

# **Are Tortoise Recovery Actions Effective?**

***William I. Boarman***

***USGS, WERC &***

***Conservation Science Research & Consulting***

***William B. Kristan, III***

***CSU, San Marcos***

***Ed LaRue***

***BLM &***

***Circle Mountain Biological Consultants***

***Paul Burgess***

***Redlands Institute***

# Supporters

- *Marine Corps (MCAGCC)*
- *National Park Service (MNP)*
- *US Fish and Wildlife Service (Ventura)*
- *Bureau of Land Management (CDD)*

# Goal/Objectives

- *Goal: Evaluate the state of knowledge about effectiveness of tortoise recovery actions.*
- *Objective 1: Gather and critically evaluate best available evidence.*
- *Objective 2: Map the extent of efforts to monitor recovery actions.*



# Questions

How much information is available to support recovery actions, and what kind of information is it?

Is the effectiveness of recovery actions well supported by scientific evidence?

How can tortoise management be improved?

# Caveats

- *Evidence of threat ≠ effective recovery*
- *Absence of evidence ≠ evidence of absence*
- *No new data analyses*
- *Focused on California*

# Data Squeeze

- **BLM**
  - Barstow
  - Moreno Valley
  - Needles
  - Ridgecrest
  - Sacramento
- **State Parks**
  - Red Rock Canyon
- **USGS**
  - San Diego
- **FWS**
  - Ventura
  - Barstow
  - Carlsbad
- **NPS**
  - JTNP
- **DOD**
  - MCAGCC
  - China Lake NAWS
  - Fort Irwin

# Based Evaluation on Several Criteria

- *Individual vs. population*
- *Project vs. action-level*
- *Study design*
- *Source of information*
- *Certainty of recovery*

# Results

- ***395 documents found***
- ***107 were relevant***
  - 44 were “designed studies”
  - 107 were other types of information

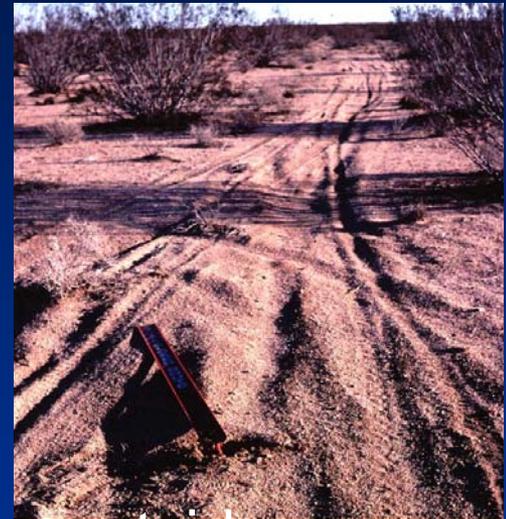
# Limit OHV Access

- Monitored before and after controlled races

Some success demonstrated

Some failures demonstrated

Evaluations were too subjective



- Network reductions

Routes/tracks proliferated, but less than outside

Little evidence of effect on diffuse problems

# Limit OHV Access

- Vertical mulching
  - Claimed to work, but no studies.
- Needs
  - Effect of OHV removals on tortoise populations, weeds, and habitat.
  - Effect of OHV reductions.
  - How much degradation can tortoises withstand?
- OHV means many things

# Restrict or Eliminate Grazing

- Some exclosure studies  
Improvements noted
- Level of impact varies with distance  
from water source
- Needs:  
Threshold stocking levels



# Road Mortality and Barrier Fencing

- Moderately well studied
  - 89% reduction in road kills
  - Use culverts
- Different materials tested
- Needs
  - Population-level effect
  - Bycatch rate
  - Culvert design & spacing



# Other Actions We Could Evaluate

- *Reserves*
- *Construction*
- *Habitat Restoration*
- *Translocation*
- *Predator Management*



# **Actions We Could not Evaluate**

- *Burros*
- *Habitat Loss*
- *Habitat degradation*
- *Disease*
- *Control of Invasives*
- *Drought*

# Conclusions

- *Few studies designed to evaluate effectiveness of recovery actions.*
- *Many lost opportunities*
- *Managers must often rely on non-scientific information*

# Recommendations

- *Coordinate monitoring activities*
- *Conduct studies to assess population responses*
  - Managers and Stakeholders: find the funds and obtain scientific advice on design, implementation, and interpretation
  - Scientists: develop and seek funding for effectiveness studies
  - Publish results