



U.S. Fish and Wildlife Service
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Desert Tortoise Science Advisory Committee Meeting
Meeting Summary
October 30-31, 2010
Tucson, AZ

Meeting Goals and Objectives

- Develop role of the SAC
- Explore ideas for spatial PVA project
- Determine SDSS modeling opportunities and suggestions for improvement
- Review and endorse/modify current draft translocation guidance
 - Brainstorm/solidify ideas for maximizing scientific opportunities from renewable energy development

Attendees

Peter Hudson, SAC-Penn State (chair)
Earl McCoy, SAC-Univ. South Florida
Katherine Ralls, SAC-Smithsonian
Bob Steidl, SAC-Univ. Arizona
Steve Campbell, SAC post-doc-Univ. Arizona

Roy Averill-Murray, DTRO
Linda Allison, DTRO
Cat Darst, DTRO
Kim Field, DTRO
Chris Mullen, DTRO

Meeting Summary

1. General updates and role of SAC

The SAC inquired about the status of the revised recovery plan (in regional office awaiting signature) and expressed some concern about its timely publication. The role of the SAC is transitioning from providing advice on major principles pertinent to the revision of the recovery plan to providing advice on specific applied research topics in support of the recovery program, including working directly on focused projects or manuscripts.

The Disease Workgroup submitted a proposal (experimentally investigating epidemiology of *Mycoplasma agassizii*, with applications concerning translocating tortoises) to NSF last December. The proposal was favorably reviewed but not funded. Peter plans on coordinating the resubmission of a modified proposal this December. The Disease Workgroup next meets in Escondido in early December.

2. Desert tortoise “spatial PVA”

Steve has been funded by the Army, through the DTRO, as a post-doctoral fellow to conduct demographic analyses to inform patterns of impacts and survival in a spatial context. Steve and Bob provided an overview of possible directions to investigate spatial patterns of desert tortoise demography. A potential direction would be based on a recent paper, Saracco et al. (2010), that modeled survival rates across a large landscape. This type of analysis would require either the collaboration of Kristin Berry and use of unpublished capture-recapture data she has generated over the last 25 years or so (as well as similar data currently available from Nevada, Arizona,

and Utah) or simulations based on general demographic “bounds” described in the literature and from other available data, including the Sonoran population of the desert tortoise. Bob and Steve met with Kristin last week about a possible collaboration and await additional feedback from her.

3. Spatial Decision Support System

Cat provided an overview of the SDSS, illustrating the components of geospatial information on threats across the landscape, models of threats-stresses-demographics + recovery actions, and estimation of relative risk to desert tortoise populations, as well as changes to that risk based on the implementation of recovery actions or other detrimental activities. The SAC found the structure of the SDSS to be a “remarkable” advance in characterizing relationships between threats and tortoises and as a framework within which to prioritize both recovery actions and research on areas of uncertainty. Specific recommendations include:

- a) We need to gather information to validate and test models (or important nodes in the models) based on results from field studies.
- b) Sensitivity analyses should be conducted to highlight areas of critical uncertainty that should be addressed in a), above.
- c) A desert tortoise population “surface” should be integrated into the SDSS so that risk is modeled across important areas for tortoises rather than uniformly across the landscape. The USGS habitat model, with urban and other highly converted areas masked out, appears to be the best available proxy for desert tortoise populations, thereby representing areas of highest probability of tortoise occurrence/management benefit.
- d) The stress-to-demographic effect links need to be strengthened (additional funding has been secured from the California Energy Commission to pursue this).

Action Item: Cat will coordinate with Bob and Steve to refine the direction of the “spatial PVA” project and identify opportunities to apply the CEC funding to best fit into the SDSS. The CEC project includes a “start-up” meeting for additional SAC input in California within the first few months of funding, so a future meeting will be scheduled in early spring to continue working on this topic.

4. Application of spatial information to establishment of Demographic Study Areas (as per Recovery Criterion 1b)

In addition to (or reiteration of) previous SAC discussions, demographic studies areas should be geographically well dispersed within each recovery unit. Representation among variable levels of habitat “quality” and/or presence of population stresses is also desirable in order to improve the possibility of detecting population effects or trends (i.e. trends may be more apparent outside of the best or highest-density populations). In each geographic area of interest, plots representing low, medium, and high values of habitat and/or stress variables would be desirable. One possibility includes stratifying study areas according to the USGS habitat potential model.

Action Item: The DTRO needs to sketch out several potential scenarios (i.e. what could be happening to populations on the ground, including demographically) and the sampling designs that would be required to detect those scenarios. These scenarios and sampling designs would be provided to the SAC for further review and evaluation.

5. Solar energy development and translocation guidance

Kim outlined the basic principles and issues underlying translocation guidance currently being applied to solar energy developments in desert tortoise habitat. The SAC reiterated ecological concerns, above and beyond potential disease transmission, about translocating desert tortoises (or any wildlife) on top of existing populations. The group also discussed broader implications of completely eliminating habitat from within the matrix between current tortoise conservation areas (TCAs). That is, desert tortoise populations within our current conservation areas were historically interconnected with each other across the range of the tortoise, the conservation areas were never intended to be islands of habitat, and new, relatively high-density populations continue to be discovered within this matrix, potentially contributing to long-term population viability. Because the Mojave Desert has always been a large, continuous expanse, interrupting or fragmenting the ecosystem with multiple industrial developments could have unpredictable effects on tortoises inside the TCAs. The SAC took the position that maintenance of the basic continuous structure of the desert is likely necessary for long-term maintenance of habitat quality inside the TCAs and for persistence of the entire population of desert tortoises. It is important to maintain functional use of habitat within the matrix of habitat inside and outside the TCAs..

This discussion led to a “hierarchy of preference” by the SAC for renewable energy development within desert tortoise habitat:

- 1) Distributed solar development on rooftops and similar structures proximate to energy consumers {*avoids fragmentation and reduced function of desert and isolation of embedded tortoise conservation areas*}
- 2) Utility development on previously disturbed lands (e.g., unoccupied desert tortoise habitat) {*avoids fragmentation and reduced function of desert and isolation of embedded tortoise conservation areas*}
- 3) Development of occupied desert tortoise habitat, avoiding tortoise conservation areas and matrix areas that connect or link tortoise conservation areas. Specific matrix areas that would be desirable to preserve as well areas where development would be acceptable need to be identified. {*minimizes isolation of tortoise conservation areas*}
- 4) Development of “softer” footprints within occupied desert tortoise habitat (e.g., leave enough vegetation for some tortoises to persist among the mirror arrays), accompanied by research to evaluate the effectiveness of such development {*minimizes impacts to desert processes, including desert tortoise gene flow*}
- 5) Development of occupied desert tortoise habitat with translocation of project-site tortoises to depauperate (i.e., showing evidence of a significant decline) populations, accompanied by research to investigate the causes of prior decline or effectiveness of current management {*may fragment tortoise conservation areas, but uses project-site tortoises to recover depauperate populations without impacting undisturbed resident populations*}
- 6) Additional translocation of desert tortoises to currently occupied habitat is not recommended until results of existing research are available. The risks to wildlife populations from this type of translocation are significant and should not be propagated while multiple projects are in progress that will hopefully inform managers on the true

magnitude or effects of those risks. {*minimizes direct effects to tortoise populations inside and outside tortoise conservation areas*}

In order to maximize the benefit of research under Options 4 and 5, above, the SAC recommended that a research coordinator and/or data manager should be dedicated to ensuring that data from all the various projects are collected consistently, collated, and analyzed.

To the extent that development completely eliminates functional habitat, mitigation options on public land should include a “conservation lease” equivalent to the pertinent development lease in order to offset habitat that will be lost forever. The SDSS should also continue to be improved and be used as an objective tool to prioritize mitigation actions. A research fund established by renewable energy developers, independent of mitigation, would be highly beneficial to study the effects of epidemiology, landscape connectivity, etc. and to help maximize the “green” nature of these projects.

Action Item: The SAC decided to draft a position paper for Science on the ecological and evolutionary consequences of large-scale development of desert tortoise habitat. Bob will circulate an outline among the committee for input.

Next meeting

Cat will coordinate a Doodle poll to schedule the next meeting some time in the spring, possibly in Palm Springs.