

# CARE FOR THE LAND

Conservation Discovery School Program



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## 1.0 PROGRAM OVERVIEW

### 1.1 PROGRAM SUMMARY

Care for the Land is an action-oriented program organized around three modules: Forests and Plants, Water, and Grassland, while including information on other aspects of the area. The students will act as assistant habitat managers to determine the health of the land, make recommendations to the Area on caring for and managing the land, and determine their own personal conservation actions. The guided hike will familiarize students with the natural history of the Cross Conservation Area, conservation concepts, and give them an opportunity to participate in hands-on activities and field experiments. The program includes pre and post visit activities, a teacher training session, an on-site orientation, and guided hike of the area.

### 1.2 PROGRAM GOALS AND OBJECTIVES

The goal of this program is to introduce students to the concepts of conservation and to help them gain an appreciation for the local environment and how to protect it. The program emphasizes the interactions and interdependencies that take place within ecosystems and uses the Cross Conservation Area as a living example for discussion and observation. We will also challenge students to take an active role in caring for the land through activities, discussions, and experiments.

After completing this program students will be able to:

- 1) Define conservation, interactions, and stewardship.
- 2) Discuss:
  - A. Why is conservation important?
  - B. How do interactions and interdependencies relate to conservation?
  - C. What is biological diversity?
  - D. What are some of the management challenges facing the Ann & Sandy Cross Conservation Area?
  - E. What students can do for natural area conservation and to care for the environment?
- 3) Demonstrate respect for nature by following Area rules.

### 1.3 PROGRAM VARIATIONS

**\*\*\* Care for the Land is a very flexible program.** Because grade 7 students learn differently than grade 9 students, we have included variations in the program material for the GRASSLAND RE-VISITED Module. Guide A is more appropriate for grade 7 and some grade 8 students, while Guide B is more appropriate for grade 9 and some grade 8 students.

All programs involve an orientation and a guided hike, with the opportunity to investigate forests and plants, water, and grassland ecosystems. Pre and post activities are described in this program manual as well.

## 2.0 PRE-VISIT ACTIVITIES



### 2.1 TOO CLOSE FOR COMFORT

#### Objective

Students will be able to describe the possible negative consequences for people and wildlife living close together and identify ways to minimize crowding of wildlife.

#### Procedure

1. Introduce the crowding concept by having half of the class be humans, a quarter be coyotes, and a quarter be mice, you could even have a teacher or parent be Calgary. Have them spread out in the room or in an outdoor space. You can create a boundary of space available (with a rope, or imaginary) and slowly the humans and Calgary will move closer and closer to the coyotes, who must move closer and closer to the mice, eventually squishing them against the habitat boundary.
2. Ask them how they think the human encroachment affects these species and others that rely on the area for survival.
3. Guiding Questions: All species require food, water, shelter, and space to survive- How do humans satisfy these needs differently than other species? What is different about the limitations against humans satisfying those needs vs. other species?
4. Discuss other conditions that may make animals more susceptible to crowding stress. Loss of habitat, human presence, breeding season, drought, and severe winter weather are a few stressful conditions.

### 2.2 TERMINOLOGY SCRAMBLE

#### Objective

This mix & match activity will introduce students to some of the terminology that will be used during the Care for the Land program at the Cross Conservation Area.

#### Procedure

1. Write out and divide the following words and definitions between separate pieces of paper (use different coloured pens or paper for each separate word and definition so they are easier to match up).

CONSERVATION	The use of natural resources	in a way that assures their	continuing availability to future generations.
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Conservation – The use of natural resources in a way that assures their continuing availability to future generations.

Stewardship- Responsible care-taking and management of natural resources that conserves them for future generations.

Interaction – The relationship of one organism to another.

Interdependencies – The interrelationships of wildlife with one another and the various elements of their environment.

Biodiversity – The number and variety of organisms in an area.

2. Hand out the different word and definition pieces (making sure that each student gets only one piece of the word or scrambled definition).
3. Students then find matching pieces of their definition and put all pieces in the right order so that the definition for their word makes sense. Students will now be gathered into small groups.
4. Have students discuss their word and definition, create a small skit about that concept (five minutes) and present it to the class. If time permits the students could do extra research on their topic through the Cross Conservation Area website [www.crossconservation.org](http://www.crossconservation.org). (See the At a Glance section) or the Cross Conservation Area information provided in section 3.0 of this guidebook.

(Note: For the concepts of interaction and interdependencies, students could pick an animal or bird that is in the Sightings section and conduct independent research on how these might interact and/or be interdependent on other plants, animals, or birds located at the Cross Conservation Area.)

## 2.3 FIELD TRIP FOUNDATIONS: EXPLORING VALUES, KNOWLEDGE, AND GOALS

### Objective

To have students think about how they perceive the grassland ecosystem, what they expect to learn and goals they personally want to achieve during this field study. This could be an interesting thing to look at after the trip as a post activity to see how their opinions and knowledge has changed.

### Procedure

1. Have the student's think about and record their previous experiences with grasslands, or some perceptions they may have about this ecosystem and get them to write these down. Use the Example Questions if you like and get the students to write goals they want to get out of this trip. Have them hand in their ideas when they are done and after the field trip day, hand them back and have them compare any changes they may have in their attitudes or opinions.

Example Questions:

- I rely on grasslands in the following ways:
- Some aspen parkland or grassland animal, plant, or insect species I know:
- Some human impacts on the grasslands include:
- What I expect to learn on this trip:
- My goals during this trip:

## 2.4 LETTER TO A FRIEND

### Objective

To have students research and become familiar with the Cross Conservation Area so that they have some background before they arrive. After their field trip they can compare this information with what they learned (see post activities).

### Procedure

1. Have students use the Background Information in part 3.0 of this guide to write a letter to a friend or relative about their upcoming visit to the Area. The letter should include answers to the following questions about conservation and the Area.
  - What is a Conservation Area?
  - How is the Cross Conservation Area different from a park, or other natural areas?
  - Who were the people that donated this land?
  - Why did they donate this land?
  - How has the Area been used in the past? Who uses it today?

## 2.5 SCHOOL YARD HABITAT STUDY

### Objective

Students will observe and study the different components of their school yard habitat in order to compare it to what they see and experience at the Cross Conservation Area. You can make this a simple study or more detailed depending on time. *Note: This activity would work best as a pre-visit activity with a post-visit comparison of the various habitat components.*

### Procedure

1. In the classroom, have the students discuss what components make up a habitat (e.g., food, shelter, air, water, soil) and create a chart for recording their observations of these components when they go outside.
2. Outside, ask students to look for evidence of each component that creates habitat. For example, you can ask what the schoolyard provides as shelter for different organisms (e.g., trees, shrubs, grass). Make sure that they note any organisms that they do see within this habitat. Students continue their observations until they have filled their chart of habitat components. If time allows and resources are available, students can try to identify species of trees, plants, insects, birds and other organisms found in the schoolyard.
3. Some questions to ask:
  - Are there places in the schoolyard that they think would create better habitat and why?
  - For what kinds of organisms would the schoolyard be suitable habitat?
  - What would need to change to make it suitable habitat for more organisms?
  - What would it need to support an animal such as a bear or cougar? At this point they might research an endangered or threatened species and look at what habitat needs they have and what would be needed to be done to the schoolyard to create habitat for that animal. What obstacles or challenges would they face?
  - How does habitat contribute to biodiversity?

4. While it likely isn't feasible to create habitat for a bear in their schoolyard, ask what would be possible for the students to create. It may be as easy as planting wildflowers for butterflies and bees or discussing the feasibility of a schoolyard naturalization project.

## **2.6 "PICK A PROJECT" DONATION**

### **(Optional donation program)**

#### **Objective**

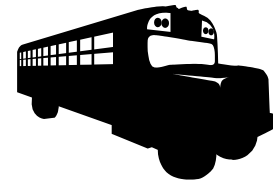
This will assist students in understanding that they can take positive action in conservation. It will also assist teachers in developing student values with respect to the environment. In certain cases this activity may also be a conservation project.

#### **Procedure**

1. Describe the Cross' donation and Suncor Energy Foundation's ongoing commitment to education.
2. Tell the students you will be visiting this natural area and it is important that it be preserved for future education. Describe our Pick a Project Donation Program and ask them to Pick a Project they think they would like to financially support.

Sample projects could be: purchasing a class set of magnifying glasses, contributing funds to an ecological study on the area, or purchasing native seed for reclamation. Other specific projects will be discussed at the inservice prior to your visit.

3. Some fund-raising options could be:
  - Have each student make a small donation (\$1.00) to a collection
  - Hold a bake sale or car wash
  - Conduct a BOTTLE DRIVE, recycle and contribute to conservation at the same time!
4. For groups that find time or money to be a concern, consider a donation of a service on the visit day. For example, arranging to have the whole class help out with the area, (e.g., cleaning up after themselves before returning to school, picking up garbage on the trail, or growing some native plants in the classroom and returning to transplant them here).
5. This activity is not meant solely as a fund-raiser, but as a means to encourage students to become actively involved in a conservation effort and to enhance the area for future visits.
6. Have the students prepared to make a presentation of their donation to ASCCA staff on the visit day. This will give us a chance to personally thank the students. We will give each class a special certificate as a small token of our appreciation.



### 3.0 ON-SITE VISIT

#### 3.1 A TYPICAL PROGRAM

- 9:30 a.m. Your group arrives by bus at Belvedere House.
- Organize group in orientation area.
- 9:45 a.m. Orientation talk given by ASCCA volunteer or staff.  
Orientation will:
- Welcome students.
  - Introduce them to the Cross Conservation Area.
  - Explain area rules and expected behavior and answer questions.
  - Introduce them to the program.
  - Accept a Pick a Project donation if applicable.
- 10:00 a.m. Snack inside and divide students into two pre-arranged groups, if appropriate.
- 10:15 a.m. Both groups head out. One group goes backwards on the Ranchers trail, one group goes forwards. Make stops along the way.
- 12:00 p.m. Lunch break.
- 12:30 p.m. Groups re-embark on hike and finish activities
- 2:00 p.m. Groups return to building for washroom break and wrap-up talk by ASCCA staff or volunteers.
- 2:30 p.m. Groups head back to school.

<b>Group A</b> (Forwards on the Ranchers Trail)	<b>Group B</b> (Backwards on the Ranchers Trail)
MODULE 1: GRASSLANDS (At Fescue sign)	MODULE 1: GRASSLAND MODULE 1 (at or after mountain lookout)
MODULE 2: WATER (at pond at the bottom of the hill)	MODULE3:FORESTS (in forest by the old seed drill)
MODULE 3: FORESTS (in forest by the old seed drill)	MODULE 2: WATER (at pond at the bottom of the hill)
MODULE 4: GRASSLAND RE-VISITED (before or at the mountain lookout)	MODULE 4: GRASSLAND RE-VISITED (at the Fescue sign)
Along the Way Activities: SOIL STOPS	Along the Way Activities: SOIL STOPS

Note : The GRASSLAND MODULE 1 and GRASSLAND RE-VISITED can be done at either grassland location on the trail. In order to be consistent, it would work best to do the GRASSLAND MODULE 1 at the first grassland stop you do, regardless of direction you are going.



**3.2 DESCRIPTION OF ACTIVITIES**

<b>Activity Title/Stop</b>	<b>Description</b>	<b>Props</b>	<b>Time required</b>	<b>Leader</b>
Orientation	Outdoors/Indoors Weather permitting Awaken Enthusiasm	ASCCA Rules	15 minutes	CCA Volunteer
Snack	Indoors/Outdoors Weather permitting		15 minutes	Teacher
Groups	Break into research teams		5 minutes	Teacher
Mission Definition	Learn the definitions by filling in the blanks and finding clues	sheets	10 minutes	Volunteer
<b>GRASSLAND</b>				
Ground Hogs	How does human impacts affect how species satisfy their basic needs?	tarp, chips	15 minutes	Volunteer
Sensory Overload	Students get an in-depth sensory experience of the grassland	scavenger hunt list, field guides	15 minutes	Volunteer
<b>SOIL</b>				
<b>ALONG THE WAY</b>	SOIL STOPS: Why is soil important? Show the students the biofacts of the components of soils and the different types we have at the area. 5 minutes each			
<b>WATER</b>				
Water sample investigation	Look at water system health. Perform water quality testing.	Water sampling kits Field Books	30 minutes	Volunteer
<b>FORESTS AND PLANTS</b>				
Tree Identification	Tree and plant identification.	Tree keys Field Books	15 minutes	Volunteer
Tree Height	Calculate the height of a tree.	Pencils Measuring Tapes Field Books	15 minutes	Volunteer
<b>GRASSLANDS RE-VISITED- GRADE 7-8</b>				
Great Grassland Evolution	Learn about the natural and human evolution of the grassland ecosystem	story, activity and sound cards	10 minutes	Volunteer
Undercover Adaptations	the predator -prey version of camouflage	animal andcards, milk jug lids	15 minutes	Volunteer
Complex Connections- energy pyramids	Describe producers and consumers in the food chain and experience how pollution can get concentrated in the web	bandanas, animal cards	10 minutes	Volunteer

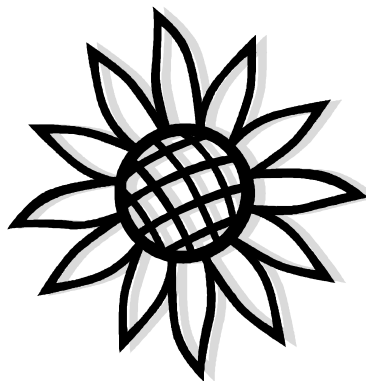
<b>GRASSLANDS RE-VISITED- GRADE 8-9</b>				
Great Grassland Evolution	Learn about the natural and human evolution of the grassland ecosystem	story, activity and sound cards	10 minutes	Volunteer
Management Mysteries	Exposes students to the complexity of land management	tarp, info cards, landuse	30 minutes	Volunteer
Taking a Stand	discuss values and attitudes towards grasslands	rope, statements	10-20 minutes	Volunteer

### 3.3 ALONG THE WAY ACTIVITIES

The volunteer leads these activities between stops. It is recommended that you do these activities in your program.

<b>ALONG THE WAY</b>				
SOIL STOPS	Have the students answer soil questions about each of the three main ecosystems we visit	Soil Questions bio-facts	5 min each	Volunteer

<b>EXTRA ACTIVITIES</b>				
Web of Life	Students examine the web of life and where they fit into it	Field Books	10	Volunteer
Scat Identification	Who Dung it? Learn what type of scat is out on the trail		5	Volunteer
Mound Identification	What is the difference between pocket gopher and ground squirrel homes?		5	Volunteer



## 4.0 ORIENTATION ACTIVITIES

Orientation: Students are given the task as assistant habitat managers to determine the health of the land. If they choose to accept the mission, they will spend the day exploring the different ecosystems and learning how habitat managers must think about and 'Care for the Land'.

**Activity 1: Mission Definition- Use the work sheet to get the students to review and learn the definitions in teams. They all must complete the puzzle correctly to get a class prize.**

The work sheets are designed to get the students familiar with terminology we may be using through out the day while giving them the opportunity to win a poster for their class. How's that for motivation!

### Definitions:

1. Conservation- The use of natural resources in a way that assures their continuing availability for future use.
2. Stewardship- Responsible care-taking and management of natural resources in a way that conserves them for future generations.
3. Interaction- The relationship of one species to another
4. Interdependence- The interrelationship of organisms with other organisms and the surrounding environment.
5. Biodiversity- The abundance and variety of species in an area
6. Food chain - refers to a dependency relationship whereby one organism is eaten by another. Several food chains make up a food web
7. Fragmentation- occurs when landscapes are divided into smaller parcels of land, eventually isolating species and discouraging movement and migration. This can be caused by roads, fences, powerlines, cultivation, towns, industry, irrigation canals, seismic and cutlines.

**Quote:** "Take nothing but pictures, leave nothing but footprints, waste nothing but time."

Definitions adapted from: Alberta Environment, Alberta Grasslands Teachers Guide, 2005  
 McGraw-Hill Ryerson Ltd. Science Focus 9: science, technology, society. 2002  
 Carroll, R.C. and G.K Meffe. Principles of Conservation Biology. 1994

***"People will not safeguard what they do not know, let alone what they do not understand. They will not protect and treat kindly what they do not appreciate."***

Ashbaugh, Chief of Outdoor Educational Services for Genessee County Parks and Recreation Commission.

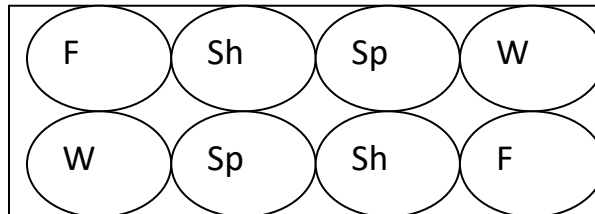
## 5.0 ON-SITE PROGRAM ACTIVITIES

### 5.1 PROGRAM ACTIVITIES

#### Module 1: Grassland

<b>Title:</b> Ground Hogs
<b>Activity Description:</b> Describes interactions and competition between a species, what species need to survive and reproduce, how humans can influence this, and why conservation is important.
<b>Objective:</b> Let students become animals and discover how human impacts can affect how they meet their basic needs. Demonstrates the effects of urban sprawl and the importance of conservation areas.
<p><b>Curriculum Connections and Key Concepts:</b></p> <p><u>Grade 7</u>                      Unit A Interactions and Ecosystems, SLOs 1, 3, 4                      ✓ Key Concepts: Environmental Management; Species Distribution; Environmental Impacts                      Unit B: Plants for Food and Fibre, SLOs 1,4                      ✓ Key Concepts: Needs and Uses of Plants; Resource Management</p> <p><u>Grade 9</u>                      Unit A Biological Diversity, SLOs 1, 4                      ✓ Key Concepts: Biological Diversity, Species, Habitat Diversity, Niches, Populations</p> <p><u>Environmental and Outdoor Education:</u>                      Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core</p>
<b>Time Required:</b> 20 minutes
<b>Materials Needed:</b> tarp, milk jug lids

1. The tarp will have 2 of each food (F), water (W), space (Sp), and shelter (Sh) caches with 5 chips representing that resource on each cache that the students must collect. If they get 1 of any chip, they survive and if they get 4 (1 of each basic need) they reproduce.
2. Have 10 students sit around the edge of the tarp until you say GO. As they gain 4 chips (1 of each resource) they can reproduce and get a friend from the side to be their offspring and once all the chips are taken, the students return the chips to the caches.
3. Next, you can try it again and as students gain 4 chips, more students should be taken from the side-lines as offspring as the population is allowed to grow. Again, after all the chips have been taken by the students they must return them to their caches.
4. Now, a city is being settled and expands rapidly so have teachers and parents walk onto half the tarp blocking students access to those chips. Now the students must get one chip to survive and must still try to reproduce or else their population will collapse and many of them should die (ie. get off the tarp).
5. Finally, a conservation area is created and the tarp is unoccupied by teachers and parents so more students can reproduce and survive etc.
6. What other ways could the population be protected (eg. parks, sanctuaries etc.)



**Module 1: Grassland**

<b>Title:</b> Sensory Overload- the 5 senses scavenger hunt
<b>Activity Description:</b> Engages students in a grassland sensory experience while addressing features and biodiversity in the grassland community.
<b>Curriculum Connections and Key Concepts:</b> <u>Grade 7 Science</u> Unit A Interactions and Ecosystems, SLOs 1, 3, 4 ✓ Key Concepts: Interactions and Interdependencies; Species Distribution; Environmental Monitoring; Succession ✓ Unit B Plants for Food and Fibre, SLOs 1, 4 ✓ Key Concepts: Resource Management; Sustainability <u>Grade 9 Science</u> Unit A Biological Diversity, SLOs 1,4 ✓ Key Concepts: Biological diversity; Species; Habitat Diversity; Niches; Populations <u>Environmental and Outdoor Education</u> ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core
<b>Time Required:</b> 10 minutes
<b>Materials Needed:</b> scavenger hunt list (1 per group of 5-6 students), pens, field books
<b>Background Information:</b> see below

**Directions:**

1. Have students get together in groups and try to find all of the specified items on the scavenger hunt list below. Any questions with actual answers are in **bold**.
2. After most groups have found most or all of the items on the list, go through the items one by one and identify what some answers may be. **Depending on site and season, not all object may be found.**
3. Talk about the difference and importance of Fescue and Brome grasses and which one supports more diversity (see background on the next page).
4. Talk about the amount of diversity on the grassland despite how it may appear compared to other ecosystems
5. Guiding Questions: What can we do protect grassland at the CCA? What can we do to protect grassland outside of conservation areas?

- Using all 5 senses discover some of the unique components in the grassland. All answers you record MUST be objects found in NATURE. DO NOT collect anything unless it says so in the instructions. Good Luck and have fun!

1. Find something that has thorns and is our provincial flower o **Wild Rose**
2. Find something spherical that is an abiotic source of energy ☀ **The Sun**
3. Collect some of the soil litter layer called humus 🌱
4. Find an insect on a blade of grass 🐛
5. Find a native grass that grows in a bunch and has purple-ish roots 🌿 What is it called? **Fescue**
6. Find an introduced grass that grows in a mat and has M's on the leaves 🌿 What is it called? **Brome Grass**
7. Find a plant that smells nice and is a light grey-green color. Can you identify this smell? ☘ **Prairie Sage**
8. Identify one sound on the grassland. Can you identify what is making it? 🗣
9. Find the colour red somewhere out there and tell us what you found ❤
10. Find something on the grassland that represents happiness to you 😊
11. Find something shiny ✨
12. Find a plant that has edible fruits that are often used in pies, jams, and pemmican X **Saskatoon Berry**

**Grassland Background:**



In April 2003, Rough Fescue was proclaimed as the provincial grass emblem for Alberta.

According to the Prairie Conservation Forum (2004),

“Rough fescue grasslands are mainly found in Canada, and Alberta has the largest area of this grassland in the world. In the foothills, rough fescue is easily recognized because it forms large tussocks known as bunch grass and has purplish stem bases. In the parkland, it has a more spreading growth habit. It provides excellent forage for livestock, in summer or winter, and is the most common native grass in Alberta’s foothills ranchlands. It also provides prime winter forage for bighorn sheep, deer, elk and bison.”

The introduced Brome grass is just one example of the many non-native plants deliberately introduced by farmers as grazing crops. Some other examples of introduced species are timothy grass, alfalfa and clover. Brome grass is extremely invasive and spreads out like a mat as it grows, choking out the native Fescue grass and other plants. In contrast, the native Fescue grows in bunches, which leaves space for other plants to grow and thereby encourages biodiversity.

As we are fortunate to have Fescue grass and native grassland at the Cross Conservation Area, we want to do what we can to protect it. This involves weed management to keep invasive weeds from taking over and scheduling cattle grazing on the native grasses to an appropriate time of the year. An upcoming Grassland and Grouse project aims to take measures to maintain the existing native grassland areas and prevent them from further shrinking.

<b>Rough Fescue Grass</b>	<b>Smooth Brome Grass</b>
 <p data-bbox="337 930 695 957">Source: Prairie Conservation Forum</p>	 <p data-bbox="954 909 1258 936">Source: Midwest Cooperatives</p>

**SOILS:**

It is important to talk about soils being essential to the survival of humans and all other living organisms. There are 3 SOIL STOPS; questions for the students to think about and answer regarding soils along the way to each ecosystem. Use the soil BIOFACT

In the Student Book:

Soil is extremely important to the survival of all living organisms on the planet! If you take the time to think about it, soil is integral to our survival and the lifestyle we enjoy. Without soil, some of the biggest problems we would face are:

- we could not eat without soil for plants to grow in
- nothing would decompose
- we would have nowhere to build our houses, buildings, roads, etc.
- we wouldn't be able to breathe without soil to support plants and photosynthesis
- pollutants and sediment in water would not infiltrate the bedrock or get filtered through soils

**So, essentially, we would have no FOOD, clean WATER, AIR, or SHELTER**  
Therefore, protecting and maintaining healthy soil is critical to ecosystem management.

**Background Information:**

There are five major **factors** that determine how soil develops. Soil components are underlined

1. **Parent material** is the mineral (non-organic) matter such as rock, soil, clay that makes up the soil.
2. **Climate** affects the types of plants that will grow, and how fast they decompose. Soil organisms (decomposers) require warmth and moisture to break down plants and animals into **humus**, a rich, dark soil that holds nutrients and water for plants.
3. The **vegetation** that grows in an area determines the amount and type of organic matter in and on the soil and protects it from erosion.
4. Water is important for bringing new soil and nutrients. In healthy soil, water and air for roots is held in the spaces between particles. Less oxygen is available if soil is saturated with water. **Topography** will affect the amount of water in an area
5. All of the above processes occur over long periods of **time**.

Healthy soil is a living community host to billions of organisms, including bacteria, fungi, earthworms, gophers and insects. These contribute to the health of the soil by breaking down plants and animal tissues into humus, aerating the soil, or making certain nutrients available to plants.

Source: McGraw- Hill Ryerson Ltd. 2001. *ScienceFocus 7: science, technology, society*. McGraw-Hill Ryerson Ltd. Whitby, ON.

A detailed vegetation and soil inventory was conducted on the ASCCA in 1997 and found several different types of soil throughout the Area. This report is quite detailed but does suggest that all of the soil types are moderately to severely limited for agricultural production. For more detailed information on the soils at the ASCCA see the report: AGRA Earth & Environmental Limited. 1997. *Vegetation and Soil Inventory of the Ann & Sandy Cross Conservation Area*. Calgary, AB.



The Cross Conservation Area strives to manage erosion and compaction by rotating pasture use by cattle, minimizing vehicle use on the land, maintaining a trail system and asking the visitors to stay on the trails. Overly eroded areas are fenced off to reduce further impact and to allow plants to reestablish.

### ALONG THE WAY



**Soil STOP-** these stops are designed to get the students thinking about soil at the different sites we visit during the day. Use the **soil Biofact** to get them thinking.

#### 1. What are the 5 main components that make up soil?

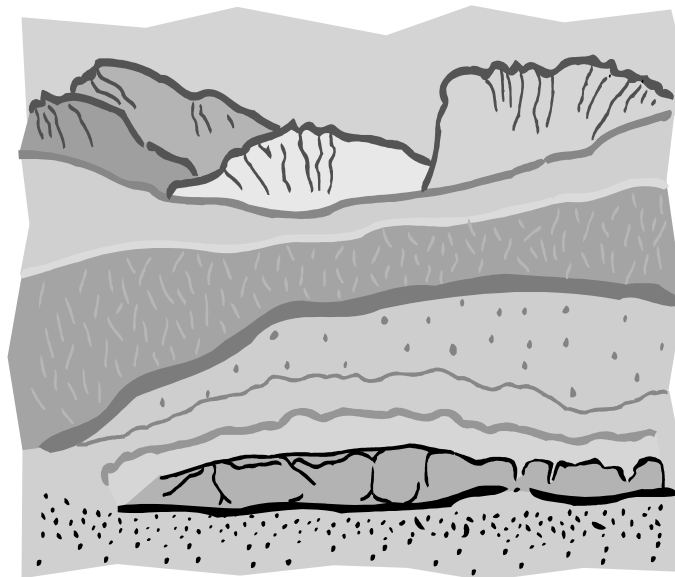
1. non- organic matter: rock, sand, and clay
2. organic matter: vegetation, waste, remains
3. soil organisms: worms, rodents, bacteria, arthropods, protozoa, fungi
4. air and water
5. nutrients: nitrogen, phosphorus

#### 2. What are 3 things affect soil quality due to human impacts on the grasslands?

- organic matter ↓ (loss of bison= loss of waste and remains)
- monocultures ↓ biodiversity (not economically feasible to have crops, livestock and pasture anymore)
- salinization (excessive irrigation raises the water table and brings dissolved salt to surface)
- soil compaction (excessive tillage by modern, heavy equipment presses soil particles together)
- fertilizer (soil gets 'addicted' and needs more every year to achieve same yields)
- Erosion (soil carried away by wind and water)

#### 3. How might the soil at the pond or a wetland be different than soil on a grassland? HINT: Think of how soil is formed.

1. parent material, 2. climate, 3. vegetation, 4. topography (which affects the amount of water), and 5. time.



**Module 2: Water**

<b>Title:</b> Water Source Investigation
<b>Activity Description:</b> Students look at water system health and conduct water quality testing. How does the health of the water contribute to biodiversity?
<b>Curriculum Connections and Key Concepts:</b> <u>Grade 7 Science:</u> Unit A: Interactions and Ecosystems, SLO's 1, 2, 4 ✓ Key Concepts: Interactions and Interdependencies, Environmental Monitoring, Environmental Impacts, Environmental Management Unit B: Plants and Fibre, SLO's 1, 2 ✓ Key Concepts: Needs and Uses of Plants, Fertilizers and Soil Nutrients, Chemicals and Biological Controls <u>Grade 8 Science:</u> Unit E: Freshwater and Saltwater Systems, SLO's 1, 3, 4 ✓ Key Concepts: Water Quality, Water-borne Materials, Erosion and Deposition, Adaptations to Aquatic Ecosystems, Human Impact <u>Grade 9 Science:</u> Unit A: Biological Diversity, SLO's 1, 4 ✓ Key Concepts: Biological Diversity Unit C: Environmental Chemistry, SLO's 1, 2,3 ✓ Key Concepts: Water Quality, Organic and Inorganic Material, Acids and Bases <u>Environmental and Outdoor Education:</u> ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core
<b>Time Required:</b> 30 minutes
<b>Materials Needed:</b> Water sampling kits
<b>Background Information:</b> See water information sheets.
<b>Directions:</b> 1) Ask students what are different ways that we can test the health of water. 2) Discuss pH and what different pH readings mean. A pH reading between 0-6.9 indicates that the substance is acidic, the closer to zero the more acidic. Lemon juice is an example of a strong acid. Where as, a pH reading of 7.1-14.0 indicates the substance is a basic. The closer to 14 the more basic the substance is. Drain cleaner is an example of a strong base. A pH reading of 7.0 is neutral. 3) Demonstrate how to conduct a pH reading by taking a sample of water and using the pH paper to determine the pH. Use your drinking water or tap water to demonstrate. If time permits, conduct a test on lemon juice and on drain cleaner samples. 4) In their student groups, have each group collect a sample of water along the water source. At the pond below the Rancher's trail have one person from each group collect a water sample and invertebrates. 5) Have students test and record the different chemical, physical and biological characteristics of their water sample (temperature, turbidity, odour, colour, flow rate, pH, and invertebrates). 6) Discuss the results. Guiding questions: What factors might affect the pH of their water? (Soil composition, plants, animals that use the water source, erosion, time of the year). What might happen to the quality of this water source if we decided to range cattle in the area? (erosion, more turbidity from sediment disruption, cow scat could pollute the water and cause algae blooms)



**Module 3: Forests and Plants**

<b>Title:</b> Seeing the Forest
<b>Activity Description:</b> How do the forests contribute to the biodiversity of the Area? Students will investigate different types of plants in the forest and look for signs of use by organisms in the forest. As well, they will take some basic tree measurements.
<b>Curriculum Connections and Key Concepts:</b> <u>Grade 7 Science:</u> Unit A: Interactions and Ecosystems: SLO's 1 ✓ Key Concepts: Interactions and Interdependencies, Species Distribution, Unit B: Plants for Food and Fibre: SLO's 1, 2 ✓ Key Concepts: Plant Varieties, Life Processes and Structure of Plants <u>Grade 9 Science:</u> Unit A: Biological Diversity: SLO's 1, ✓ Key Concepts: Biological Diversity, Species, Habitat Diversity <u>Environmental and Outdoor Education:</u> ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core
<b>Time Required:</b> 20 minutes
<b>Materials Needed:</b> Field guides and Forest Key Guides
<b>Background Information:</b> A forest can be divided into several distinct layers that are all interconnected. Each forest layer has its own characteristics and its own characteristic species, even though some animal species can be found in more than one layer. Treetops form the canopy and shade all the other plants, including young trees. Notice that trees often lose lower branches and leaves but always keep these top leaves. This is a structural adaptation to their place in the forest canopy. The understory is home to smaller trees and shrubs. The understory can be divided up into layers such as shrub, herb (e.g., flowers, mosses, ferns, and fungi), the forest floor, and the soil. The shrub layer can be quite tall or relatively inconspicuous depending on forest type or location. The herb layer of the Aspen forest sustains the largest number of species. The forest herbs have reduced light requirements and are shaded by upper layers of the forest. Many herbs have basal leaves and are evergreen. There is a narrow forest floor layer around and beneath the shrubs where many small forest inhabitants make their home. Consider leaf litter as the forest floor. Some experts also include the soil as a layer. The forest soil is a living layer full of decomposers and <u>fungi</u> that recently has been realized as essential to the health of forest trees.

***“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it’s the only thing that ever has.”***

Margaret Mead

**Forest and Plants continued****Directions:**

1. Once they have identified the types of trees, outline some boundaries then have the students look for signs of use by other organisms in the forest. They might look for scat, signs of browse, insects and insect use (e.g., webs, holes in bark or leaves, galls) rubbings, hair, tracks, birds, nests, etc.
2. No forest ecology study would be complete without some type of tree measurements. Here in pairs or groups students measure the height of a tree and diameter. Forest ecologists would probably go on to determine area (area of trees in a plot), age, and species.  
Demonstrate how to calculate the height of a tree. There are many methods to measure height indirectly, without climbing the tree or cutting it down. The method described here requires at least two people, one at the base of the tree and another at a distance from the tree. The "pencil method" uses estimation and requires no measuring equipment. Have someone hold a pencil or another object at arms length so that the top and bottom of the object line up with the top and bottom of the tree. Keeping the bottom of the pencil and tree base lined up turn it to a horizontal position. Have another person walk from the base of the tree, at a right angle from the first person, to the end of the pencil. The person walking may estimate the distance by using their footstep. You could also have students measure back to the base of the tree with a measuring tape.
3. Ask the students to use their worksheets to determine how much carbon can be sequestered from their tree.
4. Guiding question: What can you do to protect the biodiversity and health of the forest? How does the forest contribute to the biodiversity of the ASCCA? (You can have them think backwards about this by asking what would not be here if the forest disappeared?) Some answers may include: animals, birds, and insects use the forest as habitat, microorganisms and insects in the leaf litter, bacteria and nutrients in the soil, many different species of plants on the forest floor.

**GRASSLANDS RE-VISITED**

**\*\*\*Guide A and B: For Grade 7,8, and 9 classes**

<b>Activity 1: Great Grassland Evolution:</b>
<b>Objective:</b> To teach the natural and human evolution of the grasslands in an interactive way and to describe the human influences on the grasslands. This is also used prepare the students for following activities if using guide B.
<b>Time:</b> 10 minutes at most
<b>Supplies:</b> Grassland story, action and sound cards (1 set per land-use group)
<p><b>Curriculum Connections and Key Concepts:</b></p> <p><u>Grade 7 Science:</u>  Unit A: Interactions and Ecosystems: SLO's 1  ✓ Key Concepts: Interactions and Interdependencies, Species Distribution,  Unit E: Planet Earth  ✓ weathering, sudden and gradual change, geological time scale</p> <p><u>Grade 8 Social Studies:</u>  Topic A: Geography of Canada and the United States  ✓ Key Concepts: physical factors, human factors</p> <p><u>Grade 9 Science:</u>  Unit A: Biological Diversity: SLO's 1,  ✓ Key Concepts: Biological Diversity, Species, Habitat Diversity</p> <p><u>Environmental and Outdoor Education:</u>  ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core</p>
<p><b>Directions:</b></p> <ol style="list-style-type: none"> <li>1. Have the students arranged into 6 groups of 4-5 (ideally they can stay in their previous research teams). Have each group take a land-use information package (<b>agriculture, ranching, oil and gas, conservation, cities and natural factors</b>) with the costs and benefits of each use, and the action and sound cards for them to participate when the story is read.</li> <li>2. Read the story of the grassland evolution story very SLOWLY for the students and have each group give their sound and action when their word is said. Basically when their land-use is mentioned they should participate and be listening carefully when the rest of the story is being read.</li> </ol> <p><b>Follow- Up Questions:</b></p> <ol style="list-style-type: none"> <li>1. What are some of the natural factors that helped shape the grassland ecosystem?</li> <li>2. What are some of the human factors that have modified the grassland ecosystem?</li> <li>3. What are the positive and negative impacts of your land-use</li> </ol>

**\*\*\*Guide A: for grade 7 and some grade 8 classes**

<b>Activity 2: Undercover Adaptations</b> on the grassland: (a.k.a. camouflage)
<b>Objectives:</b> This game emphasizes the grassland adaptations of animals and predator/prey dynamics while exposing kids to a full sensory experience in the grass.
<b>Supplies:</b> Plant and animal cards
<p><b>Curriculum Connections and Key Concepts:</b></p> <p><u>Grade 7 Science:</u></p> <p>Unit A: Interactions and Ecosystems: SLO's 1  ✓ Key Concepts: Interactions and Interdependencies, Species Distribution</p> <p>Unit B: Plants for Food and Fibre: SLO's 1, 2  ✓ Key Concepts: Plant Varieties, Life Processes and Structure of Plants</p> <p><u>Environmental and Outdoor Education:</u></p> <p>Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core</p>
<p><b>Directions:</b></p> <ol style="list-style-type: none"> <li>1. Have the students look around at one of the lookouts (need a good spot to play camouflage!) and try to identify what wildlife might live here. Then ask what features an animal must have in order to live only in the grassland. (<b>1.speed, 2. burrowing, 3. camouflage</b>). This can introduce a modified version of Camouflage that will hopefully get them to grasp the idea of camouflage as an adaptation and defense mechanism, and the dynamics of predators and prey.</li> <li>2. Using the plant and animal cards, have all of the prey species (including plants) hide in the grass. the big predators can spread out on the edge of the game boundary and count to 20. Then they will turn around and try to find the prey species.</li> <li>3. To introduce the speed adaptation, tell the kids still left hiding that they must move closer to the predators and must collect one chip you put out (use the milk jug lids) while the predators are counting down from 15. If they can successfully run and get a chip and re-hide without being caught, they win the game. The student left closest to the predators without being caught at the end wins the 'Survival of the Fittest Award' for being the best adapted to escape predation. You can talk about how being fit helps to pass on good genes and that is how animals adapt over time.</li> </ol>

**\*\*\*Guide A: for grade 7 and some grade 8 classes**

<b>Activity 3: Complex Connections: exploring the energy pyramid</b>
<b>Title:</b> Pyramid of Life (taken from Joseph Cornell's Sharing Nature with Children)
<b>Activity Description:</b> To describe the concept of a pyramid of numbers, which shows the number of organisms consumed at different levels of the food web. It also demonstrates how pollution can get magnified throughout the levels of the pyramid.
<b>Curriculum Connections and Key Concepts:</b> <u>Grade 7 Science:</u> Unit A: Interactions and Ecosystems, SLO's 1, 2, 4 ✓ Key Concepts: Producers, Consumers, Energy Flow, Environmental Management <u>Grade 8 Science:</u> Unit E: Freshwater and Saltwater Systems SLO's 3, 4 ✓ Key Concepts: Water Quality, Adaptations to Aquatic Ecosystems, Human Impact <u>Grade 9 Science:</u> Unit C: Environmental Chemistry, SLO's 3 ✓ Key Concepts: Ingestion and Absorption of Materials, Evidence of Toxicity <u>Environmental and Outdoor Education:</u> ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core
<b>Time Required:</b> 20 minutes
<b>Materials Needed:</b> bandanas, animal and plant cards
<b>Background Information:</b> The pyramid of numbers represents the number of organisms in the successive levels of nourishment in a food chain. The producers get their energy from the sun, air, water or trace minerals. The primary consumers or herbivores eat the producers. In turn, the herbivores are eaten by the secondary consumers such as carnivores, parasites or scavengers. There can be many levels to the pyramid depending on complexity of the food chain and some organisms such as omnivores (meat and plant eaters) function at several levels. However, the pyramid works well to simplify the concept of energy levels. The pyramid can also be represented as a pyramid of biomass (the total weight of all, or a designated group of the organisms in an area). Typically, only 1/10 <sup>th</sup> of the biomass is retained from each successive level on the pyramid. That is, if the base of the pyramid starts with 1000 kilos of producers, then there would be 100 kilos of primary consumers, and ten kilos of secondary consumers etc. Even though the consumers may get bigger in size (such as a cougar) there are less of them at the top level.
<b>Directions:</b> 1) Hand out the plant and animal cards 2) Ask all those organisms that get their energy from the sun, air, water, and trace minerals to come forward and form a line (this will be all the plants). Ask them to introduce themselves. Tell them that they are the <b>producers</b> – they produce energy for themselves and for all other organisms on Earth. 3) Tell the rest of the group that they are <b>consumers</b> – they get their energy from the producers by consuming them. However, there are different types of consumers. Those that directly eat the producers are the <b>primary consumers</b> or <b>herbivores</b> and those that eat the herbivores are <b>secondary consumers</b> or <b>carnivores</b> . Ask the herbivores to step forward and kneel behind the producers. Then have the small carnivores stand behind the herbivores,



- and announce who they are. Lastly, have the large predator stand at the top of the pyramid.
- 4) Using the bandannas, tell the students that you have decided to spray the area with pesticides to control insects that are eating the plants. (Put a bandanna on the head of each plant.) The herbivores continue to eat the plants so they ingest the poison and it gets absorbed into their tissues. (Have the herbivores reach down and take the bandannas off the plants and keep eating until they have all poison.) The carnivores now eat the herbivores and store the poison in their tissues (taking all the bandannas from the herbivores and stacking them on their heads). Finally, the top predator gets all the poison after eating a lot of prey.
  - 5) Ask the students what they think will happen to this top predator. The poison will get more and more concentrated as it travels up the pyramid in a process called **biomagnification**. Animals such as eagles, peregrine falcons, northern pike and others have been greatly harmed by this magnification of chemicals. It might not occur directly to the animal itself. For example, in the case of the peregrine falcon and the chemical DDT used to control insects on crops in the mid-1900's. This bird was close to extinction because the chemical caused their egg shells to become too thin and fragile for their chicks to survive.
  - 6) **Guiding questions:** What sources of pollution might occur here on the land? How can we protect this web of life? How would a decrease in the producers affect biodiversity of an ecosystem?

*NOTE: Due to the risk of injury, students do not actually build a pyramid. By kneeling, squatting or standing in a sequence, it is simulating the different levels of a pyramid and you can ask them to imagine that they are making one*

**\*\*\*Guide B: for Grade 8 and 9 classes**

**Activity 2**

**Title:** Management Mysteries

**Activity Objectives:** This activity is designed to teach students about the complexity of habitat and resource management as well as some of the political, social, economic, and environmental factors that influence land allocation decisions.

**Curriculum Connections and Key Concepts:**Grade 8 Social Studies:

Topic A: Geography of Canada and the United States

- ✓ Key Concept: Environmental and human interactions

Grade 9 Science

Unit A: Biological Diversity, SLO 4

- ✓ Key Concepts: Biological Diversity and Habitat Diversity, human impacts on biological diversity

Environmental and Outdoor Education:

- ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core

Grade 9 Social Studies

- ✓ Topic C: Responding to Change: environmental implications of technology, mixed economies, and quality of life

Time Required: 30 min

**Materials Needed:** tarp, shower curtains, land use cards

**Background Information:** Management practices on the land are focussed on protecting habitat by limiting human impact and maintaining the quality of habitat as it exists now.

Cattle grazing and haying are used as the main management tools for habitat health. They are used to mimic the traditional role of bison on the prairies, control the fire hazard, and reduce weeds. Grazing in the forest areas also controls the encroachment of the aspen forest into the grasslands.

Of course, ranching itself contributes challenges to habitat health. Measures are taken to limit the impacts of grazing on the land. Pasture rotation reduces soil compaction and erosion.

Springs have been developed to limit erosion and pollution at the water source. A solar water pump system is also used to provide accessible water without damage to the spring or lake.

**Directions:**

1. We will have a tarp representing our grassland and we will have shower curtains that are of varying sizes representing each land-use that the students must place on the tarp as an "allocation".
2. However, not all land-uses will equally fit on the tarp. They must decide, based on the benefits and consequences, economics, basic human needs, needs of other species, and societal acceptability how much land should be allocated to each landuse and which ones should take priority.
3. We can also discuss which landuses may be able to overlap and have multiple uses on it (conservation, ranching, or sharing infrastructure (roads, bridges)
4. Just to keep it interesting, we have a group that will represent wildfire, drought, and flooding that can take away certain portions of the tarp. This can lead into a discussion about which uses can still co-exist on an altered landscape or how certain natural events may help or hinder the land uses over time.
5. Just for fun with grade 9, we can have a **reality check** and ask them who they think makes the decisions about how land is used?

**\*\*\*Guide B: for Grade 8 and 9 classes****Activity 3: Taking a Stand**

**Objectives:** This is an exercise designed to have the student's address some of their values and attitudes regarding land-use and grasslands.

**Curriculum Connections and Key Concepts:**Grade 8 Social Studies:

Topic A: Geography of Canada and the United States

- ✓ Key Concept: Environmental and human interactions

Grade 9 Science

Unit A: Biological Diversity, SLO 4

- ✓ Key Concepts: Biological Diversity and Habitat Diversity, human impacts on biological diversity

Environmental and Outdoor Education:

- ✓ Commitment To Action, Outdoor Expectations, Environmental Investigations, Outdoor Core, Personal And Group Development, Environmental Core

Grade 9 Social Studies

- ✓ Topic C: Responding to Change: environmental implications of technology, mixed economies, and quality of life

**Time:** 15-30 min depending on depth of discussion and how many statements you want to read

**Supplies:** rope, Taking a Stand statements

**Directions:**

After the grade nines or grade eights have discussed how they will allocate their grassland, it is time to discuss values and attitudes towards grasslands as a concluding individual thinking activity.

1. Spread out a rope on the ground and explain that one end represents 'strongly agree' and the other end represents 'strongly disagree'. The middle represents uncertainty or apathy towards the issue.
2. Read out a series of value-based statements and ask the students to simply walk to the strongly agree, strongly disagree, or the don't know section of a rope that has been laid out.
3. After they have spread themselves out, we try to get them to discuss why they are standing where they are on the spectrum.
4. Try to ask them related questions if they don't freely start talking. It is even better if they provide some solid arguments for each side, (or you can point out complexities that may be overlooked) and they can discuss this with each other.
5. If you have time, ask if anyone wants to change where they are standing after listening to both sides' arguments.

**5.2 EXTRA ACTIVITIES**

If time permits here are a few extra activities that can be used.

1. Title: **Web of Life**

**Directions:** Students are given a plant or animal card and in a circle say who they are (For example, I am a dandelion). Holding on to the strand of rope, toss the remainder to another plant or animal that they would be connected to in some way, whether through the food chain, habitat or some other interaction. Once everyone is connected to another organism in the web of life, introduce a disturbance such as a chemical, a disaster, or a human intervention that disrupts one organism in the web. Have that organism drop their strand. Tell the others that once they feel the web go slack they can let go of their strand and soon the web will fall apart. Relate this to the delicate balance in which all organisms are connected in the natural world and the care that humans must take not to disrupt it.

**Materials Needed:** a ball of string and animal and plant cards.

## 2. Title: Who Dung It? Scat Identification

Students will examine and identify scat and its role in the ecosystem. You can learn a lot from poop, or *scat* to those in the scientific world. Scat is an excellent way to discover who has been around, how often, what they eat, and even their health or condition. It is also important to the recycling of nutrients and energy. It provides fertilizer to plants, and even food for decomposers, insects, and other organism. The nutrients that were not absorbed by the organism that created the scat can be broken down and reabsorbed back into the earth. See the scat card for more information.

**Directions:** Along the way, ask students to look for signs of scat and try to identify what they have found. Discuss what they can learn about the organism that deposited it.

**Materials Needed:** Field Guides

## 3. Title: Mound Identification

Students will examine and identify rodent mounds. The *mounds* are made by Northern Pocket Gophers. These nocturnal rodents work at night excavating their holes and leaving the turned up dirt behind them. They cover up the entrance and exit holes, thus it is very hard to determine where they have come up to the surface.

The *holes* are made by Richardson Ground Squirrels. They are active during the day and make several high pitched PEEPS when they communicate. They leave only holes for us to see, which lead to their dens.

**Directions:** Along the way, direct students to find mounds and holes and use their guides to try to find out what made each. Have them consider what role these rodents might play in the ecosystem.

4. Bring in a poem, native legend, personal story, or quote that relates to any of the topics in this guide book.

***"We abuse the land because we regard it as a commodity belonging to us. When we see the land as a community to which we belong, we may begin to use it with love and respect."***

Aldo Leopold

## 6.0 POST-VISIT ACTIVITIES

### 6.1 WHAT DID YOUR LUNCH COST WILDLIFE?

(taken from Project Wild, 1994)

#### Objective

Students trace some foods back to their food source, examine the impacts on wildlife and the environment along the way to the consumer. Students then recommend changes to food habits that could benefit wildlife and the environment.

The food choices we make can impact wildlife and the environment.

Some agriculture practices that can have implications for wildlife include:

- Loss of habitat, although farmers can grow and harvest their crops in ways to maintain and improve wildlife habitat.
- Use of inorganic and organic fertilizers can run off or leach into water supplies and cause excess algae growth
- Use of insecticides, pesticides and herbicides can kill off a food source for wildlife or accumulate in the bodies of animals.

Other consideration of sources of impact to wildlife and the environment due to food choices involve:

- The transportation, processing, packaging and marketing industries. For example, resources are used to package the food and get them to the consumer, such as fossil fuels.
- Ethical practices in raising animals and growing plants, and the choices of food to eat (e.g., vegetarian vs. meat-eater)

In examining some of these factors, students begin to examine what they eat and how they can adopt lifestyle habits that are healthy for them and have less impact on wildlife and the environment. This is one area that junior high students have the choice to act and can make a difference as take more responsibility for what they eat.

#### Procedure

1. Students create a list of foods from their lunch, including the packaging.
2. Each student picks one food to trace back to its origins, including:
  - Where it and how it grew, was harvested, transported, packaged and sold to the consumerHave the students draw a simple flow diagram of the path the food took to get to them. The students may need to conduct additional research at this point.
3. Have the students add drawings or explanations of impacts to wildlife and the environment along the food path. As an extension, they could examine what other resources might be used along the path, such as fossil fuels, wood, water.
4. Students present their findings and their flow diagram to their classmates.
5. In a large group, have students discuss and summarize their findings.
6. Ask students to choose one lunch-time habit they can make to lessen the impact or benefit wildlife and the environment. Why did they pick this change and what consequences will it have? Suggest they track this change for one week and then discuss how easy or difficult it was to stick to it. What barriers or challenges did they face? Were there other changes they could make?

**Evaluation**

Have students name three food habits that could reduce negative effects on wildlife and the environment and explain their reasoning.

**6.2 LETTER TO MYSELF**

(taken from Joseph Cornell, *Sharing Nature with Children II*)

**Objective**

Students will reflect on their experience at the Cross Conservation Area and consider actions they can take to contribute to conservation.

**Procedure**

1. Have students write letters to themselves about their experience at the Cross Conservation Area (Writing a letter reinforces the experience for the students and imprints it in their minds. Actually mailing and receiving the letter can reinforce their enthusiasm about the experience and renew interest in continuing contact with nature.) If budget allows, provide stamps and envelopes to ensure they get sent. Or, collect the letters and hand them back several weeks later.
2. In their letters have the students answer one or more of the following questions.
  - How were things different than I thought they would be?
  - What are some different uses of the land that I didn't know before?
  - What is something that I never want to forget about this experience?
  - What are two things that I learned that I didn't know before?
  - What is one simple thing that I can do to care for the land?

You could add other questions relating to what you are learning or have learned about in class and how they related to the field trip.

**CROSS CONSERVATION AREA HABITAT STUDY (OR COMPARISON)****Objective**

Students will examine the components that comprise habitat by comparing the Cross Conservation Area to their schoolyard.

**Procedure (See Schoolyard Habitat Study for procedures)**

1. Based on their visit to the Cross Conservation Area, have students outline all the components that create habitat for wildlife at the Area and what observations they made regarding each. If comparing it with a pre or post visit schoolyard habitat study, ask students to determine and explain which habitat is likely to support more biodiversity and why.
2. Have the students list the barriers or challenges in protecting or even creating habitat for wildlife (development, housing, roads, money, proximity and use by people etc.) As well, have students write down the challenges that the Cross Conservation Area might face in maintaining and creating habitat for wildlife and possible solutions.

3. We would truly appreciate letters about the students' experiences at the Area and their thoughts and ideas on what they can do and we can do to Care for the Land. All correspondence can be sent to:

Ann & Sandy Cross Conservation Area  
Box 20, Site 23, RR8  
Calgary, AB T2J 2T9

### **6.3 GRASSLAND FOR SALE!!!**

Based on the students experience at the Cross Conservation Area and their past experiences with different media types, (especially television), have the students (in groups of 4-5) create a commercial for the grassland to sell it most effectively to a species you designate. Some ideas for species you could use are deer, coyotes, dragonflies, frogs, hawks, or any other species you want to emphasize in class.

Have the students keep in mind what your species needs to survive, what grass type they might favour, and how the grassland might satisfy these needs. In groups, they must become the grassland marketing team and must sell their plot of grassland to their specific species.

They can then present their 2-5 minute commercial with a slogan or a motto to the rest of the class and to you, who must think like the species they are assigned. You will make the ultimate decision on who has marketed their land the best and touched on the most features of the grassland.

Groups can be awarded points for clever ideas, humor (appropriate of course), and biological accuracy.

## 7.0 TAKE ACTION

There are many ways to take action to protect nature and its resources.

1. Learn more about nature. Explore a park or pond nearby, take up birding or tracking or spider-watching, research an endangered animal and learn what makes it so unique, go for a hike or bike ride. Developing an appreciation and wonder about nature is the first step to protecting nature. We take care of the livings we love.
  - ✓ Check out the Wildlife section under Conservation Links on our website [www.crossconservation.org](http://www.crossconservation.org) for some wildlife organizations to peak your interest.
2. Discover ways that you can take action.
  - ✓ Consider holding a fundraiser to contribute to our upcoming projects.
3. Check out these websites for more ideas on taking action:
  - ✓ **Canadian Parks and Wilderness Society** [www.actionchallenge.ca](http://www.actionchallenge.ca)
  - ✓ **Green Street** (link to numerous organizations and environmental action projects)  
[www.green-street.ca/links/index\\_e.html](http://www.green-street.ca/links/index_e.html) ^ click on the link for secondary projects
  - ✓ **Pembina Institute**  
[www.pembina.org/newsitem.asp?newsid=75&section=environmental\\_edu](http://www.pembina.org/newsitem.asp?newsid=75&section=environmental_edu)



- ✓ **Green Learning Online Alberta** – a Pembina Institute Website with lots of ideas of how students can take action. Take the one tonne challenge or participate in one of their other action programs.

[www.greenlearning.ca/](http://www.greenlearning.ca/)

## 8.0 REFERENCES

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## 9.0 GLOSSARY

ABIOTIC:	A non-living factor in an environment (i.e. light, water, temperature)
AESTIVATION:	Dormancy of an animal, usually to escape heat.
AMMENSALISM:	A relationship between two species in which one is affected negatively and the other is unaffected either positively or negatively.
BIOMASS:	Mass of living organisms.
BIOME:	An ecosystem of a large geographic area in which plants are of one formation and for which climate sets the limits.
BIOSPHERE:	The part of the earth's crust, water and atmosphere in which living organisms can survive.
BIOTIC:	A factor or process which is biological in nature or results from a living organism.
BROADLEAF:	A term for a plant with widebladed leaves, generally refers to flowering plants in contrast to conifers or grasses.
BROOD:	The offspring of a bird or mammal.
BROWSE:	Brushy plants utilized by deer, elk, or cattle as feed, typically feeding on the twigs, leaves, and bark.
CARNIVORE:	A meat eater.
CARRION:	The bodies of dead animals usually in a state of decay.
CLONE:	Asexually produced offspring of a common ancestor (i.e. Aspen).
COMMENSALISM:	A relationship between two species in which one benefits without affecting the other positively or negatively.
COMMUNITY:	A group of different organisms which all rely on the same physical habitat to meet their needs.
COMPETITION:	An interaction between two species in which both require the same limited resource. <u>Interspecific</u> competition occurs between two different species. <u>Intraspecific</u> competition occurs between two individuals of the same species.
CONIFER:	A plant that bears its seed in cones; usually refers to needleleaf trees; some conifers do not have needles (Yew & Larch in winter).

CONSERVATION:	The protection of natural resources.
CONSUMER:	Herbivores and carnivores that consume energy and transform it into biomass. A <u>Primary Consumer</u> is an organism that eats plants (i.e. squirrel). A <u>Secondary Consumer</u> is an organism that eats animals that eat plants (i.e. weasel). A <u>Tertiary Consumer</u> is an organism that eats animals which eats secondary consumers (i.e.hawk).
CREPUSCULAR:	Active at dawn and dusk.
DECIDUOUS:	Falling off at maturity; usually refers to trees which drop their leaves each year. May also refer to antlers which are lost.
DECOMPOSER:	Organisms that convert dead organic material into inorganic materials.
DIURNAL:	Active during the day.
ECOSYSTEM:	All living things and their environment in an area linked together by energy and nutrient flow.
FOOD CHAIN:	The representation of the flow of energy through consumer levels.
FOOD WEB:	An interlocking pattern of food chains.
GRASSLAND:	A vegetative community in which grasses are the most conspicuous members.
GUILD:	A set of coexisting species which share a common resource.
HABITAT:	The arrangement of food, water, shelter and space suitable to an animals needs.
HERBIVORE:	A plant eater.
HIBERNATION:	A dormancy stage when an animal reduces its metabolism.
INSECTIVORE:	An insect eater.
INTERACTION:	The relationship of one organism to another.
LIFE CYCLE:	The continuous sequence of changes undergone by an organism in changing from one form to another in its lifetime.
MUTUALISM:	A relationship between two species in which both benefit and both incur costs.
NICHE:	The role, function or place of an organism.

NOCTURNAL:	Active at night.
OMNIVORE:	An animal which eats both plants and animals.
PARASITISM:	A relationship between two species in which one benefits (the parasite) and one incurs a cost (the host).
PREDATOR:	An animal that kills and eats other animals.
PREY:	Animals that are killed and eaten by other animals.
PRIMARY PRODUCER	Green plants which are able to make their own food from simple organic substances.
SCAVENGER:	An organism that feeds on refuse or carrion. (Coyote & Beetle).
SYMPATRIC:	A group of different species which live in the same region.
WEB OF LIFE:	The concept that every living thing interrelates with others so if we alter one organism we alter all others. (See food web).
WILDLIFE:	Animals which are not tamed.

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