



PORTABLE POND PROGRAM (grades 1 – 5) – Teacher’s guide

Welcome to Swan Lake programming! We hope this booklet will give you some background information to help you prepare your class for our visit.

BEFORE WE ARRIVE:

1. Provide each student with an easily read **nametag**.
2. Have a plan for dividing your class into **6** small groups.
3. This is a **wet** program, please have a mop or paper towels available for accidental spills and clean up afterward.

Thank you for your co-operation.



Swan Lake nature programs strive to support Teachers in the classroom:

Big Ideas:

- Living things have features and behaviours that help them survive in their environment (gr.1)
- Water is essential to all living things, and it cycles through the environment (gr.2)
- Biodiversity in the local environment (gr.3)
- All living things and their environment are interdependent (gr.4)

Content:

- The ways organisms in ecosystems sense and respond to their environment (gr.4)
- Features of biomes (gr.4)

Curricular Competency:

- Questioning and predicting: How can you observe the concept of interconnectedness within ecosystems in your local area (gr.5)

Our Goals:

- Understand what a marsh wetland habitat is and its importance
- Observe biodiversity
- Make observations showing this biodiversity
- Recognize that marsh plants and animals have adaptations to their habitat

PROGRAM FORMAT

Your class will be doing these activities during this ONE HOUR program:

1. Exploring the importance of wetlands with a wetland grab bag activity
2. Observing small aquatic organisms from Swan Lake.
3. Discussing adaptations of our Western Painted Turtle and its predators.

We will provide laminated **observation sheets** for identifying the aquatic creatures during the program.

HABITATS

Before our visit, 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:

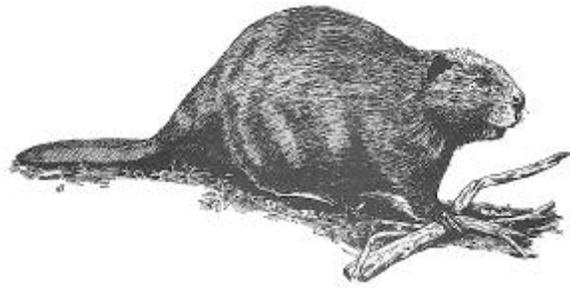
- Water
- Water-saturated soils
- Water-tolerant plants

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)

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.





WETLANDS PROGRAM ACTIVITIES

1. Wetland Metaphors

We will bring a grab bag of objects relating to a wetland. With the students, we will figure out what function the object has, how that might relate 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.
- **Baby bottle:** Breeding ground for thousands of migratory birds. Provides a nursery that shelters, protects and feeds young wildlife.
- **Strainer:** Strains silt and debris from the water, thereby keeping our water supply clean.
- **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.
- **Binoculars:** Wildlife viewing, bird watching, enjoyment out in nature.

2. Aquatic Creatures of the Lake Edge Marsh Habitat

Students will use **spoons** to collect small aquatic creatures, mostly invertebrates, and transfer them into a small observation trays (these have been collected from Swan Lake).

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; **sideswimmer 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**, "breathe" 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 like 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.

3. Adaptations: Turtle and its Predators

Students will meet our resident native **Western Painted Turtle**. We have two other types of turtles in the lake that are not native. **Red-eared** and **Yellow-eared Sliders** were sold in pet stores, and have been released into local waterways. People should not release non-native organisms into the wild. Being shy, turtles are not usually seen outside by visitors, although on warm days, they can sometimes be found basking at the edge of the lake and on the anchored logs at the west end of the lake. Students are asked to look at some of their **adaptations** and relate these to survival in their habitat.

An adaptation is something a living thing has or does to help it live in its habitat.
(Adaptations can be structural or behavioural.)

Predators of the turtle: **raccoon, mink, and Great Blue Heron**, will be discussed and students encouraged to discuss what adaptations each has to find, catch and eat turtles.

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*; *Habitatracks*; *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' artwork and writing. If you send us these about their trip to Swan Lake we will display as many as we can. Displays are put up in the long hallway to the left of the front door, in the classroom and in the Library.

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

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*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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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.