



## **Moira Lake Property Owners Association (MLPOA)**

### **Moira Lake Walleye Population Recovery Project**

#### **Project Overview and Objectives**

The Moira Lake Walleye Population Project, led by the Moira Lake Property Owners Association (MLPOA), was initiated to respond to observed declines in the lake's walleye (*Sander vitreus*) population. Moira Lake, located in Ontario's Fisheries Management Zone 18 (FMZ 18), has historically supported a robust recreational fishery. However, recent trends suggest the fishery is under severe stress, mirroring broader cool water fish population declines across southern Ontario.

This project's main objectives were to:

1. Analyze demographic and ecological data on Moira Lake's walleye population.
2. Identify and assess potential ecological, environmental, and anthropogenic drivers of population decline.
3. Recommend practical, science-based management strategies.
4. Foster stakeholder engagement to build public support and stewardship.
5. Align with provincial management goals and conservation guidelines to ensure long-term sustainability.

The study relied heavily on data from the Ministry of Natural Resources (MNR) Broad-scale Monitoring Program (2010, 2016, and 2022), complemented by scientific literature, climate change adaptation frameworks, and stakeholder input from anglers and residents.

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#### **Summary of Key Findings**

##### **1. Population Decline**

MNR netting data indicate a sharp 76% drop in sampled walleye between 2010 and 2022—from 92 fish to just 22. Biomass per unit effort also declined, and the size

structure shifted to reflect a predominantly older population. These changes suggest low recruitment and a stressed, unsustainable fishery.

## **2. Skewed Age Structure**

The mean age of walleye increased dramatically from 3.05 years (2010) to 6.32 years (2022), indicating a lack of younger cohorts entering the population. While some cohort diversity is present, the absence of robust age-0 or age-1 classes suggests minimal natural reproduction or low survival of juvenile fish.

## **3. Size Trends**

Average lengths of walleye increased, reaching over 460 mm in 2022. While this could be interpreted as improved growth, it's more likely the result of fewer, older fish dominating the population. The increasing length coincided with declining biomass, reinforcing the concern that the population is aging without replacement.

## **4. Fish Community and Ecosystem Pressures**

Biodiversity assessments identified at least 20 fish species in the lake, but centrarchids (e.g., black crappie, largemouth bass) are increasingly dominant. Their rise may be negatively affecting walleye through competition and predation on fry. Invasive aquatic plants like Eurasian watermilfoil also reduce the availability of quality spawning and nursery habitat.

## **5. Multifactorial Stress**

Contributing stressors include:

- **Habitat loss** from shoreline modification and siltation.
- **Climate warming**, which is altering thermal regimes and increasing interannual recruitment variability.
- **Fishing pressure**, particularly harvest of large females.
- **Invasive species**, shifting the trophic structure of the fish community.

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## **Recommendations for Management**

### **1. Spawning Habitat Enhancement**

Rehabilitation of historic walleye spawning habitats should be prioritized. This includes:

- Gravel substrate restoration.
- Removal or control of aquatic invasive plants.
- Shoreline re-naturalization and protection of key littoral zones.

## **2. Rehabilitative Stocking**

Stocking should be used selectively and cautiously to supplement natural recruitment. MNR guidelines and literature suggest success is more likely when:

- Extended-growth fingerlings are used.
- Genetic integrity of native stocks is preserved.
- Habitat quality supports survival.

Stocking must be carefully monitored and evaluated through follow-up assessments.

## **3. Regulatory and Harvest Controls**

New fishing regulations could include:

- Size slot limits to protect spawning females.
- Reduced daily limits to lower exploitation rates.
- Seasonal closures during spawning. Compliance and enforcement must be supported through outreach and monitoring.

## **4. Climate Adaptation Strategy**

Applying a **Resist-Accept-Direct (RAD)** framework from climate science:

- **Resist** change where possible (via habitat and regulation).
- **Accept** that some shifts (e.g., community structure) may be irreversible.
- **Direct** the system towards desired states, such as increased resilience through habitat buffering and stakeholder support.

This framework enables adaptive, forward-thinking planning aligned with ecological realities.

## 5. Public Education and Stewardship

Citizen science initiatives and education programs should be developed to:

- Engage local anglers and residents in monitoring and conservation.
- Promote catch-and-release ethics.
- Build long-term community ownership of walleye recovery.

Programs could include spawning site surveys, invasive species control events, and workshops.

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## Conclusion and Call to Action

The evidence clearly shows Moira Lake's walleye population is in decline, driven by weak recruitment, aging demographics, and multiple interacting stressors. The lake is at a tipping point.

Given its significance for recreational fishing and its role as a top predator, the walleye's decline threatens both ecological stability and economic activity in the region. Immediate and coordinated action is required.

The report outlines a ten-point action plan aligned with MNR objectives, including SMART goals for habitat improvement, regulatory change, stocking trials, and community engagement. A collaborative, science-based, and adaptive approach offers the best hope for restoring this iconic fishery.

**In February 2025, this report was formally submitted to the Ministry of Natural Resources (MNR) for their review and consideration. The MLPOA respectfully requests that the MNR evaluate and act upon the proposed recommendations to safeguard the long-term sustainability of the Moira Lake walleye population.**

The MLPOA calls on the MNR, local stakeholders, and conservation partners to support implementation of this plan. With timely effort and sustained commitment, Moira Lake can once again support a thriving, sustainable walleye fishery for future generations.

**For a copy of the complete 50-page report please contact the MLPOA directly at [moira.lake.poa@gmail.com](mailto:moira.lake.poa@gmail.com).**