

WOOD BISON CURRICULUM

Lesson 2

Wood Bison Behavior!



Photo by Doug Lindstrand

Synopsis:

This lesson includes three exercises designed to explore wood bison behavior, as well as the basics of behavioral science. Using footage collected by the Alaska Wildlife Conservation Center and Elk Island Park in Canada, students experience wood bison behavior and begin to understand why studying wood bison behavior helps scientist to predict specific needs and challenges that a species faces when restored back into the wild. For Exercise I, students watch a slide show, “Animal Behavior”, which provides background information and terms. For Exercise II, students practice the four types of observation methods by performing fun skits and documenting behaviors. For Exercise III, students watch a series of short wood bison video clips that highlight different wood bison behaviors. Students note the behaviors, stimuli, habitat, social environment and season in which behaviors are observed.

Objectives:

1. Students will learn about wood bison behavior and natural history
2. Students will actively participate in the process of discovery, using real-world footage and data collection techniques
3. Students will work individually and cooperatively as they problem solve, hone critical thinking skills, and brainstorm
4. Students will be able to identify and differentiate between stimulus and response
5. Students will be able to identify and differentiate between internal or external stimuli

Wood Bison

Lesson 2: Wood Bison Behavior!

Grade Level: 7-8

Subjects: Science, Math and Language Arts

Duration: 1-5 classroom periods

Vocabulary: ad libitum sampling, all occurrence sampling, behavior, event, external stimuli, focal animal, internal stimuli, operational definition, response, scan sampling, Seasonal Behavior, State, stimulus

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6. Students will be able to identify and differentiate between a behavioral state or event
7. Students will understand that there are many ways to collect data, and practice four methods for observing wood bison behaviors and collecting information
8. Students will create and use an ethogram to identify wood bison behavior
9. Students will understand that wood bison are federally listed as a threatened species and that state biologists and the Alaska Wildlife Conservation Center are partnering to restore a captive wood bison herd back into the Alaska wild
10. Students will understand that species behavior is key to the long term survival and success of restored animals

Background Information for Teachers

In 1973, the wood bison was federally listed as an endangered species under the Endangered Species Act (ESA). In June 2012, the US Fish and Wildlife Service lowered the wood bison status to "threatened". Wood bison once roamed many parts of Alaska prior to the 1900's, but changes in the distribution of wood bison habitat and **unregulated** hunting (which differs significantly from legal hunting) resulted in the extirpation of wood bison in Alaska. Around 1900, there were only about 400 wood bison left in North America; these wood bison were in Canada. Owing to conservation efforts in Canada, there are currently over 4,000 wood bison in healthy free-ranging herds. However, there are still no wild wood bison in the US.

Alaska Department of Fish and Game and Alaska Wildlife Conservation Center are currently working to restore wood bison populations to portions of their historic range within Alaska. Why? Restoring wood bison in Alaska would increase the number of wood bison worldwide and help ensure their long-term survival. It would also enhance Alaska's wildlife resources by restoring a **key grazing animal** to the northern ecosystem, which would affect natural processes and increase biological and habitat diversity. Restoring wood bison to Alaska would also benefit Alaska's people by increasing hunting opportunities, and by providing economic opportunities for local communities and the tourism industry.

In 2008, the Alaska Department of Fish and Game obtained 53 wood bison from a disease-free herd in Elk Island National Park in Alberta Canada. These wood bison were taken to the Alaska Wildlife Conservation Center in Portage, Alaska where they are currently residing as a captive herd awaiting release into the Alaska wild.

Understanding a species behavior, especially one that is endangered or threatened, is key to the long-term survival and success of the animal. Wildlife biologists and ethologists spend time observing animals looking for behavioral patterns, causes, functions, development and evolution of behavior. By studying behavior, scientists hope to discover how external and internal stimuli affect behavior and what immediate effects the behavior has on the species and its adaptive value in helping animals to survive or reproduce successfully in a particular environment. This is critical to species such as wood bison, currently extirpated from Alaska. Understanding how habitat, climate, other animals and humans may affect the wood bison will help to determine how a herd is managed after it is released back into the wild.

Throughout this lesson students collect data by observing real-world video footage of wood bison, working both individually and in groups to understand behavior causes and functions. These lessons are designed to build student knowledge and apply new knowledge with each lesson.

Exercise I: Animal Behavior Introduction

Materials Needed

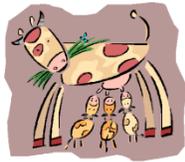
- *Animal Behavior* PowerPoint slide show
- Student Pages called "*Behave!*"

Procedure Steps

1. Show your students the PowerPoint slide show: "*Animal Behavior*"
2. During the slide show, students create a list of different stimuli (internal vs. external), responses, and identify behaviors (instinctive vs. learned)
3. At the conclusion of the PowerPoint slide show, divide your class evenly into four groups. Give each group a copy of the Student Pages "*Behave!*"
4. Allow students enough time to complete the *Behave!* Student Page worksheet.

Student Pages: Behave!

Below are several pictures of animal behaviors. Draw a line between the pictures, the behavior and the stimulus. Decide if the stimulus is external or internal. Circle your answer.



Sleeping

Vocalization

Grooming

Eating

Migrating

Charging

A pack animal is alone

Internal External

An animal wants to establish dominance (who is bigger and stronger)

Internal External

Temperature is changing and there is a lack of food

Internal External

Tired

Internal External

Hungry

Internal External

Dirty

Internal External

Exercise II: Skits and Observations

Scientists use four different methods to observe animal behaviors. During this exercise, students practice the four different methods (using skits) in preparation for observing wood bison video clips.

Materials Needed

- Student Pages "*Skit Observations*" and "*How Scientists Observe & Your Skit*"
- Teacher access to a clock or watch
- Writing utensil for each student

Procedure Steps

1. Scientists use four methods to observe animal behaviors. Discuss each of the four methods of observation with your students. The four methods are:
 - a. **Ad Libitum Sampling:** This is a play by play method where the scientist writes down as much information as possible during an observation
 - b. **Scan Sampling:** Scientists check and record behavior at set time intervals. For example if a scientist was observing a herd of elk grazing they may note how many elk were grazing, had heads down or heads up every 30 seconds.
 - c. **All Occurrence Sampling:** Scientists choose one behavior and record this behavior whenever it takes place. They will note the duration, time of day, number of occurrences etc.
 - d. **Focal Animal Sampling:** Scientists choose one animal to focus on and record all behaviors of this animal.
2. Divide students evenly into four groups. Give each member of each group their corresponding Student Page entitled *How Scientists Observe & Your Skit*. Each group will have a different Student Page.
3. Hand out Student Pages entitled *Skit Observations* to each member of each group. Again, each group will have a different Student Page.
4. Give student groups 10 minutes to come up with a skit.
5. Groups take turns presenting their skits.
6. Students record their observations on Student Pages "*Skit Observations*". Announce which method of observation the students use while watching the skits
 - a. Group 1: Basketball Game: Students use Ad Libitum Sampling
 - b. Group 2: Lunch Room: Students use Focal Animal sampling. Have students choose one person to watch during this skit and have them record their actions.
 - c. Group 3: Water and Bathroom Break: Students use All Occurrence Sampling. Have students note every time someone raises their hand to go to the bathroom.
 - d. Group 4: Study Hall: Students use Scan Sampling. The teacher is the time keeper.
7. When the skits are over, ask for several examples of the student's observations.

Group 1

Student Page: How Scientists Observe & Your Skit

There are four standard ways that wildlife biologists observe animals in the wild:

1. **Ad Libitum Sampling:** This is the *play by play* method. As a wildlife biologist, write down everything you see while observing the animals
2. **Focal Animal Sampling:** As a wildlife biologist, focus on one animal and write down all the behaviors of this animal.
3. **All Occurrence Sampling:** As a wildlife biologist, look for a particular behavior and note how often and under what circumstances this behavior occurs.
4. **Scan Sampling:** As a wildlife biologist, check behaviors at set intervals for every 30 seconds. For example, if you observe a herd of elk you note how many are grazing, how many have their heads up or down, how many are standing or lying down, etc.

Your class will practice using these methods of observation. Each group will act out one skit. Your group's skit is the "Basketball Game" described below. While you perform your skit, your classmates will use a method of observation and record what they see! While you are watching other groups' skits, you will use your Student Pages called "Skit Observation" to record behaviors using the method of observation specified for each group.

Skit for Group 1: Basketball Game

You are playing a basketball game. Divide your group into two teams and act out a game. Student scientists will be recording everything that happens similar to a sportscaster (Ad Libitum Sampling). Remember to have fun and don't forget, blocks, slam dunks and three pointers are encouraged.

Group 2

Student Page: How Scientists Observe & Your Skit

There are four standard ways that wildlife biologists observe animals in the wild:

1. **Ad Libitum Sampling:** This is the *play by play* method. As a wildlife biologist, write down everything you see while observing the animals
2. **Focal Animal Sampling:** As a wildlife biologist, focus on one animal and write down all the behaviors of this animal.
3. **All Occurrence Sampling:** As a wildlife biologist, look for a particular behavior and note how often and under what circumstances this behavior occurs.
4. **Scan Sampling:** As a wildlife biologist, check behaviors at set intervals for every 30 seconds. For example, if you observe a herd of elk you note how many are grazing, how many have their heads up or down, how many are standing or lying down, etc.

Your class will practice using these methods of observation. Each group will act out one skit. Your group's skit is the "Lunch Room" skit, see description below. While you perform your skit your classmates will use a method of observation and record what they see! While you are watching other groups' skits, you will use your Student Pages called "Skit Observations" to record behavior using the method of observation specified for each group.

Skit for Group 2: Lunch Room Skit

You are at lunch in the cafeteria. Follow this pattern: 1. Enter cafeteria 2. Look for friends to sit with 3. Open lunch 4. Eat lunch. Think about lunch time at your school what can you add to this scenario? Ex. laughing with friends, trading food, throwing food in the garbage etc. Make sure everyone adds something different to the scene.

Group 3

Student Page: How Scientists Observe & Your Skit

There are four standard ways that wildlife biologists observe animals in the wild:

1. **Ad Libitum Sampling:** This is the *play by play* method. As a wildlife biologist, write down everything you see while observing the animals
2. **Focal Animal Sampling:** As a wildlife biologist, focus on one animal and write down all the behaviors of this animal.
3. **All Occurrence Sampling:** As a wildlife biologist, look for a particular behavior and note how often and under what circumstances this behavior occurs.
4. **Scan Sampling:** As a wildlife biologist, check behaviors at set intervals for every 30 seconds. For example, if you observe a herd of elk you note how many are grazing, how many have their heads up or down, how many are standing or lying down, etc.

Your class will practice using these methods of observation. Each group will act out one skit. Your skit is the "Water and bathroom break", described below. While you perform your skit your classmates will use a method of observation and record what they see! While you are watching other groups' skits, you will use Student pages called "Skit Observations" to record behavior using the method of observation specified for each group.

Skit for Group 3: Water and bathroom break skit

You are coming back from *Gym Class*. Choose one student to be the teacher. Other students raise their hands and ask for a drink of water. After you come back from getting a pretend drink of water, raise your hand and ask to use the bathroom. Have one student do this several times.

Group 4

Student Page: How Scientists Observe & Your Skit

There are four standard ways that wildlife biologists observe animals in the wild:

1. **Ad Libitum Sampling:** This is the *play by play* method. As a wildlife biologist, write down everything you see while observing the animals
2. **Focal Animal Sampling:** As a wildlife biologist, focus on one animal and write down the behaviors of this animal.
3. **All Occurrence Sampling:** As a wildlife biologist, look for a particular behavior and note how often and under what circumstances this behavior occurs.
4. **Scan Sampling:** As a wildlife biologist, check behaviors at set intervals for every 30 seconds. For example, if you observe a herd of elk you note how many are grazing, how many have their heads up or down, how many are standing or lying down, etc.

Your class will practice using these methods of observation. Each group will act out one skit. Your skit is the "Study Hall" skit, described below. While you perform your skit your classmates will use a method of observation and record what they see! While you are watching other groups' skits, you will use Student Pages called "Skit Observations" to record behavior using the method of observation specified for each group.

Skit for Group 4: Study Hall:

You are in study hall working on your homework. Not everyone in study hall is studying. Students are studying, flying paper airplanes, sleeping, and whispering. Student scientists will be observing this scene. Choose an action to begin with (studying, flying paper airplanes, sleeping or whispering) every 30 seconds change your action. It is important that not everyone in the group does the same action at the same time.

Exercise III: Dachantee aak'ii (Wood Bison) Observations

Students apply what they learned in Exercise II to real wood bison behaviors using video clips of wood bison. Students use the four different methods of observations while watching video clips from *Wood Bison Observation Videos*. Each clip demonstrates different wood bison behaviors. These wood bison video clips were recorded at Elk Island National Park in Canada and at the Alaska Wildlife Conservation Center in Portage, AK. The bison on the clips from AWCC are some of the bison that will be restored back into the Alaskan wild.

Materials Needed

- *Wood Bison Observation Videos*; video clips are available on the Alaska Wildlife Conservation web site www.alaskawildlife.org and on Bear Trust International's website: www.beartrust.org
- Student Pages: *Notes from the Field*
- Student Pages: *Wood Bison Behaviors*
- Writing utensils
- Teacher access to a clock or watch

Procedure Steps

1. Give each student a copy of the Student Pages called "*Notes from the Field*". Students use this sheet to write down observations from video clips.
2. You will be showing eight video clips, each clip has been pre-assigned one of the four methods of observation that your students will use to record information. Tell students which method of observation they will use before the beginning of each video clip.
3. For videos marked 'Scan Sampling' help keep track of time using 30 second intervals. Tell students when to begin observing a specific behavior and when to stop.
4. Below is an example of how students should fill in their forms on their Student Pages:

Video Clip #1:

Type of Observation: Ad Libitum

Season: Fall

Habitat: Meadow land, few trees, mostly flat, near water

Animal's social environment: (alone, with herd, small group)etc.

Observations: For this observation you are going to use the Play by Play method. Think about a sports announcer giving a play by play for a basket ball game. Ask your students to give an example of a play by play.

Here is an example of a Wood Bison play by play or Ad libitum Sampling:

There is a small group of Wood Bison. One Wood Bison has its head down, grazing. Three bison are rolling on their backs. Now, one Wood Bison charges another. The Wood Bison hits the other Wood Bison with its head. They lock horns, pushing at each other. Etc.

Student Pages: Notes from the field

You are a wildlife biologist and your assignment is to observe different wood bison behaviors. You will create an inventory of animal behaviors. If you were asked to take an inventory of your refrigerator you may report that there are eggs, milk, broccoli, juice, yogurt, and strawberries. Taking inventory of animal behaviors, your report may sound more like this: sleeping, wallowing, head down, grazing, charging, cratering etc. When recording behaviors it is important not to anthropomorphize (give human feelings to an animal) the animal you are observing. After further research you might discover what you thought was an angry behavior was really a sign of courtship. Remember to stay away from words like happy and angry. You would not describe the milk in your refrigerator as joyful milk, right? You can reference *Wood Bison Behaviors* to help you name different behaviors.

Video Clip #1:

Type of Observation: **Ad Libitum**

Season:

Habitat:

Social Environment:

Observations:

Video Clip #3

Type of Observation: **All Occurrence**

Season:

Habitat:

Social Environment:

Observations:

Video Clip #2

Type of Observation: **Focal Animal**

Season:

Habitat:

Social Environment:

Observations

Video Clip #4

Type of Observation: **Scan Sampling**

Season:

Habitat:

Social Environment:

Observations:

Video Clip #5

Type of Observation: **Ad Libitum**

Season:

Habitat:

Social Environment:

Observations:

Video Clip #7

Type of Observation: **All Occurrence**

Season:

Habitat:

Social Environment:

Observations:

Video Clip #6

Type of Observation: **Focal Animal**

Season:

Habitat:

Social Environment:

Observations:

Video Clip #8

Type of Observation: **Scan Sampling**

Season:

Habitat:

Social Environment:

Observations:

Student Pages: Wood Bison Behaviors

The following are common Wood Bison behaviors. This list is intended to be used as a reference for students. Please note that not all behaviors will be observed in the video clips.

Rutting: This behavior is seen during the rut, or the period of reproduction when cows are generally in estrus. This is a behavior that occurs between bulls that includes sparring and fighting (clash heads then push upwards with heads held low) to establish dominance for mating. They may also bellow, stamp feet and snort.

Broadside Threat Posture: A bull will turn sideways to display his overall body size to intimidate opponents into submission.

Tending: Tending is a temporary bond between a bull and a cow ranging from a few minutes during the pre-rut to a few days during the rut. The bull will stay close to the cow sometimes **licking** and **butting** one another. Reproduction takes place during tending.

Courtship: The breeding season is June through September. The males are in rut between July and August. A female may run through the herd attracting attention of males when she is ready to mate. Cows usually select the highest ranking male, but not always. They may select a suitor that is not the highest ranking male. The gestation period for Wood Bison is 285 days (9 months).

Wallowing: Wallowing is when a bison rolls in the dirt or mud. During the rut, bull bison wallow to display their strength and vigor and leave their scent. Beyond the rut, both bulls and cows will wallow to remove tufts and molted fur, deter biting flies and leave their scent.

Grazing: Grazing describes a type of feeding in which an herbivore feeds on plants. Wood Bison spend 9-11 hours/day grazing.

Cratering: Cratering is a winter time behavior. Using the strength of their necks Wood Bison will clear snow from the ground to access sedges and grasses in the winter. This is a behavior predominantly performed by cows to ensure that calves have access to food.

Calving: When a cow is ready to calve the habitat plays an important role in the calving location. If the herd is out in the open, away from trees and shrubs, the cow will give birth to her young within the herd. If there is an abundance of large shrubs and/or trees

the cow will often find a secluded place to give birth. Both options are for the safety of the newborn calf to hide/protect from possible predators.

Suckling: A newborn calf will suckle in 6-10 minute intervals throughout the day. The calf will continue to suckle for 3-10 months. Bulls tend to suckle for a shorter period of time than cows. Calves will stay with their mothers for up to three years.

Imprinting: After parturition the mother cow licks and sniffs her newborn calf. This ensures cow/calf recognition familiarity. When the cow/calf pair rejoins the herd it is not unusual to see other cows also **licking** and **sniffing** the newborn.

Tail Posturing: A Wood Bison's tail is an indicator of behavior and intent. A relaxed tail signifies that the Bison is relaxed. If the tail is partially raised the bison is alert. If the tail is out in a horizontal position the bison is excited. However, a tail raised upward is a warning; the bison is in a combative posture and may be ready to charge.

Tongues: A Wood Bison will run with its tongue hanging out of its mouth. The reason for this behavior is to further open the larynx and allow for more air to enter into the lungs propelling the Wood Bison's large bodies.

Play Behavior: Play behavior peaks at dusk for young bison. The young play more than adults. They will often engage in wallowing during play, chase, play-mount and butt heads. They will not lower their heads while play butting.

Vocalization: Bulls may bellow when threatening each other

Social Behavior: Bison form groups of females with calves, young males up to 2 or 3 years of age. The Bulls will join the herd during the rut but spend most of their time in small herds of males.

Territorial Behavior: Bison are nomadic and may move several miles a day while feeding. They will return seasonally to areas of good habitat.

Tail Flicking (wagging) and Head Shaking: During the summer months Wood Bison frequently flick their tails back and forth across their hindquarters or aggressively shake their head from side to side to deter biting flies.

Sweating and Panting: Wood Bison are animals built for cold climates. During the summer as temperatures increase, Wood Bison will sweat and pant, often appearing to rock back and forth to regulate body temperature.

Licking: Animals including Wood Bison often lick their noses. This increases their sense of smell by transferring molecules from the tongue to the nose.