# Catalina Bighorn Sheep Reintroduction Project

November 19 – December 11, 2013

## BACKGROUND

On November 18, 2013, the Arizona Game and Fish Department (Department) released 31 Desert Bighorn Sheep into the Santa Catalina Mountains just north of Tucson. Bighorn sheep that once inhabited the Santa Catalinas disappeared in the early 1990s. This restoration project represents a historical new approach that involved a collaborative effort bringing together a local group of diverse stakeholders. These stakeholders formed an Advisory Committee and have been advising the Department on how best to accomplish the goal of restoring ecosystem health that would support a wide variety of species, including bighorn sheep. This methodology represents a significant change in the planning process and has been built on recognizing differences, finding commonality and working towards a common goal. The restoration project has generated a great deal of interest, and consequently, many inquiries regarding project status. The Advisory Committee and Department have decided to utilize a briefing format to deliver the most accurate and up-to-date information released in a consistent and equitable manner to all.

## ADVISORY COMMITTEE

The Advisory Committee is comprised of the following members and their respective affiliations:

Brian Dolan – Arizona Desert Bighorn Sheep Society
Mike Quigley – The Wilderness Society
Randy Serraglio – Center for Biological Diversity
Trica Oshant-Hawkins – Arizona Wilderness Coalition
Joe Sheehey – Arizona Desert Bighorn Sheep Society
Acasia Berry – Sky Island Alliance
Sergio Avila – Sky Island Alliance
Brian Ham - Sportsman
Les Corey – Arizona Wilderness Coalition

## BREIFING

The following is a summary of Catalina Bighorn Sheep Reintroduction activities on the Coronado National Forest. Additional project information can be obtained by visiting the Arizona Game and Fish Department Facebook page at https://www.facebook.com/azgafd#!/CatalinaBighorns or by visiting the Catalina Bighorn Advisory committee at http://www.catalinabighornrestoration.org/. Past updates may be viewed on either website. This update is a public document and information in it can be used for any purpose.

## DISTRIBUTION

During the first few days after the release, the sheep did what other restoration efforts have shown – they scattered and then sat tight for several days! Bighorn sheep typically have a "higher is better" innate behavior which took many of them near the top of Mt. Lemmon around 9,000 feet elevation. This behavior is a useful strategy for deterring would-be predators that may locate other prey in terrain that is easier to navigate. Bighorn also generally seek locations where they have a clear field of view that is not obscured by vegetation so that they can detect approaching predators. Many of the Catalina sheep found rock outcroppings at higher elevations and remained for a week or more prior to moving. Several of these rock outcroppings were in what managers consider poor habitat characterized by thick oak and pine woodland. Bighorn sheep remaining in these areas become increasingly vulnerable to predation.

Over the past few weeks managers have observed bighorn movements into more appropriate habitat. This is encouraging and may enhance bighorn survivability and population growth.

## CURRENT POPULATION STATUS

The original release consisted of 21 adult females or ewes, three yearling/juvenile ewes, five adult males or rams, and two yearling/juvenile rams. The animals were captured on November 16 in the Trigo Mountains near Yuma and on November 17 in the Plomosa Mountains near Quartzite. Ewes that were transplanted are hoped to be pregnant and therefore will help to increase the sheep population in the near future. The lambing season occurs from January till April. Ewes generally have 1 lamb per year with approximately 25 percent of lambs surviving. Studies have shown that human disturbance and the presence of dogs may be detrimental to successful lambing. This makes it increasingly important for people to avoid lambing areas by respecting and following regulations limiting off trail activity and not having dogs in restricted areas.

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 December 11, 2013, 26 of the 30 collared sheep relocated are accounted for.

The GPS collars used in this project represent cutting edge technology. The collars provide managers with daily information showing movements and are also equipped with a mortality function. The collar determines mortality on an animal by using three axes of movement, so if a sheep remains stationary for a predetermined period of time, the mortality function sends alerts to managers indicating that a sheep has died; however, the mortality sensors are not flawless. In this release, we have observed several sheep that immediately dispersed and then settled into areas and significantly decreased their movements. This lack of movement resulted in the collars reporting mortality events for several sheep.

Investigators have been expending significant resources to respond, thankfully only to find that the sheep were alive and well. Investigators are still learning the capability of the collars and how to better interpret the data gathered on a daily basis.

## LIFE HISTORY

The Department uses the latest science to work toward success of this project. That includes understanding the life histories of bighorn sheep and mountain lions.

Mountain lions and bighorn sheep differ in their longevity and reproductive capabilities. Mountain lions have an average life span of about 10 years in the wild, although most are substantially younger. Female mountain lions typically breed for their first time between 1.5 and 3 years of age. Females typically have twins, and give birth about once every year and a half. Survival to adult is variable, but averages about 66 percent.

Bighorn sheep also have an average life span of about 10 years in the wild. First breeding for females typically occurs during her second year. Ewes will typically have a single lamb annually, and lamb survival to adulthood is typically around 25 percent.

These natural history parameters give mountain lions a marginal edge over bighorn sheep when it comes to potential population growth. Within the Catalinas, this demographic advantage also extends to the potential for immigration of mountain lions moving into vacant habitat on the Catalinas from contiguous habitats nearby. Suitable bighorn sheep habitat is most often isolated to steeper ground with cliffs and peaks. These islands of habitat are often surrounded by substantial barriers, including highways and unsuitable habitat limiting sheep movements between mountain ranges. This situation is true for the Catalinas and due to these substantial barriers it is improbable that bighorn would naturally migrate into the existing suitable habitat found there. Although these barriers exist and limit sheep movements mountain lions are not as constrained and often move between mountain ranges.

And although the numbers themselves may favor mountain lions, the Catalinas are home to a robust deer and javelina population that mountain lions can also use for food.

Conservation of wildlife is a long term and often difficult pursuit, based on scientific research, observation, monitoring and experience, planning and coordination with land management agencies, local governments, organizations and citizens. This project features daily monitoring of bighorn sheep through GPS collars so that we have an up-to-date picture of what is happening to them each day. It is important to note that failure of the reintroduction from any number of ecological variables is also a viable possibility here; however, through our collaborative efforts, we hope to see eventual success for this project with lions and sheep coexisting in a natural balance without continued human intervention.

| Life History Parameters Compared | | | |
|---|---|---|---|
| **Parameter** | **Bighorn Sheep** | **Deer** | **Mtn. Lions** |
| Average Lifespan | 10-12 | 8-10 | about 10 |
| Young Produced | 1 lamb/yr | 2 fawns/yr | 1-6 kittens - average 3, Approx. 5 litters per female per lifetime |
| Survival rates for adults | 85% | 85% | 86%+ |
| Survival rates for young | 20-25% | 25% | 66% |
| Average recruitment | 1 every 4 yrs | 1 every 2 yrs | 1 per yr |
| Number of young 1 female produces in 10 years | 2.5 | 5 | 10 |

## MORTALITIES

To date there have been four bighorn sheep mortalities. Three of the sheep were killed by mountain lions while the fourth most likely died of capture myopathy. To follow are the details of each mortality, the result of the investigation and management actions.

On December 9, 2013, an adult ewe was found in low quality habitat characterized by thick vegetation that likely limited her visibility. Investigators determined that the sheep had been killed by a mountain lion. Pursuit of the lion was unsuccessful and has been discontinued

On December 1, 2013, an adult ewe was discovered in fair sheep habitat characterized by lower hills and mesquite scrub. The ewe was in the later stages of pregnancy. On-scene investigators concluded that the ewe had been killed by a mountain lion. The male lion was removed by Department personnel in accordance with the Mountain Lion Management Plan developed explicitly for this project, which allows for the removal of specific lions that have preyed on sheep, with the exception of females with kittens or solitary kittens. The mountain lion's stomach contents confirmed conclusively that the lion had killed and was feeding on the ewe.

On November 30, 2013, a yearling ewe was discovered in thick vegetation. The ewe was found cached in a small ravine. During the investigation of the scene, the investigating Wildlife Manager was stalked by a mountain lion that remained in close proximity. Fearing for his and the public's safety, the Wildlife Manager was forced to kill the male lion in self defense. An investigation of the sheep carcass and the

mountain lion's stomach contents confirmed conclusively that the lion had killed and was feeding on the ewe.

On November 27, 2013, an adult ram was found in the higher elevations in an area characterized by dense Manzanita bushes. The ram was scavenged by a bear and all indicators point towards capture myopathy as the cause of death. Every effort is made during the capture process to minimize capture related complications, including monitoring and controlling body temperature, minimizing handling and providing oxygen to the animal, which helps to break down lactic acid build-up. Capture myopathy is associated with a build-up of lactic acid in the muscle tissue that can lead to heart failure. Myopathy generally occurs during the first two weeks after animals are transplanted and released, but lasting effects of capture myopathy can be observed up to four weeks post release.

## .COMMUNICATION AND COORDINATION

The Advisory Committee is scheduled to provide a press conference on January 8, 2014.
Due to the upcoming holidays, the next written briefing will be provided on January 10, 2014.

## INCIDENTS

Over the first month of the project there were several investigations conducted as result of mortality signals. This effort expended a great deal of resources; however, most of the mortalities were false alarms. Over this time, managers have dedicated efforts to gain a better understanding of the mortality signals and ways to determine if they are real or not. Recent movements of sheep out of thick vegetated areas into more open, steep and rugged terrain is encouraging to wildlife managers, as this should result in the reduction of bighorn vulnerability to predation events. It is unfortunate that we have had predation events on the sheep that necessitated the removal of the mountain lions. The goal of this project is bighorn sheep and mountain lions coexisting in a naturally functioning ecosystem. To achieve that goal, it is important to quickly establish a viable population of sheep by temporarily reducing lion predation. By utilizing this approach we are minimizing the impact to the mountain lion population and foregoing indiscriminate techniques utilized elsewhere to deliberately reduce the local mountain lion population. The project is under continual evaluation and management responses will adapt to best achieve the goal of healthy sheep and lion populations in the Catalina Mountains.

## PROJECT PERSONNEL

Diane Tilton is the Acting Public Information Officer for this project and can be reached at (520) 628-5376.

## RESEARCH PROJECT FIELD NOTES

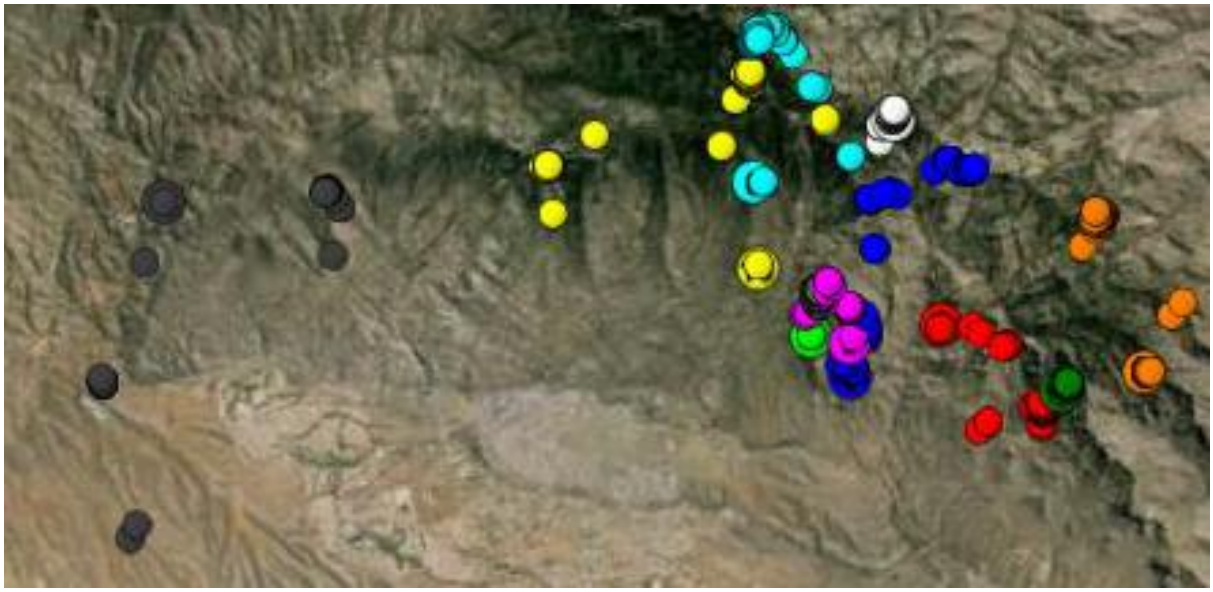
Research is an important aspect of the restoration effort. The result of research efforts will better enable managers to make data-driven decisions as the project progresses. This section will relay field notes from the researchers regarding significant activities and observations. As this aspect of the project is just beginning, there are no notes provided in this update.

## OTHER REMARKS

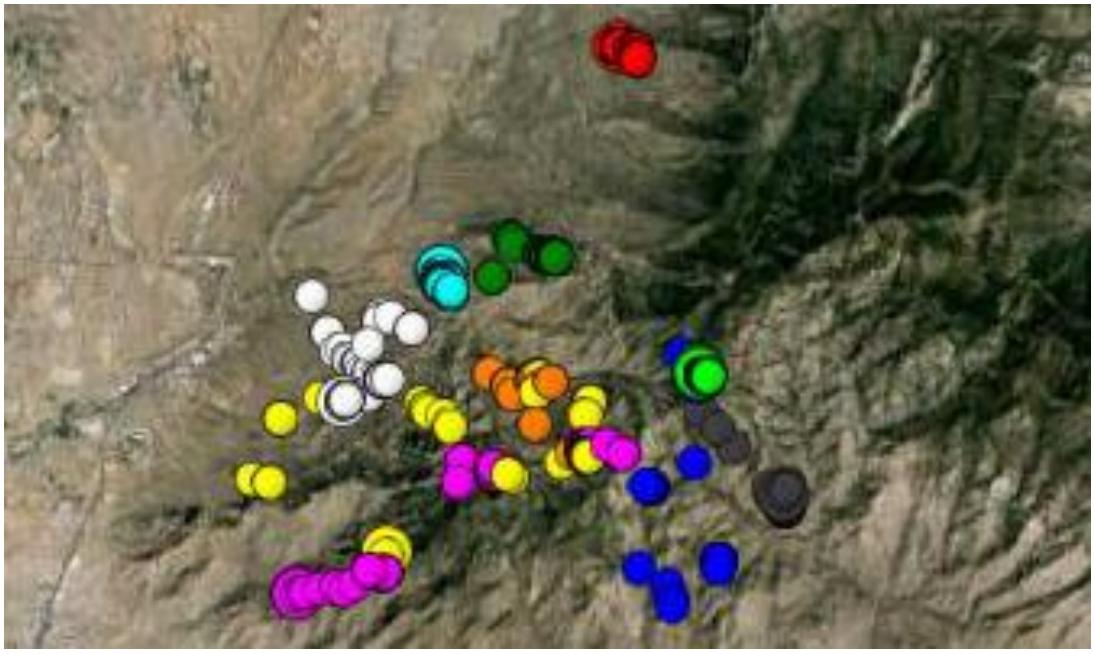
It is important to note that with this release, the Department is nearing a total number of 2,000 bighorn sheep translocations throughout the state since the program began in 1957. Because of the success of past transplants, the number of bighorn sheep in the state has increased from 1,500 to over 5,000 today. Notable examples of success in previously extirpated areas that now contain bighorn sheep because of these translocation efforts are Aravaipa Canyon, Canyon Lake, Superstition Mountains, Bighorn Mountains, Gila Bend Mountains, Virgin Mountains, Paria Canyon, Peloncillo Mountains, Hells Half Acre and West Clear Creek.

## MAPS

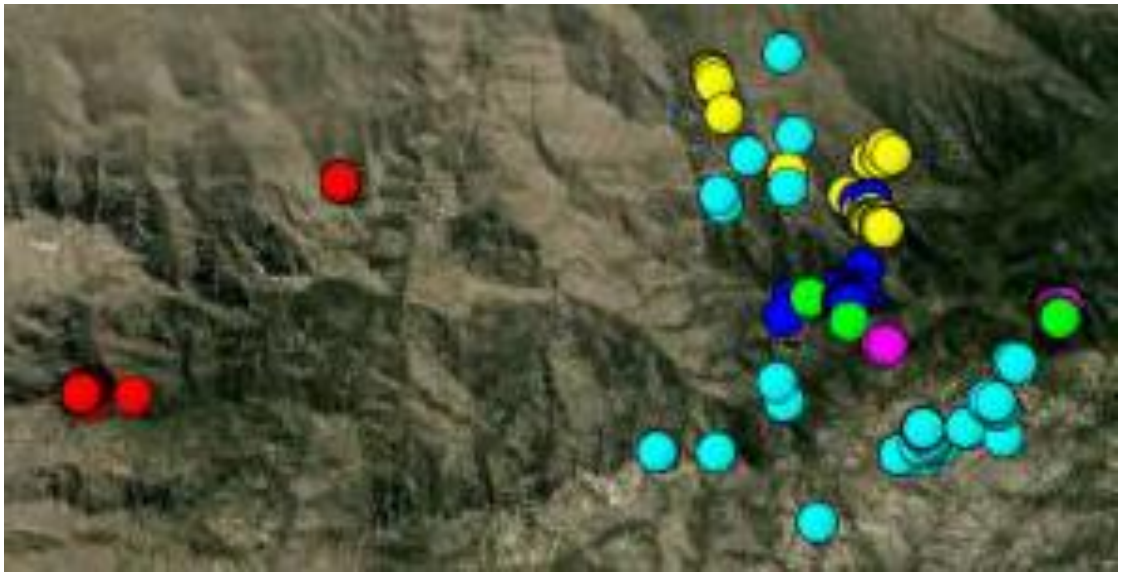
Maps are provided to illustrate bighorn locations at a given point in time. The information here is delayed to ensure the protection of sheep and minimize their disturbance, particularly during the lambing season. Each of the following maps depicts locations for an individual sheep denoted by a specific color. Each map represents a smaller subset of the total population.



Locations over time for 10 of the sheep from November 19, 2013 – December 2, 2013



Locations over time for 10 of the sheep from November 19, 2013 – December 2, 2013



Locations over time for 6 of the sheep from November 19, 2013 – December 2, 2013