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**Module 4**  
**Endangered Species/  
Endangered Spaces**

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# MODULE 4. ENDANGERED SPECIES/ENDANGERED SPACES

## Learning outcomes

Activities (page)	4-5	4-6	4-9	4-11	4-14	4-15
<b>Curriculum connections</b>	Science	Science	Language Arts	Science	Social Studies	Science
	Social Studies	Social Studies	Fine Arts	Social Studies	Language Arts	Language Arts
		Language Arts		Fine Arts	Science	Social Studies
						Fine Arts
<b>Knowledge</b> — In these activities, students will learn more about:						
1. the process of extinction and the role humans play;	•	•		•		•
2. threats to the biodiversity of species within their community;		•		•	•	•
3. endangered species and endangered spaces within the Yukon;		•	•	•		•
4. the role of territorial and national parks in preserving biodiversity.			•	•		•
<b>Attitudes and Values</b> — Following participation in these activities, it is hoped that students will:						
1. demonstrate improved personal attitudes, values and behaviours which contribute to preservation of the organisms in the community;		•	•	•	•	•
2. participate in a project to promote or preserve some aspect of the biodiversity within their community;		•		•	•	•
3. express perceptions and feelings about biodiversity through the arts and language arts, using all senses and expanding on their curiosity and wonder.	•	•	•	•	•	•
<b>Skills and processes</b> — Through these activities, students will practise their ability to:						
1. communicate and discuss issues related to biodiversity;	•	•	•	•	•	•
2. develop personal responsibility for the maintenance of biological diversity.		•		•	•	•

## Activities legend

- 4-5 Extinct!
- 4-6 Endangered Species and Spaces of the Yukon
- 4-9 Memories...
- 4-11 Good News About Protecting Biodiversity
- 4-14 Interview a Biodiversity Hero/Heroine
- 4-15 Reach Out!

## A WORD TO THE TEACHER

*Endangered Species/Endangered Spaces* introduces you and your students to the species and spaces of the Yukon which are being most affected by the activities of the Yukon's human population. Use the following activities to help your students explore the processes which lead to extinction. Help them understand and start to apply, in their own backyards, the principles of habitat preservation and linkages to current community environmental concerns.

### Focus on student experience

1. Brainstorm a list of all of the endangered animals (mammals, birds, reptiles, amphibians, fish) students can identify. Where does each one live? Do any of the animals live in the Yukon? Are there many endangered Yukon animals? Why are they not as well known as some others?
2. Begin with what students already know about extinction. Pursue the story about the dinosaurs and ask students why dinosaurs became extinct. List theories of extinction. Refer to other periods of extinction in the history of life on Earth more closer to us i.e., last glaciation.



## BACKGROUND

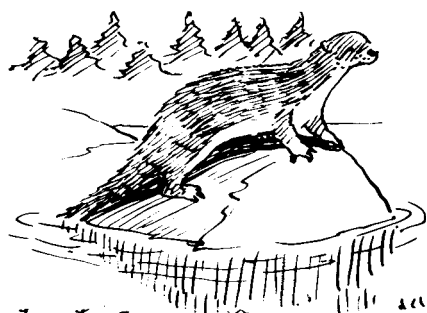
*An ecosystem is not a collection of plants and animals. It is a seamless swirl of communities and processes. If you don't save the processes, you won't save the parts.*

Chadwick, 1993

Biodiversity is dependent on habitat. Any human activity that reduces habitat reduces biodiversity. That is why we now speak not only about *endangered species*, but also about endangered spaces. It is also the reason why we speak about preserving habitat spaces as the most important factor for preserving species.

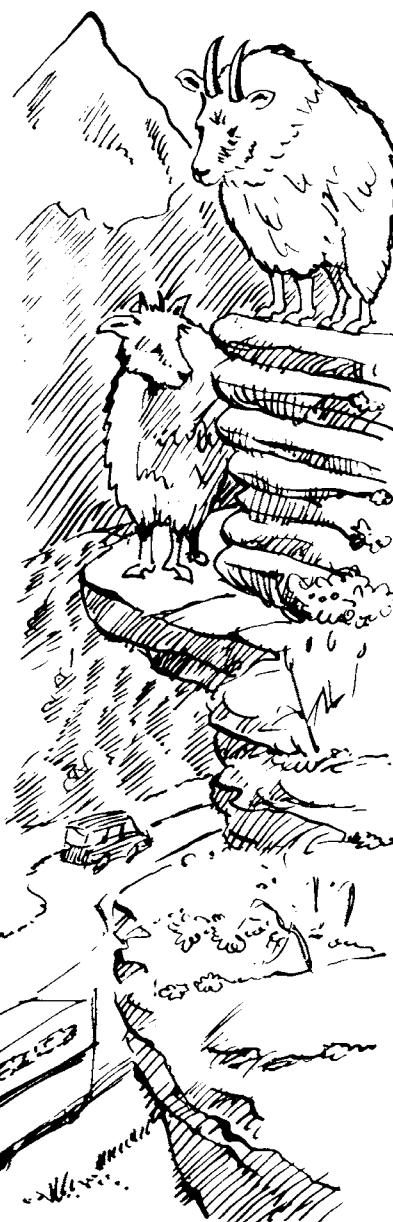


the habitat of sea otters is the kelpbeds offshore.



the habitat of river otters is sea, river & lakeshores.

Scientists now emphasize that protecting a species, such as the mountain goat, in small parks may not necessarily ensure its survival if the habitat surrounding the park is altered or removed. If a mountain goat can't get to a salt lick necessary for its ongoing health or if the healthy individuals from one population of mountain goats cannot connect to mate with individuals from another population, the ultimate health of all of the mountain goats in that area declines.



In the past, the focus was on preserving species: pandas, sea otters, grizzlies, tigers, peregrine falcons and whooping cranes, for example. But what about the small, the slithery and the leafy—less noticeable species? Without them, the ecosystems of the more well-known mammals and birds collapse.

Canada, one of the largest countries in the world, is home to tens of thousands of known species living in a variety of habitats. There are 521 species at risk identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as of November 2006. The Yukon has 7 species identified under the Yukon Wildlife Act as specially protected here but not elsewhere in Canada (see Appendix A5). The future of many of these species depends on the preservation of critical habitat and the restoration of already damaged areas. In June 2003, the Species at Risk Act (SARA) came into force to protect the wildlife found on federal lands from becoming extinct (see Appendix 5).



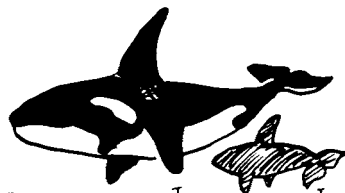
*In the past, the focus was on preserving species. Now we recognise, we must protect the whole ecosystem*

Species that are most threatened by human activity include:

- large animals, like bears that need large spaces as part of their habitat;
- slow reproducers, like whales, that take a long time to replace themselves;
- island species which can lose their genetic diversity or are vulnerable to predators introduced from elsewhere;
- species that live in the same lowland and valley habitats that are popular for human beings like Woodland Caribou.



*rabbits are fast reproducers. One pair can produce 100s of offspring in their short lifetime of 6-8 years.*



*Orcas are slow reproducers. One pair might only produce 1 offspring every 5-10 years.*



*• small isolated island populations...*



*... Lack the flexibility to cope with changes in the environment.*

There have been a number of periods during the history of the Earth when large numbers of species became extinct. Trilobites, dinosaurs, sabre-tooth tigers and millions of other plants and animals that once lived on the Earth have vanished forever. There are only their fossil remains and a few clues to tell us why they became extinct.

Today, many more animals become extinct due to human activity than because of natural processes. Our challenge is to find ways to preserve and link habitats to preserve biodiversity.

Programs are in place throughout Canada and in the Yukon including the various First Nations territories, to increase the amount of land in various parks and wilderness areas, and to preserve unique or special environments and areas that represent the different types of ecosystems. A further challenge will be to find ways to preserve and link the important protected ecosystems of our territory, thereby preserving species, genetic and ecosystem diversity.

Strategies include identifying areas with the highest levels of biodiversity, protecting as many as possible in the largest blocks possible, buffering them against the most destructive kinds of development and pollution, and making connections through landscape linkages.

Other strategies will at times include establishing a wildlife preserve where stock of wild species are kept for preservation purposes. This helps in preserving these wild species stocks from genetic contamination like for bison and elk where animals of the same species are often raised for cattle. The “Yukon Wildlife Preserve” on the Hotsprings Road near Whitehorse is a good example of that.

Making connections between areas can be as simple as...

- maintaining wildlife trees.
- leaving shelter belts of native trees & shrubs.

- making buildings attractive to wildlife

- having native plant gardens
- leaving piles of logs or rocks

- creating safe crossing for wildlife under roads.

- leaving wetland areas

- leaving hedges

- leaving wetland areas



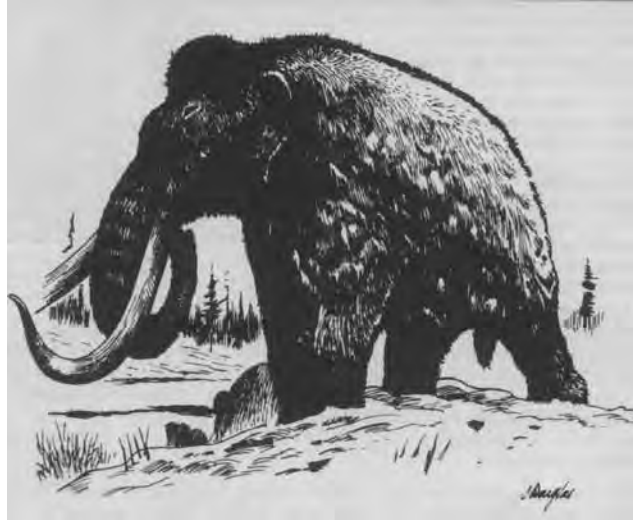
## EXTINCT!

### Aim...

To introduce the concept of extinction through the study of prehistoric animal remains.

### Ready...

A placer miner in the Klondike Valley is working her operation looking for gold. Today, removing the overburden to expose the gold-bearing gravel uncovers something more than gold! But what is it? Its 3 metre length has a gentle curve. The miner tries to lift it, but it is very heavy and she can only pick it up at the narrow end. After showing it to friends, she determines that it is a tusk from an extinct Yukon animal, the Woolly Mammoth.



The remains of this prehistoric animal reminds us of the natural process of extinction which has occurred among animals and plants throughout geological time. Our only knowledge of extinction in prehistoric times is based on preserved animal remains and fossil records.

Extinctions may come about naturally through changes such as glaciation, climatic changes, lack of adaptation of species to changing environments, loss of habitat and severe species competition. Human impact, primarily through loss of habitat, has greatly affected the process of extinction.

### Set...

1. Examine the illustration of the Woolly Mammoth. How much do you think it weighed? What was its height? Do you think it was an herbivore or a carnivore? Why?
2. Find out more about the animals of Beringia and reasons for their extinction.

### GO!

1. Draw posters or build plasticine models Beringian animals and their environment.
2. Visit a fossil site near your community or visit a museum and study some fossils there.
3. Visit the Beringia Centre in Whitehorse to learn more about Beringian animals visit their website: [www.Beringia.com](http://www.Beringia.com).
4. Check out what scientists from all over the world had to say on the 3rd International Mammoth Conference held in Dawson in March of 2003.
5. Pick a topic and research it, host your own conference, and set up a forum. For more information on Mammoth topics visit [www.yukonmuseums.ca/mammoth/](http://www.yukonmuseums.ca/mammoth/).

Reference and Image of Woolly Mammoth Courtesy of Beringia Research Notes, 1995 & 1996, Heritage Branch, Department of Tourism, Yukon Territorial Government.

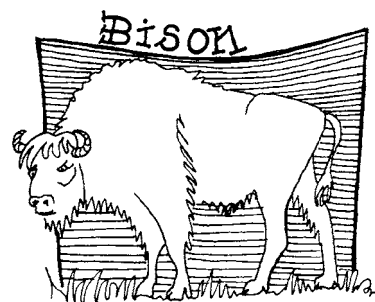
## Endangered species and spaces of the Yukon

### Aim...

To introduce species and spaces of the Yukon that are particularly at risk because of human activities.

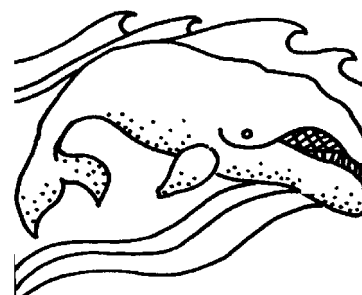
### Ready...

*Rarity is the attribute of species of all classes in all countries. If we ask ourselves why this or that species is rare, we can answer that something is unfavourable in its condition of life, but what that something is we can hardly tell.* Charles Darwin



Extinction is a natural biological process. Over the lifetime of Earth millions of species have lived and then disappeared. Sometimes the process of extinction has moved very slowly; sometimes it seems to have been massive and drastic, affecting many forms of life.

Today we are most concerned about the species and spaces that are in danger because of the actions of human. The Yukon has programs to identify and protect endangered plant and animal species and their habitats. The goal of these programs is to prevent human activities from contributing further to the extinction of Yukon species, and to preserve our unique and varied biodiversity.



### Set...

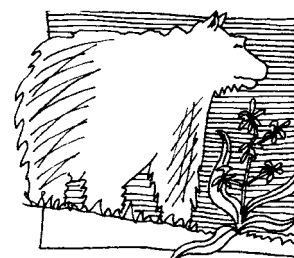
1. Pictured on the right are some species currently identified as specially protected in the Yukon. Many species find themselves at the northern edge of their range making them rare in the Yukon. For that reason, it makes some of them at risk here but none elsewhere in Canada. Some of the Yukon “specially protected” species are elk, cougar, trumpeter swan and the Chisana caribou herd.

“At risk” in the Yukon are:

- Endangered: None
- Threatened: wood bison, Baikal Sedge, Peregrine falcon (anatum subspecies).
- Special Concern: grizzly bear, polar bear, wolverine, great gray owl, short-eared owl, peregrine falcon (tundra subspecies), Squanga whitefish, Bering Cisco and western toad.



2. Described on the following page are some of the endangered spaces of our territory. Pick one of these spaces for further study using the questions in the Study Guide (4-8).



Reference: Appendix (A5)] and *Yukon Wild* by C.P.A.W.S. and the Yukon Conservation Society.



## Endangered spaces of the Yukon

### Coal

The Liard River and its many tributaries form the Liard Basin and the Hyland Highland ecoregions in the southeastern Yukon. The river valleys of this vast boreal forest region have the Yukon's largest spruce trees. Logging operations have escalated dramatically recently, yet areas of interest for protection have not been identified. Forest management policies will remain uncertain until the federal government hands over control of the Yukon's forests to the territory. The Coal River ecosystem is still intact and is proposed as a protected area candidate.

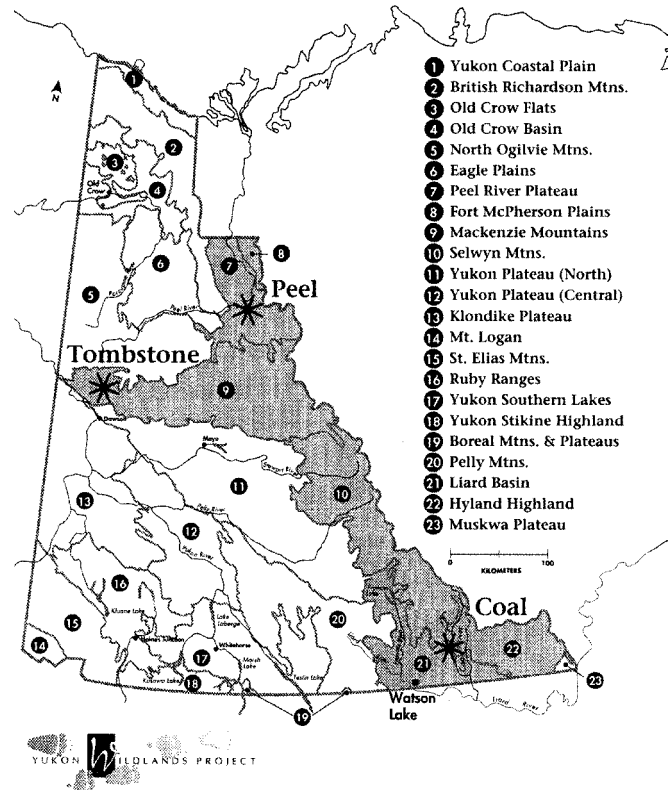
### Peel

The Wind, Snake and Bonnet Plume Rivers flow through the Selwyn and Wernecke Mountains of northern Yukon into the Peel River. This rugged and remote land is the northern spine of the mountain chain that stretches from Yellowstone to the Yukon. These rivers rush through range after range of mountains, cutting across rock slides, through canyons and flowing for miles through braided gravel flats. This area is still relatively undisturbed with free roaming grizzly bear, moose, Dall's sheep, wolf and caribou. Protection options in the Wind, Snake and Bonnet Plume watersheds need to be assessed to determine what protected areas are required to conserve wildlife and wilderness in this ecosystem. Decisions need to be made before mining exploration, roads and development proceed.

### Tombstone - A Success Story

One of the Yukon's most dramatic and well-known landmarks, the Tombstone Mountains now a territorial park was under consideration as a protected area since the mid-1970s. This

## Ecoregions of the Yukon Study Areas

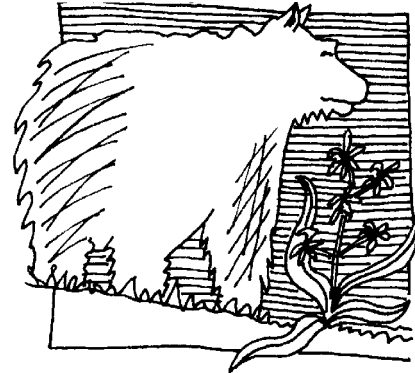


area is important habitat for a wide variety of species, including Dall's sheep, grizzly bears, songbirds and rare plants. Protection here includes important aboriginal cultural and archaeological sites and provides an accessible tourism destination with benefits to Dawson City and the Yukon. Until its protection, this area was vulnerable to industrial development. A temporary closure on new mineral claims staking has been made on 2,113.1 km<sup>2</sup> of the Tombstone Mountain area. The Blackstone Uplands (outside of the government protection proposal) has plant species found nowhere else in the world.

Information and map provided by Juri Peepre, Canadian Parks and Wilderness Society - Yukon Chapter.

**GO!**

1. Invite a naturalist to visit your class and discuss some of the plants, animals and spaces of your community which need special attention. Use the questions in the Study Guide to find out more about some of these species and spaces.
2. Prepare a display of an endangered area. On your display include illustrations, photos and/or drawings of the landscape and important animal and plant species. Include information about initiatives to protect this endangered area.



**Special species or spaces study guide**

1. Name of the space or species I am studying \_\_\_\_\_
2. Location \_\_\_\_\_
3. Special characteristics/features \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Reasons why it is endangered \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Suggested strategies and programs for protection and/or restoration \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MEMORIES

## Aim...

To reflect on the personal consequences of not hearing, and therefore not understanding, about the destruction of biodiversity.

## Ready...

Read this poem which explores the idea of listening closely to the natural world around us. If we listen carefully we may feel more concern over its destruction...SSSSHHH...LISTEN!



## Set...

### “If You Listen”

by Joyce Majiski, 1995

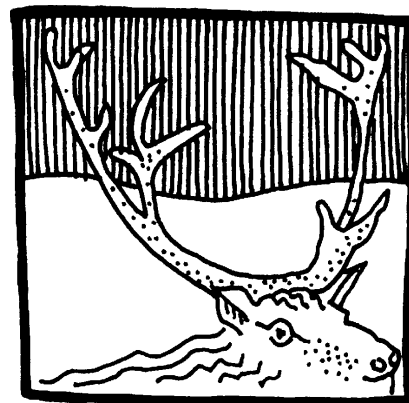
if you listen closely  
 ear bent to sculpted bleached skeletons  
 of twisted old trees;  
 fragments of ancient truths  
 whispered messages through spruce needles  
 wash up on the shores of consciousness

if you listen carefully  
 you will hear the heartbeat of the land  
 ridgelines, skylines, songlines  
 stirring forces from deep within  
 the restless need to move  
 escape unbound from things known

if you listen quietly  
 the lichen whispers  
 and the rocks may tell you from whence they came  
 carefully arranged like furniture  
 on the speckled stone  
 creating mysteries

I feel this, belly to the tundra  
 nose in cranberries  
 soft in moist lichen  
 smelling earth essence, linking memories of  
 rootedness and the flit of a bird’s wing

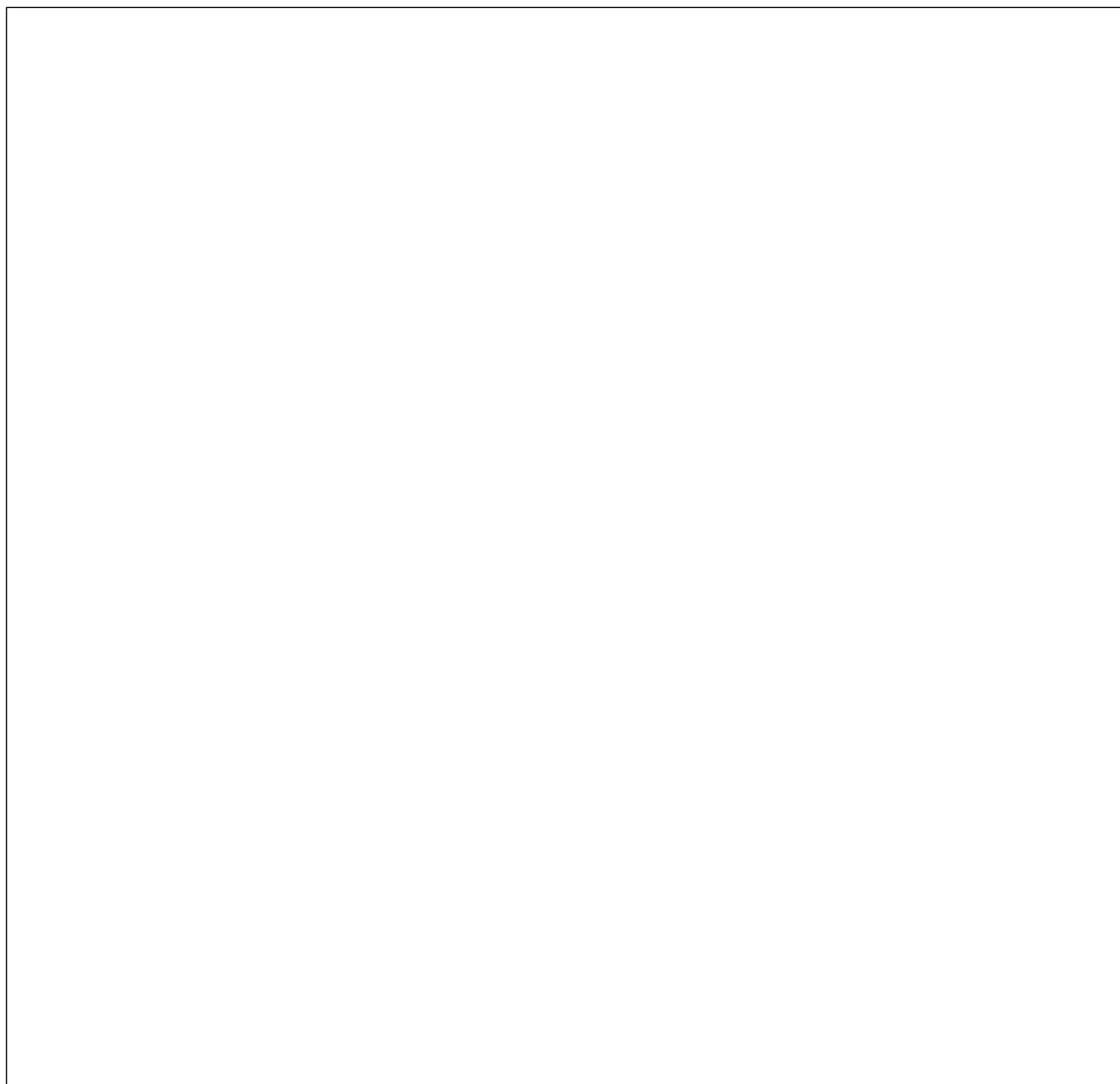
I listen for aeons of tales told  
 in the trickle of a brook  
 the groan of a glacier  
 and a pebble’s long voyage  
 home.



**GO!**

In the frame below write your own poem about a natural place that is special to you. Your natural place could be in a park you have visited, under a favourite tree, or on the shore of a lake, river, or ocean. It could even be in your own backyard.

When you have finished writing your poem, use special colours and shapes to illustrate your page, or use magazine cutouts.



**Follow-up**

Share your poems with other students in your class. Publish all of them as an anthology.

## GOOD NEWS ABOUT PROTECTING BIODIVERSITY

### Aim...

To introduce you to national and territorial strategies for preserving biodiversity.

### Ready...

Both our national and our territorial governments have set aside land as national or territorial parks to protect certain special environments.

In 1885, Sir John A. MacDonald established the first national park—Banff National Park in Alberta. The Yukon's first territorial park, Herschel Island, was established in 1987, as a requirement under the Inuvialuit Final Agreement. Since then, more areas have been set aside to preserve those special places that best represent the landscape and ecological diversity of Canada.

In the Yukon, there are many different types of protected areas\*, based on the International Union for the Conservation of Nature (IUCN) definitions. Fourteen of the Yukon's 23 ecoregions have one or more protected areas from full to negligible level of protection. Our protected areas include 3 national parks, 5 territorial parks, 2 ecological reserve, 7 habitat/ species managed areas, 2 managed resource protected area, 1 wildlife preserve, 1 national wildlife area and 1 wildlife sanctuary. They range in size from vast wilderness expanses (22,015 sq km) to small pockets of nature (16 sq km).

The purposes of protected areas are diverse. They not only satisfy cultural and recreational needs of the public, but also contribute to achieving environmental goals.

Protected areas:

- contribute to the preservation of biological diversity;
- provide natural situations for long-term scientific research;
- preserve genetic diversity for future application in areas such as agriculture, medicine and forestry;
- contribute to our understanding of our cultural heritage, including places of special spiritual significance;
- provide places where Yukoners and visitors from around the world can learn and understand about biological diversity and environmental concerns;
- provide opportunities for recreation and enjoyment of nature and the outdoors.

Setting aside protected areas is an important strategy for protecting biodiversity. However, it is also important for each of us to take responsibility to protect the biodiversity in our own backyard.

\*See page 4-16 for a map of the Yukon Protected Spaces. Colour the map to show the different classifications (full, partial, interim or none).

Reference: Yukon Wild - Natural Regions of the Yukon, Canadian Parks and Wilderness Society and the Yukon Conservation Society

**Set...GO!**

Imagine that you have the power to create a protected area out of a piece of land in or near your community. Prepare a display of your newly protected area to be presented at a visit to your community by a special municipal, territorial or national government guest.

Use the categories below to help you plan your display.

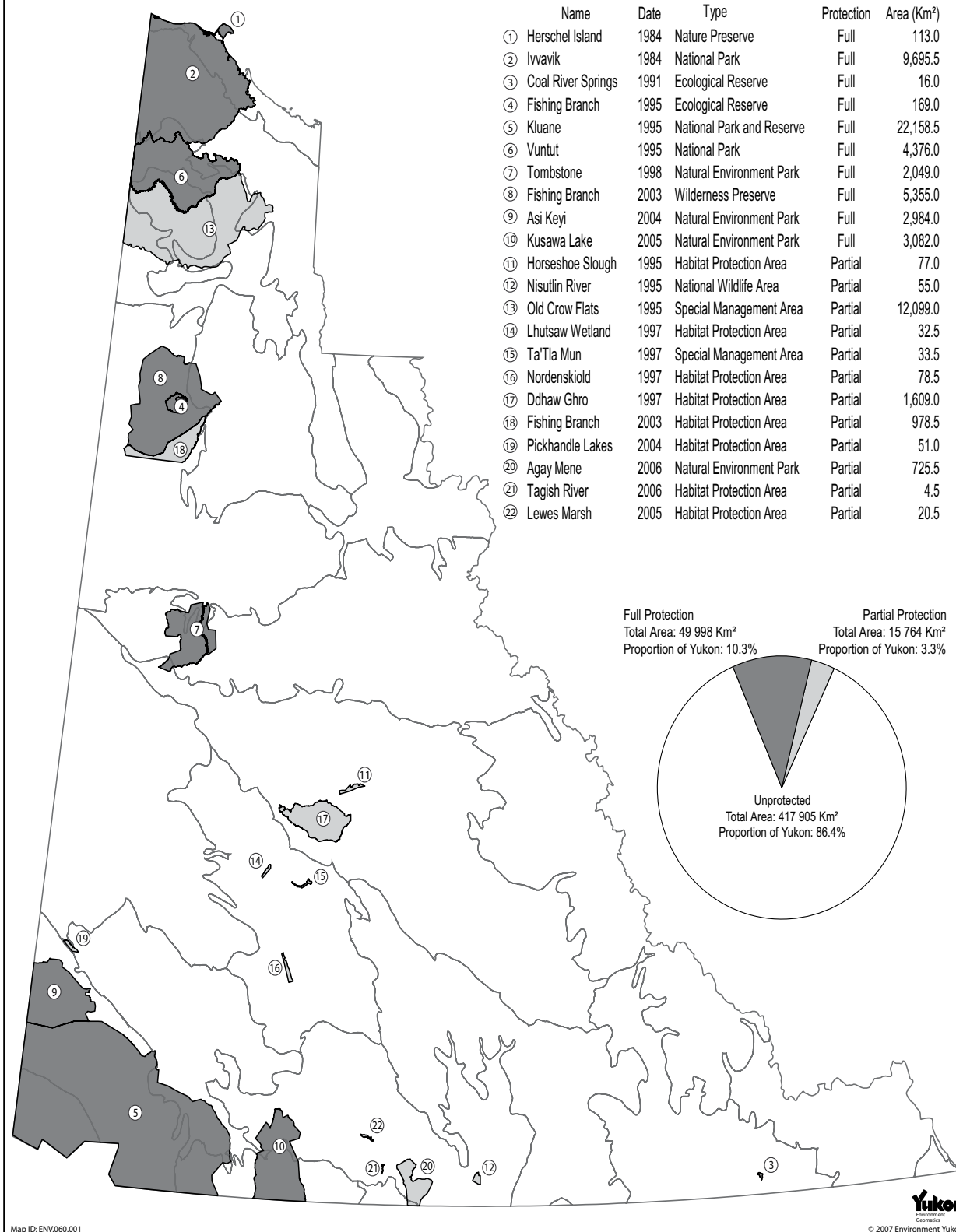
Describe your protected area (or draw a diagram of it).

List its most important special features. Why is this area special?

List the types of things (pictures, objects, maps, etc.) you will use to prepare your display.

Go to work! Let there be no limits to your creativity! Then decide how you will convince others that a park is the best use of the land.

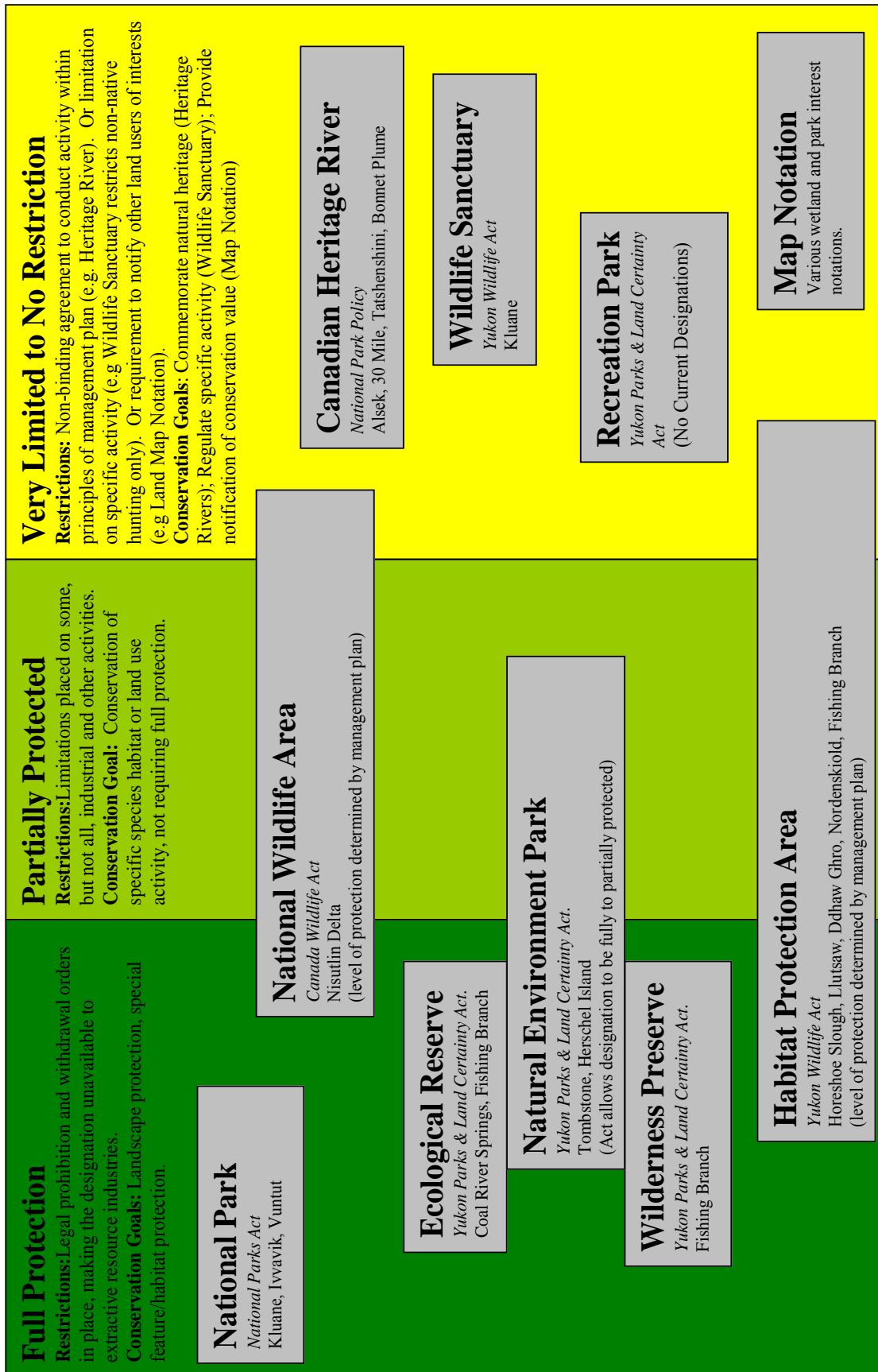
# Yukon's Protected Areas



Map ID: ENV/060.001

**Yukon**  
 Environment  
 Geomatics  
 © 2007 Environment Yukon

## Level of Protection in Yukon Conservation Area Options





## INTERVIEW A BIODIVERSITY HERO/HEROINE

### Aim...

To reinforce the concept that there are individuals in every community whose actions help protect biodiversity.

### Ready...

In every community there are people who put time, energy and money into protecting and restoring species and spaces in our communities. Be a good news reporter and cover their stories.

### Set...

1. Get together in teams of two or three.
2. Make a list of some of the people in your community who have worked on projects to preserve or restore the biodiversity of your community. They may have planted a garden of native plants; they may have worked to protect a special area; they may write about animals and plants; they may work in a museum or park. Identify them and get their telephone numbers.

### GO!

1. Phone your hero or heroine. Explain your project. Arrange for an interview in person. Tape record your interview. Be sure to ask for permission.
2. Ask your questions. Give them time to explain their project.
3. Take a picture or draw your hero/heroine at work on his/her project.
4. Write up your interview as a brief magazine article for a kids' magazine. Then create a classroom bulletin board of community biodiversity heroes and heroines using your articles and photos.

### Follow-up

1. Imagine you are working on or have completed a special project that helped protect or restore a small piece of the environment in your backyard or community. You are now a biodiversity heroine or hero! Draw your special area. Then describe it so someone far away can imagine what it looks like and why it is special.
2. Add your drawings and descriptions to your classroom biodiversity heroes and heroines bulletin board.
3. Have someone do an interview with you. Discuss your imaginary project. Tape record or videotape the interview. Your team will consist of a reporter and the camera-person.
4. Now that you've imagined it, you can plan and carry out a small biodiversity project for real. Remember, it is often the little things that count.

## REACH OUT!

### Mostly Science

1. Discuss the impact of domestic pets, especially cats, on the wildlife population of a community.
2. Complete a survey of public opinion in your class, in the school and in your family on extinction and endangered plants and wildlife. Present your data. Write a paper on your findings for presentation to a class “science conference”.
3. Collect data on how many species in Canada are added to the species at risk list every year. Show your results. Discuss your findings.
4. Discuss the importance of preserving healthy “wild” populations versus domesticated ones.

### Mostly Language Arts

1. Research and develop a creative, informative poster about an extinct or endangered plant or animal.
2. Write a biography of an endangered species. Describe its habitat, its role in the ecosystem, and why it is endangered. Conclude the biography with an appeal.
3. Read stories or novels about endangered species--e.g. *On Thin Ice, A Whale for the Killing, Never Cry Wolf*.

### Mostly Social Studies

1. Develop a snakes and ladders game using a journey through the ecozones of the Yukon. Use success stories about our endangered species and spaces for the up ladders and concerns for the down ladders.
2. Draw three maps of your own backyard. On map 1 draw in what lives there today. On map 2 draw in what might have lived there 200 years ago. On map 3 draw in what might live there 20 years from now.

### Mostly Fine Arts

1. Draw a landscape plan for your school in which you provide for the re-establishment of some rare species--e.g. butterflies, birds, plants, etc. Then create a wall-sized mural with your vision of the way your landscaping will look if it were completed. Discuss your vision with school authorities.