Catalina Bighorn Sheep Reintroduction Project
October 13 to 26, 2014

BRIEFING

The following is a summary of Catalina Bighorn Sheep Reintroduction activities on the Coronado National Forest. This project status update covers the period from October 13 - 26, 2014. For project background and previously-reported information on project events, including photos and videos, please visit www.azgfd.gov/catalinabighorn.

Additional project information can be obtained by visiting the Arizona Game and Fish Department Facebook page at https://www.facebook.com/azgafd#!/CatalinaBighorns, the Arizona Game and Fish Department webpage at http://www.azgfd.gov/catalinabighorn, the Arizona Desert Bighorn Sheep Society webpage at http;//www.adbss.org or by visiting the Catalina Bighorn Advisory Committee webpage at http://www.catalinabighornrestoration.org/. This update is a public document and information in it can be used for any purpose.

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CURRENT POPULATION STATUS

Including this reporting period, it has been over seven months since a sheep mortality. The original release of 31 sheep consisted of 21 adult females or ewes, three yearling/juvenile ewes, five adult males or rams, and two yearling/juvenile rams. Thirty of the released sheep were outfitted with satellite GPS collars to provide managers with up-to-date information to help make adaptive, data-driven decisions. As of October26, 2014, 13 of the remaining 14 collared sheep are known to be alive; one of the collars may be malfunctioning.

COMMUNICATION AND COORDINATION

The next written briefing will be provided on November 14, 2014.

CONTACT

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OTHER REMARKS

Reintroducing species, such as bighorn sheep, that have been absent from a mountain range for over 20 years requires dedication. The Arizona Game and Fish Department has persevered and been very successful in its sheep restoration efforts, increasing populations statewide from 1,100 in the 1950s to a current estimate of 5,500 bighorn sheep. During this time, the Department has learned that one of the keys to success is to augment the founding or resident herd with subsequent translocation efforts. These augmentations help the herd establish faster, generally leading to a decreased future need for direct human intervention. Within the wilderness on the Tonto National Forest (NF), habitat and predator densities closely resemble that on the Santa Catalina's, making the bighorn within the Tonto wilderness our preferred source for transplant animals. Helicopter landings in the wilderness are a concern for the public and the agencies entrusted to manage those areas. The Tonto will continue to work with the public and the Arizona Game and Fish Department on an acceptable plan for capturing bighorn sheep within designated wilderness areas. Until a final decision is made, we will capture bighorn sheep on the Tonto NF outside of designated wilderness and on Bureau of Land Management lands east of Quartzite. We now plan to take up to 20 sheep from areas outside of the Tonto NF wilderness and another 15 – 20 sheep from the Quartzite area. Up to 30 sheep in total may be removed from these areas. We will outfit the sheep with GPS collars to monitor their movements and longevity. With this technology, we will be able to compare and contrast the success of the sheep. Capture operations will involve net gunning sheep from a helicopter, and the target herd composition will be 75% females and 25% males, with 15% of all sheep being yearlings. Biological information will be gathered from the sheep, and we will collect blood samples, administer antibiotics, and provide supportive care as we handle all animals. Once sheep are processed, they are loaded into transport trailers and monitored to ensure they are healthy enough to move. The sheep will then be transported to the Santa Catalina Mountains for release.

Last year, there was a large gallery of people that observed the release. For the welfare of the sheep, this year the release will be limited to credentialed media and a small number of guests. The Department will also record the release for later public viewing. As we have learned much from this past year's challenges, we are optimistic that this release will result in higher sheep survival, as we hope the newcomers will form bands with the now-resident sheep and learn quickly which habitats are most suitable for meeting their resource needs and evading predation.

RESEARCH PROJECT FIELD NOTES

A central part of our research project on the Catalina bighorn sheep is to understand how the sheep use their environment over space and time. Ecologists have long thought that animal use of environments was dictated primarily by the distribution of resources and the presence of predators. To better understand the habitat characteristic that influence bighorn sheep habitat selection and those that may put them at increased predation risk, we will use the sheep location data being collected via satellite collars to quantify an "intensity of space use" for each sheep by constructing a utilization distribution (UD; see Figure 1 below). This three-dimensional view of an animal's home range depicts the probability of an animal using a particular location within its home range, and the approach has many beneficial aspects. For example, where most analyses using GPS location data focus solely on individual sampling points, the UD allows us to consider the entire distribution of animal movements, thus providing a more holistic and landscape perspective. The construction of a UD also allows us to essentially stack multiple layers of information in one place (that is, the variety of habitat attributes that characterize any one location within the home range) and then sample that information all at once by

'drilling' down through it at any one spot on the UD. The combination of variables underneath the UD surface helps to explain the height of that spot on the UD because they may influence the animal's choice to use this location. Several variables will be included in the UDs to help quantify differential use of habitats by the sheep. We will incorporate information on the spatial distribution of vegetation types, several habitat characteristics (collected with the aid of our stalwart volunteers!!), distance to water, roads, development, and recreation, as well as topography (including slope, aspect, and a measure of how rugged an area is) and burn history. As we also wish to examine whether the sheep select habitat consistent with presumed predator avoidance strategies, we will include other measures, such as horizontal visibility (i.e., how far or how much a sheep sees in any given location, given the vegetation and topography, as measured in the field). Once the data is in place, we'll use a statistical framework to relate the relative intensity of use, as determined by the height of a UD, to measured habitat attributes. This will allow us to evaluate the relative importance of multiple habitat attributes to bighorn sheep habitat selection patterns. We'll be building UDs for each sheep in each of two seasons—the warmer months typified from mid-April to mid-October, and the colder months from mid-October to mid-April. Our volunteers will be assisting greatly in collecting much of the habitat data from the field, and in the end, we anticipate the UDs will reveal some intriguing spatial use patterns.

Figure 1. Example of a utilization distribution (UD) from Willems & Hill (2009) showing intensity of use by animals. The inset shows a 1-dimensional view, while the larger figure shows a 3-dimensional view revealing peaks and valleys. Peaks and color coding on the UD are proportional to the intensity of space use, with warmer colors and higher peaks denoting greater intensity of use and cooler colors and valleys revealing areas of low intensity of use.