Transcripts

COPY

IN THE MATTER OF

PUBLIC MEETING AND COMMENTS ON

LOWER COLORADO RIVER

MULTI-SPECIES CONSERVATION PROGRAM

---oooOooo---

Date: Tuesday, July 20, 2004

Place: Henderson Convention Center
Vista Room
200 South Water Street
Henderson, Nevada

Time: 6:30 p.m. to 8:30 p.m.

Reported by:
Jennifer Sullivan, RPR, CCR
Nevada CCR #818

APPEARANCES:

For the Metropolitan Water District of Southern California:

JOSEPH VANDERHORST, ESQ.
Deputy General Counsel
Office of the General Counsel
700 North Alameda Street
Los Angeles, California 90012
(213) 217-6321

For the Colorado River Board:

CHRISTOPHER S. HARRIS
Environmental Program Manager
Colorado River Board
770 Fairmont Avenue
Suite 100
Glendale, California 91203
(818) 548-3023

INDEX

	PAGE
COMMENT BY JOHN HIATT	5
COMMENT BY H. HIATT	8

1 P R O C E E D I N G S

2

3 MR. VANDERHORST: Good evening everyone.
4 Welcome to the public hearing on the Lower Colorado River
5 Multi-Species Conservation Program. My name is Joe
6 Vanderhorst. I'm with the Metropolitan Water District of
7 Southern California, which is the lead agency for this
8 program, for purposes of the California Environmental
9 Quality Act.
10 We are co-lead agency with two Federal
11 organizations, The Bureau of Reclamation and the U.S.
12 Fish and Wildlife Service, are lead agencies for purposes
13 of compliance with the National Environmental Policy Act.
14 The purpose of our meeting tonight is to accept
15 public comments on the Draft Environmental Impact
16 Statement and Draft Environmental Impact Report for the
17 Colorado River -- Lower Colorado River Multi-Species
18 Conservation Program.
19 And what we're going to do, as far as the
20 process we're going to go through, is to give you a short
21 presentation so there's an outline of what the program is
22 all about, and then we're going to open it up for the
23 public comments.
24 The purpose of our meeting isn't to provide you
25 with the information which is contained in the documents

1 themselves, but it's to hear from you what your comments
2 are so that we can make the necessary changes to the
3 document and go final later on when the program is ready
4 for approval.
5 So we'll begin with a presentation that gives
6 an outline of the program, and Chris Harris, from the
7 Colorado River Board of California, is going to make that
8 presentation, and then we'll open it up for public
9 comments.
10 As you can see, we have a shorthand reporter
11 here tonight, and so we will have a transcript of all the
12 comments that we receive, and that way we'll be able to
13 consider them as we finalize the environmental documents.
14 When you make your public comments, what we
15 would ask that you do is begin by stating your name and
16 spelling it for the shorthand reporter and giving us your
17 address. And we ask that you speak clearly so that your
18 statement can be taken down accurately.
19 And we're also going to ask for everybody to
20 not go over more than five minutes so that we don't go
21 too long tonight and everybody gets a chance to give us
22 their comments.
23 If you have additional comments that you want
24 to make and you feel that five minutes isn't enough, you
25 can always submit additional comments in writing. The

1 addresses are on the chart on the table as you came into
2 the room. You can submit additional comments in writing.
3 Even if you make a verbal comment tonight, you can do
4 that.
5 So with that, we'll get underway and ask
6 Mr. Harris to give us a presentation on the program.
7 (A presentation was given
8 by Christopher Harris.)
9 MR. VANDERHORST: Thank you, Chris.
10 At this point, we will open the floor up for
11 any comments that anyone would like to make on the
12 environmental documents for the Lower Colorado
13 Multi-Species Conservation Program.
14 Do we have any members of the public here who
15 would like to make a comment?
16 JOHN HIATT: Thank you for this opportunity to
17 comment on the programmatic EIS for the Lower Colorado
18 River Program. My name is John Hiatt, H-i-a-t-t. I'm
19 here representing the Red Rock Audubon Society of which
20 I'm a conservation chair.
21 The Colorado River is essentially the desert
22 river in the southwest for Arizona, California and Nevada
23 in terms of the lower Colorado River. And when I heard
24 about the process originally for a habitat conservation
25 plan, I was excited and thrilled because there's so many

1 opportunities to do something with this river. But when Henderson-1
2 I look at this document, I am horribly disappointed and
3 saddened to see it. There is really no vision here for
4 where we will be in 50 years. We're proposing to restore
5 some 8,000 acres of habitat in 50 years. That's
6 160 acres a year. We're losing more habitat than that
7 every year to salt cedar and other invasive species.
8 With what's being planned here, we will be lucky to be
9 even 50 years from now with where we are today.
10 So I think that really we need a vision for
11 what we want this place to look like and what we're going
12 to do, and I don't see it here in this document.
13 What I see is prescriptions for much
14 single-species management. We're going to do something
15 for one species of fish here; we're going to do something
16 for a species of birds over here, but we don't actually
17 look anyplace and say, how are we going to restore a
18 complex ecosystem so that all the components are there
19 and we can have everything for at least a small section
20 of the river? I don't see that anywhere in here.
21 We allude to the Law of the River and how the Henderson-2
22 Law of the River prevents really doing anything. There
23 is no document that was written in the 1920's anywhere in
24 the world that I'm aware of which can provide a
25 reasonable prescription for solving today's problems when

Henderson-2 con't

1 it comes to natural resource management. And the Law of
2 the River was not written with the idea of preserving
3 anything in terms of natural habitat. The Law of the
4 River is an obstacle to solving problems at this point in
5 time, and we will have to change it. And it's so
6 outmoded in terms of even its recognition of what annual
7 flows are.
8 It's going to have to be changed, but everybody
9 is afraid, except Nevada, that they're going to lose
10 something when they change it, so they don't want to
11 change anything. But we're going to have to change that
12 document. We are going to have to make it modern so that
13 it addresses not only the needs of people in the states
14 which share the Colorado River, but it also can address
15 the needs for fish, birds, animals and the wild species
16 which share the river.
17 So those are my comments about this document.
18 I certainly recognize that there will be individual EA's
19 or EIS's addressing each one of the particular projects
20 along the river, but someplace we need a cohesive vision
21 for what we would expect as we go ahead over the next
22 50-year period. Thank you.
23 MR. VANDERHORST: Thank you very much. Is
24 there anybody else, any other members of the public that
25 would like to make a verbal comment at this time?

1 (No response was given
2 by the audience.)
3 MR. VANDERHORST: Okay. We will accept written
4 comments, and we do have written comment forms here
5 tonight, which you can fill out if you want to fill them
6 out here tonight and leave them with us, or you can feel
7 free to mail in either a written comment form or your own
8 letter. You can be as voluminous as you like in your
9 comments in writing and send those in. We will accept
10 those until August 18th, is the deadline for getting
11 comments in.
12 Yes, ma'am?
13 H. HIATT: I'd like to ask a question for
14 clarification. Obviously haven't done my homework,
15 haven't read the document. The covered species -- is the
16 permit going to be for the covered species and the
17 evaluation species?
18 MR. VANDERHORST: No, the permit is only for
19 covered species, and that is the Section 10 permit that
20 is authorized under Section 10 of the Endangered Species
21 Act.
22 H. HIATT: So it's like the Clark County
23 Multiple-Species Conservation Plan?
24 MR. VANDERHORST: Yes, that's correct.
25 All right. Thank you all for being here

1 tonight. We appreciate your interest in the Program.
2 (The public hearing was
3 concluded at 8:30 p.m.)
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1 CERTIFICATE OF REPORTER

2

STATE OF ARIZONA)
3) ss
COUNTY OF MOHAVE)

4

5 Be it known that the foregoing public hearing
6 was taken before me, Jennifer Sullivan, an RPR, Arizona
7 CCR and Nevada CCR, in the matter of the Lower Colorado
8 River Multi-Species Conservation Program, commencing on
9 Tuesday, July 20, 2004, from 6:30 p.m. to 8:30 p.m.
10 That I thereafter transcribed my said shorthand
11 notes into typewriting and that the typewritten
12 transcript of said public hearing is a complete, true and
13 accurate transcription of my said shorthand notes taken
14 down at said time.
15 Dated at Lake Havasu City, Arizona, this 26th
16 day of July, 2004. COPY
17
18 Jennifer Sullivan
Jennifer Sullivan, RPR, CCR
19 Nevada CCR #818 / Arizona CCR #50706
20
21
22
23
24
25

1 LOWER COLORADO RIVER MULTI-SPECIES CONSERVATION PROGRAM

2 BLYTHE PUBLIC HEARING

3

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8 REPORTER'S TRANSCRIPT OF PROCEEDINGS

9

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11

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13 Taken on Wednesday, July 21, 2004

14 At 6:39 p.m.

15 235 North Broadway

16 Blythe, California

17

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19

20

21

22

23

24

25 Reported by: Juliette L. Vidaurri, CCR, RPR
AZ CCR #50359/CA CCR #11081/NV CCR #748

1 APPEARANCES:

2 Joseph Vanderhorst
Deputy General Counsel
3 METROPOLITAN WATER DISTRICT Of SOUTHERN
CALIFORNIA
4 700 North Alameda Street
Los Angeles, California 90012
5
Christopher S. Harris
6 Environmental Program Manager
STATE OF CALIFORNIA
7 770 Fairmont Avenue, Suite 100
Glendale, California 91203-1035
8
9
10
11
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1 MR. VANDERHORST: Good evening everyone, and
2 welcome to the public hearing on the Lower Colorado River
3 Multi-Species Conservation program.
4 The first thing I would like to do is remind
5 everyone, if you have not already done so, if before you
6 leave this evening, you can sign in on our sign-in sheet at
7 the back of the room. It will be on the table at the back
8 of the room, and we really appreciate that so we have an
9 idea who is present for our public hearings.
10 Let me first then introduce myself. My name is
11 Joseph Vanderhorst. I'm with the Metropolitan Water
12 District for Southern California, and we are here tonight to
13 take public comments on a program which is a Federal, State,
14 and local effort to provide compliance with the Endangered
15 Species Act for operations on the Lower Colorado River.
16 And the purpose of this meeting is to get your
17 comments on the documents which have now been distributed
18 for public review. The documents are available. There is a
19 set of the documents here at the Palo Verde Valley Library
20 located at 125 West Chanslorway in Blythe and you can go
21 look at the documents there. You can also submit a request
22 for a copy of the documents electronically at the address
23 which is included in the Federal Register notice which you
24 can pick up on the back table.
25 I am here on behalf of the Metropolitan Water

1 District which is the lead agency for purposes of complying
2 with the California Environmental Quality Act. That's one
3 of the reasons we are here tonight, to take comments on our
4 CEQA document, which is out for your review.
5 The Metropolitan Water District is one of several
6 California agencies involved in the effort to develop the
7 multi-species plan, and we will be involved also in the
8 funding and implementations of the program if it is approved
9 and goes forward.
10 Also involved in this process are the United
11 States Fish and Wildlife Service which is a joint lead
12 agency for purposes of compliance with the National
13 Environment Quality Act or NEQA.
14 The Fish and Wildlife Service is undertaking an
15 action as part of its regulatory rule in issuing incidental
16 take permits under the Endangered Species Act, and part of
17 that process it has to do the environmental review by NEPA.
18 It is joint lead agency for federal compliance with this law
19 as is one of the coauthors of the Draft Environmental Impact
20 Statement which is what we are here for receiving your
21 comments on tonight.
22 The other joint lead agency on the federal side is
23 the US Bureau of Reclamation. That agency, of course,
24 operates most of the facilities on the Colorado River; and
25 as the federal lead agency, will also be implementing any

1 multi-species conservation program that is implemented as
2 proposed in our documents, and so they are the coagency for
3 NEQA purposes, and are here tonight to also receive your
4 comments.
5 As I said, now the purpose of this meeting is to
6 take your comments on the documents. Um, we have a Joint
7 Environmental Impact Report/Environmental Impact Statement.
8 The state and -- California state agencies and the federal
9 agencies have combined their required documents into one
10 document and issued that.
11 Um, what we want to do tonight is take your
12 comments on those documents, and you can submit your
13 comments tonight verbally. We also have public comment
14 forms in the back that you can fill out and leave with us
15 tonight.
16 You can also submit written comments at the
17 addresses that are shown back on the chart on the table and
18 also included in the Federal Register notice which is back
19 on the back table. We will be accepting comments until
20 August 18th; and after that, we will be taking all the
21 comments under consideration and reviewing and revising the
22 documents as necessary.
23 Um, the procedure for tonight will be we are going
24 to ask Mr. Chris Harris to make a short presentation about
25 the program, and that will just give you a basic description

1 of it, um, and then we're going to open up the floor to your
2 comments.
3 When we do take your comments, in order to get a
4 transcript of what you have to say, so we get it right, we
5 have a shorthand reporter here to take it down. And so what
6 we would ask that when you want to give your comment, if you
7 would stand up and begin by stating and spelling your name
8 so that the reporter can get that, give us your address, and
9 then if you would speak clearly as you can and slowly so
10 that the reporter can take it down, and I believe she will
11 let you know if she needs anything repeated to get it down
12 correctly.
13 We are going to ask that you try and keep your
14 comments to a five-minute limit so that we can get through
15 all the comments tonight in a reasonable amount of time. If
16 you feel you can't get it all said in five minutes, we
17 encourage you to add additional comments in writing; either
18 hand them to us tonight or mail them in before August 18th.
19 So without further ado then, we will have
20 Mr. Harris begin with the presentation on the program.
21 (Chris Harris made his presentation at
22 6:44 p.m. until 6:53 p.m.)
23 MR. VANDERHORST: Okay. So the program that
24 we are here to take comments on tonight is to implement that
25 Habitat Conservation Program that was just outlined, and we

1 are in the process of performing environmental review of
2 what the environmental impacts would be of implementing that
3 program, and we have a Draft Environmental Impact
4 Report/Impact Statement that's been prepared and submitted
5 for public comment, and so for tonight we would like to open
6 the floor up to take your comments on that document.
7 So if you want to speak, why don't you go ahead
8 and raise your hand and if you could stand up and go ahead
9 and talk; and again, start by saying and spelling your name
10 for the record.
11 MR. WERNER: My name is William E. Werner,
12 W-e-r-n-e-r, representing the State of Arizona, Department
13 of Water Resources, 500 North 3rd Street, Phoenix, Arizona
14 85004.
15 The Arizona Department of Water Resources has been
16 involved in development of the Lower Colorado River
17 Multi-Species Conservation program since 1994 when the
18 Department joined with sister agencies in California and
19 Nevada in funding a feasibility assessment of options for
20 proactively dealing with endangered species management
21 issues related to Colorado River operation and maintenance.
22 Following the feasibility study, the group
23 initiated an effort to develop and implement a feasible
24 multi-species management program that -- and here's the
25 bullets -- accommodates current water diversions and power

1 production and optimizes future water and power development
2 opportunities.
3 Second, works toward the conservation of habitat
4 and toward recovery of the species and; thirdly, reduces the
5 likelihood of additional threatened/endangered species
6 listings.
7 Today we have before us the Lower Colorado River
8 Multi-Species Conservation Program Draft Programmatic
9 Environmental Impact Statement/Environmental Impact Report
10 and associated documents, that describe such a program and
11 the effects of implementation of the program.
12 The Colorado River is clearly an important asset
13 to the State of Arizona and many of the state's citizens
14 benefit from water, power, and recreational resources of the
15 river.
16 Within the state, the director of the Department
17 of Water Resources is authorized, for and on behalf of the
18 State of Arizona, to consult, advise and cooperate with the
19 Secretary of the Interior of the United States in respect to
20 the exercise of the authority of the secretary of the
21 interior of any -- of any authority relative to water of the
22 Colorado River.
23 The Department believes that implementation of Blythe-1
24 conservation measures as described in Alternative 1 and
25 issuance of a Section 10(a)(1)(b) permit to the non-federal

1 applicants meets the objectives identified previously. A Blythe-1 con't
2 coordinated, comprehensive, habitat and species conservation
3 strategy best meets those objectives over the long term,
4 thus maintaining current water diversions and power
5 production and future water and power development
6 opportunities.
7 In addition, Alternative 4, focusing on off-river Blythe-2
8 habitat conservation measures that merits careful
9 consideration.
10 Conservation areas described in Alternative 4
11 could be used in conjunction with on-river areas described
12 in Alternative 1, resulting in a blend of the two.
13 In summary, the Arizona Department of Water Blythe-3
14 Resources supports implementation of proactive, coordinated,
15 comprehensive, habitat and species conservation strategy as
16 described in the draft EIS. The Department looks forward to
17 a continuing relationship with all sister state agencies,
18 federal agencies, Indian tribes, environmental groups, and
19 other interested parties as this program develops.
20 Thank you.
21 MR. VANDERHORST: Thank you, Mr. Werner.
22 (One hand was raised.)
23 MR. VANDERHORST: Yes. In the back row.
24 MR. GROTKE: My name is Chuck Grotke,
25 G-r-o-t-k-e. I would venture to say that the majority of

1 the people in this room have not had the opportunity to look
2 at the document we are supposed to be commenting on tonight.
3 With that in mind, perhaps you would accept some
4 of their questions and comments as trying to learn. I am
5 sure a bunch of us are going to be leaving for the library
6 or internet to fill out our knowledge, but I am certain
7 there's a lot of people who have just -- this is the first
8 they have heard of it.
9 MR. VANDERHORST: Okay. Yeah. Thank you.
10 Obviously the document is a voluminous document.
11 And the best way for you to get the information you need is
12 to get the document itself and read it, and then you can
13 submit any comments you have after going through it and
14 focusing on the issues that are most concerning to you.
15 You can submit your comments on that in writing,
16 and that might be the best way to deal with that. Or
17 anybody who is able to take it in electronic format, we do
18 have some CD's available with us tonight that you can pick
19 up.
20 MR. GROTKE: Will you be accepting questions
21 from the audience on what some of the comment -- or some of
22 the content might be?
23 MR. VANDERHORST: Um, that really isn't the
24 purpose of the meeting tonight. I can ask -- answer some
25 basic questions, but I don't want to get into characterizing

1 what I think the document says. It really has to speak for
2 itself. It was the result of multiple agencies' input, and
3 it's really not for me to say yes, this is what it says.
4 The reading of the document itself is the best way to get
5 the information accurately.
6 MR. GROTKE: Okay.
7 MR. VANDERHORST: I would be happy to answer
8 any basic questions people have.
9 MR. GROTKE: Perhaps after the people who are
10 familiar with the document have finished with their
11 comments, you can open it up for a little bit of Q and A.
12 MR. VANDERHORST: Okay.
13 MR. GROTKE: Thank you.
14 (One hand raised.)
15 MR. VANDERHORST: Yes, sir.
16 MR. NELSON: Les Nelson, N-e-l-s-o-n, City
17 Manager of Blythe. The State of Arizona looks like they
18 read the document. As Mr. Grotke alluded to, I don't think
19 many of us here have had an opportunity to read the
20 documents. I know you don't want this to be a -- process to
21 be a question/answer. I know you want public hearing
22 comments.
23 Nonetheless, I do have some questions. The nine Blythe-4
24 million up front, the six hundred million over a period of
25 50 years, where does that money come from; and secondarily, Blythe-5

Blythe-5 con't

1 the properties that are going to be put in a habitat, is it
2 the intent to acquire those properties if they are held
3 privately; and if so, what would be the basis for
4 determining their market value? Would there be an appraisal
5 of some sort?
6 MR. VANDERHORST: I can give you some basic
7 answers, but not all the details. The program will be
8 funded by parties who have activities on the river that are
9 covered by this program and for which they want incidental
10 take permits issued so they can continue to perform those
11 activities without fear of prosecution for violating the
12 Endangered Species Act, and there is a Chapter 7 of the
13 Habitat Conservation Plan which describes the funding
14 structure that's currently being contemplated for the
15 program, and I would direct your attention to that section
16 at this point.
17 With regard to the properties that will be used
18 for the program, projects, the habitat construction, we have
19 identified certain areas that could be used for this
20 program, but we have not specified that must be used for
21 this program. The idea was to identify what was necessary
22 in order to obtain the incidental take permits. How much
23 mitigation would be required for the activities we were
24 seeking coverage for, and we have identified the size of the
25 project necessary to get those permits in place. The

1 specific locations will be determined in the future.
2 There will be individual environmental reviews for
3 each project that comes up for implementation, and I believe
4 that we have stated in the document that any acquisition of
5 the property necessary to put those projects in place will
6 be done on a willing buyer/willing seller basis.
7 Any other comments?
8 (One hand raised.)
9 MR. VANDERHORST: Yes, ma'am.
10 MS. CARLTON: Rosalie Carlton, 620 Holley
11 Lane, Blythe, California.
12 In this plan are you going to have -- What I'm Blythe-6
13 gathering is there's going to be off-limits to the river?
14 MR. VANDERHORST: No. There will be no
15 off-limits to the river. The project, as was explained,
16 includes the creation of 8,132 acres of new habitat; and
17 because that habitat is being set up specifically for the
18 benefit of the endangered species, we are trying to get
19 protection for that habitat will be set aside and there will
20 be -- there will not be access to those areas where we are
21 creating the habitat because we don't want the species
22 disturbed. In fact, it would be a violation of the law to
23 disturb those species in the way that disrupts their
24 essential life activities.
25 So we are going to have a certain amount of

1 acreage that the program will be using and setting aside,
2 but there's a discussion in the program documents about the
3 fact we are not doing any interference with recreation as it
4 exists now on the river. We are not closing any portions of
5 the river. And the 8,000 acres is a very small portion of
6 the existing acreage that is available on the river. We
7 don't anticipate that will cause any impacts to people's use
8 of the river in any way.
9 MR. HARRIS: Let me follow up on that, too.
10 You guys live with a national wildlife refuge on the river.
11 You have three of them -- actually, four of them; imperial,
12 Havasu, and Bill Williams refuges.
13 Periodically what the refuges will do on those
14 lands, those federal lands where they've got to close
15 particular portions of the lake, whether it's Cibola Lake or
16 some areas where they are doing some bird surveying and
17 they -- those are off-limits to visitors at critical times
18 of year, particularly when some of these birds are nesting
19 and fledglings are there and so forth.
20 There may be cases like that where we have certain
21 areas that you can't access because the birds are nesting
22 and it's a real critical time of year, but in other periods
23 of the year you may go into them. It depends on the
24 management that is brought to bear on that particular parcel
25 at that time.

1 To finish up, as Joe mentioned, you know, we are
2 talking about putting an additional 8,000 acreage of
3 riparian habitat on the river. There's something on the
4 order of right now a hundred and thirty or a hundred and
5 forty thousand acres of riparian habitat on the Lower
6 Colorado River. This is just a tiny bit more.
7 So I mean, you know, where these are, we've got
8 this catalog of potential restoration sites along the river.
9 We have really no idea at this point in time exactly where
10 we will be implementing this habitat restoration. I think
11 that's something we've got to look at in the future.
12 I think the documents layout that some of the
13 criteria you would use would be you would look at the human
14 use elements in conjunction with putting potential
15 restoration sites in place.
16 MR. VANDERHORST: Let me just add, you should
17 review the document in Chapter 3 -- I believe it's
18 Section 15 of the Environmental Impact Statement has a
19 description of the recreational aspects and how the program
20 will work in conjunction with that.
21 MS. CARLTON: Would you repeat that.
22 MR. VANDERHORST: It is Chapter 3 of
23 Section 15.
24 MR. HARRIS: 3.15.
25 (One hand raised.)

1 MR. VANDERHORST: Yes, sir.
2 MR. CROSBY: Cobe Crosby, C-r-o-s-b-y, Rivera
3 Drive. I'm just a little confused. I wanted to clarify and
4 kind of expound on what she said. So this is not going to Blythe-7
5 affect boating is what you are saying as it is now,
6 recreation boating, et cetera? Because I didn't read this
7 as many people probably didn't, but I got a flier that said,
8 you know, are they going to shut down boating on the river
9 and so forth. Where did that impression come from?
10 MR. VANDERHORST: I don't know.
11 MR. CROSBY: Okay.
12 MR. VANDERHORST: There's nothing in our
13 program, nothing in our document which says we have any
14 affect on boating at all. We don't intend to shut down any
15 boating.
16 MR. CROSBY: Good. Thank you.
17 (One hand raised.)
18 MR. VANDERHORST: Yes, sir.
19 MR. JOHNSON: Tom Johnson, J-o-h-n-s-o-n. I Blythe-8
20 have fished that American Bass Tournament Series, and I
21 fished that Lower Colorado River, and I can see that what
22 you are doing down there is a great thing.
23 In other words, you are opening up places that
24 have been opened up -- that haven't been opened up for
25 years. So that portion of that I see is good.

Blythe-9

1 But I'm concerned about what's going on here in
2 the upper portion. We closed off Goose Flats. We closed
3 off Ellers. We closed off Three Fingers Lake and we've --
4 Pretty Water is now -- you can't go in the evening time.
5 Also, Cibola Lake has been closed off to regular motor
6 usage.
7 And those things I'm concerned that we're doing
8 too much to preserve an endangered species; and because of
9 doing that, we're losing other species.
10 In other words, when I go down and fish Walters
11 Camp, I used to have a place I can catch limits of fish
12 every time, won a tournament there. Today I can't do that
13 because, um, Three Fingers Lake is now closed to them, the
14 fish being able to go in there and reproduce and spawn, and
15 that's the only concerns I have. That I wish they would do
16 the same thing they've done down here. If that's what we
17 have in mind, I'm all for it; but if we plan on closing more
18 backwaters off, I'm against that.
19 Thank you.
20 (One hand raised.)
21 MR. VANDERHORST: Yes, ma'am.
22 MS. CARLTON: Is there any simple training to
23 the public on this environmental impact?
24 MR. VANDERHORST: We do have some
25 documentation available on the back table. Um, I don't know

1 whether I can say there's a simple, simple outline of the
2 program, other than what we've given tonight. The document,
3 Environmental Impact Statement, itself does include an
4 executive summary at the beginning of the document which
5 gives you a shorter outline. You don't have to go through
6 it in the detail that the rest of the document contains.
7 If you read the executive summary, it will give
8 you a broad outline of what this entails.
9 MR. HARRIS: That may focus you on other
10 areas where you may want to go get more detailed information
11 within the documents.
12 (One hand raised.)
13 MR. VANDERHORST: Yes, sir.
14 MR. HULL: Charles Hull, H-u-l-l, Assistant
15 City Manager for the City of Blythe.
16 You're an employee of MWD?
17 MR. VANDERHORST: Yes, I am.
18 MR. HULL: Okay. I would presume then that Blythe-10
19 you're lead agency role here in dealing with the habitat
20 issues that you are bringing to focus, the transfers that
21 the Colorado River water going west may impact the species
22 here locally to some degree.
23 I'm giving you a segway to explain yourself as it
24 relates to the river here and the water transfer, so please
25 take this as a positive comment that the cumulative effect

Blythe-10 con't

on the Colorado River is being mitigated here and there will not be any negative impacts because of that transfer?

MR. VANDERHORST: Well, first of all, let me say that the documents that we prepared are not the environmental review documents for any water transfer. They are simply the documents for development of a program to obtain Endangered Species Act compliance.

That being said, the compliance does include coverage for future changes in the point of diversion of water on the Colorado River, not only within California but also within Nevada and Arizona and also by federal agencies as well.

So the idea being, that this program will provide a mitigation package sufficient to offset the impacts of future water transfers wherever they may occur in the Lower Colorado River and whoever may implement them, and at this point we don't know what those future projects may be.

As you know, there are several that have already been implemented that have gone through separate environmental review, and in the future any party that intends to perform one will have to do an environmental review of the specific project.

What may be done in the future is, if there's a water transfer, parties may rely on -- to the extent that the project fits within the action as described in our

program, they may have -- they may be able to rely on the incidental take issue permit issued by that program for incidental take permit compliance only. All other environmental review has to be done at that time.

MR. HULL: Do you have a range of diversion that you analyzed from minimum to maximum? Blythe-11

MR. VANDERHORST: Yes. The program is based on a change in point of diversion of up to 1.574 million acre feet of water a year.

MR. HARRIS: Lake Havasu. That would be -- that would reach from Lake Mead to Southern international boundaries.

MR. HULL: Thank you.

(One hand raised.)

MR. VANDERHORST: Yes, ma'am.

MS. JACOE: My name is Deloris Jacoe. I'll spell it for you, D-e-l-o-r-i-s J-a-c-o-e. I'm a former Blythe resident. I've lived in Yuma, El Centro, Southern California and the Blythe area for the past 52 years, and I have seen how the water has dropped from Lake Mead over 72 feet overall two and a half years ago after our drought.

And as a person very strongly interested in ecology, I would like to know if; Number 1, I personally can have a transcript of everything that's said here tonight, and I would like to have a copy that you said was on disk, Blythe-12

1 and I would like to have further data about how Metropolitan Blythe-13
2 water is coming out of this financially and helping all of
3 the developers in Southern California.
4 I currently live in Hemet, and I have seen how the
5 farmers there have been driven out by the big developers and
6 the traffic and the smog and all of the other stuff is big,
7 big headaches, and I know what it has done to the small
8 farmers.
9 With Blythe being a farming community from day Blythe-14
10 one, I hate to see it become a ghost town if we do not
11 maintain our farming; and if we do not maintain our river,
12 for being able to have the people from the big metropolitan
13 areas come over here and have a chance to get away from
14 their smog and everything else and be able to relax on the
15 river.
16 I'm concerned because I'm going to live here for
17 the rest of my life. I can live another 40 years. I don't
18 want to do it in a smoggy city where I am now, and I want to
19 be assured that we are going to be able to have a safe food
20 supply because everyplace I go to buy groceries now it's
21 imported from Latin America; and with the terrorist the way
22 they are, the only sure source of good food we have is where
23 we grow right here and in Imperial Valley and in Arizona,
24 and I would like to be able to have some means of being
25 assured that this is going to be continued and if

1 Metropolitan Water and some of these others are not going to Blythe-14 con't
2 deprive us of that opportunity.
3 MR. VANDERHORST: Thank you, ma'am.
4 With regards to a transcript of this hearing, it
5 will be included as part of the final documentation for the
6 program.
7 MS. JACOE: Thank you.
8 MR. VANDERHORST: So if you would ask for it
9 at the sign up. If you make sure we get your address and
10 you can be --
11 MS. JACOE: It's on there.
12 MR. VANDERHORST: -- included on the mailing
13 list.
14 MS. JACOE: It is.
15 MR. VANDERHORST: Okay. Thank you.
16 (One hand raised.)
17 MR. VANDERHORST: Yes.
18 MR. NELSON: Les Nelson again. Figures the Blythe-15
19 alternative to no action alternative isn't really viable and
20 we understand that. Can you -- can you kind of give us some
21 sense if they go forward with Alternative 1, 3, or 4 some
22 kind of a time line what might happen, when it might happen.
23 I know that means you have to make some assumptions. I
24 would ask you to give us in order of magnitude what we might
25 be looking at in terms of time and implementation.

1 MR. VANDERHORST: Well, as we mentioned, it
2 is a 50-year program. So we are looking at implementation
3 over a very long time.
4 MR. NELSON: I'm looking at the front end.
5 MR. VANDERHORST: I understand. It's
6 difficult to say. We haven't got a firm time line as far as
7 how many acres would be recreated in any given time frame,
8 but we are hopeful that it will be as we call front loaded
9 as far as habitat creation is concerned.
10 There obviously needs to be at the beginning of
11 the program some screen done with regard to the need for the
12 species and the best location for the habitat and provide
13 the most benefit for the species that we are working with.
14 So that will take some time up front before we actually get
15 on the way with habitat creation.
16 I am afraid I can't be any more specific than
17 that, but there is a chart in the document that page --
18 MR. HARRIS: It's Table 7 dash 1 follows page
19 7 dash 2. Table 7 dash 1 following 7 dash 2. It's broken
20 up into five-year increments and it's by cost, but in
21 Chapter 7 each of those costs then can be related.
22 So if you are interested in looking at how many
23 acres as we ramp up with restoring the number of acres, this
24 is in Volume 2, the Draft Habitat Plan. I assume it may be
25 in the ES. It may not be.

1 You can see how the acreage could come on line and
2 I can -- as I recall, most of the acreage is in place around
3 year 30 to year 40. So ramp up on that kind of schedule,
4 then you go into kind of maintenance mode maintaining your
5 existing habitat, um, and you can see it. It kind of breaks
6 down. We've got it in five-year increments by dollar
7 amount, how much water is required, et cetera.
8 Oh, the other part of your question, Les, when do
9 you expect in a perfect world would this program begin
10 initiation.
11 Um, we would like to think the current schedule
12 right now expects a report or decision from the secretary of
13 the Department of the Interior in January 2005, which means
14 theoretically then in 2005 we would begin turning dirt and
15 doing the necessary data collection, background work,
16 et cetera, and identifying potential places along the river
17 for habitat restoration.
18 MR. NELSON: Thank you.
19 MR. HULL: Charles Hull. If you have now Blythe-16
20 eight thousand eighty-one hundred acres of new habitat that
21 you are creating, you have yet to identify those areas, you
22 probably have a general idea of zoning that you're
23 exploring.
24 You are not impeding on recreational Blythe-17
25 opportunities that exist on the river today?

1 MR. VANDERHORST: Uh-huh.

2 MR. HULL: How is it -- Like the slide you Blythe-18

3 had on the power point. Are you augmenting what's out there

4 and calling that new or are you going out and creating new

5 flood areas that are in addition to the river?

6 MR. HARRIS: It's probably worth spending a

7 couple minutes here just explaining this. If you get a

8 chance after the meeting, do come over. We have spent

9 basically the past six or seven years, all of the

10 cooperative agencies in this program, and really looking in

11 some detail at the entire reach of the Lower Colorado River

12 and including the Lower Gila, the Bill Williams River, the

13 Virgin River up in Nevada and trying to identify areas that

14 might lend themselves to this notion of habitat restoration.

15 So we put together a catalog of about 35,000

16 acres, as I recall, and a lot of it is on federal land, BLM

17 land, some of the National Wildlife refuge lands, tribal

18 lands, state lands managed by the three states, and then

19 ultimately some areas that are privately owned or managed by

20 agricultural districts.

21 We put together a catalog and just said if you

22 were able to utilize these plans, whether they're BLM,

23 private, tribal, et cetera, what could you do there? Did

24 they lend themselves well? And the document does describe

25 kind of the break down how much tribal and private, federal

1 lands along the river and how those lands could come into
2 this analysis, and they're -- actually, the criteria of
3 selecting the sites are also described in the documents.
4 So there was a methodology utilized in identifying
5 these. I think a lot of it depends upon access. Can you
6 get to it? Do you have a running source of Colorado River
7 water? That's a huge issue. Can it be maintained
8 adequately? Do you have to add a whole bunch of
9 infrastructures, roads and canals, et cetera. We like to
10 avoid that as much as possible with additional development.
11 And to kind of answer your last question, this has
12 to be a new habitat. The Fish and Wildlife Service is going
13 to give us some credit for maintaining only some of the
14 existing habitat along the river if we did certain things.
15 They also want to see new 8,132 acres of habitat
16 out there. That's really important. The eighty-one hundred
17 acres we have to go out and restore, so either take salt
18 cedar out and replace it with cotton willow and take some
19 lands that have nothing on them and create new habitat, and
20 we also get some credit for maintaining some of the existing
21 better qualified riparian habitat along the river, too.
22 These notions and these contents are all in here.
23 MR. VANDERHORST: To focus on that, you want
24 to read the Habitat Conservation Plan which is Volume 2 of
25 those set of documents.

1 MR. HULL: I'll jump on it.
2 MR. HARRIS: Little bedtime reading.
3 MR. HULL: Yeah.
4 MS. JACOE: I was wondering, is this going to Blythe-19
5 create excess water, this plan is going to take more farm
6 out of production or other things out of production to
7 create more water so Metropolitan can claim in the future?
8 Metropolitan's not going to claim any water or any excess
9 water in the future concerning this plan?
10 MR. VANDERHORST: No.
11 MS. JACOE: I just can't --
12 MR. VANDERHORST: This program doesn't
13 involve any water transfers at all. This program's going to
14 be implemented by the Bureau of Reclamation, if it's
15 approved. While it would involve the use of water for
16 purposes of the new habitat, it doesn't involve transferring
17 water.
18 MS. JACOE: Would it be using water some time Blythe-20
19 in the future?
20 MR. HARRIS: Never.
21 MR. MILLOSOVICH: I got just one. I'm Jim Blythe-21
22 Millosovich with California Fish and Game. This doesn't
23 represent my agency. I think it's important at these public
24 hearings to let the people know what the driving force is
25 behind this. Yes, this isn't from water transfers, aren't

1 the NECP, but there's a driving force behind it. They are Blythe-21 con't
2 all connected.
3 THE COURT REPORTER: Spell your last name,
4 please.
5 MR. MILLOSOVICH: It's M-i-l-l-o-s-o-v-i-c-h.
6 You didn't wake up one day and say we are going to Blythe-21 con't
7 do this. There's a reason for it.
8 MR. VANDERHORST: There's reasons for it.
9 There is the Endangered Species Act compliance for operation
10 of the river. Right now Metropolitan Water District and
11 several other water agencies in California, including the
12 Palo Verde Irrigation District here in Blythe, take water
13 out of the Colorado River. We do that without any
14 incidental take permit right now. The same thing happens in
15 Nevada, the same thing happens in Arizona.
16 So the purpose of our program is so we can comply
17 with the Endangered Species Act so we will not get
18 prosecuted for violating the law.
19 Now, it does -- because we have a 50-year program
20 and we want to make sure we have compliance with the
21 Endangered Species Act for the next 50 years, we looked
22 forward to what future actions may be taken on the river so
23 we can get them covered in one program and that program is
24 this program, and so what we need to do is consider what
25 change may occur on the river over the next 50 years.

1 Each of the states and the federal agencies
2 involved looked at what future changes and operations may
3 occur, and that included the change in transfer diversion,
4 as I previously said, of 1.574 million acre feet of water a
5 year. We didn't say who that water would go to. We didn't
6 say what agency it would be involved in that transfer.
7 If that transfer occurs, it will have to undergo a
8 separate environmental review. That is not that. This is
9 not the program that's being reviewed tonight. What's being
10 reviewed tonight is solely the Endangered Species Program.
11 Any other comments?
12 (One hand raised.)
13 MR. VANDERHORST: Yes, ma'am.
14 MS. OCHS: I'm Carey Ochs, O-c-h-s
15 C-a-r-e-y. I live at 5120 Colorado River Road. My husband Blythe-22
16 and I are landowners out there. I guess my primary concern
17 is I just basically wanted to know what the effects of the
18 implementation in our local community is going to be. I
19 think that may be what a lot of people are questioning.
20 The idea of recreation, of water rights; boating,
21 swimming on the river. I think a lot of people are
22 concerned that was going to get shut down. We had a little
23 scare with the radio announcement today. I think a lot of
24 people flocked here. We are all up in arms thinking that --
25 what your primary goal was.

1 Personally, I think it's a great plan as long as Blythe-23
2 it doesn't impede our rights as landowners and as members of
3 the community that love living in this small-town
4 environment and this slow-pace lifestyle with no smog and,
5 you know, little pollution, to utilize our river in a
6 recreational manner. That's what our concerns primary are.
7
8 One of my concerns, however, upon reading this -- And Blythe-24
9 this is really complicated to the layman when you read this.
10 It really doesn't talk about any of the possible effects of
11 the implementation in our local community. It
12 sounds great when you put it up an announced -- you talk
13 about saving birds, fish. I don't think anybody in the room
14 would, you know, think that's a wrong thing to do; but when
15 you look at a study that -- or a plan of action that we are
16 going to -- it's going to be voted in, it's going to be
17 official, it's going to last 50 years, how would that impact
18 us down the road. And
19 there's a concern of mine as a landowner to say, okay.
20 Well, maybe the marsh lands aren't cutting it. Maybe you
21 have to go a little further north up -- down the river. You
22 need a little more land, and, you know, it's a concern of
23 ours.
24 I mean, how -- What if it didn't work initially and they
25 decide to widen the scope or implement some stricter

Blythe-24 con't

Blythe-25

1 standards down the road? What guarantee do we have that
2 this initial thing is going to be what it is and as you said
3 30 years down the road I'm going to still be living here.
4 Thirty years down the road. Does that mean in 30 years they
5 could decide that, you know, we are not going to be able to
6 utilize the river in a recreational manner because -- I
7 guess that's my concern.
8 MR. VANDERHORST: Okay. Let me just say that
9 for a description -- and I understand that it's a very --
10 it's a very large document -- set of documents actually.
11 MS. OCHS: And I haven't read them. I'll add
12 that.
13 MR. VANDERHORST: I understand that. What I
14 would say to you is that for your concerns about, for
15 example, recreational issues. If you want to go to the
16 document and focus on the section that deals with
17 recreation, that would be the best way to get as many
18 answers as you can.
19 For what is going to happen in this particular
20 community, there -- right now there's not a whole lot of
21 detail because we don't know exactly where each of the
22 restoration projects are going to go.
23 There will be an environmental review when a site
24 is selected that we think is a good place to put one, and
25 then you will have another opportunity to participate at

1 that time.
2 The program, if there is any significant change,
3 this -- the program, it has to go through another
4 environmental review under California law and under federal
5 law as well. So if you pay attention, as you obviously
6 have, to the public notices that are put out in the local
7 newspapers and to the local press, um, you will hear when
8 there's a proposal to change the program because it would go
9 out again for public review.
10 MR. HARRIS: I think the other thing, too, if
11 you look at these and you kind of look at some of the areas
12 that we've identified as potential restoration sites, 35,000
13 acres total. We only need 8,000. We are not going to pound
14 a square peg into a round hole. We are really going to look
15 at the issues, the local issues, the federal issues and make
16 sure that what you did in a particular area is a great fit.
17 You know, if you've got a big chunk of habitat you
18 want to put out, southwestern willow flycatcher, you may not
19 want to put it in an agricultural area where you got
20 pesticide drift or something else you are doing for birds
21 and bunnies where the birds and bunnies are running out in
22 the field and preying on the farmers crops. You know,
23 that's probably not a good mix.
24 So I think those the criteria that we've developed
25 so far, the preliminary criteria to identify these sites are

1 in here, and they kind of lay out the rules of the road for
2 us going out and looking at these areas.
3 And I think if you look at those, I think you'll
4 see that we addressed -- we sure attempted to address it.
5 We hear that --
6 MR. VANDERHORST: Yes.
7 (One hand raised.)
8 MS. CORBETT: Sandy Corbett from Cibola,
9 Arizona. I live a mile from the wildlife refuge down there
10 and a mile from the river. Our family had -- This is for
11 more -- kind of just share with you like your concerns about
12 what might happen. I can't say what will happen. I
13 appreciate your plan.
14 Really just to share with you another experience
15 that happened up north to my family. Our family had got a
16 permanent -- we won a permanent injunction from the Federal
17 Court. Willow Beach -- If this is the top of this map, they
18 are talking about, and that's within the national park
19 actually, but it was set up as Lake Mead National Recreation
20 area.
21 When they were going to close out these home -- It
22 used to be a camp. We use to fish along the river.
23 Apparently striper came over when the damn overflowed and
24 got in on the other side. It used to be great Trout
25 fishing. Now tons of Striper fish.

1 There was a thing to protect these endangered fish
2 and so forth. It turned into affecting all kinds of things
3 what we found out. We formed -- we were concerned about
4 saving our recreation on the river. That's a lot of what
5 you guys are talking about.
6 We formed an organization which was a nonprofit
7 organization. We made a corporation in Arizona. We
8 actually fought the National Park Service. We went to
9 Federal Court in Phoenix, um, and we all lost our homes.
10 Those homes were there before it was a national recreation
11 area. The homes were shut down.
12 Part of the plan was like we are looking at the
13 plan here. Not to say -- I'm just giving you some
14 feedback -- was to keep boat docks in and do this stuff.
15 That was part of the master plan. When the public hearing
16 and so forth, and none of that has been restored. None of
17 it has been restored up there.
18 They turned it into a day-use only area. You have
19 to pay a fee. You can't stay over night there anymore.
20 These issues about hundred-year flood documents for public
21 safety. The Federal Government has to think of those things
22 for public safety, but essentially what we are talking about
23 possibly is lack of our use of lands. And that thing was in
24 combination with the National Park Service, the BOR, and the
25 BLM, and by the time when we went through this whole

1 process, took us three years. We ended up losing our homes.
2 The -- at the end of the process when it got down
3 to it, they hadn't done what was in the plan and we lost our
4 use.
5 So all I'm saying if you can -- and we also found
6 out when it got to the point of public hearing, it was too
7 late. So if there's anything you can do -- I'm going to end
8 it with a question to the gentleman up front, if you can.
9 Just being here I don't think is enough. It is
10 like write public comments if you have a concern. If you
11 don't, it's cool.
12 But if you do, I suggest you write them, get
13 talking, write letters and everything. If you have
14 concerns, try to educate yourselves first because a lot of
15 us need to find out more about it to pass that experience
16 on.
17 So if you can do a written public comment by the
18 18th, like I am suggesting, I am going to encourage you to
19 do it. Anything you can do to educate yourselves.
20 I take it seriously because it does change things,
21 potentially change things, although I'm into, you know,
22 protecting our species, but also we need to protect our
23 usage on the river.
24 The last question is: Public hearing. What, is Blythe-26
25 it too late for anything to happen? What happens after the

1 public hearings? It's done? Isn't it done? Are we done? Blythe-26 con't
2 MR. VANDERHORST: No, we are not done.
3 MS. CORBETT: Okay. Tell us what the options Blythe-26 con't
4 are for us that might have concerns about it, how this
5 public here, these people can do something if they are
6 concerned about it or not, what are the steps they can take
7 to do that.
8 MR. VANDERHORST: Right. The reason we are
9 here is to take public input on the program that we drafted.
10 The alternative -- it includes certain alternatives and it's
11 been outlined in considerable detail in those documents that
12 we discussed that are available for your review.
13 We are taking public comments. As we said, at
14 these three hearings, we are taking comments in writing as
15 well. And the process calls for us to accept all of the
16 comments that we received from the public, and then we have
17 to consider them and deal with them; and if they require us
18 to make changes to the program, then we will do so, and then
19 we will issue a final report based on all the input that we
20 received from the public and that will come out sometime
21 hopefully by the end of this year.
22 MS. CORBETT: Can I say one last thing. The
23 final report -- we found out when we did the same step in
24 the final report, what we did say could be included, your
25 letters are going to be included. But when the final report

1 comes out, it didn't say they can't stop doing what they are
2 doing. They are letting us know about it. I'm not saying
3 that as a fact. I am saying that's an experience. That's
4 exactly what happened to us.
5 MR. VANDERHORST: Understood. But please do
6 submit your comments. That's the reason for this process is
7 so we can get that input; and if your concern is
8 recreational access to the river, make sure that you let us
9 know you have a concern that you not lose recreational
10 access to the river as a result of our program.
11 (One hand raised.)
12 MR. VANDERHORST: Yes, sir.
13 MR. JOHNSON: Again, Tom Johnson. I'm going Blythe-27
14 to make one more final comment so it's on the record. I
15 believe we should have free use or free access to our river
16 in Blythe. We have no free access and when it seems like we
17 develop something, they close it off; such as, Ox Bow. We
18 no longer have Ox Bow. We can't put our boats in for free.
19 We have to pay a fee down there.
20 Once they get something down there and it looks
21 like it works, you guys get a hold of it and it is no longer
22 free. They charge you for it. We have Goose Flats, is the
23 only place you can put in now for free. You can take your
24 boat, put in, don't have to pay a fee.
25 Seems like around Blythe that all we have is when

Blythe-27 con't

1 you get something that's good, you close it off, and I'm
2 also concerned again about how they closed Goose Flats and
3 Ellers off.
4 What they did is they -- by closing both ends off
5 of both those lakes, that created no flow there. Because
6 there's no flow, the water temperature gets up in the
7 90-degrees. Now you don't see the fish. If fish don't
8 reproduce, well, you don't have Bass. You have the chub or
9 whatever that is that you are trying to preserve in there.
10 MR. VANDERHORST: Right.

Blythe-28

11 MR. JOHNSON: So I want to make sure that
12 gets on the record as far as public comment. I think we
13 need free access. I feel like Woody Guthrie; this land is
14 your land. This land is my land.
15 MR. VANDERHORST: Okay.
16 MR. HARRIS: In fact it is.
17 MR. VANDERHORST: Let me just point out,
18 though, that again this program is endangered species
19 program and is not a public recreation program. Um,
20 certainly submit your comment because it pertains to the
21 fact you don't want our program to interfere with public
22 access to the river, but also that kind of issue is one that
23 should also be brought to the attention of the fish and game
24 agencies or whatever other agencies are controlling the
25 access points to the river.

Blythe-29

1 MS. JACOE: Back to her question. I didn't
2 feel like you had responded to a complete answer of what can
3 we do. You said you would be issuing a final report. That
4 doesn't tell us what we can do regarding that final report,
5 and is that going to be what makes the law or do we get an
6 opportunity to be able to change that before it becomes the
7 law?
8 MR. VANDERHORST: That's a hard question to
9 answer because the program isn't changing the law. The
10 purpose of the program is for the agencies to comply with
11 the existing law, and the agencies will have to make the
12 final decision as to what is required for their compliance.
13 Um, we will do that considering all of the public
14 input that we receive, and so eventually the final decision
15 does get made by the agencies but only after we hear from
16 you.
17 MS. CARLTON: Does Metropolitan -- some of
18 the land use along the river, lease land or anything like
19 that?
20 MR. VANDERHORST: Metropolitan has leased
21 land along the arrive. No decision has been made yet as to
22 whether that will be included in the program.
23 (One hand raised.)
24 MR. VANDERHORST: Yes, sir.
25 MR. ANDERSON: My name is Andy Anderson,

1 A-n-d-e-r-s-o-n.

2 As a long-time resident of this area, born and Blythe-30

3 raised, grew up here, we were able to go and come and do

4 whatever type of recreation fun we liked to do, whether it's

5 mining to fishing to boating to trying to save some -- some

6 little animal. Paton came here, saved our country. We have

7 a free county. He played a very big part of it. He run

8 over every bit of this county including the river.

9 Now, you come along and say you are another

10 agency, a number of a list about this long, that we only

11 want 8,000 more acres. The BLM has wanted hundreds of

12 thousands of acres. So then they come along and take

13 hundreds and thousands of acres wilderness areas because of

14 all these endangered species. We can't go there.

15 But you only want 8,000 more acres. You are into

16 this program, what I am hearing, seven years. It's a

17 50-year program. You are going to retire and pass on. You

18 are going to retire and pass on, somebody is going to move

19 over and take over your shoes and go on. We got to have

20 another 8,000 acres in 20 years, and it's just like the BLM

21 has done, it's like all these other agencies have done.

22 They just continue to take, take, take, take.

23 This boat landing this gentleman is talking about,

24 the BLM didn't have one thing to do with put all that in

25 there; clear it, make the gravel roads, the concrete boat

ramp and all of that, but the BLM comes along, closes it up, puts up a big fee. Now we all have to pay. Blythe-30 con't

The man's right, the lady's right. You guys -- every agency just continues to take a little more. We need another 10,000 acres. We need another 5,000 acres. Is there no end to your situation? Yours is one of only -- I don't know where the end is coming, but I can see that we don't have -- the end of our use of land is becoming very, very, very narrow, and I think that's what you are hearing from everyone here.

And you guys just come along -- I shouldn't say you guys. You people, whoever. I don't understand how the Metropolitan Water District has something to do with saving this poor little bird. I thought Metropolitan Water District provided water for 300 million people out there is what I thought.

But nevertheless, you are down here. You bought farm land. I don't understand all the thing. I didn't graduate from college. I'll never be able the read all that stuff and understand it. I can read it, but I wouldn't understand it because I'm not a lawyer.

But my main object is that you want only 8,000 acres, and I will guarantee you within 20 years you will want another 8,000 acres.

I don't know whereabouts, but we have refuges. Blythe-31

1 There's acres and acres in these refuges. We can't go on Blythe-31
2 that. We used to go on it. It's like all these backwaters
3 this gentleman is talking about that we used to be able to
4 go fish, we drive our boat in, drive our car to them and go
5 fishing, swimming, whatever you want to do. But they fence
6 them off. If you're able to go in, you've got to pay big
7 bucks.
8 We have no public access to the river anymore,
9 which you also said that has nothing to do with your show
10 here tonight, but that is a very true story. We do not have
11 public access to the river anywhere.
12 And I'll leave it at that.
13 MR. VANDERHORST: Okay. Thank you.
14 And again, the issue of public access obviously
15 was a very important one and we understand that and that
16 comment will need to be addressed. Thank you.
17 (One hand raised.)
18 MR. VANDERHORST: Yes, sir.
19 MR. HERNANDEZ: Yes. Sonny Hernandez,
20 H-e-r-n-a-n-d-e-z, counsel for the City of Blythe. One of Blythe-32
21 my concerns I have always been, you know, they always say
22 reasonable access to the river. Is there a definition that
23 you have if you close off a -- an area that there's
24 reasonable access? And what is your definition of
25 reasonable access? It could be five feet, it could be two

1 feet.

2 You know, is there something in your documents Blythe-32 con't
3 that says you're allowed reasonable access to a certain area
4 of the river instead of just closing off? Because there are
5 documents right now that protect access to the river for the
6 public, but it's called reasonable and that doesn't define
7 anything. It could be five feet to the river, it could be
8 two feet. It could be, you know, a thousand feet.
9 But is there anything in your document that says
10 you are going to allow a reasonable access to the river if
11 you close off portions of it?
12 MR. HARRIS: Yeah, we are not going to close
13 off the river. I mean, that is not part of this, any
14 portion of it. That's just not what this is about.
15 MR. HERNANDEZ: To have conservation land, Blythe-32 con't
16 people -- you are going to have to close it off because
17 people are going to go in there. I don't see how. One of
18 the problems I see, you habitat. What do you do? You close
19 it off because you don't want people to enter that.
20 MR. HARRIS: That's not the river access or
21 anything like that.
22 MR. HERNANDEZ: It's a natural resource.
23 MR. HARRIS: Any natural resource, but when
24 you start getting people in there -- You don't need people
25 in there to start. It's like fire protection along the

1 river. If the habitat is at a particular stage where you
2 may need to close it during the breeding season for the
3 willow flycatcher. That's done all ready on the river in
4 places where the habitat's suitable and the birds are
5 nesting.
6 That's done already, but, you know, that's a very
7 small amount of the riparian habitat along the Lower
8 Colorado River. You know, other times of year you might be
9 able to go in as a bird watcher and look at these birds,
10 but...
11 MR. VANDERHORST: As I understand your
12 comment, the concern is that the program not interfere with
13 reasonable access based on the reasonable use you are making
14 of the river now.
15 MR. HERNANDEZ: Right.
16 MR. VANDERHORST: So if you have a point
17 where you are putting a boat in your river, we are not going
18 to make that point or if you have a point you fish on that
19 river, we are not going to keep you out of that place.
20 MR. HERNANDEZ: Right. The other question I Blythe-33
21 have, I have seen some of these programs, nature programs of
22 balance. We tend to -- we tend to unbalance. We changed
23 the food chain.
24 In other words, you get other creatures come in.
25 You have a -- If the chain is different than before. What

1 do you do when you increase this other fish or whatever? I
2 don't know. I'm not too familiar with the fish and game.
3 But what happens when you -- instead of when you try to get
4 this fish so now you increase the food chain to some other
5 animal and that increases and how do you control that
6 population from increasing because you increase the food
7 chain? You know, you change the balance of nature, what
8 nature has done.

Blythe-33 con't

9 MR. VANDERHORST: Okay. So that would be a
10 concern about --
11 MR. HERNANDEZ: Well, what I am saying -- I'm
12 trying to say -- you are changing the balance. Nature tends
13 to balance itself out.

Blythe-33 con't

14 MR. VANDERHORST: Okay.
15 MR. HERNANDEZ: What you did, you are
16 increasing this specific species which somebody's feeding
17 off of that species.

Blythe-33 con't

18 MR. VANDERHORST: Right.
19 MR. HERNANDEZ: So now you tend to increase
20 what they are feeding off of; that food they are feeding
21 off, that increases the population so you have a bigger food
22 chain. You go up the chain of food and so you are
23 increasing everything else.

Blythe-33 con't

24 MR. VANDERHORST: There's a section in the
25 Environmental Impact Statement document which discusses the

1 impact of the program on -- by California resources which
2 includes that concept, and so you may want to take a look at
3 that --
4 MR. HERNANDEZ: Okay.
5 MR. VANDERHORST: -- and supplement with a
6 written comment on specific concerns you have.
7 MR. HERNANDEZ: Okay.
8 (One hand raised.)
9 MR. VANDERHORST: Yes.
10 MR. NELSON: Les Nelson. Earlier you said Blythe-34
11 that this document would be subject to the NECO process. Is
12 it also subject to CEQA?
13 MR. VANDERHORST: The process we are going
14 through is the CEQA as well as a federal NECO process.
15 (One hand raised.)
16 MR. VANDERHORST: Yes, sir.
17 MR. OCHS: My name is Edward Ochs, O-c-h-s. Blythe-35
18 I'm regurgitating, trying to get an understanding of what
19 you are doing, Metropolitan Water District.
20 Basically what you are telling us; they authorized
21 the water to start pumping out to California aqueducts; that
22 it is legally required by you guys to do this in order to
23 maintain fines or whatever you need to meet for your
24 compliance for changing the environment trying to bring it
25 back into prospective to save what you have already taken is

1 what I am getting out of this. To bring you back into
2 compliance because pumping for the California aqueduct has
3 impacted the environment; therefore, we are going to try to
4 recoup and bring it back to what it should be?

Blythe-35 con't

5 MR. VANDERHORST: This isn't a -- to
6 restore.
7 MR. OCHS: Not to restore, but the
8 environment impact; fish, the wildlife, the other things
9 have been affected from pumping water. I hear, rather than
10 being fined, you, as Metropolitan -- my dad works for
11 METROPOLITAN Water District. I'm not -- but what is
12 happening here, we are trying to recoup what's been taken
13 out; therefore, you don't get fined, Metropolitan.

Blythe-35 con't

14 MS. FITZPATRICK: It's not only Metropolitan.
15 It's all --
16 MR. HARRIS: MTA.
17 MS. FITZPATRICK: Takes water.
18 THE COURT REPORTER: I can only take down one
19 person speaking at a time.
20 MR. VANDERHORST: I'm sorry.
21 MS. FITZPATRICK: This program covers all
22 water users in Arizona, Nevada, and California, not just
23 Metropolitan.
24 MR. OCHS: Right. But you are trying to
25 recoup what has been lost. This is what they are going

Blythe-36

about, and they are not essentially changing. The water is depleted anyway. The water has gone down. There is more water pulled out to everybody's source. We are losing water here on the river. The water level has gone down over years and it's -- I've got a dock down there, sits on the ground half the year. I expect less and less the longer I'm here. Eventually, I figure, I'm going TO have an off-road park in my backyard. Blythe-36 con't

MR. VANDERHORST: You will want to read the studies of hydrology. It will discuss how the program anticipates changes in the river flows. So you can take a look at that.

MR. HULL: Charles Hull again. The comments about water from the Lower Colorado River to any of the three states or any user. It's a gross amount of 1.574 million acre feet. Blythe-37

MR. HARRIS: This was the first case. We use the maximum amount that could conceivably be transferred targeting the points of diversion between the three states.

MR. HULL: That occurred in the past, recently?

MR. HARRIS: No. No. This is the wish list, if you would.

MR. HULL: Right.

MR. HARRIS: Transfer and move water around.

1 What is the maximum amount because we felt we really needed
2 to look at the impacts at the upper threshold, not in
3 minimum amount.
4 MR. HULL: Right. And that's the point I'm
5 going to is that any diversions that have occurred; i.e.,
6 the San Diego, MWB, PVID, those are on an existing
7 threshold.
8 MR. HARRIS: They are within that package.
9 MR. HULL: Within that total?
10 MR. HARRIS: That's right.
11 MR. HULL: They are within that total.
12 MR. HARRIS: We start from zero --
13 MR. VANDERHORST: This is what happens when
14 you ask detailed questions.
15 MR. HULL: This is important here locally.
16 200 -- that two hundred thousand three hundred and
17 thirty-one thousand that's leaving here or going to leave
18 here in the very near future.
19 MR. NELSON: That is a critical question and Blythe-38
20 to understand it and we need to know. Is the 1.5 worse case
21 scenario? This puts the planned documents in place. This
22 allows for the incidental takes. This is in large measure
23 being done through the Endangered Species Act 1973. This is
24 30 years later.
25 So that's part of it really to facilitate

Blythe-38 con't

1 something in the future and what part of what that is in the
2 future, our future water diversion, and I would like to know
3 if the future water diversion, if it's 1.5, does that
4 include the diversions that are already in place or is that
5 1.5 a new number on top of the diversion already existing?
6 That's an important question.
7 MR. HULL: Thank you, Les.
8 MR. VANDERHORST: Let me try to address that
9 then.
10 The California agencies already have an incidental
11 take permit for four hundred thousand acre feet of water in
12 transfers based on the interim surplus criteria. This is a
13 problem when you start asking these detailed questions.
14 MR. HULL: Can you refer to us a chapter so
15 we can look that up?
16 MR. VANDERHORST: We have a combined federal
17 and non-federal process. Federal agencies, they have to be
18 in compliance with the Endangered Species Act. Under
19 Section 7 of that Act, what that requires is that any agency
20 that's going to take an action that has an impact on an
21 endangered species has to consult with the Fish and Wildlife
22 Service before it does that.
23 The Bureau of Reclamation has already consulted
24 with the Fish and Wildlife Service on several actions that
25 affect the river including interim surplus water where they

1 audited through 2016 as well as the transfer of four hundred
2 thousand acre feet of water in California.
3 MR. NELSON: Colorado River water.
4 MR. VANDERHORST: Yes, Colorado River water.
5 That was to cover California transfers that were part of
6 quantification settlement agreement. That Endangered
7 Species Act compliance is in place. What the non-federal
8 agencies are now doing, all the water agencies, PVID,
9 Metropolitan Valley, Metropolitan, we are now applying for
10 our own Endangered Species Act permit under Section 10-A --
11 different section of the Act that applies to non-federal
12 agencies because we don't have a permit for that four
13 hundred thousand acre feet. It was covered under Section
14 10. We asked to include it in our Section 10 permit, and so
15 it is covered in the document for the non-federal agencies,
16 and that's part of the entire 1.574 million acre feet.
17 The -- I forgot what I was going to say. The
18 federal action that's covered by this program is only 1.17
19 million acre in transfers.
20 MR. NELSON: The 1-5 is inclusive?
21 MR. VANDERHORST: Inclusive of the four
22 hundred thousand was approved by the National Fish and
23 Wildlife.
24 MR. HARRIS: Under Section 10.
25 MR. NELSON: Thank you.

1 MR. HULL: What chapter would that be, Chris?
2 MR. HARRIS: If you look at Chapter 2 of the
3 Habitat Conservation Plan.
4 MS. FITZPATRICK: Volume 2.
5 MR. VANDERHORST: Volume 2 of the set that
6 states all of the actions in each of the states that's
7 reserving coverage.
8 MS. FITZPATRICK: That chapter is covered
9 called description of covered activities and it describes
10 them state by state; California, Arizona -- California and
11 Nevada and I'm not sure the equivalent chapter in the
12 federal document. It's also Chapter 2.
13 MR. HULL: Thank you.
14 MS. JACOE: What is the title of the federal
15 document?
16 MR. VANDERHORST: It would be -- I think it's
17 called a Biological Assessment, Volume 3 of the 4 volumes.
18 Further comments?
19 (No response.)
20 MR. VANDERHORST: Okay. Thank you very much
21 for your interest. We really appreciate you coming out
22 tonight. We appreciate interest in the program; and again,
23 we encourage future additional written comments be
24 submitted.
25 Thank you again. Good night.

1 (The public meeting was adjourned at
2 7:54 p.m.)
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1 CERTIFICATE OF REPORTER

2 State of Arizona)
)
3 County of Mohave)

4

5 I, Juliette L. Vidaurri, CCR, RPR, do hereby
6 certify that I took down in shorthand (Stenotype) all of the
7 proceedings had in the above-entitled matter at the time and
8 place indicated, and that thereafter said shorthand notes
9 were transcribed into typewriting at and under my direction
10 and supervision, and the foregoing transcript constitutes a
11 full, true, and accurate record of the proceedings had.
12 In witness whereof, I have hereunto affixed my
13 hand the 30th day of August, 2004.

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24 _____
Juliette L. Vidaurri, CCR, RPR
25 AZ CCR #50359/CA CCR #11081/NV CCR #748

TRI-STATE REPORTING, 34 SCOTT DRIVE, LAKE HAVASU,AZ 928-855-1366

LOWER COLORADO RIVER

MULTI-SPECIES CONSERVATION PROGRAM

PUBLIC HEARING

PHOENIX, ARIZONA

JULY 22, 2004

H.E.O. REPORTING, INC.

Prepared by:

P.O. BOX 1694

Hilda E. Olivo, RPR

Phoenix, Arizona 85001

Certified Court Reporter #50449

(480) 814-0849

1 A P P E A R A N C E S

2

3 Joseph Vanderhorst, Hearing Officer

4 Christopher S. Harris

5 Patti Aaron

6 William E. Werner

7 Perri Benemens

8 Tom Buschatzke

9 Robert S. Lynch

10 Carol Young

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1 MR. JOSEPH VANDERHORST: Good evening. Welcome
2 to the public hearing on the Local Colorado River
3 Multi-species Conservation Program. The program is a
4 combined federal, state and local effort to provide
5 compliance with the Endangered Species Act for operations
6 related to the Lower Colorado River, and it includes
7 agencies, the Federal government, state agencies and local
8 agencies from the states of Nevada, Arizona and
9 California.
10 My name is Joseph Vanderhorst. I am with the
11 Metropolitan Water District of Southern California, and I
12 am here on behalf of Metropolitan as the lead agency for
13 compliance for the California Environmental Quality Act,
14 which requires environmental review with projects
15 undertaken by California agencies, and Metropolitan is one
16 of the California agencies that is participating in the
17 development and implementation of the Habitat Conservation
18 Plan that is part of the Multi-species Conservation
19 Program.
20 Also involved in the development of the
21 environmental review documents, which is the purpose of
22 our meeting here tonight, is the United States Fish and
23 Wildlife Service. They are the joint lead agency for
24 compliance with the National Environmental Policy Act, and
25 their action for which they are performing an

1 environmental review. Under that act is the issuance of
2 incidental take permits for the Habitat Conservation Plan.
3 Also co-lead agency from the Federal government
4 is U.S. Bureau of Reclamation. The Bureau is not only
5 helping in the development of the Multi-species
6 Conservation Program, but will also be the implementing
7 agency when and if the program is approved.
8 The purpose of today's meeting is to accept
9 public comments on the environmental documents that are
10 out for public review at this time. We have a draft
11 Environmental Impact Statement, Environmental Impact
12 Report that is a joint document issued pursuant to the
13 California Environmental Quality Act and the National
14 Environmental Policy Act, and we're here tonight to
15 receive comments from the public on that document. It is
16 also supported by the Habitat Conservation Plan and the
17 Biological Assessment issued by the Bureau of Reclamation.
18 The process that we're going to follow tonight is
19 to begin with a presentation giving a general outline of
20 the program, and Mr. Chris Harris of the Colorado River
21 Board of California will be making that presentation. At
22 the end of that, then we will open the floor up for public
23 comments.
24 You have the opportunity tonight to give us
25 verbal comments and those will be taken down by a

1 shorthand reporter so they can be considered in finalizing
2 the environmental review documents, but you also have the
3 opportunity to provide written comments and the -- there
4 is a form on the table at the back of the room which can
5 be used for that purpose. You can leave that form with us
6 tonight. And in the alternative, you can prepare
7 separate written comments and mail those in, and the
8 address is also on the back table for anyone who wants to
9 submit written comments.
10 We would ask that everyone who is here tonight
11 please sign in on the sign-up sheet so that we have a
12 record of your attendance, and when you do make your
13 comments, if you will begin by stating your name and
14 spelling it for the shorthand reporter and giving us your
15 address, and then we would ask that you speak slowly and
16 clearly so that we get the testimony down correctly, and
17 we would also impose a five-minute limit on everyone who
18 is providing public comments tonight so that we can get
19 through the many comments we have in the short time
20 allowed.
21 If you do have additional comments that you can't
22 submit in the five minutes, we encourage you to submit
23 those additional comments in writing.
24 Without further ado, Mr. Harris, will you provide
25 your presentation?

1 (Mr. Harris' presentation was not taken down by the
2 Court Reporter.)
3 MR. JOSEPH VANDERHORST: With that we will open
4 the public hearing for comment at this time, and so you
5 may either rise at your chair or we do have a microphone
6 in the middle aisle there. Feel free to step up and
7 provide comments.
8 MR. WERNER: Thank you, Mr. Vanderhorst. I have
9 a statement I am going to repeat. While I presented it
10 last night, I will present it again.
11 MR. JOSEPH VANDERHORST: Would you mind stating
12 your name and spelling it for the record, please.
13 MR. WERNER: William E. Werner, W E R N E R,
14 representing the State of Arizona Department of Water
15 Resources, 500 North 3rd Street, Phoenix, Arizona.
16 The Arizona Department of Water Resources has
17 been involved in development of the Lower Colorado River
18 Multi-species Conservation Program since 1994 when the
19 department joined with sister agencies in California and
20 Nevada in funding a feasibility assessment of options for
21 proactively dealing with endangered species management
22 issues related to Colorado River operation and
23 maintenance. Following the feasibility study the group
24 initiated an effort to develop and implement a feasible
25 Multi-species Conservation Program management program.

1 There is three bullets here:
2 Accommodates current water diversions and power
3 production and optimizes future water and power
4 development opportunities.
5 Second, works towards the conservation of habitat
6 and toward recovery of the species.
7 Three, reduces the likelihood of additional
8 threatened and endangered species listing.
9 Today we have before us the Lower Colorado River
10 Multi-species Conservation Program Draft Programmatic
11 Environmental Impact Statement and Environmental Impact
12 Report and associated documents that describe such a
13 program and the effects of implementation of the program.
14 The Colorado River is clearly an important asset
15 to the State of Arizona, and many of the State's citizens
16 benefit from water, power and recreational resources of
17 the river. Within the State the director of the
18 Department of Water Resources is authorized for and on
19 behalf of the State of Arizona to consult, advise and
20 cooperate with the Secretary of the Interior of the United
21 States in respect to the exercise of the authority of the
22 Secretary of the Interior of any authority relative to the
23 water of the Colorado River.
24 The Department believes that implementation of Phoenix-1
25 conservation measures as described in Alternative 1 and

1 issuance of a Section 10 (a) (1) (b) permit to the Phoenix-1 con't
2 non-federal applicants meets the objectives identified
3 previously. A coordinated, comprehensive, habitat and
4 species conservation strategy best meets those objectives
5 over the long-term, thus maintaining current water
6 diversions and power production and future water and power
7 development opportunities.
8 In addition, Alternative 4 focusing on off river Phoenix-2
9 habitat conservation measures merits careful
10 consideration. Conservation areas described in
11 Alternative 4 could be used in conjunction with on river
12 areas described in Alternative 1 resulting in blend of the
13 two.
14 In summary, the Arizona Department of Water Phoenix-3
15 Resources supports implementation of a proactive
16 coordinated comprehensive habitat and species conservation
17 strategy as described in the draft EIS. The Department
18 looks forward to a continuing positive relationship with
19 all sister states, agencies, political subdivisions,
20 federal agencies, Indian tribes, environmental groups, and
21 other interested parties as this program develops. Thank
22 you.
23 MR. JOSEPH VANDERHORST: Thank you, Mr. Werner.
24 Any other public comments at this time?
25 MR. LYNCH: I guess I am in -- I am it

Phoenix-4

1 Robert S. Lynch, Robert S. Lynch and Associates, 340 East
2 Palm Lane, Suite 140, Phoenix, Arizona, 85004. I
3 obviously am an attorney. Several of the things about
4 this -- I think to start with in terms of the scope of the
5 exercise, I am concerned with reaches one and seven, reach
6 seven being the area below Morelos Dam. We have a Ninth
7 Circuit opinion that says that the Bureau of Reclamation
8 has no discretion with regard to the operation of Lake
9 Mead in terms of conserving water as a result of a dispute
10 over the forest area in the marsh area at the upper end of
11 the lake and an endangered bird. If that is true, and
12 there is no discretion in the operating of the lake, then
13 there is no jurisdiction under the Endangered Species Act.
14 We have a District Court decision from the
15 District of Columbia saying that the Bureau of Reclamation
16 has no discretion in terms of releasing water to satisfy
17 the Mexican Water Treaty. If that is true, then there is
18 no jurisdiction in the Endangered Species Act below
19 Morelos because the actions of the Bureau are
20 nondiscretionary. In those two instances there is nobody
21 else to blame because the operations are totally
22 controlled by the federal agency, and any possible
23 participation by a nonfederal interest has nothing to do
24 with their actions. So I believe that the alternative in
25 the EIS is an improperly large area, which means maybe if

1 you're going to spend $610 million you might be able to
2 expend it more effectively on the shorter area of the
3 river.

Phoenix-4 con't

4 There is also no Section 10 (a) (1) (a) voluntary
5 permit as part of any of these alternatives. It is
6 clearly authorized under these circumstances and could be
7 and should be considered as part of the scheme for
8 developing the program. I don't believe that it would be
9 particularly difficult to modify Alternative 1 to include
10 possibility of a 10 (a) (1) (a) permit, and I don't
11 believe that the analysis -- environmental analysis of
12 what will be done -- will be changed at all. It's the
13 matter of which type of permit for the Fish and Wildlife
14 Service to issue.

Phoenix-5

15 There really isn't a no action alternative for
16 this EIS. I know the law says that you're supposed to
17 have one. I know what the law says, but the alternative
18 is for Reclamation to initiate reconsultation under
19 Section 7. The true no action alternative is for somebody
20 who gets sued under Section 9 go to jail. I don't think
21 it's realistic to put that in an Environmental Impact
22 Statement, and I doubt you'd get any volunteers, but there
23 it is. The no action alternative described here is that
24 the Bureau of Reclamation enter into a Lower Colorado
25 River Multi-Species Conservation Program Programmatic

Phoenix-6

1 consultation with the Fish and Wildlife Service in Phoenix-6 con't
2 anticipation of updating the current biological opinion.
3 I also am not sure where we are at all on this. Phoenix-7
4 There was a meeting here in Phoenix last week, which I
5 unfortunately was not able to attend but my associate was,
6 and it was reported to me by him and several other sources
7 that the federal agency notified Arizona and that the
8 current offer to the Federal government of a 10-year
9 program followed by a 50-year program was going to be
10 rejected. Now, if that's true, what does that do to
11 Alternative 1? If in fact the Fish and Wildlife Service
12 is going to tell the nonfederal sponsors that the offer,
13 if you will, on the table is unacceptable, what does that
14 do to the 10 (a) (1) (b) application before the Secretary
15 and the Director of the Fish and Wildlife Service? I
16 don't know the answer to that, but it certainly seems to
17 add a complicating factor to this whole process that needs
18 to be evaluated.
19 There is also another complicating factor that Phoenix-8
20 was discussed briefly at this meeting last Thursday.
21 Apparently the Attorney General of Arizona is interested
22 in examining title to lands on the Arizona side of the
23 Colorado River with regard to whether there are additional
24 lands that could be claimed by the State under the Equal
25 Footing Doctrine. This was news to me, but if that is

1 true, then the process of identifying and acquiring lands
2 or permission to use lands for environmental mitigation
3 could be impacted by that activity, and that process needs
4 to be evaluated as well. So I think you've got some work
5 to do on redefining Alternative 1. Whether that might
6 require under the law that you renotice the draft EIS,
7 whether there is significant change or not, I am not
8 prepared to say. It may or may not. Certainly by adding
9 a voluntary permit as a possible tool, I don't see how
10 that could, but some of these other things may end up
11 giving you more problems in terms of their environmental
12 significance.

Phoenix-8 con't

13 In any event, those are my oral comments, and I
14 will submit written comments by the 18th day. Thank you.
15 MR. JOSEPH VANDERHORST: Thank you, Mr. Lynch.
16 Are there any other public comments?
17 MR. BUSCHATZKE: Paul Buschatzke, B U S C H -
18 A T Z K E. I am the water advisor for the City of
19 Phoenix. I wanted to applaud the MSCP program. I think
20 you've put together a robust comprehensive program. I
21 also think that you've opened up the door to a really good
22 process by combining Section 7 and 10 with the Bureau. I
23 think that will be a wave of the future for all of us to
24 take advantage of, and we support the preferred
25 alternative. Thanks.

Phoenix-9

1 MR. JOSEPH VANDERHORST: Thank you,
2 Mr. Buschatzke.
3 Are there any other public comments?
4 I want to thank you all very much for attending.
5 We appreciate your interest in our program, and from here
6 we will take the public comments that have been submitted
7 along with written public comments, and we will be
8 reviewing and revising the documents in accordance with
9 our consideration of those comments. Thank you, and good
10 evening.
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12 (Whereupon, the public hearing ended at 7:00 o'clock p.m.)
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Section V

Responses to Comments

FEDERAL AGENCIES

Comment Responses

U.S. Environmental Protection Agency (EPA), August 19, 2004

EPA-1 Comment noted.

EPA-2 Responses to the detailed comments addressing the issues raised are provided below.

EPA-3a The Department of the Interior (DOI) recognizes EPA's interest in addressing a planning area that addresses "the entire Colorado River ecosystem." It is appropriate to address areas within the Colorado River Basin in distinct, yet complementary programs as Congress has previously directed. For example, the Upper Colorado and San Juan River Basins Endangered Fish Recovery Programs operate within the Colorado River Basin states of Colorado, Utah, New Mexico, and Wyoming (see Pub. L. No. 106-392, 114 Stat. 1602, Oct. 30, 2000). Likewise, the Glen Canyon Dam Adaptive Management Program addresses areas within the Colorado River Basin in the Grand Canyon National Park and Glen Canyon National Recreation Area pursuant to the Grand Canyon Protection Act of 1992 (see Pub. L. No. 102-575, 106 Stat. 4600, Tit. XVIII, Oct. 30, 1992). The Lower Colorado River Multi-Species Conservation Plan (LCR MSCP) is designed to address operations of facilities authorized by the Boulder Canyon Project Act of 1928 and other related downstream activities.

Establishing a single program for the entire "Colorado River ecosystem," that includes over 244,000 square miles (nearly one-twelfth of the nation), seven U.S. states and two nations, would go far beyond the purpose and need and scope of the program evaluated in the LCR MSCP Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

The geographic scope of the LCR MSCP is consistent with past consultations undertaken by Reclamation on the lower Colorado River (LCR) and was established to encompass the portion of the Colorado River and its floodplain up to the full pool elevation of Lake Mead and areas downstream within the United States, within which the LCR MSCP non-Federal and Federal covered activities (LCR MSCP Habitat Conservation Plan [HCP] Chapter 2 and LCR MSCP Biological Assessment [BA] Chapter 2, respectively) would be implemented. Implementation of the conservation measures within the LCR MSCP planning area would effectively conserve and restore habitat, thereby contributing to the conservation of the covered species. The conservation measures would also complement existing Endangered Species Act (ESA) activities underway elsewhere in the Colorado River Basin, including those referenced above.

EPA-3b As described in section 5.11 of the HCP, the LCR MSCP is committed to coordinating LCR MSCP implementation with other ongoing and any future recovery implementation and habitat conservation programs within the Colorado River watershed.

EPA-4 A copy of the Final EIS/EIR will be provided to this address.

EPA-5 As noted in section 3.3.2.1 of the Final EIS/EIR, the lead agencies would ensure that the proposed action complies with all applicable air quality regulations, including those related to reducing emissions from fugitive dust and open burns. Mitigation measures that are consistent with these regulations are presented in section 3.3.2.1 and have been developed to reduce the air quality impacts from implementing the Conservation Plan. Because site-specific analysis and air quality emissions calculations for any specific implementing action under the LCR MSCP cannot be accurately predicted at this time, a conservative determination was made that even with implementation of feasible mitigation measures, residual air quality impacts could result. Thus, air quality thresholds may be exceeded, even with the implementation of mitigation measures. Any air emissions resulting from development of the conservation areas would, however, be short term. As noted in section 3.3.2.1 of the Final EIS/EIR, in the long term, it is anticipated the level of operation and maintenance activities producing air emissions would be less for restored habitats than would normally occur on sites used for cultivated agriculture. Therefore, to the extent that agricultural lands are used as conservation sites, it is anticipated that there would be a corresponding reduction in long-term air emissions (e.g., fugitive dust and combustion emissions).

Section 3.3.2.1 of the Final EIS/EIR has been revised to clarify why the proposed action would not conflict with or obstruct implementation of applicable air quality attainment plans.

EPA-6 Sections 3.3.1 and 3.3.2 of the Final EIS/EIR have been revised to include the requested information.

EPA-7 Research on selenium levels in the LCR Basin indicates that there are no seleniferous soils in the LCR MSCP planning area and that agricultural use of water on soils in the planning area does not contribute to increases in selenium levels as it does in the Upper Colorado River Basin (Garcia-Hernandez, et. al. 2001). There is evidence that backwaters with a direct, physical connection to the river channel have higher levels of selenium than those without such a connection. Research on this topic is ongoing. Monitoring of critical water quality parameters in LCR MSCP created aquatic habitats is a requirement of the LCR MSCP Conservation Plan (Conservation Plan). Section 3.9.2.1 of the Final EIS/EIR has been revised to clarify the assessment of potential effects of selenium associated with creation of aquatic habitats.

EPA-8 The LCR MSCP documents have assumed the use of Colorado River water for implementation of the Conservation Plan in order to fully evaluate the potential for effects within the planning area. It was reasonable for the Draft EIS/EIR documents to assume the use of Colorado River water for a number of reasons, including proximity of likely conservation sites to the Colorado River, the available normal-year water supply of 7.5 million acre-feet (maf), the presence of four National Wildlife Refuges with decreed water rights within the planning area, among other factors. Information on the effects of water use for habitat

creation and maintenance is contained in section 3.9.2.1 of the Final EIS/EIR. Non-Colorado River water supplies (either groundwater or surface water) may also be available to meet the conservation measures of the LCR MSCP.

The water supplies necessary to create and maintain the appropriate habitat function for the LCR MSCP conservation sites would be managed and utilized by Reclamation in its role as the implementing agency for the LCR MSCP. The water needed for the creation and maintenance of the LCR MSCP conservation measures would be obtained and used consistent with applicable provisions of law and existing entitlements. To the extent there are applicable limitations on the availability of Colorado River water, there are a number of approaches that may be available to provide water necessary for the proposed conservation areas. For example, in prior circumstances, legal agreements have allowed the use of Colorado River supplies as part of an exchange of water from non-Colorado River sources (e.g., Colorado River Water Delivery Agreement, at Ex. B [Oct. 10, 2003] [published at 69 Federal Register (FR) 12202, March 2004]). In this circumstance, while Colorado River water is in fact used for mitigation purposes by exchange, accounting of such water is consistent with applicable laws.

Prior to implementation of specific conservation measures, a site-specific assessment would be conducted to evaluate potential effects, including those related to water supply and water quality. The site selection criteria utilized in identifying the conservation areas selected for restoration require a thorough evaluation of potential sources and adequacy of water supply to meet the biological and ecological goals and objectives. The evaluation of specific sites would include consideration of any acquired water supply.

EPA-9 The Public Involvement Plan has been updated to reflect the conclusions reached in the Final EIS/EIR. Consultation and coordination efforts undertaken for the LCR MSCP are described in sections 1.5 and 7.2 of the Final EIS/EIR and are consistent with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance requirements of each lead agency. A total of eleven public scoping meetings were held in 1999 and 2000 to obtain public input into the scope of the LCR MSCP environmental review process. Three public information meetings were held in 2003 to inform the public on the status of development of the LCR MSCP. Three public hearings were held in 2004 to obtain public comments on the EIS/EIR. All meetings were held in the evening to facilitate participation by members of the public, and they were held in more rural communities, such as Blythe, in addition to urban areas, to obtain input from the varied populations that could be affected by the LCR MSCP. Section 7.2.1 has been amended to note this. All meetings were noticed through news releases to various media, advertised in local newspapers, and on the LCR MSCP website. Senior DOI officials provided interviews to both English and Spanish news media. Additionally, as described in section 7.2.3 of the Final EIS/EIR, a number of meetings were held with Native American tribes in the planning area.

EPA-10 Comment noted.

EPA-11 Section 1.4.2 includes a list of permits and approvals that may be required prior to the implementation of future, site-specific conservation projects. Other actions that would be required are described in detail in Chapter 2 of the Final EIS/EIR. The specific actions that would be required would be dependent upon the individual sites selected and the type of conservation measures that were being implemented.

EPA-12 EPA's comment is noted. However, the participating agencies believe that the HCP, rather than the EIS/EIR, is the most appropriate place to describe the funding assurances regarding implementation of the LCR MSCP. Accordingly, relevant information has been added to the HCP that fully describes the funding assurances.

On August 17, 2004, representatives of the States of Arizona, California, and Nevada submitted formal letters of financial commitment, during the public comment period, to the Secretary of the Interior in which they committed to "share the agreed upon LCR MSCP costs equally with the United States on a 50/50 Federal/non-Federal basis." With final approvals from their respective boards and commissions, they agree to memorialize this commitment "in a manner that meets the Service requirements for firm and clear funding assurances to support implementation of the program." These letters are attached in section II of this volume. The commitments memorialized in these letters have been incorporated into the relevant program agreements as described in the LCR MSCP HCP, and described below.

The estimated cost of the LCR MSCP is $626 million in 2003 dollars over the 50-year term of the program. This cost includes funding for land and water acquisition, habitat creation and management, species-specific conservation measures, protection measures for existing habitat, monitoring and research, and program administration. The funding commitments include increases in the funding support to match the effects of inflation on program costs and ensure full funding over the program's term. The funding would be provided by Federal, state, and local government agencies and entities that would receive incidental take authorizations under sections 7 and 10(a)(1)(B) of the ESA as part of the LCR MSCP.

In the event that program costs exceed the estimated amounts, the Funding Management Agreement (FMA) and Implementation Agreement (IA) address the responsibility for such increased costs. A description of the funding assurances for the LCR MSCP is set forth in Chapter 7 of the HCP. A Draft Final FMA is attached as Exhibit A to the HCP, and a Draft Final IA is attached as Exhibit B to the HCP.

U.S. Section, International Boundary and Water Commission (USIBWC), August 17, 2004

USIBWC-1 USIBWC is implementing reviews of the Lower Colorado River Boundary and Capacity Preservation Project that are independent of the LCR MSCP. Reclamation agrees with USIBWC's suggestion for additional coordination and analysis regarding IBWC's proposed actions for flood flow design and construction activities in the Limitrophe section related to the IBWC Lower Colorado River Boundary and Capacity Preservation Project. Reclamation would continue to participate with USIBWC, the U.S. Army Corps of Engineers, and other appropriate entities on IBWC's proposed action in this regard.

USIBWC-2 It is recognized that USIBWC's independent project actions and project reviews would continue to be undertaken independent from the LCR MSCP.

USIBWC-3 Pursuant to international treaties, the USIBWC's jurisdiction regarding proposed actions within the Limitrophe section is recognized. Nothing in the development or implementation of the LCR MSCP modifies or changes the authority and responsibility of the USIBWC in any manner.

USIBWC-4 Reclamation, on behalf of the LCR MSCP parties, would submit any relevant site-specific construction plans to the USIBWC for input to insure that appropriate analysis of all design aspects of any conservation areas constructed within the Limitrophe section would be conducted by USIBWC prior to implementation.

USIBWC-5 See Response to Comment USIBWC-4.

USIBWC-6 It is recognized that the USIBWC's proposed project (i.e., the Lower Colorado River Boundary and Capacity Preservation Project) may alter groundwater levels in the Limitrophe section. Reclamation, on behalf of the LCR MSCP, would coordinate, as appropriate, with the USIBWC and the State of Arizona regarding the potential use of Colorado River water or groundwater not accounted for as Colorado River water in the Limitrophe section during implementation of the LCR MSCP.

USIBWC-7 The final LCR MSCP document volumes have been revised to use this term consistently.

USIBWC-8 See Response to Comment USIBWC-4.

USIBWC-9 LCR river miles cited in the LCR MSCP documents are the river mile designations used by Reclamation. Reclamation identifies the Northerly International Boundary as being located at River Mile 23.1 (Pacific Southwest Interagency Committee 1976).

USIBWC-10 See Response to Comment USIBWC-7.

USIBWC-11 The text has been modified as suggested.

USIBWC-12 The text has been modified as suggested.

USIBWC-13 The text has been modified as suggested.

USIBWC-14 The text has been modified as suggested.

USIBWC-15 The text has been modified as suggested.

USIBWC-16 The text has been modified as suggested.

USIBWC-17 The text has been modified as suggested.

USIBWC-18 The text has been modified as suggested.

USIBWC-19 The text has been modified as suggested.

USIBWC-20 The text has been modified as suggested.

USIBWC-21 See Response to Comment USIBWC-9.

USIBWC-22 The text has been modified as suggested.

USIBWC-23 The extent of land cover types described for Reach 7, including woody riparian vegetation, is only for the portion of the LCR and its floodplain within the United States.

USIBWC-24 Comment noted. The reference was not intended to identify a particular maximum pre-dam peak flow, but is a generic reference to conditions that predate construction of Hoover Dam.

USIBWC-25 The final LCR MSCP document volumes have been revised to use this term consistently.

USIBWC-26 Reclamation identifies the Northerly International Boundary as being located at River Mile 23.1 and Morelos Diversion Dam at River Mile 22.1. The BA has been revised to indicate that Morelos Diversion Dam is located 1.0 mile from the Northerly International Boundary (Pacific Southwest Interagency Committee 1976).

USIBWC-27 The final LCR MSCP document volumes have been revised to use this term consistently.

USIBWC-28 The text has been modified as suggested.

USIBWC-29 The flow capacity of 18,000 cubic feet per second (cfs) is the estimated maximum flow that could be passed in the river channel without encroachment into the Main Outlet Drain Extension (MODE).

USIBWC-30 The Colorado River Flood Protection Act of 1986 required the Secretary of the Interior, in relevant part, to "define the specific boundaries of the Colorado River Floodway so that the floodway can accommodate either a one-in-one hundred year river flow consisting of controlled releases and tributary inflow, or a flow of forty-thousand cfs, whichever is greater, from below Davis Dam to the Southerly International Boundary between the United States and the Republic of Mexico." See Sec 5 (Pub.L. No. 99-450).

USIBWC-31 The text has been revised to clarify that maintenance of the existing minimum flow capacities of the Colorado River channel refers to maintaining the existing flow capacities of the channel itself (i.e., bank to bank).

USIBWC-32 The text has been revised to clarify that current levee capacity refers to the current estimated capacity of the levees (given vegetation growth), not the original design capacity.

USIBWC-33 Draft BA Table 2-25 (Table 2-28 in the Final BA) has been modified to define the column 4 and 5 headings. The heading in column 5 ("levee to levee") refers to the currently estimated capacity of the levees, not the original design capacity. The heading "Floodway Boundary" refers to the estimated capacity within the boundaries established under the Colorado River Flood Protection Act of 1986 (see Response to Comment USIBWC-30). Studies conducted and published in 1989 established the boundaries along the river corridor, given the requirement that within the boundary, a flow of 40,000 cfs or the flow associated with the 100-year river flow (whichever was greater) can be accommodated (USBR 1989).

USIBWC-34 This comment is noted. The data provided in the table is for informational purposes only.

USIBWC-35 The text has been modified as suggested.

USIBWC-36 The text has been modified as suggested.

USIBWC-37 The text has been modified to reference "Minute No. 197 of the 1944 Water Treaty."

USIBWC-38 The information referenced was intended to refer to bank-to-bank capacity.

USIBWC-39 The text has been modified as suggested.

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STATE AGENCIES

Comment Responses

Arizona Game and Fish Department (AGFD), August 17, 2004

AGFD-1 Thank you for your support of the LCR MSCP.

AGFD-2 Comment noted.

AGFD-3 Your comment is noted. The impacts of Alternatives 1 and 4 are analyzed coequally in the EIS/EIR.

AGFD-4 Responses to the detailed comments are provided below.

AGFD-5 The LCR MSCP Conservation Plan (HCP Chapter 5) seeks to establish native land cover types that provide habitats for covered species that approximate the habitats historically present along the LCR. Consequently, the Conservation Plan identifies an initial approach for creating and managing native cottonwood-willow, honey mesquite, marsh, and backwater land cover types that were historically present along the LCR in a manner that provide the elements of covered species habitats based on the best available information. The LCR MSCP recognizes that there are many information gaps (e.g., covered species habitat requirements, habitat restoration technologies) that create uncertainties regarding the successful creation and management of covered species habitats. Consequently, the LCR MSCP includes a substantial monitoring and research program (see HCP section 5.11) designed, in part, to collect information necessary to assess the effectiveness of land cover type creation and management methods in establishing functional covered species habitat. The LCR MSCP also includes an adaptive management process (HCP section 5.12) that allow for adjustments, as supported by monitoring and research results, in the design and management of created habitats to improve the habitat functions of created land cover types. Such changes, if appropriate and approved by the Service (see HCP section 5.12), could include management of non-native vegetation (e.g., saltcedar) to provide habitat for covered species.

AGFD-6 As described in the Changed Circumstances and Remedial Measures section of the Draft HCP (HCP section 5.12.3), it is possible that during periods of water supply shortage, some of the restored habitat parcels could be negatively affected through loss of habitat function, or in the worst case, a total loss of the habitat. This partial or total catastrophic loss is similar to the situation that could occur as a result of wildfire. Should this occur, the LCR MSCP participants would ensure that the lost or non-functioning habitat was restored as soon as practicably possible.

Additionally, it should be pointed out that acquiring the necessary water supplies to establish the 8,132 acres of restored habitat is one of the critical functions of Reclamation and the Program Manager and staff. First, the conservation area site selection criteria (described in HCP section 5.5.1) are intended to be utilized to aid in identification of sites that contain the following characteristics: (1) are biologically or ecologically important; (2) contain suitable

site conditions; (3) contain requisite infrastructure; (4) have feasible land acquisition mechanisms (e.g., leasing or purchase); (5) and are associated with an adequate and assured water supply, or feasible mechanisms are available to acquire water and transfer it to the restored site. Consequently, the availability of an assured water supply is an inherent part of the process for selecting the sites for conservation measures to be implemented.

See also Response to Comment EPA-8.

AGFD-7 HCP section 5.7.23 has been revised to indicate that the LCR MSCP implementation of relict leopard frog conservation measures will be coordinated with the Relict Leopard Frog Conservation Team to the extent that such coordination is consistent with the LCR MSCP Conservation Plan goals and objectives.

AGFD-8 Comment noted.

AGFD-9 HCP section 2.4.2 has been revised to clarify this covered activity. The LCR MSCP covers and mitigates for changes to inflows into Lake Mead (i.e., inflows discharging within the high pool elevation of Lake Mead) from the Virgin River and Muddy River that could be caused by potential future projects implemented outside of the LCR MSCP planning area along these two rivers. The LCR MSCP does not cover the effects to the Virgin River and Muddy River from potential future projects outside of the planning area. Such potential future projects would need to provide environmental documentation and obtain all applicable permits independent of the LCR MSCP.

AGFD-10 The text has been modified as suggested.

AGFD-11 The text has been modified as suggested.

AGFD-12 The text has been modified to address this comment.

AGFD-13 The text has been modified as suggested.

AGFD-14 The text has been modified as suggested.

AGFD-15 It is the intent of the LCR MSCP to create habitats in locations and patch sizes that best meet the conservation needs of the covered species and to manage those habitats in a manner that meets species seasonal habitat requirements, within the constraints associated with land acquisition (e.g., location of available lands, water availability, suitability of soils for habitat creation). HCP section 5.5.1 has been revised to clarify this intent.

AGFD-16 The text has been modified as suggested.

AGFD-17 The recommended change was not made because the adaptive management plan uses a variety of sources to determine reproductive success along the LCR.

AGFD-18 The text has been modified as suggested.

AGFD-19 See Response to Comment AGFD-5.

AGFD-20 The recommended change was not made because the intent of the referenced design element is to limit the establishment of saltcedar and other nonnative species. Also see Response to Comment AGFD-5.

AGFD-21 See Response to Comment AGFD-6.

AGFD-22 The text has been modified as suggested.

AGFD-23 The text has been modified as suggested.

AGFD-24 The text has been modified and now references section 2.1.1.4.

AGFD-25 The text has been modified as suggested.

AGFD-26 The text has been modified as suggested. 1 part per million (ppm) = 1 milligram per liter (mg/L).

AGFD-27 The text has been modified as suggested.

AGFD-28 The text has been modified as suggested.

AGFD-29 Comment noted.

California Department of Fish and Game (CDFG), August 18, 2004

CDFG-1 The California Department of Fish and Game (CDFG) indicates in their letter that they have previously provided comments on several LCR MSCP-related reports. The reports cited by CDFG are preliminary draft and administrative review documents containing concepts for mitigation or other materials that are not part of the official draft LCR MSCP documents circulated for public review. The LCR MSCP Program partners have evaluated and incorporated, as appropriate, comments received throughout the planning process. The following responses address the comments received on the public review versions of the LCR MSCP documents.

CDFG-2 The proposed action is appropriately defined for the purposes of the EIS/EIR; that is the adoption of a 50-year, $626 million Conservation Plan, and issuance of ESA take authorizations. In order to implement the LCR MSCP, the proposed action has been designed to meet the purpose and need as described in the EIS/EIR. The proposed action has been designed to meet the regulatory requirements of ESA, CEQA, and NEPA.

As discussed in the EIS/EIR, the proposed Federal actions include the issuance of a section 10(a)(1)(B) permit by the Service to non-Federal applicants for incidental take of covered species and the implementation and funding of the

Conservation Plan by Reclamation. For California participants, the EIR provides CEQA compliance for funding and implementation of the Conservation Plan. The EIS/EIR analyzes the potential impacts associated with implementation of the proposed Conservation Plan and alternatives and the potential impact of the incidental take of covered species that the Service is being requested to authorize. Additionally, the EIS/EIR will serve as the basis for future project-specific NEPA and CEQA compliance documents that may be required once individual conservation projects under the LCR MSCP are more fully defined and are proposed to be implemented.

In the development of the LCR MSCP, the Federal and non-Federal participants identified a range of potential actions for which incidental take permits under ESA would be requested. These "covered activities" include current activities and future potential actions and projects that may result in incidental take of the 27 species covered under the LCR MSCP. Based on this listing of "covered activities," an impact assessment was prepared and the Conservation Plan developed. The EIS/EIR is not intended to provide project-specific NEPA/CEQA compliance for these underlying "covered activities." Approval of the LCR MSCP and implementation of the proposed Conservation Plan would not constitute NEPA or CEQA compliance for any future "covered activity." This approach is consistent with the approach used in many regional HCP/Natural Community Conservation Plans (NCCPs) where ESA compliance is provided for categories of future activities. For example, the Final EIS/EIR for the recently approved Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (Riverside County Integrated Project 2003a) analyzes the impact of the take of covered species that will result from development projects within the county's 1,966 square-mile plan area, but does not constitute NEPA or CEQA compliance for the future development projects.

CDFG-3 Section 1.2 describes the purpose and the need for the project and as such summarizes the covered activities evaluated in the HCP and BA. The detailed descriptions of the Federal and non-Federal activities are provided in Chapter 2 of the BA and Chapter 2 of the HCP, respectively. Also see Response to Comment CDFG-2.

CDFG-4 See Responses to Comments CDFG-2 and CDFG-3.

CDFG-5 The LCR MSCP is intended to provide ESA incidental take coverage for covered activities for agencies within the states of Arizona and Nevada, along with covered activities of participating Federal entities (which include implementation of the Conservation Plan). These aspects of the program are not subject to the California permitting provisions referenced in the comment.

The LCR MSCP also is intended to provide ESA incidental take coverage for covered activities for agencies within the state of California. California participating entities will evaluate their obligations under California law and will comply with those laws as applicable. The California parties concur with the

statement that CDFG must comply with CEQA for its actions related to the LCR MSCP.

CDFG-6 See Response to Comment CDFG-5.

CDFG-7 NEPA and CEQA require that an EIS or EIR, respectively, analyze the impacts of a Federal or State agencies' proposed action and alternatives *to the action*. The proposed action is the adoption and implementation of the LCR MSCP Conservation Plan, and an appropriate range of alternatives to the proposed action has been analyzed. As indicated in Response to Comment CDFG-2, the EIS/EIR is not intended to provide project-specific NEPA/CEQA compliance for the underlying covered activities. The EIS/EIR, therefore, properly focuses on alternatives to the Conservation Plan, rather than on different strategies for implementing the covered activities. The approach is consistent with numerous other regional HCPs, such as the Western Riverside County, San Diego County, and San Joaquin County HCPs.

CDFG-8a The LCR MSCP participants have reviewed the adequacy of the habitat models that are described in BA section 4.6.2.1 and HCP section 3.5.1.1 in light of CDFG's comment, and have determined that the models are properly used in the analysis of effects of covered activities. The modeling approach is based on two assumptions that result in an overestimation of the extent of, and impacts to, habitat: (1) Each land cover type that is identified with a covered species is assumed to contain the necessary elements to constitute habitat for those species; and (2) A total loss of habitat is assumed regardless of the extent of the impact of covered activities on the habitat. A summary explanation of the modeling approach is included below.

<u>Habitat Modeling</u>

Use of a habitat modeling approach is consistent with the accepted tenets of conservation biology and with the approach used on other approved HCPs and NCCPs (e.g., Western Riverside County MSHCP). This approach to identifying habitat usually involves a two-step process.

The first step in developing habitat models involves a review of the relevant biological literature, particularly focusing on the components that define habitat for the covered species. The component that provides the broadest view of habitat is the vegetation community identified with the species. The vegetation community information includes both the plant species and their physical structure (height of vegetation, structural diversity, and related physical features).

The second step in the habitat modeling process involves refining the general vegetation community information based on the presence of physical elements that define habitat for the covered species. Habitat is biologically defined by physical and biological parameters that are in addition to the basic level vegetation community information. Inclusion of these parameters results in the

elimination of those areas of the vegetation community that do not meet these additional specific criteria. This second step results in a reduction in the area of vegetation communities identified as habitat. However, to implement this second step, extensive field review of the vegetation communities initially identified as potential habitat is required to assess the areas that meet the more specific criteria.

The LCR MSCP modeling approach followed the first step of this process. Existing information relative to vegetation communities within the LCR MSCP planning area was provided by Reclamation through a series of databases constructed using the Anderson and Ohmart (1984) classification system for land cover types and structural divisions. This information is presented in section 4.4 of the BA and section 3.4 of the HCP. The land cover type classifications, with the structural divisions, corresponded well with the vegetation community information used in the habitat models. Biologists from the LCR MSCP, contractors, and participants extracted the basic components of habitat for each species from a literature review. Only those vegetation communities clearly identified as providing quality habitat for the species are included in the final model; however, it was recognized that other vegetation communities might be used at a low level by individuals of the covered species. Biological information used in this analysis is included in Appendix I. An overlay of the habitat model vegetation communities on the land cover type databases provided the acreage of habitat for the covered species in the LCR MSCP planning area. These models were then the subject of the independent peer review process, and were determined suitable for use.

However, the LCR MSCP habitat models do not include the second step in modeling in which the general vegetation community data is overlain with the specific physical components required to qualify as habitat. Rather than undertake the field surveys necessary to make this refinement in the identified areas of habitat, the LCR MSCP assumes that all areas of those vegetation communities utilized by covered species qualify as habitat. The entirety of these areas is included in the effects analysis. These assumptions are used in the development of the LCR MSCP habitat models and the subsequent determination of the extent of species habitat in the LCR MSCP planning area, and thus result in an overestimation of habitat.

<u>Effects Analysis</u>

The assumptions related to groundwater declines used in the LCR MSCP effects analysis also results in an overestimation of the habitat impacts for covered species. The hydrologic modeling shows a maximum drop in groundwater of 1.6 feet that would occur in Reach 4 (Table 5-2 in the Final BA, and Table 4-2 in the Final HCP) as a result of flow-related covered activities. For areas of cottonwood-willow land cover types, the effects analysis assumes that any drop of groundwater levels would result in the complete elimination of the area as habitat. The LCR MSCP effectively assumes that the trees would die and the

value of the habitat for the covered species would be eliminated. The actual effects on existing cottonwood-willow resulting from declines in groundwater depend on two factors: (1) the existing depth to groundwater under each area of the land cover type and (2) the amount of the groundwater decline. The data to refine the extent of cottonwood-willow that would be affected under those factors was not available and would require extensive field surveys to obtain. Furthermore, the drop in groundwater levels would not be likely to completely eliminate the value of this land cover as habitat for all covered species. By assuming that all cottonwood-willow land cover type identified as species habitat would be completely eliminated, the LCR MSCP has again overestimated the acreage of habitat that would be affected by the covered activities.

For the honey mesquite type III land cover identified as covered species habitat, the literature pertaining to the effects on honey mesquite from physical changes in groundwater levels were reviewed (See Response to Comment CDFG-52). The scientific information shows that groundwater declines of the magnitude caused by the LCR MSCP covered activities would not have adverse effects to the vegetation community or the structure of the honey mesquite habitat. Therefore, no losses of habitat related to honey mesquite land cover type were identified, except for one covered species. The exception is the honey mesquite-quailbush association that provides habitat for the MacNeill's sootywing skipper (see Response to Comment CDFG-24). In the habitat model developed for the skipper, the importance of a high groundwater table that provides a dense understory of shrubs and a relatively moist microclimate was identified and used in the habitat modeling process. In this particular case, any decline in groundwater could eliminate that essential microclimate. For that reason, those acres of honey mesquite-quailbush that overlay areas where groundwater levels will decline due to covered activities were assumed to be completely lost as habitat for the skipper. These acres were counted as being lost as habitat in the effects analysis. This assumption ensures that the analysis properly accounts for effects to the skipper.

Review of the scientific literature indicates that declines in groundwater due to LCR MSCP covered activities would not result in the loss of any saltcedar land cover type. However, the effects analysis also took into account the specific habitat information available for the southwestern willow flycatcher. The flycatcher is the only LCR MSCP covered species for which habitat within the planning area has been located and mapped, so that no habitat model was used for this species. The flycatcher is found in both cottonwood-willow and saltcedar areas. However, as with MacNeill's sootywing skipper, the moist soil component is a critical factor in evaluating the effects of groundwater decline on flycatcher habitat. The analysis for cottonwood-willow already assumed that the habitat would be completely lost. The maps for identified flycatcher habitat include areas of saltcedar used by this species. The effects analysis includes these areas of saltcedar that overlay areas where groundwater decline will occur as a result of LCR MSCP covered activities. In this way, areas of saltcedar that support the flycatcher were identified and included in the acreage that could be

affected. Ongoing efforts to identify additional moist-soil areas of saltcedar land cover that may be flycatcher habitat make it likely that the amount of saltcedar land cover types not presently included in flycatcher habitat is not significant. Therefore, the LCR MSCP analysis does not underestimate either the extent or affected area of flycatcher habitat.

Although the LCR MSCP does not address the low level of use of certain land cover types (predominantly saltcedar and mixed saltcedar communities) by covered bird species, the Conservation Plan includes avoidance and minimization measures that reduce the potential for incidental take of individuals of the covered species present in these land cover types. Conservation Measure AMM3 contains provisions to avoid the breeding season of covered bird species when removal of these land cover types is implemented. This reduces the risk to the individuals, which is a key component of the HCP. Effects of implementing flow-related covered activities could include the loss of moist surface soil conditions in patches of saltcedar that may be used by the southwestern willow flycatcher and other covered bird species. As described above, the loss of moist surface soil conditions in saltcedar and mixed-saltcedar stands have been identified as part of the analysis of effects on the flycatcher. Habitat that will be created as mitigation for these effects on the flycatcher will also mitigate for any effects on the loss of these areas on other covered species.

Groundwater Monitoring

The comment also contains a recommendation that a monitoring program be established to track the actual declines in groundwater to ensure that the anticipated level of impacts is not exceeded. The LCR MSCP assessed this concept during the development of the HCP and determined that use of a monitoring program to assess effects to groundwater was less effective than assuming the loss of habitat due to any declines in groundwater levels. The assumptions in the models that provide the groundwater decline information are based on past field reviews on the LCR and are a reasonable predictor of the effects of reduced flows on groundwater. The effects analysis assumed the loss of the covered species habitats that are sensitive to any drop in groundwater. Therefore, the actual amount of groundwater decline is not relevant. Nonetheless, the provisions of the 2001 Biological Opinion (BO) (USFWS 2001) include groundwater monitoring under 372 acres of flycatcher habitat that will occur as part of the LCR MSCP. Information from that monitoring may be useful in refining the groundwater decline model and identifying any unanticipated results.

Conflict Resolution Process

Procedures for resolving conflicts between LCR MSCP participants are included in the governance structure of the program. See the Draft Final FMA attached as Exhibit A to the Final HCP for further details.

CDFG-8b Table 2.1-2 has been revised to clarify the impact analysis presented in HCP Chapter 4 and, as described below, includes the potential extent of effects on covered species habitats of drain and canal maintenance-related covered activities.

The LCR MSCP covered activities include the periodic removal of patches of emergent vegetation from along 244 miles of drains and 313 miles of canals (557 miles total) in the LCR MSCP planning area to maintain flow capacity. It is anticipated that maintenance of canals will only result in removal of a small amount of emergent vegetation over the term of the LCR MSCP and that removal will have no measurable effect on associated covered species because the design of canals generally does not allow for the establishment of emergent vegetation (small patches of vegetation may establish in locations where the canal banks have eroded and before eroded banks are repaired).

Emergent vegetation growing in drains generally occurs as relatively small linear patches that provide low habitat value for associated covered species. The exact extent of emergent vegetation that could be removed is not known because the extent and location of vegetation growing in drains varies each year. Based upon the available information regarding the design of drains and maintenance activities (e.g., bank to bank width of drains, degree of bank slope, degree of soil compaction, and implementation of maintenance activities that preclude the establishment of emergent marsh vegetation), however, it is reasonable to assume that no more than 10 percent of the 244 miles of maintained drains support patches of emergent vegetation and that the average width of patches will not exceed 10 feet. Based on these assumptions, covered activities related to the maintenance of the 244 miles of drains could remove up to 30 acres of emergent marsh vegetation that could provide low value habitat for covered species. The LCR MSCP would create 512 acres of marsh land cover that would be specifically designed and managed to provide high value habitat for associated covered species. This created habitat would mitigate for the impacts of implementing covered activities that would degrade or remove up to 243 of emergent marsh vegetation that provides covered species habitat (i.e., 213 acres of marsh land cover that would be removed by all other covered activities plus 30 acres of emergent vegetation that provides low value habitat that may be removed as a result of maintaining drains).

CDFG-9 LCR MSCP conservation areas would be selected in accordance with the conservation area site selection criteria described in HCP section 5.5.1. The LCR MSCP anticipates that much of the agricultural land within the LCR MSCP planning area would meet these criteria; however, it is anticipated that a combination of land types and ownerships would be utilized.

CDFG-10 In response to this comment, additional implementation measures that would avoid and minimize potential impacts on non-covered sensitive species have been included in the Final EIS/EIR section 3.4. While not required to mitigate for any identified significant impact, these measures are incorporated on a voluntary

basis to reduce potentially adverse impacts to non-covered sensitive species during implementation of the Conservation Plan.

The Conservation Plan was developed as an ESA compliance document that specifically identifies the conservation measures that would be implemented to fully mitigate the potential take of the covered species and contribute to their recovery. The EIS/EIR evaluates potential impacts to non-covered sensitive species (section 3.4) and where a potentially significant impact was identified, a mitigation measure that would reduce the impact to less than significant was identified. As presented in the Final EIS/EIR, Mitigation Measure BIO-1 reads "Conduct site-specific surveys for non-covered sensitive species during selection of land cover type establishment or enhancement (e.g., existing backwaters) areas and, if any are found, then implement measures appropriate for the specific site and species to avoid or minimize impacts to the extent feasible without causing impacts on covered species. These may include measures specified in the Conservation Plan to avoid or minimize potential effects on covered species (e.g., scheduling to avoid breeding times)."

CDFG-11 In response to this comment, additional implementation measures that would avoid and minimize potential impacts on non-covered sensitive species have been included in the Final EIS/EIR section 3.4. While not required to mitigate for any identified significant impact, these measures are incorporated on a voluntary basis to reduce potentially adverse impacts to non-covered sensitive species during implementation of the Conservation Plan.

CDFG-12 AMM3 is a conservation measure in the LCR MSCP Conservation Plan that avoids and minimizes effects of all covered activities that are described in the HCP and BA. Consequently, conservation measure AMM3 is part of the proposed action evaluated in the EIS/EIR. This particular measure identifies operation, maintenance, and replacement (OM&R) of drains and canals as an example of a covered activity to which this measure would apply. See Response to Comment CDFG-2.

CDFG-13 See Response to Comment CDFG-5.

CDFG-14 See Response to Comment CDFG-11.

CDFG-15 The LCR MSCP includes measures to conduct studies and surveys for the covered species for which habitat would be created. These activities would be undertaken for the 17 species identified in conservation measure MRM1, which implements studies to better define species distribution and requirements for all covered species for which the LCR MSCP would create habitat and for which similar monitoring and research conservation measures are not identified in HCP section 5.7. These measures do not apply to species that could be affected by implementation of the covered activities and the LCR MSCP, but that are not associated with aquatic, marsh, or riparian land cover types (e.g., desert tortoise).

CDFG-16 Conservation measure MRM3 would be implemented and criteria would be developed if research indicates competition with European starlings is a substantial factor limiting the reproductive success of covered species.

CDFG-17 The LCR MSCP does not propose to create "a few choice habitats," but rather would create cottonwood-willow, honey mesquite, marsh, and backwater land cover types that support the physical and biological attributes that constitute "habitat" for each of the associated covered species in the amounts specified in HCP Table 5-3. The amount of conservation and the type of conservation measures have been calculated based on the effects of the covered activities for which incidental take authorizations are being sought. This ensures that the conservation measures provided by the LCR MSCP satisfy the requirement that these effects be fully mitigated and minimized to the maximum extent practicable. A central concept of the LCR MSCP is that created patches of land cover types can be designed and managed to provide, as observed in nature, habitat for more than one species in the same patch. This is a well accepted tenet of conservation biology supported by the existing literature and is utilized in a number of approved HCPs, such as the Western Riverside County, San Diego County, and San Joaquin County HCPs.

Although the LCR MSCP Conservation Plan is based on the best available information, the HCP explicitly acknowledges (sections 5.11 and 5.12) that there are knowledge gaps regarding habitat elements for covered species and regarding habitat creation and management techniques. HCP section 5.11 provides for a substantial commitment to research and monitoring to fill these knowledge gaps and allow for adjustments in LCR MSCP implementation as indicated by results of monitoring and research through the LCR MSCP adaptive management process (HCP section 5.12). Implementation of the conservation measures would be performed in a manner that provides the specific habitat elements beneficial to each of the covered species.

CDFG-18 As described in HCP Table 5-3, the LCR MSCP does include specific criteria to determine when created habitats have been successfully established. As appropriate, these criteria may be subsequently modified by adaptive management based on research and monitoring.

In scientific and lay publications, habitat is defined in many different ways and for many different purposes. As described in LCR MSCP Appendix V and applied in the LCR MSCP documents, the LCR MSCP defines habitat as "…the specific places where the environmental conditions (i.e., physical and biological conditions) are present that are required to support occupancy by individuals or populations of a given species."

Habitat is always identified with regard to one of the covered species and is specific to each species' physical and biological requirements. Habitat may be occupied (individuals or population of the species are, or have recently been, present) or unoccupied (see "unoccupied habitat" in Appendix V).

CDFG-19 Fish and Game Code section 2081(b) (2) states, "The impacts of the authorized take shall be minimized and fully mitigated. The measures required to meet this obligation shall be *roughly proportional* in extent to the impact of the authorized taking on the species. Where various measures are available to meet this obligation, the measures required shall maintain the applicant's objectives to the greatest extent possible" (emphasis added).

Fish screens were evaluated as an alternative to the proposed fish augmentation and habitat enhancement mitigation strategies. Installation of fish screens was rejected as an alternative for the reasons provided on page 9-5 of the Draft HCP: "Given the small proportion of the population potentially exposed to diversions, the level of mortality attributable to other factors (e.g., egg, larval, and juvenile predation), and unavoidable entrainment of the vulnerable larval like stage, fish screens would not benefit the species population to any measurable degree." The Draft HCP text further states, "installing fish screens on the large number of diversions from the LCR is prohibitive given the high cost and minimal benefit of the endeavor."

Furthermore, it is important to note that not all diversions have the same risk of entrainment. Those in areas not likely to be frequented by any age class of razorback or bonytail have virtually no risk. Diversions through pumps in the main channel and very deep diversions from reservoirs are less likely to have a definable risk even at high population levels. Bonytail are more likely than razorbacks to be in deep water near canyon areas, while both use shallows extensively (Marsh and Mueller 1999 and Mueller et al. 2000). Diversions from Lake Mead by Nevada may have an increased risk to razorbacks as the lake level declines. Lake Havasu is not likely to fluctuate sufficiently to increase threats to razorbacks or bonytail from the large diversions even with a greater abundance of fish as a result of stocking efforts. Additionally, adults and juveniles can actively swim away from an intake, but larval or very small young of the year class cannot. Thus, reliance on fish screens as an avoidance strategy was determined to be less effective in benefiting the species in question.

The conservation measures proposed to offset take of fish species are outlined in the HCP sections 5.7.4 through 5.7.6, and 5.7.24. Implementation of these measures would help ensure that the existing abundance of the species in the LCR MSCP planning area is maintained as a result of replacing affected habitat and stocking subadult fish and would contribute to attainment of the recovery goals established for the species. Therefore, conservation measures as provided meet the fully mitigated standard as defined in Fish and Game Code section 2081 by not only offsetting the amount of take identified for the covered activities but by contributing to the recovery of the species.

It is acknowledged that CDFG may consult with California water diverters regarding fish screens pursuant to Division 6, Chapter 3, of the Fish and Game Code.

CDFG-20 The LCR MSCP Conservation Plan would minimize and fully mitigate the potential take of covered species.

CDFG-21 The conservation measure DETO2 as presented in the Draft EIS/EIR is incorrect. The correct DETO2 is in HCP section 5.7.3.2. The Final EIS/EIR has been revised to incorporate the full DETO2 text shown in the HCP.

CDFG-22 The LCR MSCP participants agree that it is important to maintain fully functioning habitat for the covered species and believe that the Conservation Plan will accomplish this goal. However, it should be noted that there is no legal requirement that the mitigation be fully implemented prior to implementing the covered activities.

The LCR MSCP has provided an appropriate focus on prompt implementation of the Conservation Plan as described in section 2.1.1.6 of the EIS/EIR. To ensure that habitat creation efforts are successful, the schedule includes a reasonable time to evaluate and acquire lands that are most suitable for the habitat to be created, including research into the factors necessary to support the appropriate vegetation and other elements of covered species' habitat. Even with the need to act carefully in site selection and construction, the LCR MSCP expects to have nearly all the habitat sites established within the first 20 years of the program.

In contrast, there is no schedule for implementation of the future covered activities involving changes in the point of diversion of Colorado River water. The impacts that will result from changes in river flow, as described in the Final HCP (Table 4-2) and Final BA (Table 5-2), assume full use of the 1.574 maf in changed points of diversion. These impacts will not be fully felt until all of those future potential covered activities are actually implemented.

Although the timing of the future flow-related impacts cannot be estimated, it is the goal of the LCR MSCP to mitigate ahead of time those impacts that may occur. This goal is consistent with CDFG's comment that conservation measures should be implemented prior to the impacts associated with covered activities.

CDFG-23 See Response to Comments CDFG-2 and CDFG-3.

CDFG-24 CDFG is correct that it is important to distinguish between the effects of the covered activities as described in BA Chapter 2 and HCP Chapter 2 on covered species and the impacts of implementation of the LCR MSCP Conservation Plan on all biological resources under NEPA and CEQA. The Final EIS/EIR (section 3.4, page 3.4-1) clearly states that the Biological Resources section "addresses the impacts of the *proposed action and alternatives* on biological resources, including vegetation, fish and wildlife, and sensitive species, including those covered and evaluation species that are included in the proposed Conservation Plan" (emphasis added). The proposed action, referenced in section 3.4 of the EIS/EIR, is the adoption of the Conservation Plan and the issuance of take authorization. Therefore, the EIS/EIR evaluates the effects of the take of covered species resulting from the implementation of the covered activities, but does not

evaluate the covered activities themselves. As requested by CDFG, EIS/EIR section 3.4 has been clarified to highlight this distinction and thus clarify that the purpose of this document was not to analyze the effects of the covered activities or provide NEPA/CEQA coverage for such activities.

The habitat models (see HCP Table 3-9) identify the Anderson and Ohmart (1984) marsh types 1–7 (see HCP Table 3-5) as habitat for the marsh-associated covered species. The extent of delineated marsh types 1–7 was used to define the existing extent of marsh-associated covered species habitats within the LCR MSCP planning area (see HCP Table 3-10). Implementation of flow-related covered activities, however, will only affect emergent marsh vegetation that is associated with backwaters. As described in Appendix J, implementation of the flow-related covered activities will not measurably affect reservoir elevations, and thus marsh that is maintained by reservoirs (e.g., Lake Havasu, including the Bill Williams Delta and marshes associated with Imperial Dam Reservoir) and, as described in Final HCP section 4.2.3.1, will avoid effects on Topock Marsh. Consequently, the effects analysis for the marsh-associated covered species was conducted using the methods for analyzing effects of implementing future flow-related covered activities on backwaters and associated emergent marsh vegetation as described in Appendix K and summarized in Final HCP section 4.2.3.6.

The comment's citation of effects on over 8,000 acres of marsh is in reference to preliminary data generated from analysis of potential drop in groundwater elevations beneath all land cover types, including marsh types 1–7, with implementation of future flow-related covered activities in Reaches 3–5. As described above, this information was not used to conduct the effects analysis on marsh-associated covered species because it erroneously indicates there could be effects on marshes maintained by reservoirs. Accordingly, the HCP identifies that implementing the future flow-related covered activities could result in the loss or degradation of 133 acres of backwater-associated emergent marsh that provides habitat for covered species.

HCP Chapter 4 and BA Chapter 5 have been revised to clarify the methods used to assess the potential effects of implementing the future flow-related covered activities on covered species.

The comment's citation of effects on over 70,000 acres of riparian land cover types is in reference to preliminary data generated from analysis of potential drop in groundwater elevations beneath all land cover types with implementation of future flow-related covered activities in Reaches 3–5. With the exception of cottonwood and willow, the predicted level of groundwater decline would not result in loss of woody riparian vegetation, including honey mesquite, screwbean mesquite, saltcedar, and *Atriplex* spp. (USBR 1996 and 2000). Lowering of groundwater elevations, however, is assumed to result in loss of surface soil moisture conditions that are elements of southwestern willow flycatcher and MacNeill's sootywing skipper habitat. Accordingly, the HCP

assumes the loss of all cottonwood-willow land cover types, and southwestern willow flycatcher and MacNeill's sootywing skipper habitat beneath which the hydrological modeling has indicated a probability for a decline in groundwater elevation.

CDFG-25 The agencies agree with CDFG's comment that some instances of incorrect terminology were included in the draft program documents. For example Impact BIO-1 in the Draft EIS/EIR on page 3.4-30, incorrectly states "…would remove or degrade an estimated 3,352 acres of cottonwood-willow and honey mesquite *habitats*." (emphasis added). This statement should have referred to "cottonwood-willow and honey mesquite *land cover types*." The Draft EIS/EIR, HCP, and BA have been reviewed for this usage, and instances of usage not consistent with the LCR MSCP definitions have been corrected.

As described in LCR MSCP Appendix V and applied in the LCR MSCP documents, the LCR MSCP defines land cover type as "the dominant feature of the land surface discernible from aerial photographs, defined by vegetation, water, or human uses." The LCR MSCP planning area was divided into 15 discreet land cover types for the purpose of developing the Conservation Plan.

Also see Response to Comment CDFG-18.

CDFG-26 The heading published in the Draft EIS/EIR at section 2.1.1, "Implementation of a Proposed Conservation Plan and Issuance of Section 10(a)(1)(B) Permit (Conservation Plan)," is an accurate and thorough description of Alternative 1. The heading used in section 3.4.2.1 is a summary heading that refers to Alternative 1.

CDFG-27 The impact analysis contained in the Draft EIS/EIR (section 3.4.2) did include discussions of impacts to non-covered sensitive species and covered species, including California special status species. See Response to Comment CDFG-2 regarding covered activities.

CDFG-28 Assumptions used in the LCR MSCP would result in an overestimation of incidental take associated with implementation of covered activities. This comment specifically references other comments submitted by CDFG. Accordingly, see Responses to Comments CDFG-8b and CDFG-17.

CDFG-29 The Final EIS/EIR section 3.4.2.1 has been revised to indicate that degradation or loss of land cover types that provide habitat for covered species resulting from implementation of the covered activities would occur linearly along the LCR corridor over the term of the LCR MSCP and clarifies that any negative effects associated with implementation of the covered activities would be fully mitigated with implementation of the Conservation Plan.

CDFG-30 The statement referenced in the comment was intended to reflect the net outcome of implementing both the covered activities along with implementation

of the conservation measures identified within the Conservation Plan. In light of this comment, the Final EIS/EIR section 3.4.2.1 has been revised to clarify that implementation of the covered activities and the proposed action (i.e., the Conservation Plan) are not likely to negatively affect the overall populations of covered species within the LCR MSCP planning area or regionally. This conclusion is based on the expected outcomes of implementing the covered activities and the Conservation Plan that are described for each covered species in HCP section 5.7. The potential impacts of implementing the covered activities on covered species and land cover types that provide covered species habitats are described in HCP Chapter 4. Conservation measures that would avoid, minimize, and mitigate for those impacts are described EIS/EIR Chapter 2 and HCP Chapter 5.

CDFG-31 Implementation of the Conservation Plan would fully mitigate potential effects on 1,853 acres of flycatcher habitat and contribute to southwestern willow flycatcher recovery with the establishment and management of 4,050 acres of created flycatcher habitat. For a more detailed discussion, see HCP section 5.7.2. See also Response to Comment CDFG-30.

The 13 pairs of nesting birds referred to in the comment are not nesting pairs. The comment confuses nesting pairs with resident birds. They are not equivalent terms. Resident birds are identified as occupying a site after June 15. McKernan and Braden (2002) indicate that all but one detection occurred during the June 15–16 survey. At Picacho, one resident bird was found on July 6th. No nesting has been documented below Parker Dam. Nesting pairs refer to the documentation of nests, whereas occupied sites refer to suitable habitat patches where willow flycatchers have been detected after June 15. As stated above, most willow flycatchers that are detected in the LCR MSCP planning area and elsewhere in the arid Southwest are likely to be migrants.

CDFG-32 Since 1995, the participating agencies have worked to identify the appropriate list for covered species, which includes all currently Federally listed species, as well as those that have a significant likelihood of future listing. The conservation, minimization, and avoidance measures outlined in Chapter 5 of the HCP were developed to address potential impacts to the covered species from covered activities and implementation of the Conservation Plan for which incidental take is being requested as part of ESA compliance. It would not be consistent with the purpose and need for the proposed action to direct conservation measures away from ESA-listed and other covered species to "all other species status species" as suggested by CDFG. While the focus of the HCP and Conservation Plan is on the 27 covered species, to the extent that implementation of the conservation measures improves the amount and quality of native habitats within the planning areas, secondary benefits may result to non-covered sensitive species.

Also see Response to Comment CDFG-10 (addressing coverage in the EIS/EIR of impacts of the proposed action and mitigation of the effects of implementing the Conservation Plan on other special status species).

CDFG-33 This comment confuses impacts of covered activities with impacts associated with creating new habitat that would provide benefits to covered species and other sensitive species.

Impact BIO-1 discusses the "*beneficial* impact" associated with creation of 7,260 acres of cottonwood-willow and honey mesquite. The EIS/EIR text correctly references 3,352 acres as the amount that corresponds to covered species habitat that would be affected by the covered activities. In light of the comment, the EIS/EIR text has been revised to clarify that these impacts are more precisely described as impacts to cottonwood-willow and honey-mesquite land cover types that provide habitat for covered and other species. Also see Response to Comment CDFG-2.

CDFG-34 The burrowing owl is not a covered species. Draft EIS/EIR section 3.4.2.1 identified less than significant impacts to burrowing owls from implementation of the conservation measures on agricultural land. While no specific mitigation measures are required for burrowing owls (since it is not a covered species), the Final EIS/EIR (section 3.4.2.1) has been revised to incorporate additional implementation measures that would avoid or minimize potential impacts to sensitive non-covered species from implementation of the Conservation Plan. See also Response to Comment CDFG-10.

CDFG-35 The extent of impacts of implementing the covered activities on marsh is correctly stated in the Final EIS/EIR Impact BIO-4 as 243 acres, which corresponds to the effects on marsh associated with covered species. Impact BIO-4 has been revised to specifically indicate that the 243 acres of marsh affected by implementation of covered activities is marsh that provides covered species habitat. See Response to Comment CDFG-8b concerning the additional 30 acres of effect that have been identified.

CDFG-36 For reasons described in Response to Comment CDFG-8b, the Final HCP states that 243 acres of marsh vegetation that provides covered species habitat could be affected by covered activities. The comment statement that 8,035 acres of marsh could be affected is incorrect.

CDFG-37 Page 7-2 of the EIS/EIR discusses the Fish and Wildlife Coordination Act (16 U.S.C. 661-666) and indicates that compliance with the Act may be required prior to implementation of specific conservation actions. Reclamation will comply with the Act as it deems necessary in implementing the LCR MSCP.

CDFG-38 See Response to Comment CDFG-5.

CDFG-39 The LCR MSCP non-Federal, non-flow-related covered activities include OM&R of existing water diversions, conveyance facilities, and electrical generation and

transmission facilities within the LCR MSCP planning area. HCP section 4.5 identifies impacts on covered species that could be associated with implementing these covered activities. Impacts of and mitigation for implementing covered activities related to maintaining drains and canals are addressed in Response to Comment CDFG-8b.

As described in Final HCP section 4.3.2, OM&R of hydroelectric generation and transmission facilities is expected to avoid impacts on covered species, and ground-disturbing activities that support OM&R of existing water diversion and conveyance facilities (e.g., maintenance of existing access roads) are expected to avoid removal of covered species habitats. The HCP acknowledges that there could be some low, unquantifiable, level of take resulting from vehicles striking individuals when the vehicles are operated in support of OM&R on existing roads located within species' habitat (e.g., desert tortoise, flat-tailed horned lizard).

These OM&R activities apply to established facilities and infrastructure that are maintained in a highly disturbed state relative to natural conditions and that generally support little or no covered species habitat. Consequently, it is expected that impacts on covered species, particularly with implementation of the avoidance and minimization measures described in HCP section 5.6.1, would be minimal. Furthermore, if minimal impacts are incurred, these impacts would be appropriately mitigated with the creation of covered species habitats well in excess of the amount that would need to be created to fully mitigate the effects of all other covered activities (HCP Chapter 5) and with the establishment of a $25 million contribution fund that would be used to maintain existing habitat areas in the LCR MSCP to mitigate impacts of ongoing and future covered activities.

The LCR MSCP activities conducted by project participants from the states of Arizona and Nevada and the Federal participating agencies are not subject to California permitting requirements. California participating entities will evaluate their obligations under California law and will comply with those laws as applicable.

CDFG-40 The use of California water agencies' delivery systems to make 1944 Water Treaty deliveries to the City of Tijuana, Mexico, is more fully described in section 2.2.1.7 of the BA. The maximum annual emergency deliveries are 14,400 af.

The storage and delivery of up to a maximum annual volume of 14,400 af to the City of Tijuana is an ongoing flow-related action and is not part of the 1.574 maf of possible future water transfer actions.

CDFG-41 As described in LCR MSCP Appendix V and applied in the LCR MSCP documents, the LCR MSCP defines habitat-based approach as, "The use of habitat maintenance and creation/restoration measures guided by the principles of conservation biology to develop a conservation plan for the conservation of covered species." See Response to Comment CDFG-18.

CDFG-42 See Response to Comment CDFG-41.

CDFG-43 See Response to Comment CDFG-18.

CDFG-44 See Response to Comment CDFG-8a for the response regarding the LCR MSCP habitat modeling approach and the extent of covered species habitat present in the LCR MSCP planning area.

The LCR MSCP participants believe that the analysis of impacts based on the application of the habitat models described in HCP Chapter 4 most likely overestimates the extent of impacts for the following reasons:

1. The extent of existing habitat is overestimated as a result of the habitat-based models; see Response to Comment CDFG-8a. Therefore, the extent of impact associated with the habitat also is overestimated.

2. All habitat that could be affected by covered activities is assumed to be occupied, whether or not the species is actually present, thus overestimating the level of take.

3. As described in Final HCP section 4.2., the assessment of impacts associated with implementing the future flow-related covered activities assumed a worst-case scenario. These assumptions include the following:

   - All proposed changes in points of diversion would be implemented simultaneously, and all impacts on habitat would be manifested instantaneously. This assumption overestimates the potential associated impacts because all diversions would not be implemented simultaneously, but rather over a period of years; and

   - All cottonwood-willow land cover and, therefore, the habitat it provides for covered species, would be degraded or lost where modeling indicated groundwater levels could decline, regardless of the amount of decline (e.g., a decline of 1 inch beneath a cottonwood-willow stand was assumed to degrade or result in loss of the stand as covered species habitat, even though such a reduction in groundwater would be unlikely to affect covered species habitat conditions in most, if not all, instances).

The habitat modeling approach used to delineate the extent of existing covered species habitats and the extent of impacts on habitat is consistent with the approach used for other regional HCPs and NCCPs (e.g., Western Riverside County, San Diego County, San Joaquin County). Consequently, an accepted approach in such instances and as is used for the LCR MSCP HCP, is to develop and apply habitat models and incorporate impact assumptions that likely would overestimate the extent of impacts and thus ensure that the analysis would, at a minimum, encompass the full extent of the actual impacts that may accrue through implementation of covered activities.

CDFG-45 See Response to Comment CDFG-8a. The land cover type classification system used to formulate the habitat models is predicated primarily on plant species composition, plant species dominance, and vegetation structure. The LCR MSCP acknowledges, however, that habitat for some species includes more than plant species composition and vegetation structure (e.g., micro-climate and relief). As described in Response to Comment CDFG-8a, however, delineating covered species habitats based only on plant composition, structure, and dominance ensures that the LCR MSCP overestimates the extent of existing covered species habitat, thus ensuring that the analysis of impacts on habitat encompasses the full extent of potential impacts and that the habitat to be created under the LCR MSCP will fully mitigate all the potential impacts of implementing the covered activities on habitat.

CDFG-46 See Response to Comment CDFG-25.

CDFG-47 As indicated in Response to Comment CDFG-8a, field delineating the extent of covered species habitats based on the presence of detailed habitat elements that are not identified in the land cover type classification system would result in the delineation of substantially fewer acres of covered species habitat within the LCR MSCP planning area than has been delineated through application of the LCR MSCP habitat models. By overestimating the extent of existing covered species habitat, the LCR MSCP ensures that the analysis of impacts on habitat encompasses the full extent of potential impacts and that the habitat to be created under the LCR MSCP would fully mitigate all of the potential impacts that could result from implementation of the covered activities.

CDFG-48 See Response to Comment CDFG-8a.

CDFG-49 The backwater land cover type has not been delineated as a separate land cover type and is a subcategory of reservoir or river land cover types. Consequently, the extent of aquatic land cover types that provide habitat for the covered fish species are correct as shown in Table 3-11. HCP Tables 3-8 and 3-10 have been revised to incorporate a footnote indicating the extent of backwater land cover type is subsumed into the extent of reservoir and river land cover types shown in the table.

CDFG-50 As stated in Appendix K, median levels best represent impacts to isolated backwaters due to drops in river elevation. Consequently, the analysis appropriately characterizes the effects of changes in flow in groundwater reductions associated with implementing the covered activities on biological resources.

Changes in river elevations affect "connected" and "isolated" backwater areas in different ways, including temporal impacts. Colorado River surface elevation is directly correlated with backwaters that have a direct surface connection with the river (i.e., "connected" backwaters). Those backwaters that do not have a direct surface connection (i.e., "isolated" backwaters) maintain an elevation that closely approximates the median annual river surface elevation, or the groundwater

proximate to the backwater. While the river surface elevation at one point in the system may change as much as 3 feet at one time (in April), this does not reflect a drop in elevation for all backwaters as explained below.

Annual median elevations were used for calculating groundwater elevation changes and surface elevations for backwaters not directly connected to the river by a surface connection, as well as for groundwater change modeling input. Seasonal estimates of water surface elevations were used for impact analysis on backwaters directly connected to the river by a surface connection and river surface for the months of April, August, and December. For those analyses, the lowest hourly elevation modeled in any reach for each month was used. These months were selected for the following reasons: April represents the highest flows in the system, and backwater areas are important for nursery areas for larval fish. April also represents new growth and the dormancy break for cattail and is within the Yuma clapper rail breeding season. Backwaters in August are necessary for juvenile fish cover, and December represents the lowest water elevations throughout the year. April showed the greatest impact from reduction in water surface in backwaters and river, as well as impact to emergent vegetation and was used in the assessment of effects. As a result, the impacts to backwaters and associated emergent vegetation were probably overstated.

The months of April, August, and December were used only to calculate impacts to backwaters and river surface. As stated before, the groundwater projections were based on the annual median, therefore best reflecting the groundwater elevations the entire year, depending on the presence of irrigated agriculture nearby.

CDFG-51 The Palo Verde project study accounted for a drop in groundwater due to a cessation of irrigating agricultural lands (known as "fallowing") and did not evaluate any impacts related to changes in river flow. Thus the study referenced in this comment only analyzes impacts of fallowing as opposed to declines in river flows. From 1992 to 1994, the Palo Verde Irrigation District and Metropolitan implemented a test land fallowing program. This program resulted in the fallowing of 20,215 acres in the Palo Verde Valley and reduced the amount of Colorado River water used to irrigate farmland in the valley by an estimated 185,987 af (Great Western Research 1995).

Groundwater elevations in the Palo Verde Valley were monitored and reflected an average drop of approximately 1.5 feet during the 2-year program. However, this drop in groundwater level was not caused by any reduction in river flow below Parker Dam. Rather, the groundwater drop was caused by fallowing 22 percent of the agricultural lands in the valley, which "reduced the amount of irrigation water applied to valley lands" (Great Western Research 1995). This resulted in a reduction in the amount of irrigation associated recharge to the underlying groundwater. The LCR MSCP is not a land fallowing program, and the EIS/EIR does not evaluate the potential change in groundwater from

fallowing. However, section 3.9 of the EIS/EIR does discuss the application of water on conservation sites and potential changes to groundwater elevations.

The test fallowing program cannot be used as a basis for measuring the effect that changes in river flow may have on groundwater levels. River levels were not measured during the test program. The hydrologic modeling conducted for the LCR MSCP was based on potential reductions in river elevations resulting from changes in points of diversions and not based on a reduction in surface irrigation as demonstrated in the Palo Verde Test program. Therefore, the findings from the Palo Verde Test Program are not relevant to the hydrologic modeling and impact assessment conduced for the LCR MSCP and should not be considered a source of data to corroborate or refute the analysis presented in the LCR MSCP documents.

CDFG-52 The commenter does not cite any scientific literature to support its contention that mesquite communities will be affected by flow-related covered activities. The HCP conclusion that "change in groundwater elevation is not expected to result in the loss of honey mesquite bosques" is supported by the best scientific data available. HCP section 4.5.25 does acknowledge that implementation of future flow-related covered activities could result in the loss of up to 172 acres of MacNeill's sootywing skipper habitat that is provided by adjoining patches of honey mesquite and atriplex land cover types. The potential loss of this habitat, however, would not result from the loss of honey mesquite and Atriplex plants, but rather from the potential loss of surface soil moisture conditions required by this species as a result of lowered groundwater elevations.

Honey mesquite is a facultative phreatophyte with a long taproot that is able to reach deep groundwater (Ohmart et al. 1988). Riparian mesquite have high productivity which results from several physiological and morphological adaptations which allow them to "decouple" from the normal limitations on water and nutrient resources in desert systems (Nilsen et al. 1984). Foremost, a deep root system allows mesquite to tap water sources unavailable to shallower rooted plants, while association with nitrogen-fixing symbionts releases mesquite from nitrogen limitation" (Stromberg 1993). Furthermore, the maximum projected drop in groundwater is 0.8 feet in Reach 3, 1.6 feet in Reach 4, and 1.2 feet in Reach 5. These reductions in groundwater elevation are expected to be within the species' ability to obtain subsurface water.

Similarly, the available scientific data do not support the assertion that flow-related covered activities will affect recruitment or survivorship of mesquite. Mesquite germination is stimulated by high summer temperatures combined with late summer rains or floods (Stromberg 1993). The flow-related covered activities will not affect the factors affecting mesquite recruitment or survivorship.

This assessment presented in the LCR MSCP documents is consistent with similar assessments conducted by Reclamation for projects that could result in

reducing groundwater levels along the LCR for honey mesquite, as well as screwbean mesquite and saltcedar (USBR 1996 and 2000). As described in HCP section 4.2.3, implementation of future flow-related activities is not predicted to measurably change, from existing conditions, the frequency of overbank flow events that could inundate mesquite vegetation.

CDFG-53 See Response to Comment CDFG-50.

CDFG-54 Although there is the potential for an increase in conditions that would cause stranding and dessication, we disagree that stranding and dessication would have more than a minimal affect on the abundance and distribution of razorback sucker and bonytail in the LCR.

Stranding and desiccation discussed for bonytail and razorback sucker is related to the daily fluctuations in river flow attributable to operations for generating electricity. Under the ongoing covered activities for hydropower generation, river flows over a 24-hour period vary substantially, reaching flows greater than 20,000 cfs and less than 5,000 cfs depending on the month and demand for electricity. The potential for stranding or desiccation to occur under the existing conditions is governed by two primary factors. The first factor is the site-specific channel morphology, including the presence of gravel and cobble bars, side channels, or shallow backwaters within the river reach affected by the fluctuating flows; the closer to the dam these physical channel features are located, the greater the amount of water level fluctuation will be, since fluctuations attenuate downstream (Appendix J) and water levels stabilize.

The second factor is the current distribution and abundance of bonytail and razorback sucker in the LCR MSCP planning area. The number of individual fish in the areas of greatest fluctuations is low, and most of the bonytail and razorback sucker present in the LCR do not inhabit areas subject to significant fluctuations. Implementation of the future flow-related covered activities will alter the existing conditions.

The potential for increased stranding and desiccation will depend on the amount of change in water levels and the channel morphology. Further, with the implementation of the Conservation Plan, the number of individual fish potentially present in the area of significant fluctuation would increase. The amount of this increase cannot be quantified. However, if LCR MSCP monitoring reveals areas where significant amounts of stranding or desiccation occur, through the adaptive management process, measures to reduce the take could be implemented, if warranted. Such measures could include deepening a backwater or creating a gravel bar in deeper water.

HCP sections 4.5.4.1 and 4.5.6.1 have been revised to clarify the assessment of risk for existing and future stranding and desiccation and potential take of bonytail and razorback sucker, respectively.

CDFG-55a Surveys for flannelmouth suckers in the reach from Davis Dam to Lake Havasu from 2000-2002 found that 93 percent of flannelmouth suckers captured were in the 20-mile reach from Davis Dam to Fort Mojave Ruins. This reach is primarily a main channel habitat, with two large backwaters present. Adults in spawning condition were captured as far down river as the northern boundary of the Fort Mojave Indian Reservation. Preliminary data from 2003 indicated that juvenile flannelmouth suckers were more common in the river area near Topock than had been assumed, and may have a greater preference for backwaters than the adults (Mueller 2003). Additional information on flannelmouth sucker distribution and habitat use would be acquired before decisions on backwater placement would be made. There is no intent to locate the 85 acres of habitat for the flannelmouth sucker in portions of the reach not inhabited by the species (e.g., in the southernmost section of Reach 3).

CDFG-55b The impact assessment for bonytail and razorback sucker was conducted on a reach by reach basis, but the HCP summarizes impacts on covered species among all river reaches. Implementation of the future flow-related covered activities could affect up to 85 acres of bonytail and razorback sucker habitat in Reach 3, 232 acres in Reach 4, and 149 acres in Reach 5.

The placement of the remaining 275 acres of backwaters would be based on conservation area site selection criteria and integrated with existing isolated backwater projects undertaken by Reclamation. Because desirable conditions for successful backwaters are not fully known, to commit to a strict proportional placement may preclude opportunities that would provide greater benefits to the species.

CDFG-56 As described in HCP section 5.9, the conservation measures provided in the Conservation Plan for the bonytail and razorback sucker minimize and fully mitigate impacts to the maximum extent practicable. The LCR MSCP approach to mitigating impacts on and contributing to the recovery of the bonytail and razorback sucker is to implement conservation measures that would be the most effective for recovering the species. The best available information indicates that the current abundance of nonnative fish predators/competitors in the LCR is the primary factor affecting the abundance of bonytail and razorback sucker. In addition, the information indicates that these species are not habitat limited in the LCR; therefore, creating more habitat would not result in increasing their abundance.

Augmentation of fish is deemed to be the highest priority action that can be implemented at this time to ensure the continued survival of these species and to provide a sufficient number of fish in the LCR to allow for monitoring and research that is necessary to determine behavior and movement patterns, habitat use, and other information. This collection of data will help identify future more effective conservation actions and adjust the LCR MSCP conservation measures, as indicated by monitoring and research results, through the LCR MSCP adaptive management process.

As described in HCP sections 5.7.4.2 and 5.7.6.2, the numbers of bonytail and razorback sucker that could be stocked were developed to provide a realistic basis for developing cost estimates for implementing bonytail and razorback sucker conservation measures over the term of the LCR MSCP. As described in HCP section 5.12.2.2, the conservation measures to stock bonytail and razorback sucker are also designed as adaptive management experiments. A sufficient number of fish would be tagged and stocked early in LCR MSCP implementation to provide a statistically valid basis for conducting bonytail and razorback sucker monitoring and research studies. Monitoring and research would be implemented to collect the information necessary to eliminate existing uncertainties regarding the ecology and management needs for these species in the LCR including, as described in HCP section 5.12.2.2, determining the key environmental correlates affecting survival, growth, movement, and reproduction of the bonytail and razorback sucker (e.g., key habitat [e.g., depth, velocity, channel form, cover, substrate], continuity, water temperature, food, predation). The number of bonytail and razorback suckers that would be stocked over the term of the LCR MSCP may change if results of monitoring and research indicate that the funds provided for rearing and stocking these species would make a greater contribution towards their recovery if they were redirected towards implementing other types of management actions (see HCP section 5.12.2.2). If results of monitoring and research indicate, however, that continued stocking of bonytail and razorback sucker is the most effective management action for contributing towards the recovery of these species, the full level of stocking described in HCP sections 5.7.4.2 and 5.7.6.2 would be undertaken.

Because changes that could be made to the level of stocking is predicated on the results of monitoring and research to be conducted in the future, specific alternate management actions that would be implemented and the timing of their implementation cannot be identified at this time. The process for developing and approving proposed changes to LCR MSCP conservation measures through the LCR MSCP adaptive management process is described in HCP section 5.12.1. The process specifically requires that any proposed changes in the conservation measures described in the LCR MSCP HCP would be reviewed and approved by the Service prior to adoption and implementation.

Additionally, the created habitat would be designed and managed specifically to provide native covered species habitat requirements and would be maintained free (to the extent practicable) of nonnative fish predators/competitors, thus providing habitat of substantially higher value than the affected habitat.

CDFG-57 See Responses to Comments CDFG-19 and CDFG-56.

State of California, Governor's Office of Planning and Research, August 19, 2004

No comments requiring a response were submitted.

State of Nevada, Department of Administration, State Clearinghouse (NSC), August 10, 2004

NSC-1 Comment noted.

Nevada Department of Wildlife (NDOW), June 21, 2004

NDOW-1 Thank you for your support of the LCR MSCP.

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LOCAL AGENCIES

Comment Responses

QuadState County Government Coalition (Quad), August 17, 2004

Quad-1 The specific comments provided by Imperial County (IC) are addressed under Responses to Comments IC-1 to IC-9.

Quad-2 The membership of the oversight body would have the authority to select an appropriate name.

Quad-3 The participant groups were developed on the basis of participation in the development of the LCR MSCP. Interested local government agencies have the opportunity to become members of the Steering Committee as part of the "other interested parties" participant group described in Chapter 6 of the HCP.

Quad-4 The implementation costs described in HCP Chapter 7 were based on 2003 dollar values. As stated in HCP section 7.1, implementation costs and funding would be adjusted annually for inflation. Consequently, costs would be based on the value of the dollar in the first year of HCP implementation and annually adjusted for inflation over the term of the LCR MSCP.

Quad-5 The $25 million is a portion of the non-Federal cost-share among the Applicants. As described in footnote "b" to HCP Table 7-1, the $25 million would be placed in an interest-bearing account during the first 10 years of implementation. Interest drawn from the account, however, would be used to maintain existing habitat over the full 50-year term of the LCR MSCP. Table 7-1 only indicates the actual funding contribution and does not predict the amount of funding that would be generated through interest on the contribution because interest rates are expected to fluctuate over the term of the LCR MSCP.

Quad-6 The $25 million is a portion of the non-Federal cost-share among the Applicants. The funding source to maintain existing habitat for maintenance of existing habitat under the LCR MSCP is described in the Draft Final FMA (Exhibit A in the Final HCP, referred to as the Joint Participation Agreement [JPA] in the public draft documents).

Quad-7 LCR MSCP permit holders would be required by the Service to fund and implement all elements of the LCR MSCP Conservation Plan as stipulated in the Draft Final IA (included in Exhibit B of the HCP), including the commitments to conduct monitoring and research. The LCR MSCP has committed 26 percent of the $626 million program costs specifically to implementation of monitoring, research, and adaptive management to provide the information necessary to ensure successful achievement of goals. This level of funding for monitoring and research is comparable with, and in many cases larger, than is provided for in other regional conservation plans. Based on this commitment, the LCR MSCP believes that the proposed funding levels for monitoring, research, and adaptive management (HCP Table 7-1) are appropriate. In addition, as described in HCP section 5.11, a primary function of the LCR MSCP Program Manager would be coordination with other monitoring and research programs to reduce the

likelihood for duplicating monitoring and research efforts and ensure that monitoring and research programs are implemented as efficaciously as possible.

Quad-8 See Response to Comment CO-1.

Quad-9 Stocking bonytail and razorback sucker as described in HCP sections 5.7.4.2 and 5.7.6.2, respectively, is not expected to impact non-native fishes inhabiting the LCR because they are not effective competitors with nonnative fishes. Section 3.15.2 of the Final EIS/EIR addresses impacts to sport-fishing from population enhancement measures to control piscivorous fish in established backwaters and concludes that the impact would be localized, have a minor effect on overall fish populations, and would occur in conservation areas that would not be accessible to the public. This impact was found to be less than significant.

Quad-10 The EIS/EIR did not identify a beneficial impact to recreation from the proposed action because the Conservation Plan is not specifically being developed to promote recreational uses and because the habitat would not be accessible to the public. The beneficial impact to aesthetics is identified in EIS/EIR section 3.1.2.

Quad-11 As described in HCP Chapter 6, one of the primary responsibilities of the LCR MSCP Steering Committee would be to review and approve annual work plans prepared by the LCR MSCP Program Manager, which would include proposals for land and water acquisitions necessary to implement LCR MSCP conservation measures. LCR MSCP Steering Committee meetings would be public, affording an opportunity for public review and comment during the decision making process for such acquisitions.

Quad-12 The EIS/EIR, section 3.16.2, identifies impacts of the Conservation Plan associated with the loss of agriculture-related revenue (Impact SOC-2), loss of local property tax revenues (Impact SOC-3), and loss of local sales tax (Impact SOC-4). The analysis is at a programmatic level since specific sites have not been selected, but notes differences that would occur if land were privately owned, or owned by Indian tribes or government agencies. Additional site-specific compliance, including economic and social impact analysis, would be conducted as appropriate when individual projects are identified.

Quad-13 The impact to employment and the value of agricultural sales was quantified by county in Table 3.16-4 for varying site sizes. It would be speculative to attempt to quantify the impacts to local governments because specific sites have not been selected and because this would vary according to land ownership. Also, see Response to Comment QuadState-12.

Quad-14 We agree with your comment. There are not likely to be any significant Payments in Lieu of Taxes (PILT) payments and that reference in the EIS/EIR has been removed.

Quad-15 We agree that regular review of the status of covered species is an important component for successful implementation of the Conservation Plan over the term

of the LCR MSCP. As described in HCP section 5.11, the LCR MSCP would annually submit a report to the LCR MSCP Steering Committee and the Service describing LCR MSCP monitoring and research program activities and results, including an assessment of LCR MSCP progress towards achieving the LCR MSCP Conservation Plan (HCP Chapter 5) goals and objectives. As appropriate, assessments of progress towards achieving the goals and objectives could include an assessment of the regional or range-wide status of covered species as their status may relate to developing annual project implementation priorities. The LCR MSCP adaptive management process (HCP section 5.12) provides a process for future adjustments in the LCR MSCP Conservation Plan as warranted based on monitoring and research results, including relevant new information developed by others, and as consistent with the Service's Five-Point Policy for HCPs (65 FR 106, June 1, 2000) and applicable ESA regulations.

Imperial County Planning/Building Department (IC), July 13, 2004

IC-1 The correct citation for the information regarding Imperial County has been added to section 3.11, Land Use, and the list of references. The potential need to change zoning is noted. As indicated in section 2.1.1.4 of the Final EIS/EIR, site selection criteria include consideration of zoning and general plan designations, and as noted in section 3.11.2.1, the zoning of each potential conservation site would be reviewed to minimize any potential conflicts with policies of local jurisdictions adopted for the purpose of avoiding or mitigating an environmental effect.

IC-2 The future covered activities will be subject to project-specific analysis prior to their implementation, and consistency with existing plans and policies will be evaluated at that time.

IC-3 The Salton Sea Restoration Project is not closely related to the proposed action and therefore is not included in the cumulative impact analysis (Chapter 4 of the EIS/EIR).

IC-4 As discussed in section 3.9.2 of the Final EIS/EIR, implementation of the Conservation Plan would not lower the water surface elevation of the LCR.

IC-5 See Response to Comment EPA-8.

IC-6 See Response to Comment EPA-8.

IC-7 See Response to Comment IC-1.

IC-8 See Response to Comment IC-5.

IC-9 Chapter 9 of the Final EIS/EIR has been amended to reflect that Imperial County planners were contacted during the preparation of the EIS/EIR. Imperial County planners also were contacted to identify projects to be included in the list of projects considered in the cumulative impact analysis. Additionally, a QuadState

representative has been a participating member of the LCR MSCP Steering Committee.

City of Henderson (Hend), August 17, 2004

Hend-1 Comment noted.

City of Yuma, Riverfront Development Team (Yuma), August 17, 2004

Yuma-1 The commenter may be correct that the 1,305 acres of planned habitat may be available to achieve LCR MSCP habitat creation objectives if the Yuma East Wetlands Project is included as an LCR MSCP conservation area. Once a conservation area is identified, the amount of created habitat that can be credited towards achieving LCR MSCP habitat creation objectives would be determined based on the extent of land cover types that are initially established and that ultimately would develop and be sustained as functional covered species habitat.

Yuma-2 The requested text change has not been made because while some features listed on the National Register of Historic Places may in fact be visually sensitive, meeting the criteria for such a listing does not automatically qualify a feature as being visually sensitive.

Yuma-3 Section 3.1.1.4 of the Final EIS/EIR has been modified as recommended. Also see Response to Comment Yuma-2.

Yuma-4 Comment noted.

TRIBAL

Comment Responses

Fort Mojave Indian Tribe (Ft. M), August 13, 2004

Ft. M-1 Comment noted.

Ft. M-2 The EIS/EIR uses county-level data since this is the scale for which it is available on a consistent basis from the U.S. Census. A consistent data set was used to facilitate parallel analysis for the three counties that were analyzed. The acquisition of lands for conservation areas would be on a voluntary basis based on fair market value. When site-specific activities are identified, additional environmental compliance would be performed, as appropriate, analyzing impacts associated with use of those specific sites.

Ft. M-3 See Response to Comment Ft. M-2.

FT. M-4 See Response to Comment Ft. M-2.

Ft. M-5 Comment noted. As previously stated, conservation areas would be obtained on a voluntary basis based an appraisal of fair market value and would be subject to other negotiations between the parties.

Morisset, Schlosser, Jozwiak & McGaw (MSJM), August 18, 2004

MSJM-1 Comment noted. We acknowledge the U.S. Supreme Court's opinion, decided June 19, 2000, in *Arizona v. California*, concerning the determination of the final boundaries of the Fort Yuma Indian Reservation. We understand the Court remanded the case to a Special Master for a determination of the Quechan Indian Tribe's claims to additional boundary lands and associated additional water rights.

MSJM-2 The Department of the Interior acknowledges the senior priority of the Federal reserved right for the Fort Yuma Indian Reservation. The Final EIS/EIR and BA have been modified to state that the Tribes' decreed Colorado River water rights are Indian Trust Assets, and the United States, as trustee for those Tribal water rights, is committed to protect those rights. The Final EIS/EIR and BA now expressly state that the LCR MSCP will not modify these decreed water rights in any manner.

MSJM-3 The analysis in the documents includes the Tribe's present and future exercise of its senior water rights.

MSJM-4 The LCR MSCP analyses the effects of implementing all present and future covered activities.

MSJM-5 The Draft HCP notes on page 3-8 that irrigation return flows in Reach 6 "potentially" introduce contaminants to the river, such as salts, pesticides, and selenium. All Colorado River water users, including the Tribe, are responsible for complying with the requirements of all applicable laws, including the Federal Water Pollution Control Act. The United States does not warrant the quality of

Colorado River water and is under no obligation to construct or furnish water treatment facilities to maintain or better the quality of Colorado River water except as specifically authorized by Congress.

MSJM-6 Conservation measures would be sited on tribal land only on a voluntary basis and would not interfere with the tribe's water rights or lands. Any impacts to cultural resources would be mitigated as indicated in section 3.5 of the Final EIS/EIR.

MSJM-7 The LCR MSCP would acquire water for restoration projects only through voluntary agreements with existing water rights holders. The DOI acknowledges the senior priority of the Federal reserved right for the Fort Yuma Indian Reservation. The Final EIS/EIR and BA have been modified to state that the Tribes' decreed Colorado River water rights are Indian Trust Assets, and the United States, as trustee for those Tribal water rights, is committed to protect those rights. The Final EIS/EIR and BA now expressly state that the LCR MSCP will not modify these decreed water rights in any manner. It is the Tribe's decision as to whether it participates in any potential conservation and restoration projects implemented within the Reservation boundaries under the LCR MSCP.

MSJM-8 In 2000, a Reclamation cultural resources contractor provided baseline data for the Class I overview. The information provided is being incorporated into a Class I document by Reclamation.

Prior to construction, the Reclamation would delineate and evaluate proposed project areas for cultural resources. Where appropriate, Reclamation would initiate cultural resource surveys based on project location, previous work, and site potential; this could include a Class II sample survey or a Class III 100 percent survey. In the absence of specific sites, it is not possible to identify specific impacts to any particular geographic or political area.

MSJM-9 The LCR MSCP participants would be required to comply with all relevant environmental and historic preservation laws and regulations at the time specific projects are planned and implemented. Once a project area has been identified and the specifics of the project are known and the potential impacts ascertained, the cultural resource compliance process would start. This could include a site records check and pedestrian survey for unknown or unevaluated cultural resources. If significant cultural resources were identified, these would be properly reported and consultation undertaken with appropriate agencies and/or groups (e.g., State Historic Preservation Office, Tribal Historic Preservation Office, tribes, historic preservation groups). If significant sites cannot be avoided through project design, then there may be a need for additional archaeological work (i.e., site testing, excavation); these would follow all consultation and legal protocols.

MSJM-10 Conservation measures would be sited on the Fort Yuma Reservation only on a voluntary basis. The potential loss of jobs would be a factor that would be

considered by the tribe prior to the decision to establish habitat as part of the LCR MSCP Conservation Plan.

MSJM-11 The LCR MSCP would acquire water for restoration purposes only through voluntary agreements with existing water rights holders. For an expanded discussion on water acquisition, see Response to Comments EPA-8 and MSJM-7. The potential effects to groundwater as well as water quality from implementation of the LCR MSCP are presented in section 3.9 of the Final EIS/EIR. The EIS/EIR determined that the effects to water quality were not significant.

MSJM-12 See Response to Comments MSJM-6 and MSJM-7.

This is discussed in the Draft EIS/EIR page 3.10-4, paragraph 5, lines 32-37; and page 3.10-5, lines 1-2: "No activity associated with implementation of the Conservation Plan would be initiated on tribal land without the full cooperation and express permission of the tribe on whose land that activity might occur. LCR MSCP participants and the affected tribe would work cooperatively to identify and resolve potential impacts to Indian Trust Assets (ITAs). Appropriate mitigation and /or compensation measures would be identified, negotiated, and memorialized in agreement form, thus resulting in no effect or no adverse effect to the identified ITA(s). If LCR MSCP participants and the tribe were unable to reach agreement on how best to resolve effects, the LCR MSCP activity would not be implemented on the reservation and there would be no effect to ITAs."

MSJM-13 The Laguna Reservoir Restoration and Enhancement Project is described in the BA, Chapter 2, section 2.2.4.2. The project is informally known by various names, which leads to confusion. Thus, this project will be covered by the LCR MSCP consultation, and is not a related project to be included in the cumulative impact analysis.

MSJM-14 See Response to Comments MSJM-6, and MSJM-12.

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ORGANIZATIONS

Comment Responses

National Wildlife Federation (NWF), August 18, 2004

NWF-1 National Wildlife Federation's (NWF's) support of and participation in the LCR MSCP is appreciated. Detailed responses to issues identified in this comment are addressed below.

NWF-2 Reclamation's position is supported by the ESA, its implementing regulations, and applicable case law, including *Sierra Club v. Babbitt* cited by this comment. A nondiscretionary action, with respect to a Federal agency, is one that has been imposed by Congress through applicable Federal laws, or by courts of competent jurisdiction, through applicable orders and injunctions. Reclamation's position also extends to a determination that nondiscretionary Federal agency actions pursuant to applicable Federal laws or applicable court orders do not create section 9 liability as suggested by the comment. The DOI notes that the applicable ESA implementing regulations published at 50 C.F.R. Section 402.03 expressly limit the scope of the consultation duty to actions in which there is discretionary involvement or control and do not require consultation pursuant to section 7 for nondiscretionary actions.

The referenced statement is intended to clarify that the approach and coverage in the LCR MSCP for the covered activities should not be used as precedent in any subsequent consultation. Any Federal agency must undertake consultations beyond the scope of 50 C.F.R. section 402.03. This position is supported by relevant case law. See e.g., *Sierra Club v. Babbitt*, 65 F.3d 1502, 1505 (9th Cir.1995); *Defenders of Wildlife v. Norton*, 257 F.Supp.2d 53 (D.D.C. 2003).

NWF-3 The descriptions of AGFD's and NDOW's covered activities in HCP Chapter 2 are correct, and the Draft EIS/EIR has been revised to indicate that fish stocking is not an NDOW covered activity. Because fish stocking is an AGFD covered activity, however, (HCP section 2.2), this activity could affect bonytail and razorback sucker as described in HCP Chapter 4 and BA Chapter 5. Stocking of nonnative fish in the LCR MSCP planning area is currently implemented or proposed only by the Service, NDOW, and AGFD. Because fish stocking undertaken by the Service and NDOW is covered under existing section 7 consultations and fish stocking that would be undertaken by AGFD is an LCR MSCP covered activity, references to fish stocking as a cumulative effect have been removed from the LCR MSCP documents.

NWF-4 The text concerning critical habitat and determination of effects on critical habitat in Chapter 5 of the BA has been expanded to fully explain the analysis previously completed.

NWF-5 As described in BA section 5.2, the LCR MSCP Conservation Plan appropriately distinguishes between past actions and associated conservation measures from future covered activities. A portion of the 1.574 maf change in point of diversion was covered for four currently listed species in the January 2001 BO. As part of the covered activities, under both the LCR MSCP BA and the HCP, the entire

1.574 maf change in point of diversion is included in the impact analysis for all covered species. Accordingly, it is appropriate to include the mitigation acreage associated with those impacts as part of the LCR MSCP conservation measures.

NWF-6 Reclamation's annual management actions on the Colorado River rely on modeling approaches that utilize recorded hydrological data compiled over the past century. Reclamation believes that utilization of this actual hydrologic data provides the best basis for ongoing Colorado River management activities. Accordingly, Reclamation has utilized this approach as a foundation for the modeling assumptions in the LCR MSCP. For Reclamation to use a different modeling approach in the LCR MSCP would conflict with all of the other Colorado River management actions that Reclamation has taken and is currently taking. It is important to note that by periodically including additional hydrologic data, Reclamation will account for changes related to runoff patterns and/or human demand. While this particular comment focuses on potential effects of climate change on inflows into the Colorado River, this is just one of many variables that may affect runoff and demand within the Colorado River Basin. Attempting to predict global changes in climate, shifts in demographic patterns, and other factors affecting Colorado River hydrology are far more speculative than Reclamation's reliance on actual annual hydrologic data.

Operation of the Yuma Desalting Plant is not a covered activity for the LCR MSCP. For the purposes of a complete analysis that represents the greatest level of impacts based on likely future changes in flow resulting from future covered activities, as explained in the Draft BA at 5-4, a depletion of 120,000 af per year (afy) from 2003-2020 was assumed in the model to represent the water currently bypassed to the Cienega de Santa Clara. The model assumes that this depletion will be reduced to 52,000 afy beginning in 2023. As noted in Appendix J, this assumption is intended only to provide a thorough and comprehensive accounting of Lower Basin water supply and does not assume that operation of the plant will occur. Please see Appendix J for a full discussion of the Yuma Desalting Plant in the model.

NWF-7 See Response to Comment CDFG-56. Conservation measures for the bonytail and razorback sucker (HCP sections 5.7.4.2 and 5.7.6.2) have been revised. The purpose for adaptively managing the implementation of the fish augmentation conservation measures is to ensure that the most effective possible management actions for these species are implemented over the term of the LCR MSCP.

NWF-8 The LCR MSCP EIS/EIR does address impacts to burrowing owls as described in section 3.4. Part of the EIS/EIR impact analysis included an assessment of potential impacts on non-covered sensitive species, which includes the burrowing owl, resulting from implementation of the Conservation Plan.

Implementation of the Conservation Plan could affect burrowing owls by:

- Removing foraging habitat provided by farmed fields as a result of conversion to native habitats;

- Removing nesting habitat provided by berms, earthen embankments, and other such features that are associated with agricultural-related infrastructure that could support burrowing owl nesting burrows as a result of conversion to native habitats; and

- Disturbing nesting burrows as a result of maintaining roads, ditches, and other infrastructure in LCR MSCP conservation areas that could support nesting burrows.

The primary factors affecting the decline of burrowing owls include (1) habitat loss associated with conversion of lands to urban and agricultural uses and (2) rodent control programs (Remsen 1978).

The analysis presented in the EIS/EIR provides an assessment of the potential impacts of converting agricultural land to LCR MSCP created habitat types on sensitive wildlife species, including the burrowing owl. The Draft EIS/EIR (page 3.4-32) states "Conversion of agricultural lands to cottonwood willow and honey mesquite could affect 31 species of non-covered sensitive bird species, including burrowing owl…, that use agricultural lands and irrigation ditches." The Draft EIS/EIR concludes that "conversion activities would have a less than significant impact on these species." This impact is considered to be less than significant because less than 2 percent of agricultural lands in the LCR MSCP planning area would be converted (Draft EIS/EIR page 3.4-32) if all of the created habitat were established on agricultural lands. The amount of agricultural lands actually affected, however, is likely to be less because it is reasonably certain that some of the habitat would be created on non-agricultural lands. This finding is based on application of the significance criterion that the proposed action would have a significant impact if it would "have a substantial direct or indirect effect on sensitive wildlife species identified for special status under local, state, tribal, or Federal laws, regulations, or policies" (Draft EIS/EIR page 3.4-29). Based on the potential level of effect and in accordance with CEQA (California Public Resources Code, section 21101[c]), the proposed action is not expected to cause burrowing owl populations to drop below self-perpetuating levels.

The creation of 8,132 acres of covered species habitat proposed under the LCR MSCP would occur within the participating states of Arizona, Nevada, and California. It should be noted, however, that implementation of the LCR MSCP would not affect burrowing owls in the Imperial Valley. Furthermore, if all of the LCR MSCP created habitat were established on agricultural lands in California within Reach 4, which includes the Palo Verde Valley, implementation of the LCR MSCP could result, under this worst-case scenario, in the removal of up to approximately 9 percent of the agricultural lands within California in this reach. As previously noted, however, it is expected that substantially fewer acres of agricultural land in the Palo Verde Valley could be affected because not all habitat would be created on agricultural lands and not all habitat would be created in California.

Therefore, implementation of the LCR MSCP Conservation Plan measures would not be considered a significant impact to burrowing owls in California, and no re-analysis of impacts to burrowing owls is required. The EIS/EIR section 3.4.2, however, has been revised to expand the discussion of potential impacts on burrowing owl foraging and nesting habitat that could result from implementation of the LCR MSCP Conservation Plan. As described in Response to Comment CDFG-34, the Final EIS/EIR includes implementation measures that would avoid and minimize potential effects of implementing the LCR MSCP on sensitive species that use agricultural lands, including the burrowing owl. The LCR MSCP participants note that the comment statement that "The state burrowing owl population is on the decline" is contrary to the findings of the California Fish and Game Commission (Commission). The Commission, in its "Notice of Finding Relating to the Petition to List The Western Burrowing Owl As Endangered Or Threatened" (Findings), cited its reliance on the CDFG's status report as well as information provided by other parties (Commission 2004). Page 6 of the Findings states "In short, the Commission agrees with CDFG that available information does not clearly establish a net decline in western burrowing owl abundance in the State." The Findings also cite the U.S. Fish and Wildlife Service Breeding Bird Survey for western burrowing owls in California for the 1966-2001 period, which concludes "the Breeding Bird Survey supports a conclusion that while available information shows declines and threatened local extirpations of western burrowing owls in the coastal areas described above, it is not clear that there has been an overall decline in the state's western burrowing owl population over the past 20 or more years." (Commission, 2004, p. 6). The Findings however, do support the commenter assertions regarding the abundance of burrowing owls in Palo Verde and Imperial counties.

It should be noted that the burrowing owl initially was considered for inclusion as an LCR MSCP covered species and assessments of the potential take of burrowing owls from covered activities and LCR MSCP implementation were included in the September 2003 draft documents. The burrowing owl is not a Federally listed species, and the non-Federal applicants elected not to request pre-listing take authorization from the Service. Therefore, the Draft BA and HCP circulated for public review appropriately did not include an assessment of potential take of burrowing owls.

NWF-9 The administrative draft cited by NWF was a preliminary draft containing concepts for mitigation or other materials and was not part of the official draft LCR MSCP documents circulated for public review.

The burrowing owl is not a Federally listed species, and the non-Federal applicants elected not to request pre-listing take authorization from the Service. Prior to siting and implementing site specific activities, all applicable laws would be complied with during implementation of the LCR MSCP.

See also Responses to Comments CDFG-34 and NWF-8.

NWF-10 As indicated in HCP Table 5-6 and Figure 5-3, two of the LCR MSCP conservation areas initially identified are located in Reach 7. The LCR MSCP would identify and acquire specific conservation areas for the purpose of creating covered species habitats following HCP approval. Conservation areas would be sited and established on lands acquired on a voluntary basis from cooperating landowners based on application of the site selection criteria described in HCP section 5.5.1. LCR MSCP habitats could be established on lands within Reach 7 that meet the site selection criteria as described in HCP Section 5.5.1.

In addition, as noted by this and other commenters, (see comment and response USIBWC-2) the IBWC (U.S. and Mexican sections) is currently engaged in analysis and planning for actions that may affect the habitat quantity and quality in this reach in the future. In light of these ongoing activities, the participating agencies do not believe that it would be appropriate to predetermine that Reach 7 would be the primary or exclusive location for LCR MSCP riparian habitat protection. It is more appropriate to consider all of the relevant site selection criteria as part of LCR MSCP implementation and adaptive management practices. Accordingly, implementation of the LCR MSCP actions within Reach 7 will be coordinated with USIBWC and other land management agencies, as appropriate, to take advantage of opportunities to create habitat in the Limitrophe.

The commenter's discussion of instream flows and floods fails to take into account the legal constraints of operating the LCR. The Decree of the U.S. Supreme Court in *Arizona v. California* enjoins the United States from releasing water controlled by the United States other than in accordance with the following order of priority: (i) for river regulation, improvement of navigation, and flood control; (ii) for irrigation and domestic uses, including the satisfaction of present perfected rights; and (iii) for power. The Decree acknowledges the United States obligation to release water to Mexico in satisfaction of the international treaty between the United States and Mexico (1944 Water Treaty), signed February 3, 1944. That treaty requires the annual delivery of 1.5 maf of Colorado River water to Mexico. Minute No. 242 of the 1944 Water Treaty, dated August 30, 1973, addresses the delivery of approximately 140,000 af of this 1.5 maf on the land boundary at San Luis and in Reach 7, downstream from Morelos Diversion Dam. The U.S. Supreme Court's order barring release of Colorado River water except in accordance with these authorized purposes effectively precludes instream flows south of Morelos Diversion Dam under normal operating conditions if all Colorado River water is scheduled and used efficiently. Instream flows south of Morelos Diversion Dam occur only when (i) surplus flows cannot or are not diverted by Mexico, or (ii) inadvertent over-deliveries to Mexico (that are not diverted by Mexico) occur because water users within the United States order water and then do not divert it after it is released. The strict guidelines that control the release of Colorado River water, combined with the finite supply of that water, require the United States to review estimated water requirements and consult with water users as appropriate to ensure that

all Colorado River water is used efficiently. More efficient use will reduce the incidents of inadvertent over-deliveries.

NWF-11 Final HCP section 3.3.2 and Final BA section 4.3.2 have been revised to clarify these points.

NWF-12 The best available scientific evidence does not indicate that Reach 7 is more important for migrating passerines, including southwestern willow flycatchers, than the other reaches within the LCR MSCP planning area. Nor is there evidence that migratory stopover habitat is a limiting factor for covered and other migratory species within the LCR MSCP planning area to the point where migratory bird survivorship is compromised.

Each reach in the LCR MSCP planning area is described in a comparable level of detail regarding each reach's relative value to covered species (e.g., species accounts in Appendix I), with an emphasis on the importance of a particular reach to a covered species.

As described in HCP section 5.11, the LCR MSCP would implement a substantial monitoring and research program over the term of the program. Results of monitoring and research would provide information that would reduce existing uncertainties regarding the management needs for each species, including migration habitat requirements. The adaptive management process included in the LCR MSCP allows for adjustments to the conservation strategy for each covered species and could accommodate increased conservation actions in Reach 7, should the data indicate that it would best achieve the goals and objectives of the Conservation Plan (see HCP section 5.12).

NWF-13 The LCR MSCP species status reports (Appendix I) describe the general distribution and occurrence of covered species within the LCR MSCP planning area and not by specific river reaches, unless the relative importance of occurrences within a given river reach is well documented. Given the mobility and seasonal movement patterns of birds, the LCR MSCP acknowledges that covered bird species may occur in any river reach, including Reach 7, particularly during migration. For example, the western yellow-billed cuckoo, the Arizona Bell's vireo, and the summer tanager are all expected to be present in Reach 7 (see HCP Table 3.9).

NWF-14 The LCR MSCP would identify and acquire specific conservation areas for the purpose of creating covered species habitats following HCP approval. Conservation areas would be established on lands acquired on a voluntary basis from cooperating landowners and/or tribal governments based on application of the site selection criteria described in HCP section 5.5.1. As indicated in HCP section 5.5.2, preference would be accorded to selecting conservation areas on Federal, state, and tribal lands to the extent the lands meet the conservation area site selection criteria and the need for created habitat to be protected in perpetuity. Meeting this latter requirement on tribal land may present unique challenges.

NWF-15 As of the date of the publication of the Draft EIS/EIR, no draft implementing agreement was available that represented the positions of the Federal and non-Federal entities participating in the LCR MSCP. There is no legal (statutory or regulatory) requirement to publish the Implementing Agreement prior to issuance of a section 10(a)(1)(B) permit. Aspects of the covered activities and the Conservation Plan relative to the section 10(a)(1)(B) permit requirements were made available for the comment period and were published in the Draft EIS/EIR, Draft BA, and Draft HCP. Any approved HCP must meet the statutory and regulatory provisions regarding assurance of funding.

A Draft Final IA is attached as Exhibit B to the Final HCP. A Draft Final FMA is attached as Exhibit A to the Final HCP.

The Department regrets any confusion caused by including the words "Implementing Agreement" in the title of the Federal Register notice.

Defenders of Wildlife (DW), Environmental Defense, Grand Canyon Wildlands Council, Pacific Institute, Sierra Club, Yuma Audubon Society, August 18, 2004

DW-1a The LCR MSCP participants believe that implementation of the conservation measures would achieve the Conservation Plan's goal to avoid, minimize, and fully mitigate impacts on the covered species from the covered activities as well as contribute to the recovery of listed species. As described in the Conservation Plan, the LCR MSCP provides comprehensive measures for the avoidance and mitigation of impacts, including replacing habitat of higher function and, for many covered species, more habitat (see HCP Table 5-11 and BA Table 2-56) than may be affected by implementing the covered activities.

Also, see Responses to Comments CDFG-19 and CDFG-56.

DW-1b The sufficiency of the measures provided in the Conservation Plan to avoid, minimize, and fully mitigate the impacts caused by the covered activities must be evaluated in light of the scope of those impacts. As noted in the comment, the covered activities include the future changes in point of diversion of 1.574 maf of water on the lower Colorado River. The impact analysis in Chapter 4 of the HCP and Chapter 5 of the BA explains and quantifies how the future changes in river flows will affect river surface levels and groundwater elevations, and the corresponding effects on the covered species.

The analysis of the impacts includes evaluation of the changes in river flows, reservoir levels, and groundwater elevation that would occur when the future changes in point of diversion are implemented. The results of this analysis are summarized in the HCP (section 4.2.2) and the BA (section 5.2.2). A detailed description of the hydrology model used to calculate how the future changes in point of diversion would affect the river is included in Appendices J, K, L, and M. Through this analysis, the impacts of future changes in point of diversion of 1.574 maf of Colorado River water were fully considered in developing the Conservation Plan.

As described in Responses to Comments CDFG-8a and CDFG-44, a careful approach was used in analyzing the effects to covered species' habitat that results from the changes in river flows, reservoir levels, and groundwater elevations. The scope of the effects on the covered species is summarized in Table 4-5 in the Final HCP and Table 5-5 in the Final BA. The LCR MSCP participants believe that the impact analysis overestimates the amount of impacts to covered species' habitat. Furthermore, participants believe that the creation of 8,132 acres of native habitat, the fish augmentation program, the measures to protect existing habitat, and the species-specific avoidance and minimization measures are sufficient to fully mitigate the effects of implementing the ongoing and future covered activities.

DW-1c See Response to Comments AGFD-6 and AGFD-21.

DW-2 See Response to Comment CDFG-2 for the scope of analysis of the NEPA/CEQA document. The HCP (Chapter 4) and BA (Chapter 5) inform the reader of the impacts on covered species that would result from the covered activities. They further describe the Conservation Plan that would be implemented to fully mitigate these impacts. The LCR MSCP participants disagree with the commenter's conclusion, and believe that the benefits of the Conservation Plan outweigh the effects of the covered activities.

DW-3 Each of the elements in this summary of comments is addressed in the Responses to Comments immediately following.

DW-4 The BA does contain a description of the proposed action (see Chapter 2 of the Final BA). As noted in this comment, the agencies consulting with the Service were inconsistently identified among sections of the Draft BA and the Draft HCP. The Final BA and Final HCP have been revised to consistently indicate that Reclamation, Western Area Power Administration (Western), National Park Service (NPS), Bureau of Indian Affairs (BIA), the Service, and the Bureau of Land Management (BLM) are the Federal agencies seeking consultation under the LCR MSCP.

DW-5 Western is seeking coverage under the LCR MSCP for ongoing operations. Ongoing operations and activities on the LCR for the generation of hydroelectric power at Hoover, Davis, and Parker dams are conducted pursuant to the Joint Operating Agreement (JOA) between Western and Reclamation dated February 8, 1980, which was developed to implement section 302(a)(1)(E) of Public Law 95-91. Reclamation and Western also entered into a master agreement dated March 26, 1980, to implement section 302(a)(1)(E) of Public Law 95-91, the principles agreed to by the Commissioner of Reclamation and the Administrator of Western, and to memorialize the intent to optimize power benefits while preserving other project benefits. The JOA recognizes the requirement to maximize the economic value of such power generation within the constraints of the water release schedules.

Under the JOA, at any hour, if Western schedules power to fulfill its contractual commitments and water is on order to supply that power and capacity request, Reclamation is obliged to make the power resource available (i.e., put generator units online and release the water through them). If Western requests power when water is not on order, Western is obligated to purchase power from other sources to satisfy the contractual agreements. The generation of electricity is consistent with the operational parameters contained in Reclamation and Western's JOA, and is a byproduct of Reclamation's operation of the river in accordance with the priorities pertaining to the LCR which are established by statute.

For purposes of the LCR MSCP BA, Reclamation assumes, and the hydrologic modeling is based upon, the assumption that current operating conditions and practices will continue throughout the 50-year period. Thus, ongoing power operations for the term of the LCR MSCP are covered actions and any impacts have been fully analyzed in the impact analysis.

Existing contracts, renewal of existing contracts, extended contracts, and new contracts do not change LCR operations and do not determine the availability of generation resources. When hydropower generation is insufficient to fulfill contractual commitments, Western purchases power from other sources to meet contractual requirements. Regardless of any contract activities undertaken by Western, all impacts associated with water releases (and associated power generation) have been fully analyzed for the full term of the LCR MSCP (50 years) in the LCR MSCP documents.

DW-6 The BA text cited in this comment is incorrect and has been revised to reflect that the BA will not be relied upon by the Service during intra service section 7 consultation on the section 10(a)(1)(B) permit application. The Service will use the BA in the evaluation of the Federal covered activities for which Reclamation is acting as the lead agency for the consultation.

DW-7 The BA has been revised to incorporate information pertaining to previous programmatic consultations for BLM and the NPS. There are no existing consultations for BIA and Western in the programmatic LCR MSCP planning area.

DW-8 Reclamation believes that the statements contained in the Draft BA are correct.

The legal regime relevant to the delivery of water pursuant to the Supreme Court's Decree, relevant provisions of Reclamation law, and other applicable Federal laws (commonly referred to as the "Law of The River") simply cannot be condensed in their entirety in a BA or in this response in a manner that does not, in some way "oversimplify" the issue. The relevant issue is whether Reclamation's identified covered actions have been adequately identified, reviewed, and the potential impacts associated with such actions analyzed for the purpose of the prospective ESA coverage provided by the LCR MSCP.

Within the Lower Basin of the Colorado River, Reclamation's actions delivering, in "normal" years, 7.5 maf to entitlement holders within the states of Arizona, California, and Nevada are non-discretionary pursuant to the decree in *Arizona v. California*. With respect to the delivery to any particular entitlement holder, all entities are subject to the provisions of Reclamation law that limit use of project water to that required for beneficial use, in addition to other limitations imposed by other applicable Federal statutes, or individual water delivery contracts (such as maximum quantity of use, place of use, or type of use). The annual process undertaken by Reclamation pursuant to 43 C.F.R. Pt. 417 implements these statutory and contractual provisions through a process that facilitates the Secretary's water master functions pursuant to the Decree. Reclamation's detailed analysis pursuant to Pt. 417 of the Imperial Irrigation District's use of Colorado River water in CY 2003, pursuant to court order, was based on the unique facts and circumstances applicable in that year. Any water that is either unused by a water entitlement holder, or is not beneficially used by a water entitlement holder, becomes available to the next junior water entitlement holder in the relevant Lower Division State. If senior water entitlement holder "A" has a beneficial use for its full entitlement, Reclamation's delivery of water to that entity is nondiscretionary. If senior water entitlement holder "A" is not using – or not beneficially using – a portion of its Lower Basin entitlement in any year, Reclamation's subsequent delivery of the unused water to junior water entitlement holder "B" is also nondiscretionary. As part of its duties pursuant to applicable Federal law, Reclamation makes annual determinations regarding use and delivery of mainstem Colorado River water. Among the considerations relevant to these annual determinations is the volume of water available in that year, and the met (and unmet) demands of water entitlement holders in the relevant Lower Basin state.

DW-9 Section 4.2.1 of the Final EIS/EIR has been modified to indicate that environmental compliance has been completed for this project. A Categorical Exclusion was prepared for *Repairs and Modifications to the Yuma Mesa Conduit Drainage System* (YAO-CE No. 2001-02) on March 16, 2001. On September 7, 2003, the Categorical Exclusion was supplemented by an analysis entitled *Effects on Riparian and Marsh Communities along the Colorado River Due to Water Table Reduction in the Yuma Valley*.

DW-10 On October 6, 2003 the Secretary of the Interior adopted the Inadvertent Overrun Policy (IOP) as part of the Colorado River Water Delivery Agreement Record of Decision. See 69 Fed. Reg. 12202, 12208-09 (Mar. 15, 2004). Upon its adoption, the IOP became applicable to all of the entitlement holders in the Lower Basin States, thus this comment's statement that the IOP was "extended" to Arizona is incorrect.

Arizona was included in the modeling analysis undertaken prior to adoption of the IOP. In that analysis, future overruns within Arizona were considered negligible. The magnitude of inadvertent overrun account balances were analyzed in total, regardless of which entities were projected to incur overruns

and paybacks. This approach as part of the analysis of the LCR MSCP is consistent with the IOP analysis used for both the baseline and future flow modeling.

DW-11 The Federal agencies intend to address all covered activities identified in Chapter 2 of the BA through the programmatic section 7 consultation conducted through the LCR MSCP. At the time any formal proposal is made to go forward with future covered activities, Reclamation (or other Federal agencies) would, in coordination with the Service, conduct project-specific review to ensure consistency with the impact analysis undertaken for adoption of the LCR MSCP. Reclamation committed to undertaking this future consistency analysis in the Draft BA; for example, in BA section 2.2.2.3 (future flow-related activities). This issue has been clarified with a more general reference in BA section 1.4.2.

DW-12 See Response to Comment NWF-2.

DW-13 See Response to Comment NWF-3.

DW-14 The action area is defined in BA section 1.4.1. The BA has been revised to state that the action area is coterminous with the LCR MSCP planning area. The coverage provided by the scope of the consultation is appropriate and consistent with the coverage anticipated in the 1997 BO, which required Reclamation to participate in a long-term species conservation approach on the LCR (e.g., participation in such as the LCR MSCP as described in the 1997 BO). See 1997 BO reasonable and prudent alternative (RPA) #12 at 163.

Based on the analysis of effects, the action area and the planning area are the same. The direct and indirect effects of implementing the covered activities within the LCR MSCP planning area are described in BA sections 5.5, 5.6, and 5.7. The potential for indirect effects of implementing the covered activities outside of the LCR MSCP planning area is described in BA section 5.10. The ESA regulations define indirect effects as effects that are caused by a proposed action and are later in time, but still are reasonably certain to occur (50 C.F.R. 402.02). As described in BA section 5.10, the best available information indicates that the ongoing and future covered activities would not cause effects on listed or proposed species, nor would such potential for effects be reasonably certain to occur outside the planning area.

With respect to future covered activities, the LCR MSCP provides programmatic ESA coverage for the mainstem of the Colorado River separate from any off-river non-mainstem complementary compliance activities. This approach is consistent with previous consultations undertaken in the Colorado River Basin. For example, in previous consultations, Reclamation addressed mainstem Colorado River compliance for a change in point of diversion separate from any off river non-mainstem impacts, which were addressed through complementary compliance activities (see e.g., 2001 BO). To the extent covered projects materialize, the future areas that are not addressed in this action area may require subsequent ESA consultation. Areas outside the LCR MSCP planning

area may also be subject to independent ESA coverage (e.g., through regional conservation planning activities efforts such as the Clark County MSHCP, the San Diego County HCP or other appropriate programs' planning activities).

DW-15 See Response to Comment DW-14. With respect to the comment's reference to species outside of the territorial border of the United States, the Federal agencies have carefully developed the scope of the section 7 consultation for the LCR MSCP. Based upon the unique circumstances involving other sovereign nations, the Federal agencies have included an express limitation on requested coverage, as provided in the Draft BA, at 2-1, for any potential consultation requirement for areas within the Republic of Mexico. See Response to Comment CL-1. To the extent that any such consultation is required for such prospective covered activities, the Federal agencies will address such compliance at the time any discretionary Federal actions are actually proposed. In the future, if the activities are actually proposed for adoption, the Federal agencies would undertake specific reviews of the potential impacts of the actions at the time of the proposals, review the applicable provisions of Federal law, regulations and case law at that time, and review whether any additional section 7 consultations need to be undertaken prior to adoption of the proposed action. In contrast with ongoing operations, such covered activities may never be proposed, or proposals for such activities may be decades in the future. The Federal agencies believe that this approach will best address all appropriate foreign policy considerations at the time of any such proposed action.

DW-16 The Federal agencies have carefully developed the scope of the section 7 consultation for the LCR MSCP. Based upon the unique circumstances involving other sovereign nations, the Federal agencies have included an express limitation on requested coverage, as provided in the Draft BA, at 2-1, for any potential consultation requirement for areas within the Republic of Mexico. See Response to Comment CL-1. To the extent that any such consultation is required for such prospective covered activities, the Federal agencies will address such compliance at the time any discretionary Federal actions are actually proposed. In the future, if the actions are actually proposed for adoption, the Federal agencies would undertake specific reviews of the potential impacts of the actions at the time of the proposals, review the applicable provisions of Federal law, regulations and case law at that time, and review whether any additional section 7 consultations need to be undertaken prior to adoption of the proposed action. In contrast with ongoing operations, such covered actions may never be proposed, or proposals for such actions may be decades in the future. The Federal agencies believe that this approach will best address all appropriate foreign policy considerations at the time of any such proposed action.

Subject to this express reservation, the Conservation Plan does, in fact, provide for the conservation of covered species to address *all* Federal actions along the LCR described in Chapter 2 of the LCR MSCP BA.

DW-17 Reclamation believes that the action area is correctly defined and that the effects analysis has been appropriately described. See Response to Comments CL-1, DW-14, and DW-16.

DW-18 Reclamation and the Service strongly disagree with assertions that the May 1997 BO failed to meet the legal requirements of Federal law in any manner. In fact, this particular BO has been reviewed by the U.S. District Court for the District of Arizona (Phoenix, Arizona, 1997), the U.S. Court of Appeals for the Ninth Circuit (1998), and the U.S. District Court for the District of Columbia (Washington, D.C., 2003) and all three Federal courts have found the referenced BO consistent with applicable provisions of Federal law. Defenders of Wildlife participated in all three phases of Federal litigation.

Reclamation notes that the status of certain covered species has improved at a faster rate than anticipated at the time of the issuance of the 1997 BO. Subsequent to issuance of the 1997 BO, the Service issued a BO in 2002 (Reinitiation of Formal Section 7 Consultation on Lower Colorado River Operations and Maintenance – Lake Mead to Southerly International Boundary, Arizona, California, and Nevada, April 30, 2002) that found that the biological status of the bonytail, razorback sucker, and southwestern willow flycatcher had in fact, improved since 1997. For example, since 1997, extensive annual surveys of over 130 sites resulted in identification of several populations of breeding flycatchers. In the recent analysis it was determined that several populations show a stable and increasing trend (McKernan and Braden 2002). The comment fails to note this important information on the current status of the covered species.

It should be noted that the purpose of the 1997 BO was to provide interim coverage for the Reclamation actions under consultation while the LCR MSCP was being developed and was not intended to permanently address all of the needs of the affected listed species. The RPAs in the 1997 BO were designed to improve the status of the bonytail, razorback sucker, and southwestern willow flycatcher during that interim period and, as described in the 2002 BO (page 19), were successful in doing so.

DW-19 In their BA for the extension of the operations and maintenance consultation, Reclamation listed the status of all RPAs and reasonable and prudent measures (RPMs) required under the 1997 BO. In the 2002 BO, the status of those RPAs and RPMs was confirmed. All "continuing" RPAs and RPMs (those related to monitoring, research and reporting) had been accomplished through the term of the 1997 consultation, and provision for their implementation through the extension period was assured. The two incomplete RPAs (razorback sucker stocking and construction of isolated backwater habitats) were not completed at the time of the re-initiation. The Service agreed with Reclamation's request to provide additional time to complete these two RPAs within the time period of the extension (to April 30, 2005). Because these RPAs were not completed within the original term, Reclamation added a new conservation measure for the

razorback sucker to provide additional conservation to offset the incomplete RPAs. This measure provided for a research study to assess movements and fate of stocked razorback suckers in the reach below Parker Dam. Preliminary data from this research has documented movements and habitat uses by these stocked fish that would not have been known. This additional conservation has benefited the ongoing conservation programs.

The comment's assertion that there has been "no significant improvement" to the biological status of the species is not consistent with the best available information and Reclamation's 2002 BA, along with the Service's 2002 BO on the Continued Discretionary Operations and Maintenance of the LCR. Examples of this include the following:

- Presence/absence surveys and life history studies for the southwestern willow flycatcher have been conducted annually since 1996 for approximately 130 sites and four major life history sites. The life history studies have initially concluded that the population at these sites are steady and may be slightly increasing (McKernan and Braden 2002). Survey efforts have documented the LCR population more completely and provided new information on habitat use, nest parasitism, and predation than was known in 1997.

- 1,400 acres of suitable southwestern willow flycatcher habitat have been acquired either in fee title or through conservation easements by Reclamation.

- Interagency agreements with BLM were put in place to increase fire protection along the LCR to reduce the threat of fire to occupied southwestern willow flycatcher habitat.

- Facilities (including Willow Beach hatchery and Bubbling Ponds hatchery) were upgraded to produce and stock 50,000 razorback suckers into the LCR below Parker Dam. Restocking of the full 50,000 razorback suckers will be complete by April 30, 2005.

- As of 2002, 300 acres of backwater have been modified for native fish habitats.

- Reclamation has been involved in the ongoing razorback sucker study in Lake Mead since 1997. Tagging studies of razorback suckers have taken place since 1997. Significant new information on recruitment to the wild razorback sucker population in Lake Mead has been developed (Holden et al. 2000) that indicates some degree of successful recruitment is occurring.

- Two demonstration sites for restoration of native cottonwood-willow riparian habitat have been completed. Monitoring for riparian bird species including the southwestern willow flycatcher is currently being

conducted. To date, migratory southwestern willow flycatchers have been found to utilize both sites.

- A Yuma clapper rail management plan was completed for areas under Reclamation's management authority, and clapper rail surveys have been conducted by Reclamation yearly since 1996. These surveys, along with range-wide surveys, indicate the Yuma clapper rail may be expanding their range within the southwestern United States, including into areas such as the Las Vegas Wash and the Virgin River.

DW-20 The effects of implementing the Federal and non-Federal covered activities and the LCR MSCP are described for each covered species, including designated critical habitat within the LCR MSCP planning area, in BA sections 5.5 and 5.6, respectively. The effects determinations are summarized in BA Table 7-1. BA sections 5.5.4.4 and 5.5.6.4 have been revised to clarify the potential for impacts on bonytail and razorback sucker critical habitat, respectively.

The elements of the environmental baseline from which the potential effects of implementing the covered activities on covered species are assessed as summarized in BA section 4.3. In this section, the potential effects of implementing the covered activities on the covered species are appropriately assessed relative to the environmental baseline.

DW-21 Hydrologic modeling conducted for the Draft BA/HCP utilized the best available hydrologic information at that time. The modeling was based on actual December 31, 2002 elevations of Colorado River reservoirs and the most up-to-date, verified historic record of natural flow in the river system over the 85-year period from 1906 through 1990.

In response to this comment, Reclamation conducted additional analyses based upon modeling that utilized updated hydrologic information. The new model runs were based on the actual September 30, 2004 elevations of Colorado River reservoirs (including Lake Mead) and the most up-to-date, verified natural flow data (including years 1991 through 1995). The evaluation is published in section III of this document, and is included as Attachment E to Appendix J of Volume IV, *Appendices to Volumes I–III*, of the Final LCR MSCP documents.

The potential effects of the updated information on future LCR reservoir and river operations conditions were evaluated. The evaluation is consistent with those previously conducted and is intended to provide an indication as to whether the updated hydrologic information has an effect on the previous impact analysis in the Draft BA/HCP. In particular, this evaluation was conducted to determine the following:

- effect on Lake Mead water surface elevations,
- effect on the river corridor (Reaches 3–5), and
- effect on flows to Reach 7.

For each of these three topic areas, the evaluation presents (1) a summary of the results from the previous hydrologic modeling, (2) a summary of the results from the new hydrologic modeling,(3) a comparison of the new to previous hydrologic modeling results, and (4) an analysis of the effect of the new hydrologic modeling on biological resources.

The evaluation concluded that the inclusion of the updated hydrologic information does not identify any significant new impacts or change the conclusions of effect to covered species in the Draft BA/HCP, and that no changes are required to the Final BA, Final HCP, and Final EIS/EIR.

DW-22 The analysis of the potential effects of OM&R activities was not deleted from the effects analysis. The analysis of ongoing non-flow related OM&R activities was presented in section 5.3 of the Draft BA and the ongoing flow related impact mechanisms were discussed in section 5.2.2. The analysis of the potential effects of ongoing OM&R activities has been expanded in the Final BA through the addition of section 5.2.2.3. As discussed in section 5.2.2.3, it is difficult to disaggregate the potential effects of continuing operations from the past and continued effects of past actions in the baseline. The LCR MSCP appropriately analyzes the potential effects of ongoing OM&R activities and provides comprehensive conservation measures that address the potential effects of ongoing OM&R activities as well as future covered actions.

DW-23 Please refer to Response to Comment DW-22.

DW-24 See Response to Comment NWF-4.

DW-25 The determination of the likelihood of effects from implementing the covered activities and the LCR MSCP on each covered species and designated critical habitat is summarized in BA Table 7-1. The overall potential effects from implementing the covered activities and the LCR MSCP on each of the covered species is described in the first paragraph of each species effects analysis, set forth in section 5.5 of the BA.

BA Chapter 7 has been revised to clarify that, with implementation of the LCR MSCP Conservation Plan, any effects resulting from Reclamation's proposed discretionary and nondiscretionary activities along with the Conservation Plan would not measurably affect covered species populations.

DW-26 As described in BA Chapters 2 and 5 and HCP Chapter 4, the LCR MSCP Conservation Plan does not "double-dip" on conservation measures. A portion of the 1.574 maf change in point of diversion was covered for four currently listed species in the January 2001 BO. As part of the covered activities, under both the LCR MSCP BA and the HCP, the entire 1.574 maf change in point of diversion is included in the impact analysis for all covered species. Accordingly, it is appropriate to include the mitigation associated with those impacts as part of the LCR MSCP conservation measures.

DW-27 Hydrologic modeling conducted for the Draft BA/HCP utilized the best available hydrologic information at that time. The modeling was based on actual December 31, 2002 elevations of Colorado River reservoirs and the most up-to-date, verified historic record of natural flow in the river system over the 85-year period from 1906 through 1990.

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The evaluation concluded that the inclusion of the updated hydrologic information does not identify any significant new impacts or change the conclusions of effect to covered species in the Draft BA/HCP, and that no changes are required to the Final BA, Final HCP, and Final EIS/EIR.

DW-28 Reclamation's annual management actions on the Colorado River rely on modeling approaches that utilize recorded hydrological data compiled over the past century. Reclamation believes that utilization of this actual hydrologic data provides the best basis for ongoing Colorado River management activities. Accordingly, Reclamation has utilized this approach as a foundation for the modeling assumptions in the LCR MSCP. For Reclamation to use a different modeling approach in the LCR MSCP would conflict with all of the other Colorado River management actions that Reclamation has taken and is currently taking. It is important to note that by periodically including additional hydrologic data, Reclamation will account for changes related to runoff patterns and or human demand. While this particular comment focuses on potential

effects of climate change on inflows into the Colorado River, this is just one of many variables that may affect runoff and demand within the Colorado River Basin. Attempting to predict global changes in climate, shifts in demographic patterns, and other factors affecting Colorado River hydrology are far more speculative than Reclamation's reliance on actual annual hydrologic data.

DW-29 Reclamation disagrees with the commenter's conclusions. Extension of the Interim Surplus Guidelines (ISG) through 2051 was included as a covered activity for the model for the purposes of future ESA coverage for any potential take associated with this identified future action. No assumption of the likelihood of extending the ISG through 2051 was made.

The inclusion or exclusion of a covered activity in the LCR MSCP does not provide any certainty regarding the likelihood of the DOI's position in the future as to the proposal or adoption of the identified action. The action's inclusion merely indicates that the impacts of the identified action have been included within the impact analysis for the LCR MSCP, and therefore ESA coverage has been sought for the planning area of the LCR MSCP.

Metropolitan's deferral of surplus in Calendar Years 2003 and 2004 is irrelevant to the question of whether Reclamation is seeking coverage for a potential extension of the ISG. Reclamation's inclusion of the potential future extension of the ISG in its identified covered activities does not indicate any position by the DOI on whether future extension of the ISG beyond 2015 is either warranted or appropriate. Likewise, inclusion of this (or any other) specific covered activity does not constitute any statement regarding the DOI's views on what positions the seven Colorado River Basin States may take on this or any other Colorado River management issue.

DW-30 This comment suggests that while the assumption of flows to the Cienega de Santa Clara is accurate, the modeling assumption should be rephrased "to remove any reference to operating the [Yuma Desalting] Plant; Reclamation may simply assume the bypass has been replaced without specifying how." Comment Letter at p. 9. If this suggestion were accepted, it would not change the technical analysis presented in Appendix J with respect to flows of the Colorado River below Hoover Dam or impacts to habitat of covered species; it would merely "assume" some unidentified future action reduced the bypass flows. It is appropriate for Reclamation's technical appendices to reference the possibility that utilization of the Yuma Desalting Plant could provide the mechanism to treat the water currently bypassed to the Cienega; this is the reason the plant was built, as provided in Minute No. 242 of the 1944 Water Treaty, and as authorized by Congress in the Colorado River Basin Salinity Control Act of 1974 (codified at 43 U.S.C. section 1571 note).

By including this reference, Reclamation is not proposing to operate the Plant, nor does the LCR MSCP attempt to quantify impacts of operation of the Plant or provide coverage for any potential impacts of Plant operation on listed species.

The LCR MSCP BA need not consider the effects of potential future operation of the Plant merely because of this modeling reference. As explained in the Draft BA at Chapter 5, page 5-4, a depletion of 120,000 afy from 2003–2020 was assumed in the model to represent the water that is currently bypassed to the Cienega de Santa Clara. The model further assumes that this depletion will be reduced to 52,000 afy beginning in 2023. As noted in Appendix J, this assumption is intended only to provide a thorough and comprehensive accounting of Lower Basin water supply and does not assume that operation of the Plant will occur.

DW-31 This statement provides the commenter's conclusions with respect to the specific comments that follow. See Response to Comments DW-32 through DW-62. For reasons including those summarized in the following responses, the participating agencies disagree with the legal conclusions embodied in this comment.

DW-32 The purpose of the HCP is to provide a basis for the Service to issue a section 10(a)(1)(B) permit for incidental take. Such a permit may be issued to authorize take otherwise prohibited by section 9 of the ESA, however, section 9 only applies to take within the United States or the territorial sea of the United States. For that reason, the HCP does not include the Colorado River below the Southerly International Boundary.

With the construction of dams to control flooding of the Colorado River, the Salton Sea basin is no longer fed by meanders and floods of the river and for that reason was not included in the HCP.

See Responses to Comments EPA-3a, CL-1, DW-14, and DW-16 (addressing the geographic scope of the analysis in the BA).

DW-33 As indicated in the LCR MSCP Conservation Plan, LCR MSCP conservation measures are not proposed for implementation in Mexico. Draft EIS/EIR Figure 2.1-7, HCP Figure 3-8, and BA Figure 4-8 correctly depict the LCR MSCP planning area boundary, but are overlaid on a U.S Geological Survey (USGS) base map from an earlier date. A note has been added to these figures explaining that the U.S.-Mexico border is based on the centerline of the Colorado River channel, which has changed over time. Thus, while the habitat appears to be located in Mexico, this is a function of overlaying a more current map on an older map.

DW-34 All of the covered activities described in HCP Chapter 2 and BA Chapter 2 will be implemented within the LCR MSCP planning area. The HCP has been revised to clarify that the drain and canal maintenance activities described in HCP Chapter 2 only include maintenance of drains and canals within the LCR MSCP planning area.

DW-35 The Final EIS/EIR was revised to exclude the language regarding implementing conservation measures on tributaries to the mainstem Colorado River in

Alternative 1. Potential effects of implementing Conservation Plan measures outside of the LCR MSCP planning area are described under the effects analysis for Alternative 4.

DW-36 Section 3.4.2.1 in the Final EIS/EIR section has been revised to reflect that habitat loss is not the sole factor or basis for calculating take levels (see also HCP Table 4-6).

DW-37 This statement provides the commenter's conclusions with respect to the specific comments that follow. See responses to specific comments that follow this summary comment.

DW-38a The avoidance and minimization measures described in HCP section 5.6.1 have been revised to include greater specificity regarding avoidance and minimization actions that would be implemented, as appropriate, for the types of activities covered under the HCP. A summary of how the Conservation Plan would minimize and mitigate effects of covered activities to the maximum extent practicable is provided in HCP section 5.9.

DW-38b The conservation measures do not rely on uncertain actions or inadequate water rights. The LCR MSCP HCP intends to coordinate implementation of the Conservation Plan with all relevant recovery implementation programs to ensure that benefits of implementing the LCR MSCP and species recovery programs for covered species are maximized. The LCR MSCP would implement the conservation measures using the adaptive management principles described in HCP section 5.12 in coordination with the Service. Also see Responses to Comments AGFD-6, AGFD-21, CL-1, NWF-10, and DW-48.

DW-39 The LCR MSCP correctly identifies a variety of mechanisms for creating and maintaining habitats in perpetuity. The specific appropriate mechanism for securing permanent mitigation sites would depend primarily on landownership (e.g., establishing permanent mitigation on Federal lands would require a different mechanism than establishing permanent mitigation sites on private lands).

As described in HCP section 5.10, the timing of implementing LCR MSCP covered activities and conservation measures cannot be specifically identified at this time because of uncertainties regarding when the need to implement a specific covered activity may materialize and the time required to collect detailed information necessary to ensure that created habitats are successfully established. Although not required under the ESA, the LCR MSCP intends, as described in HCP section 5.10, to create habitat in advance of when impacts of future covered activities are incurred.

HCP section 5.4.2 describes the process whereby the LCR MSCP would develop detailed criteria in conjunction with the Service and identifies a set of more general, broad-based criteria from which they would be developed. The level of commitment to maintain existing habitat is established as the amount of habitat

that can be maintained by the $25 million LCR MSCP initial contribution within the first 10 years following HCP approval, plus the interest accrued on the initial contribution over the term of the LCR MSCP.

This comment incorrectly states that the 37,526 acres of initially identified conservation areas described in HCP Table 5-6 and the additional 270,500 acres of agricultural lands represent nearly the entire 717,814-acre LCR MSCP planning area (HCP Table 3-8). The 30 initially identified conservation areas identified in HCP Table 5-6 are lands for which sufficient information has been previously developed (both by the LCR MSCP and others) to indicate that site conditions suitable for creating habitat are likely present, but for which additional site analysis would be required to confirm their suitability. Other lands in the LCR MSCP planning area for which preliminary site information is not available also are likely suitable for creation of habitats. Most agricultural lands within the LCR MSCP planning area are presumed to support soils, water sources, and topography that would also be suitable for creating habitat. HCP section 5.5.1 has been revised to indicate that, based on the best available information, there are sufficient lands available within the LCR MSCP planning area to ensure the creation of 8,132 acres under the LCR MSCP.

Impacts of implementing the covered activities would occur in all river reaches. As described in Final HCP Table 5-5, however, LCR MSCP habitats that would be created for each species must be created within reaches of the river that are occupied by and accessible to the species. The only exception to this tenet would be areas where backwaters would be created where the bonytail currently are not present, but would be stocked in the future under the LCR MSCP.

In addition, habitats created for species with restricted ability to move among habitat patches (e.g., Colorado River cotton rat) must be located near known occupied habitat to facilitate the future occupancy of the created habitat. Consequently, we have not included a site selection criterion (HCP section 5.5.1) emphasizing the need to locate created habitats near impacted habitats, but instead have focused on proximity to occupied habitat.

DW-40 See Response to Comment CDFG-56.

DW-41 The only reason that the stocking targets identified in the Conservation Plan to benefit razorback suckers and bonytail would not be undertaken is if, over the term of LCR MSCP implementation, other approaches to conservation of these species are identified that would provide greater biological benefit to these species.

As described in HCP section 5.12.2.2, the conservation measures to stock bonytail and razorback sucker are designed as adaptive management experiments. A sufficient number of fish would be tagged and stocked early in LCR MSCP implementation to provide a statistically valid basis for conducting bonytail and razorback sucker monitoring and research studies. Monitoring and research would be implemented to collect the information necessary to eliminate existing

uncertainties regarding the ecology and management needs for these species in the LCR including, as described in HCP section 5.12.2.2, determining the key environmental correlates affecting survival, growth, movement, and reproduction of the bonytail and razorback sucker (e.g., key habitat [e.g., depth, velocity, channel form, cover, substrate], continuity, water temperature, food, predation). The number of bonytail and razorback suckers that would be stocked over the term of the LCR MSCP may change if results of monitoring and research indicate that the funds provided for rearing and stocking these species would make a greater contribution towards their recovery if they were redirected towards implementing other types of management actions (see HCP section 5.12.2.2). If results of monitoring and research indicate, however, that continued stocking of bonytail and razorback sucker is the most effective management action for contributing towards the recovery of these species, the full level of stocking described in HCP sections 5.7.4.2 and 5.7.6.2 would be undertaken. See also Response to Comment CDFG-56.

DW-42 See Response to Comment DW-38b.

As described in Response to Comment CDFG-56, the most important measure that can be undertaken at this time to mitigate effects and help ensure the eventual recovery of bonytail and razorback sucker is to augment the existing populations to reverse the current downward trend in abundance. The LCR MSCP would replace affected covered fish habitat with higher value habitat that would be managed to exclude nonnative fish predators/competitors. Because these species are not currently habitat limited in the LCR (i.e., establishing more habitat would not increase species abundance), the LCR MSCP correctly emphasizes stocking bonytail and razorback sucker rather than creating additional habitat. The conservation measures, therefore, are consistent with and complement reasonable and prudent measures included in previous BOs for activities on the LCR.

DW-43 The minimum performance criteria for created yellow-billed cuckoo habitat is presented in HCP Table 5-3, and the initial design and management concepts for created yellow-billed cuckoo habitat are described in HCP section 5.7.14.2. As described in HCP sections 5.6.2, 5.11, and 5.12, the LCR MSCP would undertake monitoring and research to better define the habitat requirements of and to refine habitat creation and management methods for covered species, including the yellow-billed cuckoo, through the LCR MSCP adaptive management process. Based on monitoring and research results, including relevant new information developed by others, the LCR MSCP is committed to adjusting habitat creation and management methods over the term of the LCR MSCP where such adjustments would improve the function of created habitats and are consistent with the adaptive management process described in HCP section 5.12.

DW-44 See Response to Comment NWF-8.

DW-45 See Response to Comment NWF-9.

DW-46 The LCR MSCP is intended to provide ESA incidental take coverage for covered activities for agencies within the states of Arizona and Nevada, along with covered activities of participating Federal entities (which include implementation of the Conservation Plan). These aspects of the program are not subject to the California statutory provisions referenced in the comment.

Issuance of an incidental take permit pursuant to 16 U.S.C. section 1538(a)(1) does not authorize a California permittee to violate California laws.

DW-47 The Clark County MSHCP provides mitigation for the sticky buckwheat and threecorner milkvetch to achieve the following goals: (1) no net unmitigated loss or fragmentation of habitat in Important Management Areas (IMAs) and Less Important Management Areas (LIMAs) and (2) maintain stable or increasing population numbers. While this level of conservation adequately addresses the covered activities in the Clark County MSHCP, it does not provide for other types of conservation that may be identified as needed for the species. The LCR MSCP contribution to the Rare Plant Work group would provide funding for conservation actions that would not be covered by the Clark County MSHCP.

We have revised sections 5.7.26 and 5.7.27 of the HCP to make it clear that we are providing funding for conservation measures identified in the Clark County MSHCP that are beyond the permit requirements of that program. The LCR MSCP agrees with the commenter that the $10,000 mitigation per year would not be counted as mitigation for the County MSHCP, but would instead be counted as mitigation for the LCR MSCP.

DW-48 The LCR MSCP documents have assumed the use of Colorado River water for implementation of the Conservation Plan in order to fully evaluate the potential for effects within the planning area. It was reasonable for the Draft EIS/EIR documents to assume the use of Colorado River water for a number of reasons, including proximity of likely conservation sites to the Colorado River, the available normal-year water supply of 7.5 maf, the presence of four National Wildlife Refuges with decreed water rights within the planning area, among other factors. Information on the effects of water use for habitat creation and maintenance is contained in section 3.9.2.1 of the Final EIS/EIR. The referenced information in Appendix N is not intended to indicate that the only potential source of water to accomplish the conservation measures in the LCR MSCP is mainstem Colorado River water. Non-Colorado River water supplies (either groundwater or surface water) may also be available and used to implement the conservation measures of the LCR MSCP.

The water supplies necessary to create and maintain the appropriate habitat function for the LCR MSCP conservation sites would be managed and utilized by Reclamation in its role as the implementing agency for the LCR MSCP. The water needed for the creation and maintenance of the LCR MSCP conservation measures would be obtained and used consistent with applicable provisions of law and existing entitlements. To the extent there are applicable limitations on

the availability of Colorado River water, there are a number of approaches that may be available to provide water necessary for the proposed conservation areas. For example, in prior circumstances, legal agreements have allowed the use of Colorado River supplies as part of an exchange of water from non-Colorado River sources (e.g., Colorado River Water Delivery Agreement, at Ex. B [Oct. 10, 2003] [published at 69 FR 12202, March 2004]). In this circumstance, while Colorado River water is in fact used for mitigation purposes by exchange, accounting of such water is consistent with applicable laws.

Acquiring the necessary water supplies to establish the 8,132 acres of restored habitat is one of the critical functions of Reclamation and the Program Manager and staff. First, the conservation area site selection criteria (described in HCP section 5.5.1) are intended to be utilized to aid in identification of sites that contain the following characteristics: (1) are biologically or ecologically important; (2) contain suitable site conditions; (3) contain requisite infrastructure; (4) have feasible land acquisition mechanisms (e.g., leasing or purchase); (5) and are associated with an adequate and assured water supply, or feasible mechanisms are available to acquire water and transfer it to the restored site. Consequently, the availability of an adequate and assured water supply is an inherent part of the process for selecting the sites for conservation measures to be implemented.

Prior to implementation of specific conservation measures, a site-specific assessment would be conducted to evaluate potential effects, including those related to water supply and water quality. The site selection criteria utilized in identifying the conservation areas selected for restoration require a thorough evaluation of potential sources and adequacy of water supply to meet the biological and ecological goals and objectives. The evaluation of the site selection criteria would include consideration of any acquired water supply.

DW-49 See Response to Comment NWF-10.

DW-50 The USIBWC's Lower Colorado River Boundary and Capacity Preservation Project is not a covered activity for the LCR MSCP, nor does the LCR MSCP Conservation Plan provide mitigation for the USIBWC's project.

As discussed in section 4.1 of the LCR MSCP EIS/EIR, the cumulative impact analysis evaluates whether the implementation of the Conservation Plan would have cumulative impacts when combined with other projects. The Conservation Plan would have long-term beneficial impacts on biological resources, and therefore, would not contribute to a long-term cumulative impact on biological resources regardless of the scope of biological impacts caused by other projects. For that reason, the following statement in the Final EIS/EIR is correct: "The extent to which long-term impacts on biological resources would occur as a result of the USIBWC project is not known at this time, but the long-term impacts of the proposed action would be beneficial and would not contribute to a cumulative impact in combination with the development project."

The LCR MSCP participants disagree with the comment that Reclamation's Yuma Area Water Resources Management Group Drainage Project would have cumulative impacts on Reach 7 of the Colorado River for the reasons stated in Response to Comment DW-9.

DW-51 See Response to Comment NWF-10.

DW-52 The participating agencies respect the efforts of the Cocopah Indian Tribe to address the biological resources of their reservation lands. As described in the Response to Comment NWF-10, LCR MSCP conservation areas would be selected through application of the site selection criteria described in the HCP section 5.5.1 and could include, on a voluntary basis, activities undertaken by others, such as the Cocopah Indian Tribe.

DW-53 See Response to Comment NWF-11.

DW-54 See Response to Comment NWF-12.

DW-55 See Response to Comment NWF-13.

DW-56 The LCR MSCP participants believe, as described in HCP section 5.9, that the Conservation Plan mitigates the effects of the covered activities and the Conservation Plan to the maximum extent practicable. The LCR MSCP disagrees with the commenter's legal conclusions regarding the standard "maximum extent practicable."

The HCP includes a discussion in Chapter 9 of other mitigation and minimization measures that were considered and rejected. The commenter does not suggest any additional measures that could be undertaken, with the exception of burrowing owl, which is not a covered species.

The Glen Canyon Dam Adaptive Management Program cannot provide funding for all potential conservation activities that would benefit the humpback chub in the Grand Canyon. However, the Program scientists do look at the entire conservation need of the species, and can identify worthwhile projects that are outside of the scope of the Program that could be funded by the LCR MSCP. Provision of funds to the Program for implementation of these conservation projects will contribute to the conservation of the humpback chub. The level of conservation provided by the LCR MSCP for the humpback chub is adequate to fully mitigate the amount of incidental take resulting from the covered activities.

The comment correctly notes that there is not a specific finding that "conservation activities in the Colorado River delta [in the Republic of Mexico] are impracticable." It is not the role of agencies, or any entity, in the United States to make a determination of the practicability of conservation measures in the Republic of Mexico.

The United States and the Republic of Mexico undertake many bi-national conservation projects, and the United States remains committed to undertaking such activities when consistent with national policy. The participating agencies do not, however, believe it would be appropriate for the LCR MSCP to rely on implementation of potential conservation measures in the Republic of Mexico as a basis for section 7 or section 10(a)(1)(B) compliance for covered activities within the United States (such as the ongoing operation of Hoover Dam and associated facilities).

To the extent that the United States and the Republic of Mexico undertake bi-national conservation activities in Mexico in the future, (whether in the Colorado River delta or elsewhere), such actions could complement the extensive conservation measures in Arizona, California and Nevada that are described in Chapter 5 of the HCP.

See also Response to Comment DW-47 (regarding conservation measures for sticky buckwheat and threecorner milkvetch).

DW-57 On August 17, 2004, during the public comment period, representatives of the States of Arizona, California, and Nevada submitted formal letters of financial commitment to the Secretary of the Interior in which they committed to "share the agreed upon LCR MSCP costs equally with the United States on a 50/50 Federal/non-Federal basis." With final approvals from their respective boards and commissions, they agree to memorialize this commitment "in a manner that meets the Service requirements for firm and clear funding assurances to support implementation of the program." These letters are attached in section II of this volume. The commitments memorialized in these letters have been incorporated into the relevant program agreements as described in the LCR MSCP HCP, and described below.

The estimated cost of the LCR MSCP is $626 million in 2003 dollars over the 50-year term of the program. This cost includes funding for land and water acquisition, habitat creation and management, species-specific conservation measures, protection measures for existing habitat, monitoring and research, and program administration. The funding commitments include increases in the funding support to match the effects of inflation on program costs and ensure full funding over the program's term. The funding would be provided by Federal, state, and local government agencies and entities that would receive incidental take authorizations under sections 7 and 10(a)(1)(B) of the ESA as part of the LCR MSCP.

In the event that program costs exceed the estimated amounts, the FMA and IA address the responsibility for such increased costs. A description of the funding assurances for the LCR MSCP is set forth in Chapter 7 of the HCP. A Draft Final FMA is attached as Exhibit A to the HCP and a Draft Final IA is attached as Exhibit B to the HCP.

As described in Draft HCP section 5.4.3 (page 5-11) the Conservation Plan describes the LCR MSCP's commitment for maintaining habitats created as mitigation for permanent impacts of covered activities, as appropriate, in perpetuity. As described in HCP Chapter 7, the LCR MSCP provides funding and funding mechanisms sufficient to fully implement the conservation plan consistent with the regulations set forth 50 C.F.R. Part 17, thus assuring that the mitigation would be implemented.

DW-58 Issuance of an incidental take permit pursuant to 16 U.S.C. section 1538(a)(1) does not authorize a permittee to violate other laws.

CDFG reviewed the LCR MSCP in light of State fully protected species laws and State enacted legislation. In a letter from Michael R. Valentine, General Counsel, California Department of Fish and Game to Steve L. Spangle, Field Supervisor, U.S. Fish and Wildlife Service, dated April 14, 2004, he concluded "In summary, the Department has the authority to authorize take of fully protected species under the LCR MSCP, because existing statutes, as well as non-codified legislative language, show that the Legislature intended to allow the Department broad discretion to authorize the take of fully protected species to help California meet its commitment to reduce its use of Colorado River water, and to allow take in and around the LCR, including activities under the LCR MSCP."

DW-59 See Response to Comment DW-58. California Fish and Game Code section 2081.7 requires a determination by the CDFG rather than the Service. The determination would be required when the applicants to whom California law is applicable seek to obtain authorization from the CDFG for take under California law.

DW-60 The LCR MSCP Final EIS/EIR section 7.1.3 has been revised to reference the California Endangered Species Act (CESA). The LCR MSCP activities conducted by project participants from the states of Arizona and Nevada and the Federal participating agencies are not subject to California permitting requirements, including CESA. California participating entities will evaluate their obligations under California law and will comply with those laws as applicable. Issuance of an incidental take permit pursuant to 16 U.S.C. section1538(a)(1) does not authorize a California permittee to violate California laws.

DW-61 When the Draft EIS/EIR was published, no Draft IA was available that represented the positions of the Federal and non-Federal entities participating in the LCR MSCP. There is no legal (statutory or regulatory) requirement to publish the IA prior to issuance of a section 10 permit. Aspects of the covered activities and the Conservation Plan relative to the section 10(a)(1)(B) permit requirements were made available for the comment period and were published in the Draft EIS/EIR, Draft BA, and Draft HCP. Any approved HCP must meet the statutory and regulatory provisions regarding assurance of funding.

On August 17, 2004, during the public comment period, representatives of the States of Arizona, California, and Nevada submitted formal letters of financial

commitment to the Secretary of the Interior in which they committed to "share the agreed upon LCR MSCP costs equally with the United States on a 50/50 Federal/non-Federal basis." With final approvals from their respective boards and commissions, they agree to memorialize this commitment "in a manner that meets the Service requirements for firm and clear funding assurances to support implementation of the program." These letters are attached in section II of this volume. The commitments memorialized in these letters have been incorporated into the relevant program agreements as described in the LCR MSCP HCP.

A Draft Final IA is attached as Exhibit B to the Final HCP. The JPA is now entitled the "Funding and Management Agreement." A Draft Final FMA is attached as Exhibit A to the Final HCP.

The Department regrets any confusion caused by including the words "Implementing Agreement" in the title of the Federal Register notice.

DW-62 The Federal agencies consulting with the Service under section 7 of the ESA are not requesting and cannot be granted no surprises assurances. In accordance with the ESA, Reclamation and other participating Federal agencies will be subject to reconsultation requirements, if warranted by future conditions.

The section 10(a)(1)(B) permit applicants will request "No Surprises" assurances for covered species through submission of the section 10(a)(1)(B) permit application. The Service will review the request and will provide or not provide the requested "No Surprises" assurances based on review of the LCR MSCP HCP and the Service's policy for issuance of "No Surprises" assurances in effect during the permit application review period.

The Service guidance for this post-court order period states that applicants may continue to prepare their HCP documents with requests for "No Surprises" assurances and submit them to the Service for processing. Until such time as the new rulemaking on Permit Revocation Rules is complete, the Service is prohibited from approving new incidental take permits containing "No Surprises" assurances. Language in the terms and conditions of the permit may reference "No Surprises" assurances requested, but specifically defines that they are not enforceable.

DW-63 The Final BA has been modified as suggested.

DW-64 The LCR MSCP documents were provided on the LCR MSCP website (www.lcrmscp.org), on CD and, in some instances, as paper copy for public review and comment. Please refer to either the website or CD provided earlier to view the table inadvertently missing from your paper copy.

DW-65 The reference to 915 above mean sea level (msl) is an error. The modeling used for the draft program documents was based upon the correct shortage level of 950 feet msl. The Final BA has been revised to address this comment.

DW-66 The LCR MSCP documents were provided on the LCR MSCP website (www.lcrmscp.org), on CD and, in some instances, as paper copy for public review and comment. Please refer to either the website or CD provided earlier to view the table inadvertently missing from your paper copy.

DW-67 The LCR MSCP documents were provided on the LCR MSCP website (www.lcrmscp.org), on CD and, in some instances, as paper copy for public review and comment. Please refer to either the website or CD provided earlier to view the table inadvertently missing from your paper copy.

DW-68 The Final BA has been revised to address this comment.

DW-69 The Final BA has been revised to address this comment.

DW-70 The Final BA has been revised to address this comment.

DW-71 The Final BA has been revised to address this comment.

DW-72 The Final BA has been revised to address this comment.

DW-73 See Response to Comment DW-33.

DW-74 The LCR MSCP documents have been revised to ensure species names are correct.

DW-75 The LCR MSCP documents have been revised to include the correct species conservation measure code designations.

DW-76 The text has been updated.

DW-77 See Response to Comment NWF-10.

DW-78 Your comments have been addressed, as appropriate, in the Final LCR MSCP documents.

Environmental Defense (Env. D), August 18, 2004

Env. D-1 See Response to Comment NWF-10.

Env. D-2 See Response to Comment NWF-11.

Env. D-3 See Responses to Comments NWF-12 and NWF-13.

Env. D-4 Comment noted.

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INDIVIDUALS

Comment Responses

Robert S. Lynch & Associates (RSLA), August 18, 2004

RSLA-1 Your comment is noted. The LCR MSCP is intended to be a comprehensive program by which the Federal agencies and the non-Federal parties are achieving all relevant ESA obligations for the covered species regarding the covered activities within the LCR MSCP planning area. The DOI considers the comment's reference to the nondiscretionary duty of the Secretary to capturing water in Lake Mead behind Hoover Dam to be a reference to the nondiscretionary injunction imposed by the U.S. Supreme Court in its Decree entered in *Arizona v. California.* In addition, the DOI considers the comment's reference to the release of water from Morelos Diversion Dam to refer to the United States nondiscretionary duties pursuant to the 1944 Water Treaty. These issues have been directly addressed in *Arizona v. California*, 376 U.S. 340 (1964); *Defenders of Wildlife v. Babbitt*, 130 F.Supp. 2d 121 (2001); and *Defenders of Wildlife v. Norton*, 257 F.Supp. 2d 53 (2003).

Inclusion of the full pool elevation of Lake Mead (Reach 1) is appropriate because some of the Federal and non-Federal covered activities (see BA Chapter 2 and HCP Chapter 2) may affect reservoir elevations at Lake Mead. Similarly, inclusion of Reach 7 is appropriate because Federal and non-Federal non-flow-related covered activities would be implemented in this reach. In addition, conservation areas could be established in Reach 7 as well.

RSLA-2 Section 10(a)(1)(A) permits would not meet the purpose and need of the proposed action. Based on guidance received from the Service, project Applicants elected to submit a section 10(a)(1)(B) permit application. If a section 10(a)(1)(B) permit is issued, the Service and the implementing entity will evaluate the need to issue section 10(a)(1)(A) permits for implementation of the monitoring and research component of the Conservation Plan.

RSLA-3 Both NEPA and CEQA require the consideration of a "no action" or "no project" alternative (40 C.F.R. 1502.14[d]; 14 Cal. Code of Regs. 15126.6[e]). The analysis must take into account the predictable actions by others if the proposed action is not implemented. The lead agencies disagree with the commenter's assertion that the true "no action" alternative would be to do nothing. It is reasonable to expect that individual agencies would seek to comply with existing legal requirements on a case-by-case basis if the LCR MSCP is not implemented, as they have in the past. It is also reasonable to expect that most of the actions proposed for incidental take authorizations will be implemented during the term of the LCR MSCP.

Absent proceeding with the LCR MSCP, for the participating Federal agencies, it is expected that consultations will be initiated and concluded in accordance with section 7 of the ESA. However, the text of section 2.1.2 of the Final EIS/EIR has been revised to include the reasonable possibility that potential non-Federal permittees would conclude that they do not require a section 10(a)(1)(B) permit for their actions, either because they choose not to implement those actions or

they determine that their actions do not cause incidental take of protected species.

The LCR MSCP provides an alternative to the existing action-by-action approach to endangered species permitting. It offers a comprehensive conservation program that will afford far greater benefits to covered species than the project-by-project review for Federally listed species that would occur under the no action alternative.

RSLA-4 See Response to Comment EPA-12.

RSLA-5 Your name will be retained for the Final EIS/EIR mailing list.

B. Sachau (BS), July 2, 2004

BS-1 Cessation of diversion of water from the Colorado River is not reasonable, feasible, consistent with applicable law, or within the scope of the LCR MSCP. Please see Response to Comment CDFG-2.

HCP section 5.6.1 includes avoidance and minimization measures to reduce the likelihood or impacts on the covered species. EIS/EIR section 3.4.2 includes mitigation measures that would avoid and minimize impacts of implementing the LCR MSCP HCP on special status species, covered species, and other sensitive species.

As indicated in Chapter 1 of the EIS/EIR, the LCR MSCP EIS/EIR does not revisit the authorization of any ongoing covered activity (including water diversions). Rather, it is limited to assessing the impacts of the ESA take authorization being requested for the covered activities and the impacts that would result from implementation of the Conservation Plan. Finding replacement water sources is outside the scope of the proposed action.

Carey L. Ochs (CO), July 21, 2004

CO-1 As described in HCP section 1.4.4, the LCR MSCP is seeking ESA compliance for the Federal and non-Federal covered activities described in BA Chapter 2 and HCP Chapter 2, respectively, for the next 50 years. The 50-year term of the LCR MSCP was established to allow for the implementation of all the BA and HCP covered activities and the successful implementation of the LCR MSCP Conservation Plan (for example, full development of functions of created habitat). In addition, HCP section 5.12 describes the adaptive management process under which the Conservation Plan will be implemented. This section provides for periodic evaluation of its implementation, including the implementation schedule.

The concerns regarding water sport impacts are noted. Impacts to recreational activities are addressed in section 3.15.2 of the EIS/EIR. As indicated in this section, developed and heavily used recreational areas would not be suitable for

habitat establishment and thus would not be directly affected by the proposed action. Thus, no changes to currently established recreation areas would result from implementation of the Conservation Plan. The section also notes that water-based recreation generally would not be affected by implementing the Conservation Plan because the water surface elevation of the Colorado River would not be changed, and the use of boating areas would not be restricted.

CO-2 See Response to Comment CO-1.

Dennis Bell (DB), June 26, 2004

DB-1 We will notify you of the availability of the Final EIS/EIR when it is released.

Common Letter (CL), August 11, 2004

CL-1 The geographic scope of the LCR MSCP is appropriate. It is possible to accomplish ESA conservation obligations through a conservation plan focused within the United States. Implementation of the proposed Conservation Plan within the United States would benefit covered species, including those that are associated with riparian and marsh communities, that migrate or otherwise have the ability to move between Mexico and the United States.

Extending the LCR MSCP to address habitat within the sovereign nation of Mexico is not consistent with the international relations between the United States and the Republic of Mexico or the relevant provisions of the ESA (see ESA section 8). Numerous bi-national efforts for cooperation on environmental conservation programs between the United States and the Republic of Mexico have been undertaken between the two nations and are currently underway. The Federal agencies and the non-Federal parties are achieving all relevant ESA obligations for the covered species regarding the covered activities within the LCR between the full pool elevation of Lake Mead to the Southerly International Boundary with Mexico. The United States has not ignored the existence of the Colorado River Delta within the Republic of Mexico; in fact the two nations are actively working on issues regarding the Mexican Delta pursuant to, among other processes, a binational agreement pursuant the 1944 Water Treaty (see Minute No. 306 of the 1944 Water Treaty, available at http://www.ibwc.state.gov). A recent Federal court decision regarding this issue concluded that Reclamation does not have a duty to consult pursuant to section 7 of the ESA for its actions in delivering water within the Lower Basin of the Colorado River to Mexico pursuant to 1944 Water Treaty. See *Defenders of Wildlife v. Norton*,_257 F.Supp. 2d 53 (2003). The approaches embodied in the LCR MSCP are consistent with, and rely upon the findings of the court in this case.

CL-2 The LCR MSCP is not a commitment to an undefined goal of restoration of historical conditions. Rather, the LCR MSCP represents a comprehensive plan by which the Federal agencies and the non-Federal parties are achieving all

relevant ESA obligations for the covered species regarding the covered activities within the LCR MSCP planning area.

Implementation of the LCR MSCP does protect and improve habitat for populations of the covered native species, as well as for other native species whose habitats would be provided by the created LCR MSCP land cover types. In this respect, the LCR MSCP is a commitment to, in part, the restoration of historic conditions in the LCR MSCP planning area (i.e., the presence of native species and native riparian, marsh, and backwater land cover types).

The LCR MSCP must be undertaken in light of existing and applicable statutory obligations (e.g., operation of the Boulder Canyon Project and associated works on the LCR). Federal law precludes undertaking many of the actions that would be required to return the LCR to predevelopment conditions, such as the removal of dams and appurtenant works.

The LCR MSCP is designed to contribute to the recovery of listed species and reduce the likelihood for future listing of non-listed species, which includes restoration of some elements of the historical ecosystem.

Implementation of the LCR MSCP does not preclude and, indeed, would complement, the development of other conservation programs in the future that would also restore portions of the historical LCR ecosystem. Also see Response to Comment CDFG-56.

CL-3 When the Draft EIS/EIR was published, no Draft IA was available that represented the positions of the Federal and non-Federal entities participating in the LCR MSCP. There is no legal (statutory or regulatory) requirement to publish the IA prior to issuance of a section 10(a)(1)(B) permit. Aspects of the covered activities and the Conservation Plan relative to the section 10(a)(1)(B) permit requirements were made available for the comment period and were published in the Draft EIS/EIR, Draft BA, and Draft HCP. Any approved HCP must meet the statutory and regulatory provisions regarding assurance of funding.

On August 17, 2004, during the public comment period, representatives of the States of Arizona, California, and Nevada submitted formal letters of financial commitment to the Secretary of the Interior in which they committed to "share the agreed upon LCR MSCP costs equally with the United States on a 50/50 Federal/non-Federal basis." With final approvals from their respective boards and commissions, they agree to memorialize this commitment "in a manner that meets the Service requirements for firm and clear funding assurances to support implementation of the program." These letters are attached in section II of this volume. The commitments memorialized in these letters have been incorporated into the relevant program agreements as described in the LCR MSCP HCP.

A Draft Final IA is attached as Exhibit B to the Final HCP. A Draft Final FMA is attached as Exhibit A to the Final HCP.

J.C. Martin I (JMI), August 16, 2004

JM1-1 Comment noted.

J.C. Martin II (JM2), August 16, 2004

JM2-1 Comment noted.

Mark Belles (MB), July 13, 2004

MB-1 Your name will be retained for the Final EIS/EIR mailing list.

MB-2 The portion of the LCR between the full pool elevation of Lake Mead and Glen Canyon Dam will not be affected by the covered activities. Therefore, this reach of the LCR is not included as part of the LCR MSCP. Aspects of conservation in this reach of the LCR are under the aegis of the Glen Canyon Dam Adaptive Management Program pursuant to the Grand Canyon Protection Act of 1992 (see Pub. L. No. 102-575, 106 Stat. 4600, Tit. XVIII, Oct. 30, 1992). Implementation of covered activities within the LCR MSCP planning area will have no effects on the LCR reaches extending from Glen Canyon Dam to the full pool elevation of Lake Mead. Also see Response to Comment EPA-3a.

MB-3 The operation of Glen Canyon Dam is not a covered activity of the LCR MSCP. Its effects on downstream resources are covered by a separate series of NEPA documents and an ongoing adaptive management program pursuant to the Grand Canyon Protection Act of 1992 (see Pub. L. No. 102-575, 106 Stat. 4600, Tit. XVIII, Oct. 30, 1992).

This comment and the following comments from this commenter provide information to support the commenter's position to study removal of Glen Canyon Dam. With respect to this issue, Congress has specifically required that "No funds appropriated for the Department of the Interior, by this Act or any other Act, shall be used to study or implement any plan to drain Lake Powell or to reduce the water level of the Lake below the range of water levels required for the operation of the Glen Canyon Dam" (PL 108-108 Sec. 132, signed 11/10/03).

MB-4 See Response to Comment MB-3.

MB-5 See Response to Comment MB-3.

MB-6 See Response to Comment MB-3.

MB-7 See Response to Comment MB-3.

MB-8 See Response to Comment MB-3.

MB-9 See Response to Comment MB-3.

MB-10 See Response to Comment MB-3.

MB-11 See Response to Comment MB-3.

MB-12 See Response to Comment MB-3.

MB-13 See Response to Comment MB-3.

MB-14 Comment noted. See Response to Comment MB-3.

MB-15 See Response to Comment MB-3.

Margaret Adam (MA), August 11, 2004

MA-1 See Response to Comment CL-1.

MA-2 See Response to Comment CL-2.

MA-3 See Response to Comment EPA-12.

Bobbie Flowers (BF), August 12, 2004

BF-1 See Response to Comment CL-1.

BF-2 See Response to Comment CL–2.

BF-3 See Response to Comment EPA-12.

Donald Lipmanson (DL), August 15, 2004

DL-1 See Response to Comment CL-1.

DL-2 See Response to Comment CL-2.

DL-3 See Response to Comment DW-61.

Ann Pinkerton (AP), August 16, 2004

AP-1 See Response to Comment CL-1.

AP-2 See Response to Comment CL-2.

AP-3 See Response to Comment DW-61.

Diana Singleton (DS), August 15, 2004

DS-1 See Response to Comment CL-1.

DS-2 See Response to Comment CL-2.

DS-3 See Response to Comment DW-61.

Alanna Louin (AL), August 16, 2004

AL-1 See Response to Comment CL-1.

AL-2 See Response to Comment CL-2.

AL-3 See Response to Comment CL-2.

AL-4 See Response to Comment DW-61.

Christel Allacher (CA), August 16, 2004

CA-1 See Response to Comment CL-2.

Terry Woods (TW1), August 15, 2004

TW1-1 Comment noted.

Terry Woods (TW2), August 15, 2004

TW2-1 See Response to Comment CL-1.

TW2-2 See Response to Comment CL-2.

TW2-3 See Response to Comment DW-61.

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PUBLIC HEARINGS

Transcript Responses

Henderson, Nevada (Henderson), July 20, 2004

Henderson-1 The LCR MSCP is designed to restore and improve conditions for 27 covered species through a combination of conservation measures that would be implemented by the participating agencies over the 50-year term of the program. The LCR MSCP, however, is not designed to modify conditions on the LCR to replicate those that existed prior to development of the infrastructure and facilities built over the past century. As described in HCP and BA sections 1.2, the LCR MSCP goal is to achieve the following:

- conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed;
- accommodate present water diversions and power production and optimize opportunities for future water and power development, to the extent consistent with the law; and
- provide the basis for incidental take authorizations.

The LCR MSCP Conservation Plan (HCP Chapter 5) describes the conservation measures that, when implemented, would achieve this goal. The creation of the LCR MSCP habitats and other conservation measures would contribute towards improving the environmental condition of the LCR ecosystem, and implementation of the LCR MSCP would not preclude implementation of subsequent conservation programs that would seek to restore additional elements of the ecosystem and, indeed, would complement such programs. As indicated in HCP section 5.10, all of the habitat would be created within 20 to 30 years following HCP approval, rather than the 50 years cited in this comment.

Henderson-2 Comment noted.

Blythe, California (Blythe), July 21, 2004

Blythe-1 Comment noted.

Blythe-2 See Response to Comment AGFD-3.

Blythe-3 Comment noted.

Blythe-4 Please refer to the revised Chapter 7 of the HCP for information regarding funding.

Blythe-5 As indicated in HCP section 5.5.2, the LCR MSCP would accord preference, to the extent consistent with the conservation area site selection criteria described in HCP section 5.5.1, to creating habitats on Federal, state, and tribal lands. If sufficient suitable public lands are not available, private lands would be acquired on a voluntary basis from willing sellers or leasers. The LCR MSCP anticipates that, should private lands be acquired for the purpose of creating habitats, they

would be acquired through lease or purchase based on the appraised fair market value.

Blythe-6 See Response to Comment CO-1.

Blythe-7 See Response to Comment CO-1.

Blythe-8 Comment noted.

Blythe-9 See Response to Comment CO-1.

Blythe-10 Chapter 4 of the HCP and Chapter 5 of the BA discuss the impacts of covered activities on the covered species within the LCR MSCP planning area. Chapter 5 of the HCP describes the conservation plan that provides mitigation for the effects of these covered activities on covered species and their habitats.

Blythe-11 The program is based on a maximum change in point of diversion of 1.574 mafy.

Blythe-12 The public hearing transcript is included in the Final EIS/EIR.

Blythe-13 Please refer to the revised Chapter 7 of the HCP for information regarding funding.

Blythe-14 Impacts to agricultural resources are in section 3.2 of the Final EIS/EIR.

Blythe-15 Please refer to section 2.1.1.6 of the Final EIS/EIR, "Timing of the Implementation of Conservation Measures."

Blythe-16 As indicated in section 2.1.1.4 of the Final EIS/EIR, site selection criteria include consideration of zoning and general plan designations, and as noted in section 3.11.2.1, the zoning of each potential conservation site would be reviewed to minimize any potential conflicts with policies of local jurisdictions adopted for the purpose of avoiding or mitigating an environmental effect.

Blythe-17 See Response to Comment CO-1.

Blythe-18 Implementation of the Conservation Plan would result in the creation of new habitat.

Blythe-19 See Response to Comment EPA-8.

Blythe-20 See Response to Comment Blythe-19.

Blythe-21 The purpose and need of the LCR MSCP are discussed in section 1.2 of the Final EIS/EIR.

Blythe-22 See Response to Comment Blythe–19.

Blythe-23 See Response to Comment CO-1 regarding impacts to recreational resources. Other potential impacts to local communities are addressed in their respective sections of the Final EIS/EIR (e.g. sections 3.16, Socioeconomics and 3.3, Air Quality).

Blythe-24 All project approvals at this time would be based on the development of 8,132 acres of habitat consistent with the manner described in the EIS/EIR.

Blythe-25 See Response to Comments CO-1 and Blythe-24.

Blythe-26 Subsequent to the public hearings, the participating agencies have thoroughly reviewed all comments received on the Draft BA, HCP, and EIS/EIR and incorporated appropriate revisions into the Final BA, HCP, and EIS/EIR. In addition, specific responses have been prepared for each public comment received as published in this volume of responses to public comments.

Numerous opportunities for public input into the LCR MSCP have been provided. Consultation and coordination efforts undertaken for the LCR MSCP are described in sections 1.5 and 7.2 of the Final EIS/EIR. A total of eleven public scoping meetings were held in 1999 and 2000 to obtain public input into the scope of the LCR MSCP environmental review process. Three public information meetings were held in 2003 to inform the public on the status of development of the LCR MSCP. Three public hearings were held in 2004 to obtain public comments on the EIS/EIR. All meetings were held in the evening to facilitate participation by members of the public. Additionally, a website, www.lcrscp.org, was established to make information about the EIS/EIR process available to a wider audience. The website includes a description of the LCR MSCP, current participants, files available to download, meeting schedule, past meeting notes, news and interest items, and links to other sites. Reclamation also maintains LCR MSCP information and related documents at www.lc.usbr.gov. This website includes the entire Public Involvement Plan, notices, public scoping summaries, and other information intended to help keep the public informed about the LCR MSCP. Each website has links to related websites.

Prior to issuance of the Record of Decision by Reclamation and the Service, as the NEPA lead agencies, the Final EIS will be available for public review pursuant to notice published in the Federal Register. No Record of Decision will be executed prior to 30 days after publication of the Federal Register notice. With respect to CEQA compliance, as the CEQA lead agency, Metropolitan must certify the EIR at a public meeting of its Board of Directors.

Blythe-27 See Response to Comment CO-1.

Blythe-28 See Response to Comment CO-1.

Blythe-29 See Response to Comment Blythe-26.

Blythe-30 See Response to Comment Blythe-24.

Blythe-31 See Response to Comment CO-1.

Blythe-32 See Response to Comment CO-1.

Blythe-33 Impacts to biological resources from the implementation of the proposed action are addressed in section 3.4 of the Final EIS/EIR.

Blythe-34 The EIS/EIR is a joint NEPA/CEQA document.

Blythe-35 The purpose of and need for the proposed action are addressed in section 1.2 of the Final EIS/EIR, and its goals and objectives are summarized in Chapter 2.

Blythe-36 The proposed action would not affect the water level of the LCR, as discussed in section 3. 9.2.

Blythe-37 The program is based on a maximum change in point of diversion of 1.574 mafy.

Blythe-38 Chapter 2 of the HCP and Chapter 2 of the BA describe the covered activities, including ongoing water diversions and future changes in point of diversion up to 1.574 mafy.

Phoenix, Arizona (Phoenix), July 22, 2004

Phoenix- 1 Comment noted.

Phoenix -2 See Response to Comment AGFD-3

Phoenix -3 Comment noted.

Phoenix -4 See Response to Comment RSLA-1.

Phoenix -5 See Response to Comment RSLA-2.

Phoenix -6 See Response to Comment RSLA-3.

Phoenix -7 See Response to Comment RSLA-4.

Phoenix -8 The HCP and EIS/EIR consider the potential use of both publicly and privately owned land. No specific sites have been identified. All land acquisition would be conducted on a voluntary basis and in a manner consistent with regulatory requirements. When site-specific activities are identified, additional environmental compliance, as appropriate, would be performed analyzing impacts associated with use of those specific sites. See also Response to Comment RSLA-2.

Phoenix -9 Comment noted.

ACRONYMS AND REFERENCES

ACRONYMS USED IN THE RESPONSES TO COMMENTS

af	acre-feet
afy	acre-feet per year
AGFD	Arizona Game and Fish Department
BA	Biological Assessment
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BO	Biological Opinion
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	cubic feet per second
DOI	U.S. Department of the Interior
DW	Defenders of Wildlife et al.
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
FMA	Funding and Management Agreement
FR	Federal Register
HCP	Habitat Conservation Plan
IA	Implementation Agreement
IMA	Important Management Area
IOP	Inadvertent Overrun Policy
ISG	Interim Surplus Guidelines
ITA	Indian Trust Asset
JOA	Joint Operating Agreement
JPA	Joint Participation Agreement
LCR	Lower Colorado River
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
LIMA	Less Important Management Area
maf	million acre-feet

mafy	million acre-feet per year
mg/L	milligram per liter
MODE	Main Outlet Drain Extension
MSHCP	Multi-Species Habitat Conservation Plan
msl	mean sea level
NCCP	Natural Community Conservation Plan
NDO	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NPS	National Park Service
NSC	State of Nevada, Department of Administration, State Clearinghouse
NWF	National Wildlife Federation
OM&R	operation, maintenance, and replacement
PILT	Payments in Lieu of Taxes
ppm	parts per million
RM	river mile
RPA	reasonable and prudent alternative
RPM	reasonable and prudent measure
U.S.	United States
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USIBWC	U.S. Section, International Boundary and Water Commission

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Attachment A

List of Signatories to the Common Letter

List of Signatories to the Common Letter

NAME	STREET	CITY	STATE	ZIP	DATE/TIME SENT
A.W.	2330 43rd Ave., East Flat 405B	Seattle	WA	98112	8/11/2004
Abate, Andrew	307 N. Third St., Apt. B	King City	CA	93930	8/11/2004
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Abbott, Barbara	147 Pilgrim Rd.	Haverhill	MA	01832	8/20/2004
Abbott, Brandon	25 Hyde Hill Rd.	Williamsburg	MA	01096	8/19/2004
Abraham, Christine	2995 Michael Dr.	Newbury Park	CA	91320	8/20/2004
Abril, Ed	660 N. Citrus Ave.	Tucson	AZ	85748	8/20/2004
Ackoff, Karen	117 Laurel St.	South Bend	IN	46601	8/21/2004
Acs, Deborah-Leigh	308 West State St. #14	Black Mountain	NC	28711	8/21/2004
Acuna, Tamara	111 N Hill St., Rm 109	Los Angeles	CA	90012	8/16/2004
Adam, Margaret	72425 Cactus	Twentynine Palms	CA	92277	8/11/2004
Adams, Cynthia	15 Beulah Park Dr.	Santa Cruz	CA	95060	8/12/2004
Adams, Jessica	12246 Fox Hound Ln.	Orlando	Fl	32826	8/18/2004
Adamski, Constance	17 Council Dr.	Oxford	CT	06478	8/23/2004
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Alasti, Isabella	5320 Monalee Ave.	Sacramento	CA	95819	8/16/2004
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Alcumbrac, Kieran	210 Red Oak Dr. W, Apt P	Sunnyvale	CA	94086	8/16/2004
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Anderson, David	130 Broomsedge Trl	Athens	GA	30605	8/21/2004
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Anglemyer, Tami	707 Redbud Tr., Apt. 9	Buchanan	MI	49107	8/22/2004
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Antillon, Rick	1507 SE 14th St.	Fort Lauderdale	FL	33316	8/18/2004
Antuna, Martin	309-A Oregon Ave.	Petaluma	CA	94952	8/11/2004
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Ashkin, Laura	P.O. Box 1595	Portola	CA	96122	8/11/2004
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Asmussen, Dawn	8601 W. Monterey Way	Phoenix	AZ	85037	8/16/2004
Atamian, Priscilla	2764 Wallace Street	Santa Clara	CA	95051	8/11/2004
Atkinson, Patrick	261 Fairmount Ave., Apt. 30	San Luis Obispo	CA	94611	8/15/2004
Atlas, Shane	111 Gair St.	Piermont	NY	10968	8/11/2004
Augusta, Kathleen	1404 Floribunda Ave., Apt. 304	Burlingame	CA	94010	8/11/2004
Averill, Karen	785 L. Fk. Humbug Crk. Rd.	Applegate	OR	97530	8/18/2004
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Bafik-Vehslage, Michelle	9019 Keoning	San Antonio	TX	78251	8/17/2004
Bailey, Chantal	1649 Novato Blvd #3	Novato	CA	94947	8/11/2004
Bailey, Joyce	1844 Denmark Dr.	Orange Park	FL	32003	8/17/2004
Bailey, Kim	1901 Plumb Branch Rd.	Knoxville	TN	37932	8/15/2004
Baird, Janet	Rr. 2 Box 275	Jeannette	PA	15644	8/11/2004
Baker, Steve	1231 E. Colton Ave.	Redlands	CA	92374	8/16/2004
Bakewell, Mac	126 La Plata	Santa Barbara	CA	93109	8/11/2004
Balderston, Anne	415 Begonia Ave.	Corona Del Mar	CA	92625	8/15/2004
Baldwin, Laura	56 Fremont Ave, #3	Seaside Heights	NJ	08751	8/11/2004
Banwell, Jesse	341 Fairmount Ave.	Santa Cruz	CA	95062	8/11/2004
Barboza, Valerie	1756 Cordova Dr.	San Luis Obispo	CA	93405	8/16/2004
Barker, Danielle	4212 Vista Del rio Way, Apt. 2	Oceanside	CA	92057	8/11/2004
Barnes, Chris	410 Rennard Dr.	Exton	PA	19341	8/17/2004
Barnes, Pliny	410 Jordan Dr.	Redlands	CA	92373	8/15/2004
Barney, Sina	P.O. Box 1794	Willits	CA	95490	8/16/2004
Barry, Sharon	287 San Marino Rd. SW	Palm Bay	FL	32908	8/21/2004
Bateman, Billie	204 S. 348th Ave.	Tonopah	AZ	85354	8/21/2004
Bates, Julie	3605 Southwood Ave.	San Mateo	CA	94403	8/11/2004
Bates, Rita	2922 S. Delaware Ave.	Milwaukee	WI	53207	8/15/2004
Bauman, Kevin	5889 Orchard Bend Rd.	Bloomfield	MI	48301	8/16/2004
Baumer, Susan	13 Morgan Ct.	Bedminister	NJ	07921	8/18/2004
Bausman, Fred	3228 W. Village Ln.	Springfield MO	MO	65807	8/17/2004
Beach, Heather	13 Street	New Haven	CT	06511	8/20/2004
Beachy, Melissa	2925 Hyde Park St.	Sarasota	FL	34239	8/18/2004

Beadman, Hannah	844 Laveta Terrace	Los Angeles	CA	90026	8/11/2004
Behrens, Joanna	P.O. Box 2514	Jackson	WY	83001	8/15/2004
Belasco, Michael	4527 39th St., Apt 6	San Diego	CA	92116	8/16/2004
Bellotti, Alice	1 Oakland Dr.	Jackson	NJ	08527	8/17/2004
Benner, Lisa	Hcr 67 Box 16 A	Mifflin	PA	17058	8/21/2004
Benner, Margaret	42 Buttonwood Ln. Country Manor West	Carlisle	PA	17013	8/21/2004
Benningson, Barbara	2339 Ramona St.	Palo Alto	CA	94301	8/11/2004
Benson, Robert	432 Lily St.	San Francisco	CA	94102	8/11/2004
Benton, Coralie	1549 NW North Heights Dr.	Albany	OR	97321	8/21/2004
Bernard, Janice	100 Revolutionary Rd.	Scarborough	NY	10510	8/20/2004
Bernucca, Gregory	2748 Campus Walk Ave., Apt 15F	Durham	NC	27705	8/16/2004
Bew, Linda	515 Stewart Dr.	Hinesville	GA	31313	8/21/2004
Beyer, Lynne	1281 Murfreesboro Pike Ste. 300	Nashville	TN	37217	8/19/2004
Biale, Cheryl	7711 Greenridge St., SW	Olympia	WA	98512	8/17/2004
Bindrim, Erica	13047 Bourne Pl.	Bristow	VA	20136	8/18/2004
Birdsall, Patricia	305 N. Mountain Trail	Sierra Madre	CA	91024	8/11/2004
Bishandeski, Joann	129 N. Main St.	Pascoag	RI	02859	8/21/2004
Bishop, David	36 Pearl Ave.	Wheeling	WV	26003	8/15/2004
Black, Morrigan	104 Preston Ave.	Brazoria	TX	77422	8/17/2004
Blakely, Stephen	1439 Windjammer Lp	Lutz	FL	33559	8/21/2004
Bleha, Patricia	3209 Fosca St.	Carlsbad	CA	92009	8/17/2004
Boden, Linda	4828 West 27th Ave.	Denver	CO	80212	8/23/2004
Bodet, Sue	435 West Chownan St.	Kill Devil Hills	NC	27948	8/21/2004
Bogear, Lee	6397 North Cypress Ave.	Winton	CA	95388	8/11/2004
Boggio, dorothy	210 N. Mercer St.	New Wilmington	PA	16142	8/21/2004
Bolin, Amy	1200 Lincoln St, Unit 179	Bellingham	WA	98229	8/20/2004
Bonfiglio, Julia	1111 Carlisle Dr.	San Mateo	CA	94402	8/17/2004
Bonometti, Robert and Ginny	260 Golds Hill Rd.	Winchester	VA	22603	8/20/2004
Bookstein, Torey	2950 Portage Bay W	Davis	CA	95616	8/11/2004
Boren, Gary	501 Guerrero #6	San Francisco	CA	94110	8/11/2004
Borum, Erica	2600 Dyer Way	Reno	NV	89512	8/11/2004
Boudrie, Mary	1231 Persimmon Ave, Apt. 20	El Cajon	CA	92021	8/15/2004
Boulanger, Kerry	9 Southgate Dr.	Bedford	NH	03110	8/21/2004
Bovasso, Lucy	333 E 30th St., Apt. 1-J	New York	NY	10016	8/11/2004
Bowden, Tracy	829 Anrmore Cir.	Redlands	CA	92374	8/22/2004
Boydston, Diane	2540 Ribier Way	Rancho Cordova	CA	95670	8/21/2004
Boyers, Lowell	521 West 26th St.	New York City	NY	10001	8/18/2004
Boylston, Elizabeth	P.O. Box 6329	Snowmass Village	CO	81615	8/17/2004
Brakopp, Evelyn	1143 Akipola St.	Kailua	HI	96734	8/21/2004
Brandes, Susan	1639 E 1st St.	Tucson	AZ	85719	8/11/2004

Braun, Clait	5572 N. Ventana Vista Rd.	Tucson	AZ	85750	8/11/2004
Brenner, Natasha & Noah	19 Warren Ln.	Jericho	NY	11753	8/18/2004
Breslin, Bob & Nancy	1360 Patricks Point Dr.	Trinidad	CA	95570	8/16/2004
Brett, Derek	1407 S. Osceola Ave.	Orlando	FL	32806	8/18/2004
Brice, Margarite	406 Thor St.	White Sands Missile Range	NM	88002	8/22/2004
Brickner, Julia	660 N. Chippewa St.	Chandler	AZ	85224	8/17/2004
Brinkman, Kara	680 N. Cloverleaf Loop	Springfield	OR	97477	8/20/2004
Briscoe, Jennifer	22406 Huntington Ct.	Woodhaven	MI	48183	8/19/2004
Broderson, Shelagh	136 Evergreen Ln.	Berkley	CA	94705	8/11/2004
Broe, Harley	1503 A Lake Washington Blvd.	Seattle	WA	98122	8/20/2004
Brooks, Jean	2432 S. Coleman St.	Bisbee	AZ	85603	8/21/2004
Brooks, Jillian	P.O. Box 480	Bonsall	CA	92003	8/11/2004
Bross, Bonnie	1609 Poplar Ave.	Kansas City	MO	64127	8/22/2004
Brown Miller, Jacqui	1348 Bridle Ct SE	Olympia	WA	98501	8/22/2004
Brown, David	9325 Oren Thompson Rd.	Charlotte	NC	28213	8/20/2004
Brown, Sharon	4105 Hugh McKeen Dr.	Silver City	NM	88061	8/21/2004
Brown, Sharon	3618 St. Gaudens Rd.	Miami	FL	33133	8/15/2004
Brown, Vera	6 Barcelona Cir.	Redwood City	CA	94065	8/11/2004
Brownlee, Victoria	P.O. Box 36	Millwood	WV	25262	8/21/2004
Bruckman, Leonard	8595 Kingsgate Dr.	Granite Bay	CA	95746	8/11/2004
Bruno, Amy	792 Surf Ave.	Stratford	CT	06615	8/21/2004
Brush, Debbie	10455 W. Berry Dr.	Littleton	CO	80127	8/19/2004
Bryman, Alexandra	428 Altair Pl.	Venice	CA	90291	8/17/2004
Bucco, Gloria	841 S. 50th St.	Lincoln	NE	68510	8/20/2004
Buckmaster, Lee	1965 Emmons Rd.	Cambria	CA	93428	8/11/2004
Buffett, Beverly	2007 Ponderosa Street Apartment 3b	Santa Ana	CA	92705	8/11/2004
Bug, Kiddo	11th St.	Quakertown	PA	18951	8/11/2004
Bukszar, Tara	1005 E. Huffaker Ln.	Reno	NV	89511-1	8/21/2004
Burch, E.	1116 W. Airport Ave.	Lompoc	CA	93436	8/11/2004
Burgess, Tammy	9445 Patricia Dr.	Otisville	MI	48463	8/21/2004
Burghart, Barbara	39 Emerald St.	Bridgeport	CT	06610	8/11/2004
Burke, Barbara	322 Zion Rd.	Hillsborough	NJ	08844	8/20/2004
Burket, Ruth	12828 Brookdale St.	Victorville	CA	92392-7943	8/20/2004
Burkhart, David	7735 Sunnyside Rd. SE	Salem	OR	97306	8/11/2004
Burnett, Deborah	551 Park Road	Spring City	PA	19475	8/19/2004
Burnett, Kimberly	119 Laurel Grove Ave.	Kentfield	CA	94904	8/11/2004
Burns, Charmion	845 Marine Ave.	Manhattan Beach	CA	90266	8/11/2004
Burns, Vicki	760 Geary St # 510 M	San Francisco	CA	94109	8/11/2004
Burton, Laura	18079 Rancho St.	Encino	CA	91316	8/11/2004
Buss, Bill	P.O. Box 1185	Corrales	NM	87048	8/22/2004

Butterfield, Lisa	P.O. Box 5051	Arcata	CA	95518	8/11/2004
Butts, Leona	13817 Plum Circle	Clearlake Oaks	CA	95423	8/11/2004
C.W.	529 S. 32nd St.	Manitowoc	WI	54220	8/20/2004
Cahill, Joan	898 E. River Dr.	Margate	FL	33063	8/18/2004
Cain, Thomas	1991 Willeys Lake Rd.	Custer	WA	98240	8/20/2004
Calicott, James	3886 Birchleaf Rd.	Memphis	TN	38116	8/11/2004
Cameron, Daniel	6 Beaumont St.	Melrose	MA	02176	8/11/2004
Campbell, Karen	1819 Grant Ave. #B	Redondo Beach	CA	90278	8/16/2004
Cannon, Frank	P.O. Box 14581	South Lake Tahoe	CA	96151	8/11/2004
Cape-Thrower, Christa	1527 Mammoth Pl.	Rohenert Park	CA	94928	8/11/2004
Cappadoro-Nicely, Marilyn	6370 Pompano St.	Jupiter	FL	33458	8/17/2004
Cardran, Gary	29 4th Ave. #2	Haverhill	MA	01830	8/19/2004
Carlig, Joseph	3420 Yosemite Ave.	El Cerrito	CA	94530	8/11/2004
Carlson, Genevieve	11035 Bennetts Valley Hwy.	Penfield	PA	15849	8/18/2004
Carolin, Jeff	4 Washington Ct.	Stamford	CT	06902	8/15/2004
Carpenter, Regina	2879 St. Andrews	Williams	AZ	86046	8/11/2004
Carpenter, Regina	2879 St. Andrews	Williams	AZ	86046	8/11/2004
Carr, Lindsey	6516 #2 El Nido Lane	Isla Vista	CA	93117	8/15/2004
Carrao, Gary	14 26th Ave	Venice	CA	90291	8/11/2004
Carte M.D., Mike	10094 W. Edna St.	Boise	ID	83704-4	8/21/2004
Carter, Margaret	1612 Third St.	Manhattan Beach	CA	90266	8/11/2004
Carter, Nancy	3398 Red Lake Rd.	South Lake Tahoe	CA	96150	8/11/2004
Case, Rachael	322 N. D Street	Lake Worth	FL	33460	8/18/2004
Caserta, Alison	762 Belted Kingfisher Dr. N.	Palm Harbor	FL	34683	8/20/2004
Casey, Echo	932 E. King St.	Tucson	AZ	85719	8/11/2004
Cash, Irma	8600 Old Plank Road	Charlotte	NC	28216	8/21/2004
Cashner, Frances M.	6027 Charlotte Dr.	New Orleans	LA	70122	8/18/2004
Cassidy, Doris	3000 S. Catalina Dr., Apt. 129	Yuma	AZ	85364	8/11/2004
Castellano, Edward	2035 shannon Rd.	Gulf Breeze	FL	32566	8/19/2004
Chamberlain, Lora	2113 W. Moffat St. #2	Chicago	IL	60647	8/18/2004
Chan, Kai	750 N Shoreline Blvd. Apt 152	Mountain View	CA	94043	8/16/2004
Chaplin, Ron	72 W Edward St.	Iselin	NJ	08830	8/21/2004
Chapman, Virginia	10229 Wellington Blvd.	Powell	OH	43065	8/17/2004
Chappell, Donna	3530 Gladstone	Sarasota	FL	34231	8/11/2004
Chauhan, Arun	4583 River Pkwy. Apt. L	Atlanta	GA	30339	8/20/2004
Chauser, Jacqueline	1746 E. Belmont Ave.	Anaheim	CA	92805	8/11/2004
Cherrey, Marjorie	1110 20th Ave.	Monroe	WI	53566	8/21/2004
Chesnutt, Judy	463 Harman Street Apt. 3 R.	Brooklyn	NY	11237	8/20/2004
Chess, Nancy	10668 Eastborne Ave., #101	Los Angeles	CA	90024	8/11/2004
Cho, Yu Jin	602 S. 5th Ave.	Bozeman	MT	59715	8/19/2004

Christensen, Harold	2516 Aberdeen Ln.	Henderson	NV	89014	8/11/2004
Ciotti, Mark	10350 Caminito Cuervo #106	San Diego	CA	92108	8/11/2004
Clarence, Henry	1011 Overlook Road	Berkley	CA	94708-1	8/11/2004
Clark, Chuck & Gail	16329 W. County Road, 18 E	Loveland	CO	80537	8/11/2004
Clark, Leigh	409 Penny St.	Garner	NC	27529	8/22/2004
Clark, Matt	Nau Cstl ox 5697	Flagstaff	AZ	86001	8/11/2004
Clausing, Mary	34 Vernon St.	Patchogue	NY	11772	8/11/2004
Clayton, Melissa	563 Longwood Cir.	Oldsmar	FL	34677	8/11/2004
Cochran, John	1037 Church St.	San Francisco	CA	94114	8/11/2004
Cochrane, Barbara	11361 S. Champlain Ave.	Chicago	IL	60628-5	8/21/2004
Coco, Joseph	9 Cloverdale Ct.	Buffalo Grove	IL	60089	8/15/2004
Cohen, Ellen	3612 N. 33rd St.	Tacoma	WA	98407	8/17/2004
Cohen, Leslie	546 58th St.	Oakland	CA	94609	8/11/2004
Cohen-Kurland, Miriam	269 Wormwood Hill Rd.	Mansfield Center	CT	06250	8/20/2004
Colangelo, Elizabeth	10417 Cedarsong Rd.	Nevada City	CA	95959	8/11/2004
Colburn, Kathleen	2105 Friar Tuck Ln.	Oxford	AL	36203	8/21/2004
Cole, Cal	1530 Hightower Dr.	Uniontown	OH	44685	8/11/2004
Cole, Marianne	4317 E. 3rd St.	Long Beach	CA	90814	8/11/2004
Collazo, Jaime M	8530 Boarwalk Trail Dr., Apt. 2032	Temple Terrace	FL	33637	8/15/2004
Condit, Helen	1160 E. Perrin Ave, Apt. 208	Fresno	CA	93720	8/22/2004
Conklin, Joyce	70 Pleasure Dr.	Riverhead	NY	11901	8/18/2004
Connolly, Olga	4561 Montair Ave. #10	Long Beach	CA	90808	8/21/2004
Conyette, Jacqueline	5838 SW 3rd St.	Miami	FL	33144	8/17/2004
Cook, Margaret	66 Oakwood Ct.	Fanwood	NJ	07023	8/19/2004
Cooper, Ayelet	4045 Verona Rd.	South Euclid	OH	44121	8/20/2004
Cooper, Chad	1124 Orchard Ave.	Liberty	MO	64068	8/16/2004
Cooper, Victoria	1993 3rd Rd.	Wakefield	KS	67487	8/21/2004
Cope, Kelly	116 S. Branciforte Ave.	Santa Cruz	CA	95062	8/11/2004
Copeland, Walt	34646 12 Wildwood Cyn Rd.	Yucaipa	CA	92399	8/11/2004
Corbett, T.	2118 Reynolds St.	Sarasota	FL	34231	8/18/2004
Cordeau, Stephanie	526 2E Ave.	Quebec		FFFFF	8/19/2004
Corley, Bee	2712 Secure Place	Lancaster	CA	93536	8/11/2004
Cormier, Andree	P.O. Box 280579	Northridge	CA	91328	8/20/2004
Coslet, Christine	80 Lakeview Ave.	Ringwood	NJ	07456	8/21/2004
Costas, George	2700 Southhampton Rd.	Croydon	PA	19021	8/15/2004
Coulter, Barbara	12200 Academy Rd. NE	Albuquerque	NM	87111	8/21/2004
Coultes, Julie	308 Tamara Rd.	Guthrie	OK	73044	8/20/2004
Covit, Raymond	673 W. 20th St., Apt. 3	San Pedro	CA	90731	8/11/2004
Cowden, Mike	4216 Wilma	Wichita	KS	67218	8/18/2004
Cowling, Rebecca	12867 Tewksbury Drive	Herndon	VA	20171	8/17/2004

Cox, Lorri	25416 120th Pl. SE	Kent	WA	98030	8/11/2004
Cox, Lynn	695 Mohican Way	Westerville	OH	43081	8/19/2004
Cox, Pamela	3720 S Walapai Dr., Apt. 3	Flagstaff	AZ	86001	8/16/2004
Cox, William	17065 Linda Mesa Dr.	Morgan Hill	CA	95037	8/11/2004
Craig, Eugene	631 Hermitage St.	San Jose	CA	95134	8/11/2004
Craig, Patrick	19380 Pine Glade	Guerneville	CA	95446	8/16/2004
Crisman, Miriam	6750 Boca Pines Trl., Apt. D	Boca Raton	FL	33433	8/20/2004
Crocker, Katherine	230 Hampton Ave.	Salt Lake City	UT	84111	8/21/2004
Crosby, William	146 Francis St.	New Britain	CT	06053	8/15/2004
Cross, Nelcha	9647 Folsom Blvd.	Sacramento	CA	95827	8/11/2004
Crow, Laura	1150 Pine St. #16	Oroville	CA	95965	8/11/2004
Crow, Laura	1150 Pine St. #16	Oroville	CA	95965	8/11/2004
Crow, Laura	1150 Pine St. #16	Oroville	CA	95965	8/11/2004
Crusha, Connie	1077 Vista Madera Ln.	El Cajon	CA	92019	8/11/2004
Cuevas, Ricardo	2011 Daly St.	Los Angeles	CA	90031	8/11/2004
Culp, Greg	2820 Caminito Cape Sebastian	Cardiff	CA	92007	8/11/2004
Cunha, Nancy	95 Newman Ave. N 809	Rumford	RI	02916	8/20/2004
Curry, Sean	1328 N Frisco Ave., Apt G	Springfield	MO	65802	8/21/2004
Curry, Sean	1328 N. Frisco Ave., Apt. G	Springfield	MO	65802	8/15/2004
Da Lomba, Tracy	4055 Ghiotti Ct.	Pleasanton	CA	94588	8/11/2004
Dabney, Mary	258 Highway 55	Jamestown	KY	42629	8/11/2004
Dahlke, Taylor	25 Harmony Lane	Walnut Creek	CA	94597	8/16/2004
Dahm, Dolores & Ira	P.O. Box 360	Cotati	CA	94931	8/11/2004
Dale, Adrienne	2639 Pamela Ave.	Ann Arbor	MI	48103	8/16/2004
Dalpino, Idajane	6 Navajo Ln.	Corte Madera	CA	94925	8/11/2004
Daly, Marie	4427 E. 17th St.	Tucson	AZ	85711	8/20/2004
Danoff Fanizza, Shoshana	317 Charles St.	Carpentersville	IL	60110	8/17/2004
Dapore, Wendy	5333 Buttonwood Ct.	Foresthill	CA	95631	8/17/2004
Dart, Robert	2646 Palma Dr. Ste 210	Ventura	CA	93003	8/11/2004
Davidson, Montyka	5099 Spencer Rd.	Cleveland	OH	44124	8/21/2004
Davies-Sigmund, Steven	3153 Leola Ave.	St. Louis	MO	63139	8/15/2004
Davis, Beverly	203 N. Cleveland Ave. Apt. 79	Long Beach	MS	39560	8/11/2004
Davis, Martha	560 Broadway St.	Venice	CA	90291	8/16/2004
Davis, Pat	5314 Baza Ave.	Woodland Hills	CA	91364	8/11/2004
Davis, Rebecca	8885 W. Thunderbird Rd., Apt. 2109	Peoria	AZ	85381	8/11/2004
De Sio, Elisse	662 Third Ave.	Redwood City	CA	94063	8/17/2004
Dean, Robert	4365 E 13th Cir.	Tucson	AZ	85711	8/11/2004
Dececco, J.	260 Bartlett Way	Santa Cruz	CA	95060	8/11/2004
DeFrancesco, Victor	P.O. Box 85553	Tucson	AZ	85754	8/15/2004
Dempsey, Jean	918 Marlin Dr.	Jupiter	FL	33458	8/21/2004

Dengenhart, Dawn	345 Mountain View Ave.	Longmont	CO	80501	8/21/2004
Dexter, Diana	6309 W. 101st. Pl.	Overland Park	KS	66212	8/17/2004
Dezellem, Carol	120 E. Pearl St.	Port Hueneme	CA	93041	8/19/2004
Diesel, Beth	56 Juniata College	Huntingdon	PA	16652	8/19/2004
Dietrich, Jessica	10780 Atrium Dr.	San Diego	CA	92131	8/11/2004
Dinonne, Ayako	310 Suncrest Ct.	Oviedo	FL	32765	8/19/2004
Dishman, Patricia	512 General George Patton Rd.	Nashville	TN	37221	8/20/2004
Disney, Mike	4770 East Windsor Ln.	Columbus	IN	47201	8/22/2004
Dispain, Shelley	11760 Capri Cir. So. #303	Treasure Island	FL	33706	8/18/2004
Distenfeld, Rebecca	158 Cumberland St.	Mastic	NY	11950	8/21/2004
Divizich, Deanna	438 Van Dyke Ave.	Oakland	CA	94606	8/12/2004
Dixon, Daron	822 W. Avenue L	Calimesa	CA	92320	8/19/2004
Dobbins, Timothy	1255 Page St., Apt. 7	San Francisco	CA	94117	8/15/2004
Doerring, Beth Ann	205 S. 4th St.	Kenedy	TX	78119	8/19/2004
Doire, Lillian	P.O. Box 7021	Cumberland	RI	02864	8/11/2004
Dombeck, Carrie	4312 Valley Forge Rd.	Durham	NC	27705	8/19/2004
Donoso, Valeska andrea	2522 30th St.	Santa Monica	CA	90405	8/11/2004
Dorn, Paul	414 Iris Pl.	Davis	CA	95616	8/16/2004
Dorsey, Cherilyn	4779 Cumberland Cir.	El Paso	TX	79903	8/11/2004
Dougherty, Jerold	119 Head of River Rd.	Corbin City	NJ	08270	8/11/2004
Douty, Shirley	6229 N Capri Ct.	Fresno	CA	93711	8/11/2004
Dow, Patricia	1119 E. Mitchell St.	Tucson	AZ	85719	8/11/2004
Downing, Jennifer & Brian	70 Glen Ave.	Stockholm	NJ	07460	8/17/2004
Downing, Sonja	6891 Fortuna Rd.	Goleta	CA	93117	8/11/2004
Drew, Janet	P.O. Box 162	Santa Rosa	CA	65402	8/17/2004
Dubnoff, Ena	2506 4th St.	Santa Monica	CA	90405	8/11/2004
Duffy, Mary	5443 Palo Verde St.	Montclair	CA	91763-2537	8/11/2004
Dufur, Lisa	5662 E. Ashlan	Fresno	CA	93727	8/17/2004
Duin Ratcliff, Amy	723 NE 6th St.	Ankeny	IA	50021	8/21/2004
Dunleavy, Pat	2025 Normandy Ave.	Deptford	NJ	08096	8/20/2004
Duran, Chris	1200 Dudley St.	Lakewood	CO	80215	8/22/2004
Durrenberger, Joe	11504 Victoria Ave.	Los Angeles	CA	90066	8/21/2004
Dutra, Sarah	251 California Ave.	Providence	RI	02905-2	8/21/2004
Dyer, Holly	834 Robinwood Dr.	Troy	MI	48083	8/18/2004
Dyer-Cobb, Melissa	770 Crain St.	Carson City	NV	89703	8/17/2004
Early, Gordon	156 Hanover Ln.	Mountain Home	AR	72653-8	8/17/2004
Echevarria, Mari	2316 Windcastle Ln.	Knoxville	TN	37923	8/19/2004
Eck, Patricia	12987 Penefield Ln.	Huntley	IL	60142	8/21/2004
Eckert, R.	1743 Lakeside Dr. S	Forked River	NJ	08731	8/11/2004
Eckland, Sandra	8660 Hickory Dr.	Anthony	TX	70821	8/15/2004

Eden, Jonathan	494 Vincente Ave.	Berkley	CA	94707	8/19/2004
Edwards, Colene	2307 E 2nd St. Apt 11	Bloomington	IN	47401	8/21/2004
Edwards, Elaine	1900 Market St.	Philladelphia	PA	19103	8/18/2004
Egbert, Rachael	5252 Rapid Run Rd.	Cincinnati	OH	45238	8/18/2004
Egen, Ned	2233 E. Hawthorne St.	Tucson	AZ	85719	8/11/2004
Eggers, Tamar	938 A Stanyan St.	San Francisco	CA	94117	8/11/2004
Ehrhardt, Erin	6271 N. Celery Pl.	Tucson	AZ	85741	8/17/2004
Eib, Arol	P.O. Box 308	Greenwood	FL	32443	8/16/2004
Eldred, Mary	903 Sir Winston St.	Henderson	NV	89052	8/19/2004
Elin	616 Soper Ave.	Rockford	IL	61101	8/11/2004
Embrey, Stephanie	4205 E. Anaheim St.	Long Beach	CA	90804	8/11/2004
Embry, Jeanne	3840 Kingfish Dr. SE	Saint Petersburg	FL	33705	8/20/2004
Emmetti, Maria	1159 Manzanita Ln.	Manhattan Beach	CA	90266	8/11/2004
Emory, Del	412 W. Elmwood Ave. # C	Burbank	CA	91506	8/19/2004
Ensley, Heidi & Phil	2740 Granada Ave.	San Diego	CA	92104	8/11/2004
Ercolini, Val	15 Bennett Road	Redwood City	CA	94062	8/15/2004
Erickson, Elaine	1426 Frontero Ave.	Los Altos	CA	94024	8/11/2004
Espiritu, Kathy	1051 Treadway Rd.	Munster	IN	46321	8/22/2004
Essary, Renee	6721 Old Carlisle Rd.	Dover	PA	17315	8/15/2004
Estrada, Judy	9 Via Rosal	Camarillo	CA	93012	8/11/2004
Evans, Dinda	P.O. Box 178695	San Diego	CA	92177	8/11/2004
Evans, Nancy	2445 Tierra Dr.	Los Osos	CA	93402	8/11/2004
Evans, Willow	2828 3rd St., Apt. 11	Santa Monica	CA	90405	8/17/2004
Facio, Laura	1721 N. Church St.	Redlands	CA	92374	8/15/2004
Fairfield, John	2 Portola Rd.	San Francisco	CA	94131	8/11/2004
Falcone, David	560 Rsd # 19A	New York	NY	10027	8/22/2004
Faraklas, Judy	105 Bill of Rights Ln.	Downingtown	PA	19335	8/11/2004
Farrell, Courtney	937 Deer Creek Ln.	Fort Collins	CO	80526	8/21/2004
Faulkner, Dave	P.O. Box 426	Lemon Grove	CA	91946	8/11/2004
Federov, Alexandra	3819 Ave Isla Verda Ph 2	Carolina	PR	00979	8/15/2004
Felt, Gilda	4045 E. Cambridge Ave.	Phoenix	AZ	85008	8/11/2004
Ferguson, Cynthia	9305 Medallion Way	Sacramento	CA	95826	8/11/2004
Ferguson, Paula	307 Ramsey Ave.	Hopewell	VA	23860	8/21/2004
Feria, Carole	4574 Normandie Pl.	La Mesa	CA	91941	8/11/2004
Ferrer, Ana Maria	113 Hogback Mountain Rd.	Montville	ME	04941	8/21/2004
Fierle, Ina	5050 Tanglewood Ln., Apt 1105	Odessa	TX	79762	8/17/2004
Fifield, Wilbert	5301 E Fort Lowell Rd., Unit C	Tucson	AZ	85712	8/15/2004
Finch, Matthew	11433 Orchardview Dr.	Fenton	MI	48430	8/15/2004
Fink, Kimberly	13201 Bruce B. Downs Blvd. Mdc 56	Tampa	FL	33612-3	8/18/2004
Firth, Robyn	100 W Greenbush Rd.	Tuckerton	NJ	08087	8/21/2004

Fischer, John	230 Grove Acre Ave., Apt 313	Pacific Grove	CA	93950	8/12/2004
Fischer-Bixler, Simona	13390 John Wyatt Dr.	Manassas	VA	20112	8/21/2004
Fischoff, Rachel	5911 Canyon Heights Ln.	Los Angeles	CA	90068	8/11/2004
Fisher, Clarence	2013 Mistletoe Dr.	Richardson	TX	75081-3	8/21/2004
Fisher, Victoria	839 N. Cordova St.	Burbank	CA	91505	8/11/2004
Fitzgerald, Jeanne	4601 Sherwood Lane	Houston	TX	77092	8/20/2004
Flade, Donna	125 N. Doheny Dr.	Beverly Hills	CA	90211	8/11/2004
Flanagan, Stephen	9738 Jefferson Parkway Apt. B3	Englewood	CO	80112	8/21/2004
Fleming, Elizabeth	115 112th Ave NE Apt #115	Saint Petersburg	FL	33716	8/17/2004
Fleming, Lori	300 County Line Park Rd.	Manson	NC	27553	8/16/2004
Fleming, Terrance	516 Beaver St., Apt B	Santa Rosa	CA	95404	8/15/2004
Floyd, Kim	5375 shirley J Lane	Wrightwood	CA	92397	8/16/2004
Fogerty-Ball, Lynda	420 Maint St., P.O. Box 43	West Townsend	MA	01474	8/15/2004
Foley, Gerard	13272 Orange Knoll Dr.	Santa Ana	CA	92705	8/11/2004
Foley, Robert	6 Marvel St.	Taunton	MA	02780	8/18/2004
Foley, Theresa	26655 N. 79th St.	Scottsdale	AZ	85262	8/11/2004
Folsom, Susan	P.O. Box 1147	Lawndale	AZ	90260	8/11/2004
Forbes, Kelly	1616 Troon Howl	O'Fallon	IL	62269	8/17/2004
Forney, Maureen	941 Bridge Rd.	San Leandro	CA	94577	8/11/2004
Forquell, Mary	602 Elmgrove Road	Rochester	NY	14606	8/20/2004
Foster, Joyce	10572 Wilkins Ave.	Los Angeles	CA	90024	8/11/2004
Fountain, Sherry	13609 Youngstown Ave.	Orlando	FL	32826	8/22/2004
Fox, Geraldine	706 Yarborough St.	Bossier City	LA	71111	8/18/2004
Francis, Michael	947 Maxwell St.	Fortuna	CA	95540	8/11/2004
Freedman Patrick, Wendy	5226 Green Rd.	West Bloomfield	MI	48323	8/21/2004
Freeman, Mary	10691 E. Timeless Dr.	Tucson	AZ	85748	8/11/2004
Freeman, Nicholas	4041 Wade St., Apt 2	Los Angeles	CA	90066	8/11/2004
Freitas, Julene	472 Jean St.	Oakland	CA	94610	8/11/2004
Friedmann, Vivian	17800 Burbank Boulevard, Unit 306	Encino	CA	91316	8/11/2004
Frikken, Lora	18047 Buckhannon	Roseville	MI	48066	8/11/2004
Fritz, David	732 N. St.	Davis	CA	95616	8/11/2004
Frye, Thomas	945 W. Broadway Rd., Apt 1094	Mesa	AZ	85210	8/11/2004
Fuhrman, Stanley	14 Riggs St.	Ansonia	CT	06401	8/15/2004
Fuller, Roy	P.O. Box 392	Caroga Lake	NY	12032	8/21/2004
Fulop, Debra	35 NE 20th Ave.	Pompano Beach	FL	33060	8/18/2004
Fuss, Joanne	2073 Redwood Dr.	Santa Cruz	CA	95060	8/11/2004
Gabriel, Kristina	803 Quince Orchard Blvd., Apt. 24	Gaithersburg	MD	20878	8/21/2004
Gaffney, Amber	2365 Baldwin St.	Arcata	CA	95521	8/15/2004
Gale, Anita	310 Pleasure Isle Dr.	Covington	KY	41017	8/20/2004
Gallichio, Julia	6242 Buena Vista Ave. #A	Oakland	CA	94618	8/18/2004

Ganz, Shiela	1546 Great Hwy	San Francisco	CA	94122	8/11/2004
Garcia, Diana	109 Seaman Ave., Apt 3 G	New York City	NY	10034	8/19/2004
Garcia, Ernie	1824 Haaz Way	Oxnard	CA	93030	8/16/2004
Garcia, Jasmin	1143 W. Oak Ave.	Fullerton	CA	92833	8/11/2004
Garcia, Yvonne	1314 E. 17th Ave.	Tampa	FL	33605	8/21/2004
Garfield, James	681 Lottie St.	Monterey	CA	93940	8/11/2004
Garry, Gordon	P.O. Box 36	Guinda	CA	95637	8/11/2004
Gartland, Ron	4057 Lyman Rd.	Oakland	CA	21830	8/21/2004
Garvin, Micheal	1 Spring Hill Cir.	Sausalito	CA	94965	8/15/2004
Gaviola, Brigette	8317 Westlawn Ave.	Los Angeles	CA	90045	8/12/2004
Gaydos, John	3024 E Back Ln, Apt 3	Phoenix	AZ	85032	8/11/2004
Gearhart, Dessie	650 Hurricane St.	Franklin	IN	46131	8/21/2004
Geary, Christine	N. 14719 Farragut Ln.	Mead	WA	99021	8/20/2004
Geiss, Geoffrey	802 Ussie Ave.	Canon City	CO	81212	8/15/2004
Gerber, Juliana	1129 54th St.	Oakland	CA	94608	8/18/2004
Gerdes, Heather Lea	4353 Teesdale Ave., Apt. 6	Studio City	CA	91604	8/11/2004
Geyer, Donna	1937 Country Club Road	Fort Collins	CO	80524	8/18/2004
Gibson, Christopher	15 Avenue A	Ogdensburg	NJ	07439	8/11/2004
Giffroy, Renee	195 W. Haviland Lane	Stamford	CT	06903	8/23/2004
Gilberg, Dani	3332 Milbridge Dr.	Antioch	TN	37013	8/11/2004
Gilmartin, Kristen	1501 S. Stoneman Ave.	Alhambra	CA	91801	8/11/2004
Gluth, Alfred	18691 Nye Rd.	Galien	MI	49113	8/19/2004
Godin, David	29 Deer Dr.	South Beach	NY	11789	8/22/2004
Goeman, Brandy	716 Connie Dr.	Las Vegas	NV	89107	8/11/2004
Goldberger, Adam	14 Sterling Pl.	Brooklyn	NY	11217	8/22/2004
Goldgerg, David	231 Buffalo Trail	Flagstaff	AZ	86001	8/16/2004
Goldman, Robert .	27 Birch Ct.	Ridgefield	CT	06877	8/20/2004
Goldstandt, Christy	8704 N Hartman St.	Portland	OR	97203	8/21/2004
Gomez, Carol	20 River Rd. Rocks Village	Haverhill	MA	01830	8/17/2004
Gonsoski, Robin	6165 Garbe Ave.	Woodbury	MN	55125	8/17/2004
Gonzalez, Cassie	8734 Goodhue St. NE	Blaine	MN	55449	8/21/2004
Gonzalez, Jose	3847 Steve Lillie Cir.	Stockton	CA	95206	8/17/2004
Goodman, Lucy	609 4th Ave.	Miami	AZ	85539	8/11/2004
Goodwin, Cara	4412 A SW Shattuck Rd.	Portland	OR	97221	8/12/2004
Gordon, Cynthia	2821 E. Vista Dr.	Phoenix	AZ	85032	8/11/2004
Gordon, Linda	9 south Miller Ave.	Penns Grove	NJ	08069	8/21/2004
Graham, Kimberley	308 Orange Ave., Apt. 24	Coronado	CA	92118	8/18/2004
Graham, Marsha	5 Corte Lenosa	Greenbrae	CA	94904	8/12/2004
Grail, Christine	P.O. Box 57052	Sherman Oaks	CA	91413	8/11/2004
Gramp, Cheryl	21 Rushmore Ln.	Hackettstown	NJ	07840	8/16/2004

Grant, Nichole	5530 Beaver Dam Road	West Bend	WI	53090	8/21/2004
Gravenmier, Keshara	4745 Rustic Rd.	Fair Oaks	CA	95628	8/16/2004
Gray, Lisa	1136 Miller Ln.	Tehachapi	CA	93561	8/11/2004
Green, Kenneth	1221 NE 82nd Ter	Kansas City	MO	64118	8/21/2004
Green, Pamela	15 Franciscan Ridge	Portola Valley	CA	94028	8/11/2004
Green, Thomas	8050 West Mesa Point Dr.	Tucson	AZ	85743	8/11/2004
Greenbank, Debbie	8932 La Serena Dr.	Fair Oaks	CA	95628	8/17/2004
Gregerson, Gary	P.O. Box 421912	San Francisco	CA	94142	8/11/2004
Griggs, Brenda	202 Arnold Blvd. Trlr 116A	Abilene	TX	79605	8/21/2004
Grigsby, Natalie	1206 Overbrook Dr.	Ormond Beach	FL	32174	8/21/2004
Grosvenor, Vickie	4831 Camphor Ave.	Sarasota	FL	34321	8/11/2004
Grotegut, Bette	5824 SW Arnold St.	Plattsburg	MO	64477	8/17/2004
Grotegut, Katie	5824 SW Arnold St.	Plattsburg	MO	64477	8/16/2004
Grotz, Arlene	2029 Lyon Ave.	Belmont	CA	94002	8/11/2004
Grow, Elaine	2307 S. Grand Blvd., Apt. A	Spokane	WA	99203	8/21/2004
Guastello, Michele	8 Asoleado Dr.	Carmel Valley	CA	93924	8/17/2004
Gullette, Alan	3620 Rhoda Ave.	Oakland	CA	94602	8/11/2004
Gunn, Leslie	1428 Camiito Septimo	Cardiff	CA	92007	8/11/2004
Haas, Lesley	320 A4 Stevenson Ln.	Towson	MD	21204	8/17/2004
Habib, Shahnoor	1401 Meadow Vista Dr.	Carrollton	TX	75007	8/15/2004
Hager, John	11760 S 1300 W	Riverton	UT	84065	8/18/2004
Hakey, Donald	423 Howe Ave. # 304	Shelton	CT	06484	8/20/2004
Hales, Janine	11855 Westview Pkwy.	San Diego	CA	92126	8/11/2004
Hamby, Orion	1101 Red Mill Blvd.	Virginia Beach	VA	23454	8/17/2004
Hamilton, Debbie	3886 Nowlin Rd.	Kennesaw	GA	30144	8/11/2004
Hampson, Donna	59 Atherton St.	Ayer	MA	01432	8/18/2004
Hampton, Betty	411 Camp Road	West Monroe	LA	71291	8/22/2004
Hancammon, William	6703 Stardust	North Lauderdale	FL	33068	8/21/2004
Hancock, Susan	11934 Palms Blvd.	Los Angeles	CA	90066	8/15/2004
Haner, Lu	9 Sherman Rd.	Millis	MA	02054	8/20/2004
Hanson, Kathryn	5431 Meadow Cir.	Huntington Beach	CA	92649	8/21/2004
Harding, Kevin	526 2 E Ave.	Quebec		FFFFF	8/19/2004
Hargesheimer, Linda	474 Morris Ave.	Newfield	NJ	08344	8/11/2004
Harney, Eileen	17 Maplewood Rd.	Medfield	MA	02052	8/17/2004
Haro, Kevin	3545 Nassau Dr.	Brookfield	WI	53045	8/21/2004
Harpole, Thane	2668 Kings Creek Rd.	Hayes	VA	23072	8/19/2004
Harradine, Gabrielle	4544 Westlawn Ave., Apt. 6	Los Angeles	CA	90066	8/11/2004
Harrington, Sharon	10906 Country Haven Dr.	Gibsonton	FL	33534	8/21/2004
Harris, Laura	943 W Holt	Ontario	CA	91762	8/21/2004
Harrour, Linda	4355 Rilea Way #1	Oakland	CA	94605	8/11/2004

Hart, Beverly	4563 N 17th Ave.	Phoenix	AZ	85015	8/17/2004
Hasso, Linda	3700 S. West Court Avenue #2029	Sioux Falls	SD	57106	8/23/2004
Haugsten, Christian	204 Albertz St.	Cloverdale	CA	95425	8/11/2004
Hauserman, Hilary	1204 E. Jefferson St.	Boise	ID	83712	8/11/2004
Hawkins, Peter	17 Fowler Ct.	New London	CT	06320	8/11/2004
Hayes, Brenda	403 Saint Mary's Rd.	Hillsborough	NC	27278	8/21/2004
Hayes, Joseph	185 Rainbow Dr.	Grand Junction	CO	81503	8/18/2004
Hayes, Sara	3705 Country Club Dr., Unit 9	Long Beach	CA	90807	8/11/2004
Hays, Jess	2120 Martin Crest Dr.	Akron	OH	44312	8/18/2004
Heacox, Barbara	1808 Harkness St.	Manhattan Beach	CA	90266	8/18/2004
Heffernan, Daniel	1703 W. Benjamin Holt Dr.	Stockton	CA	95207	8/17/2004
Heffington, Julie	225 Pestana Ave.	Santa Cruz	CA	95065	8/16/2004
Heine, Debra	5807 Spring Ivy Lane	Spring	TX	77379	8/16/2004
Heinzig, Dennis	136 Marion Ave.	Mill Valley	CA	94941	8/11/2004
Henderson, Cheryl	218 Normandy Ln.	Somerset	KY	42503	8/19/2004
Hennessey Botkin, Liza	12999 Blairwood Dr.	Studio City	CA	91604	8/11/2004
Hennig, Kai	1628 Portland Ave.	Berkley	CA	94707	8/11/2004
Henry, Russell	8511 Timberwood Ln.	Haughton	LA	71037	8/20/2004
Herbert, Crystal	618 Mills St.	Raleigh	NC	27608	8/19/2004
Herbst, Eve	402 S. Westlake Ave. #32	Los Angeles	CA	90057	8/11/2004
Herman, Judy	P.O. Box 3534	Jackson	WY	83001	8/16/2004
Heyman, William	3152 Big Sky Dr.	Thousand Oaks	CA	91360	8/11/2004
Hicks, Barbara	5010 Sun Cir.	Sarasota	FL	34234	8/21/2004
Hill, Cheyrl	23314 Summer Pine Dr.	Spring	TX	77373	8/11/2004
Hill, Tomi	406 Big Cedar Way #B	Brandon	FL	33510	8/21/2004
Hillerich, Debbie	3001 James Court	Beaver Dam	KY	42320	8/18/2004
Hillier, Jill	218 19th St., Apt C	Huntington Beach	CA	92648	8/11/2004
Hilsinger, James	145 South St., Spc A9	San Luis Obispo	CA	93401	8/11/2004
Hilton, Carol	4112 S. Fulton Pl.	Royal Oak	MI	48073	8/15/2004
Hirschfeld, Karen	6027 Kylie Court	Chino Hills	CA	91709	8/11/2004
Hirth, Denise	29911 West Lynwood St.	Buckeye	AZ	85326	8/11/2004
Hise, Diane	6068 Clay Spur Ct.	Centreville	VA	20121	8/21/2004
Hjelmstad, Gwendolyn	16638 N. 35th St.	Phoenix	AZ	85032	8/19/2004
Hochberger, Liviana	111 Chesnut Field	Peachtree City	GA	30269	8/19/2004
Hockwalt, Megan	20223 Rhapsody Rd.	Walnut	CA	91789	8/16/2004
Hodges, Susan	P.O. Box 1133	Alachua	FL	32616	8/19/2004
Hoerlein, Sara	636 Cheyenne Dr., Apt. 5	Fort Collins	CO	80525	8/19/2004
Hoff, William	114 Pappy Hunt Lane	Hot Springs	AR	71913	8/21/2004
Hoffbauer, Becky	303 E. Preston St.	Stanwood	IA	52337	8/11/2004
Hogan, Judith	556 Scenic Dr.	Santa Barbara	CA	93103	8/11/2004

Hoggan, Lynda	2521 Electric Ave.	Upland	CA	91784	8/11/2004
Hollander, Emily	10714 Tabor St.	Los Angeles	CA	90034	8/15/2004
Hollums, Kirby	8199 S Fillmore Way	Centennial	CO	80122	8/21/2004
Holt, Mark	5925 Moraga Ave.	San Jose	CA	95123	8/14/2004
Holtzman, Lisa	1809 Oak St. Apt. B	Santa Monica	CA	90405	8/11/2004
Holtzman, Michelle	13547 Ventura Blvd. #292	Sherman Oaks	CA	91423	8/11/2004
Hooper, Beth	1343 Ward St.	Berkley	CA	94702	8/11/2004
Horlick, Susan	8496 Yashuntafun Rd.	Tallahassee	Fl	32311	8/18/2004
Horn, Melissa	1592 Antelope Lane	Williams	AZ	86046	8/23/2004
Horvath, Melora	93 N Cooper Rd. Unit 27	Chandler	AZ	85225	8/11/2004
Houck, Faith	9349 NW 53rd Ct.	Sunrise	FL	33351	8/15/2004
Howard, Judith	32110 Robinson Hill Rd.	Golden	CO	80403	8/21/2004
Howard, Walter	300 Fieldbrook Place	Charlotte	NC	28209	8/19/2004
Howe, Linda	91 School Rd.	Elmont	NY	11003	8/21/2004
Howie, Mary	1710 Jim Latta Rd.	Rougemont	NC	27572	8/18/2004
Hughes, Jennifer	2604 Commons Blvd. # B	Augusta	GA	30909	8/19/2004
Huljev, Anthony	7407 W. Manchester Ave., #7	Los Angeles	CA	90045	8/11/2004
Hunt, James	521 Orange Ave. #9	Chula Vista	CA	91911	8/11/2004
Hurley, Brady	P.O. Box 9414	Aspen	Co	81612	8/11/2004
Hurley-Shoaf, Kimberly	426 Beech Dr.	Lexington	NC	27292	8/22/2004
Hurst-Matulewicz, Darcia	2524 130th Street SE	Everett	WA	98208	8/11/2004
Huskey, Marylin	4333 E. Angela Dr.	Phoenix	AZ	85032	8/15/2004
Hutchinson, Jill	103 Merrimac Ct.	Lexington	SC	29072	8/21/2004
Hutchinson, Terrance	21305 Conklin Ct.	California City	CA	93505	8/19/2004
Huth, Peggy	1817 Island View Dr.	Mesquite	TX	75149	8/22/2004
Hutson, Krissy	2222 N. 13th St.	Phoenix	AZ	85006	8/11/2004
Hyde, Francine	214 Wedgewood Dr.	Pittsburgh	PA	15227	8/21/2004
Inouye, Keri	206 E. Chilton Dr.	Tempe	AZ	85283	8/15/2004
Isbell, Susanna	21 Grand St.	Oneonta	NY	13820	8/11/2004
Iyer, Lisa	3018 Corte Hermosa	Newport Beach	CA	92660	8/11/2004
Jackson, Anne	P.O. Box 516	Morgantown	PA	19543	8/16/2004
Jackson, Barbara	P.O. Box 562	Wichita Falls	TX	76307	8/20/2004
Jackson, Joseph	640 Homewood Dr.	Pittsburg	PA	15235	8/20/2004
Jackson, Tom	720 16th St, Loft 418	Denver	CO	80202	8/15/2004
Jackson, Weldon H	2789 Bardy Road	Sant Rosa	CA	95404-8	8/15/2004
Jacobi, Robert	P.O. Box 68	Healdsburg	CA	95448	8/17/2004
Jamvold, Shunko	340 Acadia Ln.	San Rafael	CA	94903	8/17/2004
Janousek, Jennifer	9657 Inver Grove Trail	Inver Grove Heights	MN	55076	8/16/2004
Janowitz-Price, Beverly	796 N. Sunset Rd.	Apache Junction	AZ	85219	8/11/2004
Javinsky, Elizabeth	10551 Greenbrier Rd., Apt 317	Minnetonka	MN	55305	8/15/2004

Jay, B.	511 Hill St. #310	Santa Monica	CA	90405	8/20/2004
Jazwinski, Joan	9929 E. Placita De Las Palmeritas	Tucson	AZ	85747	8/11/2004
Jeffs, Michelle	8330 N. 19th Ave. #3125	Phoenix	AZ	85021	8/19/2004
Jelinek, Alexander	10070 Pasadena Ave, Apt. C	Cupertino	CA	95014	8/11/2004
Jensen, Noelle	2750 So. Durango # 2041	Las Vegas	NV	89117	8/11/2004
Jezyk, Peter	7270 N. Wade Rd.	Tucson	AZ	85743	8/11/2004
Jiminez, Blanca	6120 Hooper Ave., Apt. 4	Los Angeles	CA	90001	8/11/2004
Jo, Pamela	Box 8347	Incline Village	NV	89452	8/16/2004
Joffe, Gary	1260 Napoli Dr.	Pacific Palisades	CA	90272	8/20/2004
Johanson, Karen	1720 Sky Mountain Way	Henderson	NV	89014	8/17/2004
Johns, Kathy	2261 S. Williams Rd.	Greenbrier	TN	37073	8/19/2004
Johnson, Beverly	6142 E. Port Bay Rd.	Wolcott	NY	14590	8/21/2004
Johnson, Janet	175 S. Main St.	Manchester	CT	06040	8/20/2004
Johnson, Jill	463 Springwood Dr.	Joliet	IL	60431	8/20/2004
Johnson, Kathryn	261 Meadow Dr.	Genoa City	WI	53128	8/11/2004
Johnson, Lizabeth	21705 52nd Ave. West	Mountlake Terrace	WA	98043	8/18/2004
Johnson, Michelle	916 Divisadero St.	Fresno	CA	93721	8/16/2004
Johnson, Nancy	73465 315th St.	Collins	IA	50055	8/19/2004
Johnson, Terry Floyd	1327 E. 4th St., Ste. D	Long Beach	CA	90802	8/11/2004
Johnson, Tim	P.O. Box 2188	Seward	AK	99664	8/19/2004
Johnston, Steve	1543 N. Plaza De Lirios	Tucson	AZ	85745	8/11/2004
Johnston, Timothy	3094 Lake Dr., Apt. F7	Marina	CA	93933	8/11/2004
Jones, Linda	1349 Hollowell St.	Ontario	CA	91762	8/11/2004
Jones-Napier, Pennye	236 Walnut St. NW	Washington	D.C.	20012	8/17/2004
Jordan, Diana	201 N. 67th Ave.	Hollywood	FL	33024	8/16/2004
Jorgenson, James	1121 Top O' Hollow Rd.	Ames	IA	50010	8/18/2004
Judah, Debe	125 S. Kalanchoe Ave.	Broken Arrow	OK	74012	8/16/2004
Jurgens, Barbara	13005 NE 71st St.	Kirkland	WA	98033	8/19/2004
Justice, Mark	1940 Fullerton Rd., Apt. 57	Rowland Heights	CA	91748	8/12/2004
Kadletz, David	2778 Worden St.	San Diego	CA	92110	8/22/2004
Kaitlin, N.	104 SE 6th St.	Battle Ground	WA	98604	8/16/2004
Kalina, Matt	8342 E. Weldon Ave.	Scottsdale	AZ	85251	8/11/2004
Kalman, Janet	901 NW 4th Ave.	Boca Raton	FL	33432	8/15/2004
Kalmar, Angie	9552 Via Venezia	Burbank	CA	91504	8/17/2004
Kane, Caroline	4664 Vantage Ave.	Valley Village	CA	91607	8/11/2004
Kaneko, Sabine	674 Via Santa Ynez	Pacific Palisades	CA	90272	8/11/2004
Karlsvik, Sandra	P.O. Box 32	Fox Island	WA	98333	8/15/2004
Kashanian, Nematolah	170 Prospect Ave.	Hackensack	NJ	07601	8/21/2004
Kato, Masashi	440-1-212 Kamiyabe-Cho Totsuka-Ku	Yokohama	Ch		8/21/2004
Katz, Alissa	Lanikaula	Hilo	HI	96720	8/17/2004

Kawa, Sandra	1620 SE Green Acres Ci. N101	West Warwick	RI	02893	8/12/2004
Kegelman, B.	665 S. Wawaset Rd.	West Chester	PA	19382	8/11/2004
Kehn, Phillip	9 Poplar Ave.- Elsemere	Wilmington	DE	19805	8/11/2004
Kelly, Rebecca	421 Chisolm Trl.	Hurst	TX	76054	8/19/2004
Kennedy, Barbara	3009 Beach Ave.	Venice	CA	90291	8/11/2004
Kennedy, Heather	220 Sonora Dr. SE	Calhoun	GA	30701	8/22/2004
Kennedy, Jean	5001 Robinsong Rd.	Sarasota	FL	34233	8/21/2004
Kenny, Joseph	3770 Ruette San Raphael	San Diego	CA	92130	8/11/2004
Kerby, Katherine	4612 W. Hayward Pl.	Denver	CO	80212	8/15/2004
Kerwell, Cherie	417 N. Durkee St.	Appleton	WI	54911	8/20/2004
Kesselman, Barry	45 Crocked Rd.	Medford	MA	02155	8/20/2004
Kessler, Kresta	212 Bibb Ave.	Beckley	WV	25801	8/21/2004
Ketterer, Marcia	2102 W. Dahlia Dr.	Phoenix	AZ	85029	8/11/2004
Kieffer, Ramsay	622 Adams Dr.	Milford	DE	19963	8/11/2004
Kilgore, Darlene	723 W 101st Ave.	Tampa	FL	33612	8/21/2004
Kindred, Loretta	212 Prospect St.	Shreveport	LA	71104	8/16/2004
King, Marcia	11350 Chenault St.	Los Angeles	CA	90049	8/17/2004
Kirby, Lynn	4148 Maybelle Ave.	Oakland	CA	94619	8/11/2004
Kirby, Rya	231 Moran St.	Reno	NV	89501	8/11/2004
Kirkpatrick, Jennifer	28555 Melling Dr.	Scappoose	OR	97056	8/21/2004
Kirshner, Nicole	60 E. 8th St., Apt 17 E	New York City	NY	10003	8/20/2004
Kisluk, Jan	1914 Eaton Rd., P.O. Box 1325	North Conway	NH	03860	8/22/2004
Kisor, Dave	1970 7th St., #112	Riverside	CA	92507	8/12/2004
Kistler, Lousie	3645 W 46th Ave.	Denver	CO	80211	8/21/2004
Kistner, Carrie	186 Chesnut St.	Manchester	CT	06040	8/19/2004
Kitchens, Elizabeth	2201 Virginia St., Apt 5	Berkley	CA	94709	8/16/2004
Klein, Emily	1436 Missouri St.	San Diego	CA	92109	8/17/2004
Klein, Laura	1519 Virginia St.	Berkley	CA	94703	8/16/2004
Kogan, Susan	209 Belmont Pl. #209	Boynton Beach	FL	33436	8/22/2004
Kondreck, Janine	799 Dahlia St. Apt 201	Denver	CO	80220	8/19/2004
Konie, Lisa	13446 Alvarado Ct.	Saratoga	CA	95070	8/16/2004
Koplik, Elaine	20 Stonehenge Ln. Apt. 10 A	Albany	NY	12203	8/20/2004
Koplik, Mary	20 Stonehenge Ln. Apt. 10 A	Albany	NY	12203	8/20/2004
Kosinski, Cindy	104 Mary St.	Binghamton	NY	13903	8/11/2004
Kovacs, Natalie	23592 Windsong Apt #51-G	Aliso Viejo	CA	92656	8/11/2004
Kozak, Fred	19 Waters Edge	Marston Mills	MA	02648	8/21/2004
Kral, Suzanne	13208 Chillicothe Rd.	Chesterland	OH	44026	8/19/2004
Krampert, Melissa	24 Cabot St. Apt. 1	Salem	MA	01970	8/20/2004
Kreider, Ben	228 W. Main St., Apt #2	Mountville	PA	17554	8/15/2004
Krenelka, Jo	10157 Jett Dr.	St. Louis	MO	63136	8/18/2004

Kritzer, Sherry	P.O. Box 938	Moss Beach	CA	94038	8/15/2004
Kropf, Joseph	48 Everett St.	Kensington	CT	06037	8/15/2004
Krueger, D.	5280 Little Mountain Dr., Apt. H3	San Bernardino	CA	92407	8/16/2004
Krug-Foster, Christa	P.O. Box 208	Visalia	CA	93279	8/19/2004
Krupitiski, Daniel	2135 Beverwil Dr.	Los Angeles	CA	90034	8/11/2004
Kuhn, Rosie Marie	1655 W. Tenaya Way	Fresno	CA	93711	8/11/2004
Kuiper, Amy	5220 Osceola	Denver	CO	80212	8/21/2004
Kuo, Stephanie	5032 Amberwood Dr.	Fremont	CA	94539	8/11/2004
Kushner, Barry	343 Penn St.	Burlington	NJ	08016	8/20/2004
La Mar, Diana	3647 Jennifer St.	San Diego	CA	92117	8/22/2004
La Spada, Erica	830 Woodfield Ct.	Kissammee	FL	34744	8/20/2004
Lacobucci, Maryann	177 N. Madison Ave.	Upper Darby	PA	19082	8/11/2004
Lamont, Diane	11922 Tennessee Ave.	Los Angeles	CA	90064	8/11/2004
Landowne, Deborah	108 Belle Ave.	San Rafael	CA	94901	8/11/2004
Langlitz, Linda	22710 John Rolfe Ln.	Katy	TX	77449	8/11/2004
Langsam, Raphael	11250 78th Ave., Apt 1 D	Flushing	NY	11375	8/18/2004
Langston, Diane	P.O. Box 628	Buchanan Dam	TX	78609	8/19/2004
Lanning, Kathryn	3417 S. Heritage St.	Visalia	CA	93277	8/11/2004
Lanning, Michalyn	603 Woodlake Cir.	Sugar Land	TX	77478	8/22/2004
Lanoir, Bridget	12 Lake Placid Club Dr.	Lake Placid	NY	12946	8/15/2004
Lanteri, Pete	75 Chenango Dr.	Bay Shore	NY	11706	8/21/2004
Lantz, Carol Ann	27494 S Boundary Rd.	Corvallis	OR	97330	8/21/2004
Larosa, Gary John	34-24 82nd Street Apt 4-L	Jackson Heights	NY	11372	8/11/2004
Larson, Anissa	2398 N Keystone Dr.	Flagstaff	AZ	86004	8/15/2004
Lauder, David	322 Hambletonian Dr.	Oak Brook	IL	60523	8/19/2004
Lavin, Jennifer	1618 Cherry Lake Way	Heathrow	FL	32746	8/17/2004
Lawrence, Sylvia	1709 4th St., S.E.	Auburn	WA	98002	8/20/2004
Lawrence, William	1802 SW 10th Ave. #308	Portland	OR	97201	8/21/2004
Layden, Marcella	300 Kenyon St. NW #F2	Olympia	WA	98502	8/18/2004
Leatto, Renne	11011 Groveshire Ct.	Ocoee	FL	34761	8/21/2004
Lebo, Harlan	3265 Military Ave.	Los Angeles	CA	90034	8/16/2004
Lee Deanna	14 Gomez Way	Mill Valley	CA	94941	8/17/2004
Lee, Donna	387 Vista Linda Dr.	Mill Valley	CA	94941	8/11/2004
Lee, Robin	2009 SE Larch Ave.	Portland	OR	97214	8/22/2004
Leffmann, Paula	19074 Fitzgerald Ln.	Covington	LA	70435	8/17/2004
Lehr, Jennifer	19676 Grand View Dr.	Topanga	CA	90290	8/11/2004
Leiser, Stephanie	21071 Entrada Raod	Topanga	CA	90290	8/16/2004
Lemieux, Jean	3074 Cascade Ct.	Camino	CA	95709	8/11/2004
Lemontangue, Donna	20 Hurd Bridge Rd.	Clinton	CT	06413	8/21/2004
Lenihan, Janet	225 Monroe St., Apt. 2	Monterey	CA	93940	8/11/2004

Leong, Jennifer	695 Arbor Dr.	San Leandro	CA	94577	8/17/2004
Levitt, Lacey	11747 W. Sunset Blvd.	Los Angeles	CA	90049	8/11/2004
Lewis, Timothy	130 N. Hamilton St., Apt. 11	Chandler	AZ	85225	8/16/2004
Libbey, Richard	2120 Ocean Blvd.	Atlantic Beach	NY	11509	8/15/2004
Lichtenberger, Mark	2650 Wheatfield Cir.	Simi Valley	CA	93063	8/11/2004
Lickey, Adrienne	5133 Wild Cherry Ln.	Strawberry Plains	TN	37871	8/22/2004
Liebenow, Kimberly	4297 Calernbar Way	Paradise	CA	95969	8/15/2004
Liessner, Janet	206 City Rd.	Woodstock	CT	06281	8/11/2004
Lightford, Arlene	147 El Pinar	Los Gatos	CA	95032	8/11/2004
Lihou, Christopher	1338 28th St. S. Apt 2	Arlington	VA	22206	8/19/2004
Lindgren, Kristie	1423 Brentwood Dr.	Round Lake Beach	IL	60073	8/19/2004
Lindwright, Philippia	2184 Rosewood Ln. North	Roseville	MN	55113	8/20/2004
Link-Schreiber, Doris	N 621 Cth Dd	Withee	WI	54498	8/20/2004
Linthicum, Susan	8409 Twin Lakes Blvd.	Tampa	FL	33614	8/11/2004
Lisiewski, Kitrina	270 Federal Rd.	Monroe Township	NJ	08831	8/18/2004
Litman, Robin	6301 N Sheridan Rd.	Chicago	IL	60660	8/21/2004
Litten, Jesse	515 Kelton Ave.	Los Angeles	CA	90024	8/11/2004
Loh, Val	2552 Peter Street	Honolulu	HI	96816	8/21/2004
Long, Vernon	960 Cynthia Dr.	Sandwich	IL	60548	8/12/2004
Lopez, Brigitta	1815 N. Alvarado St.	Los Angeles	CA	90026	8/15/2004
Lopez-Balbontin, Adrian	T 401 Charles E. Young Drive West	Los Angeles	CA	91202	8/15/2004
Loucks, Cynthia	965 Sharlot Ave.	Prescott	AZ	86303	8/21/2004
Loudon, Sharon	24203 N 200 E Rd.	Long Point	IL	61333	8/11/2004
Louin, Alanna	1141 Lighthouse Ave., Apt. 432	Pacific Grove	CA	93950	8/17/2004
Love, Sarah	838 S. Scoville Ave., Apt 1	Oak Park	IL	60304	8/19/2004
Loveall, Kristie	P.O. Box 378	Lodi	CA	95241	8/11/2004
Lovelace, Lanelle	13994 Marc Dr.	Pine Grove	CA	95665	8/21/2004
Loveland, Jim	1410 Freemont St.	Gulfport	FL	33707	8/20/2004
Lowe, Lewis	5860 Lynn St.	San Diego	CA	92105	8/21/2004
Lowe, Lewis	5860 Lynn St.	San Diego	CA	92105	8/21/2004
Lubovich, Suzanne	7351 Sportsman Club Rd NE	Bainbridge Island	WA	98110	8/11/2004
Lucas, Diane	1330 Airport Rd.	Morris	IL	60450	8/11/2004
Lucchese, Anthony	169 Brewery Rd.	New City	NY	10956	8/18/2004
Lund, Sierra	4147 Edith Ct.	Prescott Valley	AZ	86314	8/16/2004
Lundeen, Bill	6970 N. Taylor Ln.	Tucson	AZ	85743	8/17/2004
Lunsford, Jim	1788 La Force Rd.	Alpine	CA	91901	8/11/2004
Lyons, Anthony	706 Grand St.	Lamar	MO	64759	8/15/2004
Macaruso-Lineberger, Gina	8040 E. Flying Z Ln.	Floral City	FL	34436	8/18/2004
MacDonald, B.C.	P.O. Box 69	Albion	CA	95410	8/11/2004
Macdonald, Laura	619 Victory Parkway	Elmhurst	IL	60126	8/19/2004

Macdonald, Meilani	66155 Acoma Ave.	Desert Hot Spring	CA	92240	8/20/2004
Macdonald, Sarah	8050 Cooper Ave.	Inver Grove Heights	MN	55076	8/20/2004
Machart, Delores	9442 S Albany Ave.	Evergreen Park	IL	60805	8/21/2004
Mackrell, Thomas	3116 Peach St., Apt. 2	Erie	PA	16508	8/17/2004
Maddock, June	9094 S. Pine Drive	Beulah	CO	81023	8/19/2004
Maher, Lauren	3030 Waverly Dr. #6	Los Angeles	CA	90039	8/11/2004
Mahrt, Jack	209 Roosevelt St.	Coalinga	CA	93210	8/17/2004
Mair, Dean	P.O. Box 65	Woodruff	AZ	85942	8/11/2004
Majors, Carol	10022 Reseda Blvd. Unit 20	Northridge	CA	91324	8/11/2004
Majors, Shirley	3533 E. Hearn Rd.	Phoenix	AZ	85032	8/20/2004
Maldonado, Chris	412 N. Whitcomb St.	Fort Collins	CO	80521	8/20/2004
Malloy, Benjamin	1700 Freeman Dr., Trlr. 27	Saint Peter	MN	56082	8/19/2004
Maloney, Kristie	5015 Brookhaven Way	Antioch	CA	94531	8/11/2004
Mamula, Christine	55 Susan Ln.	Stafford	VA	22556	8/21/2004
Mangerino, Janice	295 Marguerita Ln.	Pasadena	CA	91106	8/11/2004
Manning, Laura	6041 Suellen Ct.	Goleta	TX	93117	8/11/2004
Manning, Meaghan	121 Villa Circle	Boynton Beach	FL	33434	8/19/2004
Mapp, Michael	22 15th Ave.	San Francisco	CA	94118	8/17/2004
Marasca, Alithea	2130 Ash St.	Palo Alto	CA	94306	8/16/2004
Marcalus, Michele	8475 Greenleaf Ln.	Rancho Cucamonga	CA	91730	8/11/2004
Marchese, John	3155 Laurel Ave.	Henderson	NV	89014	8/11/2004
Marchesi, Wendi	1465 Washington St.	San Francisco	CA	94109	8/11/2004
Marcotte, Keith	6 Hopkins Rd.	Jamaica Plain	MA	02130	8/19/2004
Marcus, Martin	5015 Greenbriar Ave.	San Diego	CA	92120	8/15/2004
Maris, Kathi	1955 N. Mount Carmel	Wichita	KS	67203	8/21/2004
Maris, Keith	1955 N. Mount Carmel	Wichita	KS	67203	8/21/2004
Markowitz, David	950 High School Way, Apt. 3227	Mountain View	CA	94041	8/11/2004
Marks, Linda	Star Rte Chilao Maint Sta.	La Canada Flt	CA	91011	8/11/2004
Marohn, Kris	2736 Summertree Dr.	Carrollton	TX	75006	8/18/2004
Marris, Kathleen	2350 Bear Valley Rd. P.O. Box 583	Point Reyes Stat	CA	94956	8/11/2004
Marshall, Ava	3212 W. Platte Ave.	Colorado Springs	CO	80904	8/19/2004
Marshall, Jack	21569 Main St.	Barstow	CA	92311	8/20/2004
Marshall, Lisa	15023 Rain Shadow Ct.	Houston	TX	77070	8/21/2004
Martin, Elandriel	7743 E. Avenue U	Littlerock	CA	93543	8/11/2004
Martin, Gloria	125 G18 West	Carney	MI	49812	8/16/2004
Martin, Michelle	1110 Patton Way	McDonough	GA	30252	8/21/2004
Martselos, Jerry	2 Alderbrook Rd.	Bronx	NY	10471	8/16/2004
Marx, Gregg	6207 Maryland Dr.	Los Angeles	CA	90048	8/16/2004
Massberg, Lori	4247 Hunters Circle West	Canton	MI	48188	8/19/2004
Massimino, Frances	6950 Sayre Dr.	Oakland	CA	94611	8/11/2004

Mastri, Frank	165 Silver St.	Bridgeport	CT	06610	8/11/2004
Matejcek, Patricia	117 Forest Ave.	Santa Cruz	CA	95062	8/11/2004
Mathews, Jennifer	110 El Nido Ave., Apt. 84	Pasadena	CA	91107	8/15/2004
Mattaliano, Mary Ann	29 W 18th St.	Bayonne	NJ	07002	8/21/2004
Mattaliano, Mary Ann	29 W. 18th St.	Bayonne	NJ	07002	8/21/2004
Matthews, Sharon	211 Hillcrest Dr.	Encinitas	CA	92024	8/11/2004
Matthews, Sharon	211 Hillcrest Dr.	Encinitas	CA	92024	8/11/2004
Maxheimer, Susan	42915 Wisconsin Ave.	Palm Desert	CA	92211	8/15/2004
Maybury, John	1302 Rosita Rd.	Pacifica	CA	94044	8/21/2004
Mayers, Melinda	33 Crystal Lake Ln.	Spring	TX	77380	8/11/2004
McCallum, James	907 Towson Dr.	Abigdon	MD	21009	8/21/2004
McConaghy, Stacy	2433 Sweetbriar Lane	Rock Hill	SC	29732	8/21/2004
McCrae, Lyle G.	716 NE 10th St.	North Bend	WA	98045	8/15/2004
McCreless, Erin	95 Clark St.	New Haven	CT	06511	8/19/2004
McCullough, Megan	789 Santa Ana Blvd.	Oak View	CA	93022	8/19/2004
McCune, Sean	9535 Acer Ave., Apt 602	El Paso	TX	79925	8/17/2004
McDaniel, Roxanne	407 Orange St., Apt. 501	Oakland	CA	94610	8/16/2004
McDonald, Claude & Cynthia	6633 Mt. Forest Dr.	San Jose	CA	95120	8/16/2004
McDonald, Mary Ann	2653 2nd Ave., Apt 3	Sacramento	CA	95818	8/11/2004
McEachern, Nina	303 Market St., Apt. 527	San Diego	CA	92101	8/11/2004
McIntrye, Susan	P.O. Box 117	Derby Line	VT	05830	8/17/2004
McKenney, Shannon	1623 Wesey Ave.	Utica	NY	13502	8/11/2004
McKenzie, Catherine	3825 Chatfield Ave.	Baton Rouge	LA	70808	8/21/2004
McKinney, Laura	12707 Mitchell Ave. #201	Los Angeles	CA	90066	8/11/2004
McLellan, Tawny	222 Avd De La Vereda	Ojai	CA	93023	8/15/2004
McMillan, Laurie	125 Tambec Trce NW	Lilburn	GA	30047	8/21/2004
McNally, Maurine	4023 North Pontiac Avenue	Chicago	IL	60634	8/21/2004
McNamara, Vivian	401 B Richmond St.	El Segundo	CA	90245	8/19/2004
McNaughton, Patricia	Rr #3	Desoto	KS	66018	8/11/2004
McNeil, Daniel	7815 A Timber Commons Ln.	Charlotte	NC	28212	8/18/2004
McNiff, Claudia	1623 E. Candlestick Dr.	Tempe	AZ	85283	8/11/2004
McNitt, Ruth	1752 S. Rogers Cir.	Mesa	AZ	85202	8/11/2004
McPherson, Ray	P.O. Box 1155	Aberdeen	WA	98520	8/22/2004
McRae, Lyle, G.	716 NE 10th St.	North Bend	WA	98045	8/15/2004
Meacham, Meribeth	2810 Franklin St., Apt. 32	San Francisco	CA	94123	8/17/2004
Medanic, Rachel	265 Vernon St., #109	Oakland	CA	94610	8/15/2004
Medeiros, Mary	2799 Castle Hill Ct., Apt 2	Sacramento	CA	95821	8/20/2004
Meeker, Jim	2712 Onate Rd.	Roswell	NM	88201	8/21/2004
Meglashen, Ann	1384 Rio Santa Cruz	Green Valley	AZ	85614	8/22/2003
Melendez, Chris	4633 Bountiful Way	Las Vegas	NV	89121	8/20/2004

Mercury, Rhyann	7409 Yarmouth Ave.	Reseda	CA	91335	8/15/2004
Merrill, Deborah	653 Partridge Ave.	Menlo Park	CA	94025	8/11/2004
Merrill, Susanne	1874 Castle Rock Road	Afton	VA	22920	8/11/2004
Messina, Matthew	104 Hempstead Ave.	Lynbrook	NY	11563	8/18/2004
Meyers, Mandy	120 S. Delsea Dr.	Clayton	NJ	08312	8/11/2004
Meyert, Suzanne	152 Branchbrook Dr.	Henrietta	NY	14467	8/19/2004
Miceli, Susan	P.O. Box 177	Streamwood	IL	60107	8/19/2004
Michaels, Shirley	4849 E. Palo Brea Ln.	Cave Creek	AZ	85331	8/11/2004
Michalski, Misty	32383 Corydon St.	Lake Elsinore	CA	92530	8/16/2004
Mies, Charles	13n258 Wedgewood Dr.	Elgin	IL	60123	8/21/2004
Mikkelson, Bernadette	188 Walter Ave.	Hauppauge	NY	11788	8/21/2004
Miles, Charlie	3830 E. Windsong Dr.	Phoenix	AZ	85048	8/11/2004
Miller, Edmund	488 University Ave., Apt 619	Palo Alto	CA	94301	8/11/2004
Miller, Gloria	P.O. Box 1130	Springville	CA	93265	8/16/2004
Miller, Jean	1023 New Dawn Lane	Odenton	MD	21113	8/20/2004
Miller, Leslie	10022 Reseda Blvd., Unit 8	Northridge	CA	91324	8/11/2004
Miller, Meshell	3636 Jenny Lind Ave.	North Highlands	CA	95660	8/11/2004
Miller, Michael	3973 Greasewood St.	Yucca Valley	CA	92284	8/17/2004
Mink, Erin	500 W. 11th St. #300 E	Lawrence	KS	66044	8/19/2004
Mishka, Erica	4179 N. Bloomington Ave., Apt. 203	Arlington Heights	IL	60004	8/15/2004
Mishodek, Sandy	P.O. Box 1614	Running Springs	CA	92382	8/16/2004
Mitchell, Denise	2149 Savoy St.	Corpus Christi	TX	78414	8/19/2004
Mitrou, Gina	25023 Peachland Ave. Apt. 152	Newhall	CA	91321	8/11/2004
Mizerany, Catherin	2365 Virginia Ct.	Arnold	MO	63010	8/22/2004
Mollen, Phyllis	205 W. 91st St., Apt. 3B	New York	NY	10024	8/23/2004
Montelli, Patricia	118 Richards Glen Dr.	Franklin	TN	37067	8/15/2004
Montgomery, Douglas	707 Haight St., Apt. 2	San Francisco	CA	94117	8/11/2004
Mooberry, Jane	1917 Sea Gull Dr.	El Paso	TX	79936	8/21/2004
Moody, Kristel	536 Deer Creek Ct.	Jackson	NJ	08527	8/20/2004
Moon, Rachel	6311 Bach Dr.	West Chester	OH	45069	8/19/2004
Moore, Whitney	144 Skyland Dr.	Lakeland	FL	33813	8/19/2004
Morasca, Alithea	2130 Ash St.	Palo Alto	CA	94306	8/17/2004
Moreno, Christine	6251 Palm Trace Landings Dr. Apt 119	Davie	FL	33314	8/11/2004
Morford, Carrie	119 Vivian Dr.	Pleasant Hill	CA	94523	8/16/2004
Morgan, Amy	P.O. Box 247	Rivesville	WV	26588	8/17/2004
Morgan, Michelle	1760 Avenida Del Mundo Unit 201	Coronado	CA	92118	8/11/2004
Morris, Caren	2604 Spearpoint Dr.	Reno	NV	89509	8/11/2004
Morris, Marion	36482 Rodgers Ln.	Yucaipa	CA	92399	8/11/2004
Morris, Marion	36482 Rodgers Ln.	Yucaipa	CA	92399	8/11/2004
Morris, Sharon	23693 Glenbrook Ln.	Hayward	CA	94541	8/11/2004

Morrison, Fran	17875 La Rosa Ln.	Fountain Valley	CA	92708	8/16/2004
Morse, Debbie	3700 Lyon Rd., Apt. 260	Fairfield	CA	94534	8/11/2004
Mortellito, Nina	401 East 88th St.	New York	NY	10128	8/20/2004
Mortellito, Nina	401 East 88th St.	New York City	NY	10128	8/20/2004
Moryusef, Alberto	17890 W Dixie Hwy., Apt 305	North Miami Beach	FL	33160	8/21/2004
Mosher, Monique	14 Sylvia Ln.	Corrales	NM	87048	8/11/2004
Moshier, Deborah	5 Sea Meadows Lane	Waterford	CT	06385	8/19/2004
Mueller, Marianne	345 Forest Ave, Apt. 111	Palo Alto	CA	94301	8/15/2004
Muenter, Andrea	1755 Partridge Dr.	San Luis Obispo	CA	93405	8/11/2004
Mufalli, Sam	709 Church Rd.	Cherry Hill	NJ	08002	8/17/2004
Mullan, Terry	16237 N 57th St.	Scottsdale	AZ	85254	8/12/2004
Mullins, Veneita	280 Grant Ave.	Satellite Beach	FL	32937	8/18/2004
Munn, Sharon	432 158th St. SE	Bothell	WA	98012	8/20/2004
Murphy, Barbara	P.O. Box 695	Somers	NY	10589	8/15/2004
Murphy, Liz	9560 White Meadow Rd.	Pollack Pines	CA	95726	8/11/2004
Murphy, Michele	3707 Brooklyn Ave.	Brooklyn	MD	21225	8/18/2004
Murphy, Penny	8480 Gulf Beach Highway	Pensacola	FL	32516	8/20/2004
Murray, Joel	1507 E West Hwy. Apt. 173	Silver Spring	MD	20910	8/21/2004
Myers, Jim	4038 E. Hayhurst Ln.	Tucson	AZ	85712	8/11/2004
Naftaly, Stanley	521 N. La Cumbre Rd., Apt. 52	Santa Barbara	CA	93110	8/11/2004
Namisnik, Wendy	3138 Prince Henry Dr.	Sacramento	CA	95833	8/11/2004
Nance, O.	P.O. Box 255	Carlotta	CA	95528	8/11/2004
Navas, Mary Ellen	743 A Walker Ave.	Oakland	CA	94610	8/11/2004
Navon, Gina	46 1st St.	Rumson	NJ	07760	8/22/2004
Neidhammer Jr., William.	1127 Canadochly Rd.	York	PA	17406	8/16/2004
Nelson, Barbara	462 Esplanade	Pelham	NY	10803-2646	8/11/2004
Nelson, Frances	1651 Cumberland St.	St. Paul	MN	55117	8/16/2004
Nelson, Jeanne	5017 Stonehedge Dr.	Santa Rosa	CA	95405	8/11/2004
Nelson, Louise	8992 Edcliff Ct. SE	Aumsville	OR	97325	8/11/2004
Nelson, Lynnze	1875 Orange Grove Dr.	San Jose	CA	95124	8/16/2004
Nemour, Stacey	527 S. Hobart Blvd #503	Los Angeles	CA	90020	8/11/2004
Nestler, Diane	227 S. San Gabriel Ave.	Azusa	CA	91702	8/11/2004
Neveux, Dominique	1820 Simpson Ave.	Reno	NV	89503	8/15/2004
Niccoli, Arthur	2 Nakomo Dr.	Litchfield	NH	03052	8/11/2004
Nicholls, Valerie	1000 SW 130th #104	Seattle	WA	98146	8/20/2004
Nicholson-Schenk, Marguerite	6626 McCallum St.	Philadelphia	PA	19119	8/16/2004
Ninneman, Douglas	414 E Cedar Ave. Apt. 4	Burbank	CA	91501	8/21/2004
Nittinger, Donna	P.O. Box 1543	Sebastopol	CA	95473	8/19/2004
Nobbe, Nancy	11187 Chase Way	Wesminister	CO	80020	8/22/2004
Noll, Sharon	1660 E Crimson Canyon Pl.	Tucson	AZ	85737	8/16/2004

Norman, Gina	738 W. Valley View Dr.	Fullerton	CA	92835	8/20/2004
Norwine, Judith	323 E. 11th St.	Port Clinton	OH	43452	8/11/2004
Novak, Judy	21073 Foothill Trail	Akeley	MN	56433	8/17/2004
O., Nance	P.O. Box 255	Carlotta	CA	95528	8/12/2004
Obuckley, Todd	881 Airport Rd.	Chapel Hill	NC	27514	8/18/2004
Obudzinski, Dirk	710 N. Hummingbird Ln.	Sedona	AZ	86336	8/17/2004
Ochoa, Zenobia	900 W. Zeering Rd.	Turlock	CA	95382	8/11/2004
Oden, Carroll	13218 N 76th Pl.	Scottsdale	AZ	85260	8/15/2004
O'Donnell, Matt	2340 Lemur St.	Santa Rosa	CA	95401	8/11/2004
Ohanian, Diane	7890 Hemphill Dr.	San Diego	CA	92126	8/16/2004
Oldham, Danielle	12 W. 2nd Ave., Apt D	Conshohocken	PA	19428	8/17/2004
Oliver, Ardis	8851 Gothic Ave.	North Hills	CA	91343	8/17/2004
Oliver, Jennifer	408 Sansom St.	Upper darby	PA	19082	8/11/2004
Olson, Sandra	1819 Elm St.	Alameda	CA	94501	8/11/2004
Oman, Gilda	415 Miramar St.	Upland	CA	91784	8/11/2004
Orcholski, Gerald	2400 Brigden Rd.	Pasadena	CA	91104	8/11/2004
Ortiz, Rachel	14347 Huntingfield Ct.	Orlando	FL	32824	8/18/2004
Osborn, Kellie	6377 Rouget Rd.	Palmyra	MI	49268	8/21/2004
Osborn, Kristin	850 Beech St. #102	San Diego	CA	92101	8/11/2004
Oster, Carol	86 Bonnie St.	Glasgow	MT	59230	8/23/2004
Ostrowski, Marcia	3850 N. Fanning Dr., Unit C-4	Flagstaff	AZ	86004	8/11/2004
Ourusoff, Peter	3833 Ross Rd.	Sebastopol	CA	95472	8/15/2004
Outler, D.	4862 N.E. 4th Ave.	Fort Lauderdale	FL	33334	8/18/2004
Overton, Paul	6810 Dilusso Dr. #276	Elk Grove	CA	95758	8/16/2004
Owen, Aledajeanne	P.O. Box 61	Oak Harbor	WA	98277	8/21/2004
Owen, Betty	1190 Pismo Ave.	Los Osos	CA	93402	8/11/2004
Paddock, Kathryn	5386 Jed Smith Rd.	Hidden Hills	CA	91302	8/22/2004
Paddock, Margaret	1790 W. Desert Willow Dr.	Cottonwood	AZ	86326	8/11/2004
Paige, Stacey	621 S. Gramercy Pl. Apt 310	Los Angeles	CA	90005	8/16/2004
Pak, Phyllis	8987 Roosevelt Hwy	Warm Springs	GA	31830	8/11/2004
Pakradooni, Jennie	81 Surrey Street	Brighton	MA	02135	8/20/2004
Paley, Jane	11133 Rose Ave., Apt. 8	Los Angeles	CA	90034	8/11/2004
Palladine, Michelle A.	777 E. Tahquitz Canyon Way, Ste. 200	Palm Springs	CA	92262	8/16/2004
Palmer, Geri	248 Bernick Dr.	Langhorne	PA	19047	8/21/2004
Palmer, Richard	P.O. Box 576864	Modesto	CA	95357	8/11/2004
Palozola, Rosemarie	9199 Sunshine Blvd.	New Port Richey	FL	34654-4	8/18/2004
Panjabi, Arvind	5501 Continental Dr.	Fort Collins	CO	80526	8/19/2004
Panzica, Marguerite	12528 Stillman St.	Lakewood	CA	90715	8/16/2004
Parham, Glenda	P.O. Box 146	Humphrey	AR	72073	8/19/2004
Parke, Elizabeth	1212 E. 7th St.	Pittsburgh	KS	66762	8/21/2004

Parker, Erika	Carriage Hills	Conroe	TX	77384	8/20/2004
Parker, Judson	917 Shabbona Trl	Batavia	IL	60510	8/18/2004
Parker, Nicole	8411 Hunting Saddle Dr.	Hudson	FL	34667	8/22/2004
Parker, Rodney	Carriage Hills	Conroe	TX	77384	8/20/2004
Parnell, Barbara	5301 SW 19th St.	Plantation	FL	33317	8/11/2004
Patterson, Donna	4474 Viadelesbrisas	Scottsdale	AZ	85258	8/11/2004
Peak, Matthew	708 35th Ave.	San Francisco	CA	94121	8/11/2004
Pealer, Renate	3421 Dawn Dr.	Hamilton	OH	45011	8/15/2004
Pedone, Chris	2131 Gilpin St.	Denver	CO	80205	8/17/2004
Peeplez, Kelle	P.O. Box 1649	Perris	CA	92572	8/11/2004
Peltier, Michelle	13107 E. Button Rd.	Elk	WA	99009	8/20/2004
Pendry, Joseph	P.O. Box 3346	Freedom	CA	95019	8/11/2004
Perkins, Guy	220 Carville Cir.	Carson City	NV	89703	8/11/2004
Perlman, Eileen	9810 Zelzah Avenue Ste 112	Northridge	CA	91325	8/11/2004
Perrault, Claire	1185 20th St. #103	Key West	FL	33040	8/21/2004
Perry, Lisa	37117 Royal Oak Rd.	Fruitland Park	FL	34731	8/18/2004
Persico Lettiere, Paula	181 Powers St. Bsmt.	Brooklyn	NY	11211	8/20/2004
Perykasz, John	172 Read Ave.	Yonkers	NY	10707	8/15/2004
Pesteanu, Loretta	331 16th St., Apt. 1	Brooklyn	NY	11215	8/15/2004
Peters, John	3841 4th Ave.	San Diego	CA	92103	8/11/2004
Peterson-Hosto, Audrey	10350 Cyclone Ave.	Yuma	AZ	85365	8/21/2004
Phillips, Janice	5380 Brittainywood Rd.	Kernersville	NC	27284	8/20/2004
Phillips, Patricia	487 Wolcott Ave.	Kent	OH	44240	8/16/2004
Philp, Hilary	10809 Blix St., Unit 2	North Hollywood	CA	91602	8/11/2004
Piani, James	9485 Pinedale Cir.	Sandy	UT	84092	8/21/2004
Picken, Libby	15 East Eager St., Apt. 1F	Baltimore	MD	21202	8/17/2004
Pier, Italia	1914 Corinth Ave., Apt. 101	Los Angeles	CA	90025	8/11/2004
Pierce, Deborah	9182 Generations Dr.	Elk Grove	CA	95758	8/11/2004
Pierce, Sharon	120 Rosina Ave.	Modesto	CA	95354	8/15/2004
Pietrocarlo, Paul	18248 N 6th Dr.	Phoenix	AZ	85023	8/11/2004
Pike, Nancie	8435 Geyser Ave.	Northridge	CA	91324	8/11/2004
Pilgrim, Doug	2299 NE Goldenrod Cir.	Bremerton	WA	98311	8/21/2004
Pirkhl, Mike	8566 Calabash Ave.	Fontana	CA	92335	8/11/2004
Pitkin, Peter	1411 Enchanted Way	San Mateo	CA	94402	8/19/2004
Pitt, Terry	5726 NE Detroit Ave.	Kansas City	MO	64119	8/17/2004
Pizano, Luis	1939 Senate St.	St. Louis	MO	63118	8/17/2004
Pohorylo, Erast	2134 Haven Rd., Apt F	Wilmington	DE	19809	8/15/2004
Polacsek, Alyssa	224 E. 21st. St.	New York City	NY	10010	8/18/2004
Polesky, Alice	890 Kansas St. Apt. 4	San Francisco	CA	94107	8/11/2004
Pollack, Jerry	10438 Las Lunitas	Tujunga	CA	91042	8/11/2004

Pollan, Jeffrey	32 Wildwood Gardens Apt. G2	Port Washington	NY	11050	8/15/2004
Pollock, Michele	107 Vesey Street	Brockton	MA	02301	8/16/2004
Polsky, David	1102 Rosario Dr.	Topanga	CA	90290	8/11/2004
Porter, Candice	13419 W. 126th Pl.	Overland Park	KS	66213	8/22/2004
Porter, Dereck	9261 Lime Circle	Cypress	CA	90630	8/11/2004
Porter, Sandra	4320 5th Ave. N	Saint Petersburg	FL	33713	8/18/2004
Potter, Diane	1905 Laurel Park Highway	Hendersonville	NC	28739	8/18/2004
Powdrell, Laura L.	332 Jessica Way	Northbridge	MA	01534-2101	8/22/2004
Powers, Michael	5601 E. Holmes St.	Tucson	AZ	85711	8/11/2004
Powers, Regina	3309 Sollers Point Road	Baltimore	MD	21222	8/17/2004
Preece, Shawna	P.O. Box 353	Brandenton	FL	34206	8/21/2004
Preuss, G.	405 Ruth St.	Bridgeport	CT	06606	8/19/2004
Price, David	P.O. Box 163	Bryn Mawr	CA	92318	8/11/2004
Prive, Melissa	13 N. Main St. Apt. 2	Waterbury	VT	05676	8/20/2004
Proe, Steve	P.O. Box 94	Greenwood	CA	95635	8/11/2004
Proksch, Veronica	104 W Lowe Ave.	Fairfield	IA	52556	8/15/2004
Quaid, Kerey	37703 2nd St.	Fremont	CA	94536	8/16/2004
Quaid, Nicole	1551 Echo Park Ave. #301	Los Angeles	CA	90026	8/11/2004
Quandt, Cathleen	2413 C 5th St.	Berkley	CA	94710	8/11/2004
Quartararo, Lisa	159 Archangela Ave.	Colonia	NJ	07067	8/15/2004
Quig, Alec	60580 Gentle Run Ct.	South Bend	IN	46614	8/19/2004
Quijano, Sigfrido	185 Rue Berlioz	Montreal	PQ		8/17/2004
Raba, Eric	4225 Inglewood Blvd., Apt. 306	Los Angeles	CA	90066	8/11/2004
Racine, Bob	1643 W. 5th St.	Mesa	AZ	85201	8/12/2004
Racz, Andrew	Box H183 Lehigh University	Bethlehem	PA	18015	8/18/2004
Raich, Katie	5700 N. Tamiami Trail Box 238	Sarasota	FL	34243	8/18/2004
Rakotz, Jenelle	1022 Summit Avenue	South St. Paul	MN	55075	8/20/2004
Ramirez, Julie	19264 Lowell Ave.	Hayward	CA	94541	8/17/2004
Rao, Sharon	8622 W. Davis Rd.	Peoria	AZ	85382	8/11/2004
Raper, Connie	2614 Woodmont Dr.	Durham	NC	27705	8/19/2004
Rasche, Sandra	P.O. Box 116	Ruth	CA	95526	8/11/2004
Rasey, Karen	426 W. Cottonwood Ln., Lot 9	Casa Grande	AZ	85222	8/11/2004
Rashkind, Jennifer	39010304 Keys Complex	Gainesville	FL	32612	8/21/2004
Ratliff, Jeremy	1465 West 78th Circle	Denver	CO	80221	8/22/2004
Ray, Michelle	7507 Moredale Rd.	Louisville	KY	40222	8/21/2004
Redenbach, Christy	718 Springlake Rd.	Lawrenceville	GA	30045	8/21/2004
Reed, Lisa	P.O. Box 295	Green Valley	AZ	85622	8/16/2004
Reese, Jameala	603 Brentwood Pl.	Brandon	FL	33511	8/22/2004
Reese, Marianne	42870 Via Oporto	Fremont	CA	94539	8/17/2004
Reese, Rebecca	2512 Custer Ave.	Odessa	TX	79761	8/19/2004

Reeves, Connie	P.O. Box 7724	Lakeland	FL	33807	8/21/2004
Reeves, Kathleen	3593 Asperwood Circle	Coconut Creek	FL	33073	8/21/2004
Refsell, Nadine	5960 Stoneridge Dr., Ste 206	Pleasanton	CA	94588	8/11/2004
Regan, John	11 russell Rd.	Winchester	MA	01890	8/20/2004
Regenery, Lynn	1957 Prestwick Ln.	Wilmington	NC	28405	8/21/2004
Regrave, Denise	3310 Longleaf Ct.	Tallahassee	FL	32310	8/17/2004
Rehfuss, Tom	706 Wellington Sts.	Sparta	Wi	54656	8/19/2004
Reich, Heather	21980 Victory Dr.	Hayward	CA	94541	8/17/2004
Reilly, Peter	1555 Mill Race Lane	West Chester	PA	19380	8/21/2004
Reinbold, Gary	1301 N. Dearborn #604	Chicago	IL	60610	8/18/2004
Reisert, James	7 Charlemonte Court	North Chelmsford	MA	01863	8/21/2004
Rentschler, Dennis	P.O. Box 2168	West Dover	VT	05356	8/15/2004
Reynolds, Janet	7435 Walling Ln.	Dallas	TX	75231	8/20/2004
Ricci, Scott	588 E. San Lorenzo Rd. # 202	Palm Springs	CA	92264	8/11/2004
Ricciardi, H.	Woodview Dr.	Brookfield	CT	06804	8/23/2004
Rice, Jan	P.O. Box 454	Cazadero	CA	95421	8/21/2004
Rich, Dana	3425 19th St., Apt. 8	San Francisco	CA	94110	8/16/2004
Rich, Ruth	1733 South Holt	Los Angeles	CA	90035	8/11/2004
Richards, Loretta	25431 N 63rd Dr.	Glendale	AZ	85310	8/11/2004
Richardson, Colleen	405 Leibrandt Ave., Apt 1	Santa Cruz	CA	95060	8/11/2004
Richman, Heather	333 Castle Dr.	Santa Cruz	CA	95065	8/11/2004
Rickard, James	12341 Colinstone Pl.	Glen Allen	VA	23059	8/15/2004
Rickert, Odette	18311 Las Cumbres Rd.	Los Gatos	CA	95033	8/11/2004
Rico, Carmen	185 Rue Berlioz	Montreal	H3E1C1		8/11/2004
Ridolfi, Paula	380 Rector Pl. Apt. 24b	New York	NY	10280	8/21/2004
Rini, Thomas	7018 E. Elbow Bay Dr.	Tucson	AZ	85710	8/11/2004
Riordian, Kim	650 Mt. Vernon Pl.	Batavia	IL	60510	8/21/2004
Rivera, Jason	11277 Sardis Ave.	Los Angeles	CA	90064	8/11/2004
Roberts, Jan	804 E Clubhouse Ln.	Queen Creek	AZ	85242	8/15/2004
Robison, Anne	14633 McCormick St.	Sherman Oaks	CA	91411	8/11/2004
Roche, Lauretta	265 S. Main St.	Flemington	NJ	08822	8/16/2004
Roche, Robert	16 Newton Ln.	Trumbull	CT	06611	8/21/2004
Rodgers, Julie	7406 NE 145th Pl.	Kenmore	WA	98028	8/15/2004
Rodriguez, Carol	22798 Av. San Luis	Woodland Hills	CA	91364	8/17/2004
Roed, Ingrid	3964 20th St.	San Francisco	CA	94114	8/11/2004
Roeder, Carol	2928 Peach Tree Rd.	Fallon	NV	89406	8/11/2004
Rogers, Charlotte	513 E. Abriendo Ave.	Pueblo	CO	81004	8/11/2004
Rogers, Margaret	15420 La Miranda Blvd., Unit 204	La Miranda	CA	90638	8/11/2004
Rogers, Susan	129 N. Swall Dr.	Los Angeles	CA	90048	8/21/2004
Roka, Rutham	648 Circlewood Dr.	Venice	FL	34293	8/18/2004

Rolsky, Robert	9940 E. Mariposa Grande Dr.	Scottsdale	AZ	85255	8/11/2004
Romenro, Dottie	23644 Via Delicia	Valencia	CA	91355	8/11/2004
Romesburg, Denise	7326 N. 21st. Ave.	Phoenix	AZ	85021	8/11/2004
Root, Charlene	8634 Friends Ave.	Whittier	CA	90602	8/11/2004
Root, William	2022 E 5th St.	Tucson	AZ	85719	8/15/2004
Rorke-Davis, Shawn	303 E. Orange Dr.	Phoenix	AZ	85012	8/11/2004
Rose, Pandora	434 Creelman Ln.	Ramona	CA	92065	8/11/2004
Rosellini, Sandy	645 Maybell Ave.	Palo Alto	CA	94306	8/19/2004
Rosenberg, Jeanne	1844 Harbinson Canyon Rd.	El Cajon	CA	92019	8/16/2004
Rosenblum, Michael	651 west 70th st.	Kansas City	MO	64113	8/21/2004
Rosenkrantz, Stewart	2319 SE 9th St.	Pompano Beach	FL	33062	8/15/2004
Rosenthal, Ann	1138 Alice St.	Davis	CA	95616	8/11/2004
Rosenthal, Carol	6248 Morella Ave.	North Hollywood	CA	91606	8/11/2004
Ross, Claudia	3135 Redcoat Ln.	Sacramento	CA	95827	8/11/2004
Ross, Margaret	705 E. Park Dr.	Payson	AZ	85541	8/11/2004
Ross, William	1111 N. Crabtree Ln.	Mount Prospect	IL	60056	8/11/2004
Rothman, Marisa	701 Ocean Ave. #201	Santa Monica	CA	90402	8/11/2004
Routson, Diane	P.O. Box 140006	Toledo	OH	43614	8/22/2004
Rowe, Vicki	3132 Auburn Rd.	Bloomington	IL	61704	8/21/2004
Rowley, Sean	P.O. Box 94	Fabius	NY	13063	8/21/2004
Rowley, Sean	P.O. Box 94	Fabius	NY	13063	8/21/2004
Royce-Wilder, Carol	445 28th Ave.	Venice	CA	90291	8/11/2004
Rueda, Kristy	109 Endicott St.	Boston	MA	02113	8/18/2004
Ruggles, Suzanne	P.O. Box 546	Westhampton	NY	11977	8/20/2004
Rumple, Pamela	9743 W. 85th St., Apt A	Overland Park	KS	66212	8/15/2004
Rush, Charlene	100 Anderson St., Apt 541	Pittsburgh	PA	15212	8/11/2004
Rush, George	8260 Via Urner Way	Bonsall	CA	92003	8/16/2004
Rushing, Laura	11160 Jollyville Rd., #2-438	Austin	TX	78759	8/21/2004
Russell, Dorothy	P.O. Box 908	Lamar	CO	81052	8/16/2004
Ryan, Amy	24 Crossings Circle, Apt. D	Boynton Beach	FL	33435	8/18/2004
Sabroso, Maryann	9671 Hawaiian Summer St.	Las Vegas	NV	89123	8/18/2004
Sacks, Ivy	11525 SW 212th Pl.	Vashon	WA	98070	8/11/2004
Sadowski, Joan	11 Wilton Dr.	Wilmington	MA	01887-2	8/15/2004
Sakamoto, Diane	98-2061 Kaahumnu St. Apt C	Aiea	HI	96701	8/18/2004
Sakoda, Fumiko	P.O. Box 104	Rosston	OK	73855	8/20/2004
Saltanis, Peter	326 Moose Hill Rd.	Monroe	CA	06468	8/11/2004
Samide, Brenda	160-55 99th St.	Howard Beach	NY	11414	8/15/2004
Samuels, Harold	5659 Ramara Ave.	Woodland Hills	CA	91367	8/11/2004
Sander, Erik	1856 W. North Ave., Apt. 3 F	Chicago	IL	60622	8/18/2004
Sanders, Gary	3980 Bibbits Dr.	Palo Alto	CA	94303	8/11/2004

Sanders, Richard	2022 Driftstone Dr.	Glendora	CA	91740	8/16/2004
Sandle, Susanna	5719 Dalton Dr.	Farminton	NY	14425	8/19/2004
Sanner, Michele	4868 Bruges Ave.	Woodland Hills	CA	91364	8/11/2004
Santangelo, Elaine	8470 E. Foothill St.	Anaheim	CA	92808	8/11/2004
Santivong, Richard	628 W. Newmark Ave.	Monterey Park	CA	91754	8/11/2004
Saravanan, Bhavani	455 Hope St., #3F	Stamford	CT	06906	8/19/2004
Sargent, Robert	320 Main St.	Salem	NH	03079	8/21/2004
Sario, Terry	4666 N. 19th Ave.	Phoenix	AZ	85015	8/11/2004
Savage, Robin	P.O. Box 1523	Exmore	VA	23350	8/19/2004
Sawicki, Jeannine	11026 Jordan Ct.	Parker	CO	80134	8/16/2004
Sayer, Kyeann	2274 Hidalgo Ave.	Los Angeles	CA	90039	8/11/2004
Schaefer, Erica	739 21st. St.	Hermosa Beach	CA	90254	8/21/2004
Schaeffer, Dieter	1106 W. Circulo Del Sur	Green Valley	AZ	85614	8/18/2004
Schaffel, Susan	11105 Bexley Ln.	Austin	TX	78739	8/19/2004
Schechter, Andy	4 Tunison Close	Hillsborough	NJ	08844	8/23/2004
Scheffler, Ann Marie	P.O. Box 4730	Crestline	CA	92325	8/11/2004
Scheppler, Trisha	1415 Palm Dr.	Burlingame	CA	94010	8/17/2004
Schneider, Gregory	540 Edgar Rd.	Westfield	NJ	07090	8/15/2004
Schoenberg, Leslie	208 April Ave.	Vernon Hills	IL	60061	8/19/2004
Schoene, Clare	1519 Oak St.	Santa Monica	CA	90405	8/18/2004
Schoene, Elizabeth	1519 Oak St.	Santa Monica	CA	90405	8/16/2004
Schou, Per	8907 Sommerland Way	Austin	TX	78749	8/18/2004
Schubert, Amanda	P.O. Box 135	Farmington	WA	99128	8/11/2004
Schuessler, Gail	2025 E 3rd St.	Tucson	AZ	85719	8/17/2004
Schulte, Peggy	6034 N. Marmora Ave.	Chicago	IL	60646	8/20/2004
Schultz, Kenneth	6161 E 4th St.	Tucson	AZ	85711	8/11/2004
Schulze, Carolyn	35840 Los Coyotes Rd.	Lake Elsinore	CA	92530	8/11/2004
Schwab, Diana	1027 9th St., Apt 5	Santa Monica	CA	90403	8/11/2004
Schwager, Kathy	14 Weidner Ln.	Patchogue	NY	11772	8/22/2004
Sciacca, Barbara	P.O. Box 4853	Cave Creek	AZ	85327	8/11/2004
Scrivner, Paul	6433 W. 82nd Street	Los Angeles	CA	90045	8/15/2004
Sears, Michael	404 N. 2nd, St. #1	San Jose	CA	95112	8/11/2004
Seider, John	21 Grand St.	Oneonta	NY	13820	8/11/2004
Seki, Leslie	2680 Butler Ave.	Los Angeles	CA	90064	8/11/2004
Semel, John	200 E. 66th Street # A 303	New York City	NY	10021	8/20/2004
Shafer, Shana	1200 Jeanette Ave.	Union	NJ	07083	8/15/2004
Shapiro, Sid	10957 Elderwood Ln.	San Diego	CA	92131	8/11/2004
Sharer, Deborah	3907 Giboz Rd.	Marshville	NC	28103	8/18/2004
Shawvan, Jim	2260 El Cajon Blvd. #890	San Diego	CA	92104-1	8/22/2004
Shea, Cheli	52960 Avenida Alvarado	La Quinta	CA	92253	8/11/2004

Shellenberger, Matthew	1201 Dupont St.	Bellingham	WA	98225	8/20/2004
Shepherd, Kila	2913 Juanipero Way	Medford	OR	97504	8/11/2004
Sherba, Kim	99 Pearl Ave.	Johnson City	NY	13790	8/22/2004
Shippy, Jane	517 Fieldcrest Ave.	Stevens Point	WI	54481	8/17/2004
Shirar, Gloria Jean	1015 Harrison St.	Bristol	PA	19007	8/19/2004
Shomer, Clare	834 S. Longwood Ave.	Los Angeles	CA	90005	8/11/2004
Short, Lee A.	7858 Gatehouse Dr.	Houston	TX	77040	8/21/2004
Shpiller, Natasha	1240 W. Farwell # 2A	Chicago	IL	60626	8/18/2004
Shurman Phd, Susan	11 Hovey St.	Quincy	MA	02171	8/11/2004
Siegel, Charles	2140 Shattuck ave., Ste. 2122	Berkley	CA	94704	8/11/2004
Siepker, Paul	144 Northpointe Dr.	Mountain Home	AR	72653	8/16/2004
Siewart, Barbara	5601 W. Cambridge Ave.	Phoenix	AZ	85035	8/17/2004
Sikorski, Taryn	8102 Dunn St. #A	Austin	TX	78745	8/22/2004
Siladie, Shirah	251 Westview Ave.	Columbus	OH	43214	8/20/2004
Silan, Sheila	6600 Summerhill Rd.	Somerset	CA	95684	8/11/2004
Silva, Adam	237 Clay Dr.	Seven Points	TX	75143	8/19/2004
Sims, Kate	2732 Greenwood	Whichita	KS	67216	8/22/2004
Sislin, Leno	2240 Ben Lomond Dr.	Los Angeles	CA	90027	8/11/2004
Sisson, Karen	1291 Cheney Hwy Apt. F	Titusville	FL	32780	8/16/2004
Skidmore, Michael	6161 N. Sheridan Rd., 1B	Chicago	IL	60660	8/11/2004
Skudney, Dennis	17211 E. Baca Dr.	Fountain Hills	AZ	85268	8/11/2004
Slawson, Camly	1023 Judah St.	San Francisco	CA	94122	8/16/2004
Sloan Freel, Elizabeth	11872 Bray St.	Los Angeles	CA	90230	8/17/2004
Slonim, Tracey	19792 Gloucester Ln.	Huntington Beach	CA	92646	8/11/2004
Smith, Charles	368 Avenida Arboles	San Jose	CA	95123	8/17/2004
Smith, Deborah	3044 NW 30th St.	Oklahoma City	OK	73112	8/21/2004
Smith, Holly	14438 Jones Maltsberger	San Antonio	TX	78247	8/22/2004
Smith, Judith	2712 Grande Vista Ave.	Oakland	CA	94601	8/11/2004
Smith, Julie	1048 Bay Oaks Dr.	Los Osos	CA	93402	8/11/2004
Smith, Marie	1516 30th Ave.	Woodstock	MN	56186	8/18/2004
Smith, Matt	3007 Robin Hood Dr.	Greensboro	NC	27408	8/19/2004
Smith, Roger	2275 S. Bascorn Ave., Apt. 211	Campbell	CA	95008	8/11/2004
Smith, Scott	1616 Monte Vista Ave.	Claremont	CA	91711	8/11/2004
Smith, Tracy	130 Harbour Dr.	Dawsonville	GA	30534	8/19/2004
Snyder, Clarice	6248 E. Waltann Lane	Scottsdale	AZ	85254	8/11/2004
Snyder, Renee	16922 Kinzie Street	Northridge	CA	91343	8/11/2004
Sobanski, Sandy	110 1st St., Apt. 3	Hoboken	NJ	07030	8/18/2004
Sobel, Marilyn	329 Haverford Place	Swarthmore	PA	19081	8/17/2004
Soifer, Robin	P.O. Box 2921	Crested Butte	CO	81224	8/19/2004
Solem, Sue Anne	310 Umsted Dr.	Chapel Hill	NC	27516	8/23/2004

Soza, Valerie	500 NW 60th St., Apt. 1	Seattle	WA	98107	8/11/2004
Spangler, Steven	7048 Cinnamon Teal Way	El Dorado Hills	CA	95762	8/11/2004
Spears, Nancy	15 Southgate Dr.	Bossier City	LA	71112	8/19/2004
Spencer, Lyle	Box 632	Calvert City	KY	42029	8/16/2004
Speranza, Marianne	5717 Concord Commons Dr.	Dayton	OH	45459	8/23/2004
Spitler, Dusty	242 S. Pleasant St.	Prescott	AZ	86303	8/11/2004
Spitz, Marlene T.	1525 So. Cape Verde Pl.	Tucson	AZ	85748	8/11/2004
Spivak, Howard	6825 Will Rogers Dr.	Fair Oaks	CA	95628	8/15/2004
Springsteen, Kathleen	10884 West Kl Ave.	Kalamazoo	MI	49009-9	8/19/2004
Spruse, Victoria	156 Vacation Lane	Waveland	MS	39576	8/17/2004
Srygley, Jane	317 E. Walnut St.	Allentown	PA	18109	8/22/2004
St. Gerard, Judy	151 Park Ave., Apt 203	Monterey	CA	93940	8/11/2004
Stacey, Julie	P.O. Box 6775	Jackson	WY	83002	8/18/2004
Staelens, Bethany	3301 29th St.	Long Island City	NY	11106	8/18/2004
Stahl, Charlotte	2700 W. Powell Blvd., Apt D 231	Gresham	OR	97030	8/18/2004
Stallibrass, Bernice	P.O. Box 1364	High Springs	FL	32655	8/21/2004
Stallone, Elizabeth	248 Vista Dr.	Cedar Knolls	NJ	07927	8/18/2004
Stamer, Joy	3321 Winlock Rd.	Torrance	CA	90505	8/11/2004
Starr, Julie	664 Miller Ave.	South San Francisco	CA	94080	8/18/2004
Stebler, Timothy	2834 Mark Cir.	Stillwater	OK	74075	8/11/2004
Steele, Karen	2150 Temple Cir.	Eureka	CA	95503	8/11/2004
Steffan, William	1085 Rancho Santa Fe Rd.	Olivenhaim	CA	92024	8/11/2004
Steger, Ralph & Laura	19551 Aldbury St.	Canyon Country	CA	91351	8/22/2004
Stemig, Kathie	900 Loma Dr.	Hermosa Beach	CA	90254	8/11/2004
Stevens, Kathleen	6114 W. 55th St, Unit 2	Chicago	IL	60638	8/21/2004
Stewart, G.V.	381 Musser Ln.	Bellefonte	PA	16823	8/21/2004
Stewart, Glenn	3801 W. Temple Ave. Bio. Sciences Dept.	Pomona	CA	91768	8/18/2004
Stewart, Kate	P.O. Box 23	Monument	CO	80132	8/21/2004
Stewart, Renell	5264 S. Equestrian Ave.	Sierra Vista	AZ	85650	8/11/2004
Stewart, Richard	7882 13th St.	Westminister	CA	92683	8/16/2004
Stewart, Tom	564 Cardessa Ln.	Grant	AL	35747	8/16/2004
Stewart-Teitelbaum, Emma	26 Olmsted Rd., Apt. A	Stanford	CA	94305	8/16/2004
Stock, Melissa	2662 Bostonian Dr.	Los Alimitos	CA	90720	8/21/2004
Stoddard, David	3316 Kilkenny St.	Silver Spring	MD	20904	8/16/2004
Stoever, Veronica	1637 Santa Rosa Ave.	Glendale	CA	91208	8/11/2004
Stolfus, Christopher	1328 Rhode Island St.	Lawrence	KS	66044	8/21/2004
Storey, Amber	420 W. Baraga Ave. #2	Marquette	MI	49855	8/22/2004
Stout, Mary	904 Country Club Dr., Apt. A	Bloomsburg	PA	17815	8/21/2004
Strader, Shamane	P.O. Box 252	Smithville Flats	NY	13841	8/20/2004
Strange, Dana	3528 Jewett Ave.	Highland	IN	46322	8/20/2004

Stratmann, Johannes	105 South Mercer Dr.	Irmo	SC	29063	8/22/2004
Stratton, Robert	350 Minnewawa Ave., Apt 170	Clovis	CA	93612	8/11/2004
Stromberg, Judy	415 Silva Ave.	Eureka	CA	95503	8/11/2004
Strommer, Chelle	529 Market St. Apt 4-I	San Diego	CA	92101	8/11/2004
Stubblefield, Kerri	795 Ohleyer Rd.	Yuba City	CA	95993	8/11/2004
Stubblefield, Kerri	795 Ohleyer Rd.	Yuba City	CA	95993	8/11/2004
Stubbs Ph.D, Bruce	3425 Topeka St.	Carlsbad	CA	92008	8/11/2004
Sturza, Brett	5130 NW 49th St.	Redmond	OR	97756	8/18/2004
Stylianides, Claire	7575 Bately Ct. #11	Sebastopol	CA	95472	8/16/2004
Sulanke, Thom	6940 E Sr. 45	Bloomington	IN	47408	8/11/2004
Sullivan, A.	298 Creek St.	Wrentham	MA	02093	8/16/2004
Sullivan, Selina	5712 E. Fairmount St.	Tucson	AZ	85712	8/11/2004
Sultan, Linda	2614 Rock Dove Way	Elk Grove	CA	95758	8/11/2004
Summers, Paula	5132 Rabeneck Way	Fair Oaks	CA	95628	8/11/2004
Sunderland, Sandra	1943 W. Canada Hills Dr.	Tucson	AZ	85737	8/17/2004
Sutton, Rebecca	1548 Arch St.	Berkley	CA	94708	8/15/2004
Suzuki, Mika	22 Granada Dr.	Corte Madera	CA	94925	8/17/2004
Svensson, Peter	207 Harbor Dr.	Santa Cruz	CA	95062	8/22/2004
Svensson, Peter	207 Harbor Dr.	Santa Cruz	CA	95062	8/20/2004
Sventy, Robert	148 Oakwood Ave.	Edison	NJ	08837	8/17/2004
Swanson, Roberta	1414 S. Beverly Dr., #3	Los Angeles	CA	90035	8/14/2004
Sweeney, Deborah	17315 Kennedy Dr.	North Redington Beach	FL	33708	8/22/2004
Swensen, Ruth	2587 Daisy Ln.	Fallbrook	CA	92028	8/11/2004
Swenson, Patricia	713 Valley View Dr.	Allen	TX	75002	8/11/2004
Swope, Richard	8903 SW 178th Ter.	Village of Palmetto Bay	FL	33157	8/18/2004
Sylvester, Kyle	1116 High	Bremerton	WA	98337	8/19/2004
Szymanski, Debbie	1021 E. Sherri Dr.	Gilbert	AZ	85296	8/11/2004
Taggart, Carol	1705 Valparaiso Ave.	Menlo Park	CA	94205	8/17/2004
Takvorian, Lawrence	1241 Granite Road	San Marcos	CA	92069	8/17/2004
Tankenson, Ethel	4035 Meier St.	Los Angeles	CA	90066	8/11/2004
Tao, Jacqueline	23470 Coyote Springs Dr.	Diamond Bar	CA	91766	8/21/2004
Tava, Jennifer	23930 Harvard Shore Dr.	Saint Clair Shores	MI	48082	8/19/2004
Taylor, Alyson	2595 S. Bundy Dr.	Los Angeles	CA	90064	8/17/2004
Taylor, Cynthia	6172 Hwy. 8 S	Germantown	NC	27019	8/18/2004
Taylor, Debra	620 E 40th St.	Dover	OH	44622	8/17/2004
Taylor, J. Holley	5745 SW 75th St., #362	Gainesville	FL	32608	8/18/2004
Taylor, Judy	285 Linder Terrace	Fremont	CA	94536	8/11/2004
Taylor, Steven	1702 Pullman Ln.	Redondo Beach	CA	90278	8/18/2004
Teper, Shannon	1920 S. Palmetto Ave.	Flagler Beach	FL	32136	8/19/2004
Terry, Jody	22 Veneita Mdws.	San Rafael	CA	94903	8/17/2004

Thayer, Jeff	3073 Jemez Dr.	San Diego	CA	92117	8/11/2004
Theodore, Michael	24009 Ventura Blvd. Ste. 240	Calabasas	CA	91302	8/11/2004
Theodosiadis, Eva	443 Home Ave.	Staten Island	NY	10305	8/21/2004
Thomas, Patricia	1064 Genoa Ln.	Carson City	NV	89706	8/11/2004
Thompson, Tegan	5832 Homewood Ave.	Buena Park	CA	90621	8/16/2004
Thorson, Trina	6413 W. 77th St.	Los Angeles	CA	90045	8/19/2004
Thurgate, Nan	325 Searidge Rd., #1	Aptos	CA	95003	8/15/2004
Tiarks, Daniel	816 N. Hayworth Ave. #1	Los Angeles	CA	90046	8/11/2004
Toback, Norman	3243 Oakdell Rd.	Studio City	CA	91604	8/11/2004
Todd, Jan	12978 Byron Rd.	Nevada City	CA	95959	8/17/2004
Tollison, Denice	5417 W. Lake Rd.	Fredonia	NY	14063	8/23/2004
Tomasello, John	714 Samoa Ln.	Novato	CA	94947	8/11/2004
Toomey, Deidre	6306 Perry Rd.	Mebane	NC	27302	8/18/2004
Torres, Rebeca	23 Leatherstocking St.	Cooperstown	NY	13326	8/21/2004
Toth, Robert	6881 W. Greenbriar Dr.	Glendale	AZ	85308	8/11/2004
Towner, Linda	8114 Westlawn Ave.	Los Angeles	CA	90045	8/16/2004
Townsend, Annette	6653 Branch Estates Dr.	Olive Branch	MS	38654	8/18/2004
Trautman, Jamene	18881 Mora Kai Lane #32	Huntington Beach	CA	92646	8/11/2004
Travali, Ronna	17323 Caminito Canasto	San Diego	CA		8/21/2004
Travis, Annabelle	5926 Hillside Dr.	El Sobrante	CA	94803	8/11/2004
Trice, Keri	10201 NW 48 Manor	Coral Springs	FL	33076	8/11/2004
Trujillo, Rebecca	1608 N. Cahuenga Blvd. #1121	Hollywood	CA	90028	8/16/2004
Truman, Nancy	874 Manitou Ave.	Akron	OH	44305	8/15/2004
Truxel, Bess	15504 Greenway Rd.	Cleveland	OH	44111	8/19/2004
Tucker, Barbara	14155 Oro Grande St.	Sylmar	CA	91342	8/11/2004
Tuckman, Roy	3661 Regal Pl. Apt 5	Los Angeles	CA	90068	8/11/2004
Umano Jones, Georja	222 6th St., Unit D	Santa Monica	CA	90405	8/11/2004
Unger, Marylin	22205 Ho Springs Rd.	Desert Hot Spring	CA	92241	8/21/2004
Uplinger, Melvin	2009 N Nicole Ln., Apt. 205	Round Lake Beach	IL	60073	8/21/2004
Uschuk, Judith	327 Sawtelle	Tucson	AZ	85716	8/17/2004
Valentine, Victoria	310 Somerset P.O. Box 125	Norwich	KS	67118	8/19/2004
Valentino, Ronald	878 14th St., Apt. 201	San Francisco	CA	94114	8/11/2004
Vallario, Deb & Randy	Bolton St.	Manchester	CT	06040	8/20/2004
Van Ausdall, Marci	4532 Fertile Valley Rd.	Newport	WA	99156	8/21/2004
Van Ausdall, Marci	4532 Fertile Valley Rd.	Newport Beach	WA	99156	8/21/2004
Vance, Barbara	P.O. Box 92134	Pasadena	CA	91109	8/11/2004
Vandergraff, Teresa	100 Brentwood Circle, Apt B	Alexandria	KY	41001	8/22/2004
Vanderlaan, Kim	2006 Winwood Lane	Lakeland	FL	33813	8/18/2004
Vanderleelie, Roy	61536 Crest Circle Dr.	Joshua Tree	CA	92252	8/11/2004
Vandermeer, Denise	20511 Hatteras St.	Woodland Hills	CA	91364	8/17/2004

Vanderpool, Reba	2008 Avignon Pl.	Half Moon Bay	CA	94019	8/11/2004
Vandusen, Janice	1247 Marolf Dr.	Atalissa	IA	52720	8/21/2004
Vangi-Stern, Eva	54 Avenida Pastor	Rio Rico	AZ	85648	8/11/2004
Vanpelt, Freddie	10910 W. Coggins Dr.	Sun City	AZ	85351	8/11/2004
Varbol, Barbara	11220 Grandview	Overland Park	KS	66210	8/19/2004
Vardon, Gary	4216 Bannock Dr.	West Valley City	UT	84120	8/15/2004
Veillette, Sandra	111 Summit Rd.	Richmond	MA	01254	8/11/2004
Velasco, Stephen	1150 Kingston St.	Costa Mesa	CA	92626	8/11/2004
Ventriglia, Linda	439 Fullerton Ave.	Newport Beach	CA	92663	8/11/2004
Verner, Edward	13967 Marquesas Way, Slip 28	Marina Del Rey	CA	90292	8/16/2004
Verri, Laura	410 Milan Dr. #201	San Jose	CA	95134	8/22/2004
Verry, James	1580 N. Cheshire Dr.	Pueblo West	Co	81007	8/17/2004
Vestal, Ronald	20 Corte Alegre	Greenbrae	CA	94904	8/11/2004
Vichules, Eva	115 West Valboa Dr.	Tempe	AZ	85282	8/11/2004
Villarreal, Gian	8162 Richmond Ave. #606	Houston	TX	77063	8/17/2004
Villemaire, Genevieve	2504 Zuider Zee Circle	Elverta	CA	95626	8/11/2004
Vozoff, M.	10866 Wilshire Blvd. #1100	Los Angeles	CA	90024	8/11/2004
Vuyovich, Veronika	400 E. McConnell Dr. #59	Flagstaff	AZ	86001	8/16/2004
Waddell, Ashley Elizabeth	1864 Hill Dr.	Eagle Rock	CA	90041	8/11/2004
Waddell, Chris	2165 NE 187 St.	North Miami Beach	FL	33179	8/16/2004
Wahl, Nancy	12710 Green Mountain Way	Granite Falls	WA	98252	8/18/2004
Waldner, Mark	3531 Greensward Rd.	Los Angeles	CA	90039	8/17/2004
Walker, Dana	1604 A Dekalb Ave.	Atlanta	GA	30307	8/20/2004
Walker, Grace	3555 A 17th St.	San Francisco	CA	94110	8/11/2004
Wallace, Julia	60 Ramona Ave.	San Francisco	CA	94103	8/11/2004
Wallack, Shirley	P.O. Box 1115	Kenwood	CA	95452	8/20/2004
Walters, Kirsten	2170 Dalton Dr.	Eugene	OR	97404	8/21/2004
Walton, Joyce	1634 Tyler St.	Berkley	CA	94703	8/15/2004
Ward-Stalnaker, Nicole	980 Bush St., Apt. 500	San Francisco	CA	94109	8/11/2004
Warenycia, Dee	104 Stratford Ct.	Roseville	CA	95661	8/17/2004
Warren, Hal	P.O. Box 1661	Freedom	CA	95019	8/11/2004
Weaver, Sandy	1472 Tonto Dr.	Bullhead City	AZ	86442	8/22/2004
Webb, John	10869 Wells Ave.	Riverside	CA	92505	8/11/2004
Weber, Annie	3701 B Pemberton Ave.	Richmond	VA	23222	8/21/2004
Weber, Jim	8309 Willheather Glen	Austin	TX	78750	8/15/2004
Weber, Marc	14 Blue Willow Ln.	New City	NY	10956	8/21/2004
Weber, Ted	222 Main St., Apt 160 Annapolis	Annapolis	MD	21401	8/19/2004
Weisz, Russell	319 Laguna St.	Santa Cruz	CA	95060	8/11/2004
Wells, Peggy	1803 S. Washington St.	Denver	CO	80210	8/18/2004
Welter, Christopher	2920 Basswood St. #118	Denver	CO	80260	8/20/2004

Wendt, Diana	910 Carlson Ave.	Oakland	CA	94610	8/15/2004
West, Jeffrey	310 Pitney Lane Space #34	Junction City	OR	97448	8/22/2004
West, Robin	15 Patterson Ave.	Menlo Park	CA	94025	8/11/2004
Whaley, Richard &Susan	4334 Liberty Bell Ct.	Eureka	CA	95503	8/21/2004
Whatley, Marsha	2916A Old Marksville Hwy.	Pineville	LA	71360	8/20/2004
Wheatley, Benjamin	10 Sheridan Cir.	Wellesley	MA	02481	8/20/2004
White, Deborah	2125 Peterson Ln.	Santa Rosa	CA	95403	8/12/2004
Wiener, Steven	4782 La Villa Marina Unit D	Marina Del Rey	CA	90292	8/19/2004
Wikle, Victoria	P.O. Box 151	Villa Grande	CA	95486	8/11/2004
Wilcox-Kahler, Leslee	65 Rose Valley Rd. #65	Wallingford	PA	19086	8/17/2004
Wiley, Carol	15457 el camino	Victoville	CA	92392	8/12/2004
Wilford, Barb	3152 Patty Ln.	Middleton	WI	53562	8/20/2004
Williams, Roxane	32009 Hysell Run Rd.	Pomeroy	OH	45769	8/21/2004
Willis, Jessica	2020 Damuth St. #3	Oakland	CA	94602	8/11/2004
Wilson, Thaddeus	10136 Dafne Ln.	San Diego	CA	92124	8/15/2004
Winter, Jennie	815 A Belmont Ave.	Belmont	CA	94002	8/11/2004
Winterhalter, Aaron	197 Edwin Dr.	Vacaville	CA	95687	8/15/2004
Witherington, Katherine	116 Apache Lane	Sedona	AZ	86351	8/18/2004
Wojtalik, Alan	3723 Green Oak Ct.	Parkville	MD	21234	8/21/2004
Wolf, Danielle	11127 B Fairhaven Ct.	Faifax	VA	22030	8/17/2004
Wolf, Jennifer	P.O. Box 472	Cardiff	CA	92007	8/22/2004
Wolf, Nancy	2401 Wallace Ave.	Louisville	KY	40205	8/21/2004
Wolff, Vicky	1179 Wildflower Ct.	St. Augustine	FL	32086	8/21/2004
Woller, Wendy	1123 E Colby St., Apt 516	Whitehall	MI	49461	8/22/2004
Wolverton, Karen	170 Brownsburg Rd.	Newtown	PA	18940	8/21/2004
Wood, Carol	362 West 260th St.	Bronx	NY	10471	8/15/2004
Wood, Sarah	532 2nd St.	Lemont	IL	60439	8/21/2004
Woodman, Jean	1501 Ashland Ave.	Evanston	IL	60201	8/20/2004
Woods, Bonnie	12385 Creek Crest Rd.	Reno	NV	89511	8/11/2004
Woods, Donna	2319 Oxford Dr.	Kannapolis	NC	28081	8/19/2004
Workman, Debra	1135 Waterford Forest Cir.	Cary	NC	27513	8/18/2004
Worth, Carla	19315 195th Ave.	Big Rapids	MI	49307	8/11/2004
Wouk, Nina	1259 El Camino Real # 215	Menlo Park	CA	94025	8/11/2004
Wright, Diana	4144 Summers Ln.	Klamath Falls	OR	97603	8/21/2004
Wright, Kimberly	18796 Caminito Cantilena, Apt 136	San Diego	CA	92128	8/11/2004
Wright-Kaiser, Carol	8202 Railroad St.	Stinesville	IN	47464	8/16/2004
Wu, Molly	964 Buckeye Dr.	Sunnyvale	CA	94086	8/11/2004
Yablong, Naomi	2912 W. Morse Ave.	Chicago	IL	60645	8/11/2004
Years, Patricia	2155 S Ocean Blvd. #18	Delray Beach	FL	33483	8/17/2004
Yocklovich, Evelyn	101 Maple St, P.O. Box 105	Mount Gretna	PA	17064	8/22/2004

York, Mark	10799 Sherman Grove Ave., Spc 39	Sunland	CA	91040	8/11/2004
York, Pam	31729 Mayfair Lane	Beverly Hills	MI	48025	8/20/2004
Young, JoEllen	10752 Garfield Ave.	Culver City	CA	90230	8/18/2004
Youngren, Marguerite	14 Blueberry Hill Rd.	Medway	MA	02053	8/19/2004
Yung, Jackie	590 W. Hills Way NW	Salem	OR	97304	8/20/2004
Zaino, Liza	6 Beaumont St.	Melrose	MA	02176	8/11/2004
Zaitlin, Linda	88 Pinnacle Rd.	Harvard	MA	01451	8/21/2004
Zichittella, Richard	303 Market St., Apt. 527	San Diego	CA	92101	8/11/2004
Ziemer, Theresa	1099 Denali Rd.	Elburn	IL	60119	8/23/2004
Zimny, Gloria	69641 Parker	Richmond	MI	48062	8/19/2004
Zimny, Heather	69641 Parker St.	Richmond	MI	48062	8/20/2004
Zlevor, Jo-Anne	718 Goold St.	Racine	WI	53402	8/16/2004
Zoldak, Loretta	729 Jeran Dr.	Dallas	TX	75217	8/18/2004
Zoller, Kristel	2023 Windsong Trl.	Round Rock	TX	78664	8/19/2004
Zulick, David	28 Myrtle St.	Cranford	NJ	07016	8/15/2004