



**Educational Package of Suggested Activities for
GRADE FOUR**

WELCOME TO SAFARI NIAGARA

A class visit to a zoo or nature park such as Safari Niagara is an excellent learning opportunity for students in any grade level. For many grades the experience can fulfill program goals or expectations from Ministry of Education Curriculum Documents, notably Science and Technology 2007 and Social Studies 2004.

Even where, at a particular grade level, there is no direct link to the curriculum documents there are opportunities for you, the teacher, to connect pre visit, on-site and post visit classroom activities to the hands-on experience of the day. The management of Safari Niagara recognized these direct and implied connections beginning with the inception and opening of the park. To assist you in planning for your visit we assembled a team of teachers at all grade levels to produce materials which will hopefully be of use to you. These curriculum materials have been upgraded several times as Ministry of Education documents were revised. However, the suggested activities remain essentially the same because good teaching ideas are forever!

You may note that the format of the attached materials can vary from grade to grade. This reflects the philosophy, experience and teaching styles of the writers. It is expected that in using the materials you will adapt them to your own classroom environment, picking and choosing those most suited to your style.

Regardless of how you plan to enhance your visit to our facility by classroom activities the fundamental truths remain. Zoos and nature parks today are becoming both a last refuge for many endangered species and a hope for their recovery at some point in the future. Humankind must accept the responsibility for the recovery of the planet. The closer we can get our students to physical contact with the real world and the wonders of nature the more they will, as adults, appreciate the gravity of this task.

Safari Niagara: Unit for Grade Four

The grade four Understanding Life Systems Unit on “Habitats and Communities” is an excellent unit to motivate students, especially with field work, like a trip to Safari Niagara.

The focus of this study is mainly on environmental studies; however, there are many opportunities to include language and math activities.

The activities do not have to be done in any particular order, and it doesn't matter if most of them are done prior to or after a field-trip to Safari Niagara. This depends on the type of activity you choose to do on site. For example, if the students are to discuss animal adaptations as they tour, then the adaptations, and possibly the food chain lessons should be done prior to the visit. As well, the food chain lesson should be done before the food web lesson, and probably the herbivore, carnivore, omnivore classification exercise. Again, there is a great deal of flexibility. So the activities are not divided into before, during, and after.

Possibly the most logical approach would be to work on the Zoo-keeper, and Adaptations exercises prior to the field-trip. Then the students will have a greater appreciation for the amount of planning and care that has gone into construction, and maintenance for the wildlife present at Safari Niagara.

There are many references to web-sites throughout the unit as there is a wealth of material and most schools seem to have excellent Internet access. Many sites listed are more suitable for the teacher. However, a couple are excellent student resources. For example the government sponsored “Hinterland Who's Who” site is excellent for student research. Although the species list is not too extensive, each species listed has a wealth of information, and the information is organized under titles such as “Adaptations”. Students can find range maps, picture of the species, and a wealth of printed material.

Enjoy your trip, and the educational activities that Safari Niagara has provided for you.

OPPORTUNITIES FOR INTEGRATION

Mathematics:

- construct labeled graphs both by hand and by using computer applications, and create intervals suited to the range and distribution of the data gathered;
- read and interpret data presented on tables, charts, and graphs and discuss the important features;
- compare experimental results with predicted results

Language:

- communicate ideas and information for a variety of purposes and to specific audiences;
- begin to write for more complex purposes (e.g. to present and discuss their opinions);

Social Studies:

- construct and read a wide variety of graphs, charts, diagrams, maps, and models for specific purposes (e.g. area of regions, size of populations);

Suggested PRE-VISIT Activities

1. This lesson in environmental education is to demonstrate to children the interdependence of animal life and environment. It could be an excellent introduction to the Life Science unit on "Habitats and Communities."

Describe the fundamental necessities of animals (food, water, shelter and space), in a suitable arrangement, and how without these essential components, animals cannot survive. For teachers who have taken a "Project WILD workshop you will recognize this activity as a modification of "Oh Deer".

Choose every fourth student to become a deer.

Mark off two parallel lines on the playground that are about ten to twenty meters apart.

Have all the "deer" behind one line and all the rest behind the other line. When a deer is looking for food, it should clamp its hands over its stomach. When it's looking for water, it puts its hands over its mouth. When it is looking for shelter, it holds its hands together over its head. The space is provided so they don't look for space at this time. This can be added in another game. A deer can choose to look for any of these needs during each round, but it cannot change what it is looking for in that round. It can change in the next round if it survives. The students who are the components of habitat may choose which they will be at the beginning of each round. They will depict the component in the same manner as the deer.

The game starts with all players lined up on their respective lines and with their backs to the students at the other side. The teacher asks all students to pick their sign. When they are ready, count: "One...two...three." At the count of three, the students turn and face each other showing their signs.

The deer run to the habitat component they are looking for and take that component back to the deer side of the line. This represents the deer's success at meeting its needs and reproducing as a result. Any deer that fails to find the component it was seeking decomposes and becomes part of the habitat, joining the students on the habitat side.

The teacher keeps track of the number of deer at the beginning and ending of each round. Continue play for about a dozen rounds.

At the end, discuss the activity; encouraging the students to talk about what they experienced and saw.

The students could also make a graph of the number of deer alive at the end of each round. This will show further patterns, and lead to more discussion. A written summary could also be made as to what they have learned from the activity, or a story could be written about what could happen in real life during one of the cycles.

Insights gained through discussion could include:

- the deer population fluctuates, which is a natural process.
- some factors can limit growth.
- fluctuations go through a cycle.
- a variety of factors affect wildlife populations (drought, fire, deforestation).
- an excess of threatening factors can endanger a species of animals.
- a good habitat is the key to wildlife survival.
- a population will increase in size until some limiting factors stop it.
- nature is never in balance, but is constantly changing.

The simulation could be played again, with variations added. For example, if there is a drought no student on the habitat side can choose water as their symbol, or a housing development uses up 1/2 the space. In these situations, the appropriate environment is removed, which will limit deer populations. A parallel activity is the “ Cougar Hunt”, which is found at

<http://www.earth2kids.org/teachers/species.html>

2. Bring nature into the classroom. Terrariums are easy to make, fun, and easy to maintain. They are self-watering, versatile, and can be used to observe different types of ecosystems (desert, prairie, bog, etc.). They can be created and used at anytime during the year. And after the lesson is over they can be enjoyed for many months to come! As well, by using different kinds of soils, plants, lighting conditions, water amounts....many different experiments can be conducted.

1) Collect watertight clear containers. Try using 2 liter plastic soda bottles as they don't take up much space, and are then a reused item. Two bottles can be cut with one inverted over the other. Or the lid could be cut off of one bottle and with the cap on, inverted and pressed into the bottle for a seal.

2) Cover the base with stones, sand, or charcoal (or any combination of these) to drain the soil to prevent it from becoming waterlogged. About 5 cm is plenty.

3) Add about one cup of water, or enough to just cover the stones.

4) Add soil. If you don't want weeds use potting soil. If you want an interesting environment use garden soil that could be full of weed seeds, however don't tell the students about that possibility. This could lead to some great discussion when the weeds start.

5) Many plants do well in terrariums. Try moss, grass-seed, prairie grasses, quick growing radishes, or any seed that fits a particular theme.

6) Add naturalization features such as rocks, moss, dried twigs, decomposing matter, etc.

7) Place in a bright area, but not in direct sunlight, unless you are trying to replicate a dark environment.

8) Try adding animal life after the plants are developed. However don't leave any animals in for any length of time. Try earthworms or insects.

The success of the terrariums will come from constant comparisons to the real world environments. Constantly draw parallels between the mini-environment

and real ones. The stones represent bedrock. The water in the stones represents underground water. When the water works its way into the air and condenses, comparisons to the water cycle can be done. Obviously soil and the air parallel the real world but in smaller quantities. The last ingredients needed are warmth and sunlight for successful plant growth. Plant needs should be constantly emphasized. Once enough vegetation is established the introduction of animal life with related needs discussions could be done. A log of changes in the environment can be done in their daily journals.

3. Your class is about to receive its first-ever Siberian tiger from another zoo. There aren't many of these special animals left in the wild (only about 400), and your mission is to make sure this one thrives in his new home. Since Siberian tigers may not survive in the wild, zoos may be their only safe haven for some time to come

Tiger Facts to Consider:

- It may look cute but it is 60 times heavier than your normal house cat.
- It is a wild animal, and always will be.
- It is a powerful jumper and can easily leap 3 meters off the ground.
- Even though 90% of them are born in zoos, they prefer the wild.
- Trees are needed to help keep them keep cool and to provide a scratching post.
- Rock ledges help for places to perch.
- A pond for swimming, drinking, and cooling off is vital.
- Different kinds of grasses and shrubs would help to simulate the natural environment.
- Protection from people is needed so they don't feed or bother it.
- A well balance diet for health and energy is very vital.
- They would rather hunt for meals.
- Something to chomp and gnaw on is helpful.
- Even though a lot of time is spent on sleeping, exercise is required.

Use the related page to discuss how to care for this animal, or use the following website.

<http://www.teachersfirst.com/autoframe.htm?http://www.nationalgeographic.com/tigers/index.html>

4. Be a Good Zoo-keeper!

Have individuals then design a cage or area for an animal of their choice. This could be done in groups. Use the related page to help with design features. The most important thing is to provide for the animal's well being and at the same time making sure that people can view and be safe from your animal. Use a variety of methods for presentation:

- map
- model
- samples e.g. food
- written description
- a feeding chart
- oral presentation

Design an area for your particular animal that provides for its basic needs, which include food, water, shelter, space, climate, and specific needs (e.g. exercise).

Food:

- proper amount: Moose need 45 kilograms of willow branches per day
- proper timing: snakes eat weekly, while rabbits eat constantly
- correct type of food: koalas only eat certain kinds of eucalyptus leaves
- meets animals needs: hawks benefit from catching live food
- nutritious: commercial food has the proper balance and often has vitamins
- specific situations: weight control, pregnant animals need varying diets

Water:

- clean
- available at all times

Climate:

- proper temperature: Polar bears and sloths have different climate needs.
- moisture: Many butterflies need tropical rainforest type conditions.
- lighting: blue light can fool nocturnal animals into activity for viewing

Space:

- not overcrowded: Most animals require a certain size territory.
- protection from predators: Rabbits wouldn't survive long in a cougar cage.

- clean: This helps prevent illness by limiting bacteria growth.
- enriched: To help with exercise and boredom: Use climbing structures, toys, hiding meals, or including live meals to help. Making it naturalistic by adding rock formation, pools, vegetation (grass, shrubs, trees), also helps. Sloths need trees.
- place for shelter and hiding: Animals need protection, and privacy.
- barriers protect the animal from people (feeding, probing, etc.) This could be a moat, net, glass, wire net, cage, or wall.

Care:

- Observe the animal daily for changes in behaviour, eating habits, or appearance, for signs of health difficulties.
- Make sure medical attention is available.

Note: Use a variety of methods to show the proper environment e.g. map, model, samples (food), written description, feeding chart, and or oral presentation.

Discuss how plants and animals adapt constantly to changes in their environment. Both adapt through physical changes, however animals also adapt through behavioural changes.

Discuss challenging conditions for either plants or animals. These include weather (drought, harsh environment, low sunlight, snow, heavy rain, high humidity), landscape (steep mountains, amount of shelter, sandy soil, rocky terrain, water bodies), animals(competition for food, predators, hosts, overgrazing), vegetation (thorns, sparse, tall trees, lack of diversity), or any factor that may affect any of the basic needs (food, water, space, shelter, space, climate factors, or arrangement). Perhaps a WEB of challenges any particular plant or animal could face would be a good initiator.

Present the information on the cheetah and discuss the physical and behavioural adaptations that help it. Demonstrate on the overhead projector how to fill in the adaptations chart with information (chart above). For example, the Cheetah has some challenging conditions which make it difficult to survive. It is difficult to hunt for food. Grasslands are disappearing. And stronger animals often steal their food. Discuss the physical and behavioural adaptations and how they help.

The students may have knowledge of other challenging conditions or adaptations which can be included in the discussion.

Discuss their knowledge of animals and how they are adapted e.g. habits (hibernation, migration, nocturnal, stalking), appearance (camouflage), physical (keen eyesight, strong beaks, strong talons, speed, shell for protection).

Using the chart provided, each student could research one animal and present their findings to the class. Classmates could record their favourite adaptation from each presentation. This would end up being a good cross section of animal adaptations represented.

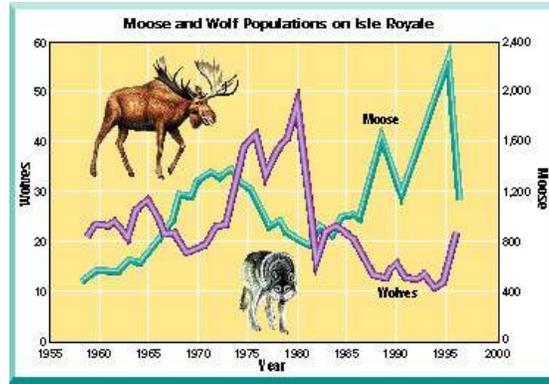
The same procedure could be used for plants. The physical parts of a plant often depend on their environmental conditions e.g. leaves (waxy or small leaves to prevent evaporation in dry areas, long roots to reach water, fragrant flowers to attract insects, smooth bark to discourage insects, spreading branches to catch the sun).

Each person could research and present information on plant adaptations and students could again record their favourite, or the most significant or unusual adaptation.

Two excellent websites to help with adaptations are:

-for animals: http://www.cws.scf.ec.gc.ca/hww_fap/eng_ind.html

-for plants http://www.cnr.vt.edu/dendro/sols/sci4.5/4.5_adapt.htm



The visit to Safari Niagara

The main purpose of the field trip is to motivate the students and collect information. The type of information collected will depend on what pre and post activities the class is working on. For maximum enjoyment use simple or motivating data collection methods such as a cell phone, iPad or digital camera. Each group could organize and maintain information on a particular theme, or in a particular area, and then results shared when the class returns to school. The groups do not keep notes as they tour. It would be better to work 2 or 3 times on the chosen activity throughout the tour.

Any of the following activities would blend nicely with the content of the unit:

A) Compare 3 different types of animals by making a list of similarities and differences. It would be more effective if two of them were similar, and the third quite different e.g. lynx, lion, and ostrich. Point out beforehand that they should also include the setting and any habits the animals display in their comparison.

B) Observe the artificial environment for one or two of the animals. Identify ways in which it meets the animal's needs. A good outline for this might be the student worksheet for zookeeper. It would help students observe things they might otherwise miss. The main question could be "What things have the people at Safari Niagara done to provide for the animals needs?" Extensions of this could include having the students compare the environments for 2 or 3 different kinds of animals. Upon return to the school the students could do any of the following activities:

- report to the class how the needs of the particular animal were met.
- create a model of the animal's environment.
- try to figure out ways of making the environment even better without spending much money.
- make a brochure for Safari Niagara that highlights 2 or 3 different species of wildlife and gives a clear description of their mini-environment.

C) Do a scavenger hunt based on terminology studied in the classroom. Have them find one or two examples from each of the following categories:

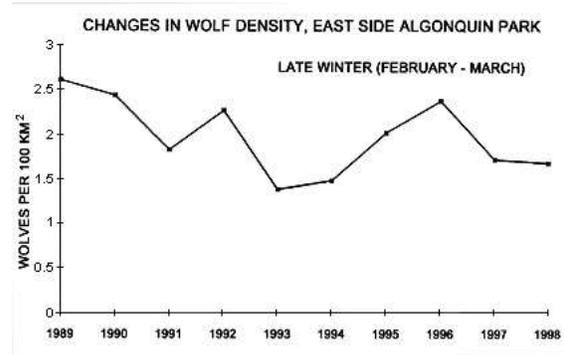
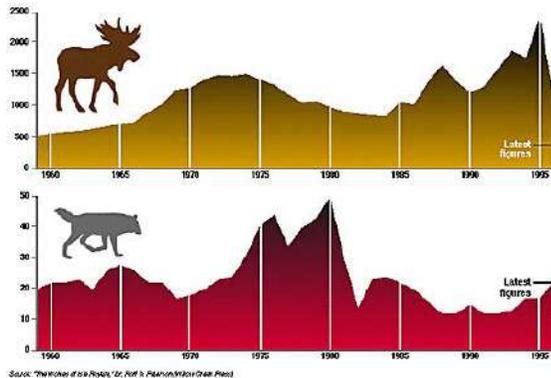
- 1) predator
- 2) pollinator
- 3) super camouflage
- 4) scavenger
- 5) nocturnal
- 6) herbivore
- 7) invertebrate
- 8) mammal
- 9) reptile
- 10) producer
- 11) primary consumer
- 12) secondary consumer
- 13) top consumer
- 14) animals with hooves
- 15) vertebrate,
- 16) migratory animal
- 17) animal that stalks prey
- 18) prey
- 19) carnivore
- 20) extremely fast

There is a variety of other criteria that could be added e.g. warm blooded, have fur, lay eggs, or sharp teeth.

Many animals would fit more than one criteria, and they would have a relatively easy time of filling in the spaces. But if an animal could only be used once, it would be more challenging. As well if they don't have the list of animals they would need to be more observant. Back at the school they can then be provided with the list of animals to try to fill in any spaces.

It would be a good idea to let them fill in the scavenger sheet after every 10 animals. That way they aren't writing constantly during the tour which would detract from it. Yet, it would be often enough so that they would likely remember what they have seen.

D) Lastly, the tour could just be a leisurely walk through Safari Niagara with the group leader constantly encouraging observations which are then shared at the end of the trip.



The above graphs represent scientific studies on predator-prey relationships. Interpretation of any of the above graphs will not only lend itself nicely to science studies, but also graphing skills. Results in the real world can also be compared with the student made graphs from the “Oh Deer!” simulation. The web-sites for the 3 graphs are at the bottom of the page in order to help teachers design their own worksheets.

Predator-Prey relationships could include:

- identifying factors that could affect predator populations (disease, not enough prey, harsh winter, hunting, etc.).
- identifying factors that could affect the prey populations (not enough winter browse, excess of predators, disease, hunting, etc.).
- comparing predator and prey population numbers.

Graphing skills could include (for either predator or prey, or both):

- identifying population numbers in a specific year.
- identifying maximum or minimum population numbers.
- identifying years in which populations increased or decreased.
- estimating mean population number
- calculating the range (from minimum to maximum)
- identifying the median, and mode for one of the populations.
- identifying and explaining patterns in any of the populations.
- comparing predator results between the various graphs

The topic “Habitats and Communities” leads to a variety of ideas and approaches. The following are starting points for other activities you may wish to pursue:

Create an action plan to improve an environment. Possibly your own school yard may be a good choice. There are many resources available for this activity. As well, funding may be obtained through local conservation groups, TD Friends of the Environment Fund, and the Trillium foundation or other businesses who offer money for environmental projects.

Choose an area and look for signs of animal life. They may not be obvious at first, however a thorough search can reveal interesting results. Feathers, worm holes, ant hills, droppings, a hole in a leaf, spider web, etc. are all significant. Try turning over logs, looking under leaves, digging into the soil, looking at water under a microscope, or looking above you, will reveal even more signs of life. The students could then assess the area as to its suitability to sustain life, or its healthiness as an environment, or the degree of human impact.

Gather literature on the human impact on the environment. Read and discuss a few articles or stories over the course of the unit. This could lead to good journal entries, debates, or discussions. Using books like “Isn’t it a Beautiful Meadow” or “The Great Kapok Tree” and “Just a Dream” are wonderful sources for identifying theme, main idea, sequence of event, or purpose of writing.

Art ideas could include the making of a mobile to represent a food chain or web. To make it look more artistic, it could be made from pictures of animals glued to cardboard. A collage showing good or bad environmental practices could be affective. And there is always the proverbial poster. However they should have a clear theme or point before attempting this.

Do a mini-research unit that compares two or three kinds of animals e.g. three different members of the cat family. It would be a good idea to choose animals from the list that they are likely to see or have seen at Safari Niagara..

Graphing animal weights or heights on a computer can be an extremely worthwhile activity.

As a class join an environmental group such as FON.

Compare two habitats e.g. wheat field and forest.

Identify as many similarities and differences as possible.

Research solutions to environmental problems. Identify the problem, the impact on the environment, and 3 or 4 solutions.

Conduct an experiment on plants. This would work out especially well if combined with the terrarium activity. Students could identify the factors that they think will affect plant growth in the terrarium environment. Each student or group of students could experiment on one of the factors that could affect plant growth. For example, sunlight might be tested. To do this 4 or 5 terrariums would need to be made. They must be identical in all aspects. However they must receive different amounts of light, or different kinds of light, e.g. artificial and natural. Graphs could be kept of plant growth which could lead to a variety of graph interpretation skills.

Research is an activity that is often done with any unit. In this unit however the research could parallel the various activities that were done. The students would pick an animal and then produce one of each type of activities that they have done as a class. It would include a range map, a Links circle, a cage design, an adaptations chart, a food chain, a food web, etc. This would be an excellent method of reviewing the material and skills of the unit.

Lastly, don't forget that students at this age seem to love any study of animals, and will often have some good ideas themselves for educational activities.

Definitions:

Adaptations: These are special structures and behaviours that help an organism to succeed in its ecosystem.

Bio-diversity: It is the variety of life within an ecosystem and includes the ecological processes.

Carnivores: They are animals that primarily eat other animals.

Consumer: They are animals that cannot make their own food, and must eat producers or other consumers for energy.

Decompose: The breaking down of materials into smaller pieces so they are reused in the ecosystem.

Decomposer: It is microscopic organisms that feed on dead and decaying matter that breaks down the material into nutrients that are then available for use by other organisms.

Ecosystem: It is all of the relationships and interactions among the living things in an environment. It includes the geography, climate, flora, and fauna.

Endangered: A species facing imminent extinction throughout all or part of its range if the limiting factors are not reversed.

Extinct: It is when all members of a species have ceased to exist.

Food Chain: It is the feeding relationships through which plants and animals depend on each other for food. It is the transfer of food energy from one living organism to another.

Food Web: They are created when two or more food chains connect.

Habitat: The region or environment occupied by a species or individual of a species.

Herbivore: They are animals that primarily only eat plants.

Limiting Factor: It is anything that helps keep a species in balance by slowing population growth.

Omnivores: They are animals that can eat both plants and animals.

Primary consumer: It is the first consumer in a food chain. They are animals that consume (eat) only green plants for food energy.

Producer: They are green plants and are the first link in the food chain. They produce food using energy from the sun.

Scavenger: An organism that eats dead organisms.

Secondary consumer: They are animals that rely on food energy from animals that are primary consumers.

Additional Resources:

The following agencies are excellent resources for all aspects of the environment. There is a wealth of online information which can be used as a teacher resource, or as student resource. There is also a variety of printed material available that can be ordered. There are many worthwhile links. As well there are many suggested activities or leads to activities which would enhance any educational program.

It is also possible to get one or more of the following to sponsor an environmental project for your class.

Federation of Ontario Naturalists (FON): This provincial organization protects nature through research, education, and conservation actions and its own collection of nature reserves. www.ontarionature.org

Canadian Parks and Wilderness Society (CPAWS): This group works co-operatively with government, First Nations, business, and other organizations and individuals to protect Canada's wild ecosystems in parks and wilderness areas. <http://www.cpaws.org/>

Canadian Wildlife Federation (CWF): They represent members and supporters from hunting and fishing organizations, and promotes the sustainable use of natural resources. Also provides information on Canadian wildlife through its "Hinterland Who's Who materials". www.cwf.fcf.org/

Ducks Unlimited (DU): This organization works to protect, restore, enhance, and manage important wetlands and habitats for the benefit of North America's waterfowl. [Www.ducks.org/](http://www.ducks.org/)

Nature Conservancy Canada (NCC): They are dedicated to creating nature preserves and conserving critical habitat by direct purchase, donations, or conservation agreements. <http://www.natureconservancy.ca/>

Wildlife Habitat Canada (WHC): This group assists in acquiring land and habitats, promotes research on managing habitat, and runs projects focusing on conservation. [Www.whc.org/](http://www.whc.org/)

World Wildlife Fund Canada (WWF): This organization is dedicated to the worldwide conservation of nature and ecological processes. www.panda.org

National Audubon Society: This organization has a vast network of affiliates who are directly involved in conservation and education. <http://www.audubon.org/>

Toronto Zoo: They have developed many outreach programs, and have promoted public involvement in research programs such as the amphibian survey. <http://www.torontozoo.com/>

Government agencies:

-Canadian Wildlife Service: www.cws.scf.ec.gc.ca

-Environment Canada: www.ec.gc.ca

-Ontario Ministry of Natural Resources: www.mnr.gov.on.ca

Niagara Peninsula Conservation authority: This local agency not only has areas that are worth visiting for field trips, but educational presentations as well. <http://www.conservation-niagara.on.ca/>

Earth day: This site includes a source of events, activities, and campaigns to promote a healthy environment. www.earthday.ca

ROM www.rom.on.ca

Bird Studies Canada: This organization which used to be the Longpoint Bird Observatory is now a national organization which is conducting vital field research in which individuals or classrooms can get involved in. <http://www.bsc-eoc.org/>

Sierra Club of Canada: This is a national organization with major campaigns on climate change, bio-diversity, and pesticide use. www.sierraclub.ca

