A Century of Change? Fish in Isle Royale's Inland Lakes

Isle Royale National Park



Photo courtesy of David Gallagher

In the 1920s, researchers surveyed fish in Isle Royale's inland lakes. Nearly a century later, how much has changed?

Fish communities are a key part of lake ecosystems and can help reveal changes in ecosystem health. About 99% of the island is designated as wilderness. This gives researchers a rare opportunity to study fish populations in a relatively undisturbed setting.

Some of Isle Royale’s 43 named inland lakes had not been fully surveyed for fish in nearly 30 years—and only a few times over the past century. These long gaps make it difficult to know whether fish communities in these remote lakes are changing or remaining stable.

To learn more, park staff partnered with researchers from the University of Minnesota and the Grand Portage Band of Lake Superior Chippewa to study fish community trends. The findings will help inform management decisions.

Revisiting Isle Royale's Inland Lakes

The research team reviewed fish survey data from the 1920s and 1990s across 23 inland lakes. They then resurveyed those same lakes in 2023 and 2024. The study was designed to match earlier sampling methods as closely as possible so results could be compared across time.

The field crew traveled by boat to reach each study lake. Sometimes they docked at campgrounds, while other times they anchored offshore and canoed in. From there, they hauled gear—gillnets, minnow traps, a beach seine, and camping supplies—to the sampling site. Once on site, the crew set nets and traps across a range of depths and habitats. They returned the next day to collect gear, identify and measure fish, and record their findings.



The field crew transported nets, traps, and other equipment by boat and on foot to remote inland lakes across Isle Royale National Park.

Photo courtesy of Abby Hietala (left); Photo courtesy of Sami Awwad (right)

Each sampling method provided a different piece of the picture. Gillnets targeted larger fish in deeper water, while minnow traps and seines targeted smaller fish in shallower water. To detect hard-to-catch species, researchers also examined stomach contents of larger fish.

The team also measured water temperature, oxygen levels, and nutrient levels. This information helps explain why certain species are found in some lakes but not others.



Pulling a gillnet (left) and seining fish (right) during field sampling in Isle Royale.

Photo courtesy of David Gallagher (left); Photo courtesy of Ayse Kelemet (right)

Results: Stability with Subtle Shifts



A variety of fish species found in Isle Royale's inland lakes during sampling.

Photo courtesy of Sami Awwad

Encouragingly, no invasive fish were detected, and there was little evidence of impacts from human activity! Fish diversity has remained relatively stable. Earlier surveys recorded 28 species, compared to 27 in the most recent study.

However, the types of fish found in some lakes changed over time. Some of the most notable changes occurred in the park's largest lakes. These lakes are typically more stable than shallower lakes. Cold-water species generally became less common, while species that tolerate a wider range of conditions became more common. With temperature and precipitation expected to increase, fish that depend on cold, oxygen-rich water may face greater risks.

Sculpin and stickleback species were most often missing from recent surveys. Blackchin shiner and pumpkinseed were among the most frequently newly detected species. In some lakes, northern pike became more numerous and larger on average. Yellow perch and walleye became less abundant, although walleye grew larger on average.



Lead researcher David Gallagher holds a cisco (Coregonus artedi) documented during the study.

Photo courtesy of Pearl Krieger-Coble

Cisco are an important indicator of high-quality cold-water habitat. Researchers found them in every lake where they had been previously recorded, including one where they were thought to have disappeared. Although only a single cisco was found in that lake, its discovery suggests a small population may still be present.

Why This Matters for Park Management

This study gives park staff a clearer picture of how inland lake fish communities have changed over time. The findings will help them decide whether changes to park

management are needed. So far, the results do not point to major concerns, but they do provide useful context for understanding long-term trends.

The findings can help park staff make decisions about fishing regulations. For example, changes in the number and size of fish may help show whether current regulations are working as intended. As the park's natural resource manager Mark Romanski explained, "the park wants to allow harvesting while also limiting impacts to fish communities."

The study also helps guide future monitoring. Researchers identified several larger lakes and a few smaller lakes where changes were more noticeable. Prioritizing these lakes for future surveys could help the park more efficiently track trends, such as species loss or the arrival of non-native fish. As harmful algal blooms become more common in the park's inland lakes, continued monitoring could also help staff understand how the blooms affect fish.

How You Can Help

Isle Royale's inland lakes have remained remarkably intact for generations, but that doesn't mean they are unchanged. As a visitor, you play a role in that story. Follow fishing regulations and fishing conservation guidelines, respect wilderness areas, and take time to learn about the ecosystems around you.

These lakes and their fish communities have developed over thousands of years since the last glaciers retreated. Careful stewardship can help protect them for generations to come.

Want to learn more?

Visit the full report from this study to explore the results in more detail.

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