

View Point

The Greater Sage-Grouse Story: Do We Have It Right?



By Matthew A. Cronin

On the Ground

- Greater sage-grouse were found to be threatened or endangered with extinction in a preliminary assessment in 2010, with a final decision on an Endangered Species Act (ESA) listing due in 2015.
- ESA criteria regarding endangered status (in danger of extinction), threatened status (likely to become in danger of extinction), the foreseeable future (in which a species will become in danger of extinction), and a significant portion of a species range (without which a species will be in danger of extinction) are not definitive, rely on predictions, and are all concerned with species extinction, not simply population declines.
- The 2010 ESA determination for sage-grouse relies on observations of declining populations, predictions from models with uncertain assumptions, incomplete population data, and anticipated habitat changes. Prediction of species extinction from this information can be considered speculation, and insufficient for an ESA listing.
- Wildlife management without the encumbrances of the ESA and its associated litigation and regulation can be used to maintain and enhance species that are not in immediate danger of extinction, such as sage-grouse.

Keywords: Greater sage grouse, *Centrocercus urophasianus*, extinction, endangered species act, predictive models.

Rangelands 37(5):200–204

doi 10.1016/j.rala.2015.07.003

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Vermeire et al.¹ published a seminal paper in 2004 showing that claims justifying an Endangered Species Act (ESA) listing of the black-tailed prairie dog (*Cynomys ludovicianus*) were not valid. These authors noted that interpretation of data and “selective disregard of literature on the basis of personal values” caused polarized opinions about prairie dog ecology and status, and

they advocated for objective evaluation of all applicable science. Much of the argument about prairie dogs was clarified by Vermeire et al.’s presentation of field observations and data, relevant literature, and common sense understanding of prairie dogs by those in the agriculture community.

I replicated the title of Vermeire et al.’s paper, with substitution of greater sage-grouse (*Centrocercus urophasianus*) for prairie dog because both species are widely distributed over some of the same geographic regions and both were considered for ESA listing. Greater sage-grouse were found to be warranted for ESA listing as a threatened or endangered species by the U.S. Fish and Wildlife Service (FWS) in 2010.² This ESA listing was precluded by higher priorities, with a final decision due in 2015. Vermeire et al. discussed specific topics related to prairie dog ecology and potential impacts on populations. In this paper, I take a different approach and discuss basic science concepts integral to the ESA and the use of predictions and models as a basis for designation of greater sage-grouse as in danger of extinction. There has been extensive work on greater sage-grouse subsequent to the 2010 ESA finding that will be used in the final 2015 listing decision. I will discuss some of this new information, but I will focus on the basic tenets used to justify the 2010 finding that greater sage-grouse are threatened or endangered with extinction.

Sage-Grouse Species, Subspecies, and Populations

First, we must identify what is or is not endangered with extinction. Because the ESA defines species as “species, subspecies, and (for vertebrates) distinct population segments (DPS)” and subspecies and DPS designations are often subjective,^{3,4} this is not a simple question.

In the case of sage-grouse, two species have been designated: greater sage-grouse (*Centrocercus urophasianus*) and Gunnison sage-grouse (*Centrocercus minimus*). These were considered conspecific until recently when Gunnison sage-grouse was described as a separate species.⁵ I suggest that adjacent historical ranges, limited genetic differentiation, and lack of definitive evidence of reproductive isolation of Gunnison and greater sage-grouse make this designation uncertain.⁶ There is considerable debate over the recent trend of increasing species designations of birds and mammals^{7,8} that may be relevant to the Gunnison sage-grouse species

designation. Gunnison sage-grouse have been listed as a threatened species separately from greater sage-grouse.⁹ Two subspecies of the greater sage-grouse have been recognized, the eastern (*C. u. urophasianus*) and western (*C. u. phaios*) greater sage-grouse, although these designations have been deemed invalid,² as is the case for many other avian subspecies.⁴ A DPS of greater sage-grouse is also recognized (Mono Basin in Nevada and California) and has been found to be not warranted for ESA listing.¹⁰

This leads to an obvious logical dilemma for those making the ESA listing decision in 2015 for the entire species of greater sage-grouse: If a population of greater sage-grouse (Mono Basin) is not endangered with extinction, the entire species cannot be endangered with extinction. In any event, there are presently two species of sage-grouse (Gunnison and Greater) considered threatened or endangered with extinction.

Endangered Species Act Criteria

Under the legal terminology of the ESA,¹¹ “endangered” means in danger of extinction, and “threatened” means likely to become endangered in the foreseeable future (often considered to be 30 or 100 years) throughout all or a significant portion of the species’ range. Endangered (i.e., in danger of extinction) is also described in simple terms as a species “at the brink of extinction now”¹² and presumably means that the species is likely to go extinct without the intercession of ESA actions. The meaning of “extinct” is consistent in *Webster’s Ninth New Collegiate Dictionary*: “no longer existing,” and in the FWS definition¹³: “An extinct species is a species no longer in existence.”

A significant portion of a species’ range is:

*A portion of the range of a species is ‘significant’ if the species is not currently endangered or threatened throughout all of its range, but the portion’s contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.*¹¹

The term “foreseeable future” is not defined, but its designation is left to the discretion of the Secretary of the Interior (who is responsible for FWS), with these qualifications:

*... the foreseeable future extends only so far as the Secretary can explain reliance on the data to formulate a reliable prediction. What must be avoided is reliance on assumption, speculation, or preconception... The Secretary has broad discretion with respect to what constitutes the foreseeable future....*¹⁴

These definitions are focused on species extinction, and it is clear that the intent of the ESA is to prevent a species from becoming extinct (i.e., reaching a population number of zero). However, except for “extinction” these ESA terms are scientifically vague and can lead to inconsistent and unpredictable decisions.¹⁵ For example, FWS must decide if a species is in danger of extinction or is likely to become in danger of extinction and what constitutes a significant portion of the range and the foreseeable future with regard to species extinction. These determinations necessarily rely on predictions, the accuracy of which will rely on many factors.

Are Greater Sage-Grouse Endangered with Extinction?

The predictions of greater sage-grouse extinction are based on complex models with uncertain theoretical assumptions regarding genetic variation and fitness and on incomplete data on greater sage-grouse numbers and demographics. Of course, theory and models are integral to science, but they are not always a reflection of reality in nature.

In its determination that the greater sage-grouse is warranted for listing under the ESA,² the FWS did a laudable job reviewing and synthesizing an immense amount of literature, including descriptions of widespread greater sage-grouse population declines and their possible causes. However, the essential question is: Is the *entire species* actually threatened or endangered with *extinction*? The FWS has found this to be the case in their finding that the greater sage-grouse was warranted as a threatened or endangered species.² Such details as a species being threatened (i.e., not presently endangered but likely to become so) or being endangered in a significant portion of its range (i.e., not the entire range but enough of the range to make the entire species endangered with extinction) do not change the basic tenet that species extinction is the primary concern of an ESA listing. In all categories (endangered, threatened, foreseeable future, and a significant portion of its range), potential extinction of a species is the criterion that makes it appropriate for ESA listing. A species need not be in immediate danger of being reduced to zero, but it must be facing a high likelihood of being so in the foreseeable future to be considered under the ESA.

Extinction is an extreme prediction, considering that greater sage-grouse occupy 56% of their historical range² in 11 States and two Canadian Provinces (Fig. 1), and although the number of greater sage-grouse is uncertain it was estimated to be 535,542 birds in 2010 (Table 1). Although there have been recent population declines and problems with impacts to habitat, predation, and other factors as with all wildlife species, I contend that greater sage-grouse are not in immediate danger of extinction. Rather, the 2010 endangered finding was based on predictions of future impacts and habitat loss using demographic models, primarily those of Garton et al.¹⁶ These models have inherent uncertainty and questionable assumptions. Regardless, in the model results many greater sage-grouse populations were actually found not likely to go extinct, and thus it is logical to conclude that the species is not likely to go extinct (as with the Mono Basin population noted above). However, FWS² stated:

We anticipate adverse habitat impacts...and synergism between these impacts (e.g., fire and invasive species expansion) to increase habitat loss; therefore, Garton et al.’s sic (in press)¹⁶ likely overestimate the resulting future habitat carrying capacity and population numbers. (p. 49)

Based on the current and ongoing habitat issues identified here, their synergistic effects, and their likely continuation in the future, we conclude that this threat is significant such that it provides a basis for determining that the species warrants listing under the Act as a threatened or endangered species. (My emphasis). (p. 52)

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