



PORTABLE POND PROGRAM

This one hour program is delivered in your classroom.

Please provide the following:

1. An easily read **name tag** for each student
2. Divide your class into **groups of 3 to 4 students** before the program
3. Tables or desks for your groups of students to work on

Goals

Students will be able to:

- Recognize a marsh wetland habitat
- Observe wetland biodiversity
- Record observations showing this biodiversity (optional)
- Recognize that marsh plants and animals have adaptations to their habitat

The program consists of the following activities:

1. Group discussion of "what is a wetland"
2. Grab bag of items related to "why are wetlands important"
3. Group discussion of "who lives in a wetland"
4. Discussing adaptations of our Western Painted Turtle and its predators
5. Observing and drawing (optional) of lake plants and animals

INTEGRATION WITH SCIENCE INTEGRATED RESOURCE PACKAGE

From Grade 4 Life Science: Adaptations of organisms

"By making sense of how organisms live in their environments, students develop an understanding of the diversity and interactions of living and non-living things. They research and/or experiment with animals and plants in a variety of habitats to determine the effects of structure and behaviour on both individuals and species within that environment. Students design experiments and control variables to determine how organisms respond to changes in the environment. Students can demonstrate their knowledge of how animals adapt to their surroundings by writing questions and using them to make up quizzes for others to answer. They demonstrate their scientific skills and processes when they conduct and report on their scientific investigations."

Our Program will contribute to these I.R.P. Learning Outcomes:

- Compare the structures and behaviours of local animals and plants in different habitats and communities

- Analyse simple food chains
- Determine how personal choices and actions have environmental consequences

PROGRAM OVERVIEW

What is a wetland?

WET / LAND

Usually transition zones between dry land and deep water.

All wetlands have water, special soil and hydrophytes (water loving plants).

Most common: swamps (wetlands with trees), bogs (peat accumulating, poorly drained, and acid loving plants), and marshes (our focus today).

Marshes have an inflow and outflow and are characterized by the presence of herbaceous plants such as cattails, grasses and sedges (***sedges have edges, rushes are round, bulrushes are sedges where cattails are found!***).

Why are wetlands important?

Wetland Metaphors

We will bring a grab bag of objects relating to a wetland. In this group activity we will figure out what function the object has, and how this relates to a wetland.

- * **Sponge:** plants absorb nutrients and help them cycle through the food web. Absorb excess water caused by runoff thereby prevent flooding and erosion. Retains moisture for a time even if standing water dries up.
- * **Small pillow:** Resting place for migratory birds.
- * **Soap:** Cleans the environment
- * **Egg beater:** Mixes nutrients and oxygen in the water
- * **Small doll cradle:** breeding ground for thousands of migratory birds. Provides a nursery that shelters, protects and feeds young wildlife.
- * **Strainer:** Strains silts and debris from the water, thereby keeping our water supply clean.
- * **Paper coffee filter:** Natural filtering systems that removes smaller impurities from the water (such as excess nutrients and toxins).
- * **Bottle of antacids:** wetlands trap and neutralize sewage waste and promote the decomposition of many toxic substances.
- * **Small box of cereal:** Provides nutrient rich food for wildlife and humans
- * **Toy house:** Habitat for diverse wildlife.

Who lives in a marsh?

- **Turtle talk**

Presentation with ***Wrinkles***, our live Western Painted turtle, as well as turtle objects, mink skull, raccoon skull and pelt, and heron foot.

➤ **Mini pond dip**

Each group gets 1 large white tub with lake water and assorted creatures, 4 small nets, 4 spoons, 4 small magnifying lenses, 1 ice cube tray for sorting the creatures. Optional drawing sheets.

Aquatic Creatures of the Lake Edge Marsh Habitat

Students will use **dip nets** to collect small aquatic creatures, mostly invertebrates, and transfer them into a collecting tub. Adaptations of each animal for breathing will be discussed.

These animals possess many **adaptations** to allow them to get the food, air and shelter that they need. It is interesting to observe the many ways they cope with problems of aquatic life, such as moving and breathing underwater, catching food, and seasonal temperature changes. This habitat supports a community where competition is stiff between predators and prey.

Damselfly nymphs have a very streamlined shape; **side swimmer shrimp** are flattened laterally; and **backswimmers** and **water boatmen** have oar-like legs. The 3 trailing gills of **damselfly nymphs** help in their locomotion, while the expulsion of water from the anal cavity of **dragonfly nymphs** propels them forward.

Many small, slower moving creatures, like the **snails**, **worms** and **water mites**, absorb air through their skin. While the larger or faster moving animals may also breathe through their skin, they need extra oxygen. Various anatomical features have evolved to allow these aquatic animals to obtain sufficient oxygen. **Damselfly nymphs** have 3 external gills trailing behind them and **dragonfly nymphs** have internal gills in their anal cavity. **Backswimmers** and **water boatmen** carry bubbles of air with them when they dive. Short hairs trap an air bubble giving them a silvery appearance on their sides. **Mosquito larvae and pupae**, and **Water Sticks** breathe through "snorkels".

Adaptations help hunters catch food. **Damselfly nymphs** hide in the vegetation and grab small animals by extending their lower jaws. Voracious **Giant water bugs** suck blood from their prey. **Horse leeches** use suckers to hold on. Most hunters are fast moving.

The hunted greatly outnumber the hunters. Prey organisms include millions of **plankton**. Plankton consists of free-floating, microscopic plants and animals. A rapid increase in the number of plankton is called a **plankton bloom**. This can be caused by a change in environmental conditions, such as water temperature, hours of sunshine, or the amount of sediment or dissolved minerals in the water. **Phytoplankton** (plant plankton) are found near the surface where the water is generally warmer and there is sufficient light for photosynthesis. The most common types in Swan Lake are *Volvox* or "Tennis-ball algae"; *Aphanizomenon* which looks grass clippings, and *Oedogonium* which forms large floating masses on the lake in summer. **Zooplankton** (animals) are creatures that move themselves. Our most common include *Daphnia* (water fleas), various copepods, rotifers and ostracods (seed shrimp).

Other creatures in Swan Lake Edge Habitat include: **orb and pouch snails, roundworms, flatworms, fly larvae, hydra, and fish and fish fry** of Pumpkinseed Sunfish, Stickleback and Sculpin.

HABITATS

Before your program, it would be helpful to introduce the concept of **habitat** to your students.

The **Habitat** of an animal is the "neighbourhood" where it lives and obtains everything it needs to survive: **food, water, shelter, air and space**. If one of these components is missing, the animal will cease to live there.

Habitat destruction is one of the main reasons for the decline of animal populations and endangerment of species.

In Canada, the loss of **Wetland Habitats** to farming, urban development, draining and clear cutting, and introduced invasive species has resulted in a decrease of many animal species including amphibians, waterfowl and fish.

WETLANDS

Wetlands are essentially wet lands. Water is present at or near the ground surface all or part of the time. This means that only wetland vegetation can survive in a wetland.

All wetlands have three basic characteristics:

- water
- water-saturated soils
- water-tolerant plants

Canada's Wetlands are classified into **five main groups**: bogs, fens, marshes, swamps and shallow water. These are further divided into seventy different wetlands. For more information see ***The Wetlandkeepers Handbook***. (BC Wildlife Federation or www.bcwf.bc.ca/programs/wetlands/wetlandkeepers.html)

In the Students' Journal, page 3 of ***Wetland Ecosystems I*** (Gr 4 to 6) of the ***Ducks Unlimited Canada*** kit, lists four of these wetland ecosystems: **marshes, swamps, fens** and **bogs**. These ecosystems are further described in the Students' Journal, pages 6 to 8 of the ***Wetland Ecosystems II*** (Gr 7 to 8). The former resource states "Of all the wetland types, the **marsh** is the most productive. Marshes are shallow wetlands less than two meters deep. In different areas of the marsh, different plant communities thrive. In deep water areas, **submergent** and **floating-leaved** plants grow. In the shallower portions of the marsh, **emergent** plants can be found. Marshy areas like this may also develop in the shallow parts of lakes and streams."

Wetland habitats provide animals with the necessities of life: abundant **food** source,

adequate **water** supply, **space** to live and to grow, and **shelter** for resting and nurturing young. Without wetlands, we would not have many of our own sources of food and income. The study of interactions of organisms in a wetland habitat leads to an understanding of our own impact on this environment and the role we can take in preserving and restoring wetlands.

FOLLOW-UP ACTIVITIES

1. **Microscope Work:** Investigate water life, soil, plants etc. Compare the organisms from a different pond to that of Swan Lake. Discuss why there would be differences. Is there a difference in the wetland habitat? Compare in a chart.
2. **Food Chains:** How are the plants and animals of the lake interrelated: Make a mural of pond life to show the network of "who eats whom". Make food chains in pictures.
3. Play the **Webbing Game**. See Joseph Cornell's book, Sharing Nature with Children.
4. **Pond Life:** Use clay or plasticine to make scale models of pond creatures, and make a **diorama** showing **biodiversity**.
5. **Project Wild, Project Wet, Wildlife Trees, Backyard Biodiversity, WOW The Wonders of Wetlands** (available from **Wild BC**, Ministry of Environment): use activities concerning habitat: The Beautiful Basics; Everybody Needs a Home; Habitat Lapsit; Habitacks; Habitat Rummy; Designing a Habitat; Oh Deer; Puddle Wonders; Adaptation Artistry, or specifically wetlands like Marsh Market.
6. Observe the different habitats near your school. Give them names and find out what kinds of plants and animals live there. Investigate what the animals use for food and shelter and how they are adapted.
7. Read Diane Swanson's Detective series:
The Sixth Street Wetland Detectives, 1996
The Kingfisher Camp River Detectives, 1998
And Forest and Grassland etc. detectives printed by Pacific Edge Publishing Company, Gabriola.
8. Research, discuss, draw, or create real or pretend animals that live in different habitats. This could be a group activity using their imagination. Students could even create "costumes" displaying adaptations of their animals and do a demonstration to the class.
9. Ducks Unlimited Canada **Wetland Ecosystems I** activities in their educational kit.

We greatly appreciate students' feedback! If you send artwork or writing describing your experiences we will display as many as we can around the Nature House.

TEACHERS' REFERENCES

NOTE: This is a list of some recommended books. You will probably find many other good ones. **Asterisks** denote books that have suggestions for nature activities.

*Ducks Unlimited Canada. Wetland Ecosystems I and II. www.ducks.ca 1-800-665-DUCK

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Hare, T. et C. Lepplae-Couwez. 1991. Les habitats en voie de disparition. Aladdin Books Ltd., London.

*Hickman, Pamela. 1993. Habitats. Kids Can Press Ltd., Toronto.

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Howard, Fran. 2006. Wetlands. Buddy Books

*Hunken, Jorie. 1994. Ecology for All Ages. The Globe Pequot Press.

Kalman, Bobbie. 2006. A Wetland Habitat. Crabtree Publications.

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Kozloff, E. 1976. Plants and Animals of the Pacific Northwest. University of Washington Press.

*Lingelback, J. 2000. Hands-On Nature. Vermont Inst. of Nat. Science.

Lyons, C.P. and Merrilees, Bill. 1995. Trees, Shrubs and Flowers to Know in B.C. and Washington. Lone Pine Publishing, Vancouver.

Pojar, J. and A. MacKinnon. 1994. Plants of Coastal B.C. B.C. Ministry of Forests.

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Thompson, G., J. Coldrey, G. Bernard. 1984. The Pond. Wm. Collins and Sons Co., Ltd., London.

Watson, G. 2006. Wetlands. Weigl Publishing.

*Wild BC. Project Wet, Project Wild, Backyard Biodiversity. Western Reg. Environ. Educ. Council. WOW! The Wonders of Wetlands
Distributed through workshops by B.C. Min. of Environment, Wild BC.