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MSCO3 2020  
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# THE MUSEUM OF SOUTHWESTERN BIOLOGY



Debra M. Hill  
U.S. Fish & Wildlife Service  
P.O. Box 1306  
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Dear Debra:

In response to an invitation from Wally Murphy, Field Supervisor of the US Fish and Wildlife New Mexico Ecological Services Field Office, I would like to submit this review of the proposed rule to list the Dunes Sagebrush Lizard (*Sceloporus arenicolus*) as endangered throughout its range.

To help you judge my comments I submit a short summary of my experience with conservation aspects of reptiles. I have taught Conservation Biology, Herpetology, and General Vertebrate Zoology within the Biology Department of the University of New Mexico since 1986 where I am a professor and curator of the Herpetology Division of the Museum of Southwestern Biology. I and several of my students worked on *Sceloporus arenicolus* in the 1990s. In addition I worked on the conservation biology of the Galapagos National Park from 1977 through 2004.

## Review:

The Dunes Sagebrush Lizard is in danger of extinction. As demonstrated by many of the studies reviewed in your proposed rule, *S. arenicolus* has a small geographic range and within that range its distribution is tightly coupled with Shinnery Oak. The size of an organism's geographic range has been shown to be the best predictor of likely extinction and organisms with small geographic ranges are more susceptible to extinction than organisms with larger geographic ranges (Payne & Finnegan 2007). In addition, organisms with specific ecological requirements are more susceptible to extinction than organisms with more general ecological requirements (Davies et al. 2004). Thus, even without consideration of anthropogenic effects, *S. arenicolus* warrants special consideration to ensure its persistence as a species. Unfortunately human activity throughout the geographic range of the Dunes Sagebrush Lizard has critically exacerbated those two components of its ecology to the point that extinction is a very real threat.

In summarizing the anthropogenic effects exacerbating the precarious status of *S. arenicolus* the proposed rule reviews five factors which I would like to address here.

### **Factor A - The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range.**

The proposal's summary is well done and truthfully summarizes what has happened in the past and how that has led to severe reductions in the population levels of *S. arenicolus*. A potential suggestion would be to move some of the effects of oil, gas, solar and wind energy development along with some of the OHV activity from this section to Factor B (Overutilization). I suggest this because those activities have two distinct effects - one is destruction and alteration of habitat which the proposed rule correctly covers here. The other is direct increases in mortality associated with vehicular and other activity. From an organism's point of view the effects of directly increased mortality that is purposeful ("Overutilization") are the same as directly increased mortality that is accidental (no real place for this in the five factors). Thus the vehicular activity that directly kills individuals or destroys their nests isn't really a habitat factor - it is a utilization (even if that utilization is accidental) factor. An alternative to this would be to categorize the direct (but accidental) killing of individuals within Factor C (Disease or Predation) and call it "accidental human predation." Some of this might seem like academic hair-splitting, but habitat alteration/destruction and mortality increase the probability of extinction in fundamentally different ways. Within the factors laid out in the proposed rule it seems most appropriate to me for the accidental mortality to be included as Commercial Overutilization because it is mortality caused by a commercial activity. However, as a biologist, I understand the biological consequences of mortality in contrast with the biological consequences of

habitat destruction/alteration but I may not understand the administrative or legal requirements of placing threats within the five predetermined factors.

I think that the proposed rule underestimates the potential harm from solar development. Most of the treatment of solar development is limited to roads and installation activity. However the large-scale solar facilities I have seen cover great areas with the panels themselves. Thus the installation of such large scale solar facilities would have additional impacts equal to Shinnery Oak removal for the areas covered by the solar arrays.

**Factor B - Overutilization for Commercial, Recreational, Scientific or Educational Purposes.** The proposed rule summarizes the potential consequences of purposeful overutilization well. However, as mentioned above under Factor A, I think there is considerable overutilization that is accidental and that could be included here.

**Factor C - Disease or Predation.** The proposed rule summarizes the lack of knowledge regarding population-level effects of disease. The conclusion states that disease is not considered a threat now or in the foreseeable future. Given that we don't know the effects of disease, would it be more accurate for the rule to state that you can't make a conclusion about the effects of disease due to the lack of knowledge? As it is in the current form the proposed rule seems to suggest that if we don't know enough about a potential threat it is probably OK.

**Factor D - The Inadequacy of Existing Regulatory Mechanisms.** The proposed rule goes into great detail regarding existing agreements and the lack of regulatory mechanisms that actually protect habitat of *S. arenicolus*. The conclusion that existing regulatory mechanisms aren't sufficient is correct. I suspect they simply can't be sufficient and therefore listing the Dunes Sagebrush Lizard as endangered is absolutely necessary.

**Factor E - Other Natural or Manmade Factors Affecting Its Continued Existence.** The section on competition could include *Sceloporus undulatus* as a potential competitor to be complete, but I don't think that would alter the conclusion. Another common cause of anthropogenic extinctions relates to the presence of exotic or alien species. The proposed rule does not mention predation by nor competition with alien species. I suspect that alien species are not an important factor for *S. arenicolus*, but perhaps mentioning them would provide a complete picture. Exotic species of ants have been proposed as contributing to population declines of several species of lizards - including species in Texas and Oklahoma.

**Summary** - the proposed rule presents a scientifically supported conclusion that *Sceloporus arenicolus* is in danger of extinction, that a number of anthropogenic actions exacerbates the situation, and that existing regulatory mechanisms and actions have failed to reverse a pattern of declining populations. Listing this species as endangered is a necessary step that can improve the chances this species will persist.

Davies, K.F., C.R. Margules, & J.F. Lawrence (2004). Ecology, 85 (1): 265–271.

Payne, J.L. & S. Finnegan (2007). The effect of geographical range on extinction risk during background and mass extinction. Proc. Nat. Acad. Sci. 104 (25): 10506–11.

Best Wishes,



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