SIERRA NEVADA BIGHORN SHEEP: 1995-97 STATUS

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Bighorn sheep that inhabit the central and southern Sierra Nevada Mountains of California are a unique form of that species. Despite a successful restoration program that reestablished three populations between 1979 and 1988 to augment the two surviving native ones, these sheep have lost ground in total numbers in the past decade. This occurred because of an unusually high density of mountain lions that developed in the 1980's, which was the apparent cause of a shift in migratory behavior of all five Sierra Nevada bighorn populations. Each ceased to descend to the eastern base of this mountain range in winter and spring beginning in the mid 1980's. All populations have declined substantially as a result, with an unusually snowy winter of 1995 playing a strong role in some of these declines. Beginning in 1995, we have devoted a large effort to developing accurate demographic information on these five populations as critical baseline information for any conservation effort for recovery of these sheep. This report summarizes information obtained from 1995 through summer 1997. Data collection efforts have been made in both summer and winter, and relative allocation of effort between these two seasons has varied greatly among populations depending on their habitat use patterns. Populations will be discussed from south to north.

Mount Langley Population

As recently as 1990, this population was known to exceed 40 sheep. Our data collection occurred in the summers of 1996 and 1997 and the intervening winter. In the first summer we made 5 trips into this area and documented 3 ewes, 1 female lamb, and 10 rams. The same 3 ewes, 1 female lamb, and 2-year old ram were seen repeatedly as a group and were the only ewes evident in the population. During winter, this same group was found at the base of the mountains in the Carroll Creek winter range. A total of 5 other rams were also found along the base of the range this past winter. In the summer of 1997, our adult ram count increased to 11, but the same 3 ewes with a yearling ewe (the 1996 lamb) were the only ewes found. They were accompanied by two lambs and a young ram we believed to be a 2-year old different from the young rams accompanying them in 1996 (now a 3-year old). This new ram would have been a yearling in 1996 and still living with ewes, but was not with this group. This suggests that a few more ewes may exist, probably in Tuttle Creek, but this has not been established. The known ewe group summers primarily in Diaz Creek. Tuttle Creek canyon has been studied from its south rim repeatedly without success. Also, no recent sign of sheep could be found on the summit plateau of Lone Pine Peak in 1996, which was previously used by occupants of Tuttle Creek. It remains a possibility that the ram seen with the ewes this past summer was the same one that accompanied them in 1996 and simply misinterpreted as a 2-year old.

Mount Williamson Population

No members of this native population were seen between 1985 and 1997. They last used their low elevation winter range in 1985, when the population numbered 31 sheep, a size (29-31) it had remained at since first censused in 1978. In 1996 we explored the former summer range of ewes in the upper Georges, South Bairs, and Williamson Creeks, and were impressed by the paucity of evidence of sheep remaining. Sign suggested no more than a single sheep using these areas.

In the summer of 1997, we took 2 trips into this region. On the first we observed a ram on the north flank of Mount Williamson and documented from fresh tracks in nearby snow that 2 other rams apparently accompanied him, but must have been out of sight (ewes do not accompany rams at this time of the year). This was consistent with a report of 3 rams from the summer of 1996 on Diamond Mesa. On the second trip, we walked completely around Mount Williamson in a single day in order to cover all historic summer ewe range. On the east side of Mount Williamson we again found very sparse sign of sheep including no evidence of lambs. However, on the west side of the north ridge of Mount Williamson above Williamson Creek we found very fresh tracks, beds, and feces of a ewe-lamb group that had probably been there the previous day. We were able to determine from fecal samples that this group contained 3 different adults and at least 1 lamb. Given that a yearling ram might have been one of the adults, we conclude that 2-3 ewes remain in this population. Apparently, these few remaining ewes now reside only on the north ridge of Mount Williamson.

Mount Baxter Population

In the 1970's and 1980's, prior to winter range abandonment, this population consisted of two distinct subpopulations -- the Sand Mount herd that wintered south of Sawmill Creek, and the Sawmill Canyon herd that wintered north of Sawmill Creek. Since they ceased using these winter ranges, the ewes of the Sand Mountain herd have broken into 2 herds: those that winter south of Oak Creek and summer mostly in the same area (the Black Mountain herd), and those that still appear occasionally on the Sand Mountain winter range following heavy storms and summer mostly east of Mount Baxter (the Sand Mountain herd). Each of these three herds has necessarily been censused differently in recent years. The Black Mountain herd has been counted in summer at high elevations, the Sand Mountain herd in winter following heavy storms when they appear at the mouths of Black Canyon and Sawmill Canyon south of the creek, and the Sawmill Canyon herd in both summer and winter.

Considerable effort in the summer of 1995 established the Black Mountain herd at 6 ewes and 3 lambs. Time constraints have not permitted further data collection on this herd since then, but sign on Black Mountain in summer 1997 indicated a persisting small population. Four ewes have been counted in the Sand Mountain herd in each of 3 consecutive winters beginning 1995. Two lambs accompanied them in 1995 and one in 1997. A focused summer effort accounted for 7 ewes and one lamb in the Sawmill Canyon herd in 1995. In the winter of 1997, this subpopulation began reoccupying its former winter

range for an extended period in winter, during which 6 ewes, 3 lambs, and 3 young rams (2 yearling and 1 2-year old) were accounted for. Some adult rams have been recorded during data collection on the Mount Baxter population, including 6 older adults in the summer of 1995, but ram numbers are unknown overall because efforts have been concentrated in ewe habitats when rams reside elsewhere. Past sex ratios would predict about 10-12 rams in this population, which appears to total 15-17 ewes overall, or about 15% of its former size.

Wheeler Ridge

In the winter of 1996, 8 adult ewes, 4 lambs (2 of each sex), and 4 rams (3 2-3 year olds and 1 older) were counted in this population. In this past winter, these numbers were 8 adult ewes, 1 yearling ewe, 5 lambs, 2 yearling rams, and 5 adult rams (1 3-year old, 2 4-year olds, and 2 older). One of these rams spent most of the winter on Mount Tom.

Lee Vining Canyon

Beginning in the summer of 1995, this population has been censused by a group effort in early summer, which we supplement as needed with additional field work throughout summer. It consists of 2 subpopulations, one north of Lee Vining Creek and one on Mount Gibbs, the former of which currently is split into a main group on Mount Warren and a small group on Tioga Crest.

In 1995 there were 14 ewes, 4 lambs, 14 rams, and 1 unidentified sheep counted north of Lee Vining Creek and 1 ewe, 1 yearling ram, 1 lamb, and 3 rams on Mount Gibbs. The count in 1996 was 15 ewes, 13 lambs, 1 yearling ewe, 2 yearling rams, and 13 rams north of Lee Vining Creek, and 1 ewe, 1 female lamb, 1 2-year old ram, and 4 older rams on Mount Gibbs. Both 1995 and 1996 provided situations for clearcut census results. This was not so in 1997 because of more scattered distribution of the sheep. In particular, one group of 3 ewes, 3 lambs, and 2 yearlings seen during the group census, and identifiable by some notably small lambs, could never be relocated during considerable followup work. The result is that north of Lee Vining Creek, there were at least 12 ewes, 6 lambs, 5 yearlings (4 female, 1 male), and 12-13 rams, but there were probably 15 ewes, 9 lambs, 8 yearlings, and 12-13 rams. On Mount Gibbs there were 1 adult ewe, 1 yearling ewe, 1 male lamb, and 2 rams (1 3-year old, 1 older).

SYNTHESIS

Ordering the five populations from small to large yields Williamson, Langley, Wheeler, Baxter, and Lee Vining. In 1996, the total reproductive base for Sierra Nevada bighorn was about 47 ewes, and total adults was just under 100. The overall population including lambs was 120-125 in 1996. There is clear evidence of a recovery pattern in some populations, but small numbers limit numerical gains. For instance, the known ewe population of the Mount Langley population increased by 33% this past year, but the numerical gain was 1 yearling ewe. The Lee Vining Canyon population continues to show the most promise of producing notable numerical gains and thereby become a new source

of reintroduction stock. The ewes using the Sawmill Canyon winter range may begin showing a high reproductive success.

A notable development this past winter was the reoccupation of some former winter ranges. The Mount Langley population did this, as did most of the Sawmill Canyon herd ewes. One ewe from the Sand Mountain herd also spent much of the winter low on the south side of Sawmill Creek with her female lamb, as she did in 1995. The remaining ewes of the Sand Mountain herd showed a similar tendency following a major storm in mid January. They traversed the old Black Canyon winter range almost to Sand Canyon and occupied it a week before retreating to Black Canyon, not to be seen again during winter. These behavioral changes are correlated with an apparent steady decline in the mountain lion population in the eastern Sierra. The lion population adjacent to the Wheeler Ridge population has been monitoring very closely since 1992 in conjunction with the deer herd that winters there. This lion population has declined every year and it now numbers less than 50% what it was in 1992. Since immigration has been the only factor slowing its decline, this declining population trend probably reflects a regional pattern. This bodes well for bighorn recovery. First, reproductive output of ewes that occupy low elevation winter ranges should return to what it was prior to winter range abandonment. Second, this will provide more options for the use of future reintroduction stock, such as the augmentation of those herds that are using low elevation winter ranges.

Predation has not disappeared as a conservation problem. One mountain lion that discovers one of the small surviving bighorn groups wintering at low elevation can seriously compromise its future, and again lead to winter range desertion. Also, a large coyote population is Lee Vining Canyon in winter appears to be keeping those sheep at high elevations in that season. Coyotes killed the only yearling ewe in that population this past winter when she attempted to winter in Lee Vining Canyon with a couple of older ewes.

The discovery of a population still remaining on Mount Williamson, while very small, opens up more options (e.g. augmentation) for the its recovery. It also reopens the subject of conducting controlled burns in some of the canyons there to improve habitat. Overall, the findings of the past year give some reason to be guardedly optimistic about the possibility of recovery of Sierra Nevada bighorn, but many possible unpredictable future events, including the expected El Niño winter, could reverse the limited recent gains.