

Boreal Species at Risk

Science Kit

Boreal forest based teaching provided through:

Forest Resource Improvement Association of Alberta

Box 11094, Edmonton, AB T5J 3K4 | ph. 780.429.5873 | www.friaa.ab.ca

Lesser Slave Forest Education Society

1201 Main Street SE, Slave Lake, AB T0G 2A3 | ph. 780-849-8627 | www.lsfes.org

Lesser Slave Lake Bird Observatory

Box 1076, Slave Lake, AB T0G 2A0 | ph. 780-849-8240 | www.lslbo.org | www.borealbirdcentre.ca

Boreal Species at Risk Lesson Kit

Teacher Introduction

The boreal forest is a complex ecosystem that we live in. It supports a unique variety of plants and animals specific to this ecosystem including ourselves. There must be a balance in what we use from the land and how we interact with other organisms to ensure the health of the boreal forest for future populations.

The boreal forest is a vast wilderness that contains many renewable and non-renewable resources that we use today. Our presence in the boreal forest has steadily increased as our country's population expands and we explore and consume natural resources. One renewable resource we utilize is the trees. Trees provide us shelter, food, furniture and paper to name a few. As we try to manage the boreal forest and its numerous resources we must be conscious of the impact to native plants and animals. This lesson is about boreal wildlife species whose populations are at risk of diminishing or disappearing from the boreal forest. Let's explore the reasons behind the population changes and what the government's plans are to mitigate this.

Icons to help identify curriculum connections



Curriculum Connections

- Social 10-1 Unit 3: Perspectives on Globalization
To what extent does globalization contribute to sustainable prosperity for all people? Explore multiple perspectives regarding the relationship among people, the land and globalization. Evaluate actions and policies associated with globalization that impact the environment
- Social 10-2 Unit 3: Living in a Globalizing World
To what extent should we embrace globalization? Does globalization contribute to sustainable prosperity for all people? Recognize and appreciate impacts of globalization on the interdependent relationships among the economy, people and the environment. Analyze the impact of actions and policies associated with globalization on the environment.
- Science Grade 7 Unit A: Interactions and Ecosystems
How do human activities affect ecosystems? What methods can we use to observe and monitor changes in ecosystems and assess the impacts of our actions?
- Science Grade 9 Unit A: Biological Diversity
What is biological diversity? By what processes do diverse living things pass on their characteristics to future generations? What impact does human activity have on biological diversity?
- Science 14 Unit D: Investigating Matter and Energy in the Environment
How is human activity influencing the natural flow of matter and energy in the biosphere? Should humans as a species be concerned about the effects of their activities on other species and the environment?
- Science 20 Unit D: Changes in Living Systems
Analyze and describe the adaptation of organisms to their environments, factors limiting natural populations and evolutionary change in an ecological context.
- Biology 20 Unit B: Ecosystems and Population Change
What are the major biotic and abiotic characteristics that distinguish aquatic and terrestrial ecosystems? What data would one need to collect in a field study to illustrate the major abiotic characteristics and

diversity of organisms? What mechanisms are involved in the change of populations over time? In what ways do humans apply their knowledge of ecosystems to assess and limit the impact of human activities?

- **Biology 30** Unit D: Population and Community Dynamics
How does one determine if populations are changing over time? In what ways may individual members of a population interact with one another or with members of a different population? What quantitative measures indicate that populations change over time? What role does society play in managing wildlife populations?

Lesson Details

Time required: The estimated minimum time required is 80 minutes; this will be broken into two parts. There is a take home portion for student research and presentation preparation. The first section is to introduce the topic of Species at Risk and the student case study. The second part is the student presentations to the class, group discussion and use of the board game. Teacher preparation time is estimated at 15-30 minutes. This includes time to read the background information, review the introduction video and become familiar with the topic and its relation to your curriculum.

Resource requirements: Internet access, smart board or computers to view video, print materials, game board and pieces.

The LSFES (www.lsfes.org) and the LSLBO (www.lslbo.org) can you provide the full lesson kit with materials or you can download and print the kit components separately from either website.

This lesson kit is split into multiple components. Each component will help reinforce the basic ideas surrounding Species at Risk and our interactions with them.

Kit Components:

1. **Video** – The 5 minute video provides an introduction to what Species at Risk are and how they are classified. It touches on the process of how a species becomes classified and the Government Acts regulating species management. <https://www.powtoon.com/online-presentation/dbHTYgNgDIZ/sara-intro/>
The video web link provided can be viewed on any computer device or on a smart board if available. This video should be viewed first.
2. **Student Handout** – This introduction handout reiterates the topics discussed on the video such as the Species at Risk Act, the Alberta Wildlife Act, the Species at Risk classifications and processes to protect species. This handout is a reference sheet for the student.
3. **Case Study Assignment** – The assignment is outlined in the video and student handout. This checklist is a breakdown of the research components that are to be included in the student case study presentation.
4. **Fact Sheets** – Provided are fact sheets for 6 preselected boreal Species at Risk. Each species has a unique interaction with the boreal forest in Alberta, its classification or the species class. The fact sheets provide a quick introduction of the 6 suggested species. The students are to complete a more in depth case study of one Species at Risk in the boreal forest. You can choose to provide these species selections and sheets to your students to speed up the lesson. These are only suggestions, any boreal species can be chosen to research.
5. **Class Discussion Questions** – After the presentations we suggest a group discussion to reinforce the topic and management concerns of boreal Species at Risk. We have provided opening questions that can help direct class discussions and focus in on the specific curriculum topics.
6. **Survive or Perish Board Game** – The game we have created is the boreal Species at Risk version of the classic board game "Snakes and Ladders". The student follows along the numbered squares encountering "snakes" (waterfalls) and "ladders" (vines) to reach the ultimate goal, survival. The board game helps the students identify with the Northern Leopard Frog and the perils of living in the boreal forest as a threatened species. It is a fun approach to reinforce how our actions or inaction can affect the survival of other wildlife species.

Lesson Part 1

- Estimated time 30-40 minutes
- Introduce the topic of Species at Risk in the boreal forest. Watch the 5 minute video provided.
<https://www.powtoon.com/online-presentation/dbHTYgNgDIZ/sara-intro/>
- Class case studies:
Option 1: Split the class into 6 groups. Each group is assigned one of the pre-selected species. Handout the student introduction that includes the assignment details and the accompanying fact sheets. The fact sheets are a starting point for research and introduction to their species and its classification.
Option2: You can choose to have the students do individual, pair or group case studies. Have them select a boreal Species at Risk for their presentation.
- Students are to research and develop a presentation for the class on their Species at Risk. Select a due date for the presentations.

Lesson Part 2

- Estimated time 40-80 minutes
- Case study presentations from the student groups.
- Group discussion about species management. Use opening questions provided to assist in directing discussions and critical thinking.
- Northern Leopard Frog "Survive or Perish" Game. This quick and easy game shows the obstacles that this species faces daily to survive and reproduce. This game is for 2-6 people and takes 10-20 minutes.
- Wrap up the topic highlighting the different regulations that help the security and recovery of a species at risk and how human interactions can adversely affect or benefit a species.

Student Assignment

Students can work individually or be divided into pairs or six small groups for this assignment. The students will research and present information on a current Species at Risk in the boreal forest. The students are to present a case study of their species to the class in a 3-5 minute presentation (verbal presentation, poster, slide show or a video).

Optional: We have chosen 6 Species at Risk that showcase the boreal region and various limiting factors. A one page summary is provided for each species to get you started. The species are Little Brown Bat, Canada Warbler, Woodland Caribou, Northern Leopard Frog, Wolverine and the Arctic Grayling.

Minimum topics to be covered for each case study:

1. Species name
2. Provincial and national status
3. Physical description of the species
4. Range or habitat
5. Factors affecting their status
6. Consequence of their disappearance
7. Current research being done and any interesting findings
8. What is being done to help your species population?
9. Other interesting facts
10. Optional Question— Science20 – Calculate your species population growth rate over time and present it in a graph.

Images and maps should be included in the presentation.

Class Discussions – “Balancing the Boreal”

This is a class activity where students measure the social, environmental and economic impact of management decisions. (i.e. What are the real benefits and costs of their decisions?) Possible answers are in italics.

1. What can we do here in Alberta if what is causing a species population decline is not within our country's borders?



- *We can ensure that the species is able to access what it requires to live and thrive in its habitat when in our country, such is the case with migratory birds and fish.*
- *We can lobby our government and the government where the issue is to make changes and protect the species and its habitat.*
- *We can educate those in the other country about the limiting factors for that species. This will assist in its protection and recovery.*
- *Social media is one way we can reach across the miles to learn and interact with people from all over the world.*

2. Should we try to save every species? If yes, at what cost (economically, environmentally, financially)?



- *Every species has the right to exist. However more information may be needed to objectively make this decision.*
- *What is the cost to society for the loss of this species? Biodiversity. Is this species key in the food chain?*
- *What is the dollar cost to society to try to save this species? Job loss. Closure of areas. Excessive funding of research, protection and enforcement.*
- *Is the species at the end of its habitat range or is it thriving in other areas? Perhaps the loss is marginal if it is at the end of its habitat and is secure in other areas.*
- *What mechanisms are involved in the change of populations over time? Can the limiting factor's effects be reversed in a timely fashion to ensure survival? Very low population numbers, scale of the problem etc.*

3. What is the impact of a species no longer existing? Is the extinction local or global?



- *Will the species loss affect another species survival? Such as the need for bees to pollinate flowers.*
- *There will be repercussions of a species lost in the local biotic cycle. (Food source, nutrient cycle, life cycle etc.)*

4. Do the regulations and laws do enough to help save a species?



- *This may require a further look at the related Acts and other Acts such as the Fisheries Act and Migratory Bird Convention Act.*
- *Can we balance sustainable development with proper management of the wildlife species? There are always costs be it economic (jobs), environmental (habitat loss or loss of species) or social (community and global responsibility). Each factor must be weighed to determine a sustainable management solution.*
- *There has been success in the reestablishment and survival of a species in their habitat. Examples are the Trumpeter Swan and Wood Bison. There have also been failures with the recent extirpation of the Greater Prairie Chicken in Alberta.*

5. Can one person or class make a difference to a species survival?



- *We can educate people about a species status and its need for protection.*
- *We can assist in research and population tracking to get the most accurate information.*
- *We can lobby our government to review the species and the limiting factors for species at risk classification and management strategies.*

6. Can you explain the difference between a provincial and federal species at risk listing?



- *A federal Species at Risk listing is governed by the Species at Risk Act (SARA). There are national regulations that must be followed when a species is listed. COSEWIC is an independent body that reviews and requests a species listing federally.*
- *A provincial Species at Risk listing is governed by Alberta's Wildlife Act. There are different parameters and regulations that are specific to Alberta's Wildlife Act. This act handles more than just species at risk.*

- A species may have a different listing federally and provincially. A species may be classified federally because of the low population numbers or habitat constraints across the country but they might be in a secure state in a particular province or zone.
- SARA applies on federal lands (e.g., national parks), but Alberta's Wildlife Act is still the dominant legislation for management of species at risk on private lands and public lands under provincial jurisdiction. There are several federal/provincial committees in place to ensure a cooperative approach for the management of species at risk.

7. What are some of the challenges that land managers face today when planning for the forest? For example, how does a Forester manage for timber and animals when they are planning their harvesting operations?



- Can we adequately manage for all forest values? We have a greater understanding of the relationships between elements in nature and inventory of the forest. The information technology that is used to predict and track forest values is extensive and is only getting better. This allows managers to use the best information available locally and regionally to make their decisions.
- There are provincial and federal laws that govern all industry's actions. The forest industry is managed by regulated professionals so that responsible, informed decisions are being made about the forest.

8. What are some of the abiotic and biotic factors that affect a species population?



- Abiotic factors: soil, relative humidity, moisture, ambient temperature, sunlight, nutrients, oxygen
- Biotic factors: competitors, predators and parasites
- Explain how limiting factors influence organism distribution and range.

9. What data would you need to collect in a field study?



- You would need to collect many different parameters such as habitat (type of plants, water source, etc.), climate (temperature, moisture etc.), presence/absence, actual sample of a specimen, disturbances.
- What relationships should you investigate between wildlife and its environment to hypothesize the cause of a species population decline? Examples: Life cycles, food sources, breeding grounds, habitat connectivity, restrictions to travel, invasive species, introduced diseases or predators, ecosystem changes.
- Is data collected at one point in time enough to base a management decision on? Often season, weather or life cycles may influence the data you collect on certain species. Managers have to have a broad overview of the situation and the limiting factors of a Species at Risk. The data sets used in their analysis must be over multiple years to get a clearer picture of the population trends and environmental changes over time.
- Are there specific items you would need to collect for your species? How would you access data from other locations or countries such as in the case of a migratory bird? Will the information be reliable and accurate?

Survive or Perish Board Game

- Estimated time 10-20 minutes per game
- Board games can be borrowed from the LSFES (780-849-8627) or the LSLBO (780-849-8240). Or you can download and print the game on two 11"x17" sheets. If you print the game you will need a dice or spinner and 4-6 player tokens per game.
- The game is suitable for ages over 12. Two to four players per game is optimal but up to 6 can play at one time.
- Players navigate the board to try to get to square #100 to win and survive for another day.
- There are more waterfalls ("snakes") to represent the increased pressures a species at risk faces to survive. This game reinforces the different limiting factors the Northern Leopard Frog encounters.

Directory of Internet Research Resources

- Committee on the Status of Endangered Wildlife in Canada - www.cosewic.gc.ca
- Alberta Environment and Sustainable Resource Development - esrd.alberta.ca/fish-wildlife/species-at-risk/
- Species at Risk Public Registry - www.sararegistry.gc.ca
- Hinterland Who's Who - www.hww.ca

Boreal Species at Risk - Student Introduction

Boreal Forest Species at Risk

In the field of forestry, forest managers must assess multiple components that affect the environment when they are making management plans. In the planning phases they must consider factors such as water, soil, wildlife, traditional uses, resource extraction, fire risks, and reforestation. For example, a forester has to determine where and when to put a creek crossing in so that it doesn't affect a Species at Risk or impact the water resources.

Biodiversity is the variety of life in a given area. Everything we need for a good quality of life is provided by the natural world; we are inherently connected to it. Species at Risk are the most vulnerable components of biodiversity, and face complex challenges. It takes time and effort to address complicated issues such as these. It is a job that no one government, business or agency can implement and solve on their own. Challenges facing biodiversity and natural resources require cooperation, innovation and a sincere desire to reach out, understand and work with one another to find common ground.

(Environment and Sustainable Resource Development, www.esrd.alberta.ca)

What is the Boreal Forest? The Boreal Forest is circumpolar. It circles the northern portion of the globe and is found across Canada, Alaska, Scandinavia and Russia.

Mainly covered with cold-hardy pine, spruce, larch, poplar, fir and birch forests, the boreal zone also contains lakes, rivers and wetlands. It features naturally treeless areas as well, including alpine areas on mountains, heathlands in areas near the coasts and grasslands in drier areas.

(Natural Resources Canada, www.nrcan.gc.ca)



What is a Species at Risk? A species at risk is a wildlife species that may disappear from the environment if nothing is done to save it. It is an extirpated, endangered, threatened species or a species of special concern.

Classifications for Species at Risk:

- **Extinct:** a wildlife species that no longer exists.
- **Extirpated:** a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the world.
- **Endangered:** a wildlife species that is facing imminent extirpation or extinction.
- **Threatened:** a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its decline.
- **Species of Special Concern:** a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Who decides what wildlife species are classified?

The federal and provincial government have different processes to determine if a species is classified.

Federal Government Process:

1. **COSEWIC** (Committee on the Status of Endangered Wildlife in Canada) is a committee of experts that assesses and designates which wildlife species are in some danger of disappearing from Canada. After they have conducted a species assessment they make a recommendation to the government for a species listing.

The government will determine the classification of a species and it will be protected and managed under the Species at Risk Act (SARA).

2. The Species at Risk Act (SARA)

The SARA is a key federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides for the legal protection of wildlife species and the conservation of their biological diversity.

The SARA Process:

1. **Monitoring** - Monitoring starts with an inventory of wildlife species to get an idea of the population status and trend, its ecological function, and a way of tracking information. As a result, the Minister publishes the report on the general status of wildlife species, every 5 years.
2. **Status Report** - The species assessment process is conducted by COSEWIC. Based on the status report, they use a committee of experts to conduct a species assessment and assign the status of a wildlife species believed to be at some degree of risk nationally.
3. **Response Statement** - In response to an assessment and status designation, the Minister issues a response statement. This document reflects the jurisdictional commitment to action and acts as a start to the national recovery process.
4. **Recovery Strategy** - A recovery strategy outlines what is scientifically required for the successful recovery of a species at risk. This includes an identification of its critical habitat and what needs should be addressed. An action plan then identifies the various projects and activities with associated timelines.
5. **Evaluation** - Evaluation programs are carried out against the goals and objectives of the recovery strategy and action plan, where they are most effective. As a result, the Minister must produce an annual report on the administration and implementation of the Act.



Monitoring, assessment, response, recovery, and evaluation are ongoing processes that are taken to improve the species status and ecosystem.



Provincial Government Process:

The Province of Alberta has its own process to identify and manage species at risk in the province.

To help understand the stability of Alberta's wild species and the level of monitoring and protection they may need, each species is assigned a status. The approach is science-based, systematic and allows the incorporation of social and economic values. It is collaborative and supported by the provincial Wildlife Act. Alberta is represented on COSEWIC for assessing and classifying the national status of species.

(Alberta Environment and Sustainable Resource Development, www.aesrd.gc.ca)

Alberta's Strategy for Species at Risk:

1. **General Status Assessment:** Rank the relative security (General Status) of all wild species to prioritize risk assessment, data collection and conservation initiatives.
2. **Detailed Status Assessment:** Assess and document the risk of becoming endangered for those species having a general status that suggests serious concern regarding current or future population viability.
3. **Wildlife Act Listing:** Formally designate species that are Endangered or Threatened, as well as Species of Special Concern.
4. **Recovery Planning:** Develop Alberta Recovery Plans for all Threatened and Endangered species.
5. **Preventing Species from Becoming at Risk:** Develop management plans for Species of Special Concern, to prevent them from becoming Endangered or Threatened.
6. **Implementing Recovery and Management Actions:** Coordinate and facilitate the implementing of recovery plans and management plans, with actions being carried out by government, non-government organizations and private individuals.



Why does a wildlife species population diminish?

There are many limiting factors that affect a species ability to reproduce, grow and maintain their populations.

- Disease
- Predator/ prey relationships
- Impacts of weather conditions
- Accidental deaths
- Food shortage
- Environmental pollution
- Habitat loss and degradation
- Hunting, trapping and gathering
- Road and access risks
- Travel and migration risks

The protection and conservation of wildlife species are addressed at both a national and provincial level. Protecting and maintaining suitable habitat is critical in maintaining long-term wildlife health and viability. Wildlife health is an important indicator of the health of Alberta's environment.

Things to think about:

- How do we balance the conservation of the environment while still encouraging jobs and development?
- If we chose to create a no development wildlife zone what are the impacts socially (human welfare) and economically (community prosperity) to making these management decisions?
- What are the benefits and costs of these decisions?
- What is the impact to society and the environment if a species no longer exists?
- At what cost should we try to conserve a wildlife species?
- What are some of the issues that forest managers must consider when planning their harvesting and reforestation actions?
- Do some species have greater importance (socially and in the environment) and therefore we should manage for them first in our landscape and forest planning?

Student Assignment

Your mission is to research and present information on a current Species at Risk in the Boreal Forest. You must present your findings to the class in a 3-5 minute presentation.

Be creative, you can choose to do a verbal presentation, poster, slide show or a video.

Optional: We have chosen 6 Species at Risk that showcase the boreal region and various limiting factors. A one page summary is provided for each species to get you started. The species are Little Brown Bat, Canada Warbler, Woodland Caribou, Northern Leopard Frog, Wolverine and the Arctic Grayling.

Minimum topics to be covered for each case study:

1. Species name
2. Provincial and National Status
3. Physical description of the species
4. Range or habitat
5. Factors affecting their status
6. Consequence of their disappearance
7. Current research being done and any interesting findings
8. What is being done to help your species population?
9. Other interesting facts

Images and maps should be included in the presentation.

Directory of Internet Research Resources

Note: Be conscious of the internet sites that you are using for your research and project information. Try to choose reputable organization websites or research websites. It is always a good idea to list the resources that you have used to locate your information for further reference and justification.

- Committee on the Status of Endangered Wildlife in Canada - www.cosewic.gc.ca
- Alberta Environment and Sustainable Resource Development – www.esrd.alberta.ca/fish-wildlife/species-at-risk
- Species at Risk Public Registry - www.sararegistry.gc.ca
- Hinterland Who's Who - www.hww.ca



PHOTO CREDIT AKSMITH (EN.WIKIPEDIA.ORG/WIKI/ARCTIC_GRAYLING)

Arctic Grayling

Scientific Name: *Thymallus Arcticus*

Taxonomy: Fish

Range: Yukon, Northwest Territories, Nunavut, British Columbia, Alberta, Saskatchewan, Manitoba

Last COSEWIC Assessment: No status

SARA Status: No status

Government of Alberta Status: Sensitive, Species of Special Concern

Fact Sheet

Information adapted from:

Alberta Environment and Sustainable Resource Development website (www.esrd.alberta.ca/fish-wildlife/wild-species/fish/salmon-trout-related/arctic-grayling/arctic-grayling.aspx)

Government of Alberta, Wildlife Status Report No. 57 (www.esrd.alberta.ca/fish-wildlife/species-at-risk/species-at-risk-publications-web-resources/fish/documents/SAR-StatusArcticGraylingAlberta-Mar2005.pdf)

Appearance

The Arctic Grayling can be identified by their colourful and very large dorsal fin, which is much larger than that of any other cold-water fish. The top of the dorsal fin is rounded.

They have large scales with brown or black spots on the body behind the head.

Average body length ranges from 30-40 cm and can measure up to 55 cm.

Average weight ranges from 300 – 800 grams and can measure up to 1.3 kg. Larger Arctic Grayling can be found in other ranges.

Spawning occurs from May to June. Grayling migrate from lakes and larger rivers to smaller streams to spawn.

Boreal Distribution

The Arctic Grayling are native to North America, and are found primarily in the Athabasca, Hay and Peace River drainage systems of Alberta.

A small population of this fish can be found in the Belly River in southwestern Alberta and in mountain ponds that have been stocked.

Threats

Populations of this fish have decreased over the past few decades due to:

- Increased accessibility by humans to remaining habitat, resulting in increased harvest by recreational fisherman.
- Blocked migration routes, altered stream flow, and increased sedimentation resulting from increased resource landuse.
- Warming water temperatures attributed to climate change and landscape alterations.



Image by: Karl Geist

Habitat

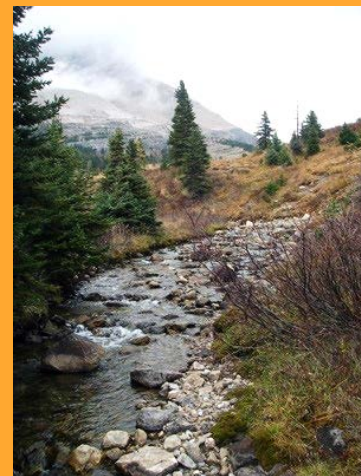


Photo: www.tucanada.org

The Arctic Grayling are cold water fish that are primarily found in boreal and foothill rivers and streams.

Generally, in foothills streams, grayling occur in flowing water of moderate gradient that usually remains cool and clear. In boreal areas, many populations occur in clear, tannin-stained (brown) rivers that drain northern muskegs. A few populations in northern Alberta occur naturally in small clear lakes.

They are sensitive to sediment loads in their habitat.



PHOTO CREDIT © JOHN A. NAGY (WWW.SARAREGISTRY.GC.CA/SPECIES/SPECIESDETAILS_E.CFM?SID=636)

Woodland Caribou

Boreal Population

Scientific Name: *Rangifer tarandus caribou*

Taxonomy: Mammal

Range: Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Newfoundland and Labrador

Last COSEWIC Assessment: Threatened Status

SARA Status: Schedule 1, Threatened
Government of Alberta Status:

Threatened

Fact Sheet

Information adapted from:

Species at Risk Public Registry (www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=636)

Appearance

Caribou, ancient members of the deer family (Cervidae), are one of Canada's most widely distributed large mammals. Caribou are unique among Cervids in that both sexes have antlers.

The Woodland Caribou's coat is mostly brown in summer (more grey in winter), but the neck, mane, shoulder stripe, underbelly, tail underside and patch just above each hoof are creamy white. The caribou is 1.0 to 1.2 m high at the shoulder, and mature individuals weigh 110 to 210 kg. The average weight for bulls is 180 kg; for cows it is 135 kg.

The caribou's coat consists of a fine crimped under-fur with a thick layer of guard hairs on top. The guard hairs are hollow (like straws), and the air trapped inside acts as insulation to keep in the caribou's body heat.

Distribution

Caribou are classified by ecotype (where they occur and how they behave) for their management and conservation. There are three major types of caribou in Canada: Peary, Barren-ground, and Woodland. Woodland Caribou, the largest and darkest-coloured are irregularly distributed

throughout our boreal forest and mountains from the island of Newfoundland to British Columbia.

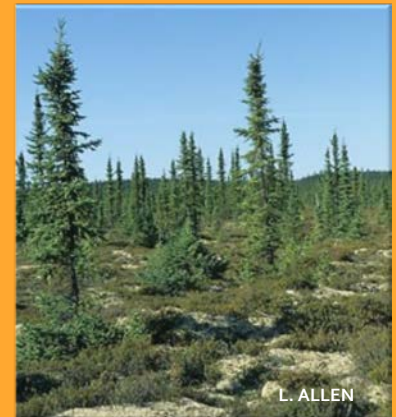
Recent research efforts have increased the number of known populations to more than 64, and this number is expected to rise further as more individuals are radio-collared and distributions are delineated. Population surveys prior to 2002 estimate there are 33,000 forest-dwelling caribou in the Boreal population — 18% of the total for Canada.

Threats

The following factors all contribute to the decline of the caribou:

- habitat destruction
- fragmentation of habitat
- disturbance by humans (including construction of roads and pipelines, agriculture, mines, forestry)
- predation (by wolves, coyotes, and bears)
- hunting
- weather and climate change.

Habitat



albertawilderness.ca/caribou-mountains-features

In winter, Woodland Caribou use mature and old-growth coniferous forests that contain large quantities of terrestrial and arboreal (tree-inhabiting) lichens. These forests are generally associated with marshes, bogs, lakes, and rivers.

In summer, the caribou occasionally feed in young stands, after fire or logging.

Many subpopulations of the Woodland Caribou Boreal population show a preference for peatlands; they generally avoid clear cuts, shrub-rich habitat and aspen-poplar dominated sites. The most common tree species in preferred habitats are Black Spruce, White Spruce, and Tamarack.



PHOTO CREDIT © (RIVERINSTITUTE.CA/SCIENCE-RESEARCH/RESEARCH-PROJECTS/)

Little Brown Bat

Little Brown Myotis

Scientific Name: *Myotis lucifugus*

Taxonomy: Mammal

Range: Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador

Last COSEWIC Assessment: November 2013, Endangered Status

SARA Status: No status, no schedule
Government of Alberta Status: Secure

Fact Sheet

Information adapted from:

Species at Risk Public Registry (www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1173)

Hinterland Who's Who (www.hww.ca/en/species/mammals/little-brown-bat.html)

Appearance

The Little Brown Bat weighs between 7 and 9 grams, and has a wingspan between 25 and 27 cm. Females tend to be slightly larger than males but are otherwise identical. It is pale tan to reddish or dark brown with a slightly paler belly. The ears and wings are dark brown to black.

They are nocturnal and are one of the few terrestrial mammals that use echolocation to gather information on their surroundings and prey location. The echolocation calls, similar to clicking noises, bounce off objects and this echo is processed by the bat. These noises are at a very high frequency and cannot be heard by humans.

Distribution

In Canada, the Little Brown Bat is found in all provinces and territories except Nunavut.

Even though Little Brown Bats do not usually migrate to destinations outside of Canada, individuals can move up to 1000 km from summer roosts to winter roosts where they hibernate. Its winter roosts are called hibernacula.

Threats

In the last 6 years, it is estimated that 5.7 to 6.7 million bats of several species, but mainly Little Brown Bat, have died in the northeastern United States and eastern Canada. This sudden increase in mortality has been associated with White-nose Syndrome (WNS) which is caused by a fungus likely from Europe. WNS impacts hibernating bats ability to survive the winter and has reduced populations by >75% in infected hibernacula.

Although WNS has not been found in Alberta yet, there is strong evidence that the same mortality trends will occur across the western Canadian population of Little Brown Bat.

Other threats to the Little Brown Bat include:

- disturbance or destruction of hibernacula and maternal colonies
- habitat loss
- use of pesticides
- presence of toxins in food web.

Habitat



www.hww.ca/en/species/mammals/little-brown-bat.html

Bats will roost in tree cavities or other places, like bat boxes, that stay dark and warm during the day. The fact that they huddle together and choose warmer locations is thought to help the pups grow more rapidly.

The species has been observed in a great variety of habitats, including all forest types, the southern edge of the Arctic tundra and urbanized areas, but it prefers areas close to wetlands, lakes or streams in the summer because of greater food availability. Most Little Brown Bats consume over 600 insects per hour when feeding at night.

On February 3, 2012, an Emergency Assessment Subcommittee of COSEWIC assessed the status of the Little Brown Bat as endangered.



PHOTO CREDIT ERIC BEGIN (WWW.FLICKR.COM/PHOTOS/ERICBEGIN/654449235/)

Northern Leopard Frog

Western Boreal Populations

Scientific Name: *Lithobates pipiens*

Taxonomy: Amphibian

Range: Northwest Territories, Manitoba

Saskatchewan, Alberta

Last COSEWIC Assessment: April 2009,

Special Concern Status

SARA Status: Special Concern

Government of Alberta Status:

Threatened

Fact Sheet

Information adapted from:

Species at Risk Public Registry (www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=552)

Appearance

The Northern Leopard Frog is green, brown or a mixture of the two. It gets its name from the dark spots surrounded by light borders on its back and sides, which resemble leopard spots. Light-coloured ridges line its back, one on each side, from behind the eyes to the lower back. The underside is whitish and prominent.

Adults are 6 to 11 cm long. Females are generally larger than males. The eggs are small (1.5 mm in diameter) and velvety black on top with white undersides. Newly hatched tadpoles are slender and black, and measure only 8 mm.

Distribution

The western boreal distribution of the Northern Leopard Frog occurs in Manitoba, Saskatchewan, Alberta and the Northwest Territories.

Prior to the large-scale declines observed in the early 1970s, the Northern Leopard Frog was widespread throughout its range. In much of Alberta, the species has steadily declined in abundance and remaining populations are small and isolated.

Threats

Northern Leopard Frog declines observed in many areas of Western Canada are associated with habitat loss, degradation and fragmentation. The species' diversified habitat requirements make it particularly vulnerable to such changes. The species is also threatened by emerging diseases.

The introduction of non-native species, including invasive plants as well as fish species that prey on tadpoles and adults, is another major threat to the Northern Leopard Frog.

Grazing cattle and other livestock can damage Northern Leopard Frog breeding, foraging and overwintering habitat on the prairies.

Pesticides have caused reduced growth rates, paralysis and mortality in tadpoles. In addition, frogs exposed to contaminants are more susceptible to pathogens.

Collection of individuals may also contribute to their decline. Embryo mortality may be attributed to ultraviolet radiation.

Habitat



The Northern Leopard Frog uses separate sites for overwintering, breeding and foraging. Contiguity between these habitats is necessary for the species' survival.

Overwintering sites are well-oxygenated bodies of water that do not freeze to the bottom. These include streams, creeks, rivers, spillways below dams, deep lakes and ponds.

Breeding and tadpoles occur in pools, ponds, marshes and lakes, and occasionally occur in slow-moving streams and creeks with abundant vegetation and no fish.

In the summer, the frogs are found in a wide variety of habitats, particularly moist upland meadows and native prairie.



PHOTO CREDIT - ISTVAN OROSI

Canada Warbler

Scientific Name: *Wilsonia canadensis*
Taxonomy: Bird
Range: Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia
Last COSEWIC Assessment: April 2008, Threatened Status
SARA Status: Threatened
Government of Alberta Status: Sensitive
 Protected under the Migratory Birds Convention Act

Fact Sheet

Information adapted from:

Species at Risk Public Registry (www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1008)

Appearance

The Canada Warbler is a small, brightly coloured songbird 12 to 15 cm in length. The males, which have a bluish-grey tail and upper parts contrasting with a yellow throat and breast, are typically more brightly coloured than the females and juveniles.

In both sexes, black stripes form a collar on the breast, although this collar is less defined in the females. The bill is thin and there are yellow "spectacles" round the eyes.

In the males, the head is bluish with a black forehead and cheeks, which join with a band of well-defined black stripes that run across the breast.

The forehead and cheeks of the female are bluish-grey rather than black.

Boreal Distribution

The Canada Warbler breeds in the summer, in all provinces and territories except Nunavut and Newfoundland and Labrador. Eighty-five percent of the global breeding population of the Canada Warbler is in Canada.

Threats

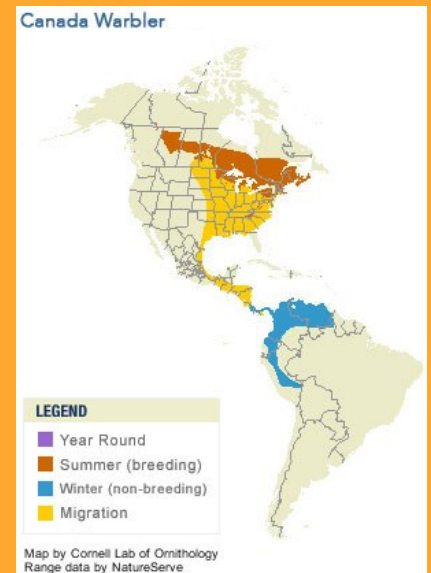
The factors responsible for the decline of the Canada Warbler have not been identified. However, habitat loss and degradation in the wintering range of this migratory bird are thought to be the most likely factors.

The forests of the northern Andes (South America), the main wintering grounds of the Canada Warbler, are among the most threatened in the world. Approximately 90% of these forests have now been cleared for agriculture, fuel wood, or the cultivation of illegal drugs. Non-selective herbicides have been sprayed to eliminate these drug crops.

In western Canada, road development in the boreal forest may have played a major role.

Finally, the decrease in spruce budworm outbreaks in eastern forests since 1970 may also have contributed to the decline of the species.

Habitat



The Canada Warbler is found in a variety of forest types, but it is most abundant in wet, mixed deciduous-coniferous forest with a well-developed shrub layer. It can be found in riparian areas and new forests resulting from industrial or natural disturbance that contain a high density of shrubs.

In winter, this migratory bird uses primarily mature cloud rainforests at an elevation of 1000 to 2500 m, as well as old-growth forests, forest edges, coffee plantations, agricultural field edges and semi-open areas.



PHOTO CREDIT ©CHOWDER (CHOWDER.WIKIA.COM/WIKI/FILE:WILD_ANIMAL_WOLVERINE_HD_PHOTOS_3.JPEG)

Wolverine

Scientific Name: *Gulo gulo*

Taxonomy: Mammals

Range: Yukon, Northwest Territories, Nunavut, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Newfoundland and Labrador

Last COSEWIC Assessment: May 2014, Special Concern Status

SARA Status: No schedule, no status

Government of Alberta Status: May be at risk - Data deficient, July 2014

Fact Sheet

Information adapted from:

Species at Risk Public Registry (www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=137)

Government of Alberta, Status of Alberta Wildlife Report (esrd.alberta.ca/fish-wildlife/wild-species/mammals/weasels-related/wolverine.aspx)

Appearance

The wolverine is a solitary, medium sized carnivore. The largest land-dwelling member of the weasel family, the wolverine reaches 125 centimeters in length and may weigh up to 16 kilograms.

The wolverine can defend its food aggressively against wolves and bears by using its muscular body, razor sharp teeth and strong jaws, and by covering food with foul-smelling secretions from its anal gland. The wolverine's dense, chocolate brown coat usually has two buff stripes that run along the flanks joining at the base of a large bushy tail.

Distribution

The wolverine inhabits the Boreal and Rocky Mountain natural regions.

Historically found across Alberta, the wolverine is now restricted to the northern, boreal half of the province and along the mountains and foothills. It is widely ranging but at low densities. The species reliance on carrion (decaying flesh) limits the number of individuals supported by an area.

Threats

Human encroachment and the resulting habitat alteration have reduced the wolverine's range. Human settlement, logging, oil and gas development, mining and recreational development all render the habitat less suitable for wolverines and increase mortality.

The Wolverine is most abundant where large ungulates are common. Therefore threats can be increased by activities that reduce the amount of ungulate carrion available during winter such as rabies control programs, hunting and trapping.

The Wolverine needs vast undisturbed areas to maintain viable populations because it has a low reproductive rate, low population density, and large home range. Removal of a few individuals can negatively impact the reproductive success of the population.

Recent research in the Alberta Rocky Mountains indicates that wolverines avoid areas with lots of human disturbance.

Habitat



www.hww.ca/en/species/mammals/wolverine.html

It is found in a variety of ecozones, including the boreal forest, tundra and subalpine regions. It is more influenced by food availability (especially ungulate carrion during the winter) than by specific habitat characteristics.

It inhabits a variety of treed and treeless areas at all elevations including the northern forested wilderness, the alpine tundra of the western mountains, and the arctic tundra.