



**U.S. Fish and Wildlife Service**  
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**Desert Tortoise Science Advisory Committee Meeting**  
**Meeting Summary**  
**November 14, 2008**  
**Las Vegas, NV**

**Meeting Goals and Objectives**

- Address public comments on recovery plan relative to scientific underpinnings of the plan
- Redefine “post-planning” objectives and future direction of the SAC
- Refine disease white paper based on latest information
- Outline concepts/approach for implementing monitoring of demographic study areas (i.e., Recovery Criterion 1b)

**Attendees**

Linda Allison, DTRO  
Roy Averill-Murray, DTRO  
Cat Darst, DTRO  
Kim Field, DTRO  
Jody Fraser, DTRO

Kristin Berry, SAC  
Peter Hudson, SAC  
Katherine Ralls, SAC  
Michael Reed, SAC  
Richard Tracy, SAC (afternoon)  
Fran Sandmeier, UNR (afternoon)

**Meeting Summary**

**Public comments on recovery plan**

The group discussed numerous comments in various topical areas as briefly summarized below.

**Monitoring and recovery criteria**

*Indicator species instead of the desert tortoise* – The SAC is unaware of any existing evidence that there are true indicator species for the tortoise; i.e., there is no reason to believe that side-blotched lizards, kangaroo rats, or other species will respond to environmental conditions in the same way as tortoises or help us to better understand the status of the tortoise. If proponents have supporting documentation on such species and the effectiveness of this approach specific to the desert tortoise, the SAC would like to review those data.

*Permanent study plots* – While a comparison of historical plot data and recent range-wide monitoring data is planned, this has not been a high priority so far. Historical but localized trend data are unlikely to change the current range-wide recovery direction. As the SAC makes progress in identifying specific demographic study areas, which will draw heavily from the historical plots (rather than a random sample from across the range, due to issues related to obtaining sufficient sample sizes to measure demographic rates), increased emphasis will be placed on this analysis.

*Statistical confidence levels and population trends vs. baseline* – A) Many commenters do not understand the statistical effect of increasing alpha from 0.05 to 0.10. A 90% CI describing trend



of actual data will be narrower than a 95% CI. Such a CI could lead us to decide the trend really is non-zero and increasing more often for a 90- than for a 95% CI. However, it does not mean that a no-growth trend will more often be described as an increasing one. If the true trend in the population is actually a zero- or declining trend, the narrower CI will prevent us from describing that trend as a positive one. As such, the recommendation in the draft plan represents a more conservative conservation threshold. B) For trend analysis, the baseline is density at the beginning of the regression. The baseline used to calculate lambda is the N of the year before:  $\lambda = N(t+1)/N$ . Historical N is not used. Regarding the possibility that basing recovery on increasing trends beginning with reduced populations will result in the species being delisted at numbers well below historic levels, there are no historic data on landscape-level population numbers to even make such a comparison, and there is no basis to presume that historic densities seen on localized plots are necessary for long-term survival and recovery across entire conservation areas. Further, recovery is not linked to “lambda greatly exceeding 1”. For tortoises, with low intrinsic reproductive rate, lambda is expected to be only slightly positive during population growth and may well even be negative in areas at carrying capacity. In otherwise suitable habitat, this would reflect a healthy population.

*Defining size classes and proportions represented in each in demographic analyses* – This information will be established based on the ultimate sampling design. The classes and target proportions may differ by region or situation and will be evaluated on a case-by-case basis.

#### Relationship of tortoise conservation areas to climate change

Tortoise conservation areas are defined based on tortoise habitat within those boundaries. If habitat changes within, then the conservations areas and relevant recovery prescriptions apply to the newly configured habitat. The recovery plan direction to model effects of climate change on the current composition of tortoise habitat will also inform the adequacy of current tortoise conservation areas for long-term recovery.

#### Grazing and fire prevention

Data are unavailable for the Mojave Desert ecosystem to indicate that cattle grazing can be an effective fuel-reduction tool without further perpetuating invasive plants. Cattle grazing may help create and maintain habitat for natives where the grassland ecosystem is highly productive (like on the coast, not the Mojave), disturbance was previously cause by native grazers and browsers (not the Mojave), and where unintended negative consequences are less likely (not in more arid systems, like the Mojave). However, the recovery plan does allow for experimentation of reducing fuels through grazing outside tortoise conservation areas. If existing data have been overlooked, the committee encourages advocates to provide appropriate citations to help modify recovery recommendations.

#### Proactive recovery intervention

The committee agrees that some type of localized intervention may be appropriate for recovery implementation teams to consider to enhance forage conditions, ameliorate water shortages, or improve other elements for survival, noting that this type of effort is not a substitute for threat abatement.

### Buffers and corridors

We should maximize the protection of habitat within currently designated tortoise conservation areas. As such, protection of the conservation area boundaries should be strengthened, recognizing that these areas must provide for recovery and serve as buffers from pressures outside the boundaries. Edge effects from projects “bleeding” into the conservation areas should be prevented. For this species, corridors *between* conservation areas (e.g., providing for evolutionary gene flow across the entire range) is not a recovery priority, given the time scale of management relative to tortoise evolution. (See the response to comments on climate change and habitat, above, however.)

### Predator control

The committee does not view predator control as a tenable long-term approach and questions its value as a short-term measure. Much literature shows that killing predators just results in new individuals filling in the opened spaces. Addressing the causes for increased predator populations is more important than killing predators themselves. In addition, predator removal could prove harmful to prey populations that are regulated primarily by parasitic infections rather than by predation. It would be acceptable to experimentally evaluate targeted predator (whether raven, coyote, or other) control to enhance tortoise survival, but specific data should show success of these efforts. Any decision should be reversible based on new information.

### Research

*Recovery action 5.1, stable age distributions* – “Stable” should be deleted and this action moved to 4.1 in order to characterize age distributions relative to stable or increasing populations compared to decreasing ones.

*Recovery action 5.3, restoration vs. ability of tortoises to use altered landscapes* – Action 5.2 should be broadened or clarified to deal with how tortoises function within altered landscapes and/or habitat affected by changing climate.

*Recovery action 5.6, population structure and subdivision* – A peer reviewer suggested that additional genetic data would not contribute much to current recovery efforts, and resources would be better spent on field studies to determine effectiveness of current recovery actions. The committee agreed.

*Population viability analysis* – As new demographic data become available, PVA should be reinvestigated. More emphasis should be placed on exploring the impact of environmental catastrophes and long-term persistence within the tortoise conservation areas.

### Disease

We need focused experiments, put resources towards these experiments, and especially designing the “killer” (definitive) experiment. The distribution of disease range-wide remains an unknown, but researching this is a low priority because of variable results from ELISA tests; it may be more appropriate to make assumptions about where disease is expected to occur and test these areas (e.g., as part of focused experiments noted above).

### SAC composition and independence

The committee is independent of the DTRO. To more explicitly address this point, the committee will assign a chair from among its membership. The chair (Peter Hudson volunteered) will coordinate with the DTRO on topics for the agenda and will lead the SAC through discussion of topics at each meeting. Members with a conflict of interest on a particular recommendation will declare their conflict and recuse themselves in any related decision making.

### **Open Forum**

An open forum was held from 11:30-12:15. One person attended, representing the QuadState Local Government Authority. Discussion topics primarily focused on research and disease.

### **Future direction of SAC**

A charter will be developed to address the purpose, organization, and responsibilities of the SAC, addressing the issues raised in the comments described above.

### **Disease white paper**

The SAC discussed the disease white paper (Appendix B in the draft revised recovery plan), especially relative to a new publication (authored by Ken Hunter et al. at the University of Nevada-Reno) indicating that the desert tortoise has innate antibodies to *Mycoplasma*. Researchers from the University of Florida provided a white paper (received electronically during the meeting) critiquing the Hunter paper, but the SAC agreed that it should not serve as a peer reviewer of pre-press publications. Instead, as with the original recommendations to Hunter et al., the committee will more strongly rely on findings from the published literature, which already have gone through a rigorous peer-review by subject experts. Recommendations on disease (or other topics) will be revisited as new information is published.

Most of the SAC's discussion centered around a draft flowchart/decision tree to be added to the white paper, relevant to moving tortoises around the landscape. The decision tree will inform decision-making in evaluating "translocatable" tortoises, hierarchically relying on clinical signs, ELISA tests, PCRs, and western blots. Outstanding questions concern a) determining appropriate populations into which tortoises may be translocated and b) the spatial scale across which laboratory-based disease evaluation may or may not be required (i.e., within what scale is it unnecessary to conduct disease testing to move tortoises – 100 m, 1 km, within the same valley, inside any natural or anthropogenic barrier, etc.? Should the distance be based on some factor of mean home range size?). Another topic for potential research on individuals deemed "non-translocatable" includes the use of metagenomics to identify all tortoise pathogens in sick animals to gain a better understanding of the range and potential interactions of pathogens occurring in desert tortoises.

**Action Items:** **Cat, Kim, and Peter** will revise the white paper and new translocation decision tree for discussion at the next meeting. **Kristin** will draft a similar decision tree for resident tortoises.

### **Monitoring demographic study areas**

This topic was deferred to a future meeting so that Earl McCoy and Bob Steidl would be able to participate directly.

**Next meeting**

The next meeting date is to be determined in February or March, at the San Diego Wild Animal Park in Escondido if available. The meeting will focus on finalizing the disease white paper, monitoring, and opportunities and new directions at the Desert Tortoise Conservation Center (in coordination with the Zoological Society of San Diego, who will be beginning management of the Center).