

Lake Trout (*Salvelinus namaycush*)

Data: Alaska Department of Fish & Game

Partners: AK

Species Status Review:

Alaskan populations of lake trout include areas of very slow growth and low productivity. As a result, lake trout in Alaska are easily susceptible to overfishing. Restrictive fishing regulations and remoteness of fisheries have mostly prevented overexploitation. Strict habitat requirements make the species extremely susceptible to changes in habitat. Fortunately, the habitats occupied by the species have experienced little impact from land use or from industrial contaminants and are mostly still in pristine condition.

Sportfishing Status of Lake Trout:

Lake trout support important recreational fisheries in Alaska roadside and remote lake systems. Sport fishing for lake trout is popular throughout the year, with some of the best fishing occurring through the ice. The sport harvest of lake trout in Alaska has decreased during the last two decades while catch has remained relatively stable. Conservative fishing regulations instituted are most likely responsible for the harvest reduction. Fishing regulations most often consist of a minimum-size limit and a bag and possession limit of one or two fish per day. Minimum length restrictions usually reflect the size at which at least 50% of the population is sexually mature, and are usually enacted to protect a component of the spawning population while maintaining the opportunity for harvest of large fish.

Because of the long life span of lake trout, most of the biomass of a population will consist of fish five to 15 years of age or older. If these fish are removed, it takes several years to replace them and restore the biomass to its original abundance. Due to their low productivity and vulnerability to overfishing, mortality associated with catch-and-release fishing must be considered in managing lake trout fisheries in Alaska, especially with any increases in angling for sport.

Western Native Trout Status report

Distribution of Lake Trout:

The distribution of lake trout in Alaska represents the northern and western edge of their native geographic range in North America. Lake trout have generally been considered intolerant to saltwater, however anadromy has been documented from otolith microchemistry analyses in the Canadian Arctic. Additionally, historic reports indicate that lake trout have been found in river mouths and brackish coastal areas in Canada, and at the head of tidewater in Bristol Bay, Alaska (Swanson et al. 2010). Otherwise, they are generally absent from lowland regions. The native range of lake trout in North America is strongly related to the maximum extent of the last glaciation, and lake trout in Alaska may have survived the last glacial epoch in unglaciated refugia (Behnke 2002).

Range of Lake Trout:

Lake trout range widely in Alaska from north to south but are not found in the Yukon-Kuskokwim lowlands or the coastal drainages of Southeast Alaska. Lake trout inhabit the deeper lowland lakes along the central Arctic coastal plain, as well as waters in the Brooks Range and Alaska Range. Lake trout inhabit clear, mountain lakes in northern Alaska as well as turbid glacial lakes on the north side of the Chugach Range and on the Kenai Peninsula.



Lake Trout: (Salvelinus namaycush)

Alaska Lake Trout Habitat Requirements:

A cold, deep, oligotrophic lake with a sufficient prey base and few competitors is ideal habitat for lake trout in Alaska. Self-sustaining populations also exist in turbid glacial lakes, although those lakes do not provide ideal habitat. The fish are broadcast spawners and preferred spawning locations are along wave washed rocky shorelines often in less than 2 m of water. Strict habitat requirements make lake trout in Alaska extremely susceptible to changes in habitat. Lake trout spawn every other year or less frequently in northern Alaska; while in more southern Alaskan populations, such as those on the Kenai Peninsula, spawning may occur annually. Lake trout growth varies from place to place depending on diet, water temperature, altitude, and genetics.

Concerns, Issues, or Obstacles relative to the Conservation and Improvement of the status of Lake Trout:

Population Viability Concerns

There is little concern for population viability for lake trout in Alaska.

Genetic Considerations

Very little research on genetics has been done on lake trout.

Disease Concerns

None.

Habitat Concerns

Lake trout habitat in Alaska is largely intact, however mineral and resource extraction exists in a number of locations across its range. Major habitat concerns include sedimentation, changes to water quality, and bioaccumulation of toxic elements such as mercury and arsenic.

Introduced Species Concerns

Alaska has had relatively few problems with invasive, non-native aquatic plants. However,

invasive aquatic plants pose an increasing threat to the integrity of native aquatic communities. Actions taken to detect and prevent the introduction and spread of invasive aquatic plants in Alaska are necessary in order to avoid the environmental and economic harm invasive plants have caused in other parts of the United States. If introduced into other habitats outside of its native range, the highly carnivorous lake trout can severely impact native species

Overutilization Concerns

Current regulations are sufficient to prevent overutilization. Additional mechanisms to adapt regulations can be implemented as needed to prevent overutilization.

Oil and Gas Development Concerns

There are some existing oil and gas developments in the range of lake trout; however, the threats currently remain limited and mechanisms are in place to protect fish and their habitats.

Opportunities and Strategies for Improving Lake Trout Status in Alaska:

- Fish population surveys and analysis
- Radiotelemetry studies
- Regulatory actions (fishing regulations, water use, land management, etc.)

Population Surveys, Genetic Analyses, and Fish Population Manipulation:

Lake trout in Alaska have not been studied as much as other salmonids. Abundance and age structure of populations should be assessed periodically, especially on lake systems with high angling pressure such as Hidden Lake on the Kenai Peninsula, and others.

Key Actions:

Continue assessing stock status of exploited stocks.
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Develop and implement consistent methods for fish population status and trend analyses.

Assess population size and length structure of lake trout stocks.

Lake Trout Radiotelemetry studies:

Key Actions:

Conduct radiotelemetry studies of populations most at risk.

Identify spawning areas most at risk to overfishing.
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Enforce regulatory mechanisms that prevent impacts associated with recreational angling.
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Maintain and protect lake trout habitat from degradation by achieving compliance with existing habitat protection laws, policies, and guidelines
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Provide technical information, administrative assistance, and financial resources to assure compliance with the listed objectives.
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Regulatory and Administrative Actions:

Maintaining the sportfish status of the lake trout and enforcing regulations to control over-utilization will be an important component of maintaining the health of lake trout populations. In addition, working with others to maintain appropriate regulations for prevention of disease, water quality impairment, and habitat disturbance are important considerations.

Key Actions:

Evaluate potential effects of resource development and climate change

Provide technical information, administrative assistance, and financial resources to ensure compliance with the listed objectives.
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Maintain and protect lake trout habitat from degradation by achieving compliance with existing habitat protection laws, policies, and guidelines.

Enforce regulatory mechanisms that prevent impacts associated with recreational angling.
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Enhance and maintain regulatory mechanisms that prevent diseases or illegal introduction of nuisance species.

Recommended Actions to improve the status of Lake Trout in Alaska:

1. Fish population surveys to determine health of exploited and non-exploited stocks.
2. Radiotelemetry studies to determine important spawning habitats and locations.
3. Regulatory actions (fishing regulations, water use, land management, etc.) to protect habitat and fish stocks.

References:

- Behnke, R.J. 2002. Trout and salmon of North America. The Free Press, New York, NY.
- Swanson, H. K., K. A. Kidd, J. A. Babaluk, R. J. Wastle, P. P. Yang, N. M. Halden, and J. D. Reist. 2010. Anadromy in Arctic populations of lake trout (*Salvelinus namaycush*): otolith microchemistry, stable isotopes, and comparisons with Arctic char (*Salvelinus alpinus*). Canadian Journal of Fisheries and Aquatic Sciences 67:842-853.



This publication was funded (or partially funded) by Federal Aid to Sportfish Restoration Funds through the Multistate Conservation Grant Program (Grant WY M-8-P), a program supported with funds from the Wildlife and Sport Fish Restoration Program of the U.S. Fish and Wildlife Service and jointly managed with the Association of Fish and Wildlife Agencies, 2006-9.