

# What's so Different About Those Sheep?

## Objectives:

Students will be able to identify the four subspecies of wild sheep in North America, as well as the habitat of each. Posters, or informational books/tri fold pamphlets will be created identifying each sheep and its habitat, including adaptations for each habitat.

**Grade level:** 2-6

**Duration:** An hour or more

**Group Size:** Individually, or projects could be completed by teams of students

**Setting:** indoors

## Common Core State Standards:

- CCSS.ELA.RI – Identify the main purpose of a text, including what the author wants to answer, explain and describe.
- CCSS.ELA.RI – Explain how specific images contribute to and clarify a text.
- CCSS.ELA.RI – By the end of the year, read and comprehend informational texts, including science and technical texts in the specific grade complexity band proficiently.

## Next Generation Science Standards:

- 3-LS4-3 Biological Evolution: Unity and Diversity- Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

## Background:

There are three species of wild sheep that are native to North America.



There is the bighorn sheep, the Dall sheep, and the Stone (also Stone's) sheep. The Dall and Stone sheep are known as thinhorns. The bighorn sheep has a few subspecies, including the desert bighorn and the California bighorn.

Each species and subspecies have been adapted for the particular area in which it lives.

\*See more on each sheep in the informational text articles that may be given as reading text to the students (primary grade and intermediate grade text has been developed).

## Materials:

- informational text articles on each type of sheep (there is a primary book and intermediate grade text)
- "Three Species of Wild Sheep" document to show class
- poster board to make posters OR blank paper to make tri-fold pamphlets
- crayons, colored pencils
- Optional: Develop tri-fold pamphlet using a computer program, such as Microsoft Word.

**Procedures:**

1. Engage the students by showing photos of the three types of wild sheep. Explain that North America has four types of mountain sheep and these are three of them (the 4<sup>th</sup> is the Stone sheep).

2. Explain that today they will learn about the habitat of each of these three sheep and how each sheep has adapted for its specific place it lives.

3. Pass out printed information (found at end of this lesson), based on the grade level you are teaching (there is a primary edition and an intermediate edition). Students read through informational text on the sheep (either will the teacher or independently). Perhaps have students highlight key information that would be good to put into a poster or a tri-fold pamphlet.

4. Individually, or in small groups, students use information they have identified in text to create an educational poster on each sheep's habitat (or a tri-fold pamphlet). Students draw, or cut out elements from magazines of the habitat of each sheep, along with a drawing of each type of sheep.

5. Display the finished work and ask students what they have learned. Discuss how each environment has characteristic life forms, adapted to its climate, kinds of available food, etc. Emphasize that animals adapt to survive.



Rocky Mountain Bighorn



Dall Sheep (thinhorn)



Desert Bighorn

## Intermediate

### **Subspecies of Thinhorn Sheep: Dall Sheep**

Watchful and difficult to approach, Dall sheep challenge the wildlife watchers, hunters, and photographers who pursue them. The sheep too are challenged - by the harsh alpine environments of Alaska and northwestern Canada where they live. The animals meet this challenge because of several unique adaptations.



Year-round residents of the alpine environments, the sheep live mostly above timberline on ridges, dry meadows, and steep mountain slopes. There are always rocky outcrops and cliffs nearby. The sheep rarely venture far from this rugged terrain, using it to escape predators, including wolves, golden eagles, bears, mountain lions, and humans. Natural mountaineers, the Dall sheep negotiate this terrain with speed and agility and rarely fall.

Dall sheep eat a variety of items. They eat many types of grasses. They also eat sedges, which are a grass-like plant with triangular stems and inconspicuous flowers, growing typically in wet ground. Broad-leaved plants are another variety of food. Finally, dwarf willows make up a portion of their yearly food supply as well. In winter, when these foods are scarce, the sheep add lichens (a simple slow-growing plant that typically forms a low crust like, leaf like, or branching growth on rocks, walls, and trees) to their diet. In foraging, or looking over a wide area to find food, the sheep must move seasonally between traditional summer and winter ranges.

Winter weather is the main factor that affects Dall sheep numbers. In sheep habitat, temperatures normally stay below freezing, snowfall is light, and winds sweep many ridges and slopes, keeping snow cover light. These conditions allow the sheep good access to winter forage. However heavy snows, temporary thaws, and freezing rains can create a frozen barrier preventing the sheep from digging for the plants. Conditions like these can cause population "crashes." The winter diet is much more limited, and consists primarily of dry, frozen grass and sedge stems available when snow is blown off, lichen and moss.

Many Dall sheep populations visit mineral licks during the spring, and often travel many miles to eat the soil around the licks. Mineral licks are places where animals can go to lick essential mineral nutrients from a deposit of salts and other minerals found naturally. Natural licks are common, and they provide the biometals needed (sodium, calcium, iron, phosphorus, zinc, and trace elements) required in the springtime for bone, muscle and other growth.

## **Subspecies of Thinhorn : Stone Sheep**

The Stone sheep lives more south than the Dall sheep and are somewhat larger, weighing in around 180 to 220 pounds on average. Once in a while, an adult ram could weigh around 250 pounds. The other major difference is that it is much darker in color than the Dall sheep. Colors vary greatly in both pattern and color. Then head and neck are usually lighter in color than the body. Parts of the sheep that are white include the muzzle, belly, rump, and backs of legs while the tail is black. Those living further north are often more white in color while those in southern areas are darker brown to nearly black. A Stone sheep what is more white in color is often called a Fannin sheep.

The Stone sheep has a wider and larger skull than the Dall sheep. The horns are also darker than the Dall sheep.

Stone sheep can be found in alpine country with steep and rugged cliffs and outcroppings where they can easily escape from nearby predators. Ideal habitat also includes openings and meadows for finding food. Windswept areas with low snow accumulations are important for their survival in the winter months.

They eat grasses, sedges (grass-like plant with triangular stems and small flowers), broad-leaved plants and dwarf willows. In the winter, these food types become harder to find and they add lichens to their diet. The availability and how it is distributed in their range require the sheep to move migrate between summer and winter ranges. They supplement their diet with regular visits to mineral licks. Their summer range is usually larger than their winter range.

As of 2016, it is estimated that there are 13, 100 Stone sheep that live in Canada in British Columbia and in the southern Yukon. This sheep is named after A.J. Stone who collected the first sample in 1897 and therefore, also is called a Stone's sheep (versus simply Stone sheep).

A female (ewe) stone sheep usually only has one lamb a year, which is born in the spring. For protection from predators, ewes seek out steep terrain to give birth. About a week after being born, the ewe and her lamb joins other lambs and ewes to form a



nursery band, which remain in the lambing area for 3 to 4 weeks before moving on to the summer range.

Among these sheep, rank order among males is determined by horn size. Only rams with horns of the same estimated size will fight each other. Males that are defeated in battle, as well as of lower ranking, are treated like females. The high-ranking rams disregard the actual females, except for during the rut. This permits weaker and younger males to remain in the herd without being chased off.

## **Subspecies of Bighorn : Desert Bighorn Sheep**



Desert bighorn sheep are a subspecies of bighorn sheep that is native to the deserts of the Southwestern United States and Northwestern Mexico.

The desert bighorn has become well adapted to living in the desert heat and cold and, unlike most mammals, their body temperature can safely fluctuate several degrees, helping them to survive. During the heat of the day, they often rest in the shade of trees and caves. During the hot, dry summer months, bighorn often go three to seven days without drinking, sustaining their body moisture from their food alone. After drinking up to two gallons of water in

just a few minutes, they recover from their dehydrated condition.

Southern desert bighorn sheep are adapted to a desert mountain environment with little or no permanent water. Some may go without visiting water for weeks or even a few months. They sustain their body moisture from food and from rainwater collected in temporary rock pools. They can get enough moisture from the plants they eat to aid in surviving over those months of limited water. They may have the ability to lose up to 30% of their body weight and still survive. After drinking water, they quickly recover from their dehydrated condition.

These bighorn inhabit hot and dry mountain ranges with sparse (limited) vegetation. In this environment, bighorn feed on a wide variety of leaves, twigs, flowers, forbs, grasses, and cacti.

Components of their habitat include dry desert terrain, made up of limited grasses and shrubs. Important requirements of this terrain is the topography, or escape terrain. They need to be able to see any predators that might be sneaking up on them and to have access to run away when needed. The terrain is typically rough, rocky and broken up by canyons and dry canyon washes. Steep slopes in part of their habitat provide excellent areas to give birth to lambs. These slopes make it difficult for predators to get to the lambs. Steep cliff overhangs, and often times cave indentions; can provide rest out of the sun for the sheep. Desert bighorns avoid low visibility areas with dense vegetation that can block the view of approaching predators. Distribution of waterholes, or man made guzzlers, influences patterns of home range for some desert bighorn subspecies.

## **Subspecies of Bighorn Sheep: Rocky Mountain Bighorn Sheep**

The Rocky Mountain bighorn sheep occupy the cooler mountainous regions of Canada and the United States. These bighorn sheep generally inhabit alpine meadows, grassy mountain slopes, and foothill country near rugged, rocky cliffs and bluffs. Since bighorn sheep cannot move through deep snow, they prefer drier slopes, where the annual snowfall is less than about 60 inches a year. This sheep's winter range usually lies at lower elevations than its summer range. Bighorn sheep graze on grasses and browse shrubs, particularly in fall and winter, and seek minerals at natural salt licks. Females tend to forage for food and walk, possibly to avoid predators and protect lambs, while males tend to eat and then rest and ruminate (regurgitate the food in their stomach and then chew their cud), which leads to more effective digestion and greater increase in body size.



They prefer open habitats, such as alpine meadows, open grasslands, shrub-steppe, talus slopes, rock outcrops, and cliffs; in some places, however, they may use areas of deciduous (trees with leaves) and conifer (trees with cones and pine needles) forests, especially where openings may have been created by clear-cuts or fire.

Records indicate that historically, bighorn sheep were sometimes found distant from rugged mountainous terrain. However, their current distribution sees them in scattered populations in open or semi-open terrain characterized by a mix of steep or gentle slopes, broken cliffs, rock outcrops, and canyons and their adjacent river benches and mesa tops. Densely forested areas provide little forage and poor visibility and are rarely used by bighorn sheep, except for shade in summer, escape from insects, and protection from high winds on very cold days. Visibility is an important habitat variable for bighorn sheep, so much so that the structure and height of vegetation are probably more important than type of plant species because high visibility helps in detection of predators. While bighorns feed in open areas, they are rarely found more than 400 meters from escape cover, where they have an advantage over most predators. Throughout a year, the sheep can eat between 69 to 88 different plant species. However, Rocky Mountain bighorns select forbs most frequently, followed by grasses, and then shrubs.

Key elements of winter ranges for bighorn sheep include low snow depth and wind-swept areas with sufficient forage and adjacent escape terrain for eluding predators. Wind, cold temperatures, and heavy snow accumulation are likely limiting factors for Rocky Mountain bighorn sheep in some areas. Consequently, most bighorn winter ranges occur on steep south, southwest, or southeast-facing slopes where maximum heat gain reduces cold stress and snow cover, and increases the availability of forage.



Desert Bighorn



Rocky Mountain Bighorn



Dall Sheep (thinhorn)



Stone Sheep (thinhorn)

## Stone Sheep

The Stone sheep lives in Canada. It does best in areas where there are cliffs to escape predators and openings in the trees where good grasses grow for it to eat.

The Stone sheep has a white head and neck and a white rump. The rest of the body is brown to dark brown colors.

There are about 13,100 Stone sheep. These sheep usually weigh between 125 and 200 pounds. A big ram (male) can weigh around 225 pounds.

In the summer, they eat grasses, grass-like plants called sedges that flower, and small willows. In the winter they also eat lichen.

Each spring the female gives birth to one lamb. The newborn and its mother stay in nursery groups with other lambs and ewes for about 2 to 3 weeks before heading to the summer range.



## What's so Different about those Sheep?



This book belongs to:



# Rocky Mountain Bighorn

The Rocky Mountain bighorn sheep lives in steep mountain areas. In the mountains, they like to visit the meadows to eat food, so they can see predators that might sneak up on them. They also eat grass on mountain slopes. Much of their time is spent on or near rocky cliffs. Cliffs provide protections from predators.

They don't visit the forested areas with trees much. The sheep have a hard time seeing predators such as wolves, and mountain lions that might try to sneak up on them.

Rocky Mountain sheep like eating many types of grasses. They also eat shrubs, which are woody plants smaller than trees. However, their main food is forbs. Forbs are broad-leaved plants, and many of them flower.



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grow that they also like to eat. In winter time they also eat lichens, which grow on rocks.



The Dall sheep will also find mountain sides where the wind blows away the snow. This lets them find food to eat.

Their white color in the winter helps them blend in so predators don't see them as easily.

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## Dall Sheep

The Dall sheep live in cold areas of Alaska and Canada. The sheep live mostly above where trees grow, high up on the mountains. Up high, above the trees, they have plenty mountain meadows and steep slopes. They stay close to the cliffs to run away from wolves, mountain lions, and other predators.

Dall sheep eat lots of different types of grasses. They also eat broad leaf plants, such as many types of mountain flowers. Up high on the mountain, small willow bushes



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The Rocky Mountain bighorn will move lower in the mountains during the winter, where there is less snow. This makes it easier to find food. In winter, they try to find areas where wind has blown away most of the snow. This helps them find food underneath. They will also spend much time on the south sides of mountains. The sun helps melt the snow and warm up the sheep.

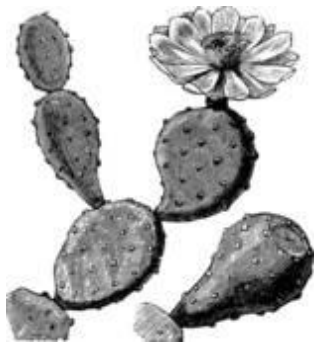
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## Desert Bighorn Sheep

The desert bighorn sheep lives in desert areas in the Southwestern United States and parts of northern Mexico.

This sheep has adapted to live in the desert heat. Unlike most animals, its body heat can actually change, which helps it survive in the heat in summers and the colder weather of winter.

This bighorn can go for days and weeks without drinking water. They can survive from water they get inside the plants they eat. In long periods of time without rain, they have been known to go months without water.



These bighorn live in hot and dry mountain ranges with small amounts of plants. They feed on cacti, twigs, flowers, bushes, grasses,

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and leaves.

They need to be able to see any predators that might be sneaking up on them and to have access to run away when needed. The land they live in is usually rough and rocky dry canyon washes.



Steep slopes in part of their habitat make it hard for predators to get to the lambs. Steep cliff overhangs can create shade for the sheep.

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