

Desert Landscape Conservation Cooperative

2013 Critical Management Questions Recommendation to Steering Committee

RECOMMENDATION: The Science Working Group is proposing that the following 6 critical management questions be approved by the Steering Committee to guide FY2013 Desert LCC funding and tasks as described in the Annual Work Plan.

PURPOSE: In order to maximize the effectiveness of Desert LCC activities and products by developing and delivering science and decision support tools that directly inform conservation design and delivery, the Science Working Group has identified and prioritized Critical Management Questions related to our Priority Science Needs identified in the Comprehensive Science Needs Assessment that are of immediate relevance to conservation partnerships and programs. Focusing on a few management questions with broad relevance across the Desert LCC geography and amongst many conservation partners will allow us to strategically target our activities and resources to directly inform on-the-ground conservation linked to measurable outcomes.

In FY 2013, these focused efforts will help us to continue to define the Desert Landscape Conservation Cooperative's niche within the conservation community and to develop the relationships, annual processes and systems, and capacity to successfully fill it. Lessons learned from this effort will inform the development of an annual process for determining and selecting critical management questions to guide our annual work plans in FY2014 and beyond.

Priority Critical Management Questions (in no particular order)

1. How are climate change and/or water management interacting to affect the physical processes that support aquatic and riparian habitats, species, and human cultures? What are viable management options to mitigate these effects and support ecosystem functions? How can the use of climate change, hydrological, ecological, and/or biological models be integrated to better understand the potential future effects of climate change, inform adaptive management and development of best management practices for aquatic and riparian ecosystems, and create related decision support tools?

Specific Examples

- a. What are the climate change impacts to hydrology (altered precipitation and resultant flow patterns both in amplitude and seasonality; groundwater recharge; soil moisture with much tighter (watershed level) modeled projections? What are the anticipated stream flow levels? And which fish will be impacted by changing stream flow levels? Develop a model that predicts anticipated changes in streams so managers can anticipate which areas will remain perennial.
- b. How do the physical processes of flow regime (as altered by water management and climate change), fine sediment and gravel transport, and solute transport interact to affect conveyance capacity, water quality, invasion of non-native, riparian vegetation, and the distribution and quality of aquatic and riparian habitats needed to support native species? Given the opportunity to do so, what is the best way to manage flows, sediment, and non-native vegetation to support a healthy ecosystem?

- c. What will be the impact of climate change on riparian systems and how can we mitigate the reduction or loss of riparian as corridors and habitat?
 - d. Develop a geospatial representation of evapotranspiration for use in the analysis of agricultural water use.
2. What species and ecological processes are sensitive to climate change and/or other large scale stressors (e.g., water management, invasive species, altered fire regime, wind erosion) and can be effectively monitored to indicate the overall effects of these stressors on ecosystems, habitats, and species, thus helping managers detect, understand, and respond to these changes? What are the best monitoring designs and protocols to detect changes to these processes and species at temporal and geographic scales suitable for providing adequate and reliable metrics?

Specific Examples

- a. What indicators should we monitor across landscapes that are sensitive to climate change?
 - b. What are the best monitoring protocols to detect the effects of climate change in the Mojave Desert and by extension throughout the DLCC?
 - c. Can a set of ecological conditions (e.g., habitat use, occurrence and distribution of fish and mussels, geomorphological cross sections, water quality, rare species such as *Hybognathus amarus*) be monitored in a way that will help us understand the changing status of the Rio Grande ecosystem in general?
 - d. Document population trends for several significant wildlife and plant species for the purpose of assessing their vulnerability due to climate change. Amend the Department of Fish and Wildlife's Ten Year Wildlife Management Plan based on the findings of the vulnerability assessment for significant species.
3. What and where are the greatest threats to native desert grassland and shrubland conservation targets (e.g., endangered species, migratory birds, other species of concern)? Where are desert grassland and shrubland habitats resilient and where are priority areas with high potential for restoration? What are the most appropriate restoration techniques for desert grassland and shrubland habitats for conservation targets, site-specific conditions (e.g., soil type, precipitation, elevation, slope, invasive species), and socio-economic constraints?

Specific Examples

- a. What are the most appropriate management techniques (e.g., mechanical or chemical brush control, banded brush treatments, roller-chopping, etc.) for restoring or enhancing arid grassland habitats for migratory birds, pronghorn, and other native species given site-specific conditions such as soil type, precipitation, elevation, and slope?
- b. Invasive Species Impacts on Endangered Species: What are effective treatment strategies for exotic plants in deserts? Is Sahara mustard stressing species of conservation concern (desert tortoise, Mojave fringe-toed lizard) and compromising their health? How does habitat fragmentation contribute to spread of invasive plants in desert tortoise habitat?

4. What species will be impacted by physiological stress due to climate change (e.g., temperature, water) and to what extent? What adaptation strategies might be applied to lessen the impact?

Specific Examples

- a. Why are most rare plants on the Navajo Reservation not reproducing? Identify and inventory pollinators to determine if that is the cause.

5. How will changes in wildfire regimes (e.g., due to climate change, land use practices, or invasive species) affect the future location, quality, and management of reserves?

Specific Examples

- a. Which aquatic and terrestrial wildlife movement corridors are vulnerable to fire?
- b. How can we best mitigate the effects of fire in riparian areas? Can Best Management Practices be developed for creating small, shaded fuel breaks to reduce ladder fuels, protect riparian habitats from catastrophic fire, and benefit native wildlife? (e.g., proposal might be for a demonstration project on a NWR).
- c. What are the impacts of altered fire regimes to habitats in the desert southwest?
- d. Evaluate the effects of forest restoration within the Navajo Nation (timber harvests, thinning, hazardous fuels reduction treatments, and prescribed fires) on the ability of the forest ecosystem to respond to climate change.

6. What are the species of amphibians and reptiles that are currently considered not vulnerable but are likely to experience negative changes in their population sizes and/or extents of distribution due to future changes in climate, fire regime and water availability in the Southwestern deserts?

BACKGROUND: In October 2012, the Steering Committee tasked the Science Working Group in the Annual Work Plan to develop a process to further focus and prioritize science needs identified in the Comprehensive Science Needs Assessment by choosing 1-3 pilot project opportunities within each desert region of the Desert LCC that can be used to identify managers' most pressing management questions and needs related to Desert LCC priorities.

In November 2012, the Coordinators and the Science Working Group presented a draft process to the Steering Committee for identifying and selecting these most pressing management questions and needs (see document titled Process to Identify Critical Management Questions that Guide Science Development and Delivery). There were no objections to this draft process.

The Desert LCC Coordinator and Science Coordinator then asked Steering Committee and Science Working Group members to submit specific management questions, as identified through existing programs or partnerships. We received approximately 60 questions.

In December 2012, the Science Working Group met for two days in Tucson, AZ to finalize the draft criteria proposed in the Process to Identify Critical Management Questions. The Science Working Group then selected six critical questions based on finalized objectives, requirements, and criteria described below.

Final Objectives, Requirements, and Criteria used in selecting Critical Management Questions

The following objectives, requirements, and evaluation criteria were used to identify and prioritize critical management questions to be used in FY 2013:

Objectives

The following objectives were identified during the Fall 2012 meeting of the Steering Committee and Science Working Group:

- Provide opportunities to address critical management questions relevant within each of the three deserts covered by the Desert LCC;
- Provide opportunities to address critical management questions related to both terrestrial and aquatic ecosystems;
- Provide opportunities for engaging tribes and Mexican conservation partners in the activities of the Desert LCC;
- Find opportunities to leverage resources within the Desert LCC and with various other partners and partnerships (e.g., Climate Science Centers, NOAA, other LCCs, CESUs, and others); and
- Promote interdisciplinary, applied science for addressing Priority Science Needs.

Requirements

These requirements were used to evaluate and prioritize critical management questions:

- Management questions relate to one or more of the science priorities in the Comprehensive Science Needs Assessment;
- Addressing the management question will directly inform decisions and actions led by conservation design and delivery partnerships or programs.

Note: In the process of prioritizing critical management questions, the Science Working Group identified the need to revise one of the Priority Science Needs identified in the Comprehensive Science Needs Assessment. The proposed revision (below) broadens the previous wording, focused on the establishment of best management practices for riparian restoration, to include all habitats and ecosystem types within the Desert LCC geographic area.

Suggested revision to Priority Science Need T1.d:

Previous: Establish scientifically-sound best management practices for riparian restoration, including time of restoration activities, water needs, control of invasive plants, and use of local seed to encourage the full complement of the desired ecological condition.

Proposed: Establish scientifically-sound best management practices and adaptive management frameworks for restoration of aquatic, riparian, spring, and terrestrial ecosystems considering conservation targets, climate change, and site specific conditions.

Criteria

These criteria were used to evaluate and prioritize critical management questions:

- Management question applies to resources (conservation targets), stressors, vulnerability assessments, or adaptive management strategies with applicability or relevance across large landscapes within the Desert LCC geographic area;
- Management question addresses an urgent issue;
- Management question is easily identifiable from existing documentation; and
- Management question is of relevance to multiple partnerships or programs.

Next Steps

January 2013	Reach out to conservation partnerships and programs working on the prioritized critical management questions to identify specific information gaps in addressing critical management questions	Coordinators, Science Working Group
February 2013	Link management questions to products and tools identified in the FY2013 Annual Work Plan (roundtables, databases, literature reviews, webinars, fact sheets, etc.) and steps needed for producing them	Coordinators, Science Working Group
Winter/Spring 2013	Use critical management questions for: developing funding opportunities and selecting proposals to fund, developing inter-agency agreements, identifying opportunities to leverage resources amongst partners, etc.	Bureau of Reclamation, Fish and Wildlife Service, others
Winter/Spring 2013	Reach out to key partnerships to solicit proposals for funding opportunities	Coordinators, Science Working Group, Steering Committee
April 2013	Present progress on Science Development and Delivery to Steering Committee (Spring meeting)	Coordinators
Spring/Summer 2013	Use FY2013 process to inform development of an annual process to identify critical management questions	Coordinators, Science Working Group
(Late) Summer 2013	Present results to Steering Committee	Coordinators
Early Fall 2013	Provide feedback on annual process	Steering Committee
Fall 2013	Incorporate feedback	Coordinators
Fall 2013	Approve annual process to identify critical management questions (Fall meeting)	Steering Committee
FY 2014	Implement annual process to link resources and deliverables to critical management questions	Coordinators, Science Working Group, Steering Committee