

NATURE DISCOVERY LEARNING WORKBOOK

CONNECTING WITH NATURE



Watersheds
CANADA

ACKNOWLEDGEMENTS

This workbook was created together by Watersheds Canada and Boyne Regional Library with the goal to educate students and families about the benefits of healthy waterways, lakes, and the surrounding environment for our collective future. This book is linked to the Manitoba curriculum for grades K-8. Additional photography is provided by Simon Lunn and Dr. Mary Ann Perron.

Watersheds Canada is a federally incorporated 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.

The Boyne Regional Library was first organized by The Young Citizen's Group in 1943. Today the library is a busy information hub and center for the community. With over 40,000 visits per year, a circulation of over 150,000 and approximately 500 children participating in the summer reading program the library continues to be relevant and one of the busiest rural libraries in Manitoba.

This Nature Discovery Backpack program is made possible because of support from:



Boyne Regional Library
Carman, MB

GETTING READY TO EXPLORE NATURE



We are so excited for you to explore your local nature. You will learn about different local species and how to protect the health of our local rivers, lakes, and beyond!

You can keep this workbook! This workbook will give you tips to safely explore nature, as well as information about different animals and plants that are found in this region. You will learn about watersheds and understand the role of the riparian zone. The workbook will teach you what you can do to help nature, with fun activities along the way!

Please return to Boyne Regional Library all field materials in the backpack.

If you are interested in learning more about Watersheds Canada, please visit watersheds.ca or scan this QR code!



STAYING SAFE



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

- Bring a hat, snacks, reusable bottle with water, sunscreen, and bug spray. Make sure to bring back your garbage so that you can properly get rid of it at home. With the help of an adult, you can also pick up any garbage you find in nature and bring it home for disposal!
- Tell someone where you are going and when you will be back.
- Watch wildlife from a safe distance. Do not try to handle wild things!
- Please leave nature for everyone to enjoy. Do not pick any wildflowers, fungi, or plants.
- Be tick aware. Wear long sleeves and long pants if walking in a wooded area. Learn more about tick safety: <https://www.gov.mb.ca/health/publichealth/cdc/tickborne/prevention.html>

WHAT IS IN MY WATER-THEMED 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, test strips to measure pH (how acidic or basic the water is), and guides to understand test results



Observation Tools

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



Identification Guides

Use the identification guides to learn more about different types of local biodiversity like dragonflies, aquatic macroinvertebrates, and damselflies. Each type of guide shows photos and information about each species like their size and where they live (their habitat).



RESILIENT SHORELANDS

The **Littoral Zone** extends from the water's edge to where sunlight no longer penetrates to the bottom of the water. This is where docks are built and people swim. However, we share this area with an incredible array of biodiversity as up to 90% of lake species (e.g., pike, ducks, otters and turtles) are born, raised, fed, or live in the littoral zone.

The **Shoreline** is the edge where the land and water meet. The mix of plants, shrubs, and trees form an intricate web of roots, foliage, and fallen limbs that hold the waterfront together and fend off erosion from wind, rain, boat wakes and ice.

The **Riparian Zone**, also known as the Ribbon of Life, extends inland from the shoreline for at least 15 metres and may be flooded during high water periods. It is a natural buffer protecting the shoreline, water quality, and natural habitat both on land and in the water. It is made up of trees, shrubs and grasses that absorb excess nutrients (e.g., fertilizers) and pollutants (e.g., seepage from septic systems, oil, gas and pesticides) before they can contaminate the water.

The **Upland Zone** is a drier forested area with better drainage compared to the riparian zone. The deep roots of trees stabilize the slope, the foliage buffers the effects of wind, the canopy cools its surroundings, and plants provide habitat for deer, birds, porcupines, grouse, rabbits, and many other creatures.



ACTIVITY #1: WATER QUALITY EXPERIMENT

The guideline for pH (potential Hydrogen) is a range of 7.0 to 10.5 in finished drinking water.¹ 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 algal bloom or increased pollution (e.g., road salt, car wash soap).

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*).

¹Health 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

Open your Water Rangers test kit. Take out a water test strip. Look at the pH chart. Before you begin testing, guess the pH levels of your water sample (make a hypothesis - an explanation of what you think will happen). Do you think the sample will be preferred by life in the water?



Where and why do you think you will find different conditions for air temperature, water temperature, and pH?

Record your findings each time on the Water Rangers data sheet in the test kit, or below on this page. What did you find?

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

ACTIVITY #2: BECOME A COMMUNITY SCIENTIST

Consider submitting any sightings you make while out by the water 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 community science programs you can pick from:



Merlin Bird ID



The Canadian Lakes Loon Survey is a program of Birds Canada, delivered in partnership with QuébecOiseaux.

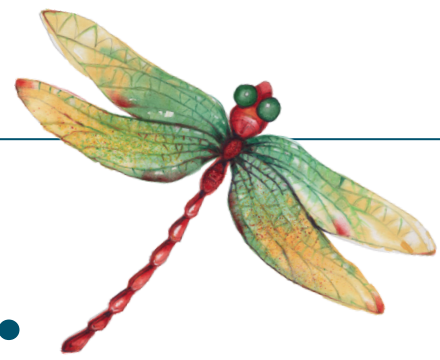
ACTIVITY #3:

COLOURING TIME!

One way Watersheds Canada works with communities to restore their local fish habitat is by building and putting brush piles back in the water. Woody debris piles (brush bundles) made up of branches, snags, and root balls give fish like pike, bass, perch, and sunfish a safe place to eat, lay eggs, rest, hide from predators, and find shade from the sun.

Colour in this pike in its new home!





ACTIVITY #4: DRAGONFLIES AND DAMSELFLIES

Design your own dragonfly using the Guide to Northeastern Dragonflies & Damselflies and describe its habitat needs.

1

2

3

4

INSECT WITH TRANSLUCENT WINGS

WINGS OPEN AND OUT AT REST

WINGS TOGETHER AT REST

THICK BODY

THIN BODY

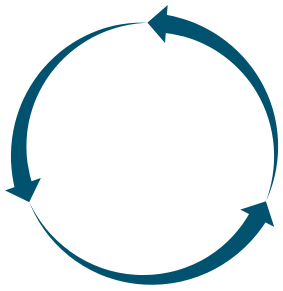
EYES CLOSE TOGETHER

GAP BETWEEN EYES

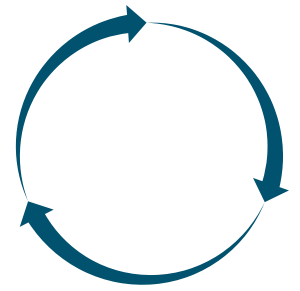
DRAGONFLY

DAMSELFLY





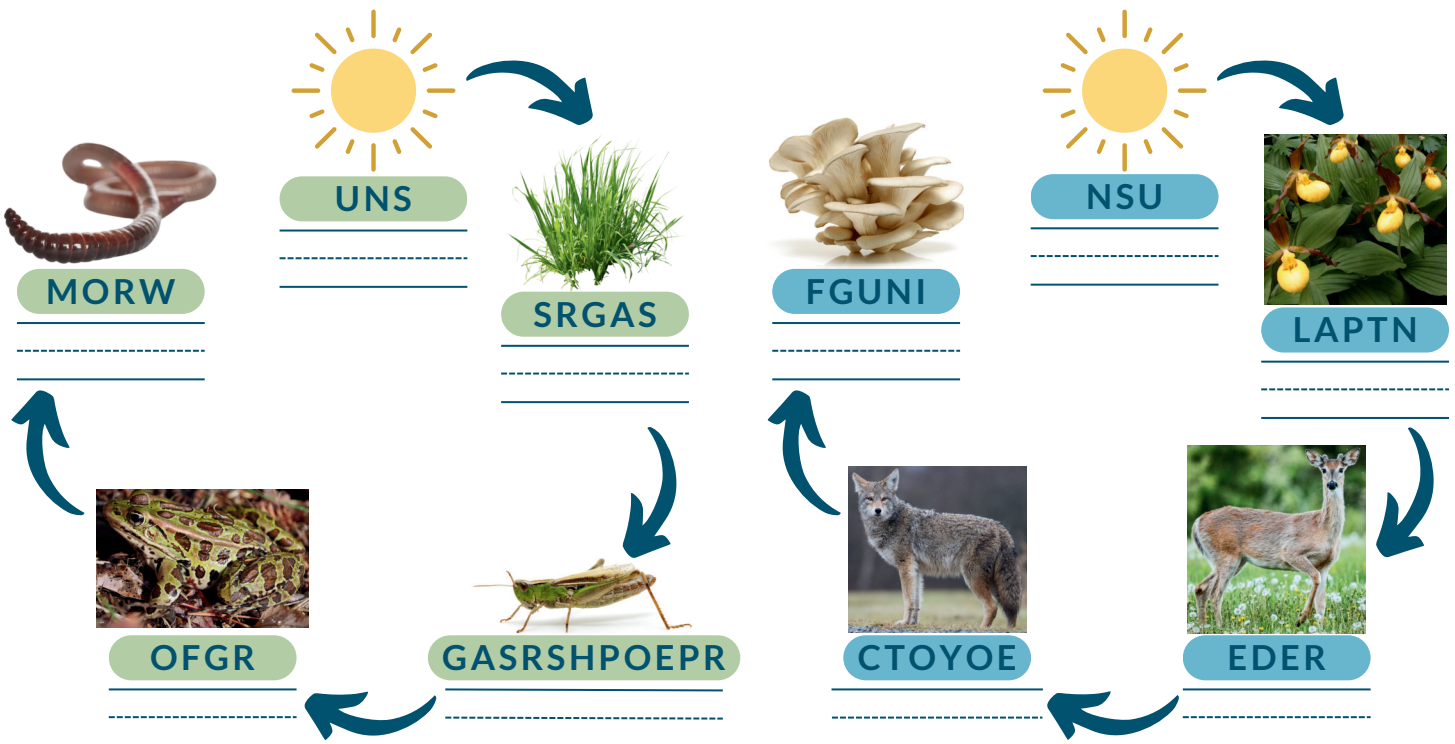
ACTIVITY #5: FOOD CHAINS



Unscramble the words using the pictures to complete the food chains.

Sunlight helps **producers** like plants to make their own food.

Primary consumers eat the plants and may be eaten by other animals called **secondary consumers**. When living things die, they become food for **decomposers** who recycle the nutrients back into the soil.



Did You Know?

A food chain shows how each living thing gets its food by depending on each other.

LAKE WINNIPEG WATERSHED

- Lake Winnipeg is about 436 kilometres long! It is a part of the Lake Winnipeg watershed. 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.
- The Lake Winnipeg watershed is the second largest watershed in Canada and includes parts of four provinces and four U.S. states.



Source: "Lake Winnipeg watershed". Environment Canada, www.ec.gc.ca/doc/publications/eau-water/COM1167/image1_e.htm

RESOURCES FOR PARENTS

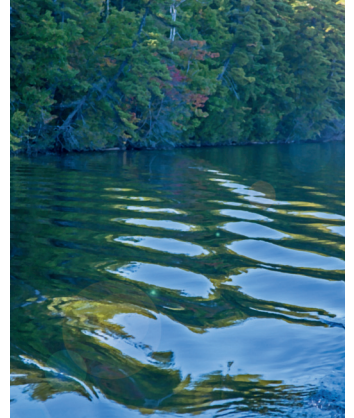
Fireworks

Noise and light from fireworks can have a negative impact on wildlife, including nest desertion. The particulate left in the sky after an explosion contains heavy metals which can land directly on the lake or be washed into the lake following a storm. This has harmful effects on the aquatic food chain. Fires and injuries to people and pets are also possible.



Be 'Wake-Aware'

Fish, wildlife habitat, shorelines, and docks are vulnerable to damage from boat wakes. Be aware of the size of your wake while operating a boat. Adjust your speed and directions to minimize your impact on shorelines. Distribute passengers throughout the boat to reduce time spent in transition speed. Wakeboard and water ski away from shorelines. If possible, opt for an outboard motor which gives the driver more control over the amount of water being forced downwards.



Natural Shorelines

As shorelines become more developed, humans are changing the way shorelines look and the species that can live there. 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. Learn more at naturaledge.watersheds.ca



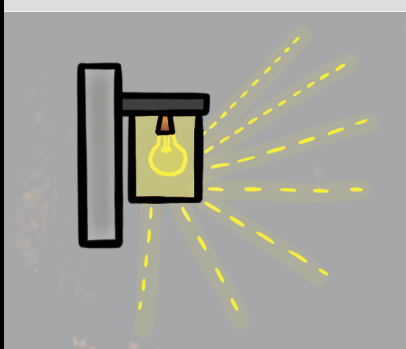
SHORELINE LIGHTING

Plants and animals have evolved to rely on Earth's natural cycles of light and dark for sleep, reproduction, eating, and protection from predators. Light pollution has a negative impact on waterfront property owners and wildlife. Glare and light trespass can reach unintended destinations far away. Many of us have likely sat at night and noticed lights at properties across the way. Take a moment to reflect on how this made you feel and consider if light from your property is also trespassing. This does not mean we have to get rid of all our outdoor lights, though! Perhaps we simply do not need as many lights, or they can be retrofitted to reduce the glare.

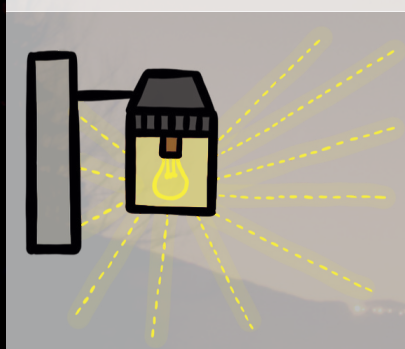
Some questions to ask yourself: Does this specific area on my property really need to be lit? Does it need to be this bright? Is the light transmitted further than it needs to be?

Not Recommended: Glare Lights

Typical 'Wall Pack'



Typical 'Yard Light'

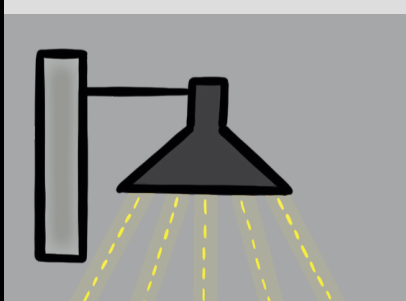


Flood Light

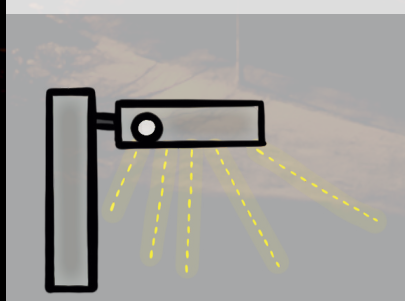


Recommended: Shielded Lights

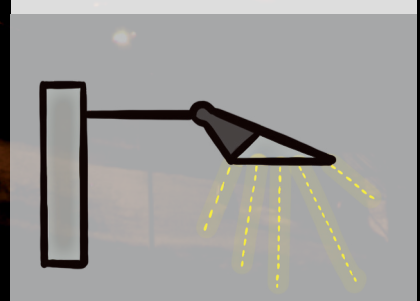
Opaque Reflector



Typical 'Shoebox'



Flood Light with Hood



Visit loveyourlake.ca/project/shoreline-lighting
to find out how shoreline lighting impacts wildlife.



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watersheds.ca



Great Blue Heron
Ardea herodias