

Figure 1. Photo of a Canada Goose
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The Impacts of the Canada Goose (*Branta canadensis*) on Lake Water Quality and Ways to Reduce their Populations in Waterfront Areas

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INTRODUCTION: THE BIOLOGY/ECOLOGY OF THE CANADA GOOSE

The Canada Goose (Figure 1) is largest and most widely distributed goose throughout the arctic and temperate regions of North America. Historical hunting had reduced migrating goose populations, prompting a massive undertaking to reestablish the species within the United States. In the early 1940's, Canada goose populations were so low that there was some fear of extinction. Efforts by the federal government and many states to provide protection brought the populations back up to a more desirable level in the 1980's. In Michigan, their numbers presently exceed 300,000 (DNR 2018). Its distinctive cackling and V-shaped migrations are known by all as a signal of changing seasons. However, not all Canada geese embark on long distance journeys; some establish resident populations which are the cause of most conflicts today. This resident type has found the perfect environment in the urban open water habitat dotting Michigan's landscape (Figure 2). Modern land-use has encouraged the creation of open spaces, eliminating ground cover for predators and providing well-manicured lawns (Figure 3)

adjacent to ponds and lakes in which Canada geese thrive. Extensive food resources, protected nesting areas, and refuge from predators has triggered a population explosion among resident geese.

Both Canada geese groups share the well-known black-headed, white "chinstrap" characteristic, making them difficult to distinguish. Geese are grazing herbivores and prefer grass, aquatic vegetation, seeds, and various grains. Adults can weigh from 10 to 17 pounds, eat up to 4 pounds of grass a day, and return up to 2 pounds of that as feces (Crawford 1999). Canada geese live up to 24 years, keep the same mate for life, and return to nest in the same location, generally during the months of March through May (DNR 2018). Adult geese are particularly aggressive during breeding and nesting seasons; and their behavior can cause problems for lake residents and visitors when they attack and nip (Eccher 2000). As the population rises nationwide and fierce turf wars follow, it's important to remember that Canada geese also provide recreational viewing and hunting opportunities for many. A continued expansion of ideal habitat requirements challenges managers and lake residents to find some level of tolerance. Further complicating management strategies for controlling resident populations, is the fact that Canada geese are managed and protected by the US Fish & Wildlife Service under the Migratory Bird Treaty Act of 1918. This has made it unlawful to kill, hunt, or disturb nests and eggs unless permitted by the Secretary of the Interior. They can be legally hunted during hunting season with the proper license; however, hunting access is often limited due to the proximity to human environments.

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Figure 2. Canada Geese feeding in a lakefront park
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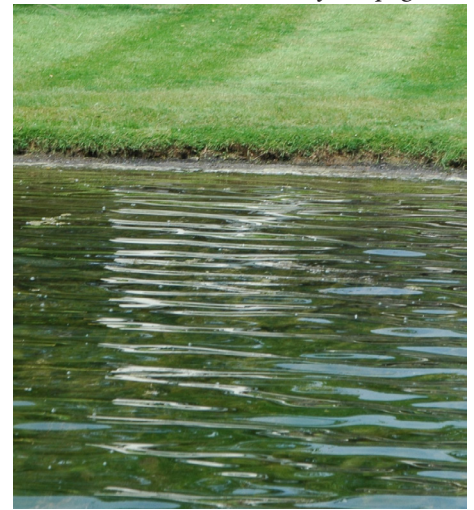


Figure 3. An example of a well-manicured lawn on a lake
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WATER QUALITY IMPAIRMENTS FROM CANADA GOOSE DROPPINGS

Many inland lakes in Michigan share an abundance of geese around the shorelines and in local wetlands and parks. In addition to being a nuisance on lawns, excess goose populations on lakes can have impacts on the water quality of the lake. Geese defecate both on land and in the lake and the droppings are high in organic matter and nutrients. These are the same nutrients that accelerate aquatic plant growth and algae blooms. Many of our lakes sustain year around populations of geese. It has been reported that one Canada goose can contribute about a half pound of phosphorus to the lake each year. Therefore if we consider a resident population of twenty geese on your lake, that would be the same as dumping in two fifty pound bags of fertilizer with a N-P-K ratio of 0-10-0 each year (Lake Notes, 1996). This would be the same as a seasonal population of forty geese that spend six months on the lake. It has been estimated that one pound of phosphorus can support about 500 pounds of algae! (Van Buren Conservation District 2012).

A study by Manny et al. (1994) found that the annual contribution of carbon, nitrogen, and phosphorus from migratory waterfowl including Canada geese (*Branta canadensis*) can exceed the external loading contributions on some inland lakes. Thus, an overabundance of geese can lead to increased nutrient loads to lakes and other water bodies. Goose feces contain pathogenic protozoa and bacteria that may emerge has a human health risk to recreational freshwater beach areas invaded by resident geese (Gorham and Lee 2014). Means of direct oral contact include children playing in the beach sand, or individuals exposed while swimming and accidentally ingesting water. Furthermore, nutrients contained in fecal matter may have a significant impact on a lakes trophic status, causing excessive weed growth and algae blooms (Cote et. al. 2010). Also, decomposition of animal waste depletes oxygen levels in shallow, warm waters during the summer months and elevates ammonia levels, producing a toxic environment for fish and other aquatic life.

MANAGEMENT OF THE CANADA GOOSE FOR WATER QUALITY PROTECTION

The long-term protection of our lake water quality requires humane and effective strategies for nutrient reduction of all possible sources which includes local and migratory populations of Canada geese. Fortunately, there are some strategies for reducing geese populations which include but are not limited to the following:

1. Encourage riparians to grow waterfront grass to ≥ 3 inches tall as geese prefer short grass. This does not have to include the entire lakefront lawn but can include a strip or buffer that extends along the shoreline and is at least 5 feet in thickness or width. Eventually tall grasses and sedges will grow at the lake/shoreline interface and will even benefit the shoreline from further erosion—especially if a seawall or rip-rap is not present. If rip-rap is present, the growth of tall grasses along the shoreline is still recommended as geese will likely not venture into a yard with an area of predatory risk.

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ASK THE EXPERTS

If you have a question about water related issues, riparian rights, and/or lakes and streams, etc., let us know by email or snail mail.

Email: swagner@mlswa.org
Mail: The Michigan Riparian
300 N. State St., Suite A,
Stanton, MI 48888

Question: What are macroinvertebrates in lakes?

Answer: Macroinvertebrates are aquatic bugs that lack a “backbone” and have many different forms in inland lakes. Such forms can include segmented and non-segmented worms, snails, clams, mites, and larvae of many different taxa. There are benthic macroinvertebrates which live in the lake sediments and those that live near shore or in aquatic vegetation. Many different forms can also be found under rocks, woody debris, and other structures. These aquatic organisms are an important component of the lake food chain and are especially critical for a healthy lake fishery. They differ as water quality indicators as some are found in most aquatic environments and others are found either in high or low water quality. They are therefore indicative of water quality problems and may aid in the detection of water quality impairments so that a process of finding corrective solutions can begin. Many macroinvertebrates prefer lake sediments with low metals, ample dissolved oxygen, and suitable habitat for foraging and reproduction.

By Jennifer L. Jermalowicz-Jones, PhD
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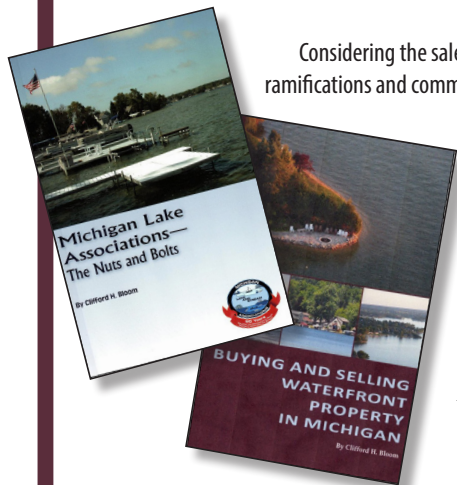
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2. Plant tall native plants near the shore to encourage a soft shoreline that geese may avoid due to the potential of predators hiding in the tall weeds (Figure 4). If tall grasses are not easily established by not mowing to the waters' edge, then intentional plantings may be needed. In these cases, it is best to call a certified Natural Shoreline; professional and they can be found on the Michigan Natural Shoreline Partnership website at: www.mishorelinepartnership.org. These professionals have unique training on how to introduce native vegetation that will grow in local soils as well as techniques for reducing erosion and enhancing the natural beauty of lake shorelines.

3. Do not feed geese or waterfowl as this encourages their presence. This principle is difficult for the wildlife enthusiasts and avid bird watchers but is really important. Geese have access to a multitude of natural food sources in and around aquatic habitats. They do not need foreign sources of food (such as bread, nuts, etc.) that will enable them to defecate more in nearby lawns.

4. Egg replacement, goose round-up, and nest destruction methods are effective to a degree but require a permit and training from the Michigan Department of Natural Resources (MDNR). Further information on these strategies and additional less invasive strategies can be found on the MDNR website at: www.michigan.gov/dnr. The Humane Society of the United States (U.S.) issued a guidebook in April of 2010 called: "Humanely Resolving Conflicts with Canada Geese: A Guide for Urban and Suburban Property Owners and Communities". This book can be found on their website at: www.humanesociety.org.

5. Coyotes or other intimidating effigies (owls, birds of prey, etc.) can scare geese away from beachfront areas and lawns (Figure 5). These decoys have a realistic appearance and are often to scale and are used in beachfront areas where tall grasses may not be favorable or possible. They can be used each season and are readily available at many home improvement stores. They can also be strategically placed in areas where geese are known to enter lawns.

6. The Audubon Society recommends placement of string 6 inches above the ground followed by another row of string an additional 6 inches above the water if this shoreline



Figure 4. A natural shoreline on an inland lake
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Figure 5. Coyote effigies used to scare geese away from beach areas
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