



GRIZZLY BEAR FOUNDATION

UNIT OF STUDY: THE IMPORTANCE OF GRIZZLY BEARS IN OUR ENVIRONMENT



Photo © Karyn Schiller



THE IMPORTANCE OF GRIZZLY BEARS IN OUR ENVIRONMENT

INTRODUCTION

Districts and Schools in the Pilot Project

The unit of study is sponsored by the Grizzly Bear Foundation (GBF), a registered charitable foundation in the province of British Columbia, Canada. GBF is dedicated to the conservation of grizzly bears through research and public education. GBF is piloting the unit in two BC school districts in April 2018.

The Districts

School District #8 (Kootenay Lake) covers approximately 15,000 square kilometers and serves 31 (primarily rural) schools in the southern interior of British Columbia.

School District #36 (Surrey) serves 70,000 students in 120 schools of the lower mainland Vancouver cities of Surrey, White Rock and the rural area of Barnston Island.

The Schools

J.V. Humphries Elementary & Secondary School (SD#8) is situated in the village of Kaslo, BC in the West Kootenay region of British Columbia, on the west shore of Kootenay Lake. Kaslo is known for the beauty and diversity of its natural wildlife and environment.

Bayridge Elementary (SD#36) is a Kindergarten to Grade 5 school of 348 students situated in a suburban residential area of Surrey, BC. It is surrounded by single family homes, backed by a forested city park area. Changing demographics have resulted in more English language support. There is an increasing number of students who are new to Canada.

The Classrooms

Both classrooms are Grade 4/5 with a mix of learning abilities. Ms. Keely Grunerud teaches the Grade 4/5 class at J.V. Humphries. Mrs. Brenda Webster teaches the Grade 4/5 class at Bayridge.

Study Unit Development

A big thank you to the following people for committing their time, energy, and expertise to this unit:

- Sylvia Dolson, Get Bear Smart Society
- Val Murray, Justice for BC Grizzlies
- Brenda Webster, Bayridge Elementary
- Keely Grunerud, J.V. Humphries Elementary & Secondary School
- Raine Playfair, Grizzly Bear Foundation



PREFACE



Photo © Steve Williamson

This teaching unit follows a year in the life of grizzly bears, through winter hibernation, spring renewal, food abundance of summer, until denning time again in late fall.

The seasons play an important role in the annual life cycle. The unit tracks their life from when they wake up in the springtime, amazingly having not urinated or defecated for many months, and not lost bone density or muscle mass, to going in search of food in vast alpine meadows and rich valley bottoms.

Leaving their dens in the spring is like the New Year for grizzly bears. They yawn and stretch and rub on trees. Cubs explore their new surroundings. It isn't long until mature males look for single females to breed. Mothers with cubs attend to the task of caring for and teaching their young. Summer and fall is spent packing on the pounds to survive another season in the den.

As snow begins to cover much of their food, winter signals a time of rest; except for pregnant females who give birth in their cozy dens and nurse their cubs during the coldest months of the year. And so the cycle begins anew.

Lesson 1 introduces specific terms that apply to the role that grizzlies occupy as ecosystem engineers and their value to both people and the land, but also to themselves. Lesson 2 explores the unique physiology of grizzlies, while lesson

3 examines how they shape the land as they move across the landscape to meet their needs. Lesson 4 looks at grizzlies' social life and ways of communicating through body posture and sounds. Lesson 5 culminates the unit by demonstrating how grizzly bears and people affect one another; it offers implications for conservation of this iconic species.

Everything that grizzlies do has a purpose during the 7 to 8 months that they are awake. They put all their waking energy into eating, mating, avoiding danger and, for females, protecting and teaching their young.

Grizzlies share much of the same habitats as people and overlap in activities on the landscape. While bears are meeting their needs, they may encounter people, human development and situations that can be hazardous or helpful to them.



CONTENTS

GRADE 4: 5 LESSONS OF 45 MINUTES EACH, PLUS FIELD COMPONENT

Unit of Study

- Preface
- Rationale
- Unit Overview
- 5 Lesson Plans
- 5 Background Information Sheets for each Lesson Plan
- 1 Field Component: bear safety presentation (indoor) and bear encounter practice session (outdoor) by a guest presenter (Gillian Sanders)

Videos

- **Why Bears?** on USB drive (incl. script) and at http://whybears.org/film/#.WqVd_ejwaUk
- **Protect What you Love** on USB drive and at <https://www.youtube.com/watch?v=tD3Etyo6F7Q>
- **All Things are Connected** on USB drive and at <https://www.youtube.com/watch?v=57V3CfP5Kak>
- **Like You** Powerpoint on USB drive

Visuals

- Term cards: Indicator, Keystone & Umbrella (lesson one)
- Value cards: economic, aesthetic, as ambassadors, cultural, spiritual and medical; as well as to themselves (lesson one)
- Scat poster
- **Who's Who?** cards (identifying the difference between grizzly bears and black bears)

- Size chart (actual size banner showing adult female grizzly bear, black bear cub)
- **Ursa Major Constellation** graphic for wall
- **A Year in the Life of a Grizzly Bear** chart
- Chart size maps of historic and current grizzly range
- 9 photos of grizzly bears as ecosystem engineers
- 8 photos of grizzly bears engaged in certain behaviours

Exercises/Games

- **Beary Puzzling** word find
- **Dengerous Journey**
- **Do You Speak Bruin?** crossword
- **What's wrong with this picture?**
- **Getting to Know Grizzlies** playing cards

Artifacts

- Grizzly bear skull, claws, track, fur (all replicas)

Additional Tools for Teachers

- Grizzly bear (GB) journals
- Pre and Post-survey knowledge of grizzly bears
- Grizzly Bear (GB) Certificates

Web links

- www.grizzlybearfoundation.org
- www.bearsmart.com



RATIONALE



In 1992, the Union of Concerned Scientists and more than 1700 independent scientists warned that humans were on a collision course with the natural world by pushing Earth's ecosystems beyond their capabilities to support the web of life. Though much has been learned since that first warning in 1992, advancements in environmental policy and human behavior have not adequately addressed the urgency of the situation. Scientists issued yet a second warning to humanity in 2017, including recommendations to immediately address this urgent state¹. Among those recommendations is stated the need for "increasing outdoor nature education for children, as well as the overall engagement of society in the appreciation of nature."

The diversity of life forms and ecosystems in Canada is vast and British Columbia is a province that stands out in this respect. Every year, BC attracts thousands of visitors from around the world who want to experience the wonder of such diverse life and wild places. But the effect of humans and our activities is a major concern². The leading cause of biodiversity loss in Canada and around the world is the loss of habitat due to human development³.

As an umbrella species, grizzlies are nature's barometer of complete and healthy ecosystems. Their ranges cover several hundred square kilometres of diverse habitat, ranging from alpine meadows to valley bottoms and beaches, so protecting grizzlies and their home benefits all plant and animal communities that coexist within their wide-ranging landscape.

Education is paramount for students to understand how grizzlies impact our environment and how we impact theirs. Our ability to thrive is inextricably interconnected. We will only protect what we care about and what we understand. When children learn about the individual nature of animals such as grizzly bears, they learn to care about their fate and also recognize the connection that humans and animals share.

There is so much unpredictability surrounding challenges that grizzlies face from the effects of climate change, collapsing salmon stocks, depleted berry crops, proliferation of resource roads, lack of safe wildlife corridors, hunting and conflict kills, etc. These are cumulative and overlapping threats to wildlife now and in the future. Good policy is based on caring, well informed understanding of wildlife and how healthy ecosystems function.

Teaching children about the iconic grizzly and interdependent plant and animal communities brings into focus the importance of how these bears live, where they live and what it takes to ensure their continued wellbeing. In this way, grizzly bears become a portal into the interconnectedness of all life, now and in the future.

¹ http://scientistswarning.forestry.oregonstate.edu/sites/sw/files/Warning_article_with_supp_11-13-17.pdf

² <http://canadianbiodiversity.mcgill.ca/english/intro/index.htm>

³ <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-species.html>



UNIT OVERVIEW

THE IMPORTANCE OF GRIZZLY BEARS IN OUR ENVIRONMENT

Big Ideas

- Grizzly bears benefit people and the planet.
- All living things sense and respond to their environment. (Science 4)
- The pursuit of valuable natural resources has played a key role in changing the land, people and communities of Canada. (Social Studies 4)

TOPIC	LESSON OBJECTIVE	ACTIVITY	RESOURCES	ASSESSMENT	NOTES/ADAPT.
Lesson 1: Grizzly bears play a key role in their ecosystem	1. Define terms Indicator, Keystone & Umbrella 2. Explain the many ways that grizzly bears have value	1. Watch video: Why Bears? (3:25) 2. Discuss in 3 small groups: 3 term cards, 7 value cards 3. Pre-survey of grizzly bear knowledge	<ul style="list-style-type: none">• Video: Why Bears?• Projector• Term cards• Value cards• GB journal• Pre-survey of grizzly bear knowledge• Ursa Major Constellation sheets and wall chart *Ext	GB journal entries	Ext: Ursa Major Constellation Teacher starts GB bulletin board
Lesson 2: Grizzly bears have unique physiology	1. List the ways that grizzly bears uniquely adapt to their environment 2. Learn that grizzly bears adaptations interest medical science	1. Use A Year in the Life of a Grizzly Bear visual to illustrate the cycle of a grizzly bear life in seasons	<ul style="list-style-type: none">• Chart paper• A Year in the Life of a Grizzly Bear overhead & chart• Blank A Year in the Life of a Grizzly Bear sheets• Beary Puzzling word find *Ext	A Year in the Life of a Grizzly Bear points	Ext: Beary Puzzling word find

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TOPIC	LESSON OBJECTIVE	ACTIVITY	RESOURCES	ASSESSMENT	NOTES/ADAPT.
Lesson 3: Grizzly bears shape their environment	1. Identify ways that grizzly bears benefit their bioregions 2. Explain how grizzly bears are “Ecosystem Engineers”	1. Show Who's Who? graphic 2. Observe grizzly bears photographs	<ul style="list-style-type: none"> Grizzly bear artifacts Who's Who? graphic Grizzly bear photographs GB journal and a blank sheet Dangerous Journey *Ext 	Grizzly bear journals: finish the sentences	Ext: Dangerous Journey
Lesson 4: Grizzly bears have a social life and ways to communicate	1. Recognize grizzly bears have a social system & ways to communicate 2. Learn that grizzly bears and people share similarities 3. Learn to respect grizzly bears by being properly informed about their nature	1. Watch Like You Powerpoint 2. Complete Do You Speak Bruin? crossword puzzle	<ul style="list-style-type: none"> Photos of grizzly bears Projector Powerpoint: Like You Do You Speak Bruin? crossword puzzle GB journals Additional notes on bear behavior 	Teacher observation GB journal entries	
Lesson 5: Grizzly bears and people affect one another	1. Recognize that grizzly bears and people can both help and conflict with one another	1. Culmination of learning to date 2. Range contraction of grizzly bears 3. Conservation measures 4. Post-survey of grizzly bears knowledge 5. Present students with GB Certificates	<ul style="list-style-type: none"> Historic and current range maps Protect What you Love video (2:09) All Things are Connected video (1:13) Post-survey of grizzly bear knowledge GB Certificates What's wrong with this picture? *Ext 	Post-survey of grizzly bear knowledge	Ext: What's wrong with this picture?



LESSON PLAN #1

LESSON OBJECTIVES

- Students will define the terms Indicator, Keystone, Umbrella
- Students will explain the many ways that GB have value

Materials/Resources

- Video: **Why Bears?** (3:25)
- Cards for Indicator, Keystone, Umbrella terms
- Value cards
- **Ursa Major Constellation** sheets and wall chart
- GB journal for each student
- Note: Begin a GB bulletin board in the classroom

STUDENTS COMPLETE: Pre-survey: What I know about grizzly bears

Introduction

ASK *What are some questions that you have about grizzly bears?*

RECORD student questions on a chart for ongoing reference.

ASK *Where do you go to enjoy being out in nature? What do you do there?*

Nature is a great teacher; wild places are not wild without healthy ecosystems. What if we could preserve wild places? We can — simply by protecting one family of animals: grizzly bears. We are just beginning to learn how grizzlies positively impact the environment. What's good for bears is good for people and wild places.

SHOW **Why Bears?** video (3:25)

ASK *What did you learn from this short video?*

RECORD student responses on chart - Have some student questions been answered?



Body

DIVIDE the class into 3 groups OR **DIVIDE** the class into several groups of 3 students each.

GB are considered a Keystone species. This means that other plants and animals depend on them for their own growth, health and protection.

HAND OUT cards with terms Indicator, Keystone or Umbrella on the front and a description of that term on the back - have students read the description of their term and restate what the term means in their own words.

HAVE all Indicator, Keystone and Umbrella card students say what they know about how grizzly bears benefit their ecosystem.

In addition to their role as a keystone species, grizzly bears are valuable in many other ways: **SHOW** charts with points on how grizzlies have value for economic, aesthetic, as ambassadors, cultural, spiritual and medical; as well as to themselves.

They even have a constellation named for them.

SHOW Ursa Major Constellation visual.

ASK *What surprises you about these values that grizzly bears have?*

Closure

HAND OUT GB Journals.

1. Students write the definitions for terms Indicator, Keystone, Umbrella in their grizzly journals.
2. Students list three important values of grizzlies.

Assessment

REVIEW GB journals to see that lesson objectives are apparent.

Extension

- **Ursa Major Constellation** sheet - draw in the bear, then add to GB journal

Notes/Adaptations

NB: This lesson will be taught around the same time that bears are coming out of hibernation so this is something the teacher might use as a “waking up” metaphor for the unit.

Adaptations for the lesson are dependent on particular class profiles.



BACKGROUND INFO: LESSON #1

Grizzly bears play a key role in their ecosystem

Grizzly bears are a good **INDICATOR** species. Healthy bear populations tell us that fish are thriving, forests are healthy, and the ecosystem is balanced. Bears need a variety of habitats to survive, thus managing habitat for bears benefits many other species, including humans. If the land is healthy enough to support a fit bear population, then it is also healthy enough to support people.

Scientists believe that grizzly bears are an essential part of healthy, fully functioning ecosystems. Known as a **KEYSTONE** species, grizzlies are ecosystem engineers that disperse seeds, till the land, fertilize forests, and help to regulate prey species. Without keystone species, ecosystems would be dramatically different or cease to exist altogether.

Grizzly bears are an **UMBRELLA** species — ensuring their survival requires that the health of the ecosystem as a whole is maintained and, by doing so, a much broader array of species is protected. Thousands of species live alongside grizzlies in bear country, like caribou, cougars, wolves, and moose. Protect bears and everything else is healthy.

Grizzly lives have value to people, including: economic (tourism), as ambassadors, of aesthetic, cultural, spiritual and medical value, as well as to themselves alone.

Economic value

Grizzly bears have considerable economic value. Wildlife enthusiasts, tourists and photographers all spend significant sums of money in order to view grizzly bears and travel in bear country. In BC, where we are still lucky enough to have healthy populations of wildlife, people come from around the world for the opportunity to spend time in their company.

In fact, surveys from areas where bears live consistently report that bears are one of the animals that visitors are most excited to see.

As ambassadors

Grizzlies are ambassadors for saving our planet's wild places; their iconic image is powerful enough to evoke the grandeur of towering mountains, ancient trees, glacial blue lakes and flowering alpine meadows. The interconnectedness of bears and wild places is inextricably complex. Grizzlies inspire us to want to protect wild places forever.

Aesthetic Value

Grizzly bears have aesthetic value to people, meaning that the primary focus is on the physical attractiveness and symbolic appeal of these animals. People are instinctively attracted to animals that are similar to themselves. Bears can stand erect like us. Their bodies are similar in shape. Their heads are round. A bear's natural



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charm and cute, cuddly-looking appearance even inspired the teddy bears we all loved and were comforted by at night.

Bears are often referred to as a charismatic megafauna meaning that they are large animals that have widespread popular appeal; they are animals that most people know about and have an affinity for.

Grizzlies also remind us of wild spaces and untouched landscapes, which is why they are often an image that's associated with Canada. They help contribute to a sense of national pride.

"Those who have packed far up into grizzly country know that the presence of even one grizzly on the land elevates the mountains, deepens the canyons, chills the winds, brightens the stars, darkens the forest, and quickens the pulse of all who enter it. They know that when a bear dies, something sacred in every living thing interconnected with that realm...also dies."

— John Murray

Cultural value

We all have much to learn and relearn from ancient cultures and their intricate relationships with wild animals.

In areas where grizzlies lived, traditional people told stories about the grizzly bear as a relative, a healer, a mentor, and a guide. Everywhere people and bears crossed paths, similar stories were shared about their interdependence and interconnectedness to the species.

Grizzly bears are central to many First Nation traditions across British Columbia, prominent in everything from tribal crests to songs, ceremonial dances, lessons, and stories passed down through generations.

For as long as grizzly bears and people have inhabited shared spaces, we have had a connection with the species.

Spiritual value

Grizzly bears are an integral part of the Canadian landscape. One study showed that people valued just knowing that bears were out there even if they never saw them. There is just something about this animal that touches us. Although difficult to capture the essence of the bear in words, it is evident that simply having bears around fuels the human spirit.

If we are observant of bears, we can learn how to have a peaceful coexistence. Bears live in the present moment. They share food resources and habitats; they are not territorial. They are not mean or malicious. If you pay attention to the rhythm of the wilderness and all of Mother Nature's creatures, your life will be enriched — filled with joy and harmony.

Medical value

Doctors and scientists have much to unravel to learn how animals' natural protection against disease or other degenerative conditions actually works; this might help us unlock treatments for certain conditions in humans.

We could all benefit from a better understanding of the bear's unique physiology and how it is different from ours.

Why don't bears suffer from osteoporosis or muscle atrophy the same as people do after long, confined inactivity? If we understood why, it could help people who are bedridden or astronauts in space.

The fact that bears don't urinate or defecate in the den could help people with kidney failure. What happens to bears' brains while they hibernate could lead to potential treatments for Alzheimer's disease.



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A bear's ability to adjust their own metabolism could aid medical doctors' work with organ transplants in people.

These are just a few examples of the secrets bears may hold to medical mysteries.

For themselves alone

Clearly, grizzlies have value to people in a number of different ways. However, the greatest value of a grizzly's life is simply the pleasure of that life to him/herself alone, just as our lives have value to us every day.

Additional Information for Teachers: Relationships with Humans (Social Studies 4)

The relationship between grizzly bears and humans is a complex one. We have been sharing the landscape since modern humans wandered out of Africa some 60,000 years ago. Although there were no doubt conflicts between bears and aboriginal peoples in Eurasia and North America, bears, especially grizzly bears, were treated with a great deal of respect.

In the northern forests, black bears were hunted for food, but grizzly bears were seldom targeted except for ritualistic purposes. In both cases, however, the killing of a bear was usually surrounded by elaborate myths and rituals. Hunters would fast for days before they went out, as a group, to bring their prey home. When they returned, the ceremonies often carried on for days afterwards as they celebrated the bear and the natural world of which they were all a part.

This relationship changed when European traders arrived. The coming of new technologies (such as the Sharps Carbine rifle) as well as new ideas spelled the end of the grizzly bear in much of North America. By the nineteenth century, trappers and hide hunters had extirpated the

grizzly bear from much of its range. The arrival of more and more settlers "necessitated" the clearing of vast areas of prairie and forest, and wildlife of all sorts, including wolves and bears, were hunted mercilessly. Sustainability was never an issue because the goal was extermination. The survival strategies that bears had developed over millennia could not defeat the guns and sheer determination of an industrial culture.

The last known Great Plains grizzly in Canada was shot and killed near the Cypress Hills in 1883, though small populations of grizzlies would hang on in the hills and mountains of the central United States until the 1930s. By the time World War II ended, grizzly bears had been relegated to the northwest United States and western Canada.

Surprisingly, those who hunted bears for sport were also responsible for transcending the popular blood-thirsty image of the grizzly and dispelling many long-standing myths about aggression in bears. The first person to challenge the view of a grizzly bear as a ferocious man-eater, perpetuated by the famous American explorers Lewis and Clark, was Lieutenant Zebulon Pike. He wrote a letter to U.S. President Jefferson stating that the bears he encountered in the Rocky Mountain West did not attack unprovoked, but defended themselves vigorously.

At the beginning of the twentieth century, attitudes began to shift. National parks were formed to preserve some of the bear's remaining habitat, and laws were enacted and enforced to protect bears and other animals from exploitation. By the mid-1950s, many bears had become roadside attractions in parks and at garbage dumps. Rather than fearsome predators to be avoided or killed at all costs, bears had become a form of entertainment.

This created as many problems as it solved for bears. People in national parks were hand-feeding bears for photo opportunities. Easy access to high-calorie garbage and treats encouraged bears



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to seek out human food in campgrounds and residential neighborhoods instead of foraging for natural foods.

As the boldness of hand-fed and food-conditioned bears increased, officials had to begin exterminating animals that made a nuisance of themselves in order to protect the very people who had created the problem in the first place.

Toward the end of the last century, the public began to place a higher intrinsic value on protecting wildlife, and management policies started to reflect the shift in attitude.

By the 1980s, feeding bears by hand or allowing them access to human food in garbage dumps was made illegal in national parks. Nonetheless, irresponsible waste management and selfish human actions persist to this day, resulting in thousands of dead bears every year.

Whether it's killing bears to rid the land of inconvenient predators, hunting bears for sport, or removing bears involved in conflicts, the intentional killing of bears is abhorrent to many people. But arguably the biggest negative impact on bear populations in the last few decades has been the unrelenting destruction of bear habitat. Increasing human population and the increasing amount of urban, recreational, and industrial developments that accompany them continue to fragment bear habitat and stress bear populations.

Putting humans and bears in close proximity results in more bear-vehicle collisions and more human-bear conflicts. Road access into wilderness areas results in increased hunting and poaching.

Grizzly bears are simply running out of room. In places where we are fortunate to live with grizzlies, we can easily share habitats by not feeding them and by respecting their needs.

Whether you regularly see grizzly bears near your home or on vacations, or if the only bear you ever see is the constellation Ursa Major, we still want the species to walk this earth.



KEYSTONE SPECIES





KEYSTONE SPECIES

Scientists believe that grizzly bears are an essential part of healthy, fully functioning ecosystems.

Known as a **KEYSTONE** species, grizzlies are ecosystem engineers who disperse seeds, till the land, fertilize forests, and help to regulate prey species.

Without its keystone species, the ecosystem would be dramatically different or cease to exist altogether.



INDICATOR SPECIES





INDICATOR SPECIES

Grizzly bears are a good **INDICATOR** species. Healthy bear populations tell us fish are thriving, forests are healthy, and the ecosystem is balanced.

Bears need a variety of habitats to survive and thus managing habitat for bears benefits many other species including humans. If the land is healthy enough to support a fit bear population, then it is also healthy enough to support people.



UMBRELLA SPECIES





UMBRELLA SPECIES

Grizzly bears are an **UMBRELLA** species — ensuring their survival requires that the health of the ecosystem as a whole is maintained, and by doing so, a much broader array of species is protected.

Thousands of species live alongside grizzlies in bear country, like caribou, cougars, wolves, and moose. By protecting grizzly food sources and habitat you ensure other species have enough to eat and places to live.

Protect bears and everything else benefits.



THE ECONOMIC VALUE OF GRIZZLY BEARS

Grizzly bears have considerable economic value. Wildlife enthusiasts, tourists and photographers all spend significant sums of money in order to view grizzly bears and travel in bear country.

In BC, where we are still lucky enough to have healthy populations of wildlife, people come from around the world for the opportunity to spend time in their company.



THE AESTHETIC VALUE OF GRIZZLY BEARS

Grizzly bears have aesthetic value to people, meaning that the primary focus is on the physical attractiveness and symbolic appeal of these animals. People are instinctively attracted to animals that are similar to themselves.

Bears can stand erect like us. Their bodies are similar in shape. Their heads are round. A bear's natural charm and cute, cuddly-looking appearance even inspired the teddy bears we all loved and were comforted by at night.

Grizzlies also remind us of wild spaces and untouched landscapes, which is why they are often an image that's associated with Canada. They help contribute to a sense of national pride.





THE IMPORTANCE OF GRIZZLY BEARS AS AMBASSADORS

Grizzlies are ambassadors for saving our planet's wild places; their iconic image is powerful enough to evoke the grandeur of towering mountains, ancient trees, glacial blue lakes and flowering alpine meadows.

The interconnectedness of bears and wild places is inextricably complex. Grizzlies inspire us to want to protect wild places forever.





THE CULTURAL VALUE OF GRIZZLY BEARS

We all have much to learn and relearn from ancient cultures and their intricate relationships with wild animals.

In areas where grizzlies lived, traditional people told stories about the grizzly bear as a relative, a healer, a mentor, and a guide.

Everywhere people and bears crossed paths, similar stories were shared about their interdependence and interconnectedness to the species.

Grizzly bears are central to many First Nation traditions across British Columbia, prominent in everything from tribal crests to songs, ceremonial dances, lessons, and stories passed down through generations.

For as long as grizzly bears and people have inhabited shared spaces, we have had a connection with the species.

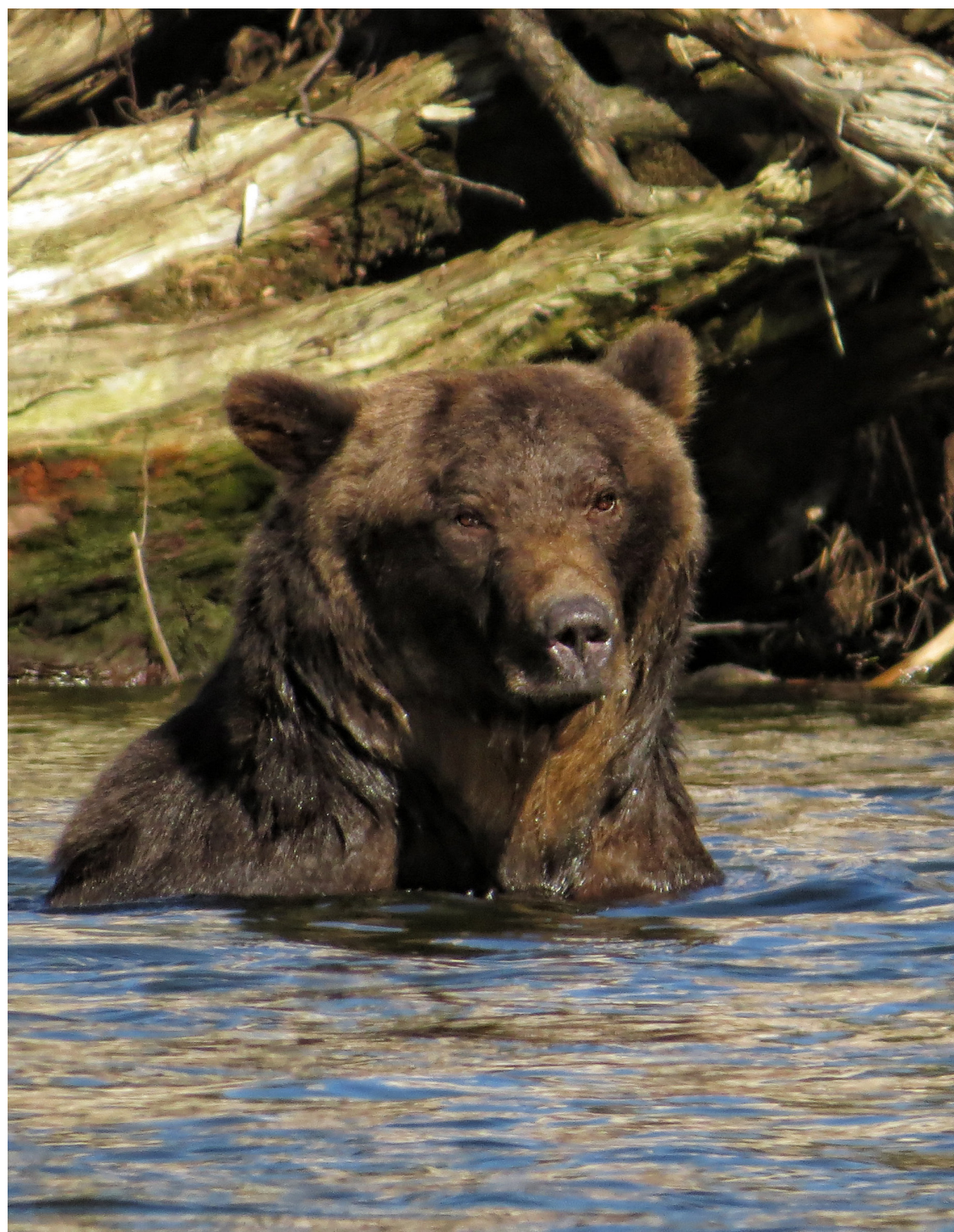




THE SPIRITUAL VALUE OF GRIZZLY BEARS

Grizzly bears are an integral part of the Canadian landscape. One study showed that people valued just knowing that bears were out there, even if they never saw them.

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THE MEDICAL VALUE OF GRIZZLY BEARS

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We could all benefit from a better understanding of the bear's unique physiology and how it is different from ours.

Why don't bears suffer from osteoporosis or muscle atrophy the same as people do after long, confined inactivity? If we understood why, it could help people who are bedridden or astronauts in space. The fact that bears don't urinate or defecate in

the den could help people with kidney failure. What happens to bears' brains while they hibernate could lead to potential treatments for Alzheimer's disease. A bear's ability to adjust their own metabolism could aid medical doctors' work with organ transplants in people.

These are just a few examples of the secrets bears may hold to medical mysteries.





FOR THEMSELVES ALONE

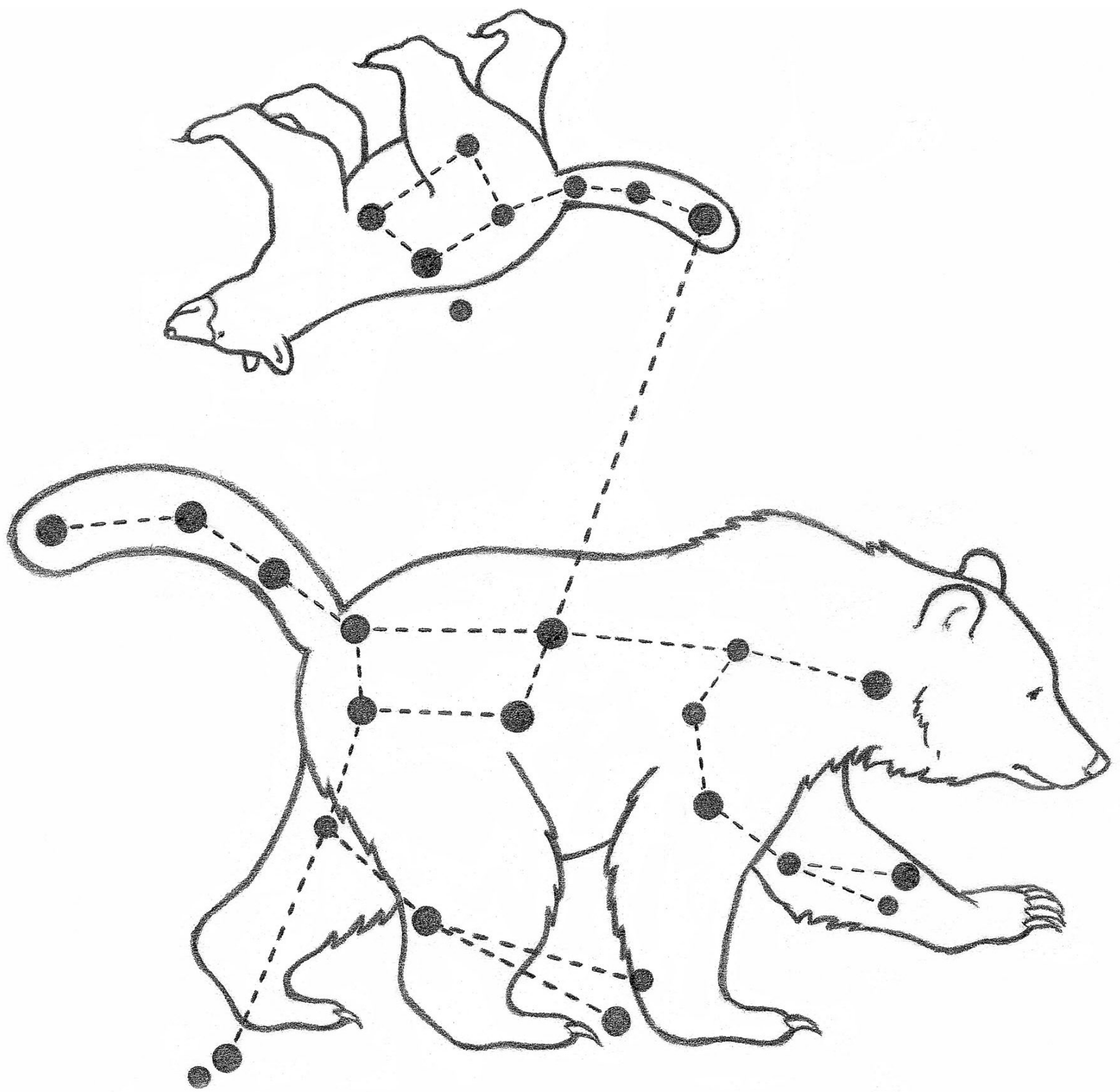
Clearly, grizzlies have value to people in a number of different ways. However, the greatest value of a grizzly's life is simply the pleasure of that life to him/herself alone, just as our lives have value to us every day.



Photo © Sylvia Dolson



URSA MAJOR & URSA MINOR



Ursa Major (which is Latin for great bear) is perhaps one of the most recognizable patterns of stars in the night sky. As kids, we came to know this group of seven stars as the Big Dipper. The handle of the Dipper is thought to be the great bear’s tail and the dipper’s cup is the bear’s flank.

This constellation has a lot of history behind it. Stories about Ursa Major date back to the Ice Age. The myths are so common and widespread in both the Old and New World that they are thought to have been carried across the Bering Land Bridge during the migrations from Siberia to Alaska—about 25,000 years ago.

It is even thought possible that the constellation actually got its name 50,000 years ago when a Paleolithic bear cult existed. It’s also one of the few star groups mentioned in the Bible (Job 9:9; 38:32).

Interestingly, although the pattern represents a variety of objects to many cultures—a plow, wagon, coffin, skunk, camel, shark, canoe, bushel, sickle, even a hog’s jaw—several

different cultures saw a big bear in the sky. First Nations mythology tells of three hunters pursuing the great bear.

A Roman myth depicts both bears, Ursa Major and Ursa Minor (Little Dipper) in a story of love, jealousy and revenge. The ancient Greeks had a few different stories to explain how the animal ended up there. One story tells of Zeus and one of his many infidelities. Zeus was married to Hera, but fell in love with Callisto. When Hera learned of the affair she swore vengeance, so Zeus turned Callisto into a bear to disguise her from his furious wife. Looking like a bear, however, carried its own risks. One day Callisto’s son, Arcas, saw a bear—really his mother—and raised his spear to kill it. To protect Callisto, Zeus quickly changed Arcas into a bear cub. Then, to head off future disasters, he put both bears among the stars. Hera saw this and finally got her revenge. She decreed that both bears would never rest again and doomed them to rotate endlessly in the night sky.



LESSON PLAN #2

LESSON OBJECTIVES

- Students will list ways that grizzly bears uniquely adapt to their environment
- Students will learn that grizzlies' adaptations/unique physiology are of interest to medical science

Materials/Resources

- Chart paper
- **A Year in the Life of a Grizzly Bear** visual (chart)
- Blank **A Year in the Life of a Grizzly Bear** activity sheets
- Extension: **Beary Puzzling** word find
- GB journals

Review

ASK *Who can describe the three big terms about GB that we learned last class?*

ASK *How many ways do we remember that GB have value?*

Introduction

ASK *Does anyone here know what grizzlies do in the winter when snow is on the ground, everything is frozen and there is no food for them?*

When snow is on the ground, everything is frozen, and there is no food for grizzly bears, they just go to sleep for a few months. It's a remarkable ability that they have evolved and of great interest to medical research to understand how they are able to maintain themselves while they sleep.

Body

SHOW **A Year in the Life of a Grizzly Bear** visual **with only the winter season showing** - have students volunteer to read the points one at a time about hibernation changes.

When they wake up, they are very hungry - **uncover the spring season.**

Through the spring and summer, they search for food and mates - **uncover summer season.**

And in the fall, they gorge on food in order to store fat for the winter - **uncover fall season.**



Grizzly bears are omnivores. They eat plants and meat. They travel long distances to get as much food as they require. Note all the different foods that grizzly bears eat in different seasons.

ASK *Imagine you went to bed in November and stayed there for 6 months. What changes would happen to you?*

RECORD student responses on chart paper, placing responses in categories that naturally fit, e.g. body changes, temperature, urge to urinate.

Incredibly, after grizzly bears wake up after their long sleep, they're really hungry and go in search of food, yet after so many months curled up in a den they haven't lost bone or muscle mass, their body temperature rises, their hearts resume normal rate and all their internal organs resume function.

ASK *Why do you think that GB adaptations are fascinating to medical science?*

DISCUSS WITH A PARTNER.

PARTNERS SHARE THEIR IDEAS WITH THE CLASS.

SHOW grizzly bears are a medical mystery visual.

ASK *How could grizzlies help astronauts? medical doctors?*

Closure

Turn to a partner and tell them the most amazing thing you learned about grizzly bears today.

On your **A Year in the Life of a Grizzly Bear** activity sheet, fill in what you have learned about grizzly bears in different seasons.

Extension

- **Beary Puzzling** word find

Assessment

ENSURE participation in partner and class discussion.

CHECK **A Year in the Life of a Grizzly Bear** activity sheet.



BACKGROUND INFO: LESSON #2

Grizzly bears have unique physiology

Bears are uniquely designed to adapt to their environment.

Males and females mate during spring. Interestingly, the mother's egg(s) are fertilized, but stay in a state of delayed implantation. In the late fall, if mom has enough fat reserves to sustain her pregnancy, give birth and nurse the cubs until spring, then the pregnancy will resume. If she has lots of fat reserves, she may have up to four cubs; if she has an average amount of fat, she may only give birth to two cubs; and if she didn't get fat enough, she won't have any cubs at all (the blastocyst or fertilized egg will just dissolve). That's how Mother Nature keeps the bear population in check. If food resources are plentiful enough to feed lots of cubs, then more cubs will be born. If food is scarce, determined by a mother with insufficient fat reserves to sustain a pregnancy and nurse her cubs, then the population won't grow the next year.

During fall, the bruin world is starting to prepare for their long winter slumber ahead. At this time of year, bears are feeding up to 20 hours a day to build up their fat reserves. In preparation for hibernation, they may gain 1.5 kg of fat per day, entering a state called hyperphagia (exaggerated eating mode).

For 3 to 6 months during winter, grizzly bears enter dens to hibernate, avoiding periods of low food availability, deep snow, and low air temperature.

In order to survive without eating, bears must slow down their physiological systems and live off their fat reserves. They actually enter a state of dormancy where:

- their heart rate drops from 40-70 beats per minute to 8-12 beats per minute,
- their metabolism [the process of converting food into energy] slows down by half, and
- their body temperatures by drop by 3-7 degrees Celsius. It's quite remarkable, actually.

While bears don't normally eat or drink during this time, they rarely urinate or defecate either. During hibernation, the bear's body essentially enters a mode of conservation, efficiency and recycling.

We used to think that when bears are hibernating they went into a coma-like state slipping into an unwakeable sleep. And while bears aren't practicing yoga or doing many activities in the den, they are as active as anyone could be in such a small living space with a drastically slowed physiology and no internet. They even dream of tasty ants, plants, and alpine vistas. They may shift positions, scratch, stretch, or adjust their bedding. The odd time, they might even leave the den, perhaps to investigate something they can smell from inside.

Amazingly, mothers give birth in the den: cubs are born in late January to early February and are about the size of a squirrel. Cubs weigh one-tenth as much as human babies and are born blind. Once they have left the womb, they find their way



GRIZZLY BEAR FOUNDATION

to their mother's teats where they nurse on fat-rich milk (and grow) until the spring. By the time the cubs are ready to leave the den, they weigh around 8 kg. Litter size is between one and four cubs; twins or triplets are common.

Grizzly bears are among the least productive mammals in North America. In theory, male and female grizzly bears born this year - if they breed as soon as they reach sexual maturity and as often as possible, and if all their offspring survive and do the same - could in the space of ten years have grown to a population of 8 bears (assuming none died).

By comparison, a pair of white-tailed deer could produce more than 1,400 descendants in the same amount of time.

Given the bear's unique physiology, they may hold secrets to medical mysteries.

Maybe even astronauts on long space voyages can benefit from what we can learn from sleeping bears? If humans were to lie still for as long as bears den, their bones would weaken and their muscles would waste away. If scientists can figure out how hibernating bears stay strong, they could find a way to help astronauts who can't do weight bearing exercise in the weightless environment of outer space.

Medical doctors could also help millions of people who are confined to beds or wheelchairs or suffering from diseases such as osteoporosis (the loss of bone density that comes with age). Even patients with kidney problems and heart disease could benefit from a better understanding of the bear's unique physiology.

While bears rarely defecate or urinate during hibernation, such a build-up of urea would cause humans to die. Bears however, have a unique ability to recycle the build-up, or urea, using its constituents to manufacture new proteins. Just

how bears do this is a mystery, but the answers may help humans who need to use kidney dialysis machines.

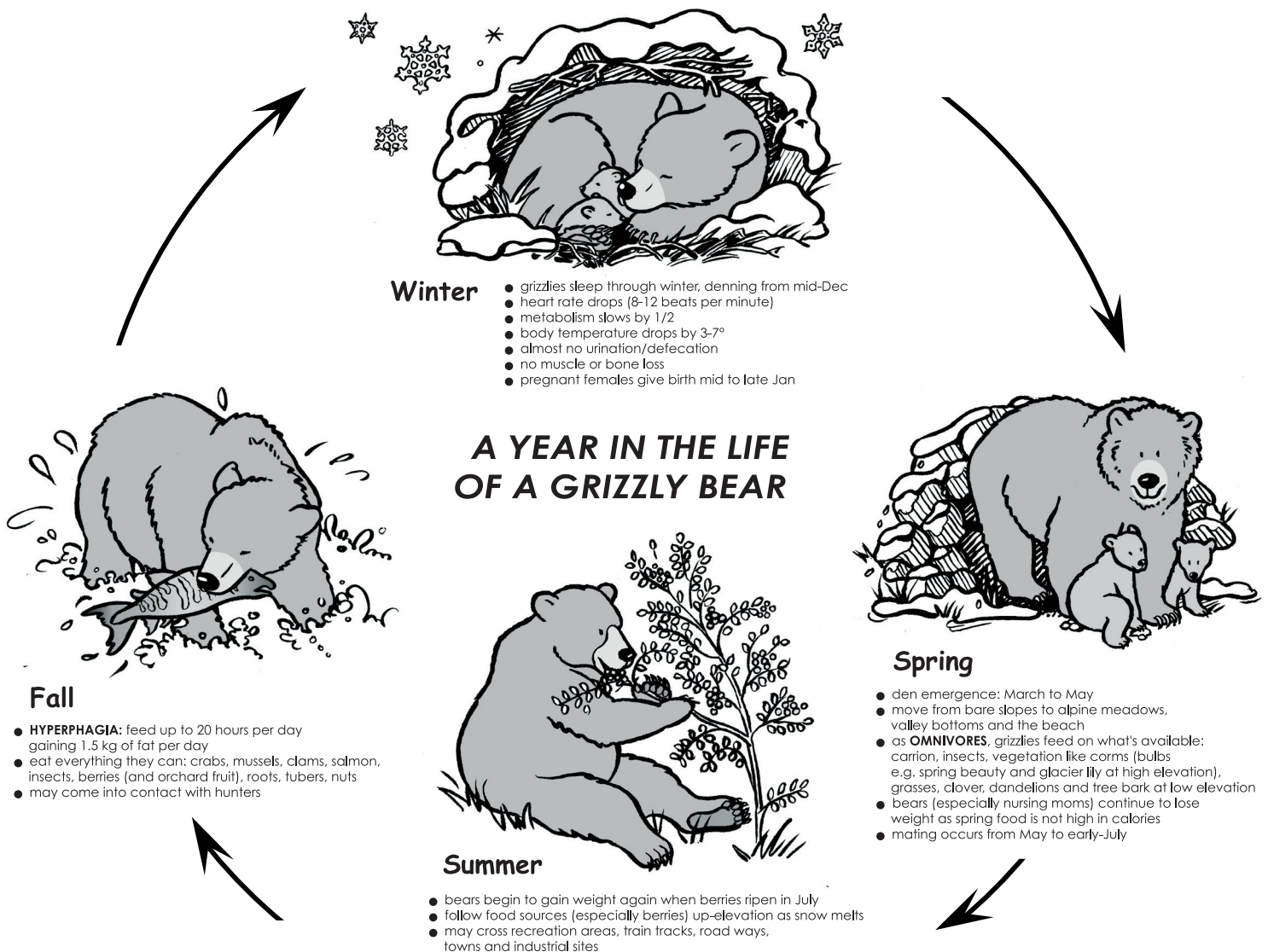
Surprisingly, when bears hibernate, their heart muscles take on very similar characteristics to certain forms of human heart disease. Yet in the spring, bears' hearts quickly recover to normal activity. Through further study, scientists hope to learn more of how bears work their magic and what might help humans recover from heart disease.

Scientists have recently discovered that there is a substance responsible for the metabolic adjustments in bears as well as other deep hibernators. They think that the substance may have applications in human medicine - in particular, the survival of organs for transplantation surgery. At present, 15 to 20 percent of all human donor organs have to be discarded as a result of deterioration. Any method that would prolong organ survival means that more transplants could occur and more lives could be saved.



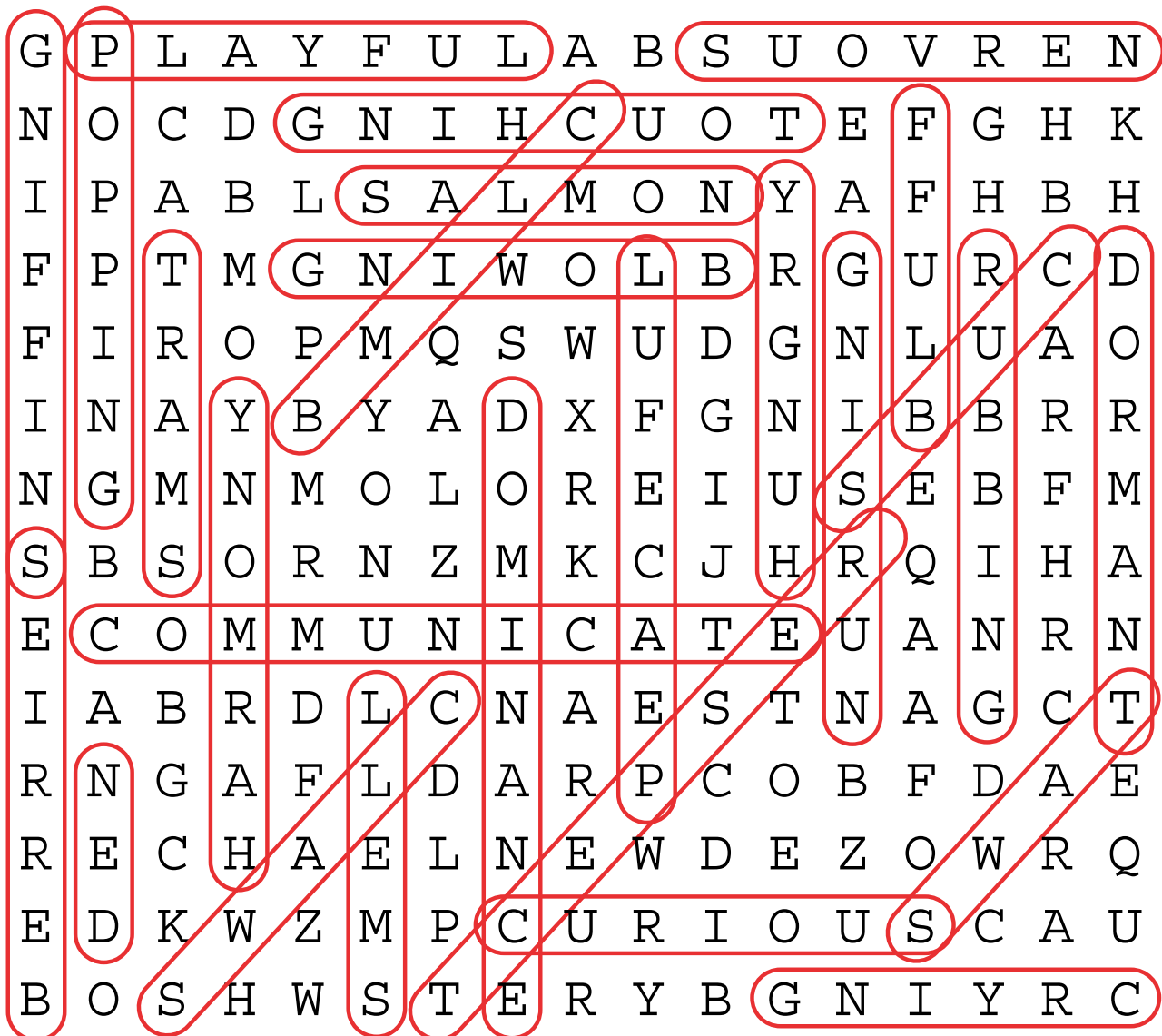


A YEAR IN THE LIFE OF A GRIZZLY





ANSWERS TO “BEARY PUZZLING”





LESSON PLAN #3

LESSON OBJECTIVES

- Students will identify ways that GB benefit their environment (bioregions)
- Students will explain how GB are “Ecosystem Engineers”

Materials/Resources

- Grizzly bear artifacts
- **Who's Who? Grizzly Bear or Black Bear: Know the Difference** Graphic
- Lesson 3 Photos of grizzly bears

Review

Sample Quiz questions, true or false: e.g. GB lose bone and muscle in their winter sleep; A pregnant GB gives birth in her den while asleep; GB are omnivores; etc.

Introduction

Last lesson, we studied how grizzly bears travel incredible distances through varied habitats, from the alpine to the valley floor, and beaches to mountain top, in search of food and mates. As they do so, they make changes to the land as they go. For this reason, grizzly bears are the “engineers” of their ecosystems, helping all the other plants, trees and animals who share the land with them.

Ecosystems are composed of many different parts, all of which interact with and affect one another. Components of an ecosystem range from the smallest bacteria and insects, to plants, birds and small animals, to the largest animals such as deer, wolves and grizzly bears. Being omnivores, grizzlies eat a large amount of plant material as well as meat. As they range between different bioregions, grizzlies provide key advantages to each bioregion that they traverse.

Body

Looking at the body of a grizzly bear gives us some clues as to how they do this.

SHOW **Who's Who? Grizzly Bear or Black Bear: Know the Difference** graphic - note claws, hump, size.

How do they: disperse seeds? fertilize the soil? aerate the soil? help trees to grow big? help birds in the forest? help other animals who live in the forest, e.g. wolves, cougar, insects, shrubs?



NB to teacher: The following activity may be done with the entire class, showing each of the images in turn, discussing how the grizzly is benefiting the land, then putting the images up on a ledge and asking students to write some sentences in their GB journals. OR: you may choose to go through each image first, then split the class into small groups and give each group one image to work with.

Summary of the 9 images

#1, 2, 3 - Eating land plants and berries - As they dig and forage, grizzlies leave bits of plant material that can be used by smaller animals and birds.

#4, 5, 6 - Fishing - Where they have access to salmon or other fish, grizzlies drag the carcasses into the forest, dispersing vast quantities of nitrogen for the plants and trees. This is a benefit to mosses, herbs, shrubs, that in turn feed birds, wolves, cougars and other forest animals.

#7, 8 - Pooping and seed germination - Grizzlies roam over large areas, constantly leaving scat for all kinds of seeds to grow and flourish. As they deposit scat and drag food into the forest, they increase beneficial nutrients in the soil that helps other plant species thrive.

#9 - Digging - The hump on a grizzly bear's shoulder is solid muscle making them powerful diggers. The holes that they make while digging for roots, bulbs and insects helps to aerate the soil, helps plants to spread, and loosens soil for other plants to gain a foothold to grow.

A strong grizzly bear population means a flourishing ecosystem with thriving flora and fauna.

Closure

ASK *Who can tell us how grizzly bears are Ecosystem Engineers?*

Grizzly bears are a keystone species who benefit all the plants and animals of their entire ecosystem.

ASK *What would happen to those ecosystems if grizzly bears disappeared?*

In GB journals, finish these sentences:

Grizzly bears are Ecosystem Engineers because _____.

If grizzly bears disappeared _____.

Extension

- **Dangerous Journey**

Assessment

HAND BACK A Year in the Life of a Grizzly Bear activity sheets to put in GB journals.

CHECK for two completed sentences in GB journals.



BACKGROUND INFO:

LESSON #3

After leaving their dens, grizzlies go in search of food, first heading to the valley bottoms where plants are beginning to sprout. Throughout the summer, grizzlies follow ripening food sources. Fall brings salmon runs (if salmon streams are in their range) - a time when bears go into hyperphagia and try to bulk up for the next hibernation. Along the way, they engineer the landscape - digging, tilling, spreading and fertilizing the land.

There is a strong connection between the good that bears do and the fact that they move between different bio-regions in search of food, i.e. beach, lowland, alpine. And, of course, this brings them into contact with people who often like to live, recreate or extract resources in those same places.

Grizzly bears shape their environment

Grizzly bears make a positive impact on the environment as farmers, by fertilizing soils, seed dispersal; and for prey control.

Like farmers in the wild, grizzly bears disperse the seeds of many plant species; each seed is deposited on the forest floor with a little 'fertilizer' to get it started. Some of these are berry producing plants that we also love, such as wild raspberries and huckleberries. These fruits provide much needed calories for bears, especially where bears no longer have access to salmon.

As grizzlies feed on migrating salmon, they drag the carcasses far into the forest where they can eat in peace. In the process, they leave the uneaten

remains alongside the coastal rivers and terrestrial habitats. The remains of the salmon contain vast quantities of nitrogen that plants need to grow. Eighty percent of the nitrogen in the forest's trees comes from the salmon. In other words, these ocean dwellers are crucial for the forest's long-term survival. These nutrients help a broad diversity of plants and animals from mosses, herbs, shrubs, trees, insects, in turn feeding songbirds, bears, wolves, cougars and other forest creatures.

Grizzlies also help maintain forest health, by aerating the soil as they dig for roots. The hump on a grizzly bear's shoulder is solid muscle so they are powerful diggers. The holes that they make while digging for roots and bulbs helps to aerate the soil, helps plants to spread, and loosens soil for other plants to gain a foothold to grow.



LESSON 3

EATING CLOVER

Grizzlies like to eat clover early in the season when it first begins to grow and is most nutritious. After it gets old and tough, clover is not nearly as beneficial.

Bears do not chew their food as much as ruminating animals like deer, moose and elk who really chew their cud. Bears swallow it with the seeds still in tact.

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LESSON 3

EATING SALMON BERRIES

Grizzlies love salmon berries and eat them as they ripen throughout the summer months.

Bears absorb the nutrition in the berries through the skin. The berries stay in tact as they are processed by the digestive system.



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LESSON 3

EATING DEVIL'S CLUB BERRIES

Grizzlies forage on ripe berries of all kinds. In fact, they will follow the ripening berries throughout different elevations throughout the season.

Berries in the valley bottoms ripen first and then as the snow melts in the mountains, shrubs begin to flower, flowers turn into berries as the sun and rain does its thing and this provides food for many animals.



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LESSON 3

FISHING

There are many different types of fishing styles: sit and wait, stand and wait, dash and grab, snorkeling, stealing, diving, and begging.

More here: <https://www.nps.gov/katm/learn/photosmultimedia/brown-bear-frequently-asked-questions.htm#3>.

All bears are individuals and have their own unique way of doing things. Mothers often teach their fishing style to their cubs. Too bad these cubs aren't paying attention to their mother's awesome snorkeling technique!



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LESSON 3

EATING SALMON

If you see bears only eating the skin, brains, and eggs of a salmon, they are practicing good energy economics.

As a bear fills up on salmon, it can “afford” to not eat certain parts of the fish. At these times, a bear’s profit margin in calories is so high that it can ignore some excess fish and leave it for scavengers like seagulls – bears generally share their food resources.



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LESSON 3

POOPING

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LESSON 3

GERMINATING SEEDS

Grizzlies are like farmers in the wild helping to disperse seeds.

Because bears deposit seeds in their scat, the seeds come complete with their own fertilizer which even holds a bit of moisture to help germinate seeds.

As such, grizzlies have a positive impact on the environment.

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DIGGING

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WHO’S WHO: GRIZZLY BEAR OR BLACK BEAR?

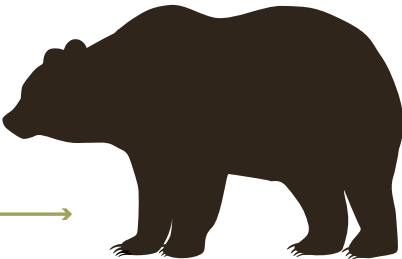
PHYSICAL CLUES:

- Short, wideset ears
- Round face

- Shoulder hump (this is actually a muscle)

- Short, stepped facial profile

- Long, pale claws



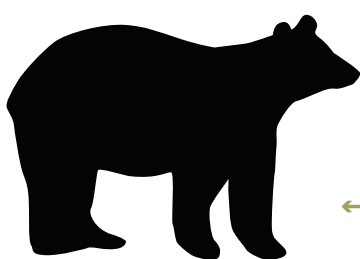
GRIZZLY BEAR *URSUS ARCTOS*

- Flat shoulder
- Rump is highest point of body

- Tall ears
- Slender face

- Straight facial profile, light muzzle

- Short, dark claws



BLACK BEAR *URSUS AMERICANUS*

ENVIRONMENTAL AND BEHAVIOURAL CLUES:

- When startled, likely to stand his/her ground or bluff charge
- Prefers open meadows
- Track shows front paw toes in almost a straight line



GRIZZLY BEAR TRACK *URSUS ARCTOS*

- When startled, likely to run away or climb a tree
- Prefer forested areas
- Track shows front paw toes in a very curved line



BLACK BEAR TRACK *URSUS AMERICANUS*



LESSON PLAN #4

LESSON OBJECTIVES

- Students will recognize that grizzly bears have a social system and ways to communicate their intent
- Students will learn that grizzlies are similar to people in many ways
- Students will respect grizzly bears by being properly informed about their true nature

Materials/Resources

- Lesson 4 Photos of grizzly bears playing, studying a toy (stick), huffing, chasing, etc.
- **Like You** Powerpoint
- **Do You Speak Bruin?** crossword puzzle
- Projector
- GB journals

Review

ASK *If you owned an engineering company, why would you hire grizzly bears?*

Introduction

SHOW **Like You** Powerpoint and **NARRATE** as you go.

ASK *What ideas do you get from the **Like You** powerpoint?*

ASK *What do you think these bears are communicating?*

RECORD student responses.

When a bear makes sounds and gestures, they are communicating something to other bears, other wildlife or to people in their space. We cannot speak bear, but we can learn to interpret what a bear wants to say when they “speak”. We can watch how a bear communicates with other bears, and then recognize the similarities when a bear tries to communicate with us. What we have learned from observing bears is that when we learn to listen and understand, it’s much easier to get along.



Body

Not unlike people, grizzly bears can be empathetic, fearful, joyful, playful, social and even altruistic. They're all individuals and have unique personalities. Like us, bears have social interactions. Mother bears are devoted and caring, affectionate, protective, sensitive and attentive. They laugh and smile, just like you and I. Like you, they may wrestle or hug, males and females nuzzle each other on the neck. They have rivals, friends, alliances and mentors. Like you... bears want to enjoy their day, play a little, get a few things done and live to a ripe old age.

SHOW photographs to the class that reveal different bear postures. Teacher uses information on the back of the image to explain what the bears are communicating.

HAND OUT Do You Speak Bruin? crossword puzzle - in small groups, students work to complete the puzzle using information learned in the lesson

Closure

ASK *Do you see similarities between people and grizzly bears?*

ASK *How do you think people and bears get into conflict with one another?*

Assessment

TEACHER OBSERVATION - did students get the idea of how grizzlies communicate?

CHECK reflections in GB Journals.

Notes/Adaptations

In order for students to have the background information to complete the crossword puzzle, check to make sure that the necessary knowledge is included in the lesson. See Background Information for Lesson 4.



BACKGROUND INFO:

LESSON #4

Bears have their own way of communicating

Understanding grizzly bear behaviour is an essential part of creating a safe environment for both bears and people. Bear behaviour is generally predictable. The more that people learn about bears, and how they behave, the less likely there will be human-bear conflict.

Most interactions between bears involve considerable tolerance and restraint. They usually display the same tolerance towards people. Bears prefer to avoid people whenever they can. Each year countless interactions occur between people and grizzly bears without harm. A meeting... a mutual departure... no attacks, no injury, no news.

Bears communicate using body language, sounds and smells. Bears treat humans just as they would other bears; the problem is that bears are very physical with each other, with the intentional use of bites, swats or body posturing. Learning about bear behavior is beneficial to people, whether or not they live or recreate in bear country.

Bear behaviour signals what they are “saying”

Grizzly Bears evolved in treeless habitats and this influenced their behavioral response to perceived threats. While a black bear’s first line of defense is retreat, grizzlies, especially mothers with cubs, will defend themselves when threatened and can be very aggressive towards other bears and

people that they perceive as threats. People must use extreme caution around grizzly bear families. However, grizzlies can be very social with one another and can even form alliances and friendships — some adult bears have even been known to mentor younger unrelated bears. Young unrelated subadults hang around in pairs and even groups. Bears who share a particular region are usually familiar with one another and meetings consist of complex social exchanges.

Grizzly Bears, like humans and other animals, have a “critical space” — an area around them that they may defend. Once people enter a bear’s critical space, the bear is forced to act — to run away or to be aggressive. The size of the critical space is different for every bear and every situation.

Bears are very curious and will inspect odours, noises and objects to determine if they are edible or playable. Standing up on their hind legs allows a bear to get more information from their senses of smell, sight and hearing. It is a sign of curiosity, not aggression. However, if they do detect a threat, they are likely to act on it.

Bears become accustomed to other bears and to people.

Grizzly Bears live in a dominance hierarchy based on age, gender, size and temperament. Mature males are at the top of the hierarchy, and subadults and cubs at the bottom. Bears establish and maintain their social position and place in the hierarchy by posturing or acting aggressively.



Grizzly bears don't actually growl, although some sounds, like a fear moan or "huffing" might have a little throaty quality. They do what is called jawing — holding the mouth open to intimidate an opponent. Hollywood movies use dubbed-in wolf or lion growling to make bears sound more threatening.

Mother grizzly bears tend to be affectionate, fiercely protective, devoted, strict, sensitive and attentive toward their cubs, raising them to an age where they can survive on their own (usually around 3 years of age). They avoid contact with male grizzlies, who can be a threat to young cubs.

Female cubs may remain in their mother's natal home range, but males are discouraged from staying and must establish a new home in order to maintain genetic diversity.

Bears learn to live around people in the same way that they live around other bears. Because plentiful food resources can be localized — salmon in a stream or berries on a mountainside — bears have evolved behaviour that allows them to tolerate each other at close distances. This behaviour is transferred to their relationship with humans. If they are not shot or harassed, bears habituate to people the same way they do to each other.

However, grizzlies command serious respect. Getting too close to a Grizzly Bear to get a selfie or a photo is a recipe for disaster, usually for the bear.

A grizzly bear that exhibits defensive behaviour **MUST** be taken seriously. A defensive grizzly is sending a clear message to an intruding human to immediately remove themselves as a threat. The grizzly may be defending cubs, a food source or themselves. Any of these circumstances could lead to a potentially dangerous situation.

Resources:

- **Like You** Powerpoint
- Grizzly Bear playing cards

Communication and Behaviour: Additional Background Material for the Teacher

When a bear makes sounds and gestures, what are they trying to communicate? We cannot speak bear, but we can learn to interpret what a bear wants to say when they speak. We can watch how a bear communicates with other bears, and then recognize the similarities when a bear tries to communicate with us. What we have learned is that when we learn to listen and understand, it's much easier to get along.

Bears communicate with each other to keep cubs and mothers together, find mates and maintain social order. While bears speak a language of dominance and submission, they are really not that unlike us. And ursine communication is not unlike communicating with your pet dog. Like us, bears show compassion, kindness, politeness and even contempt sometimes. Unlike people, bears don't generally have an "agenda", unless they have had a bad history with humans threatening them or their family. Bears respect people and only concern themselves with us if we are behaving in a threatening manner, or perhaps mistake us for another bear.

Bears convey their needs and emotions through a diverse range of body language, vocalizations and odour signals.

Body language

A bear's body posture can communicate their mood. And it's not that hard to read, so long as our minds are open and receptive and not filled with fear and misconceptions.

For example, walking or running away, sitting and lying down convey that the bear is being respectful and is comfortable with another bear or person. The bear is saying he wants to get along and does not want to fight for dominance, a fishing spot or a female.



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Conversely, a bear can convey dominance or curiosity by approaching at a walk or run. Or, he may lunge toward a perceived threat.

Bears may try to intimidate one another to get what they want. Or they may be saying, “let’s talk about it” rather than fight about it; I don’t really want to hurt myself or you. Although bears are large and powerful animals capable of causing injury to one another, they prefer to use ritualized threats and displays as an alternative to actually fighting. The grizzly may be defending cubs, a food source or themselves. Sometimes, a bear may also use these same behaviours with people – and they can be very convincing, so it’s important to listen to what a bear has to say.

A bear uses head and mouth movements as well as body orientation. A bear may relay information by “gaping” - opening its jaws wide in close proximity to another bear’s face that he’s trying to impress. A bear may circle an adversary with head high, then drop it and begin a series of short open-mouthed lunges as it becomes more challenging.

A bear that is very agitated and may be about to make contact may have their ears flattened against their head. This may signal the bear’s intentions, but it also protects the ears from bites. Approaching bears often have their ears cocked forward, likely listening for signals. A grizzly is more likely to stand his ground and “push back” with threats than a black bear.

A bear sends a very strong message by bluff charging their rival – a full-tilt run, stopping short at the last minute. Just before charging, he may lay his ears back and lower his body closer to the ground, fixing his eyes on the object of his fear. Bluffs are used to intimidate an opponent. Back off now!

Although bears may use offensive postures to communicate dominance, they also have peaceful, non-threatening exchanges. One of these interactions is play. A favourite sport of bears is wrestling and jawing – sparring with their open mouths almost touching. Dogs do this all the time

when they’re playing. A wrestling match between two bears contains many of the actions and postures seen in a potentially damaging fight, but the motivations and intensities are different.

The bond that exists between a mother and cub is constantly reinforced through play, touching and nursing. Siblings constantly touch and play together. Bears of similar social rank share elaborate greetings of rubbing and sniffing. Males and females use these same social signals during the mating season.

Vocalization

Unlike bears in movies with dubbed-in soundtracks, bears do not usually vocalize. When the need arises, they communicate with grunts by expelling air in different ways, or with a resonant “voice.” Grizzly bears are less likely to vocalize than black bears.

Bears vocalize at three levels of intensity. The lowest level or most common bear sounds are tongue clicks and grunts, which are used in amicable situations, when vocalizing to play partners, mates, cubs, and occasionally people.

Bears may use huffing or blowing (expelling air) to try and diffuse a potentially threatening situation before it escalates. It is usually accompanied by form of body language as described above.

For example, a mother bear can send her cubs scampering to safety with a single huff, and then when the danger has passed, a few grunts summon the cubs again.

In other situations, a bear may huff or clack his teeth to ask for “space”. This request should be honoured and respected by people. Bears will have their own reasons as to how they respond to another bear’s huffing or teeth clacking; they may yield to the request, or they may make a more dominant stand and insist on whatever it is they want.



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Grizzlies of close social rank use low-level vocalizations to communicate when near one another. Vocalizations may serve more than one purpose. An agitated female grizzly bear makes popping sounds by bringing in air, clicking her teeth and moving her cheeks. As she “pops” she draws in scent, warns that she is agitated, and at the same time alerts her cubs.

Startled grizzlies may clack their teeth, turn sideways to show their body size or make sudden short rushes at their contender. These warnings **MUST** be taken seriously!

The highest intensity vocalizations are expressed with their human-like voice, which they use to express a range of emotions. A bear’s resonant “voice” is reserved for strong emotions and is seldom used except by males fighting over a mate or a female defending her cub from a male. But, cubs will also readily scream in distress, whine when approaching their mother or give a tremulous hum when nursing or comfortably warm.

Adults use this voice when in pain (bawling), in fear (moaning), in combat (bellowing), or when seriously threatened (deep-throated pulsing sound). Unlike cats and dogs, bears seldom, if ever, growl, although the fear-moans of treed or trapped bears are often mistaken for growls. Predatory attacks are silent, as is normal feeding and even play.

Odours

Odours send messages to other members of the bear population. Odours from urine, feces and body scent can reveal a lot about a bear. They can identify an individual, divulge its sex and age, or whether they are sexually receptive. Males use urine to advertise their presence during the breeding season, both as an attractant to other females and as a warning to other males.

Bears often communicate with each other by marking trees with their scent. This is usually done

by standing on two legs and rubbing the back, shoulders and especially the back of the head on a tree, telephone pole or other object. They may bite and claw the trees, too. Scent reveals individual identity, reproductive status and probably mood.

Marking is most frequent by adult males before and during the mating season (from late May to early July), but some marking is done by all bears in all seasons of activity. Any bear that passes a marked tree is almost certain to stop and smell it and perhaps add its own scent. Marking is also recognized by other wildlife in the forest such as wolves, cougars, and deer.

Bears can be very social

Bears are often described as asocial when compared to wolves, chimps or lions, but to use the term “asocial” to describe bears is incorrect. While bears do not live in extended family groups or join in hunts, they can co-exist in very close proximity to each other and in fact form alliances and friendships – some adult bears have even been known to mentor younger unrelated bears; young unrelated subadults hang around in pairs and even groups (likely because there is strength in numbers).

The bears of a region are usually familiar with one another and meetings consist of complex social exchanges. Some bears like each other and other simply don’t tolerate one another in their respective home ranges – not unlike people’s relationships with each other.

Source: <http://www.bearsmart.com/about-bears/communication/> (and consultation with Ellie Lamb)

Behaviour videos

- Great Bear Stakeout (one hour): <http://xmovies8.fm/watch/OGgoDYGR-great-bear-stakeout-season-1.html> plus some short clips <http://www.bbc.co.uk/programmes/p0176qj5>



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- Mother and cubs with intruder: <https://www.youtube.com/watch?v=97bCm46Ms4s>
- Grizzlies break into 2 brutal fights at a fin whale carcass in Alaska. In the first fight the giant male attempts to drag the female by the top of her head into the ocean where he can drown her, a method bears use to kill each other more quickly, but she uses an amazing spin move to break free. https://youtu.be/da4ms51cF_M
- Two giant male grizzlies, or coastal brown bears, battle for dominance during mating season on the Alaska Peninsula. Fights like this can result in serious or fatal injuries, as the drive to mate is very strong. Female, or sow grizzlies, will chose to copulate with the most dominate males, so the winner's genes prevail- classic evolution at work. Males, or boars can grow to over 1500 pounds, making them the largest land based predators on earth (polar bears are a tiny bit bigger, but they are considered marine mammals). <https://youtu.be/-6r81UOzIHg>
- Bear fight and fishing highlights from 2010 bear viewing expeditions on Katmai Coast: <https://youtu.be/zNehtyJMK2A>

LESSON 4

FAMILIES

Grizzly family units consist of a mom and cubs.

The cubs stay with mom for up to 3 years or more, being protected and taught by her.

Bears have good memories - so cubs learn where to find food in different seasons, which pathways to walk, trees to rub on and dangers to avoid.



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LESSON 4

MOM'S ROLE

When a family travels together, mom keeps watch and is aware of everything around them.

In the forest, you can often see how a group of bears have followed in each other's footsteps.



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LESSON 4

PROTECTIVE

Mother grizzlies are very protective of their cubs.

For this reason, we need to be very respectful of family groups of bears and to give them lots of space (and carry and know how to use bear spray in case of close encounter to ensure that both people and bears can leave the situation safely).



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LESSON 4

ON GUARD

Grizzlies are watchful and will stand up to see what's going on or to see what is coming.



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LESSON 4

RELAXING

When they are relaxed, and not threatened, grizzlies can become accustomed to a human presence, seeming to pose for a photo - or even appear bored with the whole thing!



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LESSON 4

PLAYING

Grizzly cubs love to play, like any children.

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LESSON 4

TOY TIME

Bears are very curious about everything in their surroundings and can make a toy out of natural objects that they find.



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LESSON 4

IN CAPTIVITY

So much has been learned about grizzly bears since the time when they were viewed inside a cage.

Bears deserve to be wild and free rather than be stuck in a cage like this. This is from Stanley Park, Vancouver, in the early 1950s.

IN CAPTIVITY

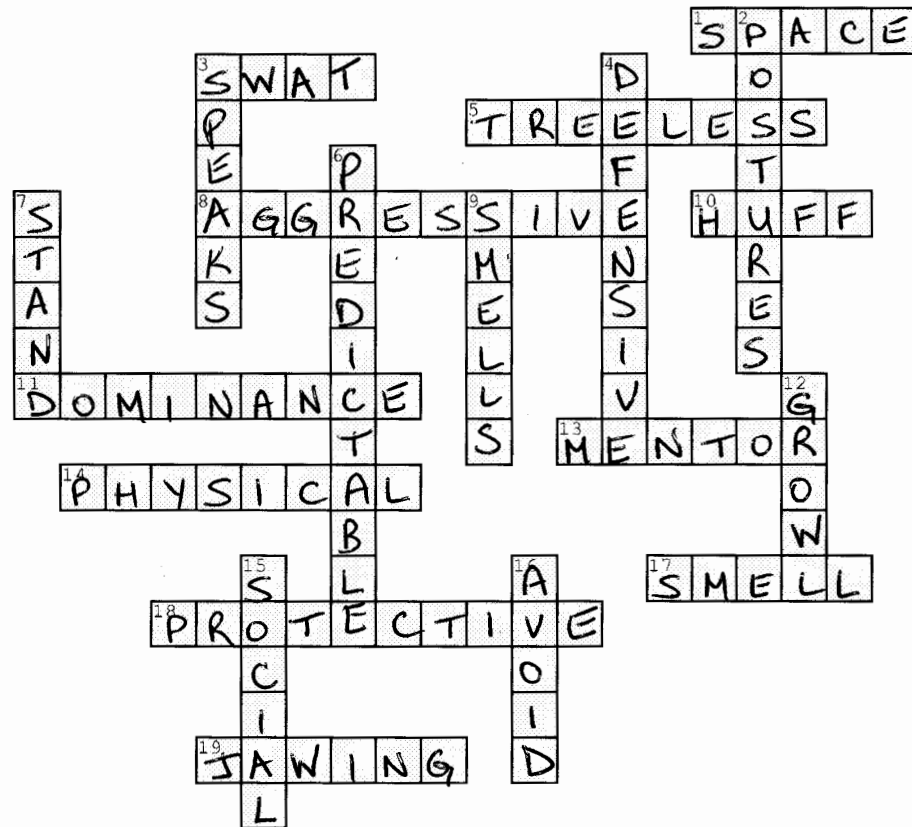
So much has been learned about grizzly bears since the time when they were viewed inside a cage.

Bears deserve to have space to roam, and be wild and free, rather than be stuck in a cage like this. This is from Stanley Park, Vancouver, in the early 1950s.



DO YOU SPEAK BRUIN?

Complete the crossword below



Created with [TheTeachersCorner.net Crossword Puzzle Generator](http://www.TheTeachersCorner.net/CrosswordPuzzleGenerator)

Across

1. Grizzly bears, like humans and other animals, have a 'critical _____' which you should respect at all times.
3. If you do get too close, a bear might _____ or bite.
5. A grizzly bear behaves differently than a black bear because they evolved in _____ habitats.
8. If a person enters a bear's critical space, the bear is forced to act - to run away or be _____.
10. A sound that a bear makes when s/he is nervous. It sounds like air being expelled loudly.
11. Bears live in a _____ hierarchy based on age, gender, size and temperament.
13. An older bear who helps a younger bear find his/her way in the world is called their _____.
14. Bear communication can be very _____. It's best not to get too close.
17. What is the bear's keenest sense?
18. Mother bears are fiercely _____ of their young.
19. When a bear holds his mouth open, it is called _____.

Down

2. Bears communicate their dominance, by displaying body _____.
3. When a bear _____, we need to listen!
4. If a bear feels threatened, s/he may behave in a _____ manner.
6. Bear behaviour is generally _____ if you understand what they are communicating to you.
7. A bear might _____ on their hind legs to get a better view of their surroundings.
9. Bears communicate using body language, sounds and _____.
12. It is a common misconception that bears make this sound. It is often the sound that is dubbed into movies in Hollywood.
15. Bears form alliances and friendships, so they are said to be _____ animals.
16. Rather than coming into conflict with people, bears prefer to _____ people whenever they can.



LESSON PLAN #5

LESSON OBJECTIVES

- Students will recognize that grizzly bears and people can both help or conflict with one another

Materials/Resources

- Chart size maps of historic and current grizzly range
- Post-survey knowledge of grizzly bears
- Videos: **Protect What you Love** (2:09) and **All Things are Connected** (1:13)

Review

Looking at the GB bulletin board, **ASK** what have we learned about grizzly bears?

Introduction

SHOW the two maps of grizzly range, historic and current.

ASK What do you observe?

ASK Why is the range of grizzly bears getting smaller?

Body

As people build more roads, communities, recreation and industry in BC, grizzlies find it harder and harder to move around. If there are no safe routes for them to travel in search of food, they can come into contact with people and get into trouble.

Female grizzlies generally travel as far as 200 to 600 km.

Male grizzlies travel quite a distance further for food and mates - their home range is 900 to 1,800 km².

That would be like us walking from _____ to _____ in just 7 months!

Teachers: Please fill in relative distances from your own community to make the distance relevant to the students in your class



SHOW *Protect What you Love* (2:09).

ASK *How can people help grizzlies?*

Describe ways that people are helping grizzlies: ending the grizzly trophy hunt; using bear proof cans; safe wildlife corridors; fencing; fruit picking; being properly informed about how grizzly behaviour and communication; educate people about keeping their distance (selfies!); camping ethics; etc.

Closure

SHOW *All Things are Connected* by Chief Seattle (1:13).

ASK *What is the main message of this video?*

STUDENTS Complete post-survey of grizzly bears knowledge.

Extension

- **What's wrong with this picture?** handout

Assessment

REVIEW post-survey answers of grizzly bear knowledge.



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BACKGROUND INFO: LESSON #5

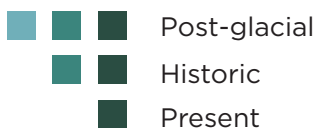
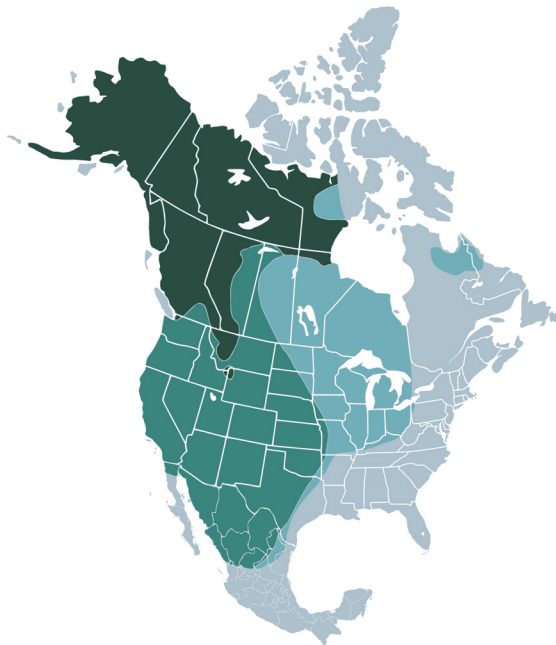
Grizzly bears and people affect one another

What if we could preserve wild places? We can, simply by protecting one family of animals: GRIZZLY BEARS.

Remember... grizzly bears are a keystone species, indicator species and umbrella species....

Protect bears and everything else is healthy.

The below map shows how the historic range of grizzly bears is shrinking.



This is you.



What grizzly bears need, you need - because we're all in this together. Our future relies on these wild places.

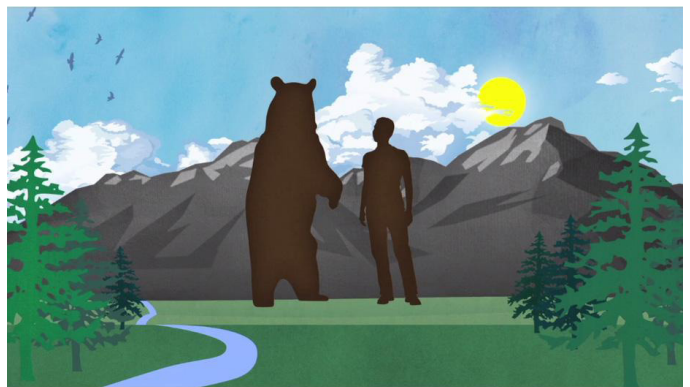


Illustration © WhyBears.org

Map Sources: Feldhamer, George A., Bruce C. Thompson, and Joseph A. Chapman. Wild Mammals of North America; Biology, Management, and Conservation (2003). Creative Commons Share Alike 3.0 Unported; and Government of Canada, COSWEIC Assessment and Status Report on the Grizzly Bear *Ursus arctos* in Canada - 2012.



What can we do?

Go on your own journey. Learn everything you can. Discover those working to protect bears, their ecosystems and the wild spaces they inhabit. Join them. Support them. Tell others.

Remember: what's good for grizzly bears is good for people and the planet.

Source: WhyBears.org

Conservation

Conservation for grizzlies requires these key life requisites: a place to live (habitat), security (freedom from persecution), sufficient foods, and a mate. Despite the widespread perception that BC has plenty of wild untouched places, the timber industry, hydro dams and other energy infrastructure, agriculture, human settlements, and recreation have brought our expanded human footprint into many natural areas.

Human-grizzly conflict

When all their needs are met, grizzly bears can live up to 25 years or more in the wild. Food availability has a direct impact on all wild animals, but the primary threat to grizzly bears is human interference: 87% of grizzly deaths are human caused.

Every year, an average of 350 grizzlies die from hunting, poaching, conflict with humans, or car and train collisions (*NB. this is a pre-2018 number that will be monitored now that the grizzly hunt has been terminated in BC*).

A world without bears?

Why is it so important to save our grizzly bears? It is not just because they should be there for our children. It is not just because grizzlies are an integral part of the ecosystem, and it is not just because people need the wild things for their own sense of peace. It is for the wellbeing of the animals themselves, because they deserve to live out their lives in peace. Grizzly bears need our care and stewardship.

Protect what you love

British Columbia may be home to as many as half of Canada's remaining grizzly bears — and the last best hope to maintain healthy populations.

Grizzlies need protection from habitat degradation/loss and food source depletion, as well as human-caused mortality resulting from vehicle/ train accidents, conflict kills, hunting, poaching, and climate change. Protect grizzly bears because they matter!

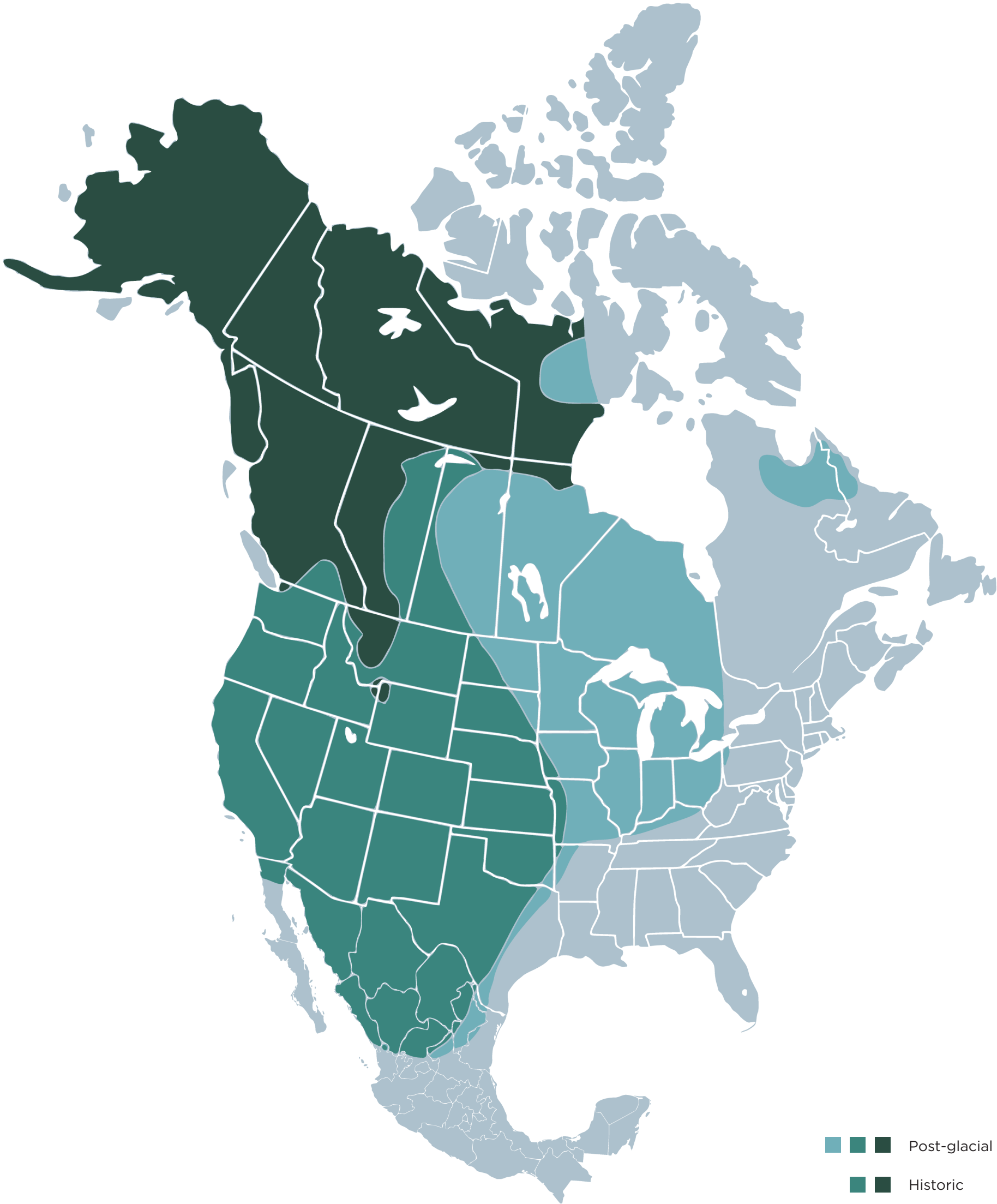
Video Resource:

- All things are connected: <https://www.youtube.com/watch?v=57V3CfP5Kak>



HISTORIC RANGE OF GRIZZLY BEARS

Sources | Feldhamer, George A., Bruce C. Thompson, and Joseph A. Chapman. Wild Mammals of North America; Biology, Management, and Conservation (2003). Creative Commons Attribution Share Alike 3.0 Unported; and Government of Canada. COSWEIC Assessment and Status Report on the Grizzly Bear *Ursus arctos* in Canada - 2012.





GRIZZLY BEAR FOUNDATION

FIELD COMPONENT

LESSON OBJECTIVES

- Students will understand what to do in case of a grizzly bear sighting

Grizzly Bear Safety Education in Schools Program

Delivery time: 1.5 hours

- 40 mins indoor bear safety presentation
- 5 mins - go outside into schoolyard
- 20 mins field component - what to do if a bear is in the schoolyard or when you see a bear
- 15 mins bear encounter practice session
- 10 mins last questions, discussion, wrap up

Presented by:

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