

**Desert Managers Group
Coordinated Desert Tortoise Initiative
Effectiveness Evaluation, Step 2
Meeting of February 6, 2003 (Draft of 3/3/03)**

I. Background

The Desert Managers Group, at the June 12-13 meeting, decided to increase emphasis on implementation of cooperative recovery actions for desert tortoise, and to become more assertive as a group in promoting recovery actions. The overall strategy was presented to, and accepted by, the Management Oversight Group at their January 13 meeting in Las Vegas.

One of the four emphasis areas in the strategy was Effectiveness Evaluation. Step one in evaluation of actions taken was to compile actions taken by member agencies toward recovery of the Desert Tortoise since listing. That step was completed in coordination with the MOG TAC and University of Redlands. In its meeting of December 3, 2002 in Needles, California, the Desert Managers Group chartered a working group to work on the second step toward evaluation. The following represents a first draft of a framework for evaluating management actions taken, or to be taken.

Effectiveness evaluation is intended to compliment the other three elements of the DMG strategy, which also have ongoing efforts. The other three elements are: 1) Desert Tortoise Population Monitoring, 2) Completion of Land Use Plans and 3) Causes for Mortality. Effectiveness would provide insight into 1) when and where actions were taken, 2) whether they were implemented as intended (or complied with), and 3) what results can be documented or observed.

II. Purpose of the Meeting

Generally, the purpose of the meeting was to begin assessing the current situation relative to livestock grazing, vehicle use management, and tortoise fencing. The intent is to develop recommendations for the full DMG. A copy of the agenda is attached. The group was assembled to address the following element of the overall DMG strategy:

"The effectiveness of the major recovery actions taken since the tortoise was listed will be evaluated. The initial assessment will focus on grazing, vehicle management, and fencing actions. The evaluation will be based on current literature and reports, will summarize the actions that have been implemented, and will assess their effectiveness in terms of population or habitat changes. The evaluation will consider the effects and uncertainties related to uncontrollable mortality factors affecting tortoise populations and habitat such as weather and disease. The assessment will provide recommendations for further studies or actions necessary to evaluate the effectiveness of actions taken or proposed. Processes and assessment products will be peer reviewed."

Once step two is completed, Step 3 will follow. Step 3 is "Long-term (15 years or longer) adaptive management or monitoring studies will be implemented in areas where management action is being taken or has been taken. Studies will be peer reviewed and stakeholder participation will be invited. Peer review participation will be based on scientific credentials."

III. Participation

Scientists

Ray Bransfield	Biologist	U.S. Fish and Wildlife Service (by phone)
Becky Jones	Biologist	California Department of Fish and Game
Jeff Lovich	Biologist/Manager	U.S.G.S., Biological Resources Division
Bill Boarman	Research Biologist	U.S.G.S., Biological Resources Division
Al Muth	Research Biologist	University of California, Riverside
Jim Wiegand	Monitoring Spec.	Bureau of Land Management
Larry Foreman	Biologist	Bureau of Land Management
Joel Schultz	Biologist	Bureau of Land Management

Managers

Jim Kenna	Field Manager/Facilitator	Bureau of Land Management
Mickey Quillman	Manager/Biologist	Fort Irwin
John Hamill	DMG Coordinator	Department of Interior
Clarence Everly	DMG Coordinator	Department of Defense

The meeting was also open to public participation and observation. The following list of people attended and offered their perspectives, especially during the first parts of the meeting, by identifying their concerns and volunteering observations.

Ed Waldheim	CORVA
Richard Zug	Concerned citizen
Chris Sprofera	SDORC
Harold Soens	AMA
John Ellis	ORBA
Gerald Hillier	Quad State CGC
Jim Arbogast	CORVA
Charles Suddeth	CORVA
Ron Kemper	Desert Advisory Council

IV. Perspectives and Expectations

The most fundamental concern addressed whether what we are doing is working, or not, and how we will know. There was a general perception that actions had been taken without sufficient monitoring in place to determine whether they were effectively contributing to recovery of the Desert Tortoise. The relative effectiveness, and thus priority, of actions taken on grazing, vehicle management and tortoise fencing was compared to alternative management actions,

especially those targeted toward disease and predation. More communication with non-scientists was recommended.

Effectiveness monitoring or evaluation has been limited. Isolating the effects of an individual action within a complex and dynamic system is difficult. The design of an evaluation, or monitoring, revolves around asking the right questions, sustaining a data collection effort, and analyzing the data objectively. Because the problem is difficult, expectations were mixed on whether effectiveness monitoring could be implemented and sustained. However, it is recognized as an essential component to adaptive management. One suggestion revolved around keeping the scale of efforts small, practical and achievable, with increments of progress on effectiveness monitoring at the ground level.

Monitoring can be as important as management action. Multiple reports (e.g. GAO) have illustrated the need. For example, monitoring provides baseline studies needed to address key questions. This discussion yielded questions about how well "recovery dollars" are being spent. Information on effectiveness is an important input into decisions about future courses of action. There may well be ways to supplement public recovery expenditures to extend the available information of observed changes in tortoise habitat.

In addition to the overall complexity of the natural systems, several other problems were identified. They include the lack of adequate baseline information, the absence of consistent and rangewide monitoring, the interaction of multiple changes in actions/activities, and inconsistency in funding. The first step is to create a framework that describes how the monitoring needs can be met, much as the discussions about a population baseline created the consensus to move forward with line distance sampling.

V. First Draft: Evaluation Element Discussions

A. Grazing

1. Identification of Changes Since Listing

Grazing use in the California Desert has, historically, been in decline. Seasonal changes and available forage standards are already in place, but without monitoring to document changes observed. Some of the changes are interim, so additional change may occur. Few options remain to study the effects of changes in grazing management with a baseline that includes grazing use, whether studies are related to grazing presence or absence, or to changes in season, duration or amount of use. There are five active cattle allotments on BLM-managed public lands within critical habitat and sheep grazing within DWMA's and critical habitat is almost entirely eliminated.

2. Possible Correlations, Analyses or Studies

The existing literature is well summarized in Boarman (2002). It includes relevant studies that address grazing effects or differences between grazed and ungrazed areas, although some require

inference from studies in other arid regions (Boarman, 2002). Studies have not been specifically designed to track a management change in grazing, with the exception of studies in the Ivanpah Valley by Turner et al (1981) and Avery (1988). Studies on direct impacts are limited, but studies are available covering effects on soils, vegetation, and dietary competition (Boarman, 2002).

Possible opportunities identified include:

- Investigate use of the Nevada test site that has not been grazed as a control.
- Set up studies in Mojave N.P. where grazing has recently been removed.
- Maintain Ivanpah studies; Continue Avery studies in Mojave N.P.
- Expand Ivanpah-type studies to other areas.
- Pakoon Basin, AZ strip (Need more info.)
- Set up monitoring on retired allotments.
- Assemble information from existing BLM range study plots and range assessments.
- Re-evaluate Tortoise and Burrow Study (TABS) plots in West Mojave (former sheep grazing area in critical habitat)
- Revisit UC Davis 1970's re-vegetation studies (Burgis Kay)
- Compile & summarize available information on historical grazing and tortoise population
- Research sources of data from history collections (e.g. Dennis Casebier)
- Compile information from BLM grazing files
- Study closed allotments, including interim closures: Document positive and negative effects from allotment closures
- Set up studies grazing permittees can conduct in order to extend information base
- Put all studies in context; compare inside and outside allotments

3. Limitations on Data and Analysis

Four states have prepared a bibliography through 1995 on desert tortoise; however, there is a large void in grazing information. Factors that make effectiveness evaluation difficult include:

- The directly applicable literature has limitations.
- Apparent absence of baseline studies before grazing removal limits analytical options.
- Complex overlaps and inter-relationships among varying qualities of tortoise habitat and the various designations that affect land use (e.g. wilderness, national park, area of critical environmental concern, etc.).
- Variations in vegetation community, habitat, livestock management (stocking rates, etc.) and tortoise densities make general application more difficult.
- The number, size and location (relative to DWMA's) of the areas that are no longer grazed limit options for future analysis.
- Significant vegetation changes are resulting from invasive species (weeds) in grazed and ungrazed areas.
- Lack of information about relationships between water sources and ravens make it more difficult to assess effects of this element of livestock management.
- Variations in climate and weather add complexity.

B. Vehicle Management

1. Identification of Changes Since Listing

The acreage of the California Desert that is open to public access by motorized vehicle has declined. Use may be viewed as general access for various purposes, including recreation, as a public access network of roads and trails, as off-road vehicle play, or as permitted events. A network of access opportunities consisting of thousands of miles of roads and vehicle trails remains available. However, the number and mileage of routes available to motorized access has declined. Most of the change resulted from wilderness designations under the California Desert Protection Act in 1994. Areas, routes and washes have also been closed to public OHV travel to protect various values or uses, primarily tortoise within DWMA's. Allowable camping and parking distances along vehicle routes designated open have also been reduced within DWMA's under three approved land use plans. As a result of closures, some use patterns have shifted, and in some cases, have shifted to include previously unused areas, or routes that were receiving lower amounts of use. Small amounts of additional access have been made available as individual projects were authorized, primarily for utility rights of way. Conversely, highway fencing has constrained access off paved roads in some areas.

The acreage available for off-highway vehicle play has also declined. However, most of those changes are not directly related to tortoise habitat. To the extent use levels for off-highway vehicle play remain constant or grow, vehicle use is spread over less acreage. Vehicle closures in other areas may increase off-highway vehicle use in tortoise habitat.

Competitive OHV use has also declined with fewer competitive events, with some permitted events confined to open areas or adjusted to fit the season when tortoises are inactive. Changes in effects to tortoise habitat may be different than other forms of vehicle use, since organized events are permitted and mitigated.

Not all of the changes in vehicle use and access correspond directly to high quality tortoise habitat. For example, wilderness areas may include good, poor, or unsuitable habitat. The distribution of changes is uneven due to: 1) completion of plans in some areas and not others, 2) differences in signing, 3) differences in enforcement, and 4) differences in proximity to population centers. However, shifts in vehicle use amounts and patterns of use have occurred. Changes in population may also have affected some of the changes in pattern, type or amount of use observed.

2. Possible Correlations, Analyses or Studies

Much of the existing literature has been summarized by Boarman (2002). It includes relevant studies that address correlations relating tortoise density and vehicle use, and potential for crushing tortoises or burrows. It also includes indirect effects that may result from changes to soil or vegetation. The changes to vegetation and soils are much more readily documented. In general, the studies do suggest correlations and potential mechanisms relating vehicle use and tortoise declines, but causes are less certain (Boarman, 2002). Studies which have been done

relate more directly to heavier use, or freeplay by OHVs. Less is known about light OHV use or dispersed use along a vehicle route system.

Closing routes or vehicle use areas has multiple direct effects including the lack of vehicle travel in the closure area, displacement of travel to other areas, creating concentrations of use (use spread over fewer miles or less area). So some clarification of the hypotheses to be tested and the relationship between interdependent effects will need to be established.

Possible opportunities identified include:

- Create paired plot studies (3 side-by-side)
- Focus on routes and their possible effects rather than open areas.
- Gather data on use levels along roads and relate to available tortoise data
- Overlay LDS with route density – possible paired routes study(s)
- Compare route density with tortoise density
- Set up studies comparing cross-country travel to use of a route system
- Set up studies at Johnson Valley Open area to assess levels of use and compatibility with tortoises
- Revisit Patton training camps - plots in 70's and 80's
- Conduct a record search from OHV pass data and approved vehicle events files
- Develop historical data on vehicle use and compare to available tortoise data
- Studies in Johnson Valley/Spangler (more info)
- Monitor open areas where they overlap tortoise habitat
- Identify data or monitoring stakeholders can participate in gathering to extend information base (e.g. collect data on sweeps from organized events).
- Seek to find locations where unregulated OHV use could occur for study controls
- Monitoring studies on the effects of helicopter compliance techniques (Ridgecrest)
- Inventory the state of vehicle use signing and enforcement
- Document where highway fencing has changed vehicle access
- Study compliance with designations

3. Limitations on Data and Analysis

Factors that will make collection of data and analysis of data difficult include:

- Variations in vegetation community and cover constrain broad comparisons.
- Studies on use of various road and trail types are limited.
- Effectiveness of mitigation measures is difficult to assess
- Information does not get captured (e.g. any take during events)
- Studies limited by small sample size and already depressed population densities.
- Confounding effects of vegetation change (especially weeds)
- Past use patterns would affect conclusions on short term studies
- Other land uses could affect study conclusions
- Lack of historic baselines for tortoise populations limit analysis (e.g. Patton Camps)
- Weather and climate fluctuations

C. Tortoise Fences

1. Identification of Changes Since Listing

Small amounts of tortoise fencing have occurred along highways and under specific project mitigation. Specific examples include Highway 58, Edwards Air Force Base road, parts of Fort Irwin road, parts of I-15, Highway 95 in Nevada, and parts of Harper Lake road. Project site mitigation often includes fencing (e.g. Mesquite Mine, Randsburg Mine, and the Honda test site).

2. Possible Correlations, Analyses or Studies

Depressions in tortoise populations, up to one-mile wide, have been documented along paved highways. Tortoise fencing is intended to reduce direct threats to tortoises, such as crushing by vehicles. In theory, by reducing road kill of other animals, tortoise fencing also reduces food sources for ravens, and thereby the abundance of a predator that affects tortoises. Existing studies, which will periodically be revisited, are underway along Highway 58. New studies are also being established at Fort Irwin along 22 miles of road. New translocation studies in Nevada (Gune (sp)) may also provide useful information. The Needles Sheephole study may also provide useful information on density. With ongoing studies, new studies or data gathering efforts may be a low priority. Information may also be able to be compiled from studies cited in Boarman, 2002 and from Interstate 40 studies in Ward Valley.

Possible opportunities identified include:

- Tie efforts in multiple states together through the MOG.
- Maintain/develop long-term studies on rate of repopulation (Jean, Nevada?)
- Develop behavior studies associated with fencing areas.
- Identify mechanism for grazers and stakeholders to add data.
- Establish a rangewide baseline protocol on how to monitor areas with tortoise fencing.
- Revisit Highway 58 with a detailed study in 10 years.
- Revisit fencing studies in Nevada.
- Evaluate the cost effectiveness of fencing based on tortoise density and road usage.
- (Develop recommended standards for fencing based on tortoise density and road usage.)

3. Limitations on Data and Analysis

Factors that will make collection of data and analysis of data difficult include:

- Determining fence effects in areas with low-density tortoise areas.
- Length of time necessary to see tortoise population changes.
- Difficulty in separating direct, indirect and unrelated effects (highway fence raven perch example)

- Need to relate to fragmentation of other species.
- Cost of fencing plus studies.
- Possible release of captives into fenced areas

VI. Meeting Summary

The meeting developed information with a mix of scientists, managers and stakeholders. The focus was on the second step under the effectiveness evaluation. Information developed is preliminary in nature and will be developed further through meetings with the full Desert Managers Group, knowledgeable scientists, monitoring experts, and stakeholders. Actions flowing from this element will also be integrated with other portions of the DMG Strategy and will seek to foster communication among researchers, field biologists, managers, and stakeholders through dissemination of useful information.