

# An Uncertain Future

Large mammals and carnivores are indicators of ecosystem health. Using a number of maps, students compare the historical and present distribution in North America of several large carnivores, and try to deduce what changes have occurred within the ecosystems in which they lived.

**Time Required:** 40 minutes

**Materials:**

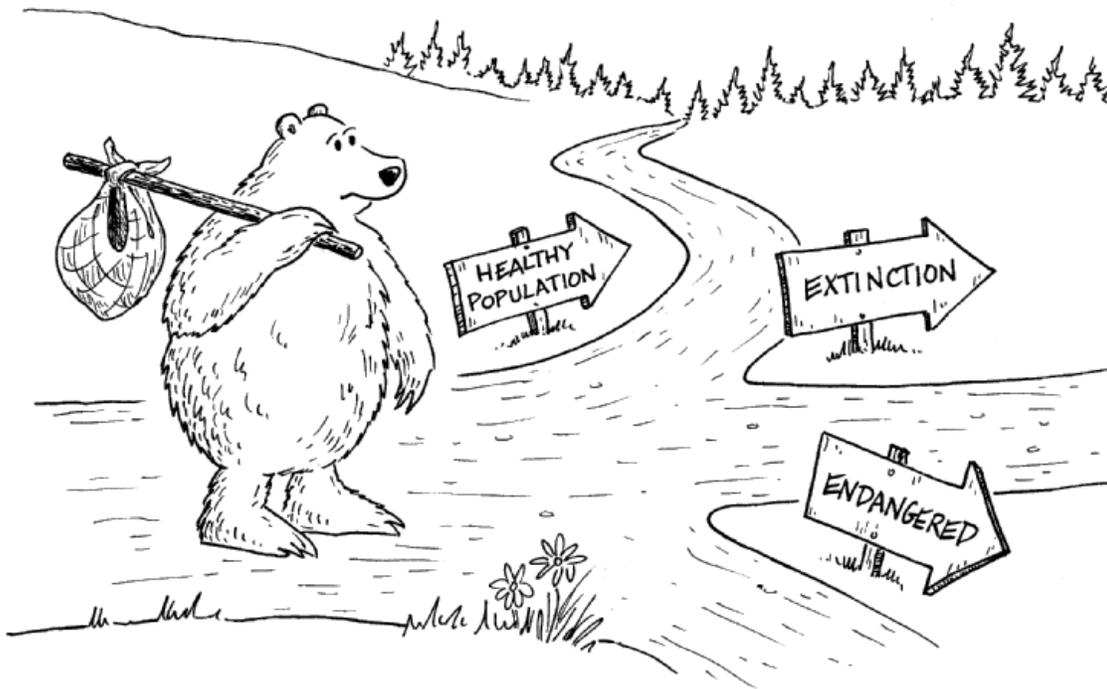
- transparency copies of all illustrations, including distribution maps for wolverine, cougar, wolf, and grizzly bear
- paper copy of the Present Distribution of Grizzly Bears map for each group of students

**Instructions for the Teacher:**

1. Ask the students:

*What is a carnivore? What is a predator?*

A carnivore is an animal that eats meat. A predator is an animal that hunts other animals for its food. While most carnivores are predators, some, such as the wolverine, are scavengers, eating animals that are already dead.



Tell students that you will be reviewing together a number of maps that show changes in the distribution of various large carnivores. The presence or absence of carnivores or large mammals in an area can usually be used as an indicator of ecosystem health because carnivores greatly influence the entire food web.

Carnivores require large areas for their habitat and they don't like being close to human activities. For these reasons, they disappear when their habitat is fragmented by human activities into smaller areas. If large predators can survive in an ecosystem, it usually means the system is healthy enough that most other animal species can also survive.

2. Review the maps of cougar, wolverine, and wolf with the class. Ask students:

***Have these animals disappeared from much of their original range? Why did this happen?***

There have been many changes to the land, which prevent large carnivores from living in their traditional habitat. Examples of change or disturbance include agriculture, mining, forestry, cities, roads, and other kinds of human developments.

***Examine the "last refuge" areas for these animals. What do you think they look like - mountains, forests, or prairies?***

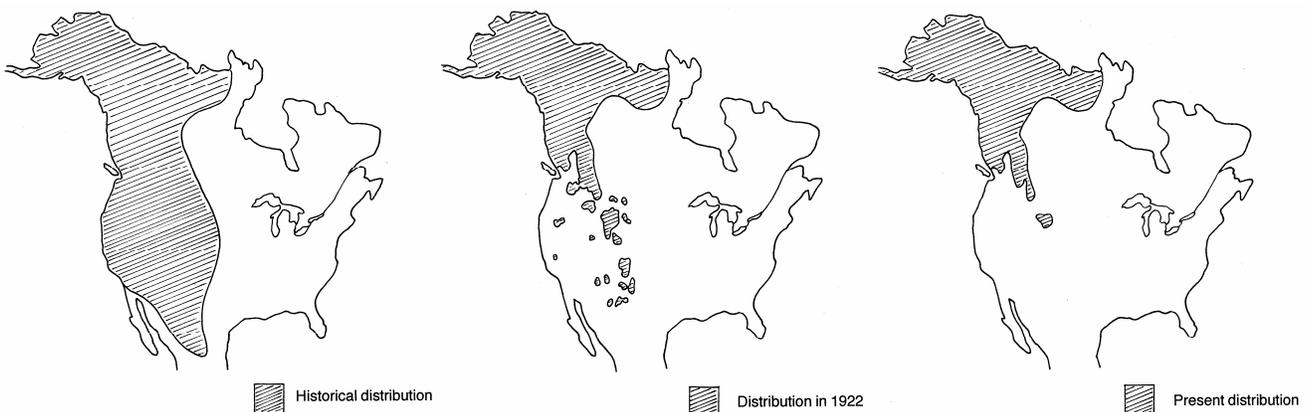
Most of the carnivores' last refuges are the mountainous areas where humans have not yet settled in large numbers. Some large untouched forests may also be home to these animals. Humans have dramatically altered the prairies because native grasslands have been ploughed up and are no longer hospitable to these animals.

3. With your students, review the map showing the historical distribution of the grizzly. Ask them:

***Was the grizzly once found in Mexico, throughout the mid-west states, or Saskatchewan?***

The answer to all three questions is yes! In fact, the grizzly is believed to have evolved in the grasslands, developing its long claws and hump of muscle on its back to help dig up plants and ground squirrels.

4. Show the 1922 Distribution of Grizzly Bears. This map shows where the grizzly could be



found over 75 years ago. Ask students:

***Why do you think the range of the bear has shrunk?***

The answer is generally the same as for the other animals. The West experienced massive immigration of pioneering families in this period. As the land was ploughed up and cities, railways, roads and industrial plants were built, the natural habitat that bears need to survive was fragmented or destroyed. This habitat loss, along with intense hunting pressure, eventually caused grizzly bears to disappear from settled areas.

Point out that in 1922 the scattered remaining ‘grizzly bear areas’ in the U.S. became surrounded by human development, and might as well be considered as islands of habitat floating in a sea of developed land.

Ask the students:

***What if you were a bear in one of these smaller “islands” of habitat (point to one of the smaller enclaves in California). Would you predict that grizzly bears still live there today? Why or why not?***

Grizzly bears no longer live here. The “islandization” of bear populations means they are isolated from other populations. They cannot connect with each other for breeding purposes. As a result, inbreeding and weakening of the population occurs, usually resulting in extirpation (local extinction) of bears from the area. Once a population dies out, whether from disease or over-hunting, bears cannot access or re-populate the area because the islands of habitat are no longer connected to each other.

5. Show students the Present Distribution of Grizzly Bears map. Ask them:

***What is the name of the remaining U.S. “island?”***

This is Yellowstone National Park. It supports a population of approximately 300 grizzly bears, which are believed to be isolated from grizzly bears to the north by ranches, highways, and other development.

***Do you think the bear will become extinct in Yellowstone?***

Nobody knows. Much uncertainty still exists about “how low you can go” in population numbers and still be sustainable. The U.S. government spends millions of dollars annually to keep the Yellowstone population alive.

**For older students**

6. Ask students:

***If you were the park superintendent in the year 2015, and your bear population was becoming inbred, what could you do to save this population?***

You could introduce fresh genetic material to the area by:

- a. creating sufficient **wildlife corridors** and **core refugia** (protected habitat) to allow the bears to reconnect with populations to the north.
  - b. capturing grizzlies from Canada and releasing them into Yellowstone. This approach requires a healthy Canadian bear population, political will on both sides of the border, and must be continued forever.
7. On the Present Distribution of Grizzly Bears map, locate the “pinch point,” the slimmest point at the base of the long peninsula that reaches down into the northern U.S. Tell students that the Banff Bow Valley is located here, and ask them:

***What human activities would cause this point to pinch off completely, forming a second island of habitat?***

Increased development in the Bow Valley would cause this, particularly if it cuts off the wildlife corridors that connect the peninsula with habitat north of the valley. Development might include railways, highways, urban expansion, resort development, and increased human use.

8. On the board, write the following terms: Probable future, Possible future, Preferred future

Ask the students:

***What is the difference between these three terms?***

The basic concept is that a whole range of different actions that we take now has the effect of creating a range of **possible futures**. The **probable future** is the one that is most likely, given what we do today; the **preferred future** is the one that we would most like to have happen. To attain this preferred future, we might need to change our current behaviour.

***Given the trends of the past century, what is the probable future of the grizzly bear range in North America?***

Use the Present Distribution of Grizzly Bears map to illustrate/brainstorm what the probable future of the grizzly bear might be. Some groups might predict extinction of bears from North America. Some groups might predict a more hopeful scenario.

***Keeping in mind that the grizzly bear is an important indicator of wilderness and ecosystem health, what is your preferred future for the distribution of the grizzly bear?***

Try to get the class to agree on an answer to this question, and use the Present Distribution map to show the class’s preferred future.

***What actions need to occur now in order to achieve this “preferred future?”***

The most important factor is the way in which we manage our remaining natural areas. Such as:

- Preventing human activities that negatively impact bears in protected areas
- Preserve (or reopen) wildlife corridors that bears use to move from one area to another
- Important unprotected land should be given protected status
- Unprotected land used by bears should not be fragmented into smaller chunks by roads and other developments
- Unprotected land that has been degraded should be restored to more natural conditions (e.g. close old roads)

- Legally protect grizzly bears under endangered species legislation

***As citizens, how can we ensure that these actions will actually occur?***

Point out that although science can help describe and predict grizzly bear distributions, it is up to us as a society to set our goals and make plans that will help us achieve these goals. As citizens in society, there are many things students can do. (Consider taking CPAWS' Action Challenge to do something positive for the environment. Visit [www.cpawscalgary.org/education](http://www.cpawscalgary.org/education) for information about this great opportunity for taking action with your class!)

For more information on the Yellowstone to Yukon Conservation Initiative, and how to teach it, see the CPAWS activity guides, “*Why the Y2Y?*” and “*Inventing the Future*” at [www.cpawscalgary.org/education/topics](http://www.cpawscalgary.org/education/topics). You can also find additional information about the Y2Y by visiting the Initiative's website: [www.y2y.net](http://www.y2y.net).

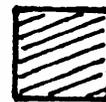
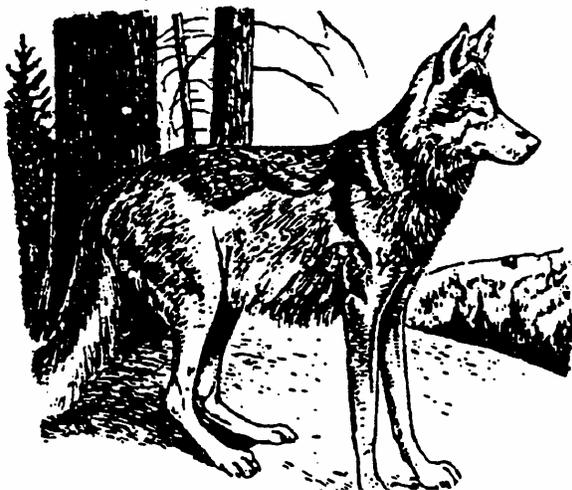
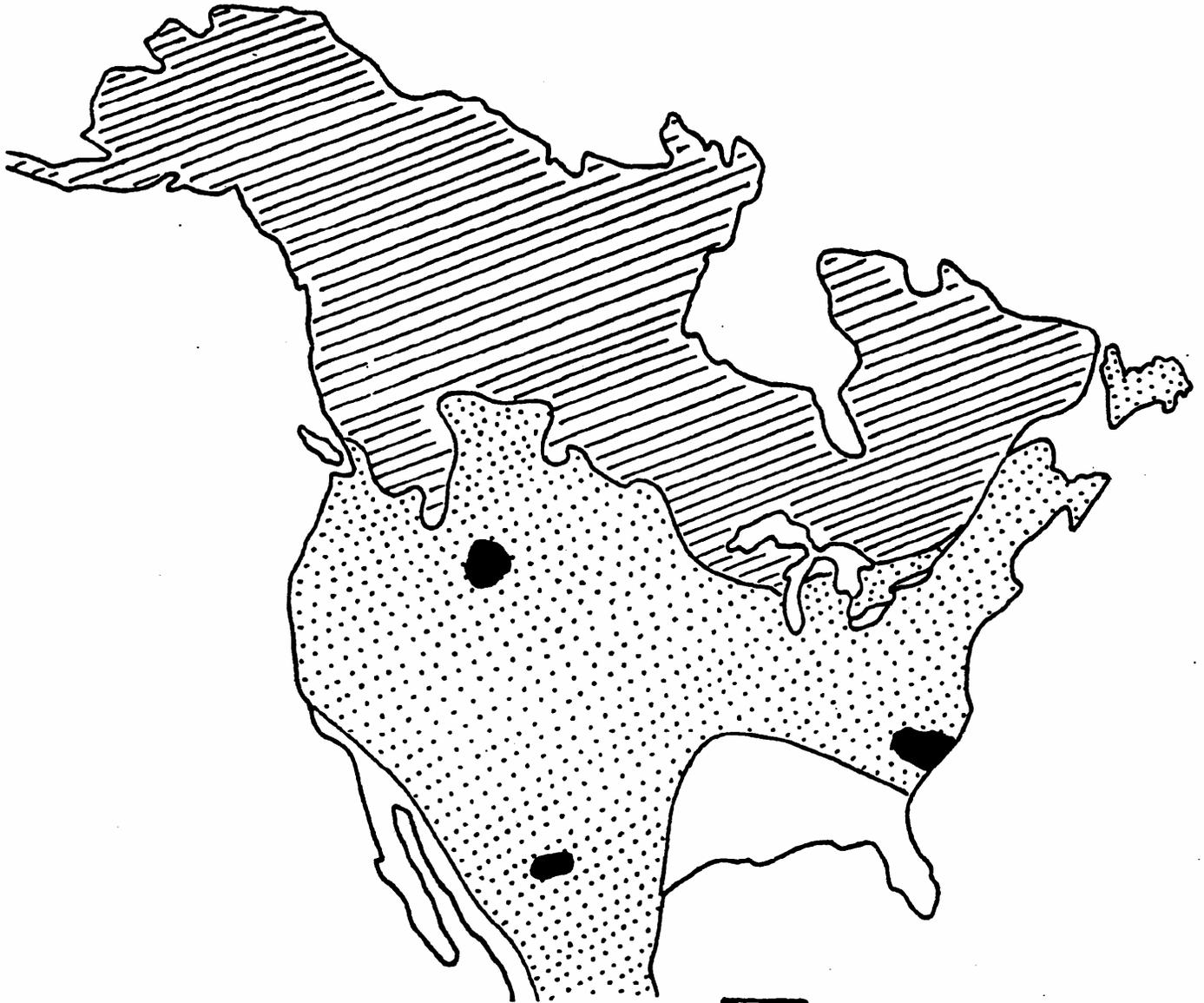
Song: Where a Border need not be



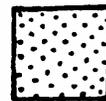
After listening and singing along to this song, ask students what they think it is about. Tell them that it is precisely the way we think in borders and “in lines” that gets animals into trouble, and threatens their survival. For example, a wolf can easily cross from the U.S., where it is protected by the U.S. Endangered Species Act, into Alberta, where wolves can legally be shot from September to May without a special hunting license.

Perhaps a solution is to think of “one world wild and free.” Think in terms of ecosystems and watersheds, not borders and boundaries created by humans.

# Wolf Distribution Map



Present range

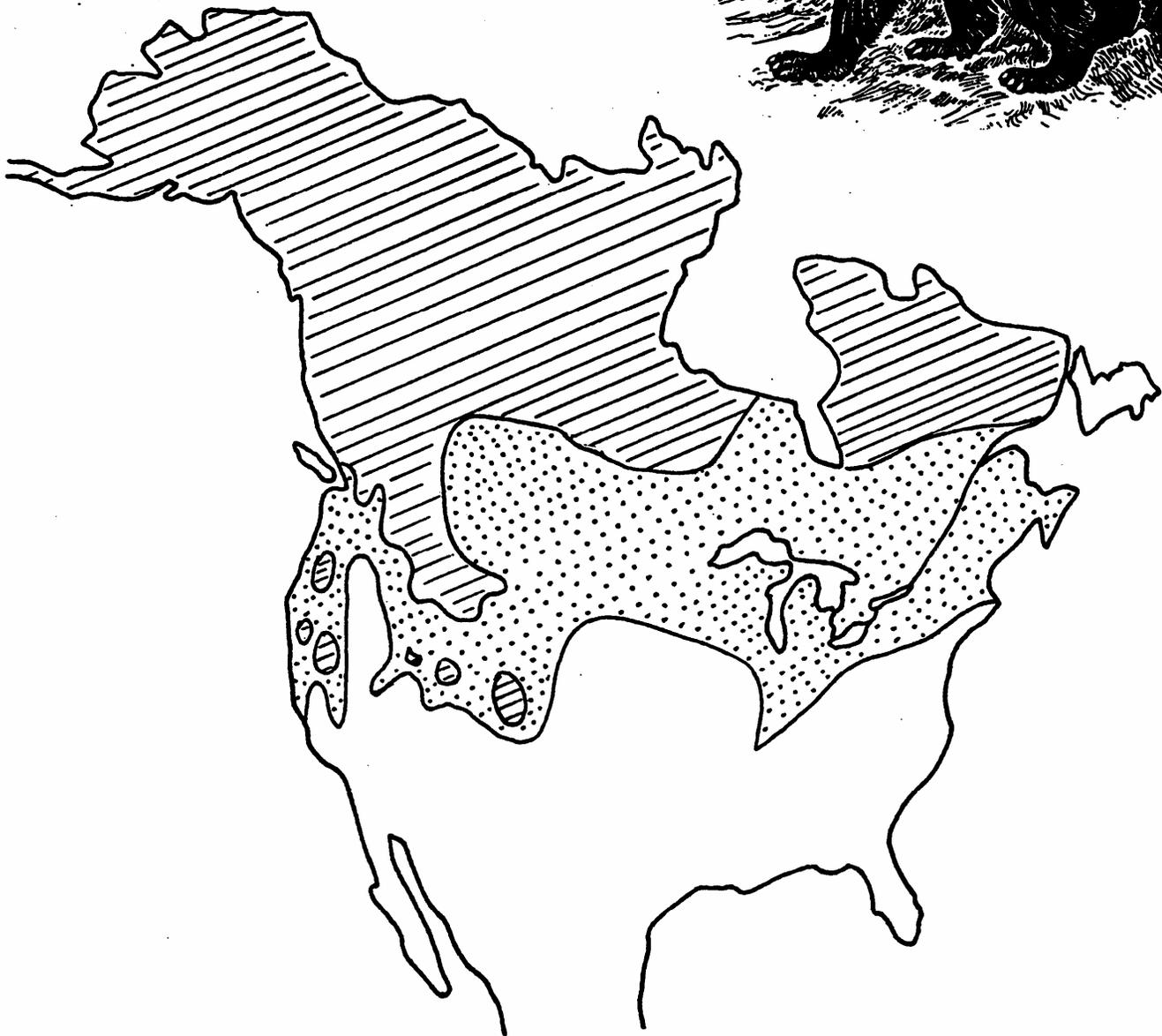


No longer present

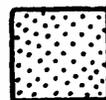


wolf restoration project

# Wolverine Distribution Map



Present range



No longer present

# Cougar Distribution Map



Present range

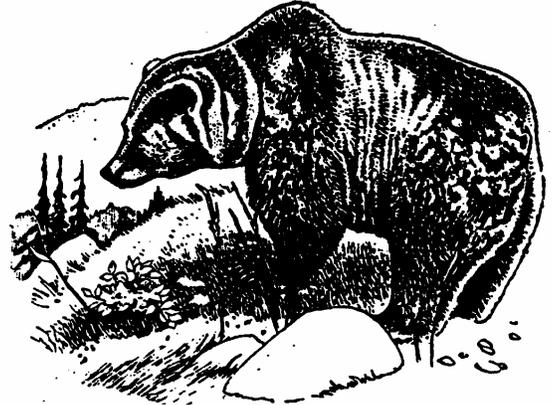


No longer present



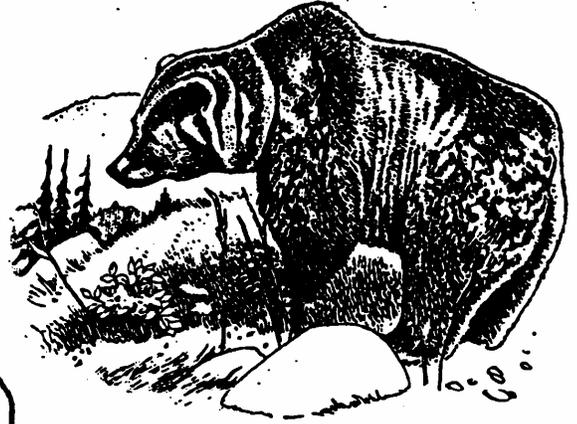
Possible sightings

# Historical Distribution of Grizzly Bears (1800s)



Historical distribution

# 1922 Distribution of Grizzly Bears



Distribution in 1922

# Present Distribution of Grizzly Bears

