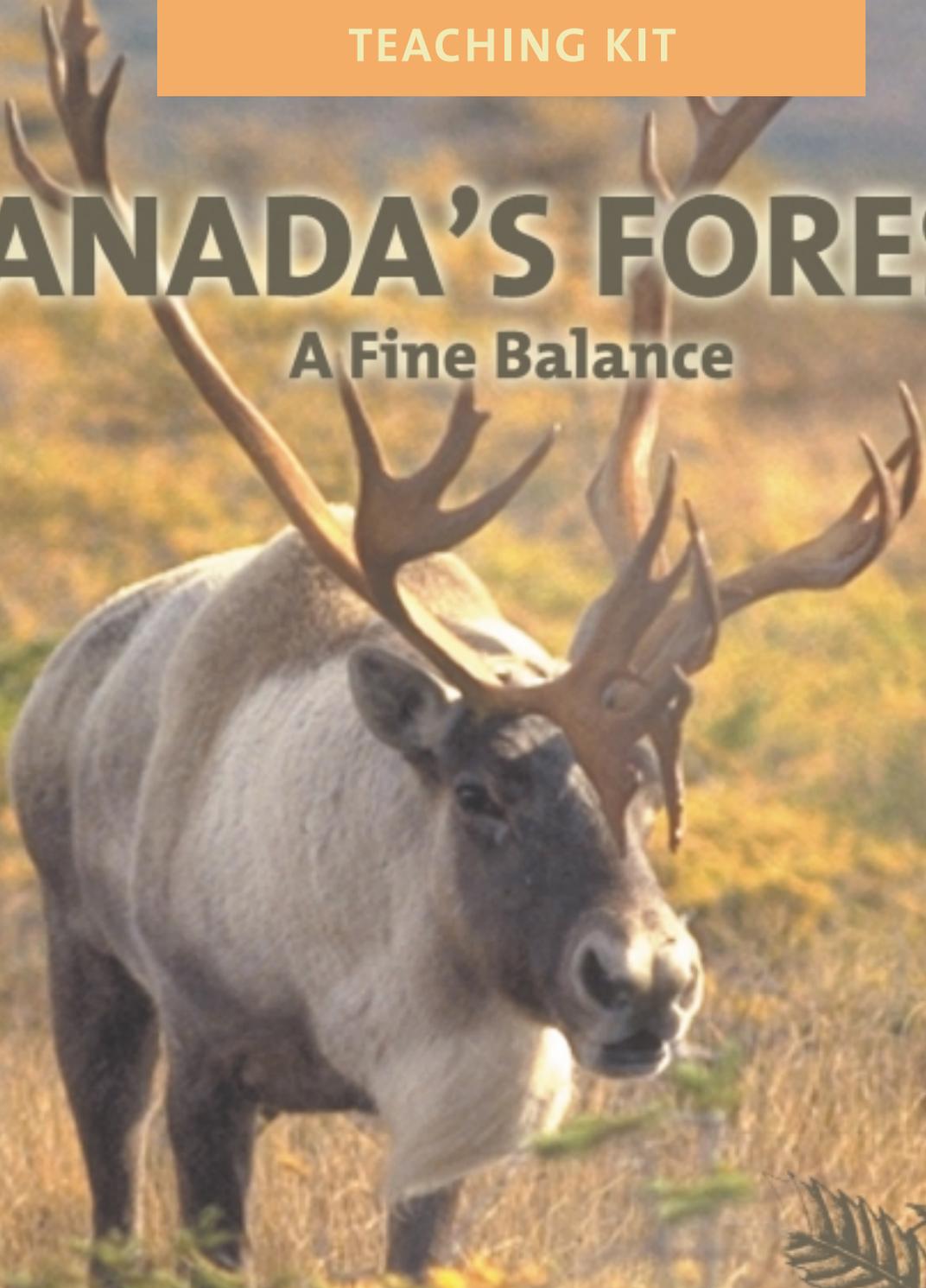


TEACHING KIT

CANADA'S FORESTS

A Fine Balance



Volume 5: Species at Risk

Forest Protection in the Classroom

As an extension to the 12th World Forestry Congress, held in Quebec City, September 2003, students from three grade five classes in the International Program of École Filteau – Saint-Mathieu in Ste-Foy took part in a unique learning exercise.

Visiting the school were: **Sally Collins**, Associate Chief of the US Department of Agriculture (USDA, Forest Service); **François Miville-Deschênes** of Natural Resources Canada; **Dave Lemkay** of the Canadian Forestry Association; and **Chantal Drapeau**, of the Société de protection des forêts contre le feu au Québec. The presentation to the students outlined the important work of each organization in the field of protection of forests and the environment. This was enhanced by the appearance of Smokey Bear and Woodsy Owl, mascots of forest protection and awareness in Canada and the USA.

In preparation for the occasion, students researched available resources for information on forest biodiversity and forest fire protection. Each class discussed and analyzed these subjects as well as the news stories of the day on the devastating wildfires in western Canada.

At the conclusion of presentations, students engaged the American, Canadian and Quebec Government forestry officials in a series of questions and answers in English and French. This proved to be a delightful learning exercise for students and visitors alike.

Our thanks to Danielle Grenier, Principal of École Filteau – Saint-Mathieu and teachers Éline Émond, Claudette Larouche, Frédéric Malouin and France Paradis, for their participation in this international event.



In the photo above are left to right: Sally Collins, Associate Chief, USDA Forest Service, Washington; Woodsy Owl, Environmental Mascot; Dave Lemkay, Canadian Forestry Association; Wilhelmina Bratton, Education Program, USDA Forest Service; Smokey Bear and Gary Barret, International Program, USDA Forest Service.

Cover Photo: Woodland caribou, boreal population, threatened in Canada © Shane Mahoney

To ensure their long term sustainability in the managed forest, the woodland caribou of the western boreal forest is receiving special attention from researchers at the University of Winnipeg and the Manitoba Model Forest.

At least 30% of the fibre used in manufacturing the paperboard for this cover comes from well-managed forests independently certified in accordance with the rules of the Forest Stewardship Council.



SW-COC-551

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Canada's Forests – A Fine Balance looks at how important forests are in sheltering and supporting wildlife species. It explores how the loss of habitat has become the main reason why the future of some species is at risk in Canada.

The lessons in this teaching kit will show teachers and students why some species are at risk in Canada, and what is being done to reverse this trend. In some cases, this means bringing them back from the brink of extinction.

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The CFA is dedicated to the wise use and conservation of Canada's forest resources through enhanced public awareness and education programs. The CFA Teaching Kit Series provides educators with the tools to help young people better understand the value of forests and the importance of protecting and conserving them.

Healthy forest ecosystems depend on a complex relationship of soils, water, plant communities, wildlife, climate and natural events such as wildfire. All Canadians should be given an opportunity to learn more about forest ecosystems and the important role that they play in the economic and environmental health of our country and our planet.



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Using This Teaching Kit

This teaching kit, the fifth in the Canada's Forests series, is designed to help teachers explore with their students the importance of Canada's forests in the survival of wildlife species. The introduction explains how a species is designated as at risk in Canada and provides teachers with useful background information to help deliver the nine lessons that follow.

Throughout the kit there are Web site addresses and other contact information so that teachers and students can explore species at risk in their region, their province or throughout the country.

Target Audience

This kit is designed to support grades and courses with the best curriculum links to species at risk. Therefore, the activities focus on grades 4, 6 and 7 (elementary cycles 2 and 3; sec. I), and address ecosystem and diversity of life learning outcomes. There are also senior activities aimed at grades 10, 11 and 12 (sec. III, IV and V), which support science, environmental science and geography learning outcomes across the country.

Instruction Key

The icons and symbols in this teaching kit will allow you to quickly identify lessons that have:

 group discussion

 presentation/performance

 writing/recording

 field investigation

 extensions

Curriculum Links

This kit allows students to expand their knowledge about species at risk in Canada and understand how forest ecosystems are a key to the survival of so many. As the kit was developed, provincial curriculum guidelines were reviewed and examined so that the activities would reflect as many learning outcomes, objectives and expectations as possible.

The kit uses learning outcomes from the *Pan-Canadian Protocol for Collaboration on School Curriculum – The Common Framework of Science Learning Outcomes*, a nationally recognized science curriculum document on which many provincial and territorial curricula are based. Each activity addresses the learning outcomes in this framework for student skills, knowledge and attitudes.

Although the activities were designed primarily to augment science learning, the lessons also emphasize exploration in language arts, social studies, drama, geography, visual arts and other key curriculum opportunities. In particular, the senior level activities are focused on geography learning outcomes and will also mesh with provincial curricula across Canada.

Note: These lessons and activities are linked to the Pan-Canadian curriculum in order to have one national reference. You will find, however, that they are easily linked to your own provincial or territorial curriculum, although they may work at grade levels other than what we have identified. Please feel free to adapt and augment the lessons to better meet your own curriculum and grade requirements.

Kit Organization

The kit provides a full set of teaching tools designed to help you achieve specific learning outcomes, while exploring the reasons why some species are considered at risk in Canada. In each of the hands-on, interactive lessons you will find:

Summary: introduces the topic or theme and the type of activity

Activity Information: provides the grade level, subject headings, estimated duration and suggested materials

Learning Outcomes: highlights key curriculum links

Teacher Background: additional information on the lesson topic

Procedure: detailed instructions required to teach the activity

Extensions: follow-up activities related to the activity.

Species at Risk in Canada

Our natural world is constantly changing. Since the beginning of time, many species have vanished and new ones have evolved. Modern society has led to changes that have hastened the loss of some species, and we have come to realize that we must take action to prevent further losses and to help some populations recover.

Today, “species at risk” is a familiar term. Yet, like many common phrases, it is sometimes hard to know exactly what it means. When is a species considered at risk in Canada? Why is this happening? Is anything being done to help? And why should we care?

This kit answers these questions. It will help teachers and students learn more about the factors that have put the future of too many native Canadian wildlife species at risk, and the actions that are being taken to help them come back. It will pay special attention to our rich, diverse forestlands, the key to survival for so many species in Canada.

Nature is an amazing and intricate puzzle made up of literally millions of species. If our actions lead to the loss of even one, the delicate balance can be disrupted. We all lose in a number of ways when a species vanishes from Earth. We may have lost something with spiritual and traditional significance for First Nations or a species that may hold the potential for future scientific or medical breakthroughs.

We are constantly learning what we must do to conserve healthy ecosystems and make sure our actions do not place species at risk. We are finding ways to not only live in harmony with our natural world, but to help reverse past damage.

Assessing Species at Risk

Created in 1977, COSEWIC (the Committee on the Status of Endangered Wildlife in Canada) is a committee of experts that uses the best and most up-to-date scientific information and Aboriginal traditional knowledge to assess which native wild species are in some danger of disappearing from Canada.

COSEWIC’s work involves mammals, birds, reptiles, amphibians, fishes, molluscs, arthropods, vascular plants, mosses and lichens. The federal government takes COSEWIC’s designations into account when establishing the legal list of species at risk, which is the basis for the wildlife protection and recovery measures in Canada.

Species at risk includes a number of categories:

Extirpated means a wildlife species no longer exists in the wild in Canada, but exists elsewhere in the wild. For example, grizzly bears are no longer found around major rivers on the North American Plains where they were once common, although they exist elsewhere in the wild.

Endangered means a wildlife species is facing imminent extirpation or extinction. Examples are American ginseng, a perennial herb that grows in Ontario and Quebec, the island blue, a butterfly of British Columbia and the beluga whale on the east coast.

Threatened means a wildlife species is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction. Examples include the peregrine falcon, anatum subspecies, and soapweed in Alberta.

Special Concern means a wildlife species may become threatened or endangered because of a combination of biological characteristics and identified threats. Examples include the western population of wolverine, the Northeast Pacific offshore population of killer whales and the black-tailed prairie dog in Saskatchewan.

COSEWIC also includes the category “extinct” for species that no longer exist, such as the Great Auk. And it identifies some species that have been evaluated and are not at risk, and others where there is not enough information to assess the risk.

As of this printing, COSEWIC has designated 441 species at risk in Canada. Of these, 21 are extirpated, 160 endangered, 108 threatened, 140 of special concern, and 12 are extinct. Information about the biology, status and recovery efforts for each species can be found at: www.speciesatrisk.gc.ca

Why Are Species at Risk?

An astounding 80 per cent of the species designated by COSEWIC are at risk due to loss of habitat. And in most cases people are the culprits. We drain wetlands to build schools, housing developments and shopping malls. We turn grasslands and wooded areas into farms. We cut forests for wood or pulp and paper.

Consider what happens if a new housing development is built on the outskirts of your community. Where do the animals, plants, birds and insects that once lived in the forests or fields go? Is there somewhere nearby where they can continue to thrive? Can they adapt to their new surroundings? Or will their population dwindle and eventually disappear?

In southern Canada, people have drained a significant portion of the original wetlands and have adversely affected most that remain. Three-quarters of Ontario's species at risk are in the south where less than 10 per cent of the original forest cover remains.

Along the Pacific Coast, species that depend on old-growth forests are affected by logging activities. Marbled murrelets are small seabirds that nest on large limbs of old-growth trees that are covered with deep moss. The trees they depend on are also commercially valuable.

We build roads, pipelines, seismic lines and power corridors that can isolate wildlife populations so that they are too small to support a viable population with adequate genetic diversity. We flood lands to create hydroelectric reservoirs, use chemical fertilizers, insecticides and herbicides. We increase levels of toxic chemicals and pollutants, introduce non-native invasive species,

overhunt or poach and suppress natural events such as wildfire. The future of some species can be impacted by something as major as climate change or as minor as driving an all-terrain vehicle through a sensitive area.

We sometimes see cases where entire ecosystems are at risk. Very little of the tall grass prairie that once covered a large area of the central United States and Canada remains, primarily because these deep, rich layered soils are perfect for agricultural development. Where have the species gone that once thrived in these open grasslands?

Who's Watching Out for Species at Risk?

While there has been an increase in both interest and action related to species at risk more recently, Canadians have long understood the importance of protecting wild areas and wildlife. Banff National Park, famous around the world for its wildlife, became Canada's first national park way back in 1885. Wood Buffalo National Park, our largest national park, was established in 1922 to protect the last remaining herds of bison in northern Canada.

While COSEWIC is the cornerstone of Canada's work related to species at risk, it depends on its partnerships with governments and organizations across Canada. The committee itself has members from each provincial and territorial government wildlife agency, federal agencies, three non-government members, and the co-chairs of the Species Specialist and Aboriginal Traditional Knowledge Subcommittees.

In 1996, the *Accord for the Protection of Species at Risk* was created to provide protection for species at risk across Canada. Through the *Accord*, federal, provincial and territorial ministers responsible for wildlife agreed to criteria for designating species at risk and guidelines for protecting the habitats of these species. They also committed to developing recovery plans for species identified as at risk.

Many other actions, federal, provincial/territorial and municipal, support wildlife and habitat, from parks creation to laws regulating everything from hunting and fishing to resource and land development. Wildlife and species at risk are an important consideration in land and resource management planning.

Species at Risk Legislation

In June 2003, when the Canadian government proclaimed into law the *Species at Risk Act*, *Bill C-5*, Environment Minister David Anderson called Canada's wildlife species and the ecosystems they live within "an important part of the natural heritage of our country and the world."

The *Act* is a new approach in Canadian legislation, that shows each and every step in the assessment, listing and recovery processes for species at risk. It provides for species and critical habitat conservation while engaging Canadians

through stewardship. The Act sets out how to decide which species are a priority for action, and what to do to protect a species. It identifies ways that governments, organizations and individuals can work together, and establishes penalties for a failure to obey the Act.

Six provinces – Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario and Quebec – have specific legislation designed to protect and conserve species at risk. Ontario's *Endangered Species Act of 1971* was the first legislation of its kind in Canada to prohibit willful harm to regulated endangered species and destruction of, or interference with, their habitats. Ontario became a leader in efforts to protect species at risk as it continued to revamp its non-game program.

Some provinces have amended existing wildlife laws to deal explicitly with species at risk, while others are developing legislation. The *Accord* requires that provinces and territories either develop new legislation or use existing legislative tools to protect species at risk. In addition, First Nations are consulted and involved in programs related to species at risk. This helps to ensure the effective implementation of any policies and legislation in land claims settlement regions, on reserve lands, and where traditional harvesting activities are being carried out.

Provincial/Territorial Links

Alberta: www3.gov.ab.ca/srd/fw/riskspecies/speciesatrisk/

British Columbia: <http://srmwww.gov.bc.ca/atrisk/>

Manitoba: www.gov.mb.ca/conservation/wildlife/managing/species_at_risk.html

New Brunswick: www.gnb.ca/0078/index-e.asp

Newfoundland and Labrador: www.gov.nf.ca/hoa/bills/bill0133.htm

Northwest Territories: www.nwtwildlife.rwed.gov.nt.ca/

Nova Scotia: www.gov.ns.ca/natr/wildlife/

Nunavut: www.nunavutwildlifeact.ca

Ontario: www.rom.on.ca/ontario/index.php
www.ontarioparks.com/english/sar.html

Prince Edward Island: www.gov.pe.ca/roundtable/

Quebec: http://www.fapaq.gouv.ca/fr/etu_rec/esp_mena_vuln/index.htm
(available in English only)

Saskatchewan: www.se.gov.sk.ca/ecosystem/speciesatrisk/

Yukon: www.yfwmb.yk.ca/comanagement/



Is Anything Getting Better?

Practicing Environmental Stewardship

The best way to protect wildlife species is to practice good environmental stewardship so that we can conserve and maintain, and even bring back, high-quality habitat. There are lots of examples of stewardship activities – large and small – in cities, farms and forests across Canada.

Leadership in Energy and Environmental Design (LEED) is a rating system that certifies green building projects if they achieve a specified number of points in categories such as building location, water conservation, energy, materials and indoor environmental quality. LEED Canada awards a point if a project's building site is selected to reduce its environmental impact, such as avoiding lands that are ecologically sensitive or provide habitat for rare or endangered species.

Ducks Unlimited began its habitat conservation work way back in 1938 when conservation-minded sportsmen noticed that wetlands and waterfowl were disappearing in North America due to drought and agricultural and urban expansion. Today, Ducks Unlimited Canada manages and restores wetlands and associated habitats that benefit waterfowl, other species and people.

Forest professionals across Canada plan logging so that the forest that remains continues to shelter wildlife, safeguard watersheds, provide soil stability and protect countless other values.

Provincial laws make sure forestry activities avoid affecting wildlife species and plant communities that are at risk.

Forest companies leave behind wildlife, trees, stumps, branches and fallen trees to maintain biodiversity and provide habitat for plants, animals and insects.

Organizations are in place to protect two of Canada's most unique forest ecosystems – Garry oak meadows on southeast Vancouver Island and Carolinian forests in southern Ontario. In British Columbia, local citizens created the Garry Oak Meadow Preservation Society in 1992 to preserve, protect and restore Garry oak stands and their natural habitats. In Ontario, Carolinian Canada, a non-profit coalition of conservation groups and individuals, is working to conserve the ecological diversity of a region that makes up just one per cent of Canada's total land area and has an estimated 2200 species of herbaceous plants, including 70 species of trees alone.

Habitat Stewardship Program

While stewardship can be carried out on a large scale, perhaps the most visible and valuable activities are done on a small scale by landowners and interested individuals. There are hundreds of stewardship projects underway across Canada, many of them funded by the Habitat Stewardship Program.

The Government of Canada established the Habitat Stewardship Program to encourage Canadians to protect habitats, help in the recovery of species at risk, and conserve Canada's natural heritage. It is one of the key components of the National Strategy for the Protection of Species at Risk. There are activities in every part of Canada:

In southern Ontario, the Six Nations of the Grand River is continuing an outreach program so that the public can learn about the importance of forested areas and the need to protect existing Carolinian stands.

Bird Studies Canada, in keeping with approved recovery plans and working in concert with local landowners and land managers, is directing stewardship activities to conserve the habitat of Carolinian forest birds at risk in the Lake Erie Lowland ecoregion of Ontario.

In the Yukon, First Nations game guardians were trained in the management of species and populations at risk so they can better understand conservation biology principles and also share their traditional knowledge with the specialists leading the training.

In southern British Columbia, the Nature Conservancy of Canada continues to help individuals and agencies practice proper stewardship and support habitat restoration at a range of Garry oak sites.

In northern Alberta, the Alberta Conservation Association helps speed up vegetative regrowth on seismic lines and roads to increase the availability of habitat for woodland caribou and other species, such as grizzly bears and wolverines, that require large undisturbed areas.

In Quebec, the Club Optimiste Montréal Colombo is bringing together many stakeholders to promote the stewardship of riparian environments and raise awareness of species at risk in Montreal.

The Kativik regional government is raising awareness in Inuit communities on the precariousness of the beluga populations in northern Quebec and encouraging them to help develop recovery plans.

In Atlantic Canada, Bird Studies Canada is working with private forestry companies to monitor and manage habitat of Bicknell's Thrushes on lands leased by these companies.

For further information, visit www.cws-scf.ec.gc.ca/hsp-pih

Bringing Back Habitat and Species

There are also examples across Canada of government and non-government organizations bringing back species from the brink of extinction or extirpation. The Recovery of Nationally Endangered Wildlife Program supports commitments made under the *Accord for the Protection of Species at Risk*, as well as the recovery requirements of the new *Species at Risk Act*.

Organizations involved in recovery programs try to respond quickly so that they can avoid having to use more intensive efforts such as reintroduction, captive breeding and relocation. They work with the co-operation of landowners, local governments, First Nations and other stakeholders who own or manage land, and watch for opportunities to raise public awareness on conservation issues close to home.

For example, the recovery/conservation team that aims to maintain self-sustaining populations of coastal plain flora in Nova Scotia is focusing on both shoreline protection and landowner education. A recovery plan for the Sydenham River, found in the Carolinian zone of southern Ontario, is improving habitat as well as strengthening knowledge and community awareness. The Sydenham River is home to many aquatic species, including at least 34 species of freshwater mussels and 80 species of fish, many of them rare.

There are numerous examples of success stories related to recovery efforts. In 1978, COSEWIC designated the swift fox as extirpated from Canada due to habitat destruction, poisoning and trapping in the early 1900s. In 1998, it was able to reclassify the species to endangered thanks to the success of captive breeding programs. The wood bison was designated as endangered by COSEWIC in 1978, and has since been reclassified to the improved threatened status in 1988.

The Peregrine Falcon *anatum* subspecies was practically eliminated from most of its range in North America because of the persistent use of pesticides such as DDT. However, due to successful captive breeding activities, and the ban on DDT, the Peregrine Falcon *anatum* subspecies is becoming more plentiful and less at risk.

To view other examples of recovery efforts in Canada, visit:
www.recovery.gc.ca

The Economics of Protection

People around the world have come to understand how important it is to consider the impact human activities might have on other species. In 1987, the World Commission on Environment and Development (commonly known as the Brundtland Commission) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Five years later, the first global agreement on conservation and sustainable use of biological diversity was signed in Rio de Janeiro by 150 governments, including Canada, and another 175 have signed since. It was the first time world leaders acknowledged that there was direct economic value in protecting biological diversity.

The Convention on Biological Diversity signed in Rio de Janeiro has three main goals:

- the conservation of biodiversity;
- sustainable use of the components of biodiversity; and
- sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable way.

The *Convention* is a legally binding document that linked traditional conservation efforts to economic goals and established principles for sharing the benefits from the use of resources. Put simply, it requires that participants, such as Canada, must acknowledge species at risk with any activities that occur within their boundaries.

Bringing the Message Home

While there is a lot going on, it is important to remember that we all need to pitch in, and we all can. It may seem like a daunting task, but there is a lot that can be done in any Canadian community. If every person does a little bit, we stand to gain a lot.

It may be as simple as taking an interest in what is happening around you. Take part in planning open houses so that you can find out how developers or forest companies are considering the needs of wildlife species in their activities. Let them know if you don't think they are doing enough.

If you are concerned about the impact of industrial or commercial activities, write a letter to the developer and outline why. You can also write a letter to the editor.

A few more ideas are listed here, to help you and your students get involved in helping species at risk.

- Whenever possible, take your classes outside and help your students become observers of wildlife.
- Invite foresters and biologists into your classroom to talk about their work in protecting species at risk.
- Contact your provincial forestry association for more information about species at risk stewardship activities.
- Select an individual forest company and find out what they are doing to conserve species at risk.
- Encourage your students to keep domestic pets under control. Don't let dogs run loose and chase wildlife, and keep a bell around the neck of cats.
- Participate in land use planning processes in your community to ensure that wildlife habitat is protected.
- Find out if there is an ongoing species at risk recovery effort in your community and ask how you can support and learn more about those activities.
- Grow native plants in your garden, while making sure to buy them from producers that do not harvest them directly from the wild.
- Avoid using herbicides and pesticides in your garden or yard.
- Install bird feeders, nest boxes and bird baths in your yard, and in the school yard.
- Help others learn about species at risk.
- Use this teaching kit to learn even more.



Species at Risk Teaching Resources

Environment Canada Species at Risk

www.speciesatrisk.gc.ca

Species at Risk Act Public Registry

www.sararegistry.gc.ca

Space for Species

www.spaceforspecies.ca

Hinterland Who's Who

www.hww.ca

COSEWIC

www.cosewic.gc.ca

Parks Canada

www.pc.gc.ca/nature/eep-sar/index_e.asp

Parks Canada educators' site

www.pc.gc.ca/edu/index_E.asp

Canadian Museum of Nature

www.nature.ca

Canadian Wildlife Federation

www.cwf-fcf.org

Canadian Nature Federation

www.cnf.ca

Wild Species

www.wildspecies.ca/home.cfm?lang=e

Convention on International Trade of Endangered Species (CITES)

www.cites.ca

Ducks Unlimited Canada Teacher Resources

www.ducks.ca/edu/resource.html

Federation of Ontario Naturalists

www.ontarionature.org

National Accord for the Protection of Species at Risk

www.speciesatrisk.gc.ca/recovery/accord_bac_e.cfm

Royal Ontario Museum

www.rom.on.ca/ontario/risk.php

World Wildlife Fund

www.wwfcanada.org

New Brunswick Federation of Naturalists

Species at Risk Education Kit 2003

www.naturenb.ca

Patrick Moore – Green Spirit

www.greenspirit.com

Check out the *Species-at-Risk in New Brunswick Education Kit 2003* for grades 4 and 7. This project is developed primarily for teachers in New Brunswick by the New Brunswick Federation of Naturalists, but can complement curriculum in any province. It is a key source for hands-on, classroom-ready activities and lesson plans for teachers and students, complementing the provincial curriculum, and available in both English and French. For copies of the kit, please contact:

New Brunswick Federation of Naturalists

924 Prospect Street

Fredericton NB E3B 2T9

Another excellent resource is *Special Places: Eco-Lessons from the National Parks in Atlantic Canada* published by Parks Canada. This interactive curriculum supplement is designed for students and teachers in both the elementary and secondary levels, and explores biological diversity, species at risk, ecosystems, habitat protection and more. The activities combine research, discussion, and group work, and are all linked to the Atlantic Canada Science Curriculum. For copies of *Special Places* please contact:

Parks Canada

Atlantic Service Centre

Historic Properties

1869 Upper Water Street

Halifax NS B3J 1S9



Acting Out for Species at Risk

Summary

Students will research a species at risk that lives in a forested habitat and prepare a television public service announcement (PSA) aimed at helping to preserve the species.

Activity Information

Level: Grades 4, 6 and 7 (elementary cycles 2, 3; sec. I)

Subjects: Habitats and Communities, Diversity of Life, Science, Language Arts, Drama, Geography

Estimated Duration: One 60-minute class period for discussion, one 60-minute period for research and development of the PSA, one 60-minute period to present PSAs. Homework may be required to complete the PSA.

Materials: markers, construction paper.

Learning Outcomes

Habitats and Communities

Identify their own and their family's impact on natural resources (e.g., identify the potential impact of their lifestyle on moose, deer, rabbit or salmon habitats and populations).

Relate habitat loss to the endangerment or extinction of plants and animals.

Compile and display data, by hand or by computer, in a variety of formats including frequency tallies, tables and bar graphs (e.g., display data in a graph from a population-simulation game).

Diversity of Life

Describe the potential impact of the use by humans of regional natural resources (e.g., identify the possible impact on the local deer population).

Teacher Background

Every day, our human population is growing. With this growing population comes the need for more space – space for houses, space for schools, space for parks and soccer pitches. This need for space places demands on the environment and other habitats. So, as the need for more land area increases, so does our need to protect and conserve forests and other ecosystems, ensuring that they are managed in a sustainable way.

Canada has a variety of forest types – you can find more information about the forest regions on the Natural Resources Canada Web site at: www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/common/maps_e.html

They include the boreal forest, a diverse forest ecosystem that stretches from Newfoundland to the Yukon across the centre of the country, (www.borealcanada.ca/about_boreal_e.cfm) and the Carolinian forest, a unique deciduous forest community in southwestern Ontario.

The boreal forest is home to tree species that include spruce, balsam fir, poplar and jack pine, and wildlife species that include red squirrels, wolverines, grizzly and black bears, Sparrows, Golden Eye Ducks, Chickadees, and even salamanders. Wildfires are common – in fact trees such as jack pine need the high temperatures that a fire brings to release the seeds from their cones. See the following Web site to learn about a major initiative to conserve the boreal forest for future generations: www.ducks.ca/conservator/243/boreal1.html

The Carolinian forest is home to a remarkable diversity of wildlife species and spaces, many found nowhere else in the country. Black walnut, Kentucky coffee trees, the tulip poplar and black gum are only a few of the very interesting and assorted tree species. It is home to songbirds galore, including the endangered Prothonotary and threatened Hooded Warblers, as well as the eastern mole, southern flying squirrel and American badger, all designated as species at risk.

There are many more forest communities in Canada, and all of them are home to at least one species at risk. Forest communities have different reasons why some of their inhabitants are at risk – it could be the result of urban development, harvesting techniques, agricultural expansion, power corridors, mining, or oil and gas exploration and transportation.

This activity has students preparing a PSA that will help protect and conserve species at risk. PSAs are specially designed advertisements or commercials that radio or TV stations air at no cost as a public service. They are designed to persuade the audience to take a specific action or adopt a particular view toward some service, issue or cause.

What is important to understand is that a PSA cannot sell a product, and since it is not paid time (meaning the radio or TV station doesn't make money by running it), it has to be very appealing and creative or it won't be aired.

Procedure

1 Begin this activity with a class discussion about the different forested areas in Canada. Help your students understand that each forest ecosystem is quite different, with different soils, tree and animal species, different kinds of aquatic systems and landforms, and with that kind of variety, many different habitats are available.

2 Divide your class into groups of two to three students each. Each group will represent individual marketing firms who have been hired by a forest ecosystem. Their job is to create a PSA for television that will do the following:

- Present information about your client, the forest community. What do the species in the forest need the forest for? Habitat. What do humans use the forest for? Recreation, forest products, aesthetic and spiritual reasons, etc. Be sure to also consider the wetlands, lakes and waterways that are an important part of the forest.
- Identify three species at risk (plant or animal) that use the forest ecosystem for their habitat.
- Explain what activities are taking place that are damaging critical habitat for these species.
- How is conservation of the forest and other ecosystems like wetlands and grasslands important to reducing the effects of climate change? Could global warming also affect species at risk?
- Present a message to the audience that this forest must be managed sustainably if the species at risk is going to recover.

Students can choose from the following forest communities. Once they have chosen their forest, they can carry out research to identify the species at risk that use the forest as habitat:

- Boreal forest
- Acadian (encompasses most of the Maritime Provinces and is closely related to the Great Lakes-St. Lawrence Forest region)
- Carolinian forest
- West Coast (the coastal region of British Columbia)
- Great Lakes-St. Lawrence forest
- Your own local community woodlands.

3 Once the students have researched their forests and species at risk, give them sufficient time to write the script for their PSA. Each student must have a role in the PSA. They must hand in their scripts for approval prior to the presentations to ensure that they have covered the criteria for the PSA sufficiently and to ensure that it is bias-free.

Students should understand that broadcasters (radio and television) choose to run public service announcements to support local non-commercial causes.

They can be reminded that their PSA, like any advertisement, is competing for public attention so they need to find a way to present their case in an appealing way – both so that the broadcasters will use it and so that listeners will pay attention and act on it.

4 After you have read and approved the scripts, give the students some rehearsal time. Once they are prepared, set aside one class period for presentations of the PSAs.

Note: You may choose to have students videotape their PSA ahead of time instead of actually presenting it in front of the class.

Extensions

Videotape the PSA presentations and share with other classes.

Take those videotapes and share with other local schools during National Forest Week.

Ask a local person in the media or a communications expert to view the PSAs and offer advice to the students.



Small White
Lady's Slipper
Cypripedium candidum



Surveying Species at Risk

Summary

Students will create and administer a survey to find out what people know about species at risk and to identify ways to increase their awareness and understanding.

Activity Information

Level: Grades 4 and 6 (elementary cycles 2 and 3)

Subject: Habitats and Communities, Diversity of Life, Language Arts, Math, Geography

Estimated Duration: One 60-minute class period for discussion, one 60-minute period to explain survey findings, homework will likely be required to complete research.

Materials: markers, construction paper.

Learning Outcomes

Habitats and Communities

Demonstrate that specific terminology is used in science and technology context (use appropriate terminology such as habitat, food chain, etc.).

Identify their own and their family's impact on natural resources (e.g., identify the potential impact of their lifestyle on moose, deer, rabbit, or salmon habitats and populations).

Compile and display data, by hand or by computer, in a variety of formats including frequency tallies, tables and bar graphs (e.g., display data in a graph from a population-simulation game).

Diversity of Life

Describe the potential impact of the use by humans of regional natural resources (e.g., identify the possible impact on the local deer population).

Teacher Background

What is a species at risk? According to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) it is defined as *any plant or animal threatened by, or vulnerable to, extinction*. To learn about different categories of risk, see page 3.

There are many things we currently know about species at risk. We know some species are already extinct and we know many others are at risk because of habitat destruction, poaching, introduction of exotic species and other pressures.

But what's important is finding out what your students know about species at risk. Do they know anything? How much does your school population know? Your community? If human activities are the most significant issue for species at risk, then it is extremely important that people understand how their activities can cause the decline of some species, and what they can do to turn this around. We do things every day that can have a negative impact on species; we can also modify our actions to reduce the impact.

This lesson lets your students collect and analyze information about what their peers and family members know about species at risk. Students will create a simple survey to be administered to a specific audience in order to collect this information.

.....

Procedure

1 **Begin a class discussion about species at risk.** Ask your students if they have ever heard of species at risk? They may have heard of endangered species, which is often synonymous with species at risk. Have they ever heard of extinction or extinct species? Review each of COSEWIC's five at-risk categories (extinct, extirpated, endangered, threatened, special concern) and provide examples so that students can visualize each category.

2 **Ask your students to raise their hands if they have ever participated in a survey.** They have just participated in a mini-survey. Have they ever completed the comment card in a restaurant inviting their views on service, the quality of the meal, etc.? This is also a survey. Ever wondered how advertisers can claim four out of five dentists prefer one brand of toothpaste? Well, they probably surveyed dentists.

Explain to students that surveys are an important tool for collecting information, opinions, statistics, data, etc. There are different purposes for collecting information and there are different ways to use the data that are collected. The data can determine what people think or know about certain issues, and the data are often used for further research.

3 **Explain that each student is going to design their own survey** so they can find out how much a particular audience knows about species at risk in Canada. They will first select their target audience, and then design a series of questions that will help them determine what their target audience knows. With the class, brainstorm potential target audiences and list them on the board. Students may come up with some of these audiences:

- the entire student population
- all students and staff
- students in their grade
- students in another grade
- family members
- neighbours

4 **Help students start thinking about what they would want to ask in their survey.** Explain that the survey can have open-ended or close-ended questions. Open-ended suggests that a respondent (the person who answers the survey) can provide any answer that they want. A close-ended question is one where respondents choose from a number of potential responses or answer yes or no, true or false. Students might also consider a rating scale, such as 1 is least familiar, 5 is very familiar.

Brainstorm a list of potential questions with your students and write those questions on the board. Use the Sample Survey to get started.

5 **Ask each student to identify their target audience and then draft their survey.** Students must ensure the following:

- The survey must have at least eight questions (make sure at least five are close-ended).
- The survey must be completed by at least 10 people (respondents).

Sample Survey

1. Have you heard of species at risk?
 Yes
 No
2. Do you know why species become at risk?
 Yes
 No
3. Can you give examples of why species become at risk?

4. Did you know that there are different categories for species at risk?
 Yes
 No
If yes, can you name some or all of them?

5. Can you name any species that are extinct?
 Yes
 No
If yes, please list them here.

6. How many species are designated by COSEWIC as at risk in Canada?
 25 to 100
 100 to 200
 200 to 300
 300 to 500

[continued on page 14]

7. Have you ever read anything about species at risk?
- Yes
 - No
- If yes, what was it?

8. Where have you heard about species at risk?
- newspaper
 - radio
 - television
 - World Wide Web
 - other _____

9. If you were going to learn more about species at risk, would you:
- surf the World Wide Web
 - read a magazine
 - watch a television program
 - all of the above
 - would not want to learn more

10. Protecting species at risk is everyone's responsibility.
- I agree
 - I disagree

11. It's not as important to protect plants as it is to protect animals.
- I agree
 - I disagree

12. Do you think the food and products that you buy and the way that you live (travel in cars, create garbage, use pesticides on gardens) might cause species to be at risk?
- Yes
 - No

13. If you said yes, what would you change in your life to have less negative effect or more positive effect?

- The survey results must be compiled into a simple chart (see Step 6).
- Once the survey results have been compiled, students will prepare simple graphs to display the data from the close-ended questions.

Students may need 30 to 60 minutes to draft their surveys. Once the students have completed their surveys, ask them to find one classmate to complete a peer review. A peer review will give them a second opportunity to ensure that their questions are clear, valid and will deliver the results that they are seeking. Afterwards, have them make at least 10 copies, and then carry out the survey with their target audience.

6 When the surveys have been completed, students can begin to compile their collected data. Below is a model of a draft outline they can use to analyze their data:

Close-ended Question Topic	Yes	No
Number of people who heard of species at risk	7	3
Number of people who have seen a movie or TV program about species at risk	5	5
Number of people who know how many species are designated at risk in Canada	8	2

Once they have compiled their data, students can then prepare simple graphs representing the responses to the close-ended questions.

Students should be prepared to describe the responses to their open-ended questions during classroom discussions.

7 Hold a class discussion about the survey results. What was the general consensus? Do people know enough about species at risk? Could more be done to inform them? Does the class have any suggestions to help? How would they advertise? What media would they use; newspaper, Internet, television, radio, a combination? What messages are most important to share with the public?

Ask students to hand in a copy of their survey, results and the raw data.

Note: You may wish to post the results on a bulletin board so that classmates and schoolmates can see them.

Extensions

- Radio or TV stations air PSAs at no cost to promote community causes. Have students prepare a PSA with a message related to species at risk in their area.
- Have your students prepare a newspaper commentary on why species at risk awareness is important in their community, and have them use the data from their surveys to create graphics on awareness of various target groups.
- Teachers can easily adapt this lesson into a class-wide survey, where students ask their families about their knowledge of species at risk and report back to the class, producing a graph or display.

Shrinking Habitat – Share the Space



Lesson Three

Summary

An interactive activity where students will physically map out a diverse forested area in their classroom, then slowly reduce the space to simulate a loss of habitat and the impact on various species.

Activity Information

Level: Grades 4 and 6 (elementary cycles 2 and 3)

Subjects: Habitats and Communities, Diversity of Life, Science, Geography, Language Arts, Drama

Estimated Duration: One 60-minute class period to act out the scenario.

Materials: markers, construction paper, string.

Learning Outcomes

Habitats and Communities

Predict how removing a plant or animal population affects the rest of the community.

Relate habitat loss to the endangerment or extinction of plants and animals.

Demonstrate that specific terminology is used in science and technology context (use appropriate terminology such as habitat, food chain, etc.).

Diversity of Life

Describe the possible impact when humans use natural resources in a region (e.g., identify the possible impact on the local deer population).

Teacher Background

This lesson includes a brief story about a community that has to make a decision about development versus conservation. Please select a species that lives in a forest from your province or territory. You will use that species in Step 3 of the learning activity, and also in the short story. You can refer to the Hinterland Who's Who Web site to choose your species: www.hww.ca. For additional information on food webs and habitats, and communities in wetland ecosystems see lesson plans available at www.ducks.ca/edu/resource.html

Habitat supports the food, water, shelter and space essential for the survival of all living species. And every species – plants, humans, fishes, you name it – has its own specialized habitat, or ecological niche. There are biotic (living) and abiotic (non-living) elements within an ecosystem.

Often species can share habitat. Owls and Hawks can both live in a woodland or forested area and hunt the same kinds of prey (moles, voles, mice, etc.) The Owl hunts at night; the Hawk hunts in the morning – so they can survive in the same setting.

In Canada, forests provide habitat for many species. When we consider a forest habitat, we need to look beyond the trees. It's not just the trees that make a forest diverse; it is the soils, water, mosses, beetles, shrubs, birds, squirrels, Hawks... *it's everything!*

Habitat constantly undergoes change. Sometimes change revitalizes habitat making it even more productive, and sometimes it is degraded. While this can be the result of catastrophic natural events – such as wildfire, flooding, drought, hurricanes or ice storms – it is often due to human impacts. Urban and suburban developments eat up large tracts of land, large-scale agricultural practices remove forests, wetlands and fields from the natural setting, and invasive species can push out original inhabitants. About 80% of species that are designated at risk by COSEWIC are affected by habitat loss or degradation.

Procedure

1 **Start with a brief introduction about the vast variety of life in forest ecosystems.** Ask your students to think about a forest near them and describe its ecosystem – the things found in the forest – and list them on the board. Remind them that forests are made up of trees, shrubs, ferns, soils, water, insects, mammals, birds, slugs, mushrooms, ants and many more species that we cannot even see with the human eye.

Note: You might want to break the class into small groups and ask each to produce a list of things that make up a forest, and then produce a class list at the end. You should also include abiotic things like rocks, logs, minerals, etc., which provide important resources for living organisms.

For a more detailed look at the implication of habitat loss, see *Shrinking Habitat* (p. 289; ISBN 1-55029-082-7).

For more information about this publication, various wildlife education programs, or to register for a Project WILD workshop in your province, contact:

WILD Education

Canadian Wildlife Federation
350 Michael Cowpland Drive
Kanata ON K2M 2W1

T: 1-800-563-WILD (9453)

F: (613) 599-4428

info@cwf-fcf.org

www.wildededucation.org/programs/wld_prog.asp



2 Ask your students what they think might happen when part of a forest ecosystem is removed. For example, if the trees were removed, what would happen to the plants and animals living in the forest? This would increase the light penetration onto the forest floor, radically altering the air and soil temperature, soil moisture, runoff and erosion. It would remove wildlife shelter and result in the loss of habitat for a significant number of species. Some species might move to a bordering area if their habitat is altered or lost. Other species might begin to colonize this new disturbed area. Ask your students what they think might happen to the mammals, insects, soils and water?

3 Explain to students that you are going to turn the classroom into a forest community so that they can explore the effects of the loss of a forest habitat on the species living there. Use pieces of construction paper or cardboard to create signs listing some of the things they identified earlier as part of a forest ecosystem, such as tree, shrub, fern, mole, mouse, coyote and other wildlife species and abiotic features. Tape the signs onto desks and tables around the classroom where they most expect these species to live. Move these around the room to better represent a forest filled with a variety of trees, plants, soils, waterways and wetlands, and other ecosystem components.

Then ask the students to decide what role they wish to play in this forest ecosystem. They need to select their species and then determine where that species would most likely live. They can choose to be a plant or an animal, but it must be something that would live in that particular forest community.

4 Next, have students select a location in the classroom that they believe would provide ideal habitat for their species. If they choose to live near the window, that would mean more sunlight for them to grow (a young seedling or shade intolerant tree, such as poplar or aspen) or to gain body heat (a snake). If they choose to live under the desk, they might need shade that the forest canopy provides (shade tolerant seedlings such as sugar maple or red oak) or cover (deer, mice and other prey species would need cover to hide from their predators).

5 Once all students have settled into their habitat, read the short story on the following page aloud to them.

6 At the conclusion of the story, ask the students what they think the community should do. Generate a few ideas, write those ideas on the board, and then proceed with the rest of the activity.

ONCE UPON A TIME, THERE WAS A COMMUNITY IN [name your province or territory]. This community was an active, growing community with a vital population of young people and adults. There were plenty of soccer pitches and baseball diamonds, a hockey arena, curling club, and all the things that make people happy.

The community was growing! As its numbers grew, so did the need for more places to live. Soon, there was not enough living space for all the people who wanted to live in the community. So, the community leaders proposed to expand and build a new housing development.

The community was surrounded by lovely woodlands, however in order to satisfy the demand for additional housing, community planners had to clear out 10 hectares of the 30-hectare mixed forest. Many wildlife species used the woodland for their habitat, including red oak, sugar maple, white and red pine, ferns, mosses, red squirrels, rabbits, Hawks, Wood Ducks, Woodpeckers and Owls, small birds, mice, coyotes, porcupines, raccoons, deer, and many others.

A meeting was called in the Community Centre so that everyone interested in the development could present their opinion. The developer and some of the community leaders felt that it was a good idea because it would provide more housing and also generate more tax dollars for community improvements.

Ecologists and conservationists were concerned about the loss of green space and the potential impact on wildlife and their habitat. What steps should be taken to make the right decisions about the development and conservation issues, and how will the community meet its growing demand for housing?

Let the students know that your classroom is the community that you read about! You will be the community planner, and you have decided to remove one-third of the trees to allow for the growth of the community. Draw an imaginary line in the room to simulate the removal of trees and consequently, the loss of habitat. Ask each student/species what has happened to their habitat, and what they will do in order to survive. You can ask them questions such as:

- Q: Do you have enough habitat remaining to survive?
- Q: Can you move to a new habitat?
- Q: Are you going to have trouble finding food?
- Q: Will you now be more easily caught by a predator?
- Q: Have you lost your nesting or birthing area for your young?
- Q: Has your drinking water supply been lost or damaged?
- Q: Do you think you could become a species at risk?
- Q: What happens to all of the people who can't find housing in the community?
- Q: How does the community continue to provide all the things that make people happy (e.g., soccer pitches, hockey arenas, etc.)?
- Q: What do you believe would happen if more habitat were removed (e.g., half of the remaining forest ecosystem)?

7 Ask each student to graphically represent what happened to their species (cartoon, graph, mural, poster) showing the effects of habitat loss – before, during and after.

Extensions

Ask students to write their own story of habitat loss from the perspective of their species.



Predicting: What If?

Summary

Students will research a species at risk in Canada and predict what will happen to it now and in the future, based on the existence of protective legislation.

Activity Information

Level: Grade 7 (sec. I)

Subjects: Interactions Within

Ecosystems; Science, Language Arts

Estimated Duration: One or two 60-minute class period(s) for discussion and to begin research, one 60-minute period to complete presentations and discuss findings.

Materials: none.

Learning Outcomes

Interactions Within Ecosystems

State a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict what an aquatic ecosystem will look like in 25 years based on characteristics of the area and the long-term changes observed in similar sites).

Defend a given position on an issue or problem, based on findings (e.g., defend a decision to increase or decrease hunting or fishing quotas for a particular species).

Describe interactions between biotic and abiotic factors in an ecosystem.

Teacher Background

It's the law. How many times have you heard that and wondered how and why a law was established? We all understand the importance of legislation. In Canada, it protects everything from our individual rights (*Charter of Rights and Freedoms*) to special areas (*Parks Act*).

While it is hard to measure the value of wildlife, we all recognize Canada's plant and animal resources offer economic, social and environmental values that need to be protected for future generations. To that end, the Government of Canada officially recognized the importance of species at risk by passing *the Species at Risk Act*, proclaimed in June 2003. This new legislation provides for the protection of species at risk in Canada. Interested individuals and organizations across the country have voiced their concern for the speed with which species were disappearing from the planet and supported the need for the Act.

The Act is intended to:

- prevent Canadian wildlife species, subspecies, and distinct populations from becoming extirpated or extinct;
- provide for the recovery of species that are extirpated, endangered or threatened as a result of human activities; and
- manage species of special concern to prevent them from becoming endangered or threatened.

Agencies with primary responsibility for the legislation include:

- Environment Canada
- Fisheries and Oceans Canada
- Parks Canada Agency
- Canadian Endangered Species Conservation Council
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
- National Aboriginal Council on Species at Risk.

There is more than just the *Species at Risk Act* that protects plants and animals.

Some other important pieces of federal legislation include:

- *Canada Wildlife Act*
- *Migratory Bird Convention Act*
- *Wild Animal and Plant Protection and Regulation of International and Inter-provincial Trade Act*
- *Canadian Environmental Assessment Act*
- *Fisheries Act*
- *National Parks Act*.

In addition to the federal legislation, some provinces and territories passed species at risk legislation. (e.g., *Nova Scotia Endangered Species Act (1999)*, *Manitoba Endangered Species Act, (1990, r.1993)*). Those provinces and territories that do not have legislation protect species at risk through federal laws or through provincial wildlife acts.

More information can be found at: www.sararegistry.gc.ca

Procedure

1 Ask your students if they have heard the term **species at risk** and, if they have, what they think it means. Begin a discussion about what they believe is being done to help these species, and then talk about the kinds of laws that are in place in Canada and in their province/territory. Focus on Canada's *Species at Risk Act*. Some questions for the discussion include:

- Q: What are the threats that species are facing? In other words, what are we protecting them from, and what is putting them at risk?
- Q: What would a law have to do to help protect species at risk? What could be done to combat the loss of species?
- Q: Does our province/territory have a species at risk act? If not, where would legislation be found to protect species at risk? Is more legislation needed?
- Q: What do we need to do to ensure that any piece of legislation that protects wildlife species is enforced?
- Q: How can private landowners be encouraged to be stewards of species at risk on their property?
- Q: How do we help pay the costs of protecting species at risk?

2 Divide the class into seven groups. Explain that each group will select a species at risk, carry out some preliminary research, and then make two predictions about the future of that species using their research.

Note: You can assign species or you can invite students to visit the speciesatrisk.gc.ca Web site to select a species of their choice.

Some suggestions include: swift fox, cucumber tree, Harlequin Duck, Vancouver Island marmot, wood bison, Acadian Flycatcher, Loggerhead Shrike, Rocky Mountain tailed frog, Eastern Prairie fringed orchid, Atlantic salmon, blue racer. Required information for some may be limited.

3 Explain that the preliminary research requires that each group record the following information in the form of a fact sheet about their species:

Natural History: What is the natural history of your species? What is its habitat? What is its range? What does it eat? Who are its predators? How does it survive?

Status: What is the current risk category? What are the reasons for this designation? Has the designation been upgraded or downgraded?

Statistics: What is the current population of this species? Compare current population figures with those of the past. Is there a projected future figure?

Recovery Efforts: What, if anything, is being done about re-introduction, captive breeding, engaging local communities in species and habitat protection, and other recovery activities? Are these efforts working?

Legislation: Is the species protected by any federal or provincial legislation?

4 Once the students have completed their preliminary research, they can proceed to their predictions. Explain that each group will present its predictions to the class and this will lead to a class discussion about whether or not the predictions for the seven species are accurate.

1. Given what you know about your species at risk, what do you believe will happen to it in 10 years, based on existing laws and recovery efforts?
2. What do you believe would happen to your species if there were no species at risk legislation, either at the provincial/territorial or federal levels, and recovery initiatives were not taking place?

Each group is responsible for preparing a brief presentation (no more than 10 minutes each) of each prediction. Students should provide a picture of their species for their own recognition, as well as their classmates'.

5 Students should submit their research and presentation notes for evaluation.

Extensions

Prepare a "what if" fact sheet on the future of the species (could include data from research that justifies conclusion) and post on a school bulletin board.

Based on their knowledge of the federal *Species At Risk Act*, invite students to make suggestions to deal with potential shortcomings of that legislation.

Consider posting each of the predictions on a wall and ask the students to think about, and follow, their predictions throughout the school year.

Species at Risk Fact Sheet



Name of Species:

Natural History

What is the natural history of your species?

What is its habitat?

What is its range?

What does it eat?

What are its predators?

How does it survive?



Status

What is the current risk category?

What are the reasons for this designation?

Has the designation been upgraded
or downgraded?

Statistics

What is the current population of this species?

What was the population figure in the past?

Is there a projected number?

Recovery Efforts

What, if anything, is being done about
re-introduction, captive breeding and other
recovery activities?

Are these efforts working?

Legislation

Is the species protected by any federal or
provincial/territorial legislation?



Recover Me!

Summary

Students will work collaboratively to research a species at risk recovery effort and produce a compelling proposal with a budget report requesting funding from a charitable company or foundation to continue these efforts.

Activity Information

Level: Grades 7 and 10 (sec. I and III)

Subjects: Interactions Within Ecosystems, Sustainability of Ecosystems, Science, Geography, Economics, Business

Estimated Duration: One 60-minute class period for discussion, one period for research and to compile findings, and one period for presentations. Homework to complete group work and research.

Materials: handout/instruction sheet.

Learning Outcomes

Interactions Within Ecosystems

Select and integrate information from various print and electronic sources or from several parts of the same source (e.g., compile information from a variety of books, magazines, pamphlets, Web sites, and from conversations with experts on the role of microorganisms in food preservation).

Identify and evaluate potential applications of findings (e.g., determine the maximum allowable number of visitors in a sensitive area such as an ecological reserve or park).

Sustainability of Ecosystems

Explain how a paradigm shift can change scientific world views (e.g., give examples such as the shift from a world view centred on humans to one focused on inter-relationships among all species, or the shift to the acknowledgement that

all biotic and abiotic factors on Earth are inter-related). Analyze the impact of external factors on an ecosystem.

Teacher Background

Wildlife isn't just birds and mammals. The term also includes reptiles, amphibians, fish, insects, trees, shrubs and a host of other organisms. As of the Fall of 2003, 441 species have been assigned one of five categories of risk by COSEWIC. The categories are: extinct, extirpated, endangered, threatened and special concern (see page 3).

Governments and many non-government partners are involved in recovery planning for a number of these species. Other conservation groups are working to protect habitats so that species that are not presently threatened stay that way. It is important to recognize that loss prevention is far less costly, and far less complicated, than recovery – we can only use our best educated guesses when it comes to replicating the complexity of nature. Because there are so many species at risk and each is unique, there are a variety of recovery teams and conservation efforts underway to help protect them.

Efforts to conserve wildlife include some of the following science-based activities:

- monitoring and data management – monitoring the health and vigour of wildlife species;
- prevention – preventing losses of biodiversity through landscape and watershed planning;
- assessment – implementing national and provincial environmental assessment processes;
- protection – working with landowners to encourage stewardship and identify and map the habitat of endangered and threatened species;
- recovery – implementing recovery strategies to help species, while improving scientific knowledge;
- public involvement – improving public involvement about species at risk; and
- education programs for youth – creating stewardship action programs to get student volunteers involved.

In an effort to conserve species at risk, there are numerous recovery efforts taking place throughout Canada. For example, the Newfoundland marten, a recognized subspecies of the marten that is native to the island of Newfoundland, has declined both in numbers and distribution since the early 1900s as a result of over-trapping and habitat loss due to logging and fire. Currently, it is listed as endangered in Canada with the last remaining populations located primarily in the southwestern part of the province.

Today, trapping for marten is closed, and a 2100 square kilometre wildlife reserve in southwest Newfoundland has been set aside to protect the largest remaining population. Scientists hope this reserve and others like it will serve as source

areas, and that the marten will disperse to reoccupy previous territory.

In 2002, a marten recovery team endorsed a number of projects that will help identify current and potential habitat and determine the potential effects of any proposed forest harvesting operations, in turn protecting and conserving the marten population.

Many partners are involved in this recovery activity. Corner Brook Pulp and Paper Ltd. (CBPP), a division of Kruger Inc., manages more than two million hectares of forest land on the island of Newfoundland. It is committed to maintaining a healthy and diverse forest ecosystem, and has funded a two-year research study to investigate the impact of forestry operations on the Newfoundland marten and continues to support long-term research on the pine marten. Logging activity has ceased in the Little Grand Lake area and CBPP supports the establishment of a reserve in the area to act as a refuge for Newfoundland marten.

Another excellent example of research and support for a species at risk involves the Vancouver Island marmot. Like Corner Brook Pulp and Paper in the east, Timber West and Weyerhaeuser, along with a host of other organizations, are pitching in with people, research, support and time to help implement the recovery plan for the marmot, raise necessary funds, and carry out associated business and public awareness activities. www.marmots.org/

As we learn more about the importance of biodiversity and the relationships between different types of species, more

efforts like the marten recovery project can be implemented to protect, conserve and encourage the recovery of species at risk.

There are a number of Web sites that cite recovery efforts across Canada. Here are some that you may want to recommend to students for their research.

www.wildernesscommittee.mb.ca/species.htm

www.wildspace.ec.gc.ca/sar-e.html

www.recovery.gc.ca

www.ontarioparks.com/english/sar.html (includes a list of key links to agencies and organizations involved in species at risk recovery efforts)

Procedure

1

Begin a class discussion about species at risk.

Q: What are species at risk? Can you identify any that might be local to your region?

Q: What are the different categories of risk for species?

A: Extinct, extirpated, endangered, threatened, special concern

Q: What are some reasons why species are at risk?

A: Agriculture, forestry and urban development has resulted in loss of habitat, invasive species, poaching, over-harvesting, etc.

Q: Why are some species at risk, while others are even more abundant now than they were a 100 years ago? (e.g., the white-tailed deer)

Q: What kind of activities could be carried out to help protect and conserve species at risk?

A: Policy and legislation to protect habitat, citizen action and stewardship, work by non-government conservation organizations, education.

Q: Who pays for all this work?

A: Private funding organizations, volunteers, government, donors (corporate, government and private)

2

Continue the discussion about who might be funding these recovery efforts. Federal and provincial/territorial agencies are leading these efforts with support from groups such as the Canadian Model Forest

Network, private forest companies, philanthropic organizations, non-government organizations, including Canadian Nature Federation, Ducks Unlimited Canada, World Wildlife Fund, Canadian Parks and Wilderness Society, etc.

Work with students to generate a list of things that potential funders may wish to consider when they decide whether or not to financially support the recovery efforts of a species at risk. Record student suggestions on the board or flip chart. These might include:

Q: What is the estimated amount of money required to pursue research and recovery?

Q: What are the potential marketing opportunities for funding agencies?

Q: What is the potential for success in recovery efforts, and what are the measures of success?

Q: Can Government initiatives lever matching funds (i.e., are companies or other organizations also providing funding)?

3 **Divide your class into groups of three or four students.** Explain that their challenge is to select an individual species at risk, research its current recovery efforts, assess its status, and prepare a report that presents a rationale for continued funding support for these efforts. (You may prefer to have them write a cover letter that requests funding.)

The students' research project should include the following information:

- Name of species – English and Latin
- Brief natural history of species – provide some general information about where and how the species survives and thrives
- Species at risk status prior to recovery effort
- Recovery efforts – who is leading the effort? what does it include?
- Why the species is/was at risk
- Has the species received help from international organizations (such as the World Wildlife Fund, United Nations, etc.)
- Results of the recovery effort – successful? Why or why not?
- Why they believe the species should be recovered
- Suggestions to improve recovery effort.

Note: Students can use these topic items as individual research themes in their reports and for their presentations. Each student in the group can carry out individual research on two or three of these sub-themes. They can then work together to put all the information into a single group report.

4 **When the students have completed their research and group report,** they should prepare a 10-minute presentation to the rest of the class that reports their findings and requests additional funding support for recovery efforts of their species at risk. The presentation should include graphs, photos, statistics, budgets, timelines, etc. that can be used to support their request for funding.

5 **Explain to the students that the class will represent the potential funding organization.** They will be able to fund only three proposals, and they will need to determine which are the selected priority proposals. During the presentations, have the class ask questions and then use the criteria generated in Step 2 as guidelines to determine their top three proposals in order of priority.

6 **When all the presentations have been delivered,** students can then pick their top three proposals. They should allocate three points for the most important proposal (that also has the most likelihood of success), two points for the second choice, and one point for the third choice. This will determine which three presentations have provided the most convincing information and have identified the greatest need for conservation activities and research for the species at risk.

Extensions

Using the best proposal, have the class provide additional suggestions for using the new funding to develop an improved recovery effort. Students may consider how to enhance existing habitat, how to increase habitat, how to reduce habitat destruction, etc. Actions may include education and communications efforts to engage youth, landowners, and the general public in the program.



Recover Me! Instruction Sheet

Your group is responsible for researching a species at risk in Canada that is currently undergoing, or that has undergone, a recovery effort to improve its “at risk” standing.

Your research must cover:

- Name of species
- Brief natural history of species
- Species at risk status prior to recovery effort
- Why is it/was it at risk?
- Nature of recovery effort – who is leading it and what is involved?
- Why they believe the species should be recovered?
- Results of recovery effort – was it successful or not? Why or why not?
- Suggestions to improve recovery effort
- Is the species receiving help from international organizations (such as the World Wildlife Fund, United Nations, etc.)?

You will be responsible for compiling a report detailing the above information that you can use as a proposal to seek funding for further research on the species at risk.

Make sure you provide a rational argument for saving the species, including why it is important and why Canada should participate in ongoing research.

Your report should include graphics, statistics, pictures, budgets, timelines and other data.

Suggested Web sites that could provide information regarding conservation and recovery efforts include:

www.Campsite24.ca

www.ontarioparks.com/english/sar.html

(includes a list of key links to agencies and organizations involved in species at risk recovery efforts)

www.recovery.gc.ca

www.wildernesscommittee.mb.ca/species.htm

www.wildspace.ec.gc.ca/sar-e.html





Live! With SARA

Summary

Students will research and present a radio or television talk show to explore Canada's *Species at Risk Act (SARA)*.

Activity Information

Level: Grades 10 and 12 (sec. III and V)

Subjects: Sustainability of Ecosystems, Evolution, Change and Diversity, Interactions Among Living Things, Science; Language Arts

Estimated Duration: One 60-minute class period for discussion, homework to complete research and questions, one period to present talk shows.

Materials: none.

Learning Outcomes

Sustainability of Ecosystems

Explain how a paradigm shift can change scientific world views (e.g., present examples that illustrate the shift from a world view centred on humans to one focused on inter-relationships among all species).

Analyze the impact of external factors on an ecosystem.

Evolution, Change and Diversity

Identify multiple perspectives that influence a science-related decision or issue (e.g., identify various perspectives on such issues as the origin of life, the protection of wild species of plants, and the preservation of wilderness areas).

Interactions Among Living Things

Evaluate Earth's carrying capacity, considering human population growth and its demands on natural resources.

Teacher Background

Legislation is an important environmental tool. Canada has legislation that protects human rights and freedoms, historical properties, and special areas.

The Government of Canada recognized the importance of protecting species at risk in Canada by passing the *Species at Risk Act (SARA)* in 2003. SARA is designed to prevent Canadian wildlife species, subspecies, and distinct populations from becoming extirpated or extinct. It also provides for the recovery of endangered or threatened species, and encourages the management of other species to prevent them from becoming endangered or threatened.

In addition to the federal legislation, most provinces and territories recognize species at risk in legislation. Some, like Nova Scotia and Ontario, have specific species at risk legislation, while others recognize species at risk through other legislation such as their provincial or territorial wildlife act.

Procedure

1 Begin a discussion about legislation, and why it is important.

Some leading questions might include:

Q: What is legislation?

Q: What is its purpose?

Q: How is it developed?

Q: What are the differences between federal and provincial/territorial legislation?

Q: How does legislation get proposed and eventually passed as law?

Q: How is legislation enforced?

Q: How can we create a balance between societal and landowner rights and penalties/rewards?

Introduce the SARA legislation and provide a general introduction to its history, purpose and role. There is an explanation of how the act will protect wildlife species and conserve their biological diversity at:

www.sararegistry.gc.ca/the_act/default_e.cfm

2 Explain that students will be exploring Canadian species at risk legislation by participating in a new Canadian talk show. Students

can brainstorm the name of the show or pick a name such as *Save Our Species!* or *Will This Be Our Last Farewell?*

The show will have a host (modeled after someone the students choose such as the *Tonight Show's* Jay Leno, Oprah Winfrey or Jay Ingram), who will explore the SARA legislation by interviewing a series of guests who will share their opinions about its history and intended outcomes. They will also discuss the possible impact on selected species at risk in Canada.

You will want to explain how a talk show is developed. Researchers support the host by finding out information about the people and topics that are featured so that they can develop relevant questions.

3 Divide the class into groups of three or four students. Each group will do the following:

a) Select a geographic region of Canada and pick a species in that region that lives in a forested environment and is at risk.

b) Research the species in order to better understand its ecology and biology. The following questions will help guide the research:

Q: What role does this species play in its ecosystem?

Q: What is its geographic distribution? If the students are feeling adventurous, offer extra marks for mapping the distribution.

Q: Is the species currently protected? If so, how?

Q: What are the threats to this species' survival?

Q: What factors may complicate the protection of this species?
(Legislation or policies relating to species at risk, current forest management practices, agricultural practices on private land, other urban land use, etc.)

Q: What role do non-government organizations and other organizations play in the protection of this species and the habitats they depend on?

c) Research a forest company that manages land in or near the habitat of the species at risk and find out if it actively plans for, and manages, the forest community to ensure protection of the species at risk.

d) Find out if the land in question is Crown owned or privately owned. How will this affect the plans to protect this species?

e) Find out if there is a recovery team that is currently working on the conservation and protection of the species. If there is, explore what they are doing. If there is not, consider what a recovery team should be doing to help the species.

f) Find out if there are environmental groups involved in protecting this species and, if so, what are they doing.

g) Find out what else provincial/territorial governments are doing or could do to help the species.

4 Each group should designate their talk show host and the rest of the students in that group will be guests that the host interviews, with the following roles:

- a wildlife biologist, heading up the species at risk team;
- a forest industry representative, responsible for managing the land base where the species at risk is located; and
- a representative from an environmental non-government organization that is concerned about the protection of the species at risk.

Note: If there is a group with more than four students, identify additional roles such as a private woodlot owner, or farmer whose property will be affected by the recovery plan; a government land use planner; someone who has been convicted of violating a law related to the species at risk (e.g., damaging habitat, poaching), a teacher or student who has taken an interest in increasing community awareness), a local celebrity or politician who has taken up the cause of endangered species protection.

5 Each group will prepare questions based on their research so that the talk show host can explore the positive outcomes of the legislation on the species at risk. Researchers should also prepare the correct answers for the guests, so that accurate information is shared with the audience.

6 Hold the talk shows! Each group will have 15 minutes for its show. The host will introduce each of the guests and then interview them. As each new participant is introduced, the previous guest can remain on the set and contribute to the new discussion. The show will be considered a success if the following has been presented:

-
- Students introduce the SARA legislation, with a brief discussion of how it relates to other government policies and legislation;
 - They examine briefly how an individual species at risk will be protected under the new legislation;
 - They show why the legislation can be a useful tool for forest companies that want to ensure the sustainability of ecosystems under their care;
 - They introduce other provincial/territorial legislation that helps protect species at risk; and
 - They recognize and explore issues around the legislation – presenting views from those who support it as well as some who think it goes either too far, or not far enough, to protect the species.

Extensions

Instead of a talk show, develop a town hall meeting where students play the roles of different interest groups responding to a forest management plan. This could include many of the same roles: wildlife biologist, forest industry representative, member of an environmental organization, interested citizen, etc.

Special Threats to Canadian Trees

There are many reasons why species are considered “at risk”. Some just naturally have small population numbers, other species have low reproductive rates. In recent times, the greatest threat to wildlife has been habitat loss, caused mostly through the activities of humans. Certain wild species are more susceptible to loss of habitat than others, particularly if they have very specific habitat requirements, depend on a large range area, or follow fixed migration routes.

Some of Canada’s own tree species are currently declining. Western white pine, a species native to British Columbia, has been seriously affected by white pine blister rust, a fungus inadvertently introduced into western North America around the year 1910. This fungus has had a huge impact on western white pine reducing its numbers to such an extent that, in many regions of British Columbia, western white pine is now considered a *ghost species*, too rare to be considered commercially viable. White pine blister rust is also affecting white-bark pine, a close relative of western white pine. Both are keystone species for ecosystem health and sustainability.

Recently, you may have heard about the threat of the Asian long-horned beetle; it has no known natural enemies within Canada’s forests and could become a serious threat to Canada’s sugar maples and other hardwood species. A single female long-horned beetle can lay 80 or more eggs under the bark of a tree. The larvae that hatch from these eggs feed on the tree’s wood, creating a network of winding galleries. Once this happens, the only way to destroy them is to identify infested trees, cut them down, then burn or chip them before the adult beetles have a chance to emerge. Spraying with insecticides doesn’t help because the beetle larvae are hidden under the bark, deep in the wood of the host tree.

Other threats exist for Canadian tree species, some found in Canada’s rare Carolinian forest. This unique forest type in southwestern Ontario is the northernmost edge of a vast temperate hardwood forest found in eastern North America. Within Canada’s Carolinian forest, you will find an impressive list of plant and animal species, including 70 species of trees. Unfortunately, within the Carolinian forest, as in other parts of Canada, threats such as Dutch elm disease, butternut canker, beech bark disease and beech scale, as well as introduced emerald ash borer, are all too common!

The poster included with this kit provides interesting facts about many of these trees and the threats that they are experiencing.



American Chestnut
Castanea dentata

Species and Spaces: At Risk, At Home



Lesson Seven

This lesson is taken from Special Places: Eco-lessons from the National Parks in Atlantic Canada, a Parks Canada educational initiative.

Summary

Students will investigate species at risk within the context of Canadian biomes and ecological land classification, focusing on Atlantic Canadian ecoregions.

Activity Information

Level: Grades 11 (sec. IV)

Subjects: Sustainability of Ecosystems, Interaction Among Living Things, Science, Geography, Resource Management

Estimated Duration: Two 60-minute class periods of teacher presentation and discussion, sufficient time for independent research and preparation, one 60-minute period for student presentations.

Materials: large classroom map of Canada, large classroom map of Atlantic Canada, access to Internet, library and electronic research tools, Descriptive Analysis Guideline handout (see page 34).

Learning Outcomes

Sustainability of Ecosystems

State a prediction and a hypothesis based on available evidence and background information (e.g., predict the impact of fishing or harvesting resources such as seaweed, after examining an aquatic ecosystem; predict the impact on an ecosystem of supplying an excess of food for a particular organism).

Explain various ways in which natural populations are kept in equilibrium and relate this equilibrium to the resource limits of an ecosystem.

Interaction Among Living Things

Describe and apply classification systems and nomenclature used in the sciences (e.g., review the ecological hierarchy of an organization of living systems, from the individual to the biosphere).

Compare Canadian biomes in terms of climate, vegetation, physical geography and location.

Teacher Background

A biome is defined as a large geographic area with somewhat uniform climatic conditions; a complex arrangement of communities characterized by a distinctive type of vegetation and maintained under the climatic conditions of the region. Typical large-scale Canadian biomes include the boreal forest, taiga, tundra, grassland, eastern deciduous forest, and desert. In this lesson, a biome is a broad spectrum term that refers to a large geographic area and is not necessarily broken down into sub-components.

In contrast to biomes, ecosystems vary tremendously and can be arranged in multiple scales where smaller ecosystems are included in larger ones. Ecosystems can also range from natural systems to systems that are heavily modified by human activities. A particular biome may be representative of a prairie, but that biome includes a variety of smaller ecosystems.

Ecological land classification has been described as a process of delineating and classifying those ecologically distinctive areas of the Earth's surface by exploring the "layers" within ecosystems. Each layer or area can be viewed as a discrete system resulting from an interplay of the geology, landform, soil, vegetation, climate, wildlife, water and human factors that may be present.

Ecological land classification is based on the following principles:

- It incorporates all major components of ecosystems: air, water, land and biota;
- The number and relative importance of factors helpful in delineating ecological units varies from one area to another;
- It is based on a hierarchy, with ecosystems nested within ecosystems; and
- It recognizes that ecosystems are interactive and that characteristics of one ecosystem can be similar to those of another.

The Canadian Committee on Ecological Land classification has identified four hierarchical generalized categories: ecozone, ecoregion, ecodistricts and ecoprovince. Three are of importance for this activity and are described below.

Ecozone Is an area of the Earth's surface representative of large and much generalized units characterized by interactive and adjusting abiotic and biotic factors. It is at the top of the ecological hierarchy. It defines (on a subcontinental scale) the broad mosaics formed by the interaction of climate, human activity, wildlife, vegetation, soils, and geological and physiographic features of the country.

Ecoregions They are the subdivisions of the ecozone characterized by distinctive large order landforms, micro-climates, vegetation, soils, water, and regional human activity patterns and uses. The ecoregions are the bridge between the subcontinental scale ecozones and the more localized ecodistricts. The Maritime Barrens ecoregion is one of the nine ecoregions in the Newfoundland ecoprovince.

Ecodistricts Found within ecoregions, ecodistricts are characterized by distinctive arrangements of landform, relief, surficial geologic material, soil, water bodies, vegetation, and land uses. The Jeddore Lake ecodistrict is one of the five within the Maritime Barrens ecoregion.

Species at Risk

In Canada, COSEWIC (the Committee on the Status of Endangered Wildlife in Canada) assesses the level of risk of extinction for wildlife species. These assessments are based on the best available scientific, Aboriginal traditional, and community knowledge on the status of each species. As of November 2003, there are 441 species designated at risk according to COSEWIC in Canada. Please visit the species at risk Web site to learn more about those species: www.speciesatrisk.gc.ca

There are five categories of species at risk, along with key Web sites and legislation information, listed in the Species at Risk Teacher Resources listed on page 9.

Parks Canada has identified the Blanding's turtle (Nova Scotia population) and water-pennywort, found in Kejimikujik National Park, as priority species for national recovery efforts.

In Atlantic Canada, there are more than 70 species at risk designated by COSEWIC and/or provincial legislation as endangered, threatened or of special concern. Although these species occur throughout the Atlantic region, their distribution is not uniform. Some species require highly specific habitat that is limited in distribution, occurring at only a few sites. It is important to remember that landscapes outside national parks and protected areas also represent critical habitat for species at risk, and need to be considered when managing for those species.

National Parks have existed in Canada for well over a century. They play an important role in the protection and study of species at risk. National Parks and National Marine Conservation Areas protect living examples of ecological diversity. They are protected for public understanding, appreciation and enjoyment, while being maintained in an unimpaired state for future generations. Each park and area offers a legacy of protection, living laboratories and centres for research about the natural world and how it functions.

This lesson uses ecological land classification criteria linked to the unique characteristics of each Atlantic National Park and its surrounding region, as a context to study species at risk.

Procedure

1 **Begin this lesson by giving your students a general introduction** to the Ecological Classification of Canada. Include an explanation of how to classify ecologically distinctive areas of the Earth. Explore the major ecological composition of ecozones and the linkages between the various biotic and abiotic components within an ecosystem.
www.ec.gc.ca/soer-ree/English/Vignettes/intro.cfm
www.cfl.scf.rncan.gc.ca/ecosys/classif/intro_eco_e.htm

2 **Discuss with your students the differences and similarities** between the biomes and the ecozones and ecoregion classification systems. (Use a large map of Canada to identify the various biomes and ecoregions that will be studied.) Use the Environment Canada Narrative Descriptions of Terrestrial Ecozones and Ecoregions of Canada.
www.ec.gc.ca/soer-ree/English/Framework/NarDesc/Canada_e.cfm

3 **Discuss and emphasize that all living things and their population size and growth, are impacted upon and influenced by the abiotic and biotic realities of an ecoregion.** For example, soil type determines (to a certain extent) the kind of plant life; wind and cold temperatures do the same. Soil moisture (bogs and wetlands) mean that plant life has adapted to survive in moist conditions, etc. You may choose to prepare a chart in order to show some of the significant factors that affect or influence population growth within the ecoregion. Your chart could look like this example:

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Biotic and Abiotic Factors that Affect and Influence Population Growth within an Ecoregion

BIOTIC	ABIOTIC
Plants (flora) (type of species, variety and arrangement of species, etc.)	Wind speed
Wildlife (fauna) (predator/prey ratios)	Amount of precipitation
Trees (conifers and/or deciduous)	Temperature
Photoperiod	Human activities impacting on habitat (forestry, tourism, mining)
Presence of decomposers	Length of growing season
Photosynthesis activities	Depth of soil
Evapo-transpiration	Soil moisture
Symbiotic relationships	Fire

4 Select the Atlantic Maritime and Boreal Shield ecozones to compare obvious biotic and abiotic differences. You may wish to prepare a chart showing and comparing the physical geography (soils, landforms), wildlife and location (see sample on page 32).

5 Identify those ecozones within Atlantic Canada: the Atlantic Maritime, Arctic Cordillera, Taiga Shield and Boreal Shield. Inventory the climate, vegetation, physical geography and location. Identify some general biotic and abiotic differences between ecoregions in each ecozone. Again, you may wish to prepare a chart to differentiate and compare the ecoregions (see sample on page 33).

6 Introduce and discuss the importance of national parks as representative examples of natural areas of Canadian significance, with particular biotic and abiotic characteristics. By law they are protected for public understanding, appreciation and enjoyment, while being maintained in an unimpaired state for future generations. One of their critical roles is to provide protection for species at risk in Canada.

7 Introduce the concept of species at risk in Canada and COSEWIC's role in identifying species populations that are at risk (www.cosewic.gc.ca). Discuss the different levels of risk (extinct, extirpated, endangered, threatened, special concern) and those factors that threaten their populations: destruction of habitat, genetic and reproductive isolation, suppression of natural events (e.g., fire) environmental contamination, over harvesting and excessive trade, climate change, disease and presence of invasive species.

8 Visit Canada's Species at Risk Website and read the information sheets on the:

Blanding's turtle:

www.speciesatrisk.gc.ca/search/species/Details_e.cfm?SpeciesID=276

Water-pennywort:

www.speciesatrisk.gc.ca/search/species/Details_e.cfm?SpeciesID=198

Both of these are found within Kejimikujik National Park. Discuss the factors that regulate the population size of these species in the national park, for example:

Blanding's turtle: nest flooding, raccoon predation, park facility development near nest sites, habitat fragmentation.

Water-pennywort: stabilization of water levels, recreational activities and vehicular damage, land development.

Student Application Activity

In order to do a nationally focused activity, you can visit Parks Canada's Web site and research other national parks in Canada: www.pc.gc.ca.

1. Divide the class into working teams of two to three students. Explain that they will be carrying out research and preparing a presentation on a species at risk in a national park and describing the ecoregion in which the species resides.

Explain that they can design any form of presentation, such as: bulletin board display, brochure, booklet, PowerPoint™ presentation, global information system (GIS) project, video news broadcast or informational video, 3-D model, or any other similar creative format.

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2. Have working teams select a species at risk that resides in a national park in Atlantic Canada (if adventurous, students can adapt to another region of Canada). Encourage working teams to select different ecoregions and/or different species at risk.
 3. Hand out the Descriptive Analysis Guideline to each group (see page 34).
 4. Working teams will carry out a descriptive analysis of their species at risk in the selected ecoregion using the guideline document to steer their research.
 5. Working teams will then deliver the results of their descriptive analysis to the class, or school at large, using a creative, interactive format of their choice.

Extensions

Justify whether or not your species at risk could survive in another ecoregion. Use one of the example ecoregions that was presented by another group of students.

Categorize the reasons why species are at risk, comparing natural, versus unnatural reasons. Discuss and debate whether we should intervene when the reasons are natural.

Introduce a change to the system (e.g., global warming with an increase of three to five degrees Celsius in the next 100 years) and identify what affect that would have on the species studied.

Compare population growth of species at risk within and outside a national park. Consider: competition, environmental quality, disease, parasitism, predation, human activities.

Reference Material

Environment Canada Species at Risk

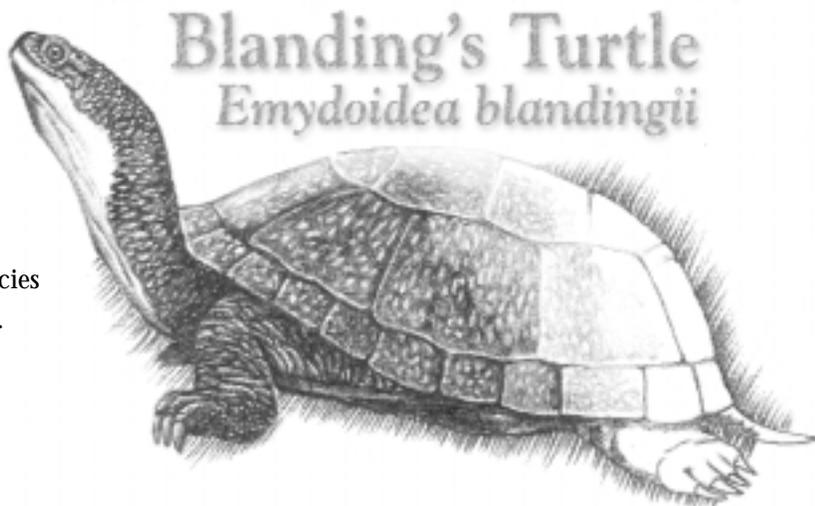
www.speciesatrisk.gc.ca

Parks Canada Species at Risk

www.pc.gc.ca/nature/eep-sar/index_E.asp

See page 9 for additional resource Web sites.

Consider working directly with the school librarian to set up for students a list of reference Web sites relevant to species at risk, land classification and other pertinent information.



Biotic and Abiotic Comparisons of the Atlantic Maritime and Boreal Shield Ecozones

	Atlantic Maritime		Boreal Shield	
	Abiotic	Biotic	Abiotic	Biotic
Physical Geography	Frequent showers Cloud cover/fog Coastal lowland Rough upland Wetland Shallow, stony soils, and outcrops composed of granite, gneiss, and other hard, crystalline rocks	Mixed coniferous- deciduous forests	Precambrian Shield Rocks Gravel Glacial deposits Lakes, ponds, wetlands Relatively high levels of precipitation to much of the area, from 400 mm in the west to 1000 mm in the east	Boreal forest Wetland plants
Wildlife		Blue whale, eastern bluebird, moose, beaver, black bear		Skunk, blue jay, loon, great blue heron, woodland caribou
Location	Appalachian Mountains Northumberland Plain Atlantic Highlands	Ecozone includes the following national parks: Cape Breton Highlands Prince Edward Island Fundy Kejimikujik Kouchibouguac Forillon	Athabasca Plains Lake Melville Paradise River	Ecozone includes the following national parks: Terra Nova La Mauricie Pukaskwa Gros Morne Mingan Archipelago



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Biotic and Abiotic Differences Between Ecoregions

	Biotic Factors	Abiotic Factors	
Ecoregions within the Atlantic Maritime Ecozone	Prince Edward Island (PEINP)	Dwarf conifers Marram grass	Glacial till Summers are warm and winters mild and snowy Coastal and salt marsh habitat for shorebirds and seabirds
	Southwest Nova Scotia Uplands (Keji NP)	White-tailed deer, snowshoe hare, porcupine, raccoon	Warm summers and mild, snowy winters Extensive wetland and rock barrens
	Cape Breton Highlands (CBHNP)	Lynx	Cool, wet summers and long winters severe winds
	Maritime Lowlands (Kouch NP)	Eastern white cedar	Stony, loamy glacial tills.
	Nova Scotia Highlands (CBHNP)	Sugar and red maple, yellow birch, red and white spruce, and balsam fir	Warm, rainy summers and mild to cold, snowy winters
	Southern New Brunswick Uplands (Fundy NP)	Ruffed grouse, bobcat	Soil moisture
Ecoregions within the Boreal Shield Ecozone	Central Newfoundland (Terra Nova NP)	Moose, lynx, black bear, red fox and caribou	Mixture of crystalline Palaeozoic strata Rugged and rocky uplands where stream erosion has cut deeply, rolling terrain of low relief elsewhere
	Maritime Barrens (Terra Nova NP)	Moose, black bear, Kalmia, sphagnum moss, tamarack, red fox, caribou	Sandy, moraine deposits
	Southwestern Newfoundland (Gros Morne NP)	Moose, black bear, caribou, marten, red fox, and lynx are typical wildlife	Cool summers and snowy, cold winters, unique geological formations

Descriptive Analysis Guideline

Your working team is responsible for carrying out a research project on a species at risk living in a national park. If you collect information under each of the headings listed below, you will better understand where the species fits into its ecoregion, and will have sufficient information to prepare a presentation to share with your class.

Note: The numbers in the second column represent the total mark that can be achieved for each activity.

ECOZONE

MARK

Identify and describe the ecozone in which your ecoregion lies	5
Identify and describe the ecoregion including climate (temperature, wind, precipitation, photoperiod), vegetation, wildlife, physical geography	5

SPECIES AT RISK

Describe your species at risk using these categories: physical description, natural history, population and distribution, threats, protection, recovery efforts	5
Explain why your species at risk thrives and survives in this particular ecoregion	5
Identify and describe the primary reasons your species is at risk. Consider ecological (e.g., habitat loss, climate change, etc.), social (e.g., recreational activities, etc.) and economic factors (e.g., land development, fur trapping industry, etc.)	10

RECOMMENDATIONS

Develop a series of six recommendations that would improve the population status of your species at risk	15
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PRESENTATION

Present your findings, demonstrating understanding of facts, terms, concepts and relationships	20
Use support visuals effectively	5
Deliver your presentation in an organized fashion	5
Encourage class interest and participation in your topic	5





What's the Big Deal?

Summary

Students will discuss and explore why species, including species at risk, are so important to humankind and prepare a brochure celebrating the value of species at risk.

Activity Information

Level: Grades 10 and 12 (sec. III and V)

Subjects: Sustainability of Ecosystems, Evolution, Change and Diversity, Interactions Among Living Things, Science, Geography, Resource Management

Estimated Duration: One to two 60-minute class period(s) to introduce and begin work. Homework to complete the brochure.

Materials: Paper for brochures.

Learning Outcomes

Sustainability of Ecosystems

Explain how a paradigm shift can change scientific world views (e.g., give examples such as the shift from a world view centered on humans to one focused on inter-relationships among all species, or the shift to the acknowledgement that all biotic and abiotic factors on Earth are interrelated).

Explain various ways in which natural populations are kept in equilibrium and relate this equilibrium to the resource limits of an ecosystem.

Explain how the biodiversity of an ecosystem contributes to its sustainability.

Evolution, Change and Diversity

Identify multiple perspectives that influence a science-related decision or

issue (e.g., identify various perspectives on such issues as the origin of life, the protection of wild species of plants, and the preservation of wilderness areas).

Interactions Among Living Things

Describe population growth and explain factors that influence population growth. Evaluate Earth's carrying capacity, considering human population growth and its demands on natural resources.

Teacher Background

The reality of life is that nearly all species on Earth eventually die out. New species are evolving every moment and replacing original species; old species are dying out and their place in the fabric of the natural world is taken over by one of the “new” species. We all have heard the news about the loss of species in the world – passenger pigeons, the Great Auk, the sea mink, the Labrador duck, the Macoun's shining moss, and many others that are gone forever from the planet.

Between 1900 and 1975, the rate of extinction rose to one species per day. In fact, some scientists believe that the Earth loses between one and three species a day. The IUCN (World Conservation Union) thinks the rate of extinction is currently 1000 to 10 000 times higher than what it should be under natural conditions. At the same time, there are new species being discovered from time to time. So what's the big deal about loss of species, about species being “at risk”? Are our conservation efforts really necessary?

The big deal is that almost all of the recent extinctions are a result of human activities and the new species being discovered are not really “new”, it's just that we never identified them before. As Canada was developed, people drastically increased the loss of biological diversity to make way for their own communities. We have managed to remove whole ecosystems from our landscape and replace them with subdivisions, strip malls and hockey arenas and other structures. Everyday things that all of us rely on like roadways, pipelines, hydro corridors and telephone towers have caused great harm to habitat and wildlife. We've moved in and taken over the homes of other species.

It's true that some species are more susceptible than others. Some have very specific habitat requirements, such as large ranges, or mature ecosystems (e.g., old growth forests) that are harder to come by with increased human development. Others have low productive rates and simply can't keep their numbers up. Others may be at the limit of their range or are unable to withstand human disturbance during times of breeding or migration. But regardless of these reasons, humans are still having an impact, putting more pressure on what may already be a delicate situation.

We all know that we share the planet with other living species – plants and animals. Often times we believe we are the most important beings; sacrificing others for our survival. So back to our question: What's the big deal?

Does it really matter if a forest company with a great environmental record slips and destroys a critical piece of habitat, pushing a species closer to the brink of extinction?

If the benefits of a species at risk can be measured by economic or personal value for individuals, it is easier to justify spending money to protect and conserve it. Usually, it's a matter of balancing measurable values with many competing interests. However, some important benefits of species at risk are not easily measured, such as genetic and medicinal values. Every species is part of a food web and if one part of the web is damaged everything else will be affected too. But, if the benefits are intangible in nature, and not easily measurable, it becomes more difficult to justify their protection.

In this activity, students will explore and justify the "value" of particular species at risk, explaining why Canadians should or should not work to conserve, protect and preserve these very special plants and animals that are so critical to the health of the planet.

Procedure

1 **Begin with a simple discussion about the diversity of living things** and how everything interacts within ecosystems, focusing on the sustainability of those ecosystems. Ask your students what they believe are some of the critical factors necessary to ensure the sustainability of ecosystems? What role do humans have in ensuring that sustainability? Document key points on the board or chart paper.

Then introduce the notion of species at risk. Ask students why some species are at risk while others are not. What are the key factors that put them at risk (e.g., habitat loss, invasive species) and what role do humans play in this?

2 **Prior to distributing the assignment, have a brief discussion about ethics.** Ask your students what they think ethics means. Do they know the difference between right and wrong? Are ethics important? How do ethics enter into the discussion around species at risk?

Ethic: the discipline dealing with what is good and bad and with moral duty and obligation; a set of moral principles or values.

3 **Organize your students so that each has a partner.** Explain that their task will be to inform and educate their fellow students about the value of species at risk by creating a six-panel brochure and associated distribution plan. Their first step is to select a species currently designated at risk by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) found at www.cosewic.gc.ca. Ensure that they select different species to prevent overlap and provide a wide variety of arguments and associated values. Include representatives from each of the following categories: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, lichens and mosses.

4 **Once each partner group has selected its species at risk,** provide them with the details of their brochure development. They need to create a brochure that includes the following:

- six panels with information on each panel (i.e., 8.5" x 11" paper, fanfolded in three, both sides of the page);
- detailed information about their selected species at risk;
- a convincing argument stating why this particular species should be protected and conserved;
- an explanation of the value of this species;
- illustrations or photographs of the species;
- the issues that are preventing the species from recovering its population successfully; and
- the groups (government and/or non-government) involved in its recovery.

Associated with the brochure development, the student partners need to also prepare a detailed distribution plan (minimum 700 words) including the following:

Q: Who is the primary target audience for this brochure?

Q: How have you designed the brochure to attract the target audience or should they modify its design?

Q: How many brochures would they need to print to distribute them effectively?

Q: Where will they distribute the brochure in order to reach the greatest number of their target audience?

Q: How will they determine if their brochure has helped change any attitudes about their selected species at risk?

5 When the brochure development is complete, each partner group will prepare a 10-minute presentation on their selected species at risk. The presentation will explain the students' understanding of the value of the species, and they will outline the information that is detailed in their brochure and distribution plan.

Extensions

Prepare a presentation for classmates, or a local community club (Rotary Club) about your species at risk.

Prepare a short movie or slide show about why people should be protecting species at risk.



The Foothills Model Forest in central Alberta is one of 11 model forests in Canada, and each brings together individuals and organizations that share the common goal of sustainable forest management. The forests become hands-on laboratories where leading-edge management techniques are researched, developed, applied, and monitored; including the latest research and work being conducted on individual species at risk.

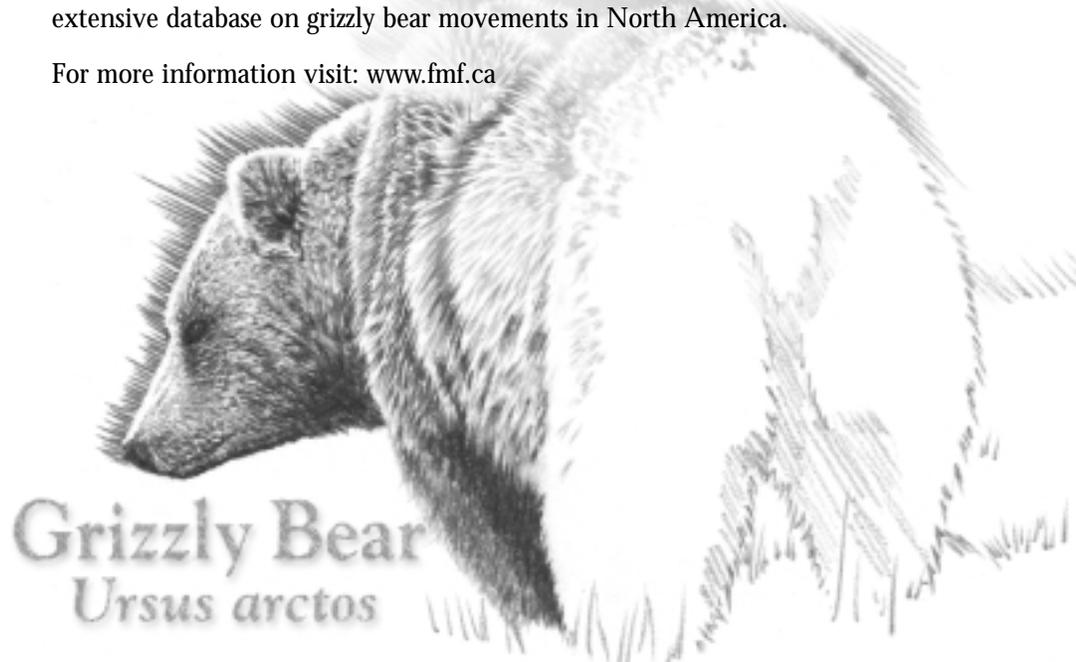
In 1999, the Foothills Model Forest in central Alberta launched the Grizzly Bear Research Program, a five-year, cooperative, international, multidisciplinary project to help conserve grizzly bears. By looking closely at bear populations, researchers can evaluate how they respond to human activities and habitat conditions.

Grizzly bears are considered an umbrella species, which means that they have large area requirements so if their habitat is maintained, the ecological requirements of other species can also be met. The Grizzly Bear Research Program is using global positioning system (GPS) collars to record the location of each bear at regular intervals every day. Early research results have found that the average size of a male grizzly bear's home range is 1000 square kilometres, with a female's home range about half that size.

In 2003, digital cameras were added to the collars so that researchers could view the world from the bear's perspective. The first recovery of digital images provided four days worth of information about grizzly bear movements and habits. The design of the cameras will be updated and tested again in 2004.

The research program will help to ensure that grizzly bears can continue to live in the foothills of the northern Rockies by gathering biological data to support current and ongoing wildlife management programs in this region. At present, the Foothills Model Forest Grizzly Bear Program holds the most comprehensive and extensive database on grizzly bear movements in North America.

For more information visit: www.fmf.ca



Balancing the Cost of Protected Areas



Lesson Nine

Summary

Students will explore the socio-economic and environmental costs and benefits of creating a protected area for a species at risk.

Activity Information

Level: Grades 10 and 12 (sec. III and V)

Subjects: Sustainability of Ecosystems, Interactions Among Living Things, Evolution, Change and Diversity, Earth Systems, Science, Resource Management

Estimated Duration: One 60-minute class period to introduce and begin work.

One 60-minute period for public consultation and a survey of findings. Homework time to complete position paper.

Materials: none.

Learning Outcomes

Sustainability of Ecosystems

Propose a course of action on social issues related to science and technology, taking into account human and environmental needs (e.g., organize a public hearing on an issue such as seasonal fishing quotas or funding for public transportation).

Evolution, Change and Diversity

Identify multiple perspectives that influence a science-related decision or issue (e.g., identify various perspectives on such issues as the origin of life, the protection of wild species of plants and the preservation of wilderness areas).

Interactions Among Living Things

Evaluate Earth's carrying capacity, considering human population growth and its demands on natural resources.

Earth and Space Science – Earth Systems

Analyze society's influence on scientific and technological endeavors (e.g., examine the social considerations related to the development of a natural resource near a park, a protected area or Aboriginal land).

Teacher Background

All species, whether plant, animal or fungi, need a habitat to survive. That habitat must include both living and non-living components. Habitats are many and varied; they include wetlands, hardwood forests, softwood forests, marine environments, prairie grasslands and tundra. Canadians are lucky to be in a country where government agencies set aside protected areas such as national parks, marine conservation areas, provincial parks and conservation authorities. These protected areas provide habitat for thousands of species (plants, animals, insects, etc.) across Canada, including species at risk.

These protected areas are important for a host of reasons. They preserve significant parts of certain ecosystems, conserve species and communities, protect landscape resources, outdoor activities, and maintain the balance of nature and research. Protected areas ensure that special places in our country are maintained for present and future generations to appreciate and enjoy.

The International Union for the Conservation of Nature (IUCN) defines **protected areas** as:

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

Examples of species at risk inhabiting a protected area include:

Endangered Species and Status	Protected Area
Peregrine Falcon (<i>anatum</i> subspecies, threatened)	Fundy National Park (NB)
Woodland Caribou (southern mountain population, threatened)	Jasper National Park (AB)
Grizzly Bear (northwestern population, special concern)	Kluane National Park and Reserve (NWT)
Newfoundland Marten (endangered)	Terra Nova National Park (NL)
American Badger (<i>jeffersonii</i> subspecies, endangered)	Kootenay National Park (BC)
Woodland Caribou (boreal population, threatened)	Nopiming Provincial Park (MB)

Although there are many reasons why protected areas are important and should be set aside, there just as many reasons not to establish them. Land designated for protection might be a source of fuelwood and fibre production for the local community. That source would be lost and the local economy may suffer if the

area is protected. Or the land might be used and maintained for mountain bike trails by an area bike club. The trails would be gone, and a healthy recreational opportunity lost.

Some existing protected areas face pressure from encroaching development and other disturbances. Land use demands adjacent to Banff National Park may have an impact on whether or not the park can adequately protect its wildlife species. There are concerns about resource development in ecologically important buffer areas adjacent to some established protected areas that can lead to things such as degradation of water or air quality, or loss of important wildlife corridors and critical habitat areas.

Community leaders, wildlife biologists, land use planners, forest industry representatives, and many others must make critical decisions every day regarding socio-economic planning and the potential impacts on the environment. They must weigh the benefits and challenges, and find a balance that protects species at risk and encourages sustainable development where appropriate.

The following lesson explores the decisions that must be made when proposing new protected areas. Students will better understand that new developments create jobs and jobs bring wealth and opportunity to communities – but that those opportunities must be held up against the protection of species at risk.

Procedure

1 **Begin a class discussion about the value of different habitats and protected areas.** Some discussion questions might include:

- Q: Explain the value of habitat. What does it provide to wildlife species, and why is it important?
- Q: What is a protected area? Why do we protect special areas? How do we protect those areas? Are you aware of any protected areas that are located in or near your community? Who is responsible for managing them? The municipality? The provincial or federal government?
- Q: Can you identify and describe some of the different categories of protected areas? (e.g., national park, marine conservation area, conservation authority, provincial park, fish sanctuary, National Wildlife Area, migratory bird sanctuary, wildlife reserve etc.)
- Q: Why are protected areas important? (e.g., biodiversity, conservation, protecting species and space diversity).

2 **Ask your students to think about the costs and benefits** of setting aside a portion of land as a protected area for a species at risk. What does it really cost? As an example, ask them to imagine a community that wants to expand, but the land it wishes to develop may be set aside as a protected area. What would be some of the potential impacts on the community if the land was not available for development? Consider some of these and list on the board students' thoughts regarding the impacts on:

- employment opportunities
- housing availability
- availability of natural resources
- recreation opportunities
- spiritual meaning
- ecological health of the area
- tourism
- community attitude about their landscape
- reclamation costs
- wetlands (flood control, water table regulation)
- trees (erosion control, help regulate water table).

3 **Divide your class into groups of two or three students.** Explain that they will be engaged in some difficult challenges that will have them graphically organize, compare and balance the importance of protected areas while at the same time, considering the costs related to housing, employment opportunities and future development for a local community. Students will then select and research a local community of their choice. You can photocopy the black line master of the graphic organizer on page 41.

You will have approximately 10 to 14 groups. Tell half of the groups to prepare an economic forecast report of approximately 500 to 750 words on the financial costs of developing a protected area (as an alternative, you might consider asking them to submit a detailed graphic organizer). What will be the economic losses or gains if the protected area is established? Will the protected area limit future development? Will potential job opportunities be lost? Will the protected area reduce opportunities for resource development, such as forest harvesting or mineral exploration? Will it increase potential recreation opportunities and likewise increase tourism in and around the community? Is it important for quality of life? What kind of community do you want to live in? Students may not be able to provide exact details, but based on the material researched, should be able to put forth their best guess.

Tell the other groups to conduct research and prepare a similar forecast report from an environmental perspective. They will explore the costs and benefits of developing a protected area adjacent to the community, but they will focus on the environmental costs and benefits. They will determine what the actual cost of setting the land aside will be, and explore the results of protecting that natural area. If the land is not set aside, what will happen to the species at risk? How large does the area have to be to protect the species? Who will manage and care for the land, and what will that cost? How do you measure the cost of healthy air and water? Recognize that it is difficult to put a price on aesthetic values, and that many of these intangible things are difficult to measure.

Let students know that when they have completed their economic forecast reports, they will be participating in a public consultation meeting for the community to decide whether or not to proceed with the protected area development.

4 **When the students have researched and prepared their economic forecast reports**, hold a public consultation meeting. This meeting will be used to present information about the proposed protected area, and provide perspectives about potential costs and impacts. You may choose to moderate the presentations yourself, or select a student moderator to serve as a mayor.

Ask each group to select a spokesperson. Introduce the meeting by asking for volunteers to share their perspectives about the proposed protected area. Each group will speak for five minutes, justifying their position using graphs, statistics and photographs as tools to help present a specific point of view and best describe their arguments. When each group has completed its presentation, call the formal meeting to a close.

5 **Following the public consultation meeting, survey the class.** Based upon the presentations, does the majority of the class wish to proceed with the protected area development? What is their rationale for proceeding or halting the development? Ask each student to submit a position paper outlining their point of view.

Extensions

Research a proposed protected area in Canada. Where is it? Why is it being proposed as a protected area? What groups or individuals support its development? Who is opposed or concerned about its establishment as a protected area? Why? Have students prepare a brief report of their findings.

Compare the establishment of protected areas in Canada with the United States, and/or another, non-North American country.

Protected areas are one way of protecting species at risk. Landowners, ranchers, farmers, resource development companies etc., have personal responsibilities. Ask students to come up with four to five examples of efforts that can be made on a personal level that can help reduce their impact on species at risk.

Students can also explore other kinds of protected areas. There are areas that are protected by conservation easements between landowners and non profit groups like Ducks Unlimited Canada (DUC), Nature Conservancy, etc., where there is a voluntary set aside of habitat and special features – this agreement goes on the land title and if the land is sold the agreement is maintained with the new owner in perpetuity. In return for giving up land use benefits the landowner may receive a tax receipt or payment comparable to the lost land value. Have students carry out research to determine if there are any of these special arrangements within your community.

Case Study Community



Location

Development Issues



Social Issues

Environmental Issues

Location of Proposed Protected Areas

Potential Organizations Concerned with Allocation of Land for Protected Areas

Glossary

at risk: Wildlife species that is extinct, extirpated, endangered, threatened, or special concern.

biodiversity: The variety of life on earth, different species, genetic variability within species and the variety of ecosystems in which they live.

carrying capacity: The amount of species that a given ecosystem is capable of supporting.

conservation: The maintenance of environmental quality, diversity and resources through the management of human activities.

COSEWIC: The Committee on the Status of Endangered Wildlife in Canada, COSEWIC is a committee that assesses species that are at risk.

ecological integrity: A condition that is determined to be characteristic of its natural region and likely to persist; specifically, when the structure and function of its ecosystems are not being stressed by human activity.

ecosystem: An interdependent and dynamic system of living organisms with their physical and geographical environment.

endemic species: A species native and confined to a certain region; it usually has a comparatively restricted distribution.

endangered: A wildlife species facing imminent extirpation or extinction.

endangered spaces: Threatened natural areas, such as tall-grass prairie, old growth forests and wetlands.

extinct: A species that no longer exists.

extirpated: A species that no longer exists in the wild in Canada, but exists elsewhere in the wild (for example, in the wild in the United States).

habitat: The arrangement of food, water, shelter space suitable for species survival.

indicator species: A species whose progress is monitored by people as an indication of what is happening to the environment as a whole.

in-situ conservation: The conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings.

invasive species: A species that has moved into an area and reproduced so aggressively that it has replaced some of the original species.

keystone species: A species whose loss from an ecosystem would cause a greater than average change in other species populations or ecosystem processes.

native species: An indigenous species that is normally found in Canada.

niche: The "place" occupied by a species in its habitat, including the particular set of circumstances (chemical, physical and biological) that enable it to survive.

non-native species: A species that did not originally occur in the areas in which it is now found, but that arrived as a direct or indirect result of human activity. Examples include purple loosestrife, Scotch pine, and Asian Longhorn beetle.

population: A group of individuals of one species, found within a prescribed area and usually somewhat isolated from other groups of the same species.

range: The geographical limits of a species or group; a migratory species usually has both a breeding range and a wintering range.

recovery: Conservation actions undertaken to benefit an endangered or threatened species until a sustainable population level of fit individuals has been reached and threats to the population have been controlled.

RENEW: The Recovery of Nationally Endangered Wildlife, a program under which teams of experts develop recovery plans for species at risk.

restoration: Returning a degraded ecosystem or population to its original condition.

special concern: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

stewardship: Management of the heritage of our natural spaces, species and culture in such a way that it can be passed on to future Canadians intact.

subspecies: A geographically limited subdivision of a species that is taxonomically different from other such subdivisions of the same species.

sustainable forest management: Management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations.

threatened: A wildlife species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

wildlife species: A species native to Canada.



CFA Programs

National Forest Week

National Forest Week is sponsored across Canada by the CFA and regionally by various provincial forestry agencies, corporations, agencies and individuals.

Established circa 1920 as Forest Fire Prevention Week, the intention was to encourage greater public awareness towards Canada's forests. At the time, there was no apparent shortage of trees for industrial expansion – the greatest threat came from forest fires, due mainly to human causes.

Since then National Forest Week, as it was renamed in 1967, has evolved to encompass the many and varied human and environmental aspects of Canada's forest resources – past, present and future. Although special activities are promoted across Canada, National Forest Week remains first and foremost a challenge to individual Canadians to learn more about their forest heritage and support greater recognition of this valuable resource.

National Forest Week is observed annually during the first full week of May, Sunday through Saturday.

How to Participate

- Arrange a tree planting activity at your school; contact: www.treecanada.ca
- Take a walk in a forested area near the school; learn about a forest, close up!
- Identify all the things in your classroom that come from the forest
- Learn about forest related organizations that demonstrate excellence in sustainable forest management
- Have students adopt a tree: care for a newly planted or a neglected tree, and learn about the species
- Contact your provincial forestry association for more teaching activities and ideas

Forest Capital of Canada – Celebrating Forest Communities

Established in 1979, the Forest Capital of Canada program highlights the valuable role forests play in the socio-economic and environmental health of our communities – past, present and future.

Each year the CFA designates a community or region to host a celebration of its forest resources. Traditionally, the various forestry agencies invite proposals from communities or regions in their province that demonstrate the capacity to mount a successful 12 to 24-month celebration. Interested communities may also submit proposals directly to the CFA.

Envirothon Canada



ENVIROTHON

The CFA is the national agency for Envirothon Canada which works in partnership with conservation groups, forestry associations, educators and cooperating natural resource agencies to organize and conduct competitions at the local, regional and provincial levels. Winning teams at the provincial levels compete at the Canon Envirothon.

The Canon Envirothon is North America's largest high school environmental education competition. Reaching more than 500 000 students across North America annually, Envirothon succeeds in its mission to develop knowledgeable, skilled and dedicated citizens who are willing and prepared to work towards achieving a balance between quality of life and quality of the environment

Program

- promotes environmental education based on teamwork, collaboration and competition
- school-based learning guided by a set of expectations and key references
- combines in-class curriculum and hands-on field experiences
- supplements environmental education inside and outside the traditional classroom

Benefits

- secondary students explore environmental issues with peers, natural resource professionals and community leaders
- students gain valuable knowledge and training in ecology and natural resource management principles and practices
- students get excited about pursuing careers in environmental studies, environmental law, natural sciences and natural resource management
- communities benefit from the involvement of young people in local environmental issues
- society benefits from a citizenry educated in the principals of environmental stewardship.

For more information about these and other CFA Programs visit:

www.canadianforestry.com

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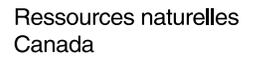
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