FIRST QUARTER REPORT OF THE SIERRA NEVADA BIGHORN SHEEP RECOVERY PROGRAM

Photo by Mark Hebblewhite

JANUARY – MARCH 2008

BIGHORN DEMOGRAPHY AND OVERWINTER SURVIVAL

The survival rate for radio-collared bighorn ewes during the 1st quarter of 2008 was 90%; 1 ewe died following a fall and 4 mortalities were of undetermined cause. Survival of radio-collared rams during January – March 2008 was 70%; 3 rams were killed by mountain lions, 1 ram had pneumonia, 1 ram died of malnutrition, and the cause of death is unknown in 5 cases.

Adequate snowfall during the winter moved bighorn sheep in many herds to lower elevation winter ranges. Herd units surveyed for population estimates during January – March 2008 include Mt. Warren, Mt. Gibbs, Wheeler Ridge, Sawmill Canyon, Mt. Baxter, Bubbs Creek, and Mt. Langley. The dispersed nature of animals on Mt. Williamson during winter precluded an adequate opportunity for surveys. However, 3 bighorn sheep (2 ewes and 1 ram) on Mt. Williamson were captured and GPS collars were deployed. This is a first for this herd unit and the collars are already providing needed information on the patterns of movement and habitat use on this massive, rugged mountain.

The herd of bighorn sheep at Mt. Gibbs continued to do well this winter. As evidenced by the accompanying photo taken in March 2008, the animals in this herd are in good condition. The herd consists of a minimum of 11 bighorn sheep including 2 mature rams, 5 adult ewes, 1 yearling ewe, and 3 lambs (born last May). This herd continues to spend winters in the alpine above 11,000 feet but they use slopes that are free of snow as a result of scouring by high winds; the tallus slope in the photo exemplifies the extent to which high elevation slopes have blown clear this winter and that forage continues to be available. The survival of lambs throughout winter indicates that even the most vulnerable class of animals in this population is persisting while using habitats at high elevations throughout the year. The Mt. Gibbs herd continues to rely on habitat within the eastern edge of Yosemite National Park.

Photo: Bighorn sheep on Mt. Gibbs during March 2008.

DISEASE CONCERNS IN THE SIERRA NEVADA

Determining the causes of mortality for Sierra Nevada bighorn sheep is necessary to identify the factors limiting recovery. Considerable effort is made to promptly recover a carcass when a radio-signal indicates that an animal has died. However, severe weather, avalanche risk, and poor access often delay efforts to recover mortalities, particularly when animals are in the alpine (>11,000 feet) during winter. Delays of a week or more are not uncommon when recovering carcasses that are difficult to access and, during such time, scavengers may have consumed much of the carcass making it difficult to determine the exact cause of death. Consequently, significant mortality factors may go undetected for some time. When we are able to recover carcasses in a timely manner we gain valuable information regarding accurate cause of death.

During January – March 2008, we identified 7 mortalities (4 rams and 3 ewes) in the Mt. Warren herd unit but the cause of death in most was inconclusive because we were unable to reach the carcasses before they had been scavenged. The necropsy results of one intact carcass, however, were notable. An adult ram that was recovered in early February 2008 was determined to have pneumonia. While we cannot confirm the source of this respiratory disease, it is of concern because of the proximity of this herd unit to active domestic sheep allotments.

During the initial years of the recovery program (2000 – 2006), Sierra Nevada bighorn sheep had no indications of disease. Unfortunately, during handling of Sierra bighorn this fall and winter, we detected contagious ecthyma (CE). CE is a viral skin disease that causes lesions around the animal's mucous membranes. While the disease is not lethal, it may interfere with nursing behavior because it is painful and, therefore, may reduce lamb recruitment. This disease was detected in bighorn sheep in both the Mt. Warren and Wheeler Ridge herds during the past year. Again, we cannot confirm the source of the disease but both of these herd units are in closest proximity to domestic sheep allotments. Domestic sheep are common carriers of respiratory pathogens and CE. We have not detected these diseases in any other herd units.


Photo: A bighorn ewe with clinical symptoms of contagious ecthyma; note the bloody scabs around the mouth. She was captured on Wheeler Ridge during October 2007.

UPDATE ON THE SEVEN OAKS WILDFIRE (MT. BAXTER HERD)

The lightning ignited Seven Oaks wildfire burned the majority of the lower elevation (5,000 – 8,000 feet) range of the Mount Baxter herd during July 2007. Lower elevation ranges are typically used in the winter and early spring months of November through May. These ranges enable access to forage when higher elevation ranges are buried in snow and, as warm weather arrives in the spring, they provide early access to high quality, newly emergent forage.

The Seven Oaks wildfire drastically changed forage conditions on the Mount Baxter range. Despite these changes, bighorn sheep use during this winter and spring was typical of patterns seen in years prior to the burn. The one exception was visual observations of a radio-collared Mount Baxter bighorn sheep using the north side of Sawmill canyon. Previously, Mount Baxter sheep were only found south of the canyon. Such sheep movement may have been motivated by forage demands or by the fire's removal of dense vegetation from the canyon bottom that created a less risky crossing. It is also possible that sheep movements across the canyon have occurred in the past but so rarely that they went undetected. In general, Mount Baxter bighorn are using the burned area extensively (Figure 1). This may be an indication that forage growth post fire has rebounded sufficiently to provide adequate forage. Alternatively, this pattern may simply indicate the habitual use of specific areas by bighorn. To understand the impact of the Seven Oaks Fire, detailed monitoring is underway to quantify vegetation quantity and quality and diet composition. The results of this year's sampling will be presented in the next quarterly report.
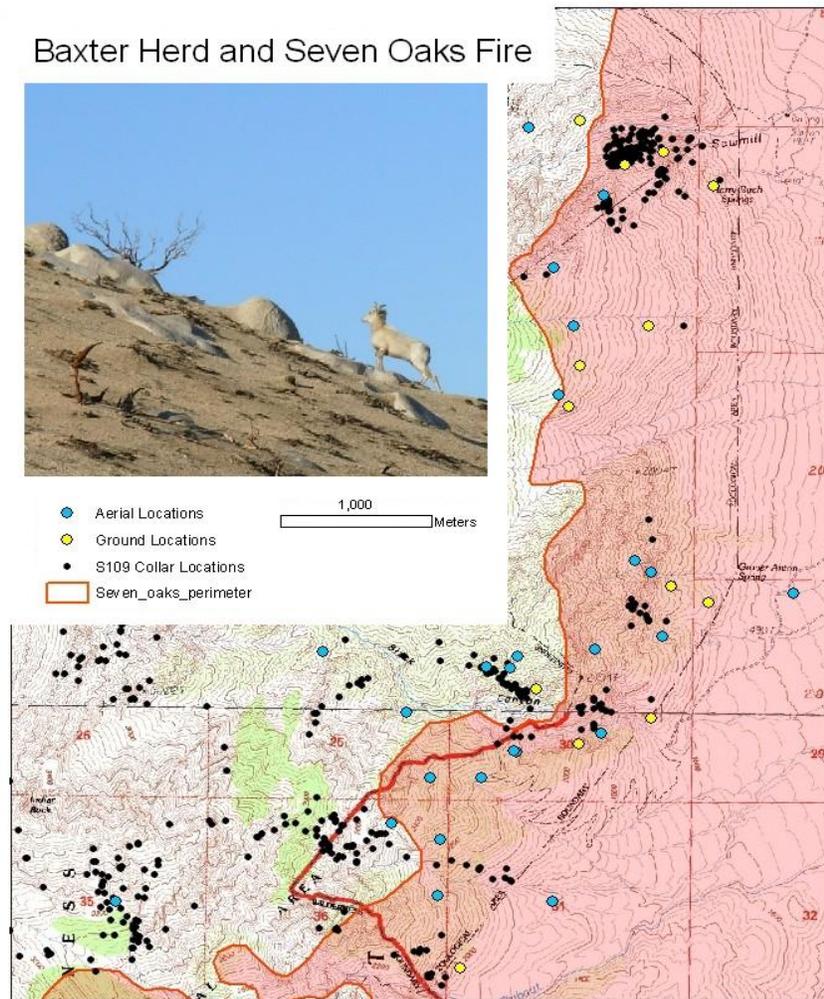
Figure 1. Aerial, ground, and GPS collar locations during December 2007 - May 2008. Weather permitting, bighorn where located by fixed-wing aircraft twice a month. The GPS collar data includes locations every four hours from a single collar on S109, a female that died from an accidental fall in March.

4

FINAL RECOVERY PLAN RELEASED

The final recovery plan for Sierra Nevada bighorn sheep was released in January 2008. It provides guidance to direct actions that will aid in the recovery of this endangered species. The recovery plan may be viewed at:

http://ecos.fws.gov/docs/recovery_plan/080213_1.pdf

Recovery actions detailed in the final recovery plan include:

1 Protect bighorn sheep habitat.
    1.1 Identify and acquire important habitat not in public ownership from willing landowners.
    1.2 Maintain and/or enhance integrity of bighorn sheep habitat.

2 Increase population growth by enhancing survivorship and reproductive output of bighorn sheep.
    2.1 Prepare and implement a management plan to temporarily protect Sierra Nevada bighorn sheep herds from predation losses, where needed, until viable herd sizes are reached.
    2.2 Increase use of low elevation winter ranges.
        2.2.1 Reduce influences of predation on winter habitat selection by Sierra Nevada bighorn sheep.
        2.2.2 Supplement small female groups where appropriate to attain threshold herd sizes that will encourage behavioral attributes favorable to winter range use.
        2.2.3 Enhance bighorn sheep winter range habitat to increase visibility where appropriate.
    2.3 Minimize probability of bighorn sheep contracting diseases causing mortality and morbidity.
        2.3.1 Prevent contact between bighorn sheep and domestic sheep or goats.
        2.3.2 Develop an action plan in the event that a pneumonia outbreak occurs.
    2.4 Manage human use locally where it is found to cause bighorn sheep to avoid important habitat and thereby compromises survivorship or reproductive success.

3 Increase the number of herds, and thereby the number of bighorn sheep.
    3.1 Develop and implement a strategy for translocations.
    3.2 Develop sources of translocation stock.
        3.2.1 Manage wild herds as sources of stock.
        3.2.2 Develop criteria for and, if appropriate, implement a captive breeding program.

4 Implement a genetic management plan to maintain genetic diversity of Sierra Nevada bighorn sheep. The plan must use data on genetic variation gathered in Task 6.1

5 Monitor status and trends of bighorn sheep herds, their habitat, and threats to them.

5.1 Develop and implement a monitoring plan for population abundance and distribution of bighorn sheep herds in the Sierra Nevada.
5.2 Monitor key predators in the vicinity of winter ranges.
5.3 Monitor vegetation structure and composition changes likely to affect bighorn sheep population parameters.
5.4 Monitor exposure to disease organisms of concern.

6 Initiate or continue needed research.
6.1 Investigate genetic population structure of existing herds.
6.2 As adequate input data become available, develop a population viability analysis (PVA) for the Sierra Nevada bighorn sheep metapopulation.
6.3 Further investigate habitat use patterns of bighorn sheep herds.
6.4 Investigate and analyze human use patterns relative to habitat use patterns of bighorn sheep.
6.5 Investigate the potential for altering habitat use patterns of mountain lions on bighorn sheep winter ranges by aversive conditioning.
6.6 Investigate future introduction sites relative to predator, domestic sheep or goats, and other potential conflicts.
6.7 Investigate and, if appropriate, develop a plan for decreasing the mortality of bighorn sheep remaining at high elevations in extreme winters.
6.8 Attempt to develop long-term data to elucidate predator-prey dynamics of this ecosystem as they affect bighorn sheep.
6. 9 Investigate likely effects of climate change on bighorn sheep habitat.

7 Engage in public outreach and sharing of information.
7.1 Conduct a survey of public uses of Sierra Nevada bighorn sheep habitat and public attitudes regarding Sierra Nevada bighorn sheep.
7.2 Develop and distribute information related to recovery efforts.
7.3 Continue, update, and coordinate existing informational and outreach programs and develop further programs as needed.
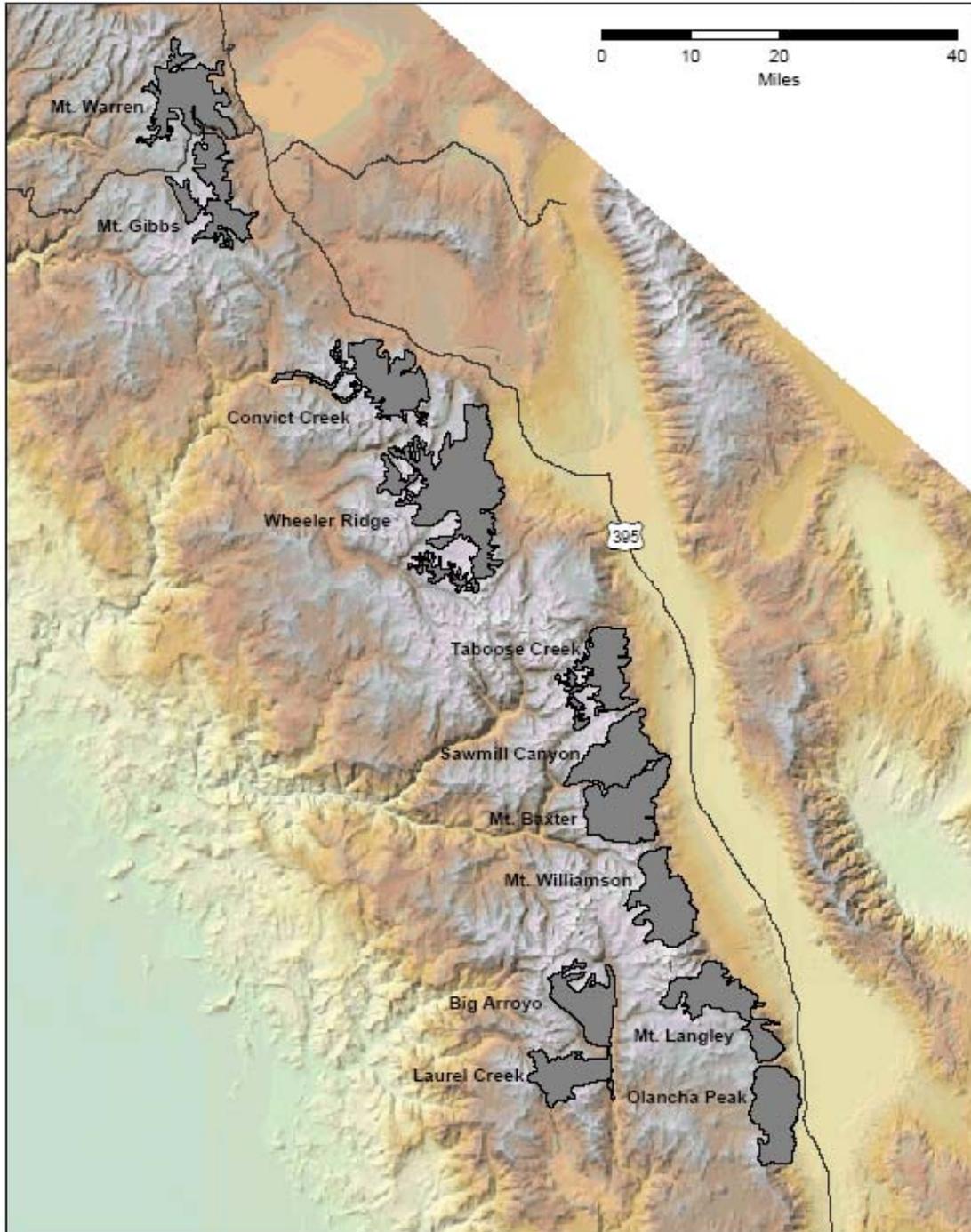
8 Establish an implementation advisory team for coordination and communication.

CRITICAL HABITAT PROPOSED

As required by the Endangered Species Act, the U.S. Fish and Wildlife Service has drafted a proposed critical habitat designation for Sierra Nevada bighorn sheep. The designation would require federal agencies to consult with the U.S. Fish and Wildlife Service on actions that they conduct, fund, or authorize that might affect critical habitat. For most actions, irrespective of designated critical habitat, consultation already is occurring as required by the Endangered Species Act because listed status under the act prohibits activities that will result in the "take" of an endangered species.

The 12 units proposed as critical habitat represent the same 12 herd units that are identified in the recovery plan as the geographic goal for recovery. Figure 2 identifies the units.

Figure 2. Units proposed by the U. S. Fish and Wildlife Service as critical habitat for Sierra Nevada Bighorn Sheep.

PERSONNEL AND ACKNOWLEDGEMENTS

Recommended citation:

California Department of Fish and Game. 2008. 1st Quarter Report of the Sierra Nevada Bighorn
Sheep Recovery Program; January - March. Bishop, CA.