GR. 5 WETLAND ECOLOGY

TEACHERS PACKAGE

An Outdoor Field Study of Trumpeter Swans and their Wetland Habitats

Government of Alberta ■ Alberta Parks

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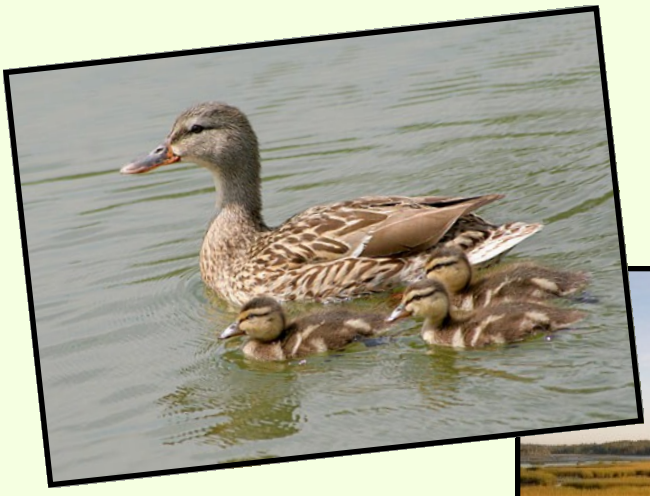
INTRODUCTION

Welcome to the teacher's planning and activity package for the ***TRUMPETER WETLAND*** *program. This full day, outdoor program provides a hands-on look at wetlands and the role they play as habitat for Trumpeter Swans in the Parkland Region around Grande Prairie. Students will explore types of wetlands in Provincial Parks or natural areas.*



PROGRAM AT A GLANCE

Time Required: ***4 hours outdoors (full day), 2 hours outdoors (halfday), 1 hour classroom***

Best season to book program: ***September, Early October, May, June***

Suggested Locations: Saskatoon Island Provincial Park, Moonshine Lake Provincial Park, Young's Point Provincial Park or a natural area near you that has a pond available.

PROGRAM OUTLINES

Students will be introduced to basic wetland ecology through a series of hands on activities in a pre-fieldtrip visit to your classroom. Following the classroom visit, a half or full day program will allow students to explore and compare two different wetland ecosystems. They will get to consider how wetlands are linked to the lands around them and how they plan an important role for Trumpeter Swans.

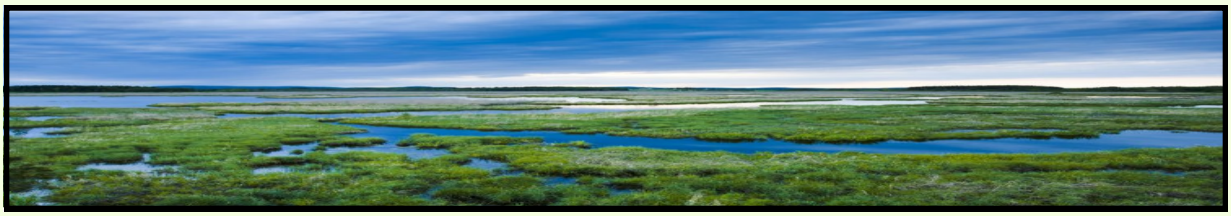
This program package will give you details on how this program fits with the Alberta Curriculum for Grade 5 Science, a planning checklist, information on what to bring and parent volunteer information.

In addition, a variety of supplementary pre-fieldtrip classroom activities, extension activities and resource materials are included to help you prepare your class for the fieldtrip and build on the topics covered in the ***WETLAND ECOLOGY*** *program.*

GRADE 5 CURRICULUM TOPICS

Life Science:

E: Wetland Ecosystems: Describe the living and nonliving components of a wetland ecosystem and the interactions within and among them.



SPECIFIC LEARNER EXPECTATIONS

- *Recognize and describe one or more examples of wetland ecosystems found in the local area.*
- *Understand that a wetland ecosystem involves interactions between living and nonliving things, both in and around the water.*
- *Identify some plants and animals found at a wetland site, both in and around the water; and describe the life cycles of these plants and animals.*
- *Identify and describe adaptations that make certain plants and animals suited for life in a wetland.*
- *Understand and appreciate that all animals and plants, not just the large ones, have an important role in a wetland community.*
- *Identify the roles of different organisms in the food web of a pond: producers, consumers, decomposers.*
- *Recognize that some aquatic animals use oxygen from air and other from water, and identify examples and adaptations of each.*
- *Identify human actions that can threaten the abundance or survival of living things in wetland ecosystems.*

CROSS-CURRICULAR CONNECTIONS

This program had been designed to meet specific curriculum requirements for the Grade 5 Science Program but there are also many curriculum connections within the Language Arts, Social Studies, Mathematics, Physical Education and Art programs of studies.

This program is also designed to reflect the goals of Parks and Protected Areas:

- *Preservation & Protection: to preserve the province's natural heritage, associated cultural heritage, ecological functions and biodiversity for current and future generations.*
- *Tourism & Community: to contribute to communities and the economy by fostering sustainable tourism experiences and ecosystem services such as clean air, land and water.*
- *Outdoor Recreation & Healthy Living: to provide inclusive nature -based outdoor recreation opportunities that contribute to societal health and well being.*

FACILITIES & SERVICES

1. *A professional interpreter will guide you on your fieldtrip and be there to answer any questions about the topics discussed .*
2. *All equipment needed for the fieldtrip will be included. There will be a break during lunch time which your class may want to bring balls, Frisbees or any other supplies for students to use during free time.*
3. *If your program is at a Provincial Park washrooms are located throughout the area.*

NOTE: *If you are spending the day in the Provincial Park, we ask that you bring any supplies that you may need for that day. If you are interested in booking the GROUP USE or DAY USE for use before or after you interpretive program, please contact the Alberta Parks office to see if there is availability.*

ALBERTA PARKS OFFICE:

780-538-5350

PLANNING CHECKLIST

- *Arrange transportation to and from the Park.*
- *Know the meeting location (Staff will let you know prior to fieldtrip).*
- *Supply name tags for the students.*
- *Check student health forms for Allergies that might be of concern. (Ensure that the Parks Staff is aware of any issues prior to the program. It is still the teachers responsibility to be prepared and administer any drugs associated with an allergy or illness).*

- *Arrange for and prepare adult volunteers (A ratio of 1 adult per 5 students is recommended).*
- *Ensure that students have a lunch and filled water bottle if necessary.*
- *Ensure students are dressed appropriately for the weather. All our programs are run in rain, snow or shine unless contacted. (See next page)*
- *Have a class discussion that reviews the role of Provincial Parks, Park Rules and behavior expectations.*

WHAT TO BRING ON THE FIELDTRIP:

The weather can be unpredictable. Please ensure that your students ***DRESS FOR THE WEATHER!***

WHAT TO WEAR:

- *Long pants*
- *Warm Sweater or Sweatshirt (Dress in layers)*
- *Waterproof Jacket and other Rain Gear*
- *Sturdy Walking Shoes*
- *Rubber Boots (Optional for pond dipping but highly recommended)*
- *Warm Socks (An extra pair of socks is helpful if other pair gets wet!)*
- *Toque, Gloves or Mittens*
- *Sunglasses or Hat*

OPTIONAL ITEMS:

- *Any Medications*
- *Binoculars*
- *Field Guides to Plants, Animals or Bugs*
- *Snacks, Lunch, Water Bottle and Water to Drink!*
- *Bug Repellant*
- *Sunscreen*

PARENT VOLUNTEER INFORMATION

ROLE: *Parent volunteers are a wonderful addition to any education program. Their main role is to help the interpreter lead groups through various activities during the fieldtrip and help keep students focused. Parent volunteers do not have to have any previous knowledge of the park.*

WHAT TO BRING FOR PARENT VOLUNTEERS:

All the activates are outdoors so please dress for the weather including protection from the sun, rain, snow or bugs. The program also involves a fair amount of walking so please wear comfortable, sturdy footwear.

PRE-FIELDTRIP ACTIVITIES

The preparatory activities described here will help you introduce the topic of wetlands to your students and will help prepare everyone for the fieldtrip. Information about wetlands have been included in this package.

1. ***Wetland Slideshow*** *- a PowerPoint presentation will help introduce the topic of wetlands, describe what a wetland is, the types of wetlands, why we need to conserve water and ways to conserve wetlands.*
2. ***Wetland Journal*** *- have students begin a journal and describe their thoughts about wetlands , what are the challenges of living in a wetland environment or describe how wetlands are important.*
3. ***Research an Animal*** *- have students write a story, poem or conduct a research project about a wetland creature that lives in your region.*
4. ***Wetland Pledge*** *- Have students research possible ways to help conserve a local wetland. Make wetland conservation a class activity. Have each student write a wetland pledge on an activity sheet (included). Place all their pledges up on a bulletin board and see if they can follow them for 1 week, month, school year? (Examples: Students could pledge to go pick up garbage around a local wetland once a week, they could pledge to use reusable bags, etc.)*
5. ***Wetland Word Search*** *- search for words about wetlands.*

WETLAND SLIDESHOW

Read over the "Basic wetland information for teachers" section before the slide show to have background knowledge on the subject. (see following pages)

SLIDE 1: *Title*

SLIDE 2: *What are wetlands? - Briefly go over definitions of wetlands with students*

SLIDE 3: *How is a Wetland different than a.....*

Puddle - most puddles can't support vegetation or homes for wildlife

River - rivers are always flowing, wetlands are not usually moving

Lake - lakes have a defined bank, it is hard to tell where the water starts in a wetland

SLIDE 4: *There are 5 types of wetlands - Swamp, Bog, Fen, Prairie Pothole, Marsh*

SLIDE 5: *SWAMP*

- *Swamps have both coniferous trees (keep leaves year round) and deciduous trees (loose leaves in winter). Trees in swamps grow around the wetland and also in the wetland. It is easy to remember a swamp as a FLOODED FOREST.*
- *There are very few swamps in Alberta. Ones that do exist consist of tall shrubs like willow and dogwood.*

SLIDE 6: *BOG*

- *Bogs are usually surrounded by coniferous trees. They have a little bit of water that flows into them and stays there but no outflow. This small movement of water pushes the oxygen out of the wetland.*
- *One of the main indications that a wetland is a bog is the layer of sphagnum moss that covers the water. This high amount of peat is very acidic, making the wetland high in acidity.*
- *Due to the low oxygen and high acidity, things cannot break down as fast and they have a tendency to preserve.*

WETLAND SLIDESHOW

SLIDE 7: *FEN*

- *Fens have usually have few trees and more grasses and shrubs. They are very similar to a bog in that it has inflow but it also has outflow. Water in a fen is moving very, very slow!*
- *They do not have many nutrients. Plants need nutrients to grow; nutrients like Nitrogen or Potassium which is found in the soil. When plants can't find the nutrients they need, as the case in a fen, they find them somewhere else.*
- *Other types of plants will move in that don't need many nutrients, They are mean plants or CARNIVOROUS PLANTS. Here are 2 examples:*
  - *The Pitcher Plant: An innocent insect will fly around this pretty looking plant. It is incredibly attracted to this plant and flies inside. The plant has hairs pointing downwards and the more the insect tries to climb out, the more it gets pushed further into the belly of this plant where it drowns in a pool of digestive juices and is absorbed by the plant.*
  - *The Sundew: Very similar to the pitcher plant except the insect gets stuck on the sticky fingers which are located on the outside of the plant. As the insect struggles, the plant can feel the motion and releases digestive juices and the insect is eaten alive!*

SLIDE 8: *PRAIRIE POTHOLE*

- *These wetlands are surrounded by mostly grasses and sedges, but not many trees.*
- *Prairie potholes are holes that are full of water in the prairies. They were carved by glaciers many years ago. When the water melted from glaciers it carved out holes in the ground.*
- *The potholes in the ground are filled with ground water and rainwater.*
- *Prairie potholes are one of the most important types of wetlands. They are important because they are home to thousands of nesting birds.*

WETLAND SLIDESHOW

SLIDE 9: *MARSH*

- *Unlike fens, marshes have plenty of nutrients which means that all types of plants grow here. (Coniferous, deciduous, bushes and grasses)*
- *One of the main indications that a wetland is a marsh is a specific type of emergent vegetation that grows there; CATTAILS. Emergent vegetation is a fancy word for plants that start growing underwater and keep growing until they poke their head out of the surface of the water.*
- *Marshes have lots of BIODIVERSITY which means lots of wildlife!*

SLIDE 10: *Guess the type of wetland - Print out a variety of pictures of wetlands. Hand them out to the students and have them try and figure out what type of wetland they have.*

SLIDE 11: *Why are Wetlands important? - (read the following sheets to have a bit of background on this) Some of the main reasons wetlands are important are: they filter out sediments and chemicals, provide food and shelter to wildlife, store excess water and absorb nutrients.*

SLIDE 12: *World in a bottle:*

(You will need a water bottle filled with water and 2 plastic cups for this activity)

Tell the students that you want them to use their imaginations. You would like them to imagine that the world is only as big as the size of a basketball (point to a classroom globe if you have one). If this were true, this would be all the water in the world (show the water bottle filled with water). 97% of this water is saltwater from oceans which we cannot drink. (Pour 97% or the water into an extra cup).

97% of the earth's water is not good for drinking so that leaves all this water.....right? NO! 2% of this water is frozen in glaciers and polar ice caps. We can't get to it. (Pour 2% of the water into the extra cup.) Who's good with math? How much water do we have left? Only 1% is left. That means that this tiny bit of water is what we find in our lakes, rivers, and wetlands. It is what we use to water our lawns, brush our teeth, shower and drink from.

WETLAND SLIDESHOW

SLIDE 13: *Things we do that impact our wetlands - Have the students brainstorm some different things (Ex, leave water running, littering, develop new malls or stores—have to drain wetlands, spill chemicals or gas near wetlands, leave lights turned on, ATVing to close to wetlands or going off of trails.*

SLIDE 14: *Wetland Pledge - (see activity sheet which is included) Have the students fill out a pledge for something they can do to help out a local wetland. Go over some examples and how they could help and then hang them up in your school or classroom. (Ex. Turn the water off when brushing teeth, use a reusable water bottle, pick up garbage around the school or wetland area, get a rain barrel for your families yard)*

BASIC WETLAND INFO FOR TEACHERS

What Are Wetlands?

- *Saturated with water (wet)*
- *Poorly drained soils*
- *Water-loving plants and biological processes*

Wetland Classifications:

Permanent *= have water in them year round*

Temporary *= have water in them only part of the year*

Semi-permanent *= wetland that tends to dry up in dryer years and holds water in other years*

Ephemeral *= have water in them for only a very short time*

Wetlands are at the edge of the "terrestrial" (or Land) and water world, which means they have a lot of diversity in terms of the plants, animals and insects that live in or around their boundaries.

Wetlands: What aren't they?

A lot of people get confused about what exactly makes a wetland a wetland. It is tempting to look at any area with water in it and call it a wetland. But not every area that is wet is a wetland. So what is not a wetland?

Well, a lake is not a wetland. Lakes have well defined beds and banks, are permanent and have fairly deep water. Although many areas in and around lakes support wetland communities, they are not by true definition a wetland. Neither, for that matter, are dugouts.

Types of Wetlands found in Alberta:

1. **BOG:**
   - Bogs are freshwater wetlands characterized by spongy peat deposits (decomposed remains of plants and grasses), a growth of evergreen trees and shrubs, and a floor covered by a thick carpet of sphagnum moss. These systems, whose only water source is rainwater, are usually found in glaciated areas of Northern Canada.

   - Water in bogs is acidic because of the high peat content. Because there is very little oxygen in the soil and water, things break down really slowly and are often preserved.

2. **MARSH**:
   - A marsh is an area that is periodically saturated, flooded or ponded with water and characterized by herbaceous (non-woody) vegetation adapted to wet soil conditions. Marshes can further be characterized into fresh or saltwater marshes.
   - Marshes are formed in depressions in the landscape where water collects as standing pools.
   - Water comes from run-off, precipitation and, in some cases, groundwater.
   - Slough is a local term for a marsh in western Canada.
   - Many emergent plants like cattails, grasses and sedges are seen in and around marshes. A number of emergent plants are adapted for living in high and low water conditions, so that if the marsh dries out, the plants will become dormant until growing conditions are suitable again.
   - Marshes are often bordered by grassy meadows, willows and shrubs, which form a 'Riparian Zone' around the marsh.

3. **PRAIRIE POTHOLE**:
   - Small marshes in the rolling hills of the prairie. Pothole depressions were left behind by glaciers and are generally isolated from other marshes by higher ground.

4. **SWAMP**:
   - Forested wetlands that are flooded seasonally by standing water.
   - Not as common in Alberta and are usually confined to the transition zone between peatland and upland forest.
   - Swamps are often referred to as forested wetlands or flooded forests since they have a cover of both deciduous and coniferous trees.

5. **FEN**:
   - Fens are less acidic then bogs and will often have floating mats of plants on them.
   - The water comes mainly from groundwater but will flow into the wetlands and out very slowly.
   - Fens support a variety of plants (mostly grasses and shrubs) but also have carnivorous plants (Ex. Pitcher plant and more common the Sundew).

Value of Wetlands:

Wetlands are valued for a number of reasons but these are the common ones:

1. Hydrology:
   - Wetlands are an important part of the hydrologic cycle. Water falls to the earth as rain or snow and finds its ay into the groundwater.
   - Wetlands contribute to storing and controlling surface water and recharge or discharge groundwater.
   - Wetlands are natural reservoirs of water, often supplying water for humans, agricultural, industrial and environmental uses. In times of flooding, wetlands slow water flow and can help reduce flooding.
   - Wetlands store excess water, releasing it during dry periods or droughts. Water stored in wetlands contributes to recharging and maintaining water table levels in some areas.

2. Life Support:
   - Wetlands are also extremely important to many species of wildlife, as they provide habitat, food, shelter, water and space.
   - Wetlands are crucial to the survival of/or for maintaining the health of many species at risk.
   - Wetlands are home to 21 rare plant species in Alberta.
   - 158 species of birds depend on wetland environments for some part of their life cycle.

3. Water Quality:
   - Wetlands are essential in maintaining water quality. They help to filter sediments, they absorb nutrients, remove chemical residues and treat wastewater.
   - The vegetation in wetlands helps to trap sediments, prevents soil erosion and prevents sediments from clogging up rivers and streams.

RESEARCH AN ANIMAL

A project intended to get students ready for their wetland fieldtrip.

Ask your students to research an animal (Mammal or Insect) that makes its home in a wetland.

Students should research:

A) Their habitat

B) The food they eat

C) Their life cycle

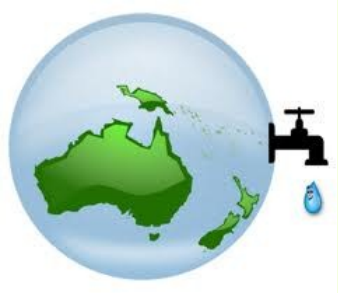
D) Their young

E) Their incredible characteristics

Some ideas of animals to research:

- *Beaver*
- *Moose*
- *Trumpeter Swan*
- *Dragonfly*
- *Mosquito*
- *Wood Frog*
- *Ruddy Duck*

You can use photos or drawings to illustrate your animal or insect. Have students present their animal to their classmates.



WETLAND PLEDGE

I _____ will pledge to...

(name)

_____

_____

_____

_____

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WETLAND WORD SEARCH

Q S G G E I Z X A W I C T T L
Z C E P S T H Q S P A N M T T
I A Q D Z E U S E R E Z Z M I
N W J F G A N A N N K T H X E
V L S P T E T I A V I M N O M
E M A I A L V M Y U C M S G E
R E C I A O R N A I R A P I R
T T R N R E T A W D N U O R G
E S D O P T E M P O R A R Y E
B Y U F F I S P H A G N U M N
R S C E E X U E L O H T O P T
A O G N P R A I R I E H X G A
T C Y Q G N Z U A R B I F X E
E E U K L G Y G F D E O S K L
P B B M O I G A R X Z T Z X I

AQUATIC
CARNIVOROUS
ECOSYSTEM
EMERGENT
FEN
GROUNDWATER
INVERTABRATE
PEATLAND
PERMANENT
POTOHOLE
PRAIRIE
RIPARIAN
SEDGE
SPHAGNUM
TEMPORARY
TERRESTRIAL

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OTHER RESOURCES

- *Wetland Ecosystems (Ducks Unlimited) http://www.ducks.ca/NATURAL/99993846.PDF*
- *Wetlands: webbed feet not required (Alberta Environment) http://environment.gov.ab.ca/info/library/8207.pdf*
- *Trumpeter Swan Society: www.trumpeterswansociety.org*
- *Tracking Radio Collared Swans: www.uen.org/swans*
- *Alberta's Wetlands: www.lethsd.ab.ca/nmh/grade5/wetlands/page1.htm*
- *Wetland Web of Life: (Canadian Parks and Wilderness Association) www.cpaws.ca*
- *Alberta Fish and Wildlife Website: www.srd.gov.ab.ca*
- *Project Wild: Resource Publication*
- *Jumbo Book of Nature Science: (by Pamela Hickman) Kids Can Press. 1996*
- *Teaching Green: www.greenteacher.com*
- *Sharing Nature with Children and Sharing the Joy of Nature with Children (by Joseph Cornel) Ananda Publications*