

Do We Want Bighorns Here?



Adapted from Project Wild

Grade level: 4-12

Duration: 2-3 forty-five minute periods

Group Size: 20-30

Setting: indoors

Skills: debate, research, discussion, communication skills

Key Vocabulary: interest group, proposal, role, trade-offs

Objectives:

Students express the pleasures and problems of living in bighorn sheep territory from different points of view

NGSS Connections:

*See detailed standards and ideas at end of lesson

3-LS4-4

MS-LS2-4 MS-LS2-6

HS-LS2-6 HS-LS4-5

Common Core State Standards:

CCSS.ELA-Literacy- Speaking and Listening

Background:

Many people who share habitat with bighorn sheep revere these animals, admire their strength and beauty, and work hard to protect their place in our world. Both Nevada and Colorado have the bighorn as its state animal. Other people complain about the damage bighorn can cause to agricultural lands, ornamental shrubs, and vehicles when hit on the road. Ranchers with domestic sheep may also fear the implications of spreading certain bacteria domestics have on to wild sheep, which can cause death in wild sheep, but not in their domestic animals. So, although bighorns can

sometimes co-exist well with people, this is not always the case. Students need to examine the problems from many different viewpoints and to recognize that simple solutions seldom exist. Then they should be ready to take a stand, and debate the issues in a meeting.

Materials:

- Role cards (one per student-some students may have the same card)
- Research materials (books, online research, phone calls to specialists, etc.)
- Town Hall meeting sign (see end of lesson)
- Optional: Costumes, hats, and props

Procedures:

1. Post a notice announcing a town meeting to discuss the question, "Do We Want Bighorn Sheep Here?"

2. Set the scene. Tell the class that bighorn sheep lived near the town of Ridgeview many years ago. However, as the population of the town grew the sheep's habitat was reduced. This, along with diseases brought in by domesticated animals reduced the herd size to just a few animals, of which various other factors, including predation, took its toll and the sheep in this area eventually all disappeared. Now a citizens group wants to reintroduce a small herd of bighorn into the cliff area outside of town. This citizen group includes land developers, a camping outfitter, motel owners, hunters, some homeowners, and the mayor.

Opposition to the proposal sprang up within days. Ranchers and farmers, off-road vehicle riders, some dog owners, hikers, commuters, and some homeowners object.

Tempers are flaring, but each side has agreed to listen to the other's position in a town meeting. They have invited experts (a highway commissioner, a local wildlife officer, a Native American tribal leader, and a bighorn sheep biologist) to provide more information on the suitability of modern-day Ridgeview as bighorn sheep habitat. The experts will discuss the effects that reintroducing the bighorn into the area would have on the local ecology and whether or not the local habitat will ensure the survival of the herd. They will consider the questions of summer and winter ranges, and the numbers of bighorn the land might support.

The meeting promises to be lively. A radio announcer, a television reporter, and a newspaper reporter will be present, taking notes and interviewing citizens.

3. Allow students to choose the roles they will play at the town hall meeting. Some roles can be duplicated or omitted as long as all interest groups are equally represented. Feel free to add other groups.

4. Give students time to research their roles. Encourage them to:

- Work with their interest group (pro, con, or bighorn expert) to identify the group's attitude toward bighorn sheep
- List the problems and/or benefits the reintroduction of bighorn might bring to their group
- Strengthen their arguments with facts such as quotes from bighorn experts, statistics, research data
- Use props such as graphs, illustrations, maps, or videos to reinforce their position.

5. Hold a town hall meeting to hear all sides of the question. It is not important

that the class come to a decision on the question, but rather that they appreciate the complexity of the problems involved in sharing habitat with wildlife. There are no clear winners or losers, and each side should be prepared to consider making trade-offs.

Evaluation:

Ask students to write a summary of the arguments for and against the reintroduction of bighorn in Ridgeville.

Extension:

Highly suggested: Watch *Wild & Wool*, a 20-minute YouTube film from 2020 which shows perspectives of domestic sheep ranchers and wild sheep biologists.

Find out if there have been any bighorn sheep reintroduced near you. The Wild Sheep Foundation has maps for each state where bighorns have been reintroduced. Contact them for more information.

Invite a local wildlife biologist into your classroom for a question and answer session involving reintroduction of bighorn (or other animal) in your state.



Student Sheet: Role Cards

The Pro Group

This group of citizens is in favor of reestablishing a bighorn herd on the outskirts of Ridgeville

<p>Pro Group</p> <h3>Carpenter/ Contractor</h3> <ul style="list-style-type: none"> Bighorn could bring tourists to town. That might create a need for more hotels, restaurants, souvenir shops, and vacation homes. You could make a lot of money building these facilities. 	<p>Pro Group</p> <h3>Motel Owner</h3> <ul style="list-style-type: none"> Bighorn sheep watchers and photographers will need a place to stay overnight. Your business could improve dramatically, especially during the fall rut when the bighorns crash their mighty horns together.
<p>Pro Group</p> <h3>Camping Outfitter</h3> <ul style="list-style-type: none"> Bighorn sheep might bring campers to town, and they would need equipment and supplies. You also could start backcountry hiking tours to see the sheep. Your business could get a real boost. 	<p>Pro Group</p> <h3>Hunters</h3> <ul style="list-style-type: none"> Bighorn are exciting big game animals. Your group would be willing to pay high licensing fees once the herd reaches its carrying capacity for the privilege of hunting them. These fees go towards improving habitat for all animals.
<p>Pro Group</p> <h3>Homeowners</h3> <ul style="list-style-type: none"> You live close to the area where the herd is to be reintroduced. You like the idea of keeping this a wild area, and would enjoy seeing the bighorn on the cliffs occasionally from your window. 	<p>Pro Group</p> <h3>The Mayor</h3> <ul style="list-style-type: none"> Bighorn sheep could be the best thing that ever happened to this town. They might bring in tourists and hunters who would spend their money in local gas stations, restaurants, hotels, grocery stores, outfitter shops, and souvenir shops. This could cause the town to grow and you get re-elected.

Student Sheet: Role Cards

The Con Group

This group of citizens is opposed to reintroducing the bighorn near Ridgeville.

<p>Con Group</p> <h3>Ranchers/ Farmers</h3> <ul style="list-style-type: none"> Bighorn might compete with your herd of cattle for grazing lands, especially during winter months when they come to lower elevations. They could break through your fences to get your winter hay storage. Who would pay for this? 	<p>Con Group</p> <h3>Off-Road Vehicle Rider</h3> <ul style="list-style-type: none"> You now enjoy zooming around all the dirt roads outside of Ridgeville. Would bighorn change that? Would some areas be closed to snowmobiles, dirt bikes, and all-terrain vehicles, as all are said to disturb bighorn.
<p>Con Group</p> <h3>Hikers</h3> <ul style="list-style-type: none"> You now enjoy hiking in the lovely tract of land that might soon be made into sheep habitat. Bighorn are very sensitive to human presence, and even a quiet hiker could disturb them. 	<p>Con Group</p> <h3>Dog Owners</h3> <ul style="list-style-type: none"> This is a small town where dogs have been allowed to run free. Unfortunately, dogs sometimes form packs and will agitate bighorn. If bighorn are reintroduced to Ridgeville, will you have to keep your dog tied up? Will dogs be allowed in areas where sheep are while you hike with your pet?
<p>Con Group</p> <h3>Homeowners</h3> <ul style="list-style-type: none"> Bighorns can be pests if they get use to humans. They might turn up in your yard, eat your shrubbery, or stomp on your lawn. In some areas like Boulder City, NV they have even made their second home the city park. 	<p>Con Group</p> <h3>Commuters</h3> <p>A highway connects Ridgeville to towns on the other side of where bighorn will be reintroduced and runs through the proposed area. Unless expensive bridges or tunnels are built for bighorn to cross the highway, they might cause many accidents. You want to know if anything will be done to protect drivers.</p>

Student Sheet: Role Cards

The Experts

These people are experienced in their fields. You need to be able to answer questions, quote statistics, and speak knowledgeably. More than any other group, you will need to do some research.

<p>Expert</p> <h3>Highway Commissioner</h3> <ul style="list-style-type: none"> • Be prepared to answer questions about bighorn on the road. How can accidents be prevented by tall fences, game bridges, and tunnels under roadways? You might talk about warning signs and educating the driving public. 	<p>Expert</p> <h3>U.S. Fish & Wildlife Service Officer</h3> <p>You are familiar with the site proposed as habitat for the bighorn herd. You know that it offers good cover and nourishing food. Water is plentiful and a local hunting group has even supplied funds to build more water guzzlers. Be prepared to answer questions about how many sheep this habitat might support.</p>
<p>Expert</p> <h3>State Wildlife Manager</h3> <ul style="list-style-type: none"> • You know the difficulties and benefits of reintroducing bighorn. You also know the regulations protecting bighorn. Be prepared to answer questions about hunting licenses, no trespassing areas, and restrictions to dogs. 	<p>Expert</p> <h3>Bighorn Biologist</h3> <ul style="list-style-type: none"> • You are an all-around bighorn sheep expert. You know about their behavior, habitat needs, anatomy, and esthetic value. You know how reintroductions of bighorn have brought them back in the U.S. from their lows in the 1960s. Feel free to support any of the others in this group with your expertise.
<p>Expert</p> <h3>Tribal Leader</h3> <p>You represent the Native Americans who live in Ridgeville. You understand bighorn's significance to your culture. Be prepared to talk about how Native American hunted sheep historically, such as the Sheep Eaters of Wyoming. You know how bighorn have been depicted in pictographs and petroglyphs, and how they feel about reintroducing bighorns to the area.</p>	<p>Expert</p> <h3>Researcher</h3> <p>You have been researching the bacteria that gets spread from domesticated sheep to wild sheep that can lead to pneumonia and death, and understand that if it happens, an entire herd can almost be wiped out. You know there are no cures, but that the best current practice is to keep 100 miles between wild sheep and domestic sheep to prevent disease spreading between the species.</p>

Student Sheet: Role Cards

The Media

These people are the recorders. You may have your own opinions, but your job is to record other's opinions and to report them to the public in an unbiased fashion.

Media

Radio Broadcaster

- Your style is straightforward. You tell it like it is. You live in the next town, but aren't really friendly with anyone here.

Media

Newspaper Reporter

- You live right here in town. You know most of these people and count many of them among your friends. You can see multiple sides to the question. Your style is folksy and familiar.

Media

Television Reporter

- You live in the city 110 miles from Ridgeville. The issues are quite clear to you, and you're a bit condescending in your attitude toward the locals. Your manner is brisk and businesslike, and you're a bit intrusive when wielding a microphone.

Con Group

Sheep Rancher

You own over 200 domesticated sheep, which provide the money for your family to survive. You have concerns over what you have heard about domesticated sheep being able to be carriers for bacteria that don't impact your sheep, but can transfer to wild sheep and cause pneumonia. Will reintroducing bighorn near the town impact the way your family makes money?

Pro Group

Photographer

You make your living taking nature photos. Having bighorn sheep right outside the town you live in could provide opportunities for great photos without having to pay for extended travels to get near these majestic animals. Your small photography shop may see an increase in shoppers, especially for local photos of bighorn sheep.

Additional Pro and Con Group Cards





NOTICE:
DO WE WANT BIGHORN
SHEEP HERE?

A PROPOSAL HAS BEEN MADE TO REINTRODUCE BIGHORN SHEEP TO THE MOUNTAINS THAT RESIDE NEXT TO OUR TOWN.

A TOWN HALL MEETING WILL OCCUR TO DISCUSS THE BENEFITS AND DRAWBACKS TO SUCH A REINTRODUCTION.

ALL ARE INVITED TO ATTEND SO THAT OUR COMMUNITY CAN HEAR FROM A VARIETY OF VIEWPOINTS SO THAT WE CAN MAKE A MORE INFORMED DECISION ON THE MATTER.

TOWN HALL MEETING TO OCCUR ON:

Next Generation Science Standards (NGSS) Detailed:

3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]

HS-LS2-6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. [Clarification Statement: Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.

HS-LS4-5 Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of

individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. [Clarification Statement: Emphasis is on determining cause and effect relationships for how changes to the environment such as deforestation, fishing, application of fertilizers, drought, flood, and the rate of change of the environment affect distribution or disappearance of traits in species.

Common Core State Standards (CCSS):

Comprehension and Collaboration:

CCSS.ELA-Literacy-Speaking and Listening Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Presentation of Knowledge and Ideas:

CCSS.ELA-Literacy-Speaking and Listening Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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