

Wildlife on the Nevada National Security Site
U.S. Geological Survey General Information Product 180
Transcript

00:06:23 Patrick Cummings
Well sheep are hard to see.

00:08:10 Kathleen Longshore
People would see bighorn sheep down by Mercury, mostly rams, rams wander.

00:12:21 Patrick Cummings
They're hard to see and there's probably not very many of them.

00:15:27 Kathleen Longshore
We never saw evidence of a reproducing population until we started the project on cougars and found that they were eating bighorn sheep.

00: 24:13 Brian Jansen
Mostly they kill what is available to them in their environment.

00:28:07 Blake Malo
We use a helicopter to capture various types of wildlife.

00:32:18 Brian Jansen
They're very unpredictable, they're extremely secretive.

00:36:01 Derek Hall
We had had some observations of mountain lions around active projects and facilities. There was a biologist attacked in the early 90s. So, from a safety standpoint we wanted to understand kind of the core range, the habitat use of mountain lions.

00:57:23 Narrator
The Nevada National Security Site, formerly the Nevada Test Site is a 1,360-square-mile rugged landscape 68 miles northwest of Las Vegas, Nevada. Scientists here are collaborating to learn more about the newly documented populations of bighorn sheep and cougars. And it's not easy.

01:20:00 Kathleen Longshore
We're studying bighorn sheep and cougars on the Nevada National Security Site looking at predator-prey interactions. And the project started as a study on cougars. What happened is when we first put collars on cougars we found out that they were actually eating bighorn sheep.

01:40:00 Narrator

Central questions of the study are how many bighorn sheep and cougars live here and what is the status of their populations? And health studies of captured animals are clarifying whether wildlife here are at all contaminated by radiation.

01:57:09 Kathleen Longshore

For bighorn sheep, life is about risk, risk from predation. And so in order to escape from their predators, they tend to stay in steep terrain, rocky terrain. And they particularly pick these types of areas when lambs are born. So, in order for the ewes to protect the lambs, that's the best they do is to stay up in these rocky areas. And the subspecies that lives in the desert is Nelson's bighorn sheep, and they are able to exist on these desert mountain ranges. Mostly they eat shrubs, and during the springtime they focus on annuals, they eat a lot of winter annuals. Little plants that you see flowering out in the desert. Sheep tend to avoid areas that are very bushy because they don't have good visibility. So, they like to see where the predators are.

02:45:25.... We need to know about their general health because there have been some disease issues in this general area. There was an outbreak of pneumonia in the population in southern Nevada and it's been pretty serious.

02:57:10 Patrick Cummings

Understanding what the health profile here is on Department of Energy land on the Nevada National Security Site is going to help us understand the bigger picture.

03:07:00 Narrator

An important part of the bighorn story, scientists learned, are the cougars.

03:12:29 Kathleen Longshore

Cougars are very solitary animals. Their densities are low on the landscape, particularly in the desert where prey densities are low. They have large home ranges and they are primarily nocturnal. So, it's really very rare to see a cougar out when you're just out hiking. Especially during the daytime.

03:33:15 Derek Hall

One tool we use to monitor mountain lion activity around the Nevada National Security Site is with motion activated cameras. We've set up 20 to 30 of these cameras, over the last 10 years, at various sites around the NNSS. And we've found actually documented 680 images, recorded 680 images, both video clips and photographs of mountain lions, which is a staggering number of images to understand where these lions are found and the frequency of use of these different sites. And it really helped us with the trapping effort as well, knowing where to set the traps and where to look for the lions to get them captured.

04:11:15 Narrator

The cougar, also commonly known as puma, mountain lion, or panther, is the largest cat in North America. An average male weighs 150 pounds. Cougars are known for their

strength, agility, and exceptional ability to jump. Their powerful legs allow them to jump 30 feet from a standstill, or jump 15 feet straight up a cliff wall. Mainly solitary, cougars interact only to mate. Females then raise the young while males return to their solitary lifestyle. Each cougar establishes its own territory. They need a lot of room to roam.

04:52:00 Derek Hall

The environment that we have here is the driest ecosystem in North America with the Mojave Desert, transitioning into the Great Basin Desert. So, it's a very dry, arid area, prey density is pretty low, so these animals are having to cover large areas to support themselves.

05:08:18 Narrator

The cougar research here began due to concerns by the Nevada National Security Site over safety for the site's employees. In 1991, a biologist here survived a rare attack by a hungry malnourished cougar.

05:23:12 Derek Hall

So, from a safety standpoint we wanted to understand kind of the core range the habitat use of mountain lions also get a handle on how many lions are out there, population estimate, and just learn more about their movements and potential risk to workers out there. So, we started with cameras with Erin Boydston with USGS, worked with her, set up a bunch of cameras around the site in mountain lion habitat.

05:51:06 Narrator

Trail cameras were placed at springs, which are important watering holes and also at sites along roads and in canyons to look for evidence of cougars.

06:01:21 Derek Hall

We got a lot of pictures of both young adults, male, female so we knew we had a reproducing population of mountain lions. We had somewhat of an understanding of where the lions were. They were using roads as travel corridors. They were using areas around springs. We documented six individual lions within a 90-square-kilometer area over a 2-month period. With the data we had from the camera traps, we knew we had a reproducing population of mountain lions on the site so we wanted to understand their movements better and so we took it to the next level and worked with USGS who contracted with Brian Jansen to come and capture mountain lions for us so that we could put the radio transmitters on them and track them with radio transmitters on them and really understand their movements and their habitat use and their diet as well, using the radio telemetry.

06:57:23 Brian Jansen

Most things in life you can eventually, with a lot of practice, master. You just cannot master catching a lion. Every lion seems to have a whole bunch of aces up their sleeve, that they've always got the upper hand and it's dang near luck to catch one. I'm Brian Jansen and I'm a mountain lion and bighorn sheep biologist.

07:16:00 Brian Jansen

So, I've been camped out here for oh about the last 18 days on the Nevada National Security Site in a region called Rainier Mesa. Tracking lions, looking for fresh sign, setting traps, and just trying to find em and catch em; they're pretty difficult to even find let alone catch.

07:22:28 Brian Jansen

There's two ways I capture mountain lions. I use foot snares and I place those on trails that I know mountain lions are going to use either from recent sign or just my estimation. And then we also use the hounds. So, on a normal day what we would do is check our traps in the morning and if we don't find anything in the traps, I'll go to places where I think a lion might have gone or places that lions frequent and park, and then we usually walk a loop about ten miles, me and the dogs. And I'm looking for tracks at the same time the dogs are sniffing for lion scent. Sometimes I can't see the tracks because the ground is hard but they leave scent, and the dogs will pick up the scent. I will let the dogs scent trail the lion as far as they can and I will follow the dogs on foot.

08:21:06 Brian Jansen

And in the course of a day they might lose the track four or five times and I'll have to help them find it. And we keep going. While we're doing that, the lion is sleeping in their day bed, because they're nocturnal and they walk around all night and so we're following the scent trail of what they did the previous night. And when we get to the lions bed, the lions not there anymore because he heard the dogs coming and they get up and move. When we hit that spot, that scent is so fresh the dogs blow out of there fast and usually catch the lion within a quarter to a half a mile. When the dogs start putting pressure on the lion, the lion will find a place to seek refuge. They'll either climb up a tree, go down in a hole, or get out on the edge of a cliff. Some place that they can protect themselves from the dogs. And then I tie the dogs up because I don't want any dog to fight with the lion and then I dart the lion and immobilize it. I protect it from falling while it's being immobilized. Once it's immobilized I bring it to a safe location and then take whatever the project wants.

09:23:11 Narrator

The tranquilized lions are weighed. The scientists look for injuries, they take body measurements, they look for parasites, and sample for evidence of disease. They examine their teeth, they draw blood and attach an ear tag. Finally, they fit the lion with a satellite, GPS tracking collar. The rest of the research begins after that. They release the animal on site and begin to follow as the satellite data pours in.

09:59:07 Brian Jansen

Ok guys come on. The two lions I just recently collared are both adult males, one was about 5 to 6 years old, one was about 3 to 4 years old. They weigh about the same, 125 and 130 pounds. The project will be able to track these lions wherever they go for the next 2 years I believe. So, one of the things we found in the past are these lions just make tremendous movement. One lion I collared on the site in a matter of a week went 70 miles to the west across Death Valley, killed deer over in the Cottonwood Mountains,

crossed Death Valley back, hunted around in the Grapevine, went up by Goldfield, comes back to the site, back across Death Valley. You could never do that kind of research without these satellite collars. I mean the things that we're learning and the extent to which these lions are roaming just far surpasses what we ever knew before.

10:58:20 Narrator

GPS collars that permit tracking are also a crucial tool for studying bighorn sheep.

11:10:05 Kathleen Longshore

Today we are putting GPS collars on bighorn sheep in the Nevada National Security Site.

11:15:27 Blake Malo

You're heading back to the airport afterwards right?

11:18:05 Kathleen Longshore

Yup... this is a new population of bighorn sheep that we just found existed a couple of years ago, and we need to have information about where the sheep are, how many there are possibly, their movement patterns.

11:34:17 Blake Malo

Our gunner is the guy in the front seat generally and he leans out and shoots the gun to catch the animal. Usually that's the first animal that he'll net, and then the mugger will hop out of the back seat and he'll go out and he'll restrain the animal and he'll work that one up while me and the gunner will go out and catch another one.

12:02:02 Blake Malo

Flying a helicopter, especially a small single engine helicopter in 30-mile-an-hour winds can be challenging at times especially when you're working in steep terrain and you're trying to get an animal to go to a certain spot where you can safely make a capture on it and your crew can get out and work it up where it needs to be, too.

12:37:13 Blake Malo

We obtain biological data including blood samples and nasal swabs, and they'll be able to look at those samples and test them for different types of sickness the sheep might have, but a very important part of the project was placing tracking collars on these animals.

12:54:17 Kathleen Longshore

And then they attach the collar and let the animal up and they're done. And...it's pretty fast.

13:24:19 Kathleen Longshore

So, these are the collars that we put on sheep, and we put these same collars on cougars. They have the GPS VHF unit down here and then we have satellite uplink, here's the antenna for the satellite uplink. At the end of the study this little mechanism has a charge in it, and it goes off and breaks off and the collar falls off the animal. We then go out and retrieve the collar.

13:47:15 Patrick Cummings

That satellite GPS collar is especially indispensable if for no other reason that we're on the Nevada National Security Site. We don't have ready access to this site and what that collars going to do, it's going to uplink with satellites, it's going to enable us to have real time or near real time positional data over seasons, over years, and that's going to give us very valuable movement information.

14:13:15 Kathleen Longshore

So, we look at differences in habitat use throughout the day. So, we know areas where sheep particularly like to forage and where they might be bedding. We're hoping to look at lambs' bed sites so that the Test Site has an idea of important areas for the sheep population on the landscape. Sheep select for cliffs and steep rugged areas at night of course when they're bedding down, which is also the time that mountain lions tend to go hunting.

14:47:01 Patrick Cummings

Predator-prey relationships are always important, and they change over time. What we see on the Nevada National Security Site with respect to large bodied predators like mountain lions impacting potentially desert bighorn sheep. We also have to think about another big game component here and that would be mule deer. We do have a mule deer resource on Department of Energy lands.

15:07:29 Narrator

Mule deer are the most common prey of cougars on the Nevada National Security Site.

15:21:19 Narrator

Tracking the collared cougars has clarified which animals they prey on and how widely they roam.

15:29:01 Derek Hall

We've captured to date nine animals, we've put radio transmitters on them, and they operate with satellite so they take locations at pre-programmed intervals; usually it's about every 6 hours or every 4 hours, so multiple times a day. And we get coordinates for those locations that are emailed to us and then we can pull those up in GIS and look at their movements.

15:50:23 Brian Jansen

We can find out when they've made a kill. What happens is, lions seem to never stop moving. They're really quite amazing. They're always moving around and normally the points that are 4 hours apart, the GPS locations 4 hours apart, they might be a mile apart from each other. The lion's moving around all night long, doing whatever it is they're doing. And when they kill something, it takes 2 to 3 days for them to eat that item because it's a large item, a deer sized animal. So, all the sudden they go from moving a mile every 4 hours to staying in the same spot for 2 days. And what happens is those GPS

points overlap each other, and we call that a cluster, it's a cluster of points. So, what we do is after the lion leaves that cluster of points, we go and see what they were doing. And ordinarily the only thing that's there is a dead animal. And so we're finding anything from grey foxes up to deer-sized animals by doing that.

16:57:25 Derek Hall

There's a seasonal difference as well. They prefer mule deer, that's their main prey, and what we've found is the prey, the mule deer, will concentrate on higher elevations of the site, Rainier Mesa, Paiute Mesa, where there's a lot of forested cover as well as sage brush meadows, and that's perfect habitat for the mule deer. And so the lions will congregate around that summer range, which is concentrated. During the winter time, the snow comes, it gets cold and so the mule deer will move off those higher elevation habitats to the lower elevation habitats; there's just a large area and so the deer get dispersed over very large areas. This also brings the lions down into bighorn sheep habitat, really rugged, steep country, canyons and that. And so the lions move off to follow the deer but then come into contact with the sheep, and so what we're seeing is a seasonal change in diet: they'll take primarily mule deer in the summer/fall and then they'll shift to mainly bighorn sheep during the winter and spring.

17:59:19 Patrick Cummings

But what we think is going to happen here, potentially anyway, is that we'll see a little nucleus of sheep maybe expand into what could be considered a viable little population on Department of Energy land.

18:17:13 Derek Hall

One of the other reasons that we wanted to do this study is that the Department of Energy is mandated by law to document potential radiation exposure from Test Site activities to the offsite public. One of those potential pathways is wildlife. So, game animals such as bighorn sheep or mountain lions or mule deer can potentially come on site, eat some contaminated material, and then go off site and then get shot and eaten by a hunter. That's one of the potential exposure pathways. And so we wanted to understand those movements both onsite and offsite, and we also wanted to identify what the radiological burden was of these animals. All of the sampling that has been done over the years has found really that from the residual radiation we're not seeing really any effects. And we actually go out and study the plants and animals that are using some of those contaminated areas. All of that information is put into our annual site wide environmental report that explains the radiation doses and stuff. And again like I said we are not seeing levels that are harmful to the animals or people that would be eating those animals.

19:32:22 Narrator

As science goes, this is a particularly elegant study. An impressive array of tools, skills, and expertise have led to insightful results on the health and life habits of wildlife here. This work is part of the Nevada National Security Site obligation to monitor and protect the local ecosystem.

19:56:13 Kathleen Longshore

I just like sheep. They're spectacular. I just love working on sheep. I mean if you're out and you watch them, they're just amazing. They're surviving in the desert in the middle of nowhere. They walk on these little steep tiny little cliffs and walls and they are just, they are just gorgeous.

20:16:01 Derek Hall

But uh, Brian Jansen was amazing he knows mountain lions, he knows how they move through the environment. Without him we wouldn't have any animals to study.

20:28:03 Brian Jansen

They have a difficult life, they're, if you think about it these lions are walking around 5 to 10 miles every night looking for something to kill with their teeth and their front legs. Once they hit 10 years old their teeth are pretty well wore out. They don't usually live a lot longer than that. In fact the vast majority of them never even reach 7 to 9 years old.

20:49:00 Patrick Cummings

I like working with bighorn sheep because it's a native animal. It historically occurred throughout the state. There are so many questions about bighorn that it takes science, good science, good researchers doing good work to answer these questions.

21:06:10 Blake Malo

It's a team effort to obtain the correct data so they can make the correct decisions on how to manage those animals so that we can maintain the resource.

21:16:17 Patrick Cummings

It is, it is a special feeling I suppose knowing that you're doing good stuff. It's a good feeling. It feels like you did work that really counts for something.

21:28:10 Brian Jansen

Tomorrow I'm going to pull up some of my gear, cameras, trail transmitters, some traps, and then I'm going to pick up camp and head home. Let's go. Vamos.