

Appendix C

South Mojave Metapopulation Management Objectives: Sheep Hole-Calumet Mountains Subpopulation

Consistent with metapopulation theory, State Fish and Game Code, the State's Bighorn Sheep Management Plan, individual herd management plans, Sikes Act Plans, Memoranda, technical documents and reports, and the best available scientific information, the Department is implementing a water source development strategy for mountain sheep management state-wide including the Sheep Hole Mountains Subpopulation.

The Sheep Hole Mountains subpopulation is currently the largest in the South Mojave Metapopulation Area (see Epps et al. 2003 for a list of demes in this region and Appendix G for a map of the metapopulation area). Even with that distinction, it is a vulnerable population as it contains less than fifty adult ewes, which is one of several of the Department's minimum desired population indices.

Also, because it is the largest deme in the southern portion of the metapopulation area it currently has the greatest probability of persistence into the near future and the greatest potential from which natural emigration would occur to other adjacent mountain ranges. By virtue of its size it also is currently identified as the likely primary source of sheep to serve as source stock for future active reintroduction efforts to other ranges within this metapopulation. As such, subpopulation growth should be encouraged. This can be achieved by improving habitat quality and promoting comprehensive use of range, both of which can be encouraged by the strategic placement and construction of artificial water sources.

Thus, the Department's objective to improve habitat quality through water source development can be met by taking the following actions:

Action #1

Develop up to six additional water sources in the subpopulation area.

Implementation

Six specific sites have been identified (see Appendix B) for proposed water source construction. A low maintenance, high volume design should be chosen such as the current design used by Desert Wildlife

Unlimited, Inc. (Lesicka and Hervert, 1994) in California, Arizona, Utah, and Mexico. A ground survey shall be undertaken to determine the final locations. The project may be funded by governmental agencies or programs or through voluntary contributions. The actual construction would be accomplished by the Department and/or its Agents and with the help of volunteer groups.

Rationale

All proposed water source locations would be placed in areas that sheep use only seasonally or currently receive little sheep use (part of the site selection and placement criteria is based upon sheep aerial survey data, telemetry data, and ground observation data).

All water source installation would contribute to the desired goal of greater habitat utilization with a by product being an increase in the sheep population. Also the water would be placed in areas likely to enhance the potential for intermountain movement. As habitat quality and availability increases, hopefully so would bighorn sheep numbers. With an increase in sheep numbers there will be a greater chance for the continued persistence of the deme and for natural emigration of animals to adjacent ranges. If sufficient numbers of sheep would warrant, surplus animals could be used as direct transplant stock for other suitable ranges where numbers are low or where sheep have been extirpated.

Also, the availability of more drinking water during dry years or under drought conditions may attenuate some of the negative impacts to sheep under such physiologically stressful conditions.

Action #2

Conduct improvements necessary to maximize the effectiveness of the existing water sources.

Implementation

Enhance Bear Claw Guzzler by completing the following: 1) re-work and enhance existing collection apparatus. This would include activities such as replacing the Johnson screen, install larger piping, adding a rain mat, and 2) expand storage capabilities.

Enhance the collection and storage capabilities of Sud's Hole guzzler.

Rationale

This work would increase the amount of water that could be collected and stored thus making more available to sheep for a greater period of time. This would reduce the need as well as the associated expenses to the

supply additional water via helicopters, during years of low or no rainfall.

Action #3

Inspect and maintain on a regular basis all water sources within the management area.

Implementation

All water sources would be inspected a minimum of twice a year in May and October. The inspections would be completed by CDFG personnel and/or their Agents, i.e. volunteer groups such as the Society for the Conservation of Bighorn Sheep. The guzzler inspection and spring survey forms would be submitted to the Department of Fish and Game through the Region 6 office and to the BLM's California Desert District Office.

Rationale

The existing artificial water sources, Suds Hole and Bear Claw Big Game guzzlers require semi-annual maintenance: including cleaning of the drinker, screen, and the area behind the dam; adjustment of the float valve and plumbing mechanisms, etc. The area below the only spring in the management area must be cleared regularly of silt and non-native vegetation.

While a newer, large capacity, drinker design with "no moving parts" will be installed in the future, it still will require inspection and maintenance. A record will be kept of the amount of water available for bighorn sheep. The amount and type of human use near water sources will also be recorded during each inspection. Additional trips to the guzzlers would be required to these sites if problems were detected and warranted repair between inspection times.

Currently, The Department and The Society for the Conservation of Bighorn Sheep maintain remote sensing devices at these drinkers which monitor the water level in the storage tanks. These instruments provide an early warning if the system malfunctions or if water levels are low and need to be refilled. If feasible and affordable, additional monitoring units may be installed at the new water sources

Action #4

Monitor and remove exotic vegetation near existing water sources.

Implementation

Exotic vegetation would be cut at the ground level and the stumps painted with an approved herbicide (BLM and CDFG) to kill the roots and prevent re-sprouting. This would be done on an as needed basis.

Rationale

The Sheep Hole Mountains currently have very little large structure exotic vegetation such as tamarisk and arundo; however, it is only a matter of time until these encroaching exotics find their way specifically into the range. These species (and others on the way) are aggressive, non-native plants capable of spreading rapidly and displacing native vegetation when environmental conditions, such as good precipitation, are favorable. Once these seeds get established they are quickly able to set roots and gather sub-surface water. These plants transpire vast quantities of water, reducing the water available to native vegetation and ultimately wildlife. In addition, plants such as tamarisk exude salt from their leaves as an adaptation to alkaline conditions. Deposited on the soil, this film of salt retards the germination of native desert plants which provide food and shelter for wildlife. Currently, both non-native grasses and annuals can be found throughout this range.

Action #5

Continue to refine the map of bighorn sheep use patterns within the metapopulation management area as new water sources are constructed. Document population changes (and other factors such as environmental conditions) as management activities are implemented.

Implementation

Conduct aerial censuses of the entire management area as monies are available. Survey flights currently last about seven hours and only cover a portion of the range. As sheep distribution changes, more time would be required to cover more habitat. Helicopters would be used to increase the opportunities for getting accurate age and sex information. Also waterhole counts are sources of valuable information in addition to opportunistic sheep observations made by individuals while conducting guzzler monitoring work. Hunters are required to provide CDFG with the count of all sheep observed during the time of their hunting activities.

Rationale

Because of the rugged terrain and distances involved, aerial surveys generally are the most efficient method available to determine the numbers and distribution of bighorn sheep in the management area. Fall flights are timed to generally coincide with the rut allow the best time to observe males and females together. The fall flight would also provide information on the survival of bighorn lambs through the critical summer months. The information gained during these flights would allow us to continually add to our knowledge of the seasonal distribution of bighorn sheep which can vary for many reasons (i.e. climate and forage availability). Defining the locations of lambing areas, ewe home ranges,

etc. are important if they are to be properly managed. These areas and others are crucial to the well-being and viability of these herds, and impacts to wildlife in these areas could be particularly devastating.

Action #6

Utilize pellet count transects and/or time-lapse cameras at selected water sources to document the use of these water sources by bighorn sheep and other wildlife sources. Photograph population demography and document use.

Implementation

Time-lapse cameras would be installed at selected water sources in the Sheep Hole Mountains during June, July and August. Cameras would be camouflaged to reduce the chance of vandalism. CDFG personnel and/or their Agents would collect and change the film.

Pellet count transects could be established and monitored twice yearly. They would provide information about relative sheep use of the area.

Rationale

The data provided by these cameras would provide more accurate information on the numbers, sex and age class of bighorn sheep. This information in conjunction with the aerial surveys would be used to identify areas crucial for bighorn sheep management area. Additionally, such sheep data would be helpful at documenting when sheep find and utilize new water sources as would pellet transect counts.