Effectiveness Monitoring – Are Management Actions Helping to Recover Tortoise Populations?

A Proposal by
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Introduction

Monitoring is one of the cornerstones of sound, modern adaptive management. Without monitoring, there is no way to evaluate whether management actions are effective, how actions should be modified, or when often-expensive actions could be scaled back or eliminated. Resource management plans require three types of monitoring: implementation, effectiveness, and validation (after Botkin et al. 2000, Mulder et al. 1999). *Implementation monitoring* determines whether recommendations laid out in the plans are actually being implemented. *Effectiveness monitoring* is used to determine whether actions taken are effective at achieving the goals and objectives of the plans. *Validation monitoring* examines the causal relationship between specific actions and population-level trends, and the validity and accuracy of assumptions, models, and predicted effects supporting the plans' recommendations.

In 1994, the Desert Tortoise Recovery Plan (USFWS 1994) recommended several actions to aid in the recovery of tortoise populations. Many of these actions have been implemented to some degree on lands managed by several agencies, including the Interior and Defense Departments, state and tribal entities. The Desert Managers Group (DMG) is in the process of evaluating how effective implementation of recovery actions have been. The primary questions being asked are: (1) what is the breadth of recovery actions taken to date, and (2) how have individual actions contributed to tortoise recovery? Phase 1 consisted of evaluating the implementation of recovery actions (implementation monitoring) and has been largely accomplished by the land managing agencies of the DMG with the assistance of the University of Redlands. Phase 2 will determine how effective actions implemented have been at their intended goals (effectiveness and validation monitoring). It is particularly important to all concerned agencies that an assessment of previous monitoring actions occurs, and the progress toward recovery and delisting of the species is documented.

Proposal

In support of DMGs efforts to assess the effectiveness of actions taken, we propose to conduct a scientific evaluation of the effectiveness and validity of recovery measures taken thus far. Three questions will be answered: when and where were actions taken; where and how have the actions (or similar actions) been monitored for success; and, what conclusions are possible about how effective the actions are, or have been, in promoting recovery of desert tortoise? We will approach the task in a manner similar to that taken when evaluating the scientific support for various threats to tortoise populations (Boarman 2002). We will attempt to obtain all reports, publications, and data pertinent to the subject from many agencies in the California deserts. We will make a critical scientific evaluation of all available publications and reports directly relevant to tortoise management and will obtain and evaluate unpublished data as well. The report will highlight the strengths and weaknesses of the data pertaining to alternative actions. We will focus particular attention on actions to reduce the effects of grazing, OHVs, and highways on tortoise populations, but will also investigate other related measures implemented. The roles of climate and disease interacting, and potentially confounding factors will be discussed. The final report will discuss the quality and relevancy of studies, provide conclusions about the effectiveness of measures based on currently available data and evidence, and recommend future monitoring and research that may be needed to further evaluate the effectiveness of recovery actions. The report will be supported by an extensive bibliography and digital maps of the spatial and temporal extent of recovery actions taken. All contributing agencies will derive benefit from this project by learning how effective previous measures have been, and by significantly increasing knowledge and awareness of impacts caused by off-road traffic and grazing, as well as the benefits of highway fencing.

For each major threat, the following objectives will be met:

1. Develop an historic record of the spatial and temporal occurrence of management before and after recovery efforts were implemented using historic records, spatially explicit data, and GIS.
2. Summarize and evaluate existing population and habitat data and results of various research and monitoring projects that pertain to the effectiveness of the action at aiding tortoise recovery in areas where actions were taken.
3. Assess possible correlations between management actions taken in California (or similar actions) and the trends in tortoise populations using the historical summaries (#1 above) and the population and habitat summaries (#2 above), describing possible conclusions together with their limitations and assumptions.
4. Recommend future evaluations, monitoring, and research necessary to answer questions concerning the effectiveness of management actions in supporting the recovery goals of the Desert Tortoise Recovery Plan (USFWS 1994).

Tasks

1. Search for and acquire all pertinent papers, reports, and records from: scientific literature, government reports, BLM records, etc. This includes interviewing knowledgeable individuals and coordinating with and perhaps visiting each BLM region, USFWS field office, and one or more of the Natural Resource Management offices on Mojave military installations to search through records for relevant reports and data. Work to be performed primarily by a BLM Biologist experienced at data mining and knowledgeable about the diverse sources of relevant data.
2. Using ArcGIS, create maps showing locations where various recovery actions have taken place and historic changes in the extent of threats as a result of management actions taken since 1980. Work to be performed by Jill Heaton and staff at the Redlands Institute.
3. Read and critique for scientific quality and relevancy papers, reports, and unpublished data pertaining to effectiveness of specific recovery actions taken. Work to be performed by William Kristan and William Boarman, USGS.
4. Evaluate and summarize results of findings in a detailed report, which will also include suggestions for future management actions, monitoring, and research. The report will be peer reviewed by several tortoise and resource management specialists. Work to be performed by William Kristan and William Boarman, USGS. The draft report will be made available to DMG member organizations for a 30-day review period prior to publication.
5. Publish findings in a report, electronic versions of which will be made available on the Web and on Cds, and in a scientific journal. Present results at relevant agency meeting(s). Work to be performed by William Kristan and William Boarman, USGS.

Deliverables

1. Separate draft subsections for OHV, Livestock Grazing, and Tortoise Barrier Fences will be submitted upon completion.
2. Draft final report will be submitted within eight months of receipt of funds. Final report will be submitted no more than three months later.
3. GIS datalayers will be submitted as they are completed, but no later than eight months after receipt of funds.

Agency Commitments

To accomplish the work in a timely fashion, the following commitments will be necessary from several agencies:

1. **National Park Service** – approximately one week of work each by a resource specialist at Joshua Tree National Park and Mojave National Preserve. Work

2. **Bureau of Land Management** – approximately two months of the lead BLM biologist's time searching for, obtaining copies of, and organizing pertinent reports, literature, and data from all sources. Additionally, approximately one week of work by an Area Biologist at each BLM Resource Area within the California Desert District. Work will consist of helping the lead BLM biologist to obtain pertinent reports and data from each unit's files
3. **U. S. Fish and Wildlife Service** - approximately one week of work each by a biologist at each field office covering the California desert. Work will consist of helping the lead BLM biologist to obtain pertinent reports and data from each unit's files.
4. **California Department of Fish and Game** - approximately one week of work each by a biologist at each office covering the California desert. Work will consist of helping the lead BLM biologist to obtain pertinent reports and data from each unit's files.
5. **U. S. Department of Defense** - approximately one week of work by a biologist at each installation in the California desert. Work will consist of helping the lead BLM biologist to obtain pertinent reports and data from each unit's files. Reports obtained from DoD installations will not be released to outside agencies without the knowledge of installation resources management personnel.
6. **U. S. Geological Survey** – approximately one week of work by each scientist working in the California desert. Work will consist of helping the lead BLM biologist to obtain pertinent reports and data from each unit's files.

Literature Cited

Boarman, W. I. 2002. Threats to desert tortoise populations: a critical review of the literature. U.S. Geological Survey, Western Ecological Research Center, Sacramento, CA.

Botkin, D. B., D. L. Peterson, and J. M. Calhoun. 2000. The Scientific Basis for Validation Monitoring of Salmon for Conservation and Restoration Plans. Olympic Natural Resources Technical Report. University of Washington, Olympic Natural Resources Center, Forks, Washington, USA.

Mulder, B. S., B. R. Noon, T. A. Spies, M. G. Raphael, C. J. Palmer, A. R. Olsen, G. H. Reeves, and H. H. Welsh. 1999. The strategy and design of the effectiveness monitoring program for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-437. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station 138 p.

U. S. Fish and Wildlife Service. 1994. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland OR.

Estimated Budget

Salaries	
PI (Boarman)	$ 7,500
Co-PI (Kristan)	40,000
Assistant (Chamblin)	10,000
Travel	4,000
Misc. supplies	2,000
Subtotal	$63,000
Indirect if from DOI (15%)	9,450
TOTAL - DOI	**$72,450**
Additional indirect if from Non-DOI (19.643%)	12,375
TOTAL – Non-DOI	**$84,825**