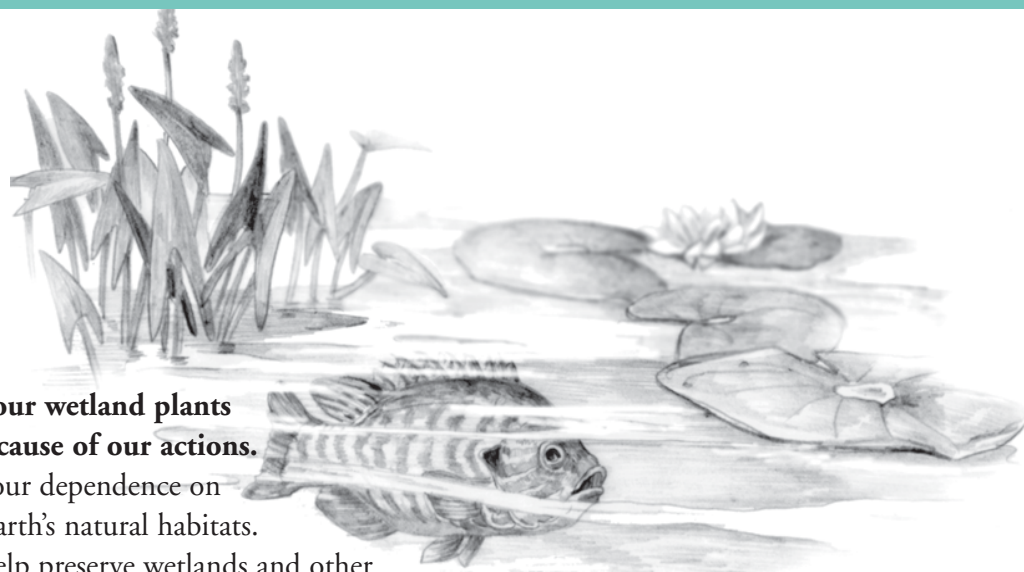


What you can do to help protect wetlands

The health and well-being of our wetland plants and animals are threatened because of our actions.

It is up to each of us to reduce our dependence on chemicals to help preserve the earth's natural habitats.

One thing that you can do to help preserve wetlands and other natural areas is to purchase organic food — food produced without the use of harmful pesticides, fertilizers or animal growth hormones. Planting your own vegetable garden and pulling weeds in your garden or lawn by hand rather than using chemicals also helps insects, birds and natural ecosystems.



Dashing Dragonflies

What you need:

- Newspaper
- Popsicle stick
- Markers or paint and paint brushes
- Glue
- Googly eyes or small rhinestones
- Scissors
- Clear packing tape
- Sewing thread (any colour or many colours!)

To make your dragonfly:

1. Spread out the newspaper over your working surface to catch any spills or splatters.
2. Colour the body (the popsicle stick) using markers or paint.
3. Glue the eyes to one end of the Popsicle stick.



4. Cut several pieces of thread of various lengths, up to a maximum of 15 centimetres.

5. Cut a piece of packing tape about 15 centimetres long. Place it sticky side up.

6. Carefully place pieces of thread on the tape to make the "veins" in the dragonfly's wings.

7. When enough veins are covering the tape, place the Popsicle stick on the tape as indicated in the illustration.

8. Cut another piece of packing tape 15 centimetres long and carefully place it sticky side down on the first piece of tape and the Popsicle stick, sealing the wings.



9. Trim the tape to look like dragonfly wings.

You can make several dragonflies and attach them with sting to a bent wire hanger to create a mobile. Or glue a magnet to the bottom of your dragonfly to make a beautiful refrigerator magnet, attach your dragonfly to a barrette for a stylish hair accessory or glue it to a wooden clothespin to make a clip to hold papers.

**ONTARIOPOWER
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OPG is committed to conserving biological diversity and protecting nature

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Damsels and Dragons in Distress

Other than in a fairy tale, where in Ontario can you find damsels and dragons? **In a wetland, of course!**

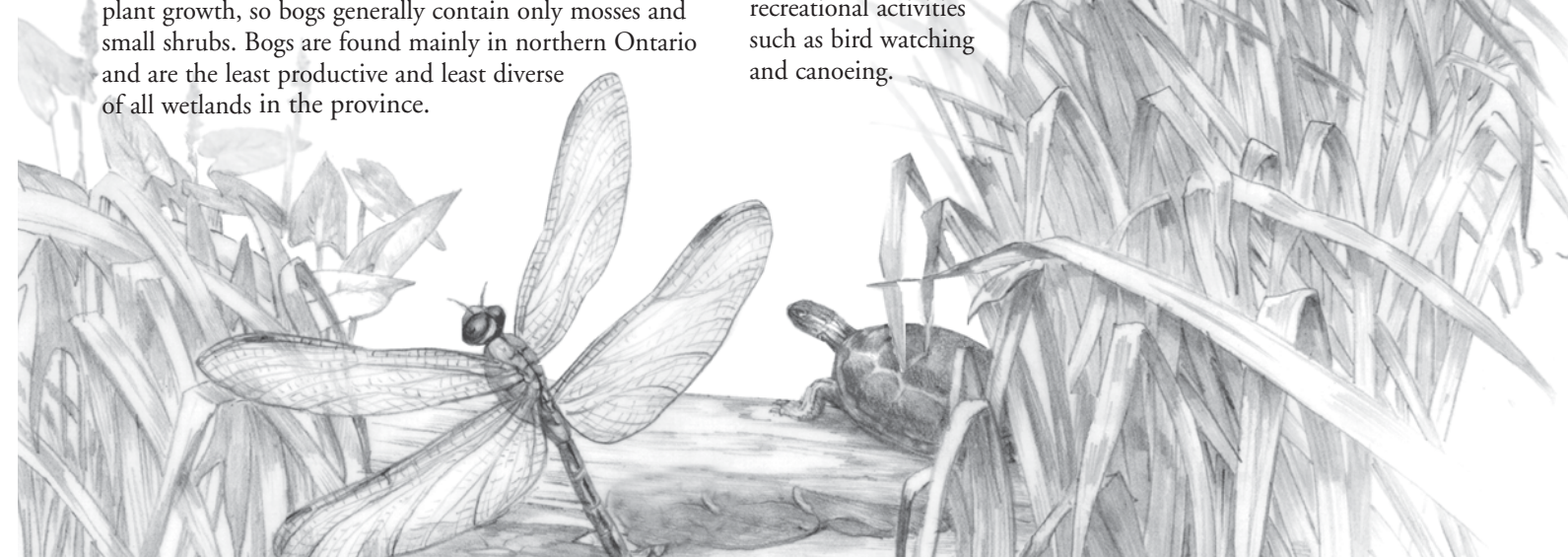
Historically, wetlands were viewed as wastelands — mosquito-infested, dark and eerie regions that were useful only if drained and filled with soil to create farmland. More recently, we have come to understand that wetlands are dynamic biomes, important habitats and one of the most diverse and productive ecosystems in the world.

Wetlands are neither completely land nor fully water, but the combination of both makes wetlands the ideal habitat for countless plant and animal species, many of which are at risk and unable to survive elsewhere.

There are four main classes of wetlands in Ontario; marshes, swamps, bogs and fens. Marshes are covered by standing or slowly moving water for most of the year. They contain abundant vegetation, including cattails and reeds, and numerous mammals, birds, insects, reptiles and amphibians. Swamps contain trees and shrubs and, although not continually covered in water, are often flooded for extended periods of time. Bogs have poor drainage and lots of standing, often stagnant, water. Because of the waterlogged nature of bogs, organic matter, such as dead leaves and animals, in bogs decompose very slowly, making the water acidic. Acidic water reduces plant growth, so bogs generally contain only mosses and small shrubs. Bogs are found mainly in northern Ontario and are the least productive and least diverse of all wetlands in the province.

Northern Ontario bogs were created when depressions in the land filled with the meltwater of retreating glaciers. Fens have a high water table and slow drainage. Also found primarily in northern Ontario, fens are slightly more productive than bogs and can support a wider variety of vegetation, including some species of trees.

Wetland ecosystems are diverse and provide important habitat for amphibians, reptiles, birds, mammals and insects. The abundance of submerged wetland vegetation helps protect the shorelines of lakes and ponds from erosion by stabilizing the soil against the impact of waves. The plentiful vegetation found in most wetlands also provides food and habitat for wetland species. Wetlands also reduce the negative impacts of flooding, help purify contaminated water and provide an ideal location for recreational activities such as bird watching and canoeing.



We know the value of wetlands, but they continue to be destroyed at an alarming rate.

Wetlands are drained of water to create farmland, filled with soil to make room for housing developments and polluted by pesticides and fertilizers from fields and lawns and by heavy metals and toxic chemicals from factories.

Wetlands can be damaged directly or indirectly. Direct damage is easy to see and occurs when humans deliberately change the landscape through draining the water and filling in the land with soil. This has been the most common type of wetland destruction in the past, as the human population of the province expanded and more and more land was needed for both housing and food production. Unfortunately, wetlands made ideal locations for farming due to the high organic content of their soil. Some of Ontario's most productive farming regions, such as the Holland Marsh area, were once wetlands.

Indirect damage occurs when excessive nutrients and chemicals enter the wetland in runoff from agricultural lands, sewage treatment facilities or factories. Some wetland plants, such as cattails, can absorb chemicals, and bacteria and other micro-organisms in the soil of wetlands

can break chemicals down into non-harmful compounds. The ability to clean and filter polluted water is what makes wetlands so important for overall ecosystem health. Unfortunately, we are continually adding more and more chemicals to our environment. The pollutants that we put into our air will eventually find their way into our wetlands. These natural areas are becoming overloaded and are not able to filter out the constant loading of toxins. Compared with direct damage, indirect damage is often more dangerous, since we cannot see the chemicals entering the ecosystem, and sometimes long-term damage has already occurred by the time we notice the problem.

One of the ways to help determine the health of an ecosystem such as a wetland is to monitor the species that live in the habitat.

Keeping data about the abundance of a certain species, called an indicator species, and checking to see whether its numbers are increasing or decreasing may be a way to help assess the amount of often invisible but dangerous chemicals that are being added to the ecosystem. Every ecosystem has species whose population may change drastically if damage is occurring in their natural habitat. For wetlands, dragonflies and damselflies are good indicator species of the presence of water pollution since both of these species spend a large portion of their lives in or around water. If the population of either of these winged beauties begins to decline, biologists know that the amount of pollution in the water may be increasing and that further studies should be conducted and actions taken to help reduce the amount of pollutants entering the wetland. Closely monitoring any changes in the population of dragonflies or damselflies will help determine overall wetland health, which is important not only for insect life, but also for birds, amphibians, reptiles and mammals.

Did you know...

as a result of draining and filling of wetlands to create more agricultural lands, southern Ontario has lost an estimated 90 percent of the wetlands that existed before Europeans settled in the province.

Did you know...

because of their acidic conditions, low oxygen levels and lack of decomposing organisms, bogs throughout northern Europe have been found to contain nearly perfectly preserved bodies of people who died thousands of years ago.

Insects have crawled on the ground and flown in the skies for millions of years. Dinosaurs roamed the earth about 200 million years ago, but the ancestors of dragonflies darted in the skies over our ancient planet more than 100 million years before the dinosaurs! Ancient dragonflies, **with wingspans nearly a metre wide**, were much larger than current species and were the largest insect ever to have lived on earth.

Dragonflies –tiny helicopters of the insect world

Female dragonflies lay eggs in the water or on vegetation close to the surface of the water. When the egg hatches and the larva, called a nymph, emerges, it stays beneath the water for the autumn and winter months. During this time, it remains immobile and, like many other creatures in Ontario, goes into a hibernation-like state until the warm weather returns in spring. Then the stealthy, agile nymph begins to hunt for aquatic insects and small creatures such as tadpoles. Depending on the species, dragonflies may remain as nymphs for as little as one month or up to four years. As they grow, their skin, called an exoskeleton, gets too tight and they must shed it, much like the way a snake sheds its skin. When the nymph is fully developed and ready to complete its metamorphosis to become an adult, it crawls out of the water and sheds its exoskeleton one last time, emerging as an adult dragonfly. Most dragonflies in Ontario live only a few months. Despite their short lives, dragonflies play an important role in the food chain, consuming large quantities of mosquitoes and other flying insects, which makes dragonflies welcome additions on canoe and camping trips or at cottages.

Adult dragonflies have large, compound eyes that almost take up their entire head and are very close together, almost touching. Dragonflies have long, slender bodies, six legs and two pairs of thin, membrane-like wings. Their wings are between five and 12 centimetres long and, when at rest, are spread straight out on either side of their bodies, forming a large cross or plus sign.

Dragonflies have a series of barbs running the length of each leg. Using these barbs, they can scoop mosquitoes and other insects right out of the air, trapping them between their legs. Dragonflies can fly at speeds exceeding 65 kilometres per hour! Aeronautical engineers (people who design and build airplanes and space ships) have studied these remarkable insects because of their unique ability to fly forwards and backwards, change direction in mid-air, and stop and hover, unlike any other species of insect.

Although all dragonflies belong to the order Odonata, adults are classified into different families on the basis of their physical characteristics. Darners are the largest, clubtails have an abdomen with an enlarged end, emeralds have bright green eyes and skimmers have short, stout bodies and are common inhabitants of many Ontario ponds.

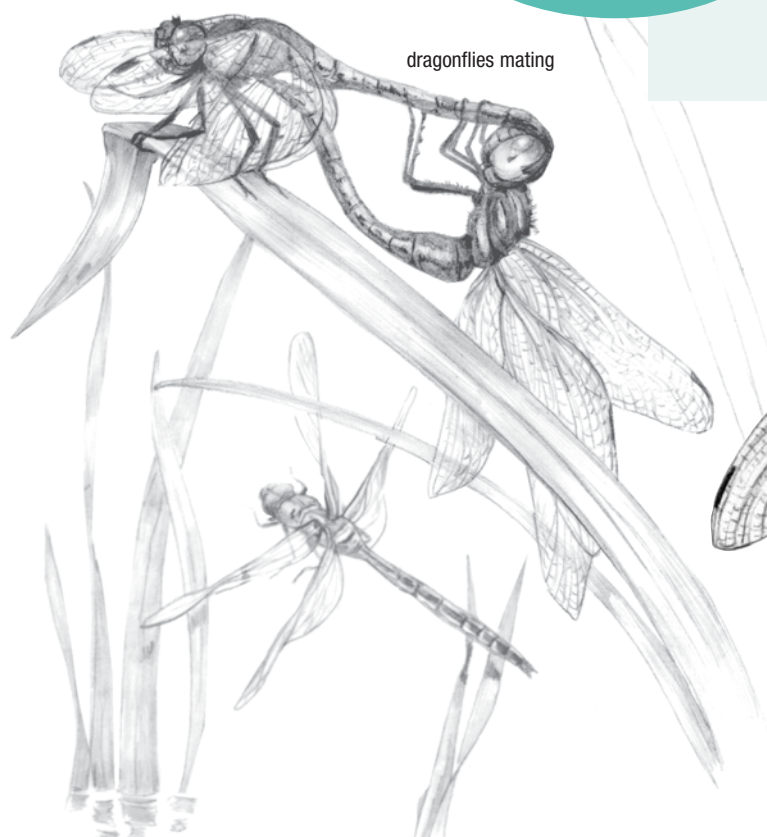
Damselflies – glittering wetland jewels

Like dragonflies, damselflies begin life as a water-dwelling nymph. Hatching in the spring, the nymph grows as it eats a variety of aquatic insects, including mosquito larvae. In late summer or early autumn, the nymphs emerge from the water, shed their exoskeletons and begin the next phase of their lives as adult damselflies.

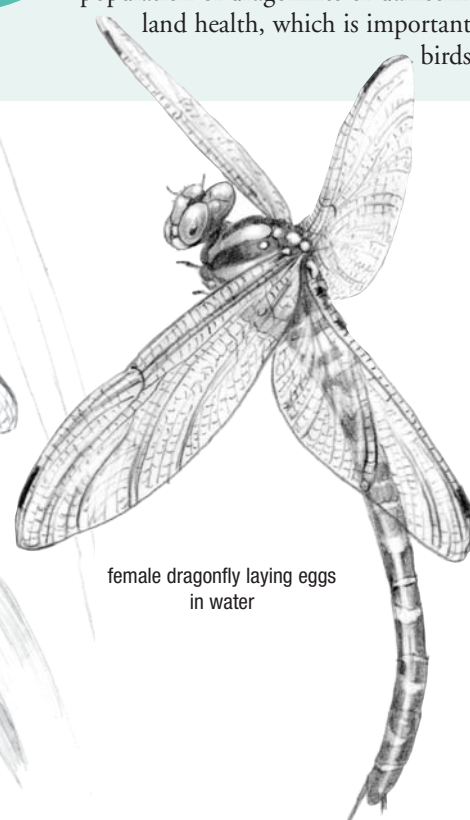
You can distinguish an adult damselfly from a dragonfly in several ways. Damselflies are smaller than dragonflies and have separated eyes, one on each side of their head. At rest, most damselflies fold their wings over their backs like flies and the majority of other winged insects. Damselflies rarely move far from the water in which they began life.

Once a female damselfly has found a mate, she lays eggs on the surface of the water and, shortly afterwards, dies. The time from when a damselfly hatches as a nymph to the end of its adult life is short — between one and three years.

Family groups of damselflies include the broad-winged damselflies, pond damsels, which are the largest and most diverse family of winged wetland inhabitants, and the spreadwings, which do not fold their wings flat over their backs but instead hold them in a fan shape.



dragonflies mating



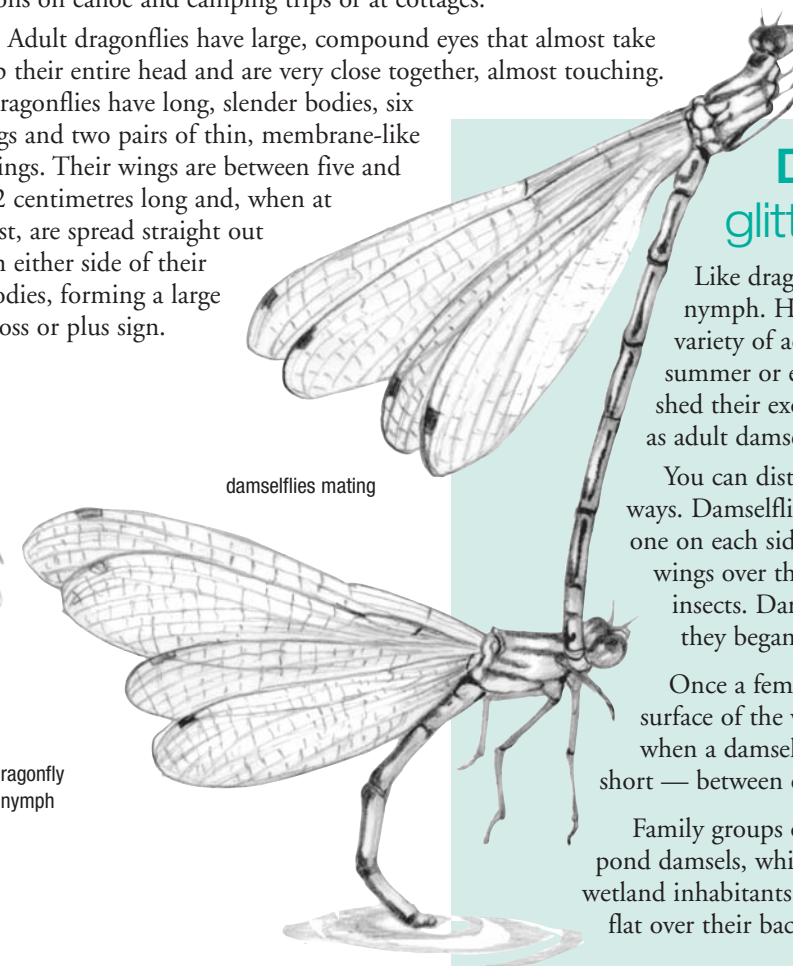
female dragonfly laying eggs in water



dragonfly emerging from nymph



dragonfly nymph



damselflies mating

