

NATURE DISCOVERY LEARNING BOOKLET

CONNECTING WITH NATURE



Watersheds
CANADA

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ACKNOWLEDGEMENTS

The following booklet was created by Watersheds Canada, including design work and content creation by Monica Seidel. The contents are linked to the Ontario curriculum for grades 7-12. Additional photography provided by Simon Lunn and Dr. Mary Ann Perron.

Watersheds Canada is a federally incorporated non-profit organization and registered Canadian charity (863555223RR0001) committed to providing education and stewardship programs to communities and individuals across the country to enhance and protect the health of their lakes, rivers, and shorelines.

This Nature Discovery project is made possible because of financial and in-kind support from:



GETTING READY TO EXPLORE NATURE



We are so excited for you to explore your local nature as you learn about different local species and how to protect the health of the Tay Watershed, and beyond!

This booklet will give you tips to safely explore nature as you learn about different animals and plants that are found along the Tay River. You will discover what a watershed and the riparian zone are, and see ways you can help nature, all with some fun activities along the way!

If you are interested in learning more about
protecting your freshwater, please visit:

watersheds.ca

STAYING SAFE



Here are some things to keep in mind when exploring outside:

- Stay home if you feel sick, if you have been in contact with anyone who has tested positive, or if you are under self-quarantine.
- Practice physical distancing and best hygiene practices when you see other people in nature.
- Bring your own mask, hat, snacks, water, sunscreen, and bug spray. Make sure to bring back any garbage you have so you can properly get rid of it at home.
- Tell someone where you are going and when you will be back.
- Watch wildlife from a safe distance and do not try to handle them.
- Do not pick any wildflowers or plants - please leave nature for everyone to enjoy.
- Wear long sleeves and long pants if walking in a wooded area. Learn more about tick safety: <https://www.ontarioparks.com/parksblog/how-to-protect-yourself-from-ticks/>

WHAT IS IN MY BACKPACK?

Water Rangers tiny test kit

- This water quality test kit is a perfect introduction to water testing!
- The kit includes:
 - a thermometer to measure water and air temperature
 - 10 test strips to measure pH (how acidic or basic the water is)
 - guides to understand test results



Waterproof Notebook

- Write down what you find while outside and in the field! Draw and take notes of what you see, smell, and hear. You can keep this notebook.



Binoculars

- What does "8x21mm" mean? These binoculars help you see things 8 times closer. The lens are 21mm wide. Turn the knob to make it clearer to see.
- Use the cleaning cloth if you need to clean the lenses (glass).



Observation Tools

- Use the collection jar to closely look at small aquatic invertebrates (they have no backbone) and insects.
- To find invertebrates, try dragging the net along the surface of the water or just below the surface (not through the mud bottom).

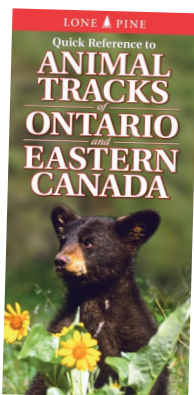
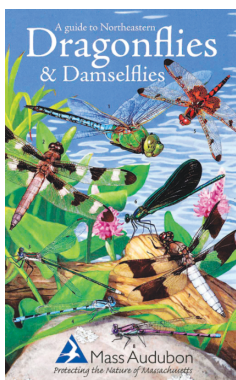
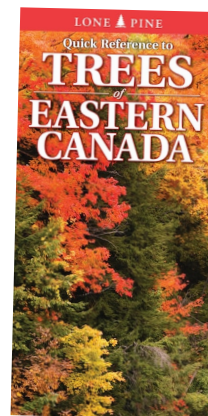


Chart C: Insects (continued)

Generalized Appearance	Microhabitats	Waters on Which	Flies on Trees or Cliffs
	2. Aquatic zone, primarily in cool, shaded areas	The edge or wing pool (shading, emergent)	2. Pines, 2. Spruce, 2. Ash, 2. Birch
	2. Aquatic zone	The edge or wing pool (shading, emergent)	2. Pines, 2. Spruce, 2. Ash, 2. Birch
	2. Aquatic zone	The edge or wing pool (shading, emergent)	2. Pines, 2. Spruce, 2. Ash, 2. Birch
	2. Aquatic zone, 2. Wetland banks, 2. Shaded areas	The edge or wing pool (shading, emergent)	None
	2. Aquatic zone or stream banks	Wing pools (shading, emergent)	2. Pines, 2. Spruce, 2. Ash, 2. Birch

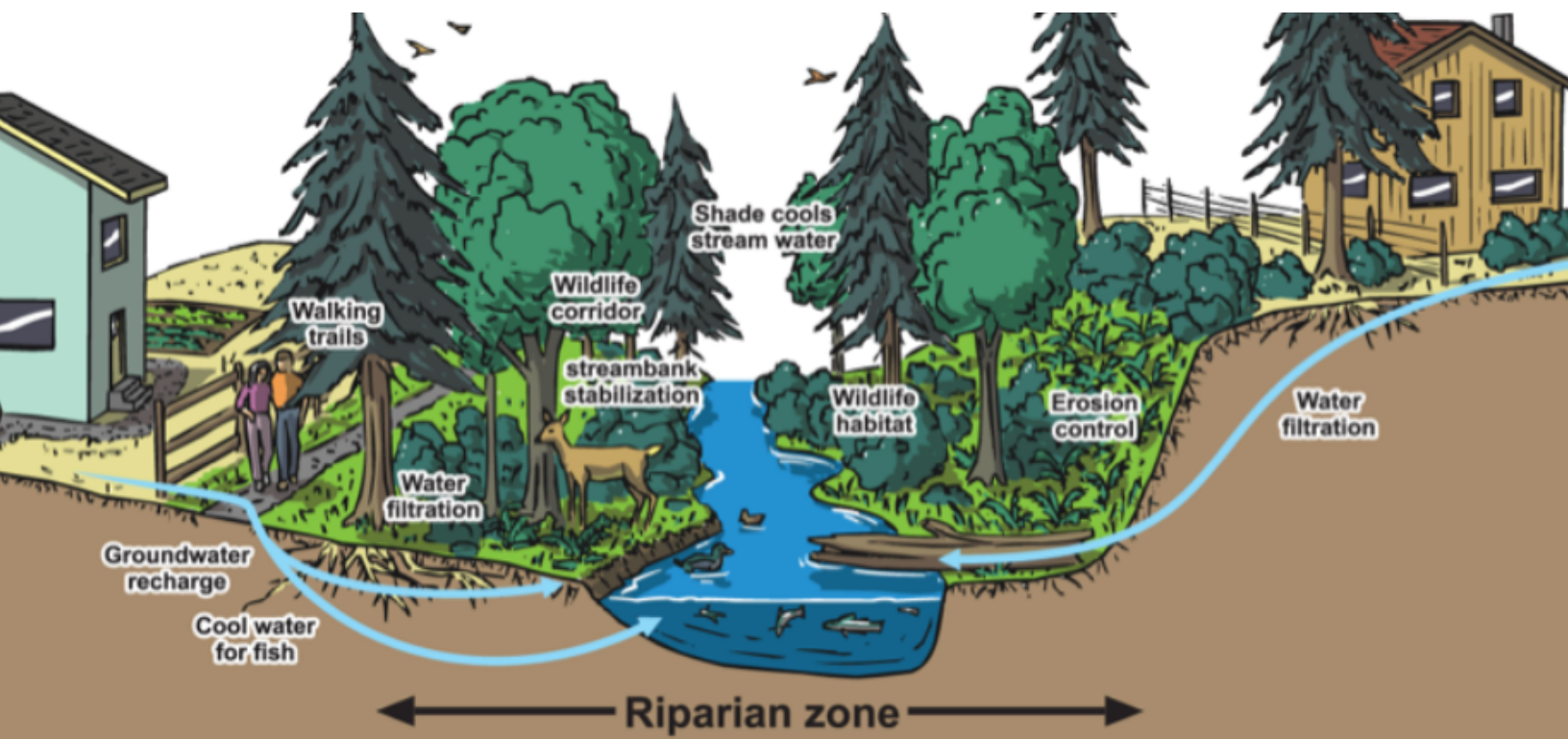


Identification Guides

Use these seven identification guides to learn more about different types of local biodiversity like wildflowers, trees, dragonflies, damselflies, birds, reptiles, amphibians, and aquatic invertebrates. Each type of guide shows photos and information about each species like their size, where they live (their habitat), and what sounds they make. See how many you can find and identify around the Tay!

THE RIPARIAN ZONE

- Shoreline ecosystems, or riparian zones, are very important and valuable habitat for land-based and water-based wildlife.
- The shoreline area includes the first 30 metres of land around a lake or river. It is considered the “ribbon of life” because it supports 70% of land-based wildlife and 90% of aquatic species at some point in their lifetime.
- Native wildlife species like birds, mammals, insects, fish, reptiles, and amphibians depend on shoreline habitat for food, water, shelter, and breeding.



Source: "Riparian Areas". (2021). Cowichan Lake and River Stewardship Society, <https://www.cowichanlandtrust.ca/portfolio-items/riparian-areas/>

ACTIVITY #1: SKETCH IT!

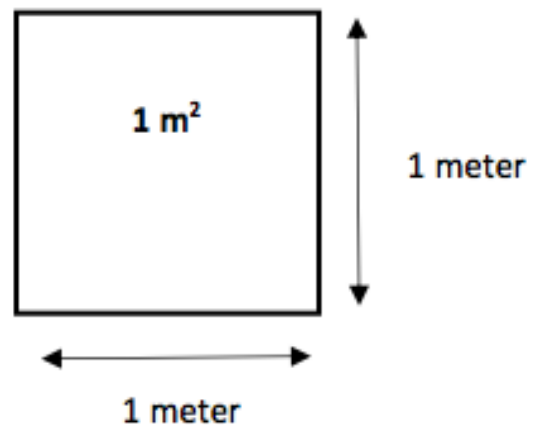
*Sketch a section of shoreline along the Tay River!
Make sure to include the riparian zone - the area of
plants between the water and the tree line.*

ACTIVITY #2: LIFE IN A SQUARE

In this activity, you will discover the diversity of living (biotic) species and non-living (abiotic) factors in a specific spot.

Find an area that seems to have a lot of biodiversity present. Your area should be about 1-metre (m) square in size.

On the next page, draw a top view of the area. Draw in any plants, rocks, insects, pollution, leaves, and any other features you find.



Kneel next to one side of your spot, and look around carefully. As you draw what you find, label what you can using your identification guides.

If you do not know the name of a species, snap a picture and try figuring it online using a website like [iNaturalist](https://www.inaturalist.org/).

Date: _____ **Time:** _____

Temperature (use your thermometer): _____

Weather conditions: _____

Follow-up questions:

1. How would you describe the diversity of your spot: high or low?
2. What non-living (abiotic) factors might affect what lives in this spot?

WHO LIVES HERE?



Red-winged Blackbird



Marsh Wren

American Bullfrog



Common Milkweed



Monarch Butterfly

White Water Lily



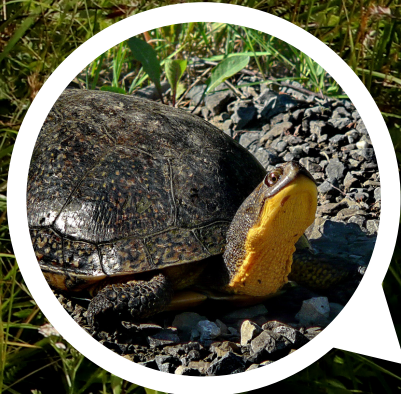
Painted Turtle



Dragonfly nymph



Northern Leopard Frog



Blanding's Turtle

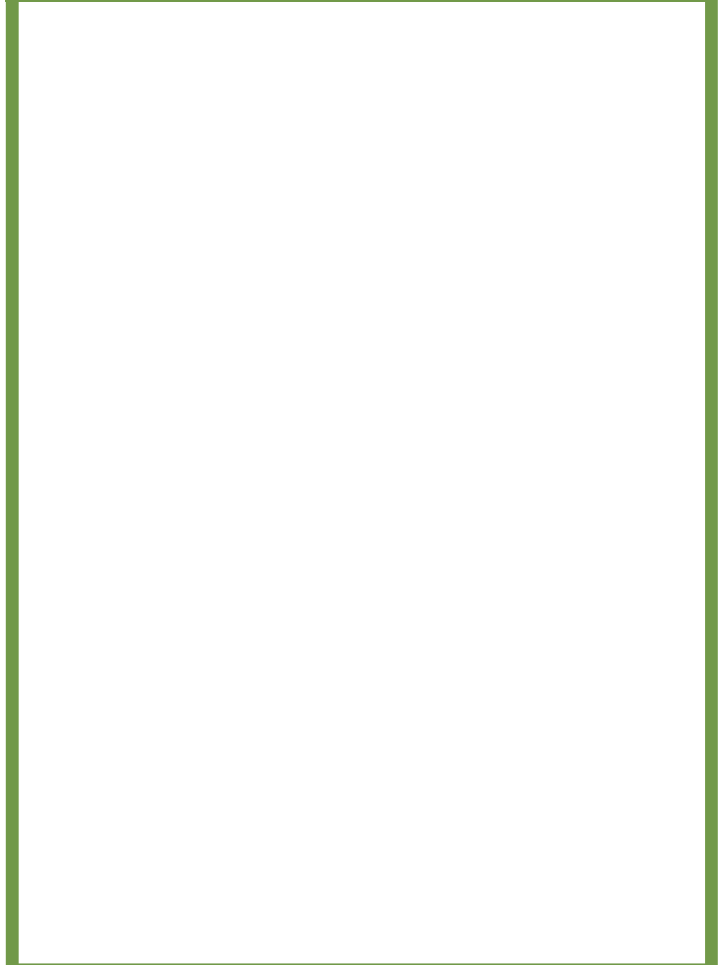
ACTIVITY #3: DO A BIO-BLITZ

A BioBlitz is a volunteer-led count of the biological species found in an area. Using your identification guides, you can get a "snapshot" of the species and biodiversity found in your area.

What can you find in 30 minutes? An hour?

BIRDS

TREES



DRAGONFLIES & DAMSELFLIES

FRESHWATER INVERTEBRATES

ANIMAL TRACKS

WILDFLOWERS

ACTIVITY #4:

TALK TO THE BIRDS

You may hear birdsong in a forest or your backyard, but have you ever tried to have a conversation with these birds?

Try to whistle and mimic (copy) their noises and use your binoculars to see if anyone comes to see you!



Red-winged Blackbird

- Males have red shoulder patch bordered in yellow (pictured)
- Have a slender, cone-shaped beak
- Habitat: near watery areas like marshes
- Close to the size of an American Robin
- Song sounds like they're singing "conk-la-ree!"



Northern Cardinal

- Females are pale brown with reddish tinges in the wings, tail, and crest, with a red-orange beak and black face around the beak
- Males are red all over, with a red bill and black face around the beak (pictured)
- Song: "cheer-cheer-cheer-purty-purty-purty"

Barred Owl

- Large owl with a round head, no ear tufts, and a medium length rounded tail
- Habitat: large, mature forests, often near water
- Nest in tree cavities (holes)
- Call: "whooo-cooks-for-you"



American Goldfinch

- In spring and early summer, males are bright yellow with black forehead and black wings with white markings (pictured)
- Habitat: fields, floodplains, roadsides, yards
- Diet: seeds
- Song: "pa-chip-chip-chip"



Northern Flicker

- This woodpecker is a ground forager, always looking for delicious insects to eat!
- Habitat: open habitats near trees (woodlands, edges, yards, and parks)
- Song: "kleeyer-wik-wik-wik"



Keep practicing your bird call identification skills with these websites:



Merlin Bird ID



ACTIVITY #5: BECOME A COMMUNITY SCIENTIST

Using the information you gathered in activities #3 and #4, consider submitting your sightings to one of the many free and open access community science programs.

When you enter your animal or plant observations online, it can help scientists and nature groups keep track of different populations over time as they see local and regional impacts from climate change, increased human development, and pollution.

Here are just a few you can pick from:



Merlin Bird ID

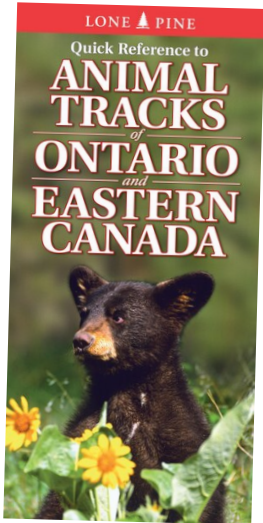




ACTIVITY #6: FOLLOW IN THEIR FOOTSTEPS

Not seeing any wildlife? You may have just missed them!

Here are some tips for finding animal tracks:

- Look for tracks in areas with wet sand and soft mud, like beaches, creek beds, trails, and puddles
 - Look in the early morning or late afternoon as the sun better illuminates shaded areas
 - Look off the trail - people's shoe prints will make it hard for you to find animal tracks
- 
- If you have never tracked an animal before, a good way to get started is to watch an animal make a track and then go look at the track right away
 - Remember that you will not always come across a track that perfectly matches what is shown in your guide! You will have to do some detective work to figure out which animal left the track.

Want more practice before you go in the field? Try this Scout Life animal track quiz: <https://scoutlife.org/quizzes/6662/>

HOW ARE PEOPLE IMPACTING NATURE?



As shorelines become more developed, humans are changing the way shorelines have looked and the species that can live there.

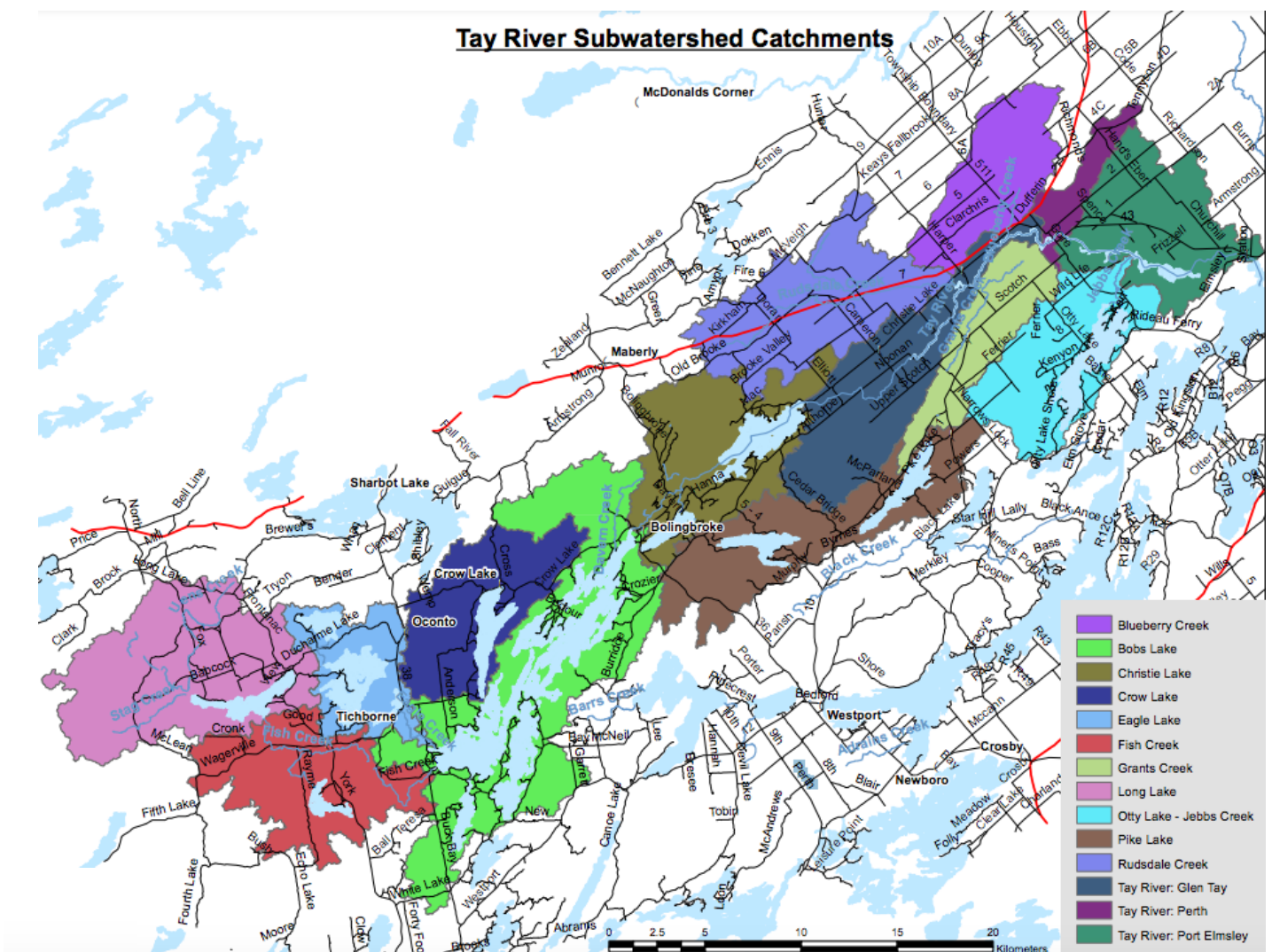
Some threats to wildlife and water health include: plastic pollution, introducing non-native (invasive) species, road mortality, and habitat removal and fragmentation.

One way to help is to replant a shoreline with native plants along the edge. This buffer helps to filter and stop things like fertilizers and pesticides from entering the water. Plant roots also help keep soil together in heavy rainstorms which prevents erosion.



THE TAY WATERSHED

- The Tay River Watershed is 850 square kilometres (km) in size and has 46 lakes.
- A **watershed** is an area of land that water flows through or across on its way to a particular water body, like a stream, river, wetland, lake, or coastline. It is the land where precipitation - like rain - falls and flows to a common, watery place.
- Did you know the Tay River is approximately 95 km long?



Source: "Watershed Information". (2021). Friends of the Tay Watershed, <https://www.taywatershed.ca/information.php>

ACTIVITY #7: WATER QUALITY EXPERIMENT

The guideline for pH (potential Hydrogen) is a range of 7.0 to 10.5 in finished drinking water (Health Canada, 2015). Generally a range of 6.5 to 8.2 is preferred for most life in the water. Different things can affect the pH of the water like an algae bloom or increased pollution.

Some aquatic animals are very sensitive to changes in pH, and are often used as living indicators ("bioindicators") of an ecosystem's health. One example is dragonflies because they have a biphasic lifecycle, meaning they spend part of their life in the water as aquatic nymphs and part of their life in the terrestrial environment as adults.



Common green darner (*Anax junius*).



Band-winged meadowhawk (*Sympetrum semicinctum*).

Reference: Health Canada (2015). Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – pH. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No H144-28/2016E-PDF).

Getting started

To compare results, use your water test kit in 5 different spots. If you cannot get to five different natural areas, use tap water and add different things to each container that might end up in our freshwater sources, like salt (road salt) and soap (car washes).

Before you begin testing, make a hypothesis - an idea that proposes a possible explanation about what will happen. Where and why do you think you will find different conditions for air temperature, water temperature, and pH?

Record your findings each time in your notebook. What did you find?



Want to learn more about the non-profit organization Water Rangers? Visit their website for videos, resources, and more: waterrangers.ca

ACTIVITY #8: POND STUDY

Your goal is to find as many different creatures as possible and identify them using your identification guides. An added bonus if you find animal tracks in the mud, too!

Materials: dip net, observation containers, identification guides

Some tips for a successful pond or lake study:

- Fill up your containers with water before starting. You are pulling aquatic creatures from the water so make sure they stay in water!
- Make sure to wash your hands before handling any creatures as sunscreen, lotions, and bug spray can be harmful to them.
- Once you are done looking at the creatures, slowly and gently pour them back in the water. Refill your container with water for your next discoveries!



HOW CAN I HELP?

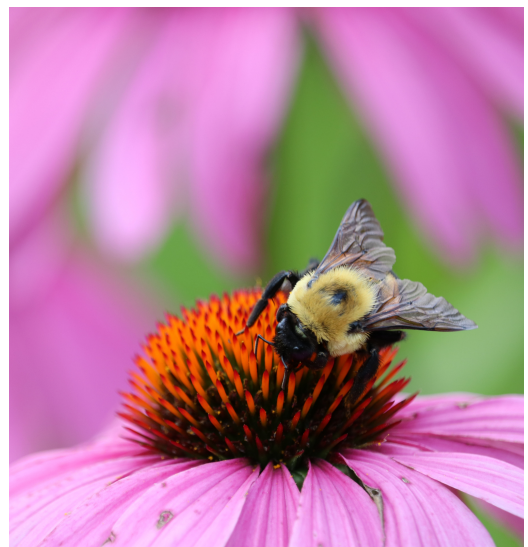
- Take photos and observations of different animals and plants you see in nature and submit them to an online database like iNaturalist, eBird, MonarchWatch, or Water Rangers.

- Do a shoreline cleanup by yourself or with your family. Snap a photo and let an organization like the Great Canadian Cleanup know what you found and how much garbage and plastic you cleaned up!



- Volunteer with a local nature group or join a field naturalist group to learn more about local wildlife and spend time in nature with other like-minded and passionate people.

- If you have a shoreline property, consider adding native plants along the shore to provide habitat, food, and stabilization to your shore. Live in the city? Plant native wildflowers to help small mammals, birds, and pollinators. Learn more: <https://naturaledge.watersheds.ca/plant-database/>



ACTIVITY #9: NATURE SEARCH

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

Ecosystem

Biodiversity

Biotic

Frog

Safety

Freshwater

Nature

Shoreline

Plants

Plastic

Riparian

Monarch

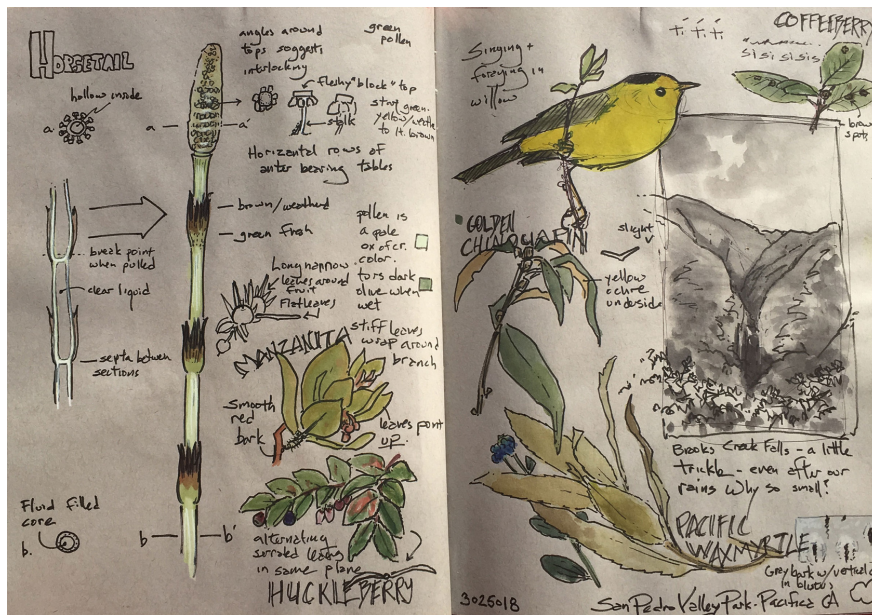
Native

Abiotic

Bird

ACTIVITY #10: NATURE JOURNALLING

Nature journaling is a way for you to document and organize what you see, smell, and hear while outside. You will collect your observations, explanations, and questions using words, drawings, and numbers (data). You do not need to be an artist!



You can journal anything that is interesting to you. Add diagrams, maps, numbers, or sketches. Count the number of species you see, and the time, weather, and date.

Source: John Muir Laws

Interested in learning more about nature journaling?

Visit: <https://johnmuirlaws.com/>



Watersheds

C A N A D A

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Great Egret