

HISTORY OF TRANSPLANTING MOUNTAIN SHEEP — CALIFORNIA

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Since Cowan's (1940) systematic revision of North American wild sheep (*Ovis canadensis* ssp.), extant and extinct populations in northeastern California and the Sierra Nevada have been referred to the subspecies *californiana*. Recently, Ramey (1993) and Ramey and Wehausen (1996) demonstrated that specimens of mountain sheep from these parts of California are genetically and morphometrically more similar to conspecifics from the southwestern United States, rather than to those from Washington and British Columbia. We acknowledge this conflict with Cowan's (1940) taxonomy, although the systematic status of *californiana* from eastern California has not yet been revised accordingly. Hence, we report herein the translocation history of mountain sheep in California currently classified as *californiana*.

Because this taxon is listed as threatened under the California Endangered Species Act (California Fish and Game Commission 1995), Cowan's (1940) taxonomy retains legal status. Information presented herein is based largely on the summary of Bleich et al. (1990) for translocations of mountain sheep in California.

Mountain sheep of the California subspecies (*O. c. californiana*) formerly occurred in ≥ 7 locations in northeastern California, and 14 other populations existed in the Sierra Nevada (Wehausen et al. 1987, Torres et al. 1994, Bleich et al. 1996). All such populations in the northeastern part of the state have been extirpated, as have been the majority of those that occurred in the Sierra Nevada. As recently as 1979, only 2 native populations persisted in the Sierra Nevada, at Mt. Williamson and Mt. Baxter (Wehausen 1980).

Northeastern California

The first translocation of mountain sheep in California occurred in 1971, when 8 females and 2 males were translocated from British Columbia to an enclosure at Lava Beds National Monument, Siskiyou County (Blaisdell 1972, Weaver 1972). In 1972, two males in this population were thought to have been killed illegally (Blaisdell (1974, 1975); as a result, an additional male was captured at the Charles Sheldon National Wildlife Refuge, Nevada, and translocated to Lava Beds National Monument (Blaisdell 1974).

In February 1980, 1 male and 3 females were translocated from the Lava Beds enclosure to the Warner Mountains, Modoc County (Sleznick 1980), and in March 1980 these were joined by 6 females (3 adults, 1 yearling, 2 lambs) and 4 males (2 adults, 2 lambs) from Sawmill Canyon and Sand Mountain (Inyo County) in the southern Sierra Nevada. During the summer of 1980, all remaining sheep at Lava Beds National Monument succumbed to pneumonia thought to have been contracted from domestic sheep (Foreyt and Jessup 1982, Weaver 1983). Similarly, the entire Warner Mountains population died in 1988 of pneumonia attributed to pathogens contracted from domestic sheep (Weaver and Clark 1988).

Sierra Nevada

In March 1979, 4 adult females, 1 yearling male and 2 male lambs from Sawmill Canyon, and 2 adult males from the adjacent Sand Mountain population, were translocated to Wheeler Crest in Mono County. In March 1980, an additional 8 females (7 adults, 1 lamb) and 2 males (1 yearling, 1 lamb) were translocated to Wheeler Crest from Sand Mountain. This population was augmented with 4 adult males from Sand Mountain in April 1982, and with 2 adult females, 1 yearling female, and 1 yearling male from Sand Mountain in March 1986. Thus, a total of 27 mountain sheep have been translocated to Wheeler Crest.

In March 1980, 7 females (6 adults, 1 lamb) and 4 adult males were translocated from Sawmill Canyon and Sand Mountain to Mount Langley in central Inyo County. The Mount Langley population was augmented with 6 females (5 adults, 1 lamb) and 3 adult males from Sawmill Canyon in March 1982, and with 6 adult males from Sand Mountain in April 1982. Thus, a total of 26 mountain sheep were translocated to Mount Langley.

In March 1986, 15 females (13 adults, 2 lambs) and 12 males (3 adults, 4 yearlings, 5 lambs) were translocated from Sand Mountain to Lee Vining Canyon, Mono County, in an effort to reestablish a population of mountain sheep that would use historical summer range in Yosemite National Park. Because of losses to a variety of causes during the first 2 years (Chow 1991), 8 additional females (7 adults, 1 yearling) and 3 adult males were translocated to Lee Vining Canyon from Sand Mountain during March 1988. Thus, a total of 38 mountain sheep were translocated to Lee Vining Canyon.

Summary

During 1979-1988, 57 females and 44 males were captured at Sand Mountain or Sawmill Canyon and translocated to 3 historic ranges in the central Sierra Nevada and 1 historic range in northeastern California; additionally, 1 female and 1 male died during these translocation efforts. The attempts to reestablish mountain sheep on historic ranges in northeastern California, using animals from British Columbia, Nevada, and the Sierra Nevada were unsuccessful. Currently, mountain sheep persist in the Sierra Nevada at Lee Vining Canyon ($n \leq 50$), Wheeler Crest ($n \leq 20$), and Mount Langley ($n \leq 30$), as well as at Mt. Baxter ($n \leq 50$) and Mt. Williamson ($n \leq 10$) (Torres et al. 1996).

Of great concern has been the precipitous population decline at Sand Mountain and Sawmill Canyon (Wehausen 1996), which together comprise the Mt. Baxter population, the source for previous translocations within the Sierra Nevada. Despite the well-organized efforts to conserve this ecotype of mountain sheep (SBSIAG 1984, Bleich et al. 1991), there are <150 mountain sheep in the Sierra Nevada, far fewer than in 1979 (Torres et al. 1996). Nonetheless, these sheep occur at 6, rather than at 3, locations, consistent with California's metapopulation conservation strategy (Torres et al. 1994), thereby reducing the probability of simultaneously losing all of the populations to a catastrophic event (Bleich et al. 1996).

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