

# The Adirondack Loon-Friendly Lake Certification Program

Environmental Education and Conservation in the Adirondacks



## Background

The Adirondack Center for Loon Conservation evolved from a partnership with the Biodiversity Research Institute that studied the effects of mercury pollution on northern aquatic ecosystems. The Common Loon (*Gavia immer*) is an indicator species, meaning that it is the most affected when the ecosystem undergoes change. Loons are a great indicator of mercury pollution as well as climate change, human development, and other environmental issues in aquatic ecosystems. In addition to its ecological value, the loon is a symbol of wilderness in the Adirondacks, beloved by its residents and visitors. Today, the Adirondack Center for Loon Conservation is a nonprofit organization based in Saranac Lake, NY. Their commitment to loons is clear in their mission statement: “Dedicated to Promoting and Inspiring Passion for the Conservation of Common Loons.” They capture and band loons in addition to observing nesting sites to monitor long-term reproductive success, and they have studied the migratory behaviors of loons in the past. The Adirondack Center for Loon Conservation still does research on the effects of mercury pollution on loon populations, but they also use their position to educate Adirondack residents and visitors on environmental issues such as air pollution and climate change.

## Purpose

The Adirondack Loon-Friendly Lake Certification Program seeks to raise awareness for the threats that loons face and give members of the community the tools they need to address those threats. Empowering community members to protect the loons on their lake allows conservation to go much further than it could with only staff members of a nonprofit working in the field. The scope of the Adirondacks is too large (6.1 million acres) for one organization to protect effectively. The Adirondack Loon-Friendly Lake Certification Program educates residents and allows them to protect loons directly. Promoting community-based environmental stewardship is therefore not only an effective mechanism for conservation but also for building awareness of larger environmental issues like acid rain, biodiversity loss, and climate change. Furthermore, social media is an effective platform for communication with Adirondack residents, especially while social distancing is in effect. Carrying out initiatives on social media allows them to be accessible to everyone. This project will use social media to survey the Adirondack Center for Loon Conservation’s followers on their efforts to protect loons as well as their awareness of issues that loons face to get preliminary data for this program.



Figure 1. (above) a loon nest in the Adirondacks, exposed and at risk of potential flooding or disturbance by humans or predators.



Figure 2. (above) an adult loon performing the penguin dance behavior., suggesting that this loon feels threatened.

## Methods

Any Adirondack resident can achieve loon-friendly lake certification by attending a presentation on loons and then pledging to these five tasks:

1. Organize two to three lake cleanups each year
2. Provide ACLC’s educational brochures to lake residents and rentals
3. Place “Help Protect Loons” signage at boat launches
4. Monitor loon nests on resident’s lake
5. Promote safer fishing practices by maintaining at least one fishing line recycling container, recycling lead sinkers, and using non-toxic tackle

Surveys go to participants of the program before and after they get “certified,” to measure basic understanding of loon natural history, behavior, and threats that loons face. A general survey also went out to all followers of the Adirondack Center for Loon Conservation on Facebook and Instagram. The surveys are incredibly important to measure behavioral changes among members and their communities.

Figure 3. (right) a fishing line recycling container. Fishing line entanglement causes a slow and painful death for loons. This can be easily prevented through the installation of these containers near fishing docks, paired with lake cleanups each summer to remove lines and hooks caught in vegetation around and in the lake. These containers are cheap, easy to install, and have been proven effective at mitigating fishing line entanglement.



## The Common Loon

The Common Loon is one of five species of loons in the *Gaviidae* family, the others being the Yellow-Billed Loon (*Gavia adamsii*), Red-Throated Loon (*Gavia stellate*), Pacific Loon (*Gavia pacifica*), and Arctic Loon (*Gavia arctica*). The Common Loon breeds in the Northern United States, with the Adirondacks as the southern boundary of breeding territory. Loons are characterized by their sharp beaks, distinctive plumage, unique calls, and specialized adaptations that help them to swim and dive. These include solid bones and the positioning of their legs far back on their body. They always nest on shorelines because although they are very fast swimmers, they have poor mobility on land. For the first few years of its life, a loon stays in its wintering grounds along the Atlantic Coast. Once breeding age is reached, a female loon typically finds a male with territory in the summer breeding grounds and they lay 1-2 eggs per year.



Figure 4. (above) an Adirondack loon performing the “foot wag” behavior, a mechanism for regulating a loon’s body temperature. It is also understood to mean that the loon feels safe. The Adirondack Center for Loon Conservation has banded this loon. Banding allows the loons to be tracked and monitored. Feather and blood samples are taken from banded loons to measure concentrations of mercury. Banding also shows that many loons (which live for 20-30 years) will return to the same breeding territory on its lake in the Adirondacks every summer.

## Threats to Loons

Loons are apex predators, eating up to a pound of fish a day. This makes them prime targets of mercury biomagnification. Mercury enters the aquatic food web through methylation, a process where microorganisms living in the water and sediment convert elemental mercury into bioavailable methylmercury. In more acidic conditions, such as those caused by acid rain, microorganisms convert mercury more efficiently, thus compounding the issue for loons. Fishing line entanglement is common for loons as well and is a death sentence if they cannot get untangled. Some people still use lead fishing tackle, and the fish that loons eat might have ingested lead sinkers, poisoning the loon. Nesting success rates have also been affected by humans: boaters and swimmers will often get too close to a loon nest and scare the loon away. If this happens too many times the nest will be abandoned. Nest are well-hidden, and even people with the best intentions can distress a loon accidentally. Powerboats’ wakes can also flood loon nests (which are always built on the shoreline) and chill the eggs, killing them. Stronger storms as a result of climate change also pose a risk of nest flooding. Loons face natural predators such as eagles and bears and will fight other loons over territory with their beaks. A loon’s beak is strong enough to puncture through solid bone.

## Results

Preliminary surveying of the Instagram and Facebook followers of the Adirondack Center for Loon Conservation yielded some data estimating how loon-friendly a lake was. The average rating given to a lake was 7.8/10 (n=18). This only accounts for lakes with residents who are active with the Adirondack Center for Loon Conservation, and this only shows perceived “friendliness,” so this score is to be taken with a grain of salt. Additionally, 72% of surveyed followers could correctly answer a question identifying the behavior of a threatened loon, suggesting that there is more work to be done in educating the community on what to do around a loon. Due to the nature of this project, much more data will be collected in the future.

## Conclusion

The Adirondack Loon-Friendly Lake Certification Program is ongoing, with surveys going out to members to measure progress and success. As more lakes become certified loon-friendly, loons will face less danger from humans. Biomagnification of mercury, lake acidification, and effects of climate change will be better studied and understood by researchers. The community-based stewardship model will also foster the conservation ethic necessary in the public to deal with today’s ecological issues.

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