Council of Lake Committees Statement of Consensus on Priority Actions to Address the Impact of Dreissenid Mussels on Great Lakes Fish Communities and Fisheries

The Council of Lake Committees (CLC) is composed of representatives from state, tribal, and provincial agencies represented on lake committees structured under the Great Lakes Fishery Commission's (Commission) *A Joint Strategic Plan for Management of Great Lakes Fisheries*:

- Lake Ontario Committee: New York, Ontario
- Lake Erie Committee: Michigan, New York, Ohio, Ontario, Pennsylvania
- Lake Huron Committee: Michigan, Ontario, Chippewa-Ottawa Resource Authority
- Lake Michigan: Illinois, Indiana, Michigan, Wisconsin, Chippewa-Ottawa Resource Authority
- Lake Superior Committee: Michigan, Minnesota, Ontario, Wisconsin, Chippewa-Ottawa Resource Authority, Great Lakes Indian Fish and Wildlife Commission, 1854 Treaty Authority, Red Cliff Band of Lake Superior Chippewa

The CLC's purposes are to: consider issues pertinent to, or referred by, the Commission (Appendix 1); consider issues and problems of common concern to member agencies; develop and coordinate joint programs and research projects; serve as a forum for state, provincial, tribal, and federal agencies; and respond to requests made to it by any of the lake committees.

Impacts of Dreissenid Mussels on Great Lakes Fish Communities and Fisheries

Zebra and quagga mussels (collectively dreissenid mussels) are native to the Black and Caspian Sea region and were unintentionally introduced into the Great Lakes from ship ballast water. Zebra mussels were first documented in Lake St Clair in 1988 followed by quagga mussels in Lake Erie in 1989. Since that time dreissenid mussels have colonized all of the Great Lakes, although their spatial extent in Lake Superior has to date been limited to nearshore areas. The full impacts of dreissenid mussels on Great Lakes ecosystems vary from minimal in Lake Superior to dramatic, depending upon habitat suitability of receiving waters. Dreissenid invasion impacts on Great Lakes ecosystems include:

- Increased water clarity and resulting changes to the composition and distribution of submerged aquatic vegetation; also promotes toxic algae blooms
- Dreissenids have effectively overrun the ecosystem by out-competing native mussels and native filter feeders, as well as displacing other benthic species.
- Food web disruption through altered phyto/zooplankton community structure and subsequent impacts on lower food web, larval stage fishes such as lake whitefish, benthic invertebrates (e.g. *Diporeia*), etc.
- Nutrient cycling alteration and disruption (near-shore shunt)

- Contaminant cycling transfer
- Transfer of pathogens
- Habitat degradation and resulting impacts on fish reproductive success
- Reduced production for species of common interest with negative impacts on fishery and cultural benefits to societies; lake whitefish (LWF) are a key example but not the only one of importance as managers seek to restore functional native fish communities.

Fish Community and Fisheries Impacts - <u>Focusing on Lake Whitefish and *Diporeia* as Key Indicator Species</u>

LWF are culturally, ecologically, and economically important to Great Lakes fish communities and fisheries. LWF stocks have varied widely in abundance but have declined markedly during the past 20 years particularly in Lakes Huron and Michigan. LWF populations in Lake Ontario are far below historical levels with limited recovery. In Ontario waters of the lake, populations are low yet stable whereas in New York waters there is only one remaining LWF spawning population, and LWF was recently listed as a species of special concern. In Lake Erie, LWF abundance has fluctuated around infrequent strong year classes. Only Lake Superior appears to have populations that are stable or more slowly declining in abundance.

The cause of LWF declines is primarily a result of poor recruitment, largely driven by dreissenid mussel impacts. The dreissenid mussel invasion also strongly correlates with the decline of *Diporeia*, an important benthic food source for LWF and other native species. Dreissenid mussels have contributed to poor LWF recruitment in several ways:

- **Loss of spawning habitat for lithophilic species**: dreissenid mussels have colonized out to depths of 175 meters. Many LWF (and lake trout) spawning reefs are covered with living dreissenid mussels or their shells, filling and degrading interstitial spaces that are critical for fish embryo/fry survival.

- **Loss of <u>Diporeia</u>:** *Diporeia* is an important benthic food source for lake whitefish and other native species. Evidence strongly suggests that dreissenid filter feeding on high lipid content diatom algae limits the availability of this preferred food resource for *Diporeia.* It is also hypothesized that dreissenid pseudofeces may have toxic and/or pathogenic impacts on *Diporeia. Diporeia* status is considered "poor" in every Great Lake except Lake Superior.

- **Alteration and disruptions of food web energy dynamics:** dreissenid mussel filter feeding also redirects and sequesters nutrients/energy from the water column into the benthos (i.e. benthification). These disruptions to the lower food web (e.g. phytoplankton and zooplankton) effectively lower overall primary production, leading to lower fish productive capacity and may create seasonal nutrient deficits for newly hatched LWF.

CLC Consensus on the Need to Pursue Dreissenid Mussel Control

1. The decline of LWF threatens a regional industry that generates millions of dollars in economic activity annually. As one of the most commercially sought-after species in the basin, LWF is the backbone of many local economies particularly for Tribal Nations and coastal communities whose identity and traditional ways of life have been intertwined with this fishery for generations. Its loss results in diminished economic wealth, reduced regional food security, and direct job losses throughout the numerous sectors that depend on Great Lakes fisheries.
2. The CLC has considered the known and suspected impacts of dreissenid mussels on Great Lakes ecosystems and fisheries. While there is much to learn about the ongoing impact of dreissenid mussels on LWF, *Diporeia* and other species, there has been and will continue to be a significant negative impact by dreissenid mussels on Great Lakes ecosystems and fisheries.
3. Collectively, fisheries and ecosystem impacts driven by dreissenid mussels have impeded the ability of many lake committees to meet their respective fish community objectives.
4. The Commission has been successful in a primary mandate related to sea lamprey control (see Appendix 1) and the Commission has been involved in exploring solutions to control dreissenid mussels through partnerships such as the Invasive Mussel Collaborative and the Great Lakes Spawning Whitefish and Invasive Mussel Project.
5. Rebuilding LWF stocks and restoring the native food web, including sensitive species like *Diporeia*, is a multi-decadal endeavor. The CLC emphasizes that dreissenid mussel control research is required to begin this extensive recovery process and ensure the health of Great Lakes fisheries.
6. The CLC agrees this challenge is best met through the proven leadership of the Commission.

Consensus Priority Action:

Dreissenid Mussel Control: The CLC requests the Commission to assume a leadership role in the research, development, and implementation of a Great Lakes dreissenid mussel control program. In this pursuit, the Commission should build upon existing partnerships to garner additional expertise and resources. The CLC is committed to working with partners and the research community to investigate mussel control solutions that are effective, practical, publicly supported and sustainable.

Adopted April 21, 2026

Appendix 1: Great Lakes Fishery Commission and Sea Lamprey Control Program

Formation of the Great Lakes Fishery Commission

The 1954 Convention on Great Lakes Fisheries, which created the Great Lakes Fishery Commission, was born from a strong need to work together across borders not only to combat sea lampreys but also to promote science and establish working relationships among fishery managers.

The Commission consists of four Canadian commissioners appointed by the Privy Council and four U.S. commissioners (plus one alternate) appointed by the President. The commissioners are supported by a secretariat, located in Ann Arbor, Michigan.

The convention charges the Commission with five major duties:

- to develop a binational research program aimed at sustaining Great Lakes fish stocks;
- to coordinate or conduct research consistent with that program;
- to recommend measures to governments that protect and improve the fishery;
- to formulate and implement a comprehensive sea lamprey control program, and
- to publish or authorize publication of scientific and other information critical to sustaining the fishery.

The convention also includes a clause mandating the Commission to establish "working arrangements" among governments to ensure multi-jurisdictional fishery management. The Commission, thus, became a focal point for cooperative Great Lakes fishery management, though was designed specifically to not supersede existing state or provincial management authority.

Sea Lamprey Control Program

Great Lakes ecosystems and fisheries have historically been impacted by over 180 invasive species. The Great Lakes Fishery Commission was created by Canada and the United States by the 1954 Convention on Great Lakes Fisheries treaty, with a mission to control sea lampreys, advance science, and facilitate interjurisdictional fisheries management and research. Sea lamprey populations throughout the Great Lakes are now controlled through an extensive integrated pest management program developed and implemented by the Commission and its agents. While sea lamprey impacts were specifically devastating to fisheries resources, the impacts of the dreissenid mussels have profoundly impacted entire ecosystems in the Great Lakes, thereby also impacting important native fishes.