

either side of the proposed boundary between the western and eastern subspecies, but found no genetic evidence to support the delineation of subspecies (Benedict *et al.* in press).

The boundary between the western and eastern subspecies is generally considered to occur along a line starting on the Oregon-Nevada border south of Hart Mountain National Wildlife Refuge and ending near Nyssa, Oregon (Aldrich and Duvall 1955; Aldrich 1963). No study has been published depicting a more precise separation between the two previously recognized subspecies. Although no study has specifically been conducted to show movement along this separation boundary, other studies involving radio-tagged sage grouse have documented movements back and forth across the proposed boundary. For example, Crawford and Gregg (2001) noted that two radio-tagged sage grouse hens captured on Hart Mountain National Wildlife Refuge in south-central Oregon moved to the vicinity of Lone Grave Butte on the Beatys Butte study area southeast of the refuge. They also noted that a hen and week-old brood moved from Beatys Butte to the Catnip Reservoir area of Sheldon National Wildlife Refuge in Nevada, a distance of over 32 km (20 mi). By mid-summer, 25 percent of marked hens (6) still alive had moved south onto Sheldon National Wildlife Refuge (Crawford and Gregg 2001). This small sample demonstrates movement of sage grouse across the boundary area separating the western and eastern populations of sage grouse.

At this time, sage grouse experts disagree about whether the western sage grouse is a valid subspecies. When informed taxonomic opinion is not unanimous, we evaluate the available published and unpublished information to come to our own adequately documented conclusion regarding the validity of taxa. Although the AOU has not made a procedural change regarding the treatment of subspecies, the best available science tells us that there is no genetic distinction between western and eastern sage grouse. Therefore, on the basis of lack of distinct genetic differences between the two putative subspecies, lack of ecological or physical factors that might contribute to population isolation, and evidence that birds freely cross the supposed boundary zone between the subspecies, we conclude that the western sage grouse is not a valid subspecies of the greater sage grouse. Because we no longer consider the western sage grouse a valid taxon, we must then consider whether the petitioned sage grouse populations might constitute a DPS.

Under our DPS policy (61 FR 4722), we use three elements to assess whether a population under consideration for listing may be recognized as a DPS: (1) A population segment's discreteness from the remainder of the taxon; (2) the population segment's significance to the taxon to which it belongs; and (3) "[t]he population segment's conservation status in relation to the Act's standards for listing (*i.e.*, is the population segment, when treated as if it were a species, endangered or threatened?)." If we determine that a population being considered for listing may represent a DPS, then the level of threat to the population is evaluated based on the five listing factors established by the Act to determine if listing it as either threatened or endangered may be warranted.

A population segment of a vertebrate species may be considered discrete if it satisfies either of the following conditions. The first condition is whether the species' population is markedly separated, or isolated, from other populations of the same taxon "as a consequence of physical, physiological, ecological, or behavioral factors." When evaluating these four factors, "[q]uantitative measures of genetic or morphological discontinuity may provide evidence of this separation." The second condition, which does not apply here, is whether the population segment be "delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act."

In determining the discreteness, or isolation, of the petitioned sage grouse, one of the factors to consider is physical separation from the rest of the taxon. The petitioner did not provide substantial information to demonstrate, nor does information in our files indicate, that the western population of sage grouse are physically isolated from nearby eastern populations. Along the eastern boundary of the petitioned sage grouse, the landscape consists of various mountain ranges, intervening valleys, and canyons, and birds are able to move between these areas. No physical barriers exist that would preclude the movement of birds across this landscape and hypothetical boundary separating the petitioned and more easterly populations. Crawford and Gregg (2001), through their studies, have documented the movement of sage grouse across this boundary. Dispersing birds have been estimated to be able to disperse up to 160 km (100 mi) (WDFW 1995;

Schroeder *et al.* 1999). The petitioner acknowledges in the petition that the ranges of western and eastern populations of sage grouse overlap in Oregon (Webb 2001).

Other factors to consider with regard to discreteness or isolation of a population are genetic, morphological, and behavioral differences. As discussed above, there does not appear to be any genetic differentiation between sage grouse individuals found in western and eastern populations. Individual morphological variation, such as color, in this [sage] grouse, as in other species, is extensive (R. Banks, *in litt.*, 1992). Banks (*in litt.*, 1992) doubts that the color difference noted by Aldrich is sufficient to warrant the description or recognition of a subspecies, with the present concepts. He continues by stating that most taxonomists today would not make the decision to name a population on the basis of the minor color variation shown in the small sample available here. Even Aldrich (*in litt.*, 1992 cited in Drut 1994) states that the amount of morphological difference required to name a distinct population as a subspecies is arbitrary. The petitioner does not provide any information to document that the petitioned sage grouse exhibits any unique behavioral traits.

In summary, to make a DPS determination, we examined physical, physiological, ecological, and behavioral factors. Since no international government boundaries of significance are involved, this condition for a finding of discreteness was not considered in reaching this determination. Neither the information presented in the petition nor that available in Service files presents substantial scientific or commercial information to demonstrate that the western population of sage grouse is discrete from the remainder of the taxon. Accordingly, we are unable to define a listable entity of the western population of sage grouse within the greater sage grouse taxon. Therefore, we did not address the second element for determining a DPS, which is the potential significance of the western population of sage grouse to the remainder of the taxon. Finally, since the western population of sage grouse cannot be defined as a DPS at this time, we did not evaluate its status as endangered or threatened on the basis of either the Act's definitions of those terms or the factors in section 4(a) of the Act.

Petition Finding

We have reviewed the petition, literature cited in the petition, other