Student Pages: Nevada Bighorn Sheep: On the Edge?

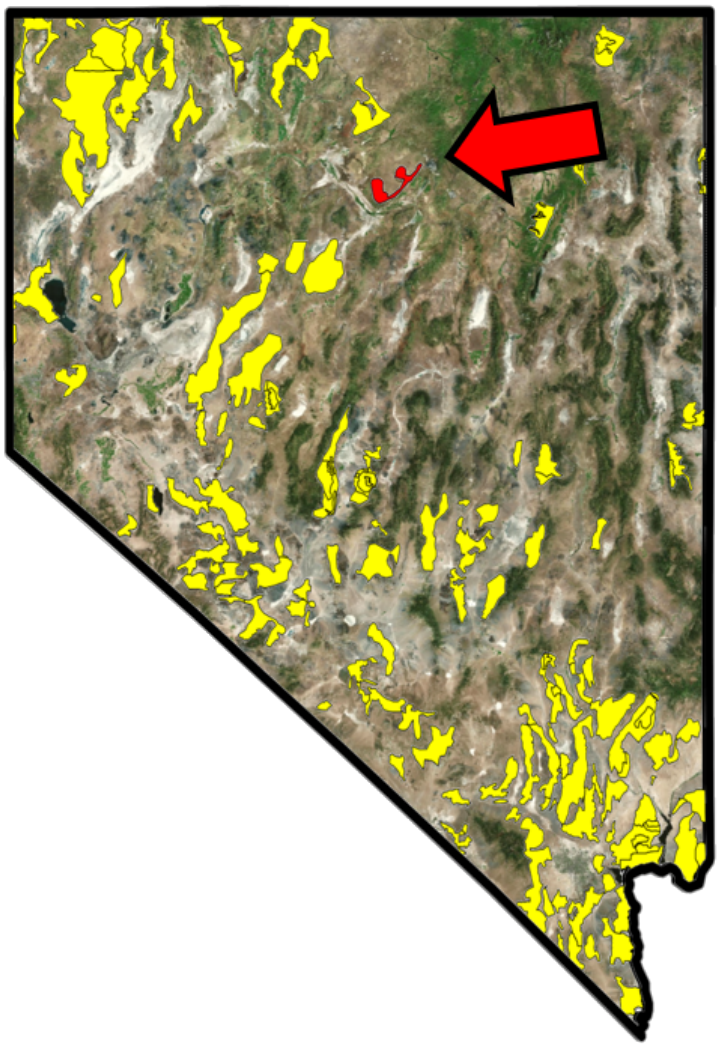
Team 2 **Your bighorn sheep herd name is SHEEP CREEK RANGE HERD**

Instructions for this Activity

You should be in one of 6 teams. Individually, read through the Background Information thoroughly, calculate the missing data in the Table 1-2, and create your graph. Then, work as a team to answer the questions and create a list of factors (things) that affect the conservation of your bighorn sheep herd. Then, as a team create a presentation that you will give to the rest of the class. At the end of these Student Pages, uou will find a list of things you should include in your presentation.

BACKGROUND INFORMATION

The Sheep Creek Range Herd is located northeast of Battle Mountain, NV and occupies about 74,959 acres.



Bighorn Sheep Subspecies

The subspecies of bighorn sheep in the Sheep Creek Range Herd is the California bighorn sheep.

History and Habitat

The Sheep Creek Range Herd was re-established during 1991 when 21 bighorn sheep were translocated into the Sheep Creek Range area. The 21 sheep came from a wild bighorn herd in Idaho. In 1993, another 25 wild bighorn sheep were translocated into the Sheep Creek Range area, the bighorns came from a wild herd in Idaho. In 1995, 7 additional bighorns were translocated into the Sheep Creek Range Herd, the bighorns came from a wild bighorn sheep herd in British Columbia.

The Sheep Creek Range area also serves as winter range for several hundred deer, antelope, and elk. In addition, a large number of cattle graze on BLM land in the Sheep Creek Range area.

The habitat in Sheep Creek Range used to be a beautiful sagebrush steppe plant community, with diverse plant species including perennial grasses and forbs. In the late 1880s, invasive annual plants were brought over with livestock. These invasive plants began to outcompete the perennial grasses, in part because of the way cattle have overgrazed the habitat for the past 100 years. Then, in 1980, wildfire began to burn the area. The area has been burned 3-4 times since 1980.

This means that the habitat in the Sheep Creek Range has changed due to a combination of: 1) cattle overgrazing, 2) invasive annual plants outcompeting native perennial plants, and 3) wildfire. The sad result is this -> what used to be a diverse, rich sagebrush steppe community has changed into a monotypic (one type of) plant community of invasive annual plants (dominated by cheatgrass and tansy mustard). This has resulted in lower quality habitat for bighorn sheep, which means the carrying capacity of the Sheep Creek Range area is lower now than it was 100 years ago.

Even though the habitat quality and carrying capacity have decreased in the Sheep Creek Range area, the number of cattle grazing on this habitat has remained the same. As food resources decrease, it would make sense to decrease the number of animals using those food resources. Due to extensive cattle overgrazing (i.e., the number of cattle grazed here has not been reduced even though the food resources here have been declining), there simply isn't enough food for all the bighorn sheep and all the cattle anymore.

So, in 2013-2014, biologists at Nevada Department of Wildlife decided to do the responsible thing and reduce the size of bighorn sheep herd. They feared that a severe winter could bring high mortality for bighorn sheep if the bighorns went into the winter lean. Therefore, in 2013-2014 they captured 38 bighorn sheep and translocated them to other wild bighorn herds. During 2014, they also started a ewe hunt to help reduce the bighorn sheep herd so that the herd size matched its lowered carrying capacity.

Attempts to restore the native sagebrush in the Sheep Creek Range habitat have so far been unsuccessful, but a non-invasive small shrub, *Forage kochia*, was introduced into the habitat to provide high quality forage for wild bighorn sheep, migratory herds of wintering pronghorn, and mule deer that share the mountain range.

Carrying capacity is the maximum size of a biological population that the environment can sustain indefinitely without degrading the environment for future generations. When a population is at carrying capacity, then the # of births = the # of deaths. The carrying capacity of the Sheep Creek Range was lowered due to cattle overgrazing, invasive annual plants outcompeting native perennial plants, and wildfire.

Water is limited in the Sheep Creek Range area, with only 4 known springs. Two water developments were built to help provide water to bighorn sheep and other wildlife.

Wild Bighorn Sheep Translocation Program in Nevada

As of February 2019, Nevada biologists have translocated 3,380 bighorn sheep in Nevada!

The following wild bighorn sheep were translocated INTO the Sheep Creek Range Herd:

1991: 21 bighorns, came from a different bighorn herd in Idaho
1993: 25 bighorns, came from a different bighorn herd in Idaho
1995: 7 bighorns, came from a different bighorn herd in Idaho

The following wild bighorn sheep were trapped FROM the Sheep Creek Herd and translocated to other wild bighorn sheep herds:

2012: 23 bighorns trapped from the Sheep Creek Herd and translocated to a different NV bighorn herd
2014: 15 bighorns trapped from the Sheep Creek Herd and translocated to a different NV bighorn herd

Factors Affecting the Conservation of the Sheep Creek Range Herd

The primary issue affecting the conservation of the Sheep Creek Range Herd is excessive cattle grazing year-round on BLM grazing allotments within the Sheep Creek Range area. The entire mountain has lost its healthy native vegetation and the annual plants that dominate the landscape are not sufficient to support both native ungulates (bighorn sheep, mule deer, and pronghorn) and domestic livestock numbers.

Another issue affecting this herd is maintaining separation between wild bighorn sheep and domestic goats to avoid transmission of diseases. A herd of domestic goats exists on private land near the Sheep Creek Range Herd. A bacteria called ***Mycoplasma ovipneumoniae*** can be present in domestic goats. ***Mycoplasma ovipneumoniae*** causes pneumonia in wild bighorn sheep.

Interestingly, even when domestic goats carry this bacteria, the domestic goats typically do not get pneumonia. However, if a wild bighorn sheep comes into contact with a domestic goat that has

this bacteria, then the wild bighorn sheep can be exposed to the bacteria and subsequently get infected with pneumonia. Moreover, the newly infected wild bighorn sheep can then bring the bacteria back to its herd and infect the entire herd with pneumonia.

The goat herd owner "rents" out his goats to farmers where the goats eat weedy plants on agricultural lands. When the goats are not working on agricultural lands, the goats live in the pastures at the base of a mountain near the area occupied by the Sheep Creek Range Herd, and they pose a disease risk to the bighorn herd. Talks were started a few years ago to come to an agreement to remove the goats or build a fence that would restrict wild bighorn sheep from interacting with the weed goats. The fence has yet to be built, but discussions continue with the private landowner (where the goats live when they are not "rented" out to farmers) and the goat operator who leases the pastures from the private landowner.

To a lesser degree, predators are a conservation issue. Predators of bighorn sheep in the Sheep Creek Range Herd include mountain lions, bobcats, coyotes, and golden eagles.

Graph It!

UseTable 1-2 on the next page to do the following:

1. Calculate the **Total Number of Bighorn Sheep Each Year** (HINT: add the Number of EWES yearlings, Number of RAMS yearlings, Number of EWES 2+ years old, and the Number of RAMS 2+ years old) for each year and put the answers in the column marked **Total Number of Bighorn Sheep Each Year** (the yellow shaded column).

2. After you have filled in all the missing data, create a graph showing the **Total Number of Bighorn Sheep Each Year**. Put **Year** on the x-axis and **Total Number of Bighorn Sheep Each Year** on the y-axis.

Table 1-2. Annual Population Estimate of Bighorn Sheep in the Sheep Creek Range Herd, for Years 1991-2018

YEAR	Number of EWES Yearlings	Number of RAMS Yearlings	Number of EWES 2+ years old	Number of RAMS 2+ years old	Total Number of Bighorn Sheep Each Year
1991	0	16	2	2	**20**
1992	3	15	3	3	
1993	5	36	4	8	
1994	6	37	7	11	
1995	9	45	9	15	
1996	9	48	9	21	
1997	6	49	6	27	
1998	5	47	6	29	
1999	5	44	6	28	
2000	8	41	8	27	
2001	8	42	8	27	
2002	10	43	11	28	
2003	10	46	11	33	
2004	17	49	18	35	
2005	13	57	14	44	
2006	10	62	10	49	
2007	15	63	15	51	
2008	17	69	17	54	
2009	14	75	15	58	
2010	18	79	19	60	
2011	28	86	28	65	
2012	23	84	23	74	
2013	10	93	9	79	
2014	11	76	10	71	
2015	9	66	10	64	
2016	16	61	16	58	
2017	9	61	9	58	
2018	8	59	8	51	

QUESTIONS (answer these as a team)

1. How many sheep were translocated TO this herd during 1993-1995 to re-establish it, and where did these translocated sheep come from?

2. What other animals besides wild bighorn sheep use the habitat in the Sheep Creek Range?

3. What three things happened that lowered the habitat quality and carrying capacity of the Sheep Creek Range area? What does carrying capacity mean?

4. How did Nevada Department of Wildlife reduce the size of this bighorn sheep herd so that the size of the herd would better match the lowered carrying capacity?

5. Why is it better to have a diverse habitat with native plant species rather than a monotypic habitat with mostly non-native plants?

6. Do you think it is a good idea to use domestic goats to control weeds in areas near bighorn sheep herds? Why or why not?

INSTRUCTIONS FOR CREATING YOUR PRESENTATION

Work as a team to put together a presentation that you will give to the rest of the class. Your presentation should include at least the following:

1) the subspecies of bighorn sheep in your herd
2) where your bighorn sheep herd lives
3) brief background information about the history of this herd and information about its habitat
4) the graph you created
5) information about how many wild bighorn sheep have been translocated TO the Sheep Creek Range Herd and how many sheep have been trapped FROM the Sheep Creek Range Herd and translocated to other wild herds
6) information about how the habitat has changed in the Sheep Creek Range area
7) definition of carrying capacity
8) a list of factors affecting the conservation of this herd
9) photos of the Sheep Creek Range, provided below

Photos of the Sheep Creek Range area are provided by Mike Cox, Nevada Department of Wildlife: