

Zooplankton – Small but Mighty!



Plankton are not unique to Ontario lake or streams; they are the basis of aquatic food chains across the world. In some place's phytoplankton is bioluminescent, meaning they are essentially glow in the dark organisms! Pictured above is bioluminescent phytoplankton in Gippsland Lakes, Victoria, Australia (Credit: Getty Images)

Did you know that when you go swimming in a lake or ocean, you are swimming with billions upon billions of microscopic creatures called plankton!

Zooplankton are microscopic animals that swim or drift in water, they are the base of the food chain for many lakes and wetlands. These tiny little creatures feed on microscopic plants called phytoplankton, while being fed upon by larger insects, fish and salamanders. Most zooplankton are filter feeders, using their appendages to strain bacteria, algae and other fine particles in the water. Adult females of zooplankton called *Daphnia* can produce their body

mass in eggs every two to three days (University of Georgia, 2019)! Although zooplankton are microscopic and rarely visible to the human eye, they are crucial for the health of our lakes by acting as both filters and food for lake species.

Decreasing zooplankton populations means less food, which results in fewer, smaller fish (EPA, 2019). There are also invasive zooplankton that have the ability to alter and endanger aquatic ecosystems by outcompeting native species for resources (Invading Species Ontario, 2019). One of the most common invasive zooplankton species in Ontario is the spiny waterflea, originating from parts of Eurasia. The government of Ontario estimates that spiny waterflea introductions result in an average 30 to 40 per cent decline in native populations of zooplankton, decreasing food supplies for small fish. Monitoring and protecting zooplankton populations is therefore crucial to tracking the health of aquatic ecosystems in Ontario lakes.

Here are a few key facts about zooplankton:

- Zooplankton are indicators of ecosystem health, biodiversity, climate change, fish productivity and nutrient outputs
- Without zooplankton, aquatic food chains would be incomplete

- Zooplankton feed off of phytoplankton sucking in and storing CO₂, when they die some of them sink to the bottom of the lake, taking carbon dioxide with them, inevitably decreasing the amount of CO₂ released in the atmosphere
- Zooplankton are highly responsive to nutrient levels, temperatures, pollution, levels of light and increases predation, meaning that a change in zooplankton concentration can indicate a subtle or extreme environmental change
- Invasive zooplankton can have adverse effects on aquatic ecosystems, negatively impacting fish populations

Changes in aquatic ecosystems such as pollution, sediment disruption and overfishing can have enormous consequences for plankton and the environment. The richer an ecosystem in biodiversity the more stable it is because there are more species and genetic variability. This isn't to say that we shouldn't work to preserve all species, but instead, that increased biodiversity allows for a more stable ecosystem less vulnerable to collapse. If you're interested in helping research and monitor Ontario lakes, The Federation of Ontario Cottagers' Associations (FOCA) has a [guide to citizen science](#) that includes Zooplankton and Benthic (aquatic insect) research! Zooplankton, although tiny, play a crucial role in the health of aquatic ecosystems and act as bioindicators to let people know when things go astray!

To learn more about plankton visit the following links:

<http://archive-srel.uga.edu/outreach/factsheet/zooplankton.html>

<https://marinebio.org/creatures/zooplankton/>

<https://askabiologist.asu.edu/explore/plankton>

<http://www.invadingspecies.com/spiny-and-fishhook-waterfleas/>

<https://www.zooniverse.org/projects/kelseyswieca/plankton-portal/about/research>

<https://foca.on.ca/wp-content/uploads/2018/02/FOCA-Citizen-Science-Guide-FINAL-2018.pdf>

<https://www.ontario.ca/page/spiny-and-fishhook-water-flea>