SPECIAL PLACES

Eco-lessons from the National Parks in Atlantic Canada for Grades 4, 6, and 7
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for Grades 4, 6 and 7
Acknowledgements

Special Places: Eco-lessons from the National Parks in Atlantic Canada was developed by Parks Canada to help students in Atlantic Canada become better environmental citizens through the knowledge and appreciation of their region’s nationally protected areas.

This curriculum supplement is the result of the collaborative efforts of Parks Canada staff in the Atlantic Service Centre and the national parks in Atlantic Canada, working closely with a large group of educators and environmental specialists. Parks Canada would like to specifically acknowledge the contributions of the following people who offered feedback and support during project development:

Appreciation is expressed to Jacqueline Babineau (Science Consultant, New Brunswick Department of Education, District 11, Richibucto and District 1, Shediac); Bob Briehl (Grade 4 Teacher, Oakville, Ontario); Brad Clarke (Program Development Specialist, Science, Newfoundland and Labrador Department of Education and Training); Clayton Coe (former Elementary and Intermediate Mathematics & Science Consultant, Prince Edward Island Department of Education, current Elementary Education Coordinator English Programs, Prince Edward Island Department of Education); Jacques Cool (former Science Curriculum Consultant, French Programs, New Brunswick Department of Education, current Provincial E-learning Coordinator for Francophone schools, New Brunswick Department of Education); Pamela Courtney Hall (Faculty of Education, University of British Columbia); Barb Elliot (Master Teacher of Ecology and Environment, Sir Sanford Fleming College, Ontario); Nicole Ferguson (New Brunswick Provincial French Science Curriculum Consultant, New Brunswick Department of Education); Grant Gardner (Dean of Science, Memorial University, St. John’s Newfoundland); Michel Genest (Program Specialist, French First Language, Newfoundland and Labrador Department of Education and Training); Dana Griffiths (former Science Consultant, Newfoundland and Labrador Department of Education); Mark Holland (Science Curriculum Consultant, New Brunswick Department of Education); Antoine Jarjoua (Francophone Secondary Math and Science Consultant, Nova Scotia Department of Education); William Kirstead (former Grade 9 Science Teacher, Bonar Law Memorial School, Rexton, current Principal); Robert Laurie (Director of Evaluation, New Brunswick Francophone Department of Education); Bob LeBlanc (former Director, English Program Services, Nova Scotia Department of Education); Barry LeDrew (former Manager of Curriculum and Learning Resources, Newfoundland and Labrador Department of Education); Annice Melanson (Francophone Elementary Math and Science Consultant, Nova Scotia Department of Education); Dan Murphy (Outdoor Education Coordinator, Newfoundland and Labrador Department of Education and Training, School District 3); Jim Petrie (Learning for Sustainable Futures, New Brunswick); Ken Roper (Senior High Mathematics & Science Consultant, Prince Edward Island Department of Education); Pierre Roy (former Grade 12 Biology Teacher, École Clément Cormier, Batouche, New Brunswick Department of Education, current Mathematics & Science Consultant, French Programs, Prince Edward Island Department of Education); Jay Thompson (French Immersion Teacher, Halifax Regional Municipality, Nova Scotia); Marilyn Webster (Science Consultant, Nova Scotia Department of Education); Ann Whalley (Vice-Principal, Strait Highlands School, Port Hawkesbury, Nova Scotia); Craig White (District 10 Science Consultant, Newfoundland and Labrador Department of Education and Training); Graham Wood (District 7 Science Consultant, Newfoundland and Labrador Department of Education and Training); Bev Yee (Manager of Environmental Education, Alberta Protection, Edmonton, Alberta).

A special thanks is extended to the many teachers and students in Atlantic Canada who piloted the Special Places eco-lessons. Parks Canada especially appreciated the extraordinary extended pilot and student video submitted by teachers Beth Smith, Jennifer MacMillan and Darren MacIntosh of the Riverside Education Centre in Nova Scotia.

The Special Places project group would like to acknowledge the endless enthusiasm and professionalism demonstrated by Susan Gesner and Erica Jeffery (Gesner & Associates Environmental Learning) during the development of our product.

Thanks are also extended for the great support received from staff at the Parks Canada Atlantic Service Centre, including Karen Jans, Manager, Heritage Presentation. The administrative assistance from Debbie Pettipas, Tatia Jones and Jackie Brooksbank was much appreciated, as was technical advice received from Graphic Designers Gerry Boulet, and Julien LeBlanc, as well as Interpretation Specialist Bruce Rickett. Gary Corbett, Kim Mawhinney and Tim Daly of Ecological Integrity Management were also very helpful. Suzanne Bagnell was an outstanding editor, in both official languages.

Outreach Heritage Presentation staff at the Parks Canada National Office also helped to make Special Places possible and the project team extends their gratitude to Jack Ricou, Myrna Andrew, Heather Oxman and Daniel Rosset.
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Welcome to Special Places: Eco-lessons from the National Parks in Atlantic Canada. This interactive Atlantic Canada Science curriculum supplement is designed for Grades 4, 6, and 7 with direct links to units on Habitats (Grade 4), Diversity of Life (Grade 6) and Interactions within Ecosystems (Grade 7). In addition, several of the lessons have cross-curriculum links to Language Arts and Social Studies.

Atlantic Canada is blessed with seven beautiful and very special national parks. In Nova Scotia, we have Kejimkujik and Cape Breton Highlands and in New Brunswick, Kouchibouguac and Fundy. Prince Edward Island National Park is a scenic coastal park located in the province of the same name. Newfoundland and Labrador boast Terra Nova and magnificent Gros Morne, a UNESCO World Heritage Site. These special places have been called living laboratories that offer valuable lessons about our fragile environment.

Parks Canada uses these parks and their national importance as case studies to teach students in Atlantic Canada about biological diversity, endangered species, ecosystems, habitat protection and more.

Special Places will help students to:

• develop a better understanding of the sciences and technologies as applied to and by national parks;

• gain specific knowledge about national parks and how, through case studies, they are managed;

• develop skills for scientific and technological inquiry, solving problems, communicating scientific ideas and results;

• develop an appreciation for Canada's nationally protected areas;

• become better environmental citizens.
How this supplement came about

Special Places has been a collaborative project between the seven national parks in Atlantic Canada and the Parks Canada Atlantic Service Centre, assisted by curriculum resource developers (Gesner & Associates Environmental Learning) and educational reviewers, including teachers and curriculum specialists. Departments of Education in each Atlantic Province were consulted. The eco-lessons have been extensively pilot tested throughout Atlantic Canada and have been adapted based on the comments received.

This diverse team of reviewers has provided support and enthusiasm throughout the development of the supplement. Parks Canada is extremely pleased with their response to the Special Places curriculum supplement. Some of the critical and supportive comments that were shared during the evaluations include:

"Parks Canada did a great job with these lessons! You are to be congratulated."

"We really enjoyed doing this unit and are pleased with the results."

"It was a lot of work but I felt great about it as we saw the products and enthusiasm of the students! Thanks!"

"Students really enjoyed learning about these parks. I'm very pleased. Great ideas – children enjoyed being creative and explaining adaptations of animals and plants!"

Students also contributed their comments about the lessons:

"Lots of fun and I would do it again."
What's in the Special Places curriculum supplement?

This package includes six full lesson plans linked to the Atlantic Canada Science Curriculum (2000), with learning outcomes, materials, background information and detailed procedures. Associated resources include a map locating the national parks within Atlantic Canada, illustrated black line photocopy master information sheets on the national parks and their species, as well as an extensive teacher's glossary. We encourage teachers to adapt the materials as necessary and there are extension activities suggested in many of the lessons. Each lesson is designed to work independently and teachers are free to select any number for classroom delivery.

These creative eco-lessons are designed to be teacher friendly and student centered. All of the hands-on activities combine research, discussion and group work. Internet references are provided for future exploration but the lessons are designed to be delivered without the need for advanced technology. You and your students can find general information about Parks Canada with links to specific national parks and colour photo galleries on our website: www.parkscanada.gc.ca.

NOTE: The lessons contained in this package are primarily meant for classroom use. Field trips and visits to the national parks are not necessary for their completion, although we encourage you to visit them if you are able to. Please feel free to contact the parks if you require more information for classroom study.

We hope you and your students enjoy these lessons on the special places that are the national parks in Atlantic Canada.
There are 39 national parks and national park reserves in Canada. Each protects an outstanding example of our country’s natural beauty and ecological diversity. They are part of an international system of protected areas in Canada, North America and the global community.

From east to west, and north to south, the national parks system covers about 2.5% of the nation’s lands and fresh water and protects outstanding representative examples of Canada’s diverse natural landscape. These irreplaceable areas are home to many of Canada’s plant and animal species, including those that are endangered or at risk.

When you put all these special places together, the story of Canada’s natural beginnings and ongoing natural processes appears. You’ll discover how glaciers shaped our land, how mountains and lakes form and disappear, and how forest fires renew the landscape. The national parks system displays the evidence of all of these dramatic and exciting changes to our natural environment, as well as tells the story of our human relationship with the land.

If you love wildlife, we have plenty of stories to share too!

You might be surprised to learn that many national parks also contain exceptional cultural resources. In fact, quite a
number of Canada’s national historic sites are actually located in national parks.

Although Canada’s national parks are quite different, they are all interconnected in special ways. A number of plant and animal species make their home in several parks. Sometimes you can find the same fossils in parks that are thousands of kilometres apart!

Canada’s national parks celebrate the beauty and variety of the land. They are set aside for the benefit, education and enjoyment of Canadians – for now and for future generations.

**Ecological Integrity**

The ecological integrity of Canada’s national parks is under threat from many sources, including pollution, shrinking natural habitats surrounding national parks, development and visitor traffic.

When we talk about “integrity” we mean that the ecosystems in a national park remain healthy and whole. Just like any creature, a park is made up of many different, interrelated and living parts. If one part is damaged or removed, the overall health of the park may be affected.

The first priority of Parks Canada and its staff for Canada’s national parks is to ensure their ecological integrity. We strive through scientific research and public consultation to understand the ever-changing stresses – both human and natural – that affect national parks. With this understanding Parks Canada can make sound ecosystem-based management decisions.

For example, Parks Canada decides which areas of a national park can withstand human activities, such as hiking and camping, and which areas need to be off limits to visitors. Once we know where people are permitted to go (and in what numbers), we communicate this information to our visitors.

Education and interpretation programs help explain why these decisions are important and how they allow park managers to make decisions to prevent further degradation of the park’s ecosystem. Your support and cooperation is essential!
Ecosystem management must be far-reaching and have a broad base of support to work well. In order to achieve this support, Parks Canada promotes understanding and collaboration among everyone whose activities influence the wildlife and ecological integrity of a park – from neighbouring landowners and businesses to visitors. For example, when a national park's management plan is being developed to guide the long-term development and operation of the park, the public and other stakeholders are invited to provide their input. Parks Canada also relies upon such initiatives as the Panel on the Ecological Integrity of Canada's National Parks to identify park management issues and long-term solutions.
National Parks in Atlantic Canada

Newfoundland and Labrador
1. Gros Morne National Park of Canada
2. Terra Nova National Park of Canada

Nova Scotia
3. Cape Breton Highlands National Park of Canada
4. Kejimkujik National Park of Canada
5. Kejimkujik National Park of Canada, Seaside Adjunct

Prince Edward Island
6. Prince Edward Island National Park of Canada
7. Prince Edward Island National Park of Canada, Greenwich

New Brunswick
8. Fundy National Park of Canada
9. Kouchibouguac National Park of Canada

MAP /xiii

SPECIAL PLACES: Eco-lessons from the National Parks in Atlantic Canada
<table>
<thead>
<tr>
<th>Grade Level/Lesson</th>
<th>Summary</th>
<th>Learning Outcomes (students will be able to)</th>
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<tbody>
<tr>
<td><strong>Grade 4</strong></td>
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<tr>
<td><em>Creature Features!</em> (p.1.1)</td>
<td>Students will work in teams to select an environment within a specific national park and then design an animal or plant that can live only in that particular environment.</td>
<td>• explain the concept of “habitat” as it relates to the needs and habits of a particular plant or animal; • compare external features and behavioral patterns of their invented species; • describe at least three adaptive features of plants and animals and how the invented species meet their basic needs in the natural habitats; • illustrate the food web that exists for their new species.</td>
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<td><strong>Grade 4</strong></td>
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<tr>
<td><em>More Than a Campground!</em> (p.2.1)</td>
<td>Students will explore the variety of habitats in each of the seven national parks in Atlantic Canada and understand what makes them special enough to be a national park.</td>
<td>• explain the concept of “habitat” as it relates to the needs and habits of a particular plant or animal; • describe in what ways each national park in Atlantic Canada is unique and special; • defend the importance of national parks in Canada; • explain how national parks can provide different things to different people.</td>
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<tr>
<td><strong>Grades 4, 6, 7</strong></td>
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<td><em>Conservation Advice for National Parks</em> (p.3.1)</td>
<td>Students will develop a poster (Grade 4) or TV commercial (Grades 6 and 7) that celebrates the essence of a national park in Atlantic Canada and emphasizes the protection of the ecological integrity of all the parks.</td>
<td>• describe each national park in Atlantic Canada with respect to its climate, physical geography and habitats; • identify ways their media encourages people to protect and preserve the ecology of their selected park; • critique various advertisements and commercial messages.</td>
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<td><strong>Grade 6</strong></td>
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<td><em>The News Knows!</em> (p.4.1)</td>
<td>Students will combine science learning outcomes with media literacy by researching and writing a newspaper article on a particular resource management issue in one of three national parks in Atlantic Canada.</td>
<td>• explain why national parks in Atlantic Canada have individual resource management issues; • develop research skills for scientific inquiry; • develop communication skills for presenting their results and ideas; • apply their understandings about the issues and interpret them through writing.</td>
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<td><strong>Grade 6</strong></td>
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<tr>
<td><em>Species at Risk – Recovery Teams to the Rescue!</em> (p.5.1)</td>
<td>Students will work together in conservation recovery teams to describe an endangered species and explain why it is endangered. They will explore efforts taken to ensure that species’ protection and status improvement within the national parks in Atlantic Canada.</td>
<td>• explain why certain species of animals and plants are endangered; • describe efforts to study the population size of some of these species; • explain what is being done to ensure the continued existence of these species within the national parks in Atlantic Canada.</td>
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<td><strong>Grade 7</strong></td>
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<td><em>The Links of Life – Ecosystem Interactions in a National Park</em> (p.6.1)</td>
<td>Students will create a diagram (mural, flow chart or other visual display) that illustrates the flow of energy in an ecosystem, using a national park as the model.</td>
<td>• distinguish between and understand the following terms: consumer, producer, decomposer, herbivore, carnivore, omnivore, food chain/web, ecosystem; • create a sketch of an ecosystem and identify the interactions that take place within that ecosystem, including both biotic and abiotic components; • explain how energy is supplied to and how it flows through a food web; • identify and investigate questions related to a local ecosystem such as &quot;what types of species live in a particular ecosystem&quot; (specific to the Extension activities); • organize and record data collected in an investigation of an ecosystem (specific to the Extension activities).</td>
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</table>
## Lesson Resources Key – Grades 4 to 7

<table>
<thead>
<tr>
<th>Resource Materials Associated with Lesson Plans</th>
<th>Creature Features! Grade 4 (p.1.1)</th>
<th>More Than a Campground! Grade 4 (p.2.1)</th>
<th>Conservation 'Advice Grades 4, 6, 7 (p.3.1)</th>
<th>The News Knows! Grade 6 (p.4.1)</th>
<th>Species at Risk Grade 6 (p.5.1)</th>
<th>The Links of Life Grade 7 (p.6.1)</th>
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<tr>
<td>Student Information Sheet – Cape Breton Highlands National Park (p.7.1)</td>
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<td>Student Information Sheet – Kejimkujik National Park (p.10.1)</td>
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<td>Student Information Sheet – Kouchibouguac National Park (p.11.1)</td>
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<td>Park Backgrounder – Fundy National Park (p.15.1)</td>
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<td>Park Backgrounder – Kejimkujik National Park (p.17.1)</td>
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<td>Park Backgrounder – Kouchibouguac National Park (p.18.1)</td>
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<td>Park Backgrounder – Terra Nova National Park (p.20.1)</td>
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<td>Clams Information Sheet (p.22.1)</td>
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<td>Sand Dunes Information Sheet (p.23.1)</td>
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<td>Peregrine Falcon Information Sheet (p.25.1)</td>
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<td>Water-pennywort Information Sheet (p.27.1)</td>
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<td>Species List for Kejimkujik National Park (p.28.1)</td>
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<td>Species List for Prince Edward Island National Park (p.29.1)</td>
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<td>Species at Risk List for Atlantic Canada (p.30.1)</td>
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<td>Opinion Sheet – Kejimkujik National Park (p.31.1)</td>
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<td>Opinion Sheet – Kouchibouguac National Park (p.32.1)</td>
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**NOTE:** Teachers may wish to create overheads to use where appropriate.
Fax Evaluation

To: Denise Hansen, Parks Canada, Atlantic Service Centre,
Historic Properties, 1869 Upper Water Street, Halifax, N.S., B3J 1S9

Fax: (902)-426-7012

Re: Evaluation — Special Places eco-lessons

Please help us to ensure that Parks Canada continues to provide educators with high quality educational materials. We would appreciate it if you would complete this evaluation for Special Places: Eco-lessons from the National Parks in Atlantic Canada and fax it using this return form. Thank you for your assistance!

Teacher’s Name:

School Name & Address: Grade Level:

How did you learn about the Special Places eco-lessons?

- Teacher newsletter
- Curriculum contacts
- Internet
- Teacher in-service
- Teaching colleague
- Other (please explain):

Which lesson(s) did you use in your classroom? (Check)

- Creature Features!
- More Than a Campground!
- The Links of Life – Ecosystem Interactions in a National Park
- Conservation ‘Ad’vice for National Parks
- The News Knows!
- Species at Risk – Recovery Teams to the Rescue!

Please help us to assess the quality of this curriculum supplement. Check the box that reflects your experience, one being the lowest, five being the highest.

<table>
<thead>
<tr>
<th>How accurately did the lesson(s) reflect the curriculum?</th>
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<th>2</th>
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<tr>
<td>How would you rate the lesson plan organization (headings, procedures, etc.)?</td>
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<td>How would you rate the student enjoyment of the lesson(s)?</td>
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<td>How would you rate the background information provided to teach the lesson(s)?</td>
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<td>How would you rate the time frame estimates for the lesson(s)?</td>
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<td>How would you rate the graphics and black-line masters?</td>
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<td>How would you rate the quality of the lesson methodologies? (i.e. creativity, soundness of pedagogy)</td>
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Comments:
### Special Places Terms

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<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Abiotic</td>
<td>Nonliving. For example, rocks, soils and waters.</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>The variety of life on Earth, including all the different plants and animals.</td>
</tr>
<tr>
<td>Biome</td>
<td>A large land (terrestrial) ecosystem such as a forest, grassland, or desert.</td>
</tr>
<tr>
<td>Biotic</td>
<td>Living organisms.</td>
</tr>
<tr>
<td>Boreal</td>
<td>Cool, temperate regions of the northern part of the Earth, where we find vast forests of evergreen trees such as black spruce and balsam fir.</td>
</tr>
<tr>
<td>Carnivore</td>
<td>An animal that feeds on other animals.</td>
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<tr>
<td>Carrying Capacity</td>
<td>Maximum population of a particular species that a given area of habitat can support over a given period of time.</td>
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<tr>
<td>Clear Cutting</td>
<td>Harvesting of all trees in a large area, leaving extensive cutovers.</td>
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<tr>
<td>Community</td>
<td>An interacting population of various species in an area.</td>
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<tr>
<td>Competition</td>
<td>Two or more individual organisms of a single species or different species using the same scarce resources in an ecosystem.</td>
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<tr>
<td>Coniferous Trees</td>
<td>Cone-bearing trees, mostly evergreens, that have needle-shaped or scale-like leaves. They produce wood known commercially as softwood.</td>
</tr>
<tr>
<td>Conservation</td>
<td>Careful preservation and protection of ecological processes and biodiversity of the environment.</td>
</tr>
<tr>
<td>Consumer</td>
<td>Organisms that cannot produce their own food and must get it by eating or decomposing other organisms; generally divided into primary consumers (herbivores), secondary consumers (carnivores) and microconsumers (decomposers).</td>
</tr>
<tr>
<td>COSEWIC</td>
<td>Committee on the Status of Endangered Wildlife in Canada.</td>
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<tr>
<td>Deciduous Trees</td>
<td>Trees that lose their leaves every fall. For example, oak, maple, poplar and birch.</td>
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<tr>
<td><strong>Decomposers</strong></td>
<td>These are the living things which feed off dead plants and animals and reduce their remains to minerals and gases again. Examples include mushrooms and bacteria.</td>
</tr>
<tr>
<td><strong>Ecodistricts</strong></td>
<td>Found within ecoregions and are characterized as distinctive arrangements of landforms, relief, surficial geologic material, soil, water bodies, vegetation, wildlife and land uses.</td>
</tr>
<tr>
<td><strong>Ecological Integrity</strong></td>
<td>A national park has ecological integrity when the structure and function of its ecosystems are not stressed by human activity and are likely to persist. In other words, “healthy plants and animals living in a healthy environment.”</td>
</tr>
<tr>
<td><strong>Ecological Succession</strong></td>
<td>Process in which communities of plant and animal species in a particular area are replaced over time by a series of different communities.</td>
</tr>
<tr>
<td><strong>Ecology</strong></td>
<td>A science that studies the relationship between organisms and their environment.</td>
</tr>
<tr>
<td><strong>Ecoregions</strong></td>
<td>Subdivisions of the ecozone characterized by distinctive large order land forms, micro-climates, vegetation, soils, water, wildlife and regional human activity patterns/use. Ecoregions are the bridge between the subcontinental scale ecozones and the more localized ecodistricts</td>
</tr>
<tr>
<td><strong>Ecosystem</strong></td>
<td>All the living and nonliving things in a certain area, including soil, air, water, animals and humans. A lake is one example of an aquatic ecosystem.</td>
</tr>
<tr>
<td><strong>Ecozones</strong></td>
<td>An area of the Earth’s surface representative of large and very generalized units characterized by interactive and adjusting abiotic and biotic factors.</td>
</tr>
<tr>
<td><strong>Endangered Species</strong></td>
<td>A species of plant or animal threatened with extinction or imminent extirpation.</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>Circumstances, objects or conditions by which organisms or communities survive.</td>
</tr>
<tr>
<td><strong>Environmental Impact</strong></td>
<td>Effects on any natural and cultural resources that result from human use.</td>
</tr>
<tr>
<td><strong>Extinct Species</strong></td>
<td>A species that no longer exists anywhere, such as the dinosaur.</td>
</tr>
<tr>
<td><strong>Extirpated Species</strong></td>
<td>A local species of plant or animal that no longer exists in its natural region but exists elsewhere.</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Food Chain</strong></td>
<td>A sequence of organisms, each of which uses the next, lower member of the sequence as a food source.</td>
</tr>
<tr>
<td><strong>Food Web</strong></td>
<td>A complex network of many interconnected food chains and feeding interactions.</td>
</tr>
<tr>
<td><strong>Habitat</strong></td>
<td>The area where an animal, plant or microorganism lives and finds food, water, shelter, living space and the other essentials it needs to survive.</td>
</tr>
<tr>
<td><strong>Herbivore</strong></td>
<td>Plant-eating organism.</td>
</tr>
<tr>
<td><strong>Invasive Species</strong></td>
<td>Non-native species that compete with local species for food and space.</td>
</tr>
<tr>
<td><strong>Keystone Species</strong></td>
<td>A species, such as the beaver, that affects the survival and abundance of many other species in its community.</td>
</tr>
<tr>
<td><strong>National Park</strong></td>
<td>A relatively large area containing representative examples of major natural regions, features, or scenery of national or international significance. National park ecosystems are not heavily altered by humans and they are protected by national governments.</td>
</tr>
<tr>
<td><strong>Natural Resources</strong></td>
<td>Any part of the environment that species depend on for their survival.</td>
</tr>
<tr>
<td><strong>Natural Selection</strong></td>
<td>Process by which some genes and gene combinations in a population of a species are reproduced more than others when the population is exposed to an environmental change or stress.</td>
</tr>
<tr>
<td><strong>Niche</strong></td>
<td>Within a habitat, a special area with special conditions that supplies a species with factors necessary for its survival. A beaver dam is one example of a niche.</td>
</tr>
<tr>
<td><strong>Non-native Species</strong></td>
<td>An exotic species that is neither native nor naturalized to the natural region and that has been introduced as a result of human activity.</td>
</tr>
<tr>
<td><strong>Old-growth Forest</strong></td>
<td>Uncut, virgin forest containing massive trees that are often hundreds of years old.</td>
</tr>
<tr>
<td><strong>Omnivore</strong></td>
<td>An animal organism that can use both plants and animals as food sources.</td>
</tr>
<tr>
<td><strong>Organism</strong></td>
<td>Any form of life.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Photosynthesis</td>
<td>A complex process that takes place in the cells of green plants. Radiant energy from the sun is used to combine carbon dioxide (CO₂) and water (H₂O) to produce oxygen.</td>
</tr>
<tr>
<td>Population</td>
<td>Group of individual organisms of the same species living within a particular area.</td>
</tr>
<tr>
<td>Predation</td>
<td>Situation in which an organism of one species (the predator) captures and feeds on parts or all of an organism of another species (the prey).</td>
</tr>
<tr>
<td>Preservation</td>
<td>The act of protecting a natural and cultural resource against eventual damage through control of human activity or natural phenomena.</td>
</tr>
<tr>
<td>Prey</td>
<td>This is the food source for predators.</td>
</tr>
<tr>
<td>Producer</td>
<td>Organism that uses solar energy (green plant) or chemical energy (some bacteria) to manufacture its own food from inorganic nutrients.</td>
</tr>
<tr>
<td>Rare Species</td>
<td>A native species of plant or animal which exists in low numbers or in isolated areas.</td>
</tr>
<tr>
<td>Scavengers</td>
<td>Species such as crows or seagulls which feed on dead or decaying organisms.</td>
</tr>
<tr>
<td>Species</td>
<td>Plants, animals or microorganisms that are so similar that they can have offspring.</td>
</tr>
<tr>
<td>Sustainable Development</td>
<td>The concept and practice of development that ensures that use of a resource or environment does not degrade the usefulness of the resource for future generations.</td>
</tr>
<tr>
<td>Sustainable Use</td>
<td>Using a natural resource responsibly, so it will still be available in the future. For example, making sure that trees grow in areas where the older ones have been cut down.</td>
</tr>
<tr>
<td>Threatened</td>
<td>A native species of plant or animal that is likely to become endangered in its natural region if steps are not taken to protect it.</td>
</tr>
<tr>
<td>Wildlife</td>
<td>Plants or animals not cultivated or domesticated by humans.</td>
</tr>
<tr>
<td>Wildlife Conservation</td>
<td>Activity of protecting, preserving, managing and studying wildlife and wildlife resources.</td>
</tr>
</tbody>
</table>
NOTE: This is a common environmental education activity that can be found in a variety of textbooks and education manuals. It has been customized to suit the national park situation in Atlantic Canada.

Summary

Students will work in teams to select an environment within a specific national park and then design an animal or plant that can live only in that particular environment.

Learning Outcomes

Students will be able to:

• explain the concept of “habitat” as it relates to the needs and habits of a particular plant or animal;

• compare external features and behavioral patterns of their invented species;

• describe at least three adaptive features of plants and animals and how the invented species meet their basic needs in the natural habitats;

• illustrate the food web that exists for their new species.

Activity Information

Grade level: 4

Subject: Science – Habitats

Curriculum linkages: Habitats Unit, 104-1; 204-3; 205-1; 300-1; 300-2; 302-1; 302-2; 302-3. (Students will be familiar with the basic needs of living things and can explore how various organisms satisfy their needs in the habitat in which they are typically found. They will look for ways in which organisms in one habitat differ from those in others, and consider how some of those differences are helpful for survival.)

CREATURE FEATURES /1.1

SPECIAL PLACES: Eco-lessons from the National Parks in Atlantic Canada
**Duration:** Approximately 90 minutes

**Setting:** Classroom

**Materials:** Art supplies (large sheets of paper, pencils, paints, markers, etc.), tape recorder, Student Information Sheets on each of the seven national parks in Atlantic Canada.

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**Teacher Background**

What do you need to survive? A house to live in, with heating in the winter and air conditioning in the summer? Perhaps you need steak and potatoes, or a vegetarian lasagna, with a tall glass of water to wash it all down. And where would you get your exercise: in the backyard, on the beach or at a playground?

If that's the case, you have just described your preferred habitat. We all have our preferred habitat. Habitat is the arrangement of food, water, shelter and space suitable for an animal or plant's needs. In simpler terms, the place where that plant or animal (or person, in our above example) lives and grows – its home address – is its habitat. All living things have specific and individual habitat needs.

For example, most peregrine falcons live and nest on cliff ledges overlooking wide-open spaces with an abundant source of prey. Red fox, on the other hand, prefer a habitat of meadows and fields interspersed with woods. An abundance and variety of food is available in this mixed habitat, as well as denning sites.

Plants need different amounts of light, soil and water and will grow and thrive depending on that mix. Cedars grow best in moist soils where the underlying rock is limestone, whereas pines are more commonly found in soils that are sandy or gravelly.

There are numerous interactions between the plants and animals in an environment. One way to explore and investigate these interactions is by examining the food chains and food webs that exist. The dependence of plants and animals on each other for food makes up a food chain. For example, green plants transform the light energy from the sun to make food, using water and nutrients they
receive through their roots. The nutrients they need come from decomposed organic and inorganic materials in the soil. A small rodent, perhaps a mole or mouse, eats the plant. A red-tailed hawk then makes a meal out of the rodent. The food chain is as follows: plant – rodent – red-tailed hawk.

However, in most natural situations, the flow of energy and food is more complex than a simple chain. Most animals eat a variety of foods, depending on their abundance and availability. So there are a variety of plants that a little mole could eat, just as there are a variety of rodents who will eat the green plants. The red-tailed hawks can feed on the mole or vole, but also on small birds, snakes, frogs and larger prey such as hares and grouse. Those animals all fall prey to other species. What results is a complex and intricate web of interdependent parts. Nature works to keep a balance within this food web.

In this activity, students are asked to study a unique environment in a national park in Atlantic Canada and create a creature that could successfully inhabit this environment. Ideally, your students will have had some prior ecosystem background studies. If they have not, Activity #1 may help them to see the intricate web of relationships that exist in any environment. Their understanding of these relationships will be enhanced as they create and research the habits and roles of their new creatures.

Procedure

Activity #1

Ask your class what plants and animals need to live and grow in any environment. Brainstorm a list of those requirements. Ask these kinds of questions to prompt their thinking:

- How do plants and animals depend on each other?
- What is an example of a food chain that you should be aware of?
- What are some of the food chains you might find in your community? In a particular national park?
• How could you demonstrate one of these food chains? (e.g. using word models; drawing a chain or food web, and connecting the components with string to map out the interconnections; using students to represent the components and using the string to link them together, etc.)

Have students select one of the ways to demonstrate the chains/webs and do it!

Activity #2

Divide students into small groups. Each group will select a national park in Atlantic Canada to study. Students will research their park using the attached Student Information Sheets and begin to understand what makes each park special. They will then be asked to invent a new plant or animal that is able to live somewhere within the park environment.

To begin, brainstorm with the entire class and list possible questions they can answer to help describe their creature. The questions can cover such things as:

• What are some of the environmental conditions under which it lives?
• What is its position in its local food chain? How does it interact with other species that exist within the park environment?
• What does your creature eat?
• What does it need for shelter?
• If it is an animal, is it diurnal or nocturnal?
• What are its typical behaviours?
• What impacts (both natural and human-made) threaten its existence and does being in the national park protect it?
• What does your new plant/animal look like?
Challenge the students to create a creature that has all-natural parts and could potentially survive and thrive in the national park. Each group is responsible for creating its own animal or plant. For example, the students who have Cape Breton National Park might create a creature that lives at the top of the Cabot Trail. It is fed entirely by scraps and garbage from the visitors to the park and it serves to ensure that the park is kept clean and cared for. Because the trees are small up there, the creature is also small so that it can hide from potential enemies – bobcat and lynx – who live in the same region. The creature might have a large mouth for gathering garbage and large paws for travelling in the snow.

Each group of students now has to introduce the new creature to the rest of the class. They may choose to do a drawing of it within the park, create simulated scientific reports, or use role playing (interview with park naturalist, interview the creature, etc.).

**Evaluation**

Ask the students to predict what will happen to their creature if there is a particular change in the park environment – for example, an oil spill near Fundy, a forest fire in Gros Morne, or another parking lot built at Prince Edward Island National Park.

**Extension**

Have students draw a diagram or cartoon strip and write a story that illustrates the interrelationships between their creature and the rest of the park environment. Make connections with the creatures invented by the other groups.

**References**

Parks Canada Website: www.parkscanada.gc.ca

CREATURE FEATURES /1.5

SPECIAL PLACES: *Eco-lessons from the National Parks in Atlantic Canada*
More Than a Campground!

Summary

Students will explore the variety of habitats in each of the seven national parks in Atlantic Canada and understand what makes them special enough to be a national park.

Learning Outcomes

Students will be able to:

• explain the concept of “habitat” as it relates to the needs and habits of a particular plant or animal;

• describe in what ways each national park in Atlantic Canada is unique and special;

• defend the importance of national parks in Canada;

• explain how national parks can provide different things to different people.

Activity Information

Grade level: 4

Subject: Science – Habitats

Curriculum linkages: 104-6; 108-1; 204-3; 206-1; 301-1; 301-2; 302-3

(Students will be able to use the terms habitat, population and community in the appropriate context, predict how the removal of a plant or animal population affects the rest of the community, and relate habitat loss to the endangerment or extinction of plants and animals.)

Duration: Approximately 120 minutes

Setting: Classroom

Materials: Markers, construction paper, paint, Student Information Sheets on each of the seven national parks in Atlantic Canada.
The area where an animal, plant or micro-organism lives and finds food, water, shelter, space and other essentials necessary to survive is called its habitat. National parks play an important role in habitat protection. They have been described as treasured sanctuaries in a sea of development. As our world continues to develop at a rapid pace, they become more important than ever! They are landscapes of outstanding natural beauty and inspiration, places where one can explore, hike, climb, ski, canoe and enjoy the great outdoors. They are also living laboratories that enable us to learn about natural systems, how they work, and how they are affected by human activity. National parks are home to many rare and endangered species such as the piping plover, and beloved symbols such as the beaver, wolf, grizzly and polar bear.

At the same time, however, they offer a place for recreational camping, a place where any and all the resources and facilities you may need are easily available. For example, Malady Head Campground in Terra Nova National Park is a place where you can experience nature at its best without sacrificing the services necessary for a good holiday. This campground boasts heated washrooms, showers, a playground and a kitchen shelter.

Then there is the option of backcountry camping at Fundy National Park. Low-impact camping at one of the 15 backcountry campsites is an entirely different kind of camping experience.

People visit the national parks for a variety of reasons. Some people seek a quiet, tranquil and rustic camping experience while others will be more concerned with wildlife viewing and not care as much about the camping facilities. Others will focus on the guided walks and evening activities that the park’s interpretive staff offer. Still others will focus on the unique recreational activities some parks offer: a heated saltwater pool at Fundy, boating and fishing at all national parks, as well as golf and other, more specialized recreational activities.
The importance of national parks as special places and their role in ecosystem protection in Canada is an important theme that you can explore with your class. Rather than assuming that the national parks are only places for them to visit on a holiday, students will discover the fundamental reasons why national parks exist in the first place.

Procedure

This lesson will have the students create a picture/mural that captures all the things that they believe make a national park special.

1 Discuss the term “habitat” with the students. Have them consider how food, water, shelter, and space impact on an animal they are familiar with.

2 Have the class brainstorm ideas about what types of “things” are found in a national park, e.g. trees, birds, water, trails, campsites, etc.

3 Ask the students to consider: “What makes a national park special?”

4 Brainstorm with the students:
   - What factors make a park special to kids?
   - What factors make a park special to their parents or caregivers?
   - What factors make a park special to wildlife?
   - What kinds of habitats can you find in different parks?
   - How do national parks protect habitats?

5 Generate a “What makes a national parks special?” list from the above factors that you want the students to consider as they prepare to develop a mural that describes national parks’ special role.
Break the class into groups of three to four. Assign each group a national park and the associated Student Information Sheet.

Explain that they will create a mural that considers some of the factors that make a national park special. They need to include at least five of the factors that are identified on the “What makes a national parks special?” list.

Each group of students will present its mural to the class.

**Evaluation**

Have the students write a story that describes the things depicted in their poster that they believe make a national park special.

**References**

Parks Canada Website: www.parkscanada.gc.ca
Conservation 'Ad'vice for National Parks

Summary
Students will develop a poster (Grade 4) or TV commercial (Grades 6 and 7) that celebrates the essence of a national park in Atlantic Canada and emphasizes the protection of the ecological integrity of all the parks.

Learning Outcomes
Students will be able to:
• describe each national park in Atlantic Canada with respect to its climate, physical geography and habitats;
• identify ways their media encourages people to protect and preserve the ecology of their selected park;
• critique various advertisements and commercial messages.

Activity Information
Grade levels: 4, 6, 7
Subject: Science – Habitats and Populations, Diversity of Life, Interactions within Ecosystems; Social Studies – Interdependence, People, Place and Environment
Curriculum linkages: Grade 4: 104-6; 108-1; 108-3; 108-6; 205-5; 206-2; 301-2; 302-1 (Students will identify their impacts on habitats and how their actions help conserve habitats, and will identify positive and negative impacts of human and technological developments on natural habitats.)
Grade 6: 105-1; 107-6 (Students will describe why various animals are endangered and describe efforts to study their population and ensure their continued existence.)
Grade 7: 113-11; 211-5 (Students will propose and defend a course of action to protect the local habitat of a particular organism.); 113-10 (Students will provide examples of problems that arise in the environment that cannot be solved using scientific or technological knowledge.); 112-4; 112-8, 209-5 (Students will use various print and electronic sources to research individuals or groups in Canada interested in protecting the environment.)

**Duration:** Approximately 120 to 180 minutes

**Setting:** Classroom

**Materials:** Art supplies (large sheets of paper, pencils, paints, markers, etc.), construction paper, costumes, video camera (optional); other prop materials; Student Information Sheets on each of the seven national parks in Atlantic Canada. Note: Grades 6 and 7 may also use copies of the Park Backgrounders if the language level is considered suitable by the teacher.

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**Teacher Background**

Each of the seven national parks located in Atlantic Canada has distinctive geologic, environmental and cultural characteristics that make it special and unique. The natural resources and the “sense of place” that each park represents reflects the interaction between the marine and land environments in Atlantic Canada, and how they impact on the region’s human history.

The geology, climate, flora, fauna and ecology of these parks form an intricate web of life that is protected and cared for under the national parks system. The national parks within the Atlantic Provinces are some of the real gems of nature in Atlantic Canada.

**Kouchibouguac National Park** is part of the Maritime Lowlands natural region and has characteristic sandy barrier islands made up of dunes and beaches, with the Acadian mixed wood forest covering over 50% of the park.
Cape Breton Highlands National Park truly represents “where the mountains meet the sea,” with a blend of Acadian, boreal and taiga vegetation and associated wildlife.

Fundy National Park represents the Maritime Acadian Highlands natural region on the upper Bay of Fundy shoreline, with spectacular tides and moist, coastal spruce and mostly fir forests.

Gros Morne National Park is a designated UNESCO World Heritage Site because of its spectacular and unique geologic formations that have resulted in coastlines, boreal forest and alpine plateaus with their inherent diversity of living things ranging from rare plants to Arctic hare and caribou.

Kejimkujik National Park is witness to the legacy of the ice age with a unique land of lakes gouged out by ice and streamlined and elongated, low hills created by glacial movement.

Terra Nova National Park is part of the Appalachian Mountain System and is characterized by low relief and a series of rounded hills rising from sea level to 200 meters. There are rocky headlands, and the bogs, ponds and streams are evidence of glaciation.

And finally, Prince Edward Island National Park is known for its protected barrier beach, coastal flora and fauna, spits and sand dunes, Acadian forest and marine coastal features such as estuaries and associated saltwater marshes as well as freshwater ponds and marshes.

These parks are special for all Canadians, but especially for those who live in the Atlantic Provinces. Unfortunately, many people do not realize that a wide range of human activities can damage the parks’ fragile and dynamic ecosystems. These include misuse of the trail systems causing erosion and other forms of impact, littering, and overuse and expansion of park facilities resulting in habitat loss.
Posters and radio and TV commercials are a proven vehicle for influencing people's decisions and actions. Every day, many people watch TV and see commercials that affect what they buy and how they act. A commercial that encourages humans to protect and preserve unique habitats and environments in the national parks could influence people to value their parks even more. This activity will have the students preparing a descriptive poster or TV commercial to encourage care and protection of the parks.

**Procedure**

1. Brainstorm with your students ways that the public can damage our natural and cultural resources. Then, continue the brainstorming process with the students, listing ways that the public can protect and preserve the resources in national parks. Consider activities such as:
   - limiting access to parts of the park;
   - ensuring that visitors remain on the trails;
   - ensuring that visitors obey all park regulations and policies;
   - increasing signage with rules, policies and suggestions for park care;
   - ensuring that visitors participate in interpretive activities.

2. Divide your class into groups of approximately four students. Assign (or have students choose) one of the national parks and hand out copies of the appropriate Student Information Sheet and/or Park Backgrounder. Have each group begin to design its poster or commercial. Ask students to:
   - identify the audience: Young people aged 7 to 12? Teenagers? Parents? People who hike? People who fish? They can choose whom they wish to target, or you can assign them a specific group;
   - identify their key message – what is the one thing you wish to get across in your commercial?;
• select a specific advertising technique (see below);
• develop a slogan or a song for the commercial (Grade 6).

3 Have students design the visual or audio effects to match their message. Consider how they will use costumes, sets, music, props, etc.

4 Have students rehearse the TV commercial until it is ready to be presented to an audience.

Here are some things to think about when preparing the commercial:

• It should appeal to basic human needs for food, shelter, clean air or water, personal space or love.

• Use a specific advertising technique, such as one of the following:
  - **Join the Club!** – The message tells viewers that by using this resource or activity, they become members in a special group.
  - **Borrowed Status** – Have the activity or resource endorsed by someone with cultural status, such as a sports hero or TV personality. Their presence transfers their special prestige to your message.
  - **Boy/Girl Next Door** – Instead of a famous spokesperson, this technique uses “ordinary” people, like your friend or the person next door, to support an activity or resource.
  - **Word from the Boss!** – This technique uses an authority figure or group to support the resource or activity.
  - **What the Pollsters Say** – The commercial says that this resource or activity has been tried by a large number of people and they support it.
  - **The Best of the Best** – The commercial uses terms that appeal to the specific audience and make that audience think it is good – words such as honest, clean, natural, etc. People can be proud when using this product, or doing whatever the commercial tells them to do.
Evaluation

Have the students evaluate each other’s posters or commercials. Ask the viewing students to:

• identify the key message;
• identify who the intended audience is;
• explain and describe what technique was used;
• indicate how effective they think the commercial will be.

Extension

Have students present their commercials to a broader audience – e.g. use them during school assemblies, concerts or other school-wide presentations, at a gathering of parents, etc.

Students can develop supporting posters that can be displayed throughout the school to emphasize their commercial messages.

Videotape all the commercials and present a copy to the national parks that have been used as examples in the projects.

References

Parks Canada Website: www.parkscanada.gc.ca
The News Knows!

Summary
Students will combine science learning outcomes with media literacy by researching and writing a newspaper article on a particular resource management issue in one of three national parks in Atlantic Canada.

Learning Outcomes
Students will be able to:
- explain why national parks in Atlantic Canada have individual resource management issues;
- develop research skills for scientific inquiry;
- develop communication skills for presenting their results and ideas;
- apply their understandings about the issues and interpret them through writing.

Activity Information
Grade level: 6
Subjects: Science – Diversity of Life; Social Studies: Interdependence, People, Place and Environment; Media Literacy; Language Arts
Curriculum linkages: (Science) 105-1; 107-6; (Social Studies) GCO, Interdependence, People, Place and Environment; (Language Arts) GCO1, 1.1, 1.3; GCO7, 7.1, 7.2
Duration: Approximately 60 to 100 minutes
Setting: Classroom
Materials: Writing paper, drawing paper for illustrations for article; Student Information Sheets and Park Backgrounders for Kouchibouguac, Kejimkujik and Prince Edward Island national parks; Opinion Sheets for Kejimkujik, Kouchibouguac and Prince Edward Island national parks; Information Sheets on the piping plover, clams and sand dunes.
Imagine that you are sitting in the kitchen, reading the morning news, sipping your first coffee, and these headlines jump out at you: “Clam Harvesting at Kouchibouguac National Park Stopped Due to Clam Bed Deterioration”. Or how about “Dogs Off Leash Threatening the Endangered Piping Plover at Kejimkujik National Park”? Or, “Four Wheel Drive Races on the Dunes at Prince Edward Island National Park”? Words like that make the reader sit up and take notice – and perhaps spill their coffee!

The news. Where else do you find information that comes to your doorstep each morning, waiting for you to read it and formulate opinions? The news media is a powerful informational tool. In this activity, students will take a stand on an issue and write an article for a small fictitious newspaper, trying to convince the readers that their opinion is the right one.

Our national parks have become popular places to visit and more people are becoming interested in visiting and learning about the parks. At the same time, this has meant that the parks are experiencing more pressure from conflicting interests and ideas about how they should be used.

Each of the three national parks in this activity – Kouchibouguac, Kejimkujik and Prince Edward Island – have management plans that provide direction for the protection, use and development of the park over a period of time. The direction contained in each of the plans must be consistent with the National Parks Act and Regulations, the Government of Canada’s Sustainable Development Strategy and Parks Canada’s policies and directions, as well as the recommendations of the Panel on the Ecological Integrity of Canada’s National Parks. Each management plan also describes some of the park’s stewardship activities, addresses the key issues facing the park, and identifies how to deal with some of the conflicting interests.

In this activity, students will research information and write a newspaper article that presents their opinion regarding a specific resource issue.
Procedure

1. Make copies of the three Opinion Sheets and all Student Information Sheets, including the piping plover, sand dunes and clam information sheets.

2. Introduce the three national parks and provide some background as to what makes each park special. (You can find this in the attached Student Information Sheets and Park Backgrounders. The language level of the Park Backgrounders is more suitable for the teacher, but the teacher may wish to provide them to the students as well.) Ask the students to describe some potential conflicting issues that they might pick up as they listen to the descriptions. When students run out of ideas, tell them that you are going to focus on one issue in each park.

3. Break the students into groups of four. Assign each group a park and hand out the park Opinion Sheet as well as the Student Information Sheet for that park. Include any other information sheets relevant to the park, i.e., Clam Information Sheet for Kouchibouguac, Sand Dunes Information Sheet for Prince Edward Island National Park and Piping Plover Information Sheet for Prince Edward Island, Kejimkujik and Kouchibouguac. Each student in the group should select one of the opinions of one of the characters and read it out loud to the rest of the group. This character will be theirs for the rest of the activity.

4. Tell the students they will now put together a small newspaper. Each of them will write an article for the newspaper that expresses the concerns of their character. The article will have:

   • an introduction to the park and a specific issue, i.e. clams at Kouchibouguac National Park, sand dunes at Prince Edward Island National Park or piping plover at Kejimkujik, Kouchibouguac or Prince Edward Island national parks;

   • a brief discussion of the issue and the number of concerns about the issue (using the opinions of the other characters);
• options for what could happen in the park with respect to the particular issue;
• their character’s opinion, in closing, about what should happen to the issue.

5 Each student will draw an illustration that captures their issue and their character’s concerns about the issue.

6 Have the students write their articles on a computer and put them together in a tabloid format. If possible, scan in some of the illustrations to enhance the tabloid.

Evaluation

Have students illustrate an imaginary national park in Atlantic Canada. Ask them to consider an issue and describe how their character would feel about what was happening with the issue. Students can then write a briefer newspaper article outlining their character’s concerns.

Extension

Have students research one of the other national parks in Atlantic Canada and identify another resource issue that is of concern.

Take all of the articles on each park, group them together and create individual tabloids for each park. Print and distribute the tabloids for the rest of the school.

References

Parks Canada Website: www.parkscanada.gc.ca
Species at Risk
Recovery Teams to the Rescue!

Summary
Students will work together in conservation recovery teams to describe an endangered species and explain why it is endangered. They will explore efforts taken to ensure that species' protection and status improvement within the national parks in Atlantic Canada.

Learning Outcomes
Students will be able to:

- explain why certain species of animals and plants are endangered;
- describe efforts to study the population size of some of these species;
- explain what is being done to ensure the continued existence of these species within the national parks in Atlantic Canada.

Activity Information

Grade level: 6
Subject: Science – Diversity of Life, Adaptations and Natural Selection
Curriculum linkages: 105-1; 107-6; 206-5 (Students will be able to explain reasons why various animals are endangered and describe efforts to study their population size and ensure their continued existence.)
Duration: Approximately 120 minutes, depending on the length of the student presentations
Setting: Classroom
**Materials:** Student Information Sheets on Terra Nova, Fundy, Kouchibougouac, Kejimkujik, Prince Edward Island National Parks; Information Sheets on the piping plover, Newfoundland marten, peregrine falcon, Blanding’s turtle and water-pennywort; COSEWIC Species at Risk List for Atlantic Canada; Presentation materials that might improve the panel discussion results (students may wish to draw maps of species habitats, create pictures of species, etc. so drawing materials may be necessary). Teachers may also wish to allow students to use copies of the attached Park Backgrounders if they feel the reading level is suitable.

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**Teacher Background**

Some sources report that since 1600, about 1600 species have become extinct worldwide. Currently there are 402 classified as species at risk in Canada. This number continues to climb and is a result of direct and indirect human impacts. Although extinction and endangerment is a natural process, excessive and intensive human activities in the environment have increased the rate of both these phenomena. Examples include habitat modification and loss, over-exploitation, unregulated or poorly regulated commercial harvesting, and disruption of migration routes and breeding behaviours, contamination, pest control and introduction of exotic species.

At the national level, the species inventory for national parks facilitates research by managers and scientists on the distribution and status of wildlife species, and in some cases, the designation of species that have been identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being at risk. As a result, specialists and managers are able to accelerate conservation efforts and identify regions in which conservation efforts are already under way, specifically in the case of reintroduced species.

Parks Canada uses the species status identified by COSEWIC, which determines the national status of wild species, subspecies and separate populations in Canada. All native mammals, birds, amphibians, reptiles, fish, and vascular plants are included; invertebrate animals and non-vascular plants are not.
National conservation (species) recovery teams exist within Canada with representation from a variety of government and non-government organizations.

COSEWIC was formed in 1977 and is composed of representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Museum of Nature, Parks Canada, Canadian Wildlife Service, and Department of Fisheries and Oceans) and three national conservation organizations (Canadian Nature Federation, Canadian Wildlife Federation and World Wildlife Fund Canada). The Committee meets annually to consider status reports on candidate species. Listing designated species provides provisions for a third-party review process.

The following categories for species at risk are found on the COSEWIC website (www.cosewic.gc.ca):

**Species of Special Concern** – A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.

**Threatened** – A species that is likely to become endangered if limiting factors are not reversed.

**Endangered** – A species facing imminent extirpation or extinction.

**Extirpated** – A species that no longer exists in the wild of Canada, but occurring elsewhere.

**Extinct** – A species that no longer exists.

It is important to know that Canada is currently in the process of establishing its species-at-risk legislation. The proposed Species at Risk Act (SARA, Bill C-5) would implement a process for species and habitat protection. This bill proposes mandatory protection on federal lands for migratory and aquatic species at risk through partners that include Parks Canada, Environment Canada and the Department of Fisheries and Oceans.
Parks Canada is committed to species conservation and undertakes research projects and recovery efforts for species at risk. Projects conducted on wildlife and plant conservation throughout Canada have increased knowledge about the serious threats to certain species.

The following activity has students assuming the role of a park ecologist, park interpreter or park warden. They will explore the status of an endangered species in an individual national park, determine why the species has become endangered and make specific recommendations about how to manage for the recovery of the species.

**Procedure**

1. Begin with a discussion of endangered species and the process by which species are identified as endangered. Ask students if they can name any of the animals or plants that are on the COSEWIC list. Ensure you review those that are found within the Atlantic Provinces. *(List attached, p. 30.1)*

2. Divide students into groups of three. Each group will be an independent conservation recovery team working at the park level. Each student in the group will take on the role of a park ecologist, park interpreter or park warden, whose responsibilities are as follows:
   - A Park Ecologist is responsible for identifying and conducting background research on the endangered species, considering its population status and habitat within the park and the greater ecosystem.
   - A Park Interpreter is responsible for communicating the importance of the endangered species and its habitats within a national park and its surrounding region.
   - A Park Warden is responsible for protecting the natural resources within the park by enforcing the National Parks Act and other regulations.

3. Have each conservation recovery team select an endangered species and a corresponding national park.
Hand out Information Sheets on the appropriate park and species. If desired, teachers may also distribute copies of the Park Backgrounders.

Students work in their conservation recovery teams to prepare a species recovery plan for a panel discussion on endangered species in the national parks in Atlantic Canada. They will cover the following points during their presentations:

- Introduce the endangered species; describe its preferred habitat and its basic ecology. Why is it endangered?
- Describe the national park and explain what it offers to the endangered species.
- Explain what is happening within the park to help preserve endangered species (e.g. recovery programs, research, inventories, etc.).

At the same time, each group will prepare a series of three questions to pose to the other conservation recovery teams following their panel presentations. The questions could be something like:

- What other species live and breed within the same habitats and impact upon the endangered species under investigation?
- How long do you think it will be until you see improvement of the status of the species under your proposed recovery plan?
- What would you do to encourage public education and participation?

Each group will present their research information in the form of a panel discussion and will answer questions from each of the other conservation recovery teams.

**Evaluation**

Each student will select one of the other endangered species and describe why it is endangered and what efforts are being taken to study this species’ populations and improve its status.
Extension

Invite local interested citizens to attend the panel discussions and pose questions as appropriate.

Invite the park manager, naturalist and/or biologist from the closest national park to attend the panel discussions. Ask them to describe what they believe were the strongest points or ideas presented from each conservation recovery team.

Suggest that interested students contact their local Member of Parliament to express their support for the Species at Risk Act (Bill C-5).

Additional information can be obtained from the website: www.speciesatrisk.gc.ca

References

COSEWIC Website: www.cosewic.gc.ca

Parks Canada Website: www.parkscanada.gc.ca

Species at Risk Website: www.speciesatrisk.gc.ca
The Links of Life
Ecosystem Interactions in a National Park

Summary
Students will create a diagram (mural, flow chart or other visual display) that illustrates the flow of energy in an ecosystem, using a national park as the model.

Learning Outcomes
Students will be able to:
- distinguish between and understand the following terms: consumer, producer, decomposer, herbivore, carnivore, omnivore, food chain/web, ecosystem;
- create a sketch of an ecosystem and identify the interactions that take place within that ecosystem, including both biotic and abiotic components;
- explain how energy is supplied to and how it flows through a food web;
- identify and investigate questions related to a local ecosystem such as “what types of species live in a particular ecosystem” (specific to the Extension activities);
- organize and record data collected in an investigation of an ecosystem (specific to the Extension activities).

Activity Information
Grade level: 7
Subject: Life Science – Interactions within Ecosystems
Curriculum linkages: 109-12; 109-13; 111-6; 208-2; 208-3; 210-1; 210-2; 306-1; 306-3 (Students will identify roles of producers, consumers and decomposers in a local ecosystem and describe their diversity and their interactions; describe interactions between biotic and abiotic components of an ecosystem.)
Food webs: they will describe how energy is supplied, and how it flows through a food web; describe how matter is recycled in an ecosystem through interactions among plants, animals, fungi and micro-organisms.

**Duration:** Approximately 90 to 120 minutes.

**Setting:** Classroom and field investigation as extension

**Materials:** Drawing/mural paper, markers, scissors, Kejimkujik and Prince Edward Island National Park Backgrounder and Student Information Sheets, flora and fauna Species Lists for both parks. If desired, a variety of species information sheets from the Kejimkujik National Park Webpage (accessed through the Parks Canada Website) and/or species information obtained through other Internet research.

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**Teacher Background**

All animals need a place to live. The environment in which an animal lives is called its “habitat”. An animal’s habitat includes food, water, shelter and space in an arrangement appropriate to that animal’s needs. All things are interrelated. When we look at a biological community, we see an intricate web of interrelationships between plants and animals. These relationships are important in terms of the flow of energy in a system.

Kejimkujik and Prince Edward Island National Parks are fascinating systems, filled with unique interrelationships and interdependencies. Kejimkujik is characterized by a myriad of lakes and rivers, as well as undulating glacial landforms. Its Seaside Adjunct is a representative example of the Atlantic Ocean shoreline. The park is a large area of natural habitat composed of native plants, forests and animals and is one of the few remaining areas of wilderness in Nova Scotia. (For additional information, please refer to the Kejimkujik National Park Backgrounder and Student Information Sheet or the Parks Canada Website: www.parkscanada.gc.ca.)
Prince Edward Island National Park is characterized by beaches, ponds, sand dunes and coastal habitats. It provides a stop-over, feeding and nesting habitat for migrating shore birds, including the internationally endangered piping plover. The park also includes rare, U-shaped parabolic sand dunes. Prince Edward Island National Park is a small park which has been heavily impacted by past and present human use. (For additional information, please refer to the Prince Edward Island National Park Backgrounder and Student Information Sheet or the Parks Canada Website.)

There are five other national parks in Atlantic Canada that have unique ecosystems and biological communities. They are individual and special in their own right and can all be explored through the Parks Canada Website.

This lesson involves researching a national park and its many inhabitants, creating an energy flow diagram, and taking the next step to do the field investigation. The students will use Kejimkujik National Park or Prince Edward Island National Park as their exploration site. They will create a mural or other diagrammatic graphic (see the sample food chain diagram below) that includes a variety of wildlife and plant species and illustrates the energy flow throughout a number of food webs.
Tell the students they are going to be creating an Eco-mural, designed to reflect the food chains and webs found within either Kejimkujik National Park or Prince Edward Island National Park.

Ask the students to review the following terms in a large group. Can they give examples of each? (See Special Places Glossary, p.xix.)

- Consumer
- Producer
- Decomposer
- Food web/chain
- Niche
- Ecosystem
- Habitat
- Photosynthesis
- Abiotic/biotic
- Carnivore
- Omnivore
- Herbivore

Introduce and describe the variety of habitats at Kejimkujik National Park and Prince Edward Island National Parks. Focus on the biotic and abiotic interactions that are most apparent, at both parks and including the Kejimkujik Seaside Adjunct. If desired, provide information, available on the Kejimkujik and Prince Edward Island National Park Websites on some of the more special features of these parks. Piping plover and Blanding’s turtle research, as well as rare plant management programs, are of interest.

During these discussions, ask the students to identify some of the obvious food chains that are apparent. Keep a running tally on the chalkboard.
5 Divide students into groups of four. Provide half the groups with the Kejimkujik Species List (p.28.1) and copies of Student Information Sheets and Park Backgrounders for Kejimkujik. Provide the other groups with the Species List for Prince Edward Island National Park (p.29.1) and the Student Information Sheets and Park Backgrounders for Prince Edward Island National Park. Ask each group to select 10 species from their Species List as their target species.

6 Students will work within their groups to determine each of the species' basic habitat requirements, its prey and its predators, and its general role in a food web at Kejimkujik or Prince Edward Island National Park.

7 The groups are responsible for creating a mural that includes each of the 10 species and also explains how each species is linked to the other, through a variety of interactions (food chains and energy transfers). Please have the students assume their mural should automatically include "decomposers", and then their 10 species. They can use arrows, cartoon balloons, or whatever technique they choose to illustrate the interactions. Encourage them to use either their own drawings or pictures from magazines. Also, remind them to include other important elements, like the rocks and minerals, sun, etc.

8 Have each group give its mural a title and present the mural to the rest of the class, explaining the interactions between species and outlining the apparent food chains and webs.

Evaluation

Have the students select one of the murals created to write a short story that illustrates the flow of energy through a food chain or a sample food web.
Extension

Students can visit a local habitat to make various observations, such as:

• identifying as many plants as possible;
• listening for sounds of wildlife (bird calls, etc.) and other sounds;
• looking for signs of wildlife – bird nests, woodpecker holes, deer trails, etc.

Ask the students to create a similar mural or diagram, exploring the interactions and food webs/chains they observe within this area. They can also predict what would happen to that area if it were suddenly subjected to a human disturbance, such as being cleared for a baseball field, etc.

References

Parks Canada Website: www.parkscanada.gc.ca
Cape Breton
National Park of Canada
Where the mountains meet the sea

What's in the park?
The Highlands are the most spectacular part of Cape Breton Highlands National Park. The Highlands are old, flat mountains with no pointy tops or peaks. They cover most of the park and have many deep river valleys and cliffs. There are two great bodies of water on either side of the park: the Atlantic Ocean and the Gulf of Saint Lawrence. Cape Breton Highlands National Park is "where the mountains meet the sea".

The mountains and ocean create many different climates (weather conditions) and habitats (homes) for plants and animals to live.
There are three kinds of forests in the park: Acadian, Boreal and Taiga. Acadian mixed forest grows in the warmer valleys. Mixed forests have hardwood trees (with leaves) mixed with evergreens (trees with cones and needles). Boreal forest of evergreen trees grows on the top of the Highlands where it is colder. Taiga forest grows in the bogs (swamps) and rocky barrens (land where almost nothing grows) on the top; this area looks like the Arctic because the trees are so short.

Each of these forests is a different habitat or home. Each habitat has slightly different climate, soils, plants and animals. Other habitats are found at the ocean shoreline such as sandy beaches, rocky headlands (cliffs) and a small intertidal zone (the area of shoreline between the limits of high and low tide).

Some of the mammals here are moose, deer, lynx, bobcat, coyote, fox, snowshoe hare and red squirrel. In the early 1900s, moose became extinct here because of too much hunting. Back in 1949 the park re-introduced (brought in) moose from Alberta and now there are thousands of moose all over Cape Breton.

The Cabot Trail is a road that runs around the park. It is one of the most famous roads in Canada because of the great beauty of the mountains and ocean.

Visitors like to hike, swim, golf, camp and see wildlife such as whales, bald eagles and moose. More than 200,000 people visit the park every year.
In 1936 Cape Breton Highlands National Park of Canada was created to protect the mountains of Cape Breton in Nova Scotia. The park protects a special part of Canada for our future.

The unique Highlands, or mountains, make this place special. The mountain cliffs at the ocean shore make this park a place of outstanding beauty. The mountains provide a place for three kinds of forests to grow and many animals to live.

Cape Breton Highlands is special because some of the oldest forests in Nova Scotia grow here. Some of the trees are more than 300 years old. They are so huge that it would take four students to make a circle around one tree. Old forests are special because there are not many left on our continent. It is very important to protect them.

The park also has plants that usually only grow in the Arctic and the high mountains of western Canada.

The park is special because it protects the habitat of species that have small populations, such as bald eagle, American marten, Atlantic salmon and Canada lynx.

The park is also special because of its interesting history. People of many cultures, including Mi’kmaq, Acadian and Scottish, all lived here.
What is the park concerned about?

The park was created to protect part of the Highlands for the future and also so that people can visit a special part of Canada. The park is concerned about how to let people visit the park without harming it too much.

Each year thousands of people visit Cape Breton Highlands and the Cabot Trail. Air pollution from cars kills certain plants such as lichens. Natural habitat is destroyed when the park makes roads, washrooms, lawns and campgrounds for visitors. When people don’t stay on trails they step on plants and damage them. Visitors also create lots of garbage and sewage.

National parks are supposed to stay natural. They are supposed to have all their plants and animals. They are supposed to have clean air and water. Some plants and animals are already missing from this park. The woodland caribou and the wolf are now both extinct in Cape Breton.

Park managers need help to protect national parks. What can visitors do? What can you do?

References

Parks Canada Website: www.parkscanada.gc.ca
Fundy
National Park of Canada
Giant tides, low mountains and deep river valleys

What's in the park?
This area is known for the Bay of Fundy and its miles of red mud called "mud flats." The Bay of Fundy has the highest tides in the world. Tides are the daily rise and fall of the sea caused by the pull of the moon and sun on the Earth's oceans.

In the Bay of Fundy, the distance from low tide to high tide is as high as a four-storey building! At low tide, when the ocean water drains away leaving huge mud flats, you can walk out onto the bottom of the bay! But you cannot stay long; high tide is six hours later and the ocean floor is once again flooded with ocean water.
The giant tides of the Bay of Fundy create many habitats (homes) for plants and animals such as seaweed, clams, sea worms, mud shrimps, crabs, mussels, barnacles, sea slugs and star fish. The habitats between the high and low tide are part of the intertidal zone (the area of shoreline between the limits of high and low tide).

It is hard to live in the intertidal zone. At high tide, plants and animals are covered with cold saltwater; at low tide, they get dried out. In summer, they bake in the hot sun; in winter they freeze. Waves crash on them and winter ice-cakes crush them. Plants and animals living here must have special ways to survive. Some stick to the rocks and others live buried in the mud. Some have hard shells and others are covered with protective slime.

Although most visitors come to see the giant tides and the amazing things that live in the intertidal zone, the park offers much more than the coastline. In fact, although the Bay of Fundy is at the edge of the park, it is not actually part of the park. However, the Bay of Fundy affects everything in the park because it makes the climate (weather conditions) more foggy, rainy and cool.

Most of the park is made up of low, rounded mountains with deep river valleys and ocean cliffs. The forest is a mixture of hardwood trees and evergreens. Hardwoods are trees with leaves, like maple, beech and birch. Evergreens are trees with cones and needles, such as red spruce and balsam fir. This mixed forest is part of what is known as the Acadian forest of the Maritime Provinces.
The forests are habitats for mammals such as moose, deer, beaver, racoon, black bear, coyote, snowshoe hare, bats, red squirrel and flying squirrel.

Each year, over 250,000 visitors come to Fundy National Park to camp, hike, watch birds and see the Bay of Fundy with its giant tides.

In 1948 Fundy National Park was created to protect the shores, hills and forests of the Bay of Fundy in New Brunswick. It protects a special part of Canada for our future.

**Why is this park special?**

The park is special because it protects the hills, forests and shores of the Fundy coast. It protects part of the Acadian forest of the Maritime Provinces and all of its rivers, rocks, soil, plants and animals. It protects both common and rare things.

Fundy National Park is famous for the giant tides of the Bay of Fundy. It is special because you can see a huge variety of intertidal life and go on a guided walk on the bottom of the Bay of Fundy. The mud flats are important feeding areas for migrating shorebirds heading south in late summer and a great place for bird watching.

Fundy National Park is also important because it provides habitat for the peregrine falcon and American marten. Both are endangered species in New Brunswick.
What is the park concerned about?

The purpose of national parks is to protect Canadian landscapes and habitats for our future. The problem is that national parks are too small to protect these habitats on their own. Some areas outside the parks must also remain wild and natural.

One of the main concerns at Fundy National Park is loss of habitat for plants and animals. Natural mixed forest cannot grow inside the park where there are campgrounds, a golf course, picnic areas and roads, so no new things will be built.

The biggest loss of habitat is happening every day outside the park because of forestry, farming and roads. Forest and swamp habitat is being destroyed. Animals and plants cannot move from place to place because there are highways, farm fields and towns in the way. The park is working with people outside the park to protect enough forest for wild plants and animals to survive.

There are also concerns about small populations of peregrine falcon, lynx, marten, salmon and several species of salamanders such as dusky salamander, four-toed salamander and blue spotted salamander. Some animals are already extinct here such as woodland caribou, wolf and leopard frog. In the 1980s the peregrine falcon and marten were both extinct and were successfully re-introduced (brought in).

References

Parks Canada Website: www.parkscanada.gc.ca
The Earth's history is literally at your feet in Gros Morne National Park*

What's in the park? Gros Morne National Park of Canada is famous for its amazing rocks, fossils and mountains. People come from all over the world to learn about its incredible geology; the rocks and fossils show the history of the Earth's formation. Visitors can even walk on an ancient ocean floor!

The rocks of Gros Morne help explain how the world's continents move around. Geologists think that North America collided with Europe, long ago. As the continents pushed against each other, mountains were squeezed up. Also, a very rare event occurred: a small piece of ocean floor was pushed up onto land in what is now the park.
This piece of ocean floor, called the Tablelands, is a red table-topped mountain. It looks very different from the Long Range Mountains around it and it has different rocks, soils and plants.

The Long Range Mountains rise majestically over the coastal lowland and ocean. One of these mountains, called Gros Morne, gives the park its name. You can also find deep fjords (FEE-ORDS) and deep valleys that were dug out by big glaciers (thick sheets of ice). Fjords are long, narrow ocean inlets or lakes with steep cliffs.

The coastal lowland has many bogs (swamps), low rocky shores and wide sandy beaches. In the intertidal zone (the area of shoreline between the limits of high and low tide), there are mussels, periwinkles, crabs and many kinds of seaweed. Gros Morne is a great place to see intertidal life in rocky pools.

Gros Morne National Park has many different habitats (homes) because of the mountains and ocean. There is a great variety of plants and animals, including some usually found only in the Arctic.

The mountain slopes are mostly covered by Boreal forest of evergreens such as spruce and balsam fir. The mountain tops are flat and rocky with few trees; the tops have low plants such as lichens and shrubs and Arctic species such as Arctic hare.

Some of the animals found in Gros Morne are black bear, caribou, lynx, red fox, marten, weasel and rock ptarmigan. There are also some of the animals that have been introduced (brought in) to Newfoundland such as moose, snowshoe hare and red squirrel.
About 120,000 visitors come to the park each year to see the incredible mountain and ocean scenery. They also like to hike, camp, see wildlife and learn about the park's amazing geology.

In 1973 Gros Morne National Park was created to protect the mountains and coastal lowlands of western Newfoundland. It protects a special part of Canada for our future.

**Why is this park special?** Gros Morne National Park is special because it protects some very rare examples of mountains, tablelands and fjords. In fact, these are so special that the park was made a World Heritage Site. This means that the whole WORLD wants it protected.

The park is also special because it protects part of the Boreal or northern forest of Canada. It protects Boreal plants and animals such as the lynx and caribou. Even though much of Canada is covered with Boreal forest, mining and logging have disturbed more than half of it. Canada needs Boreal forest that still has all of its plants and animals. Gros Morne National Park and the many other national and provincial parks can help.

The park also has animals and plants normally found in the Arctic regions of Canada. Among these are the Arctic hare and the rock ptarmigan.

Gros Morne National Park is also special because it is home to endangered species such as the harlequin duck and Newfoundland pine marten.
What is the park concerned about?

The park is concerned about the environment both inside and outside the park. Things that happen to the forest and ocean outside the park can affect the plants and animals inside the park. Animals such as caribou and moose roam freely and do not know where the park begins and ends.

The park pays careful attention to the activities of visitors and people who live in nearby communities. They do this to make sure that our natural areas and wildlife are protected for everyone to see.

The park is also studying how introduced plants and animals, such as moose and snowshoe hare, might change natural forests and wildlife populations.

Protecting endangered species is another concern. The park plays an important role in protecting animals and many species of rare plants.

References


Parks Canada Website: www.parkscanada.gc.ca
Kejimkujik
National Park of Canada

Majestic hemlocks, cool mosses, exotic fungi and orchids...
lush woodlands bursting with wildlife – birds, wildflowers, turtles and more

What’s in the park?

Kejimkujik (Kej-im-koo-jik) National Park of Canada, created in 1974, is a land of forests, lakes and rivers bursting with wildlife. It is a land once covered by glaciers (thick sheets of ice) but it is now one of the warmest places in Nova Scotia.

Kejimkujik’s many lakes and low, rounded hills were shaped by huge glaciers, which covered this area long ago, scraping out rock and soil in some places as they moved and dropping it to form low hills.
The park's lakes and rivers are habitats (homes) for many turtles, frogs and salamanders; Kejimkujik has more amphibians and reptiles than anywhere else in the Atlantic Provinces. The lakes and rivers are also home to many birds, especially common loons, and fish which include brook trout and white and yellow perch. These waters are very important to wildlife and are sensitive to air and water pollution from outside the park.

The lakes and forests were also important to the Mi'kmaq people. For thousands of years, they lived along Kejimkujik's lakeshores. Their rock carvings, canoe routes and campsites make Kejimkujik a national historic site as well as a national park. The name Kejimkujik is a Mi'kmaq name which means the "place that swells" or the "place of swells."

Visitors can explore the lakes and forests by canoeing and hiking. They can stay in the main campground or at small campsites along canoe routes and hiking trails. Each year about 120,000 people visit the park.

Kejimkujik National Park also protects a small seaside area with rocky shores, sandy beaches and saltwater lagoons (shallow ponds near the shore). This area is on the south shore of Nova Scotia, separate from the rest of the park.

So, Kejimkujik protects two special areas in Nova Scotia for our future: a large, inland area of forests, rivers and lakes; and a small area on the Atlantic coast called the Seaside Adjunct.
Why is this park special? Kejimkujik National Park is special because it protects part of what is called the Acadian forest of the Maritime Provinces. Over three-quarters of the park is protected wilderness. This means that when visitors go into this part of the park they must canoe or hike on narrow trails and stay in small, very simple campsites. The forest and wildlife are left as wild and undisturbed as possible in that part of the park.

The park’s forests include old hemlock trees up to 300 years old. This habitat has unique songbirds, goshawks and orchids.

Kejimkujik has hot summers and mild winters with little snow. These warm weather conditions, or “climate,” allow plants and animals to survive here that normally only live further south.

Kejimkujik protects up to 20 very special plants that grow along the lakeshores in soft muddy soils. One of these, called water-pennywort, is a threatened plant.

The seaside part of the park provides habitat for
the endangered piping plover; it nests on sandy beaches and feeds in the lagoons.

What is this park concerned about? Studies at the park have shown changes in populations of some species. There are fewer brook trout because of fishing and acid rain. Pine marten and piping plover face threats to their survival because of habitat loss outside of the park.

Kejimkujik National Park is a centre for nature research and studies. There are studies about forest songbirds, loons, piping plover, Blanding's turtle, water-pennywort, forests and water quality.

References

Parks Canada Website: www.parkscanada.gc.ca
Kouchibouguac (KOOSH-e-boo-gwack) is a Mi'kmaq name meaning “river of long tides.” Sandy beaches and dunes (huge piles of sand) stretch along the ocean as far as the eye can see. Sand bars (ridges of sand) and barrier islands (long islands of sand near the shore) protect salt marshes (swamps) and lagoons (shallow ponds near the shore) from crashing waves.

The beaches, sand bars and dunes are often moving because of the wind and the waves. This kind of change is considered a “natural process”, meaning it is part of nature.

The sand dunes have very few kinds of plants and animals because they are difficult places to live, having little soil or water. The sand can easily move from place to place, especially during
storms. The salty air and salty sand is harsh to most plants. Dune grass called marram grass is one of the few plants that can grow there, even if covered in sand.

The lagoons are made up of shallow water with a bottom of mud and sand. Grass-like plants called eel grass grow there. Clams, worms, mud-shrimp and insect-like animals live in the muddy sand. Shorebirds poke in the mud with their long beaks to find a feast to eat!

Away from the shore, the park is covered with mixed woods called Acadian forest. Acadian forest has evergreens such as spruce mixed with hardwood trees such as maple, birch and poplar.

Cedar swamps and bogs are two other special habitats. Cedar swamps are wet forests with cedar trees and many small plants such as mosses, ferns and orchids. Bogs are wetlands that are often compared to huge moss sponges.

The park is popular for hiking, beach walking, bird watching, picnicking, cycling, swimming, canoeing, camping and cross-country skiing. Each year, more than 230,000 people visit the park.

In 1969 Kouchibouguac National Park was created to protect coastal sand dunes, lagoons and forests for our future. It is located in New Brunswick on the shore of the Gulf of St. Lawrence.
Why is this park special?

It protects beaches, sand dunes and lagoons, which are special habitats for plants and animals. This area is known as the Maritime Plain coast. The park also protects the natural processes that form and change these beaches, dunes and lagoons.

The park protects part of what is called the mixed Acadian forest of the Maritime Provinces. It is the only national park in Canada that protects large areas of white cedar swamps.

Kouchibouguac National Park has the second-largest common tern colony in Eastern North America. It also has nesting habitat for the endangered piping plover.

What is this park concerned about?

The park is concerned about protecting the sandy dunes and the species that live there. Dune grass is easily killed when people walk on it. The piping plover, an endangered species, needs sandy beaches to lay its eggs and raise its chicks.

There are also concerns that people are digging too many clams. On some beaches there are hardly any clams left.

Also, the park is concerned about protecting the tern colony from people and gulls.

References

Parks Canada Website: www.parkscanada.gc.ca
Prince Edward Island National Park of Canada
People, the sea and the changing landscape

What's in the park?

Prince Edward Island National Park of Canada, created in 1937, is famous for its sand dunes (huge piles of sand) and beaches that stretch for miles along the ocean shore. Here you can learn how wind and waves move the land! You can also learn about the special plants and animals that live on the sandy coast.

The beaches are very popular for swimming but are also an important habitat (home) for wildlife. Migrating shorebirds find lots of food in the mud and sand. The endangered piping plover needs quiet areas of the beach for nesting.

The natural areas of the park are the result of wind, waves and time. Beach sand is made by waves pounding rocks into tiny bits. Sand is
blown into piles called dunes. Dunes may stay in one place for a while if they become covered with a special grass called marram grass. This grass is one of the only plants that can grow in sand.

Dunes are constantly being moved by the wind, one grain of sand at a time. Some of the park’s forests have been buried alive by moving dunes.

Moving sand dunes can block off bays from the rest of the ocean, forming ponds. These ponds are habitat for many plants and animals. Thousands of migrating ducks and geese stop here to rest and feed.

The park also has coastal headlands (cliffs), salt marshes (swamps) and small areas of what is called Acadian mixed forest.

The largest land mammal in the park is the coyote. It preys on snowshoe hare and other small mammals, amphibians and birds. Other common mammals are the red fox, beaver, mink, weasel, racoon, skunk, muskrat and red squirrel.

The park is also home to over 300 species of birds and is considered a great place to watch them. There are also about 400 different kinds of plants in the park.

Hiking, photography, cycling, swimming and camping are other popular activities. About 750,000 people visit the park each year.
Prince Edward Island National Park protects coastal landscapes including sand dunes ponds, salt marshes and cliffs. It protects a special part of Canada for our future.

**Why is this park special?** Beaches, sand dunes, ponds and other coastal habitats make this park special. Wind and waves constantly change these habitats. This change is part of nature, and national parks allow nature to do what it is meant to do.

The beaches, bays and ponds are important feeding places for migrating shorebirds in the spring and fall. The beaches and ponds also provide habitat for the piping plover, an endangered shorebird.

The park is home to rare dunes that are known as “parabolic dunes” because they are shaped like the letter “U.” These dunes also have an unusual shape because of what are called “counter ridges,” which are very rare on our continent.

The park also has a very important history. Archaeologists have discovered that people lived here 10,000 years ago.

Today people come from all over the world to see Green Gables, which is in the park. It is the house in the story *Anne of Green Gables.* At Green Gables we learn the story of the famous author, Lucy Maud Montgomery. She had a special love for the natural beauty of Cavendish, which she describes in her book.
What is the park concerned about?

The park is concerned about protecting the beaches and dunes from trampling by visitors. Thousands of people use the beaches in the summer. They are a threat to the dune grass, which dies very easily when stepped on, and to the piping plovers, who lay their eggs right on the beach.

The park is concerned about the loss of the Acadian forest. Early settlers in Prince Edward Island saw large forests of maple, beech, oak, balsam fir, hemlock and spruce. Most of these trees were cut down and now there is hardly any of the original forest left on the island.

The park is also concerned about the world’s changing climate (weather conditions) because of air pollution. If the world’s climate gets warmer, the polar ice caps (ice covering the north and south poles) could melt. If the ice caps melt, the sea level could rise. If the sea level rises, the beaches and dunes would be flooded and destroyed. Prince Edward Island is a very high-risk area for this.

References


Parks Canada Website: www.parkscanada.gc.ca
Terra Nova
National Park of Canada
A place where Boreal landscapes touch sheltered seas

What's in the park?

Terra Nova National Park of Canada is a very interesting place where low, forested hills and rocky coastline unfold before your very eyes.

The park is part of an ancient mountain range that has been ground down to low hills by millions of years of erosion. Huge blocks of ice called glaciers scraped over the land, also helping to erode (wear away) the rock and creating valleys. There are bogs (swamps), ponds and rivers in the valleys. Boreal (northern) evergreen forests cover Terra Nova, growing right to the edge of the Atlantic Ocean.
The rocky coastline has many sheltered coves and long inlets or “fingers of the sea.”

These coves were home to people for 5,000 years. There are cliffs, low rocky points of land jutting out into the ocean, and many different beaches along the coast.

Plants and animals that live along the coast are affected by the rise and fall of the ocean as well as by its cold temperature. The temperature of the ocean also controls the climate (weather conditions) of the land, creating late springs, cool summers and mild winters.

The most common trees are black spruce and balsam fir, but you will also see white spruce, larch, birch, aspen and red maple. These trees are common in the northern Boreal forest, which covers most of Canada.

Terra Nova National Park is home to 12 of the 14 mammals that live in Newfoundland. Moose, which were brought to Newfoundland from New Brunswick about a hundred years ago, are easy to find in the park. The native Newfoundland marten, on the other hand, is an endangered species and is much harder to see.

Some of the birds that you can see and hear in Terra Nova include bald eagles, ospreys, loons, woodpeckers and songbirds such as warblers and finches.

There are about 200,000 visitors who come to this special place each year. Some come to camp, hike and see wildlife. They also like to take part in our very exciting nature programs.
In 1957 Terra Nova National Park was created to protect part of eastern Newfoundland’s rugged coastline and Boreal forest. It is Canada’s most easterly national park and is at the edge of the Atlantic Ocean.

**Why is this park special?**

Terra Nova National Park is special because it protects part of eastern Newfoundland’s rugged coastline and part of the old range of mountains called the Appalachians.

The park is special because it protects part of Canada’s northern Boreal forest. It is important to have areas of this forest which have all of their wild plants and animals protected. Logging and mining have disturbed more than half of Canada’s northern Boreal forest.

**What is this park concerned about?**

Terra Nova is concerned about plants and animals that have been introduced (brought in), and that weren’t in Newfoundland originally. For example, moose were not found in Newfoundland originally and now there are thousands of them. Moose feed on trees and may be changing the forests because there are so many of them.
Another concern is that forest fires have not been allowed to burn. Evergreen forests need fires to be healthy; fire is a natural part of the ecosystem.

Terra Nova is also concerned about protecting the Newfoundland marten, an endangered species.

Also, there are problems facing salmon populations.

References
Parks Canada Website: www.parkscanada.gc.ca
Introduction

Cape Breton Highlands National Park of Canada was created in 1936 to protect an outstanding example of the Maritime Acadian Highlands Natural Region. The Cape Breton Highlands plateau is a part of these Highlands and consists of low, flat-topped mountains cut by deep river canyons. Steep cliffs run to the Gulf of St. Lawrence on the western coast, while on the eastern side, the slopes are much gentler. The Cape Breton Highlands are a significant geological feature, covering most of northern Cape Breton.

The Cabot Trail – a scenic highway built in the 1930s – runs along the ocean and through the Highlands of the park. Featuring spectacular mountain and ocean scenery, the park and the Cabot Trail are visited by about 200,000 Canadians and international visitors every year.

The rugged landscape created by the mountains results in many different habitats for plants and animals. Both the climate and the forests change from sea level to the top of the plateau, resulting in three major forest zones within a
relatively small area: Acadian, Boreal and Taiga. The Acadian forest (composed of hardwoods, such as maple, mixed with softwoods) is found in warmer, sheltered valleys. The Boreal forest (composed of softwoods such as spruce and balsam fir) covers the top of the plateau, where the winters are colder. At the more exposed locations on the plateau surface, the winter winds and ice are so severe that the trees are stunted. This Taiga zone is made up of extensive rocky barrens and treeless bogs, giving the landscape an arctic-like appearance.

Some of the hardwood forests in the park are more than 350 years old. Old-growth forests provide habitat for certain plants and animals that do not thrive elsewhere; the park has some of the largest remaining protected stands in North America.

Arctic-Alpine plants, left over from the ice age, are also found in northern Cape Breton. It is interesting to find small populations of these plants in Cape Breton because most of their range is in the Arctic or high mountains, far from here.

Wildlife include moose, deer, lynx, bobcat, coyote, marten, bald eagle, Atlantic salmon and woodland birds such as warblers, woodpeckers and chickadees. Cape Breton has only about 75% of the mammal species that are found on mainland Nova Scotia. For example, there are no skunks or porcupines in Cape Breton, although they are common on the mainland. Both the ocean and the mountains are barriers to the natural migration of land mammals as well as most other animals and many plants.

The most popular visitor activity in the park is scenic touring on the Cabot Trail. Many people also hike, camp and learn about wildlife through exhibits and observation. The highlight of a trip is often a whale, eagle or moose sighting.

Northern Cape Breton also has a rich history, which can be explored through exhibits and traces of the past. Mi'kmaq, Acadian and Scottish and other cultures, travelled, fished and settled here.
Park Objectives

- To protect an outstanding part of the Maritime Acadian Highlands Natural Region – the Highlands of Cape Breton. This means protecting the natural processes in the ecosystems as well as all of the natural resources (landforms, plants, animals, rocks, soil and water).

- To allow people to enjoy and learn about the park in ways that do not impair the long-term health of the ecosystem.

Park Issues

Many people think of national parks as tracts of unspoiled wilderness. But the reality is that parks suffer from pollution, global climate change, impacts of use, introduction of non-native species and use outside park boundaries, such as fishing, shipping, mining, forestry, agriculture and settlement. In other words, most threats are from human activities, originating both inside and outside national parks.

The major stressors in Cape Breton Highlands are habitat fragmentation, invasion of non-native species (exotics), pollution, climate change and impacts of the fishery and tourism. The cumulative effect of several stressors has an even greater impact on ecosystems.

1 Habitat Fragmentation – Extensive loss of natural habitat through human activities may result in small pockets of specific habitats that are isolated from other similar areas. Small, isolated populations of plants or animals are more susceptible to being wiped out than large ones: the wide separation from others of their species means the area may not be re-populated with replacements. As native species disappear, the ecosystem becomes less complex (i.e. has less natural species diversity) and may become unbalanced.

Acadian forests make up only 23% of the park, occurring in coastal lowlands and river valleys. They are naturally separated, or “fragmented” by the mountains. This natural fragmentation is compounded because most development, both inside and outside the park, occurs here. Fragmentation of hardwood forests in a major ecological concern.
Boreal forests make up most of the interior of the park and are not substantially fragmented within the park. However, in northern Cape Breton as a whole, boreal forests are highly fragmented, so the park provides an important refuge for boreal species.

2 Non-native species – Exotic species of plants and animals become a threat to an ecosystem when they displace native species and change the species composition or processes of the ecosystem. Most introduced plants in Cape Breton do not appear to pose a threat but a few – like the purple loosestrife – are so aggressive that native species are crowded out.

Earthworms, white-tailed deer and starlings are examples of non-native animals in Cape Breton. Beech bark and Dutch elm disease are introduced fungal diseases that have dramatically changed the forest composition in the Maritime provinces.

3 Absence of native species – The absence of “keystone” species such as large carnivores and herbivores is a stress that can result in ecosystem imbalance.

Caribou, moose and wolf were “extirpated” – made locally extinct – from northern Cape Breton by the beginning of the 1900s due partly to over-hunting and trapping. Although moose were successfully re-introduced in the late 1940s, introductions carry risks such as the import of disease. (Example: white-tailed deer brought the brain worm parasite, which prevented the re-establishment of caribou.)

The absence of the timber wolf, a large, natural predator, may be a factor in the present-day over-population of moose. The effects of moose browsing (feeding) are very noticeable in the forests and may contribute to long-term changes in species composition of the Boreal forest. A study is currently under way to assess park moose populations.

Several plant and animal species are “at risk” of being lost to this area, including Canada lynx, American marten and dozens of plants. Every species lost to this area reduces natural biodiversity and the ecosystem may be said to have less “integrity”.
4 Fishery Impacts – Commercial over-fishing, pollution and habitat loss resulted in a dramatic worldwide decline of Atlantic salmon in the 1980s. Park rivers provide salmon spawning habitat, and a “catch-and-release” policy provides further protection. Since salmon spend part of their life at sea, many of the stressors are external to the park.

5 Impacts of tourism – The development of visitor facilities both inside and outside of the park, such as campgrounds, golf courses and roads has resulted in habitat loss and fragmentation, primarily of Acadian hardwood forest. Visitor use of the park results in increased garbage and large amounts of vehicle exhaust. This air pollution has caused a reduction in plants near the Cabot Trail such as lichen in old-growth Acadian forests.

The most popular park trails have up to 50,000 hikers on them annually. Overuse of certain trails has resulted in extensive damage of soils and plants as well as wildlife disturbance. Impacts can be reduced by proper trail design.

A major concern that challenges park managers is the carrying capacity – what is the upper limit of visitors that the park ecosystems can handle? How can we reduce the impact of visitor use so that we still have magnificent scenery with all of its native plants and animals for future generations to enjoy?

References


Parks Canada Website: www.parkscanada.gc.ca
Fundy National Park of Canada covers 206 km$^2$ of land located along the Bay of Fundy coast in southeastern New Brunswick. It was established in 1948 to protect for all time a nationally significant and representative part of the Maritime Acadian Highlands Natural Region of Canada.

It lies astride two climatic zones – the Bay of Fundy and Southern New Brunswick zones. The Bay of Fundy zone is characterized by cool, wet summers and moderate, humid winters. Humidity is high and fog can be frequent in the summer. The mean annual precipitation is 1185 mm. By comparison, the Southern New Brunswick zone has warm summers and cold winters, and precipitation is lower and fog much less frequent than in the Fundy zone.

The forest cover is mainly mixed hardwood and softwood. The most common trees are red spruce, balsam fir, white birch, yellow birch, sugar and red maple.
Black bear, beaver, deer, raccoons, loon, coyote, red and flying squirrels, bats and snowshoe hare are some of the species that live in Fundy.

Each year the park receives over 250,000 visitors.

**Park Objectives**

- To maintain or restore regional ecological connections to allow gene flow between populations.
- To maintain all trophic levels (food levels) and their respective functions in the greater ecosystem in balance so as to ensure ecological integrity.
- To restore or enhance populations of native species where the populations have become small, have lost significant genetic diversity (variety within one species), or are threatened or endangered.
- To develop special protection measures for rare or sensitive species and communities.
- To manage human-caused stressors in the ecosystem so as to ensure that native populations and ecological processes are left relatively unimpaired.
- To develop and implement special protection measures for the Bay of Fundy coastal environment.
- To restore to a natural state areas and communities that have been damaged by human actions.

**Park Issues**

- Forestry practices including clear cutting (complete removal of a stand of trees), thinning or use of herbicides have increased fragmentation and decreased habitat connectivity. Additionally, forest roads have increased forest access and hunting pressure on deer, moose, black bears and fish.
- Concern about loss of certain species including dwarf wedge mussel, Atlantic salmon, northern leopard frog (considered extirpated or locally extinct), American marten, northern dusky salamander, four-toed salamander, blue-spotted salamander and the peregrine
falcon, and plants such as leafy green orchid, birdseye primrose and snakemouth.

- Road and highway maintenance activities disturb animals, streams and lakes within the park.

- Past forestry practices such as log driving have altered hydrology, river beds and aquatic habitats. Dams restrict the movement of some fish populations.

- The presence of invasive species has had a negative impact on Fundy because they take over habitat of native species.

- The golf course, which was constructed in 1949, has altered the vegetative cover and habitat. Culvert installation has changed the course of some brooks and caused erosion.

References


Parks Canada Website: www.parkscanada.gc.ca
GROS MORNE
NATIONAL PARK OF CANADA

The Earth's history is literally at your feet in Gros Morne National Park*

Introduction

Gros Morne National Park of Canada protects a representative example of a nationally significant area of the Canadian landscape. At 1,805 km², it is the largest national park in Atlantic Canada. Located on Newfoundland and Labrador’s Great Northern Peninsula, the park’s complex and dramatic landscape is made up of Boreal forest, diverse coastline, Alpine plateaux and an array of geological formations such as fjord lakes and hanging valleys.

In 1973, the Government of Canada and the Government of Newfoundland and Labrador agreed to establish Gros Morne as a national park in recognition of the region’s outstanding heritage values.

In 1987, Gros Morne National Park was declared a World Heritage Site by the United Nations Educational, Scientific and Cultural Organization (UNESCO) mainly because of its remarkable geological features. The park’s landscape of mountains, glacial valleys, fjords and coastal lowlands is the result of hundreds of millions of years of geological
processes. Demonstrating monumental Earth-building activity, the Tablelands of Gros Morne are considered a textbook illustration of plate tectonics. UNESCO also considered the Arctic-alpine habitat of the Long Range Mountains, the region's 5000-year-old human history and the outstanding scenic beauty of the park in the decision-making process.

When Gros Morne National Park was established, it surrounded a number of small fishing communities where residents traditionally used the nearby land for cutting firewood and snaring rabbits (snowshoe hare). Because these activities are normally not permitted in national parks, Parks Canada made special land-use provisions to allow community residents to continue harvesting activities for personal use. Such activities include:

• domestic wood cutting and snaring of snowshoe hare to take place within specified blocks;
• the use of snowmobiles where use does not affect wildlife, vegetation, or terrain;
• fish landing areas where fishers can unload their catch.

There are approximately 120,000 visitors to the park annually.

Park Objectives

Parks Canada must manage all national parks in a way that maintains their ecological integrity, protecting habitats, landscapes and fragile natural resources. This requires understanding, co-operation, support and respect for the environment on the part of many different people. Gros Morne National Park works in partnership with community councils, environmental groups, schools, business operators, and land owners and managers in adjacent areas in order to address land-use issues in the park. Some specific management objectives:

• To maintain the ecological integrity of Gros Morne National Park.
• To communicate the results of scientific research in order to help people understand the challenges involved in maintaining the park’s ecological integrity.

• To increase awareness of the significance of Gros Morne National Park.

• To help visitors experience the park’s diverse environments, by providing roads, trails and other facilities, while ensuring that these do not harm the environment.

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**Park Issues**

The first priority of a national park must be protection of the environment. The variety of stressors range from visitor use and traditional land use to pollutants, airborne and otherwise. Some specific management issues:

• While snowmobiling is an allowable activity in Gros Morne, it is important that the park work in partnership with people in the community to ensure that there are no harmful effects to wildlife, vegetation or terrain.

• It is essential to minimize the environmental impact of the park’s extensive infrastructure and of visitor use in Gros Morne National Park. On the one hand, tourism is a means of enhancing the financial and social well-being of communities. On the other, if negative impacts such as overuse are left unchecked, they may result in a degraded environment, a poor quality visitor experience and a resulting reduction in the tourism yield. Since the park’s focus is on sustainable tourism, it is important to ensure that development and use are managed effectively.

• Forest succession is one aspect of ecosystem function that Gros Morne monitors. Parks Canada must manage the stressors that could affect the forest’s ability to grow anew. This involves considering the effects of the domestic wood cutting program and of the browsing that moose (a non-native species to Newfoundland) do in the forest. It also involves considering adjacent land use issues such as the commercial logging activity that is taking place to the east and south of the park.
References

  
  
  

Parks Canada Website: www.parkscanada.gc.ca
Kejimkujik National Park of Canada

Majestic hemlocks, shading cool mosses, exotic fungi and orchids... lush woodlands bursting with wildlife—birds, wildflowers, turtles and more

Introduction

Kejimkujik (Kej-im-koo-jik) National Park of Canada is located in southwestern Nova Scotia and was established in 1974. The park has numerous inland lakes and waterways, and a coastline with varied shorelines, saltwater lagoons, dense coniferous forests and open bogs.

It experiences hot summer temperatures with mean daily temperatures of 18°C. The winter is a short season of snow cover and little snow buildup.

There are more than 50,000 visitors per year at this park, who can enjoy a variety of recreational activities such as canoeing, hiking, camping, swimming, cross-country skiing and wilderness exploration.

Common wildlife species include seals, seabirds, piping plover, southern flying squirrel and white-footed mouse.
The park protects 40 mammal species, 12 fish, 205 birds, eight reptiles, five snakes, 13 amphibians, and 544 vascular plants.

**Park Objectives**

- To manage park heritage resources to ensure their ecological integrity and the protection of features and species characteristic of the Southwest Nova Scotia Uplands.
- To minimize human impact on the park while recognizing visitor safety and educational requirements.
- To conduct and encourage selected research and monitoring of natural and cultural resources associated with the park, the ecological changes taking place, and the effects of human activities.
- To cooperate with other landowners and interest groups to maintain optimal ecosystem integrity and share land-use and research information.
Park Issues

- There is a noticeable loss of plant and animal species, such as piping plover, common tern, Blanding’s turtle, American marten, brook trout and water-pennywort, as a result of tourism pressure, habitat loss, trapping and over-fishing.

- Clam harvesting by visitors.

- Placement on the IUCN (International Union for the Conservation of Nature) endangered wilderness list because of the effects of acid rain.

References


Parks Canada Website: www.parkscanda.gc.ca
Kouchibouguac (KOOSH-e-boo-qwack) National Park of Canada is located in Kent County, southeastern New Brunswick, approximately 100 km north of Moncton and 50 km south of Miramichi. It protects 238 km$^2$ of land and water along the shore of the Northumberland Strait. The park was established in 1969 and was officially created through an amendment to the National Parks Act in 1979. The park’s name is derived from a Mi’kmaq word meaning “river of long tides.”

Kouch, as it is nicknamed, is characterized by barrier islands with long sandy beaches, salt marshes, shallow lagoons and estuaries. A mixture of red spruce, red maple, balsam fir, white pine, black spruce, hemlock and the associated forest under-storey characterizes Kouchibouguac National Park, within the Acadian forest region. Specialized freshwater communities such as the cedar swamps have evolved within the forest habitat as well as sweetwater ravines and extensive areas of raised peat bogs made of successive layers of sphagnum mosses. The park currently supports such activities as hiking,
beach walking, bird watching, picnicking, cycling, swimming, canoeing, camping and cross-country skiing.

Kouch is the only national park in Canada to protect significant stands of Eastern white cedar. Cedar swamps are specialized forest wetlands with outstanding undergrowth of mosses, ferns and orchids.

Every year the park receives over 230,000 visitors, who enjoy the modified weather extremes of the marine-influenced continental climate.

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**Park Objectives**

- To provide greater heritage protection and maintain the ecological integrity of this representative coastal area.

- To increase public heritage understanding by enhancing heritage interpretation and diversifying appreciation opportunities.

- To sustain the park's role as a good neighbour, an ecological model and a major natural and cultural destination.

Additionally, the park has the following goals addressing ecosystem integrity and management:

- To provide high levels of protection for habitat types representative of the Maritime Plain Natural Region.

- To maintain biological diversity through emphasis on the protection and preservation of representative park resource features not protected elsewhere.

- To maintain a sound ecosystem monitoring program.

- To work jointly with land managers to achieve sustainable resource use.
Park Issues

- Piping plover is an endangered species. The park has a threatened plover population and also the common tern is being affected because of habitat damage and human impact.

- Commercial and recreational over-harvesting of clams has become a significant issue for the park.

References


Parks Canada Website: www.parkscanada.gc.ca
Established in 1937, Prince Edward Island National Park of Canada is located along the central north shore of Prince Edward Island and is a representative area of the Maritime Plain Natural Region. Covering approximately 20 km², this small park protects a diverse variety of habitats including beaches, sand dunes, coastal headlands, wetlands such as salt marshes and barachois ponds, old fields and remnants of the Acadian forest (a mixed hardwood forest).

The natural features of Prince Edward Island National Park are the result of wind, waves and time. Approximately 285 million years ago, rivers carried sand, silt, gravel and mud from an ancient mountain chain into a low-lying basin, eventually forming the sandstone bedrock of Prince Edward Island. With the formation and retreat of glaciers, the island took shape. It continues to evolve today, as the coastal winds and waves of the Gulf of St. Lawrence modify the coastline.
The beaches and sand dunes are the most prominent features of Prince Edward Island National Park, representing the majority of its total area. The beaches are very popular for swimming but are also an invaluable habitat for wildlife. One of the many species that relies on the beach community for survival is the internationally endangered piping plover. Approximately two percent of the global plover population nest on the beaches of Prince Edward Island National Park between April and August each year. In addition to their importance to piping plovers as nesting areas, the beaches of Prince Edward Island National Park play a significant role in shorebird migration in both the spring and the fall.

Most of the ponds in the park were, at one time, open to the Gulf of St. Lawrence. Over time, the movement of sand dunes has reduced the water flow into the ponds and, in some cases, completely separated them from open waters. Without the influx of salt water, the remaining water has gradually become fresh, providing important habitat for migrating waterfowl and a myriad of other wildlife.

The forests that greeted the early European settlers of Prince Edward Island are no longer as they once were. Only remnants of the original Acadian forest are still in existence. The white spruce is by far the most common species today in the park, whereas common to the original forest were American beech, sugar maple, yellow birch, eastern hemlock, red oak, red and white spruce and balsam fir.

Over 400 different species of plants are found in the park. In each of the habitats of Prince Edward Island National Park, the wildlife is generally representative of Eastern Canada but there are fewer species due to the physical isolation of the island. The largest land mammal is the coyote. It preys on snowshoe hare and a variety of small mammals, amphibians, and birds. Other mammals common to the park are the red fox, beaver, mink, weasel, raccoon, skunk and muskrat. At various times of the year, the park is also home to over 300 species of birds, including the endangered piping plover and the great blue heron – the symbol for Prince Edward Island.
National Park. The great blue heron can be seen in various park habitats but most commonly at the edges of bays, salt marshes or barachois ponds where they fish. Their annual migration pattern takes them as far as South America in the winter months.

In February of 1998, Prince Edward Island National Park was expanded to include approximately 400 hectares on the Greenwich peninsula. In addition to having similar habitats as the rest of the park, Greenwich is home to rare, U-shaped dunes known as parabolic dunes. These dunes have associated features called Gegenwâlle, or counter ridges, which are very rare in North America.

The area is also very important culturally. Archaeological work has provided evidence of continuous human habitation going back 10,000 years. At various times and locations, Paleo-Indian people, Mi’kmaq, French, Acadian, Scottish, Irish and English settlers have all lived in this area.

Two protected heritage areas are also located in the park: Green Gables and Dalvay-by-the-Sea National Historic Site.

The park receives about 750,000 visitors every year. Nearly one-third of the total park area has some degree of development for visitors, such as roads, campgrounds and other facilities. Intensive visitor use in summer is one of the main problems in the area.

Visitors to Prince Edward Island National Park are encouraged to learn about and explore the park in a manner that is sensitive to its fragile resources. One of the best ways to do so is by participating in interpretation programs. Birdwatching, hiking, photography, cycling, swimming and camping are all popular activities as well.
**Park Objectives**

- To reduce human-induced stressors in the park and, in the interim, to manage them in a manner that does not impair ecological integrity (i.e. does not negatively affect populations of native species or ecological processes).

- To restore natural vegetation communities in selected areas of the park and adjacent Crown lands that have suffered a loss of ecological integrity.

- To maintain viable populations of all native species, including genetic diversity within species.

- To work with local landowners and organizations to improve stewardship of lands and waters in the greater ecosystem outside the park.

**Park Stressors**

- Habitat fragmentation

- Intensive visitor use

- Visitor/tourism facilities

- Agricultural activity near the boundaries of the park

- Global climate change

**References**


Parks Canada Website: www.parkscanada.gc.ca
TERRA NOVA
NATIONAL PARK OF CANADA
A place where boreal landscapes touch sheltered seas

Introduction

Terra Nova National Park of Canada, located in eastern Newfoundland, was established in 1957. It is 402 km² and represents the Eastern Newfoundland Atlantic Terrestrial Natural Region, part of the Appalachian Mountain System. It is Canada’s most easterly national park and is situated approximately 250 km west of the capital, St. John’s.

The park has two contrasting faces. The terrestrial face is made up of glaciated (ice-covered), boreal (northern) landscapes laced with black spruce, balsam fir, bogs and fens. The marine face has a rugged coastline with rocky headlands, vertical cliffs, intertidal zones, sheltered coves and cobbled beaches.

The seasons are characterized by late springs, cool summers and moderate winters.

Newfoundland has 14 native terrestrial mammal species and Terra Nova National Park is home to 12 of them. One of the native species is the Newfoundland marten, which
is being threatened due to human activities and is listed as an endangered species.

Two hundred bird species are found in the park and surrounding area, 92 of which breed in or near the park. Bald eagles, osprey, loons, woodpeckers and songbirds such as nesting warblers and boreal finches are common.

The tree species most commonly found in the park are black spruce, balsam fir, white spruce, eastern larch, white birch, trembling aspen and red maple.

Terra Nova receives approximately 200,000 visitors annually, as compared to 50,000 at Kejimkujik.

**Park Objectives**

- To sustain the ecological integrity of the park ecosystem and manage for continued biodiversity and sustainability.

- To manage the park's resources on the basis of an ecosystem approach. This will help ensure the preservation of significant, representative and rare resources and processes.

- To protect and manage the natural vegetation mosaic and resulting wildlife habitats so as to ensure their continued sustainability and integrity within the natural region.

- To give high priority to the protection of rare, threatened and endangered species of flora and fauna.

- To ensure compatible methodologies and results, ecosystem management planning will be undertaken in co-operation with adjacent federal, provincial and private land-use agencies.

- To minimize the potentially adverse effects of park and peripheral (surrounding area) development, visitor activities and operations upon park resources and processes.
Park Issues

- Invasive species, such as moose, which browse (feed) on young balsam fir, birch and maple saplings, negatively affect the ecological integrity of the park by altering the forest cover.

- Fragmentation of the park by the Trans-Canada Highway has created many barriers for plants and animals.

- Fire suppression (extinguishing) has produced an unnatural forest.

References


Parks Canada Website: www.parkscanada.gc.ca
The Blanding's turtle is a relatively large, northern freshwater reptile species. The species' range extends from Nova Scotia and southern Maine, to southwestern Quebec and southern Ontario, around the Great Lakes and westward to central Nebraska. The turtles live in small groups or patches especially at the edge of their range. There is an isolated Nova Scotia population found at the most northerly limit of its range. It includes about 200 individual turtles in Kejimkujik National Park and two other nearby populations, one of about 50 individuals and the other with only ten. This is all that is currently known about the Nova Scotia population. It is uncertain if the species was ever plentiful in Nova Scotia.

The turtle makes its home in shallow waters and wetlands, including stillwater streams, bogs and shallow plant-filled lake coves. These waters are very dark, tea-coloured and some flow through sphagnum (peat) moss bogs. This makes an ideal habitat for the turtles, allowing them to hide and find shelter. Typically, the females nest on gravel beaches with south facing slopes exposed to the sun. Some turtles even nest on roadsides and in gravel pits.

Females will lay approximately eight 4 cm eggs during June and July, which will hatch from September to October,
depending upon the warmth of the summer weather.

COSEWIC (Committee on the Status of Endangered Wildlife) designated the Blanding’s turtle as a threatened species in Nova Scotia in 1993.

Reasons for Species Loss
- Human activities can damage turtle habitat outside the park – dams, roads, cottage development, farms, etc.
- The more the garbage, the more raccoons have a dependable food source, ensuring more raccoons. The more raccoons, the more potential to prey on turtle eggs and reduce the turtle population.
- The cold climate limits the Nova Scotia range to a small area in southwestern end of the province.
- The cold climate also often reduces the incubation period and therefore reduces successful egg hatching.
- There is limited suitable habitat within Kejimkujik.

Efforts to Conserve
- Nests are being covered in Kejimkujik National Park to protect the turtle eggs from raccoons and other predators.
- Occasionally, turtle nests in vulnerable roadside locations are moved to safer areas within the park. There has been hatching success with this effort.
- Interpretive programs (along with pamphlets and on-site signs) inform visitors about the turtle and concerns for its survival, and how they can help.
- Nesting areas in Kejimkujik are classified (zoned) as “Special Areas” to protect crucial turtle habitat. This means that development is not permitted and human use is restricted.
- There is a National Recovery Team and a planned strategy to save the Blanding’s turtle in Nova Scotia.
• Researchers are attempting to determine the current distribution in Nova Scotia and to discover new Blanding’s turtle locations.

• The Blanding’s turtle is protected under the Nova Scotia Wildlife Act.

References

COSEWIC Website: www.cosewic.gc.ca

Parks Canada Website: www.parkscanada.gc.ca

Species at Risk Website: www.speciesatrisk.gc.ca
Clams at Kouchibouguac National Park

Though the scientific name is *Mya arenaria*, people commonly refer to these mollusks as "clams". The first settlers in the Kouchibouguac area counted on clam stocks, abundant at the time, to complete their food supply. Today, the former residents of Kouchibouguac National Park still dig for clams for their own use, as a recreational activity or to qualify for Employment Insurance Fishing benefits.

Impact on the Resource

Demand for this resource remains strong on account of increased interest by the public and better conservation and marketing methods. Sales of fresh or canned clams are steadily increasing for the preparation of fried clams, chowders and soups.
Population inventories

Bernard P. Vézina (1979), Patrick Maltais (1993) and Léophane LeBlanc, Patrick Maltais and Éric Tremblay (1996, 1997, 1998 and 1999) did six successive clam population inventories in Kouchibouguac National Park, using the same field methodology. The data obtained enabled us to compare clam populations and look at how this resource has evolved over the past 20 years.

1999 stock status

The last five studies revealed that the state of clam stocks has reached a critical level, with harvesting largely surpassing recruitment.

Beds open to clam fishing must meet two conservation criteria: a minimum of 10% of the total population of legal size (50 mm or 2 inches) and legal densities of 12 clams/m².

In 1999 inventory of clam populations revealed that 9 out of 40 beds inventoried met the two criteria, i.e. legal-sized clams (50 mm) accounted for more than 10% of the total population and they had minimum legal densities of 12 clams/m².

Protection of the resource and traditional activity

The "LaForest-Roy" Special Commission of Inquiry recommended that clam digging with hand tools be maintained in the park, even for purposes of sale outside the park, so as to guarantee the rights of former residents, while recognizing Parks Canada’s responsibility to protect this resource through appropriate regulations.

The park’s management plan states that clam harvesting activities could be temporarily prohibited if studies or resource monitoring programs show that mollusk beds are being depleted to the point that their viability is threatened.
The closure of the clam fishery has been in effect since April 1, 1997 in order to ensure the long-term protection of the resource and to allow the continuation of this traditional activity.

Clam fishing will remain closed within Kouchibouguac National Park from April 1, 2000 to March 31, 2001, except in 9 park clam beds that will be open from May 1, 2000 to November 15, 2000.

Seasonal ($10), 7-day ($5) and 1-day ($3) fishing licences will be sold only at Kouchibouguac National Park. Recreational and commercial fishers purchasing clam fishing licences will be given a map identifying the beds open to clam fishing. These will be clearly indicated by 4 markers at the site, set out with the help of the GPS device.

Every person who holds a soft-shell clam permit in Kouchibouguac National Park shall register their daily catch of soft-shell clam. Persons fishing for recreational purposes must not exceed the daily catch of 100 clams, not retain soft-shell clams which are smaller than 50 mm (2 inches) in length and will be restricted to the actual opened and marked clam beds. Qualified commercial fishers shall not retain soft-shell clams which are smaller than 50 mm (2 inches) in length).

References

For further information, please contact Kouchibouguac National Park's Warden Service.

Gilles Babin, Field Unit Superintendent, Northern New Brunswick
Introduction

Formed by wind, waves and time and held together by plants, sand dunes are an important habitat that is constantly changing.

The very beginning of a sand dune can be a pile of seaweed, a rock or a piece of driftwood behind which sand has started to fall. As the small mound of sand gets a bit bigger, plants such as sea rocket can colonize it. With a plant or two, the pile of sand gets bigger and it doesn’t take long before marram grass can colonize the beginnings of the dune. Marram grass is the most important plant on a sand dune. It spreads quickly by its specialized roots, called rhizomes, that grow not only down but sideways and through the sand. These rhizomes form a network that helps hold the sand dune in place.

A very important habitat, sand dunes are home to many plants and animals. Beach pea, bayberry, seaside goldenrod, wild rose and cranberry are just a few of the plants that are able to survive in this harsh environment after marram grass has stabilized the dune. There are many insects, such as leafhoppers, which
scurry around the roots and leaves and feed on plants. Birds such as the Savannah sparrow feed on small seeds and berries and sometimes even on the insects! Also near the roots of the plants are small mammals like the meadow jumping mouse. They attract others to this habitat – red foxes will often make their dens in the backside of a dune and northern harriers hunt for food from overhead.

Reasons for Dune Losses

Storms and strong winds can change the way sand dunes look and even push them inland. One of the major causes of sand dune change is trampling by people. People walking and playing on sand dunes damage the marram grass that holds the dunes together. In fact, it takes only ten footsteps to kill a marram grass plant. This means that the sand is no longer held in place and can be blown away, thus damaging the dune habitat.
Efforts to Conserve the Dunes at Prince Edward Island National Park

Parks Canada uses a variety of methods for protecting the dunes. Some areas are given special protection and are closed to visitors completely. In other areas, boardwalks have been installed for visitors to use instead of walking on the dunes to get to the beach. Damaged areas are sometimes restored with the planting of marram grass. Perhaps the best form of protection is education. Many people do not realize the effect their actions are having on the dunes. Park interpretation programs are a fun way to learn, and signs around the beaches and dunes help too!

References

MacQuarrie, Kate. *Life at the Edge*. Charlottetown: Island Nature Trust, 1995


Parks Canada Website: www.parkscanada.gc.ca
Introduction

The American marten is found in New Brunswick and Nova Scotia. A subspecies called the Newfoundland marten is found on the island of Newfoundland, with a population of approximately 300. The Newfoundland marten was declared an endangered species in 1996 by the national Committee for the Status of Endangered Wildlife in Canada (COSEWIC). The Cape Breton Highlands' marten population was listed as endangered in the province of Nova Scotia in 2001.
In terms of habitat, most researchers agree that the Newfoundland marten is a mature forest animal which prefers conifer forests with a high degree of canopy closure. It tends to live and rest in dens, burrows, holes, crevices and hollowed trees.

A rare member of the weasel family, the Newfoundland marten is an omnivore—meaning that it eats plants and animals—and feeds on such species as squirrels, hares, shrews, birds, insects, fish, berries, etc.

**Reasons for Species Loss**
- Killed in incidental snaring and trapping
- Lack of control on the number of snares used during snowshoe hare season
- Competition for limited food supply
- Predation by fox, owls, hawks, lynx, coyote and eagles
- Increased access to forested areas due to forest road construction and ATVs
- Diseases such as rabies and canine distemper virus

**Efforts to Conserve**
- There has been a reintroduction program at Terra Nova National Park, Newfoundland.
- A National Recovery Plan, established by the Newfoundland Marten Recovery Team, was intended to increase the number of marten on the island to a point where they are no longer threatened with extinction.
- In 1934, trapping of marten was abolished. Snaring and dry-land trapping was banned in the Little Grand Lake area in 1973 due to accidental trapping.
- A captive breeding program has been established at Salmonier Nature Park on the east coast of Newfoundland.
- The Western Newfoundland Model Forest (WNMF) has been working with various partners, playing an active role in marten research. They have been developing
improved stand and landscape-level management practices to protect marten habitat.

- Sighting records, provincial trapping records and live trapping are being utilized.

References


Newfoundland Marten Website: www.newfoundlandmarten.com

Species at Risk Website: www.speciesatrisk.gc.ca

Western Newfoundland Model Forest Website: www.wnmf.com/pine.htm
Introduction

Peregrine falcons have been called "swift-flying hunters of the sky." They are smaller than a hawk and approximately the size of a crow. They plummet and strike their winged prey, knocking them out of the air. They are at the top of the food chain, feeding upon songbirds and shorebirds.

According to the Canadian Wildlife Service, the peregrine falcon is "threatened" nationally, but it is "endangered" provincially (e.g. New Brunswick). In Manitoba, Ontario and New Brunswick it is protected under the Endangered Species Act, which protects it from shooting, collecting, harassment and destruction of habitat. It is also listed in
the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which restricts the import and export of birds and eggs.

**Reasons for Species Loss**

- **Pesticide Contamination** – The species was destroyed in Eastern Canada due to the residual chemical compound DDE, a breakdown product of the organochlorine DDT (dichlorodiphenyltrichloroethane) during the 1950s and 1960s. It was mostly used as an insecticide. DDT was sprayed over crops and remained in the surfaces of leaves and seeds. Herbivores ate the plant product and ingested the DDT. Peregrines caught and ate the birds contaminated with DDT. When accumulated in the body of the falcon, the DDT caused physiologic changes, including thinning egg shells, disruption of reproductive systems and uncharacteristic parental behavior. Finally, this led to the abandonment of traditional nesting sites.

**Efforts to Conserve**

- **A ban on the use of DDT** – A ban on the use of pesticides in the 1970s led to a reduction of residues in prey species.

- **Re-introduction** – In 1982, Fundy National Park and the Canadian Wildlife Service began programs to re-establish the birds in the upper Bay of Fundy. They established one program at Cap d’Or in Nova Scotia and one in Fundy National Park in New Brunswick.

- **Protection through the Endangered Species Act** – This act prohibits the shooting, collecting and harassing of peregrine falcons as well as the destruction of their habitat.

- **Records** – Surveys of population were carried out, looking for evidence of nesting.
References


Parks Canada Website: www.parkscanada.gc.ca

Species at Risk Website: www.speciesatrisk.gc.ca
Introduction
The piping plover is an endangered shorebird that nests and feeds along coastal sand and gravel beaches. The adults can be recognized by their size, shape and colouring. They are about the same size as a sparrow, and have orange legs, a black band across their foreheads from eye to eye, and a black ring around their necks. Their body is sand-coloured, which helps them blend into their surroundings.

Population and Range
The piping plover has been on the endangered species list since 1982. By 1996, there were only about 5900 adult piping plovers in the world. They range from Canada to the United States and the Caribbean. They are here in Canada for the summer months – around the Great Lakes in Ontario, in the Prairie Provinces and in Atlantic Canada. In Atlantic Canada, they can be found in each of the four provinces. In the summer of 2000 there were 32 piping plovers nesting in Prince Edward Island National
Park, 12 in Kouchibouguac National Park and 14 in Kejimkujik National Park. In the winter, they migrate to the southern United States and the Caribbean.

**Nests**

Piping plovers usually arrive in Atlantic Canada in April to establish nesting areas and form pairs. The nest of the piping plover is different from many other birds' nests. Their nest is a small depression in the sand, just above the high tide line, which may contain a few small shells and rocks for camouflage. They usually lay four eggs. Both adults help with incubation and after about 28 days, the young hatch. Within hours, they leave the nest and follow their parents in search of their first meal. A favourite food is beach hoppers (small, shrimp-like crustaceans) or marine worms and insects, which they find in the sand. If all goes well, after about 20 to 25 days, the young are able to fly.

**Reasons for Species Loss**

- Human use of beaches. Piping plover nests are very difficult to see and are sometimes walked on by accident.

- Piping plovers will stop feeding when people get too close.

- People sometimes bring dogs with them to the beach. Piping plovers see them as predators, which keeps them from feeding. Unleashed dogs have also been known to destroy piping plover nests.

- Garbage, which people sometimes leave on the beaches, can attract predators.

- Increased populations of predators such as red foxes, raccoons, skunks, crows, and gulls.

- Storms will sometimes cause the tides to rise to such a level that the piping plover nests are flooded and the adult plovers will have to "re-nest".
Defences

To protect themselves from danger, piping plover chicks crouch motionless in the sand so that they are almost impossible to see because of their camouflage. The adult plovers try to lure predators or danger away from the eggs or young chicks by pretending to have a broken wing and then flying away when they have lead the predator a safe distance away. While these are very good strategies, too much time spent not eating, or too much time spent away from the nest, can also be harmful. If the young chicks aren’t able to gain enough weight, the migration will be extremely difficult, if not impossible, for them. Also, if the adults spend too much time away from the nest while the eggs are incubating, they will get cold and won’t hatch.
Efforts to Conserve the Piping Plover in National Parks

• Piping plover monitors begin looking early in the spring for signs of plover activity on the beaches in the national parks where they are found.

• When the piping plovers have established their nesting area, that section of the beach is closed to the public until the chicks have fledged, or grown. Nesting areas are usually closed from early May until late July or early August, depending on the success of the season.

• The plover monitors also check for signs of predators around the nests and if there is a need, an enclosure can be placed around the nest for protection. The enclosures are made of wire mesh with openings large enough for both adult plovers and chicks to pass through with ease. The openings are too small for predators to enter, thus protecting the nest.

• During severe storms, plover monitors will place clay models of the piping plover eggs in the nest and put the real eggs in an incubator until the storm has passed. The eggs are then replaced in the nest. This helps save many piping plover eggs from being washed away or buried by blowing sand during storms.

• A banding program is also in place to help identify the adult birds and where they nest from year to year.

• Public education programs, such as guided walks, audio-visual programs, signage and exhibits, are provided to encourage visitors to help protect the piping plover.
What You Can Do to Help the Piping Plover

- Respect signs and stay out of areas of the beach that are closed for the piping plover.
- Share what you know about the piping plover with your friends and family.
- Remember to take any litter home with you that you may have brought to the beach.
- Learn more about this and other endangered species in your area.
- Find out how you can help through guardian programs in your area, either with Parks Canada or with a local conservation group.

References


Environment Canada Website: www.ec.gc.ca

Parks Canada Website: www.parkscanada.gc.ca

Species at Risk Website: www.speciesatrisk.gc.ca
Introduction

The water-pennywort is a small herbaceous perennial, living in very special aquatic environments. It appears in only two locations in Canada, both in Nova Scotia, where it is one of the province's rarest plants. This unique plant is found in two lakes in Kejimkujik National Park and Wilson's Lake in Yarmouth County.

The water-pennywort grows in mud, sand or gravel on lake shorelines in a narrow band below the high
waterline, where it is exposed during low summer waterlevels. Natural fluctuations in water levels are important for the continued existence of the water-pennywort because flooding minimizes competition from other plants.

The water-pennywort does not flower regularly, but when it does, it produces small clusters of white flowers, anytime from late July to early September.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada) designated this plant as a threatened species in Canada in 2000. Previously it was considered endangered but with warm dry summers in the last 20 years the water-pennywort has flourished and increased in numbers within Kejimkujik National Park.

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**Reasons for Species Loss**

- Human activities such as cottage construction, shoreline dredging, beach construction or lakeshore developments have altered pennywort habitat sites.

- Recreational activities along the shorelines, such as the use of all terrain vehicles, the beaching of canoes or boats, can trample these plants and their habitat.

- Some damage to plants and their habitat occurs due to people walking through plant stands near beach areas.

- Stabilization of the water level in the lakes where the water-pennywort is found (through dams and other means) may destroy the remaining populations of this plant.

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**Efforts to Conserve**

- The designation of all water-pennywort habitat within Kejimkujik as "Special Areas" will help to protect the plant. This designation or zoning means that development is not permitted and human use of these areas is restricted.

- There is a special protection site for the water-pennywort in Yarmouth County Nova Scotia.
• Interpretation programs and on-site signs introduce the threatened plant to visitors at Kejimkujik.

• Special areas where the plant grows in Kejimkujik are roped off with signage to explain why visitors can’t walk through and damage the habitat.

• Recovery plans are being developed for the water-pennywort as well as other unique flora (pink coreopsis, redroot, sweet pepperbush) that share the common habitat requirements.

References

COSEWIC Website: www.cosewic.gc.ca

Parks Canada Website: www.parkscanada.gc.ca

Species at Risk Website: www.speciesatrisk.gc.ca
### Species List: Kejimkujik National Park

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<th>Species Name</th>
<th>Type</th>
<th>Characteristic</th>
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## Species List

### Prince Edward Island National Park

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<tr>
<td>Northern leopard frog</td>
<td>Amphibian</td>
<td>Carnivore /consumer</td>
</tr>
<tr>
<td>Coyote</td>
<td>Mammal</td>
<td>Omnivore /consumer</td>
</tr>
</tbody>
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# Atlantic Canada – COSEWIC May, 2002

## Endangered

### BIRDS
- **Piping plover** (*Charadrius melodus*) N.B., Nfld.Lab., N.S., P.E.I.
- **Eskimo curlew** (*Numenius borealis*)
- **Roseate tern** (*Sterna dougalli*) N.B., N.S.

### FISH
- **Atlantic whitefish** (*Coregonus huntsmani*) N.S.
- **Atlantic salmon** (*Salmo salar*) (inner Bay of Fundy) N.B., Nfld.Lab., N.S.

### LEPIDOPTERA
- **Maritime ringlet butterfly** (*Coenonympha tullia nipsisiguit*) N.B.

### LICHEN
- **Boreal felt lichen** (*Ereoderma pedicellata*) Atlantic population N.B., N.S.

### MAMMALS
- **Blue whale** (*Balaenoptera musculus*) Atlantic population
- **Beluga whale** (*Delphinapterus leucas*) South Baffin Island and Cumberland Sound
**Right whale** (*Eubalaena glacialis*)

**Wolverine** (*Gulo gulo*) (population eastern Canada)

**American marten** (*Martes americana atrata*) (Nfld.Lab. population)

<table>
<thead>
<tr>
<th>PLANTS</th>
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<tbody>
<tr>
<td><strong>Long’s braya</strong> (<em>Braya longii</em>)</td>
</tr>
<tr>
<td><strong>Pink coreopsis</strong> (<em>Coreopsis rosea</em>)</td>
</tr>
<tr>
<td><strong>Thread-leaved sundew</strong> (<em>Drosera filiformis</em>)</td>
</tr>
<tr>
<td><strong>Eastern mountain avens</strong> (<em>Geum peckii</em>)</td>
</tr>
<tr>
<td><strong>Furbish’s lousewort</strong> (<em>Pedicularis furbishiae</em>)</td>
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<tr>
<td><strong>Barrens willow</strong> (<em>Salix jejuna</em>)</td>
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<thead>
<tr>
<th>REPTILES</th>
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</thead>
<tbody>
<tr>
<td><strong>Leatherback turtle</strong> (<em>Dermochelys coriacea</em>)</td>
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**Threatened**

<table>
<thead>
<tr>
<th>BIRDS</th>
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<tbody>
<tr>
<td><strong>Anatum peregrine falcon</strong> (<em>Falco peregrinus anatum</em>)</td>
</tr>
<tr>
<td><strong>Least bittern</strong> (<em>Ixobrychus exilis</em>)</td>
</tr>
</tbody>
</table>
### FISH
- Northern wolffish (*Anarhichas denticulatus*)
- Spotted wolffish (*Anarhichas minor*)
- Lake Utopia dwarf smelt (*Osmerus spp.*) N.B.

### MAMMALS
- Harbour porpoise (*Phocoena phocoena*) (northwest Atlantic population)
- Woodland caribou (*Rangifer tarandus caribou*) Nfld.Lab. (Boreal population)

### PLANTS
- Anticosti aster (*Aster anticostensis*) N.B.
- Fernald’s braya (*Braya fernaldii*) Nfld.Lab.
- Tubercled spike-rush (*Eleocharis tuberculosa*) N.S. (coastal plain species)
- Water-pennywort (*Hydrocotyle umbellata*) N.S. (coastal plain species)
- Redroot (*Lachnanthes caroliana*) N.S. (coastal plain species)
- Golden crest (*Lophiola aurea*) N.S. (coastal plain species)
- Plymouth gentian (*Sabatia kennedyana*) N.S. (coastal plain species)

### REPTILES
- Blanding’s turtle (*Emydoidea blandingi*) (N.S. population)
- Northern ribbonsnake (*Thamnophis sauritus*) (Atlantic population)
## Special Concern

### BIRDS

<table>
<thead>
<tr>
<th>Species</th>
<th>Subareas</th>
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</thead>
<tbody>
<tr>
<td>Short-eared owl (<em>Asio flammeus</em>)</td>
<td>N.B., Nfld.Lab., N.S., P.E.I.</td>
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<tr>
<td>Barrow's goldeneye (<em>Bucephala islandica</em>)</td>
<td>N.B., Nfld.Lab., N.S., P.E.I.</td>
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<tr>
<td>Bicknell's thrush (<em>Catharus bicknelli</em>)</td>
<td>N.B., N.S.</td>
</tr>
<tr>
<td>Yellow rail (<em>Coturnicops noveboracensis</em>)</td>
<td>N.B.</td>
</tr>
<tr>
<td>Tundra peregrine falcon (<em>Falco peregrinus tundrius</em>)</td>
<td>Nfld.Lab.</td>
</tr>
<tr>
<td>Harlequin duck (<em>Histrionicus histrionicus</em>)</td>
<td>(eastern Canadian population) N.B., Nfld.Lab., N.S.</td>
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<tr>
<td>Ivory gull (<em>Pagophila eburnea</em>)</td>
<td>Nfld.Lab.</td>
</tr>
<tr>
<td>Ipswich sparrow (<em>Passerculus sandwichensis princeps</em>)</td>
<td>N.S.</td>
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### FISH

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Shortnose sturgeon (<em>Acipenser brevirostrum</em>)</td>
<td>N.B.</td>
</tr>
<tr>
<td>Atlantic wolffish (<em>Anarhichas lupus</em>)</td>
<td></td>
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<tr>
<td>Banded killifish (<em>Fundulus diaphanus</em>)</td>
<td>(Nfld.Lab. population)</td>
</tr>
<tr>
<td>Atlantic cod (<em>Gadus morhua</em>)</td>
<td></td>
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<tr>
<td>Redbreast sunfish (<em>Lepomis auritus</em>)</td>
<td>N.B.</td>
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### LEPIDOPTERA

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Monarch butterfly (<em>Danaus plexippus</em>)</td>
<td>N.B., N.S., P.E.I.</td>
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</table>

### LICHEN

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</tr>
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<tbody>
<tr>
<td>Boreal felt lichen (<em>Ereoderma pedicellata</em>)</td>
<td>Nfld.Lab. (Boreal population)</td>
</tr>
</tbody>
</table>
MAMMALS

Fin whale (*Balaenoptera physalus*)

Southern flying squirrel (*Glaucomys volans*) N.B., N.S.

Northern bottlenose whale (*Hyperoodon ampullatus*)

Humpback whale (*Megaptera novaeangliae*) (northwest Atlantic population)

Sowerby's beaked whale (*Mesoplodon bidens*)

Gaspé shrew (*Sorex gaspensis*) N.B., N.S.

Polar bear (*Ursus maritimus*) Nfld.Lab.

PLANTS

Bathurst aster (*Aster subulatus var obtusifolius*) N.B.

Fernald’s milk-vetch
(*Astragalus robbinsii var. fernaldii*) Nfld.Lab.

Sweet pepperbush (*Clethra alnifolia*) N.S. (coastal plain species)

New Jersey rush (*Juncus caesariensis*) N.S. (coastal plain species)

Lilaeopsis (*Lilaeopsis chinensis*) N.S. (coastal plain species)

Long’s bulrush (*Scirpus longii Fern.*) N.S. (coastal plain species)

Gulf of St. Lawrence aster
(*Symphyotrichum laurentianum*) N.B., P.E.I.

REPTILES

Wood turtle (*Clemmys insculpta*) N.B., N.S.
Kejimkujik National Park

This park is located in Nova Scotia. The purpose of the park is to protect a nationally significant and representative area of the Southwest Nova Scotia Uplands. The public is encouraged to understand, appreciate and enjoy the park heritage resources in such a way that they are left unimpaired for future generations.

Kejimkujik offers such activities as canoeing, hiking, camping, swimming, cross-country skiing and wilderness exploration. There are more than 50,000 visitors per year.

The park is concerned about maintaining a balance between increasing visitor use and the continuing need to protect the park’s ecological and cultural resources.

As Park Manager, I realize we must balance the need for protection of the many special plants and animals in the park with the growing demand of campers, hikers, paddlers and others who wish to enjoy every aspect of this amazing park.

We want to protect endangered and threatened species, petroglyphs and other cultural resources, as well as some sensitive habitats. This means that public access to some areas must be limited.

We must follow the guiding principles of the National Parks Act but do have our own Management Plan. It will guide the protection, use and development over the next 15 years.
The piping plover is one of several endangered species that can be found in the park. Increased beach use and development in coastal areas has meant that their numbers have been reduced. Also, with more people comes more garbage, so there is an increase in scavenger species such as seagulls and crows, which prey on the eggs and chicks in plover nests.

Until 1990, the Kejimkujik Seaside Adjunct had the largest piping plover population in Nova Scotia. However, severe storms and nest predation have increased. The park has put up fences and signs to reduce human disturbance during nesting season.

I want to have a great outdoor experience; do some backcountry camping, canoeing, sightseeing and take in cultural history presentations. I like all the services available to me – the short walking trails, the picnic areas and the interpretive/rest stops along those trails. I am one of the 17,500 campers who enjoy Jeremy’s Bay Campground during the summer season.

I want to see the piping plover, and I want a chance to get as close to their nests as possible. I particularly like hiking on St. Catherine’s River Beach and would like to watch the birds. However, I can’t do that during their nesting season because the beach is closed to me while they nest.
Mi'kmaq

"I am native to this area. My people have lived here for over 4,000 years, and have many stories to tell about the history of the area and our people.

The Mi'kmaq feel that there are sacred and important areas within the park. We wish to work as staff at Kejimkujik so we can share our special feelings about these places with visitors so that they will respect and protect them."
Kouchibouguac National Park

The park is in Kent County, southeastern New Brunswick, and is approximately 100 km north of Moncton. It protects 238 km² of land and water along the shore of the Northumberland Strait. The park was established in 1969 and was officially created through an amendment to the National Parks Act in 1979.

Kouchibouguac includes shallow lagoons and estuaries, salt marshes, tidal zones, peat bogs, and Acadian forest communities.

The park currently encourages such activities as hiking, beach walking, bird watching, picnicking, cycling, swimming, canoeing, camping and cross-country skiing.

There are over 230,000 visitors to the park each year.

Park Manager

"As the Park Manager, I must try to protect the unique coastal area of the park. I must also try to increase awareness of the cultural and natural heritage resources of the park and its region through day and evening interpretation programs. The park plays an important role as a "good neighbour", an ecological model and a major environmental and cultural tourist destination.

I don't ban clam harvesting; I encourage it, but I do subscribe to "sustainability" to ensure that the clams are around for the long haul.

I recognize that there must be a balance between conservation and socio-economic benefits of the park in order to pay for upkeep, new facilities, etc."
Clam Harvester

"Clam harvesting is my way of life and I want to continue to do this to support my family. I am only permitted to dig for clams with hand tools. There is a chance that clam harvesting may be stopped temporarily, depending on what the scientific studies and monitoring programs uncover. They will determine if the clam beds are deteriorating and if their survival is threatened."

Tourist

"I want to visit a beautiful park with lots of lovely scenery, and I want to be able to participate in various outdoor activities. Kouch is a great place to visit and do activities such as camping, bicycling, hiking and bird watching. It's really nice to see animals such as mink, moose, coyotes, porcupine, river otter or snowshoe hare in their natural environment.

I also enjoy taking my buckets and digging clams so I can have them for dinner! That is one of the main reasons I visit this park! I find that sometimes there are not as many clams as other times."
As a local resident, I benefit from the park because of the employment and business opportunities it brings. Some members of my family have jobs because of the park. There have been several motels and other kinds of housing and services for visitors. This means there are more jobs for the local people, and money comes into our community!

I have to be honest though. I don’t always like the tourists but understand that having them helps our community.

If there are going to be new plans for the park, I want to make sure I am consulted."
Prince Edward Island National Park

This park, located along the north shore of Prince Edward Island, was established in 1937 to protect an example of the Maritime Plain natural region – most notably for its coastal barrier beaches and sand dune systems. Encompassing just 18 square kilometres of land, it is one of the smallest national parks in Canada.

Approximately 750,000 visitors come to the park every year, mainly during the summer months, making it among the most heavily visited of all national parks in Canada. Growing tourism pressures add to the challenge of maintaining its ecological integrity.

In 1998 a new parcel of land on the Greenwich Peninsula was added to Prince Edward Island National Park. It contains unique sand dune formations, rare plants and animals, as well as very significant archaeological resources. These resources are very susceptible to damage by humans so the park has limited visitor access to this area.

Park Manager

“" My job is to protect a nationally significant natural area and to encourage public understanding, appreciation and enjoyment of park heritage resources in such a way that they are left unimpaired for future generations.

I have been tasked with developing management guidelines for the new addition to Prince Edward Island National Park at Greenwich to protect its unique features while creating opportunities for visitor enjoyment and education. There is a great deal of pressure to allow people to continue to use a traditional route through the unique dune formations at Greenwich and to promote the area as a major tourist attraction. My challenge is to ensure overall protection of the nationally significant natural and cultural resources in the area.""
Local Resident

"I have lived in this area all my life and I have always gone for walks along the path through the dunes at Greenwich. I guess the dunes are special. I have watched them grow and migrate inland over the years. I don't think their movement had anything to do with us though. It was the storms that changed them. People used to let their cattle graze on the dunes to eat the grass that grows on them. They have hunted there and picked cranberries out there for a hundred years or more. There are a few footpaths and vehicle tracks over them now, but that won't hurt them. I want to be able to continue to walk where I always have and I don't want to be disturbed by all kinds of tourists either."

Environmentalist

"I believe that the only way to protect this important natural area at Greenwich is to leave it alone and to restrict the number of visitors to the area. There should be no visitor facilities put in place and the area should just be allowed to evolve naturally.

In other parts of the park there have been too many visitors and that has caused trampling of the dune vegetation and damage to the dunes. Despite the boardwalks and other visitor facilities that the park has constructed at main beach areas, visitors continue to create new footpaths over the dunes. I don't want the same thing to happen at Greenwich, where the sand dunes are even more unique and where there are so many rare plants. The traditional access route through the dunes at Greenwich should be closed to visitors as there is no way to keep people from wandering off the path and the precious natural resources could be severely damaged.

I also believe that Greenwich should not be promoted to tourists. If fewer people know about the area, fewer people will visit."
Tourism Operator

"I have heard about the new addition to Prince Edward Island National Park and I think it is a wonderful business opportunity. I have an inn and restaurant in a neighbouring community and I think that Greenwich has the potential to be a major tourist attraction. This will help to create more jobs in the local community, something that is badly needed in this area. In anticipation of the demand, I have invested a lot of money to expand my business. I have increased the number of rooms for people to stay overnight as well as the number of seats in my restaurant.

I want as many people as possible to come to the area. In my promotional brochure, I plan to include a picture of the amazing dunes at Greenwich and to advertise how close my business is to them. I don't believe that increased numbers of people will cause any damage to the dunes. I want people to be able to get as close to the unique dune features as possible so I can really promote that as an attraction, so I want Parks Canada to keep the existing path through the dunes open."