

Appendix A: Fish

Lake Whitefish

Coregonus clupeaformis

Federal Listing

State Listing SC

Global Rank

State Rank S3

Regional Status High



Photo by Submitted by angler

Justification (Reason for Concern in NH)

The lake whitefish is considered vulnerable in New Hampshire, and is believed to be limited to 6 water bodies in the state. Information about these populations is limited, though historical creel surveys and reports indicate populations with good health and high abundance (Towne 1959, Noon 1999). Current information pertaining to lake whitefish almost solely comes from occasional captures by anglers. Further studies on the population's health and status are warranted.

Distribution

Lake whitefish are distributed throughout Canada and the northern United States. Populations in New Hampshire are at the southern extent of the species' global range (Scarola 1987). Scarola (1987) maintains lake whitefish were native to 2 New Hampshire lakes (Umbagog and Winnepesaukee lakes), whereas Gordon (1937) believes lake whitefish were introduced in the Androscoggin watershed (e.g., Umbagog Lake). Two lake whitefish, possibly stocked, were found in Umbagog Lake in 1905, and none have been found since (Basley 2001). It is currently believed that populations exist in Winnepesaukee, Big Squam, Wentworth (Scarola 1987), Winnisquam, Silver (Madison) (D. Miller, New Hampshire Fish and Game (NHFG), personal communication), First Connecticut, and Francis Lakes (M. Garabedian, NHFG, personal communication, Bailey and Oliver 1939). The species has also been reported in several other water bodies within the state through stocking programs (Newfound Lake, Island Pond (Hampstead), Ossipee Lake, Sunapee Lake, Little Squam Lake, and Second Connecticut Lake) (NHFG, unpublished data). The status of these stocked populations is unknown.

Habitat

Lake whitefish are a pelagic, cool water species requiring either large rivers or deep, cold, clear lakes (Scarola 1987, Scott and Crossman 1973). Lake whitefish seek the cooler waters of the hypolimnion during summer months and are occasionally found along shoals in spring (Scott and Crossman 1973). Spawning habitats consists of shallow water reefs or tributary streams with hard or rocky substrates (Scarola 1987, Scott and Crossman 1973). Spawning occurs at temperatures ranging from 40° to 50°F (Scarola 1987) at depths typically less than 25 feet (Scott and Crossman 1973). Newly hatched larvae congregate along steep shorelines and move to deeper water by early summer (Scott and Crossman 1973).

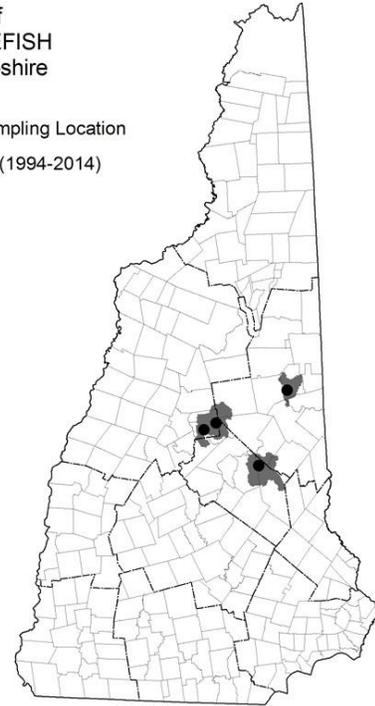
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NH Wildlife Action Plan Habitats

- Lakes and Ponds with Coldwater Habitat

Distribution of LAKE WHITEFISH in New Hampshire

- Fish Sampling Location
- Current (1994-2014)



Distribution Map

Current Species and Habitat Condition in New Hampshire

Abundant populations of lake whitefish were historically seen in some of New Hampshire's waterbodies. Scarola (1987) noted that anglers once eagerly targeted the lake whitefish. A creel census in 1952 and 1953 indicated lake whitefish were highly targeted by ice fishermen in the Squam Lakes, with estimated annual harvest yields of 500 pounds (Towne 1959). Lake whitefish have been observed in tributaries of both First Connecticut Lake and Lake Francis, and were noted for size ("three pounds or more") and fight (M. Garabedian, NHFG, personal communication). There have been reports of recent angler catches from Silver Lake (Madison) and Squam Lake (Don Miller, NHFG, personal communication). According to Scarola (1987), populations have significantly declined due to "overexploitation and abuse". The current status, abundance, and distribution of lake whitefish populations in New Hampshire remains poorly understood.

Population Management Status

At this time, it is unlikely that the 2 fish daily harvest limit affects existing populations. A recent survey of resident and nonresident anglers indicated that the lake whitefish is very rarely, if at all, caught (Duda and Young 1996). Accounts of accidental captures of lake whitefish are rare. No other direct management effort exists at this time.

Regulatory Protection (for explanations, see Appendix I)

- Harvest permit - season/take regulations

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Quality of Habitat

Deep, coldwater habitat is abundant and healthy forage populations exist in the waterbodies where lake whitefish are known to occur. Important spawning habitat has not been identified.

Habitat Protection Status

Habitat Management Status

There are no habitat management efforts targeted for lake whitefish.

Threats to this Species or Habitat in NH

Threat rankings were calculated by groups of taxonomic or habitat experts using a multistep process (details in Chapter 4). Each threat was ranked for these factors: Spatial Extent, Severity, Immediacy, Certainty, and Reversibility (ability to address the threat). These combined scores produced one overall threat score. Only threats that received a “medium” or “high” score have accompanying text in this profile. Threats that have a low spatial extent, are unlikely to occur in the next ten years, or there is uncertainty in the data will be ranked lower due to these factors.

Disturbance from water level management (Threat Rank: Medium)

Lake whitefish spawn on reefs with gravel and boulder substrate. The depth of these reefs may make them vulnerable to exposure if lake levels drop after the spawning season in late fall and early winter.

Lake trout eggs are known to be vulnerable to water level drawdowns (Thill 2014). Observations of lake trout and round whitefish spawning on a shallow reef in Newfound Lake have raised concerns about the impacts of water level management practices, which involve drawing down the lake throughout the winter. The location and depth of lake whitefish spawning areas must be identified before an assessment can be made on the potential impacts of water level fluctuation on lake whitefish egg survival.

List of Lower Ranking Threats:

Species impacts from competition (introduced species)

Disturbance from reduced area of coldwater habitat

Actions to benefit this Species or Habitat in NH

Water level management

Primary Threat Addressed: Disturbance from water level management

Specific Threat (IUCN Threat Levels): Natural system modifications

Objective:

Reduce the aquatic habitat impacts associated with artificial water level fluctuation at dams.

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General Strategy:

Work with dam managers to achieve water level fluctuations that mimic natural flow regimes. Practices such as rapid changes in water level, excessive winter drawdown, and shutting off downstream flow to refill a waterbody should be avoided. For coldwater species that spawn on shallow reefs, including lake trout, round whitefish, lake whitefish, and burbot, it is important that water levels do not drop significantly after the spawning season, such that the eggs would be exposed. Engaging stakeholders, including shorefront property owners, boaters, anglers, and hydropower project owners is critical to changing long established water level management traditions. The NH Dam Bureau is the lead on dam management issues in New Hampshire. The best strategy for improving water level management practices for fish and wildlife is to work with the Dam Bureau to identify opportunities to create more natural water level fluctuations at a certain dams and then make slow incremental changes. This allows stakeholders to adjust to the changes and make comments when conflicts arise.

Political Location:

Watershed Location:

Reduce nutrient loading

Primary Threat Addressed: Disturbance from reduced area of coldwater habitat

Specific Threat (IUCN Threat Levels): Climate change & severe weather

Objective:

Reduce the impacts of eutrophication by removing excess sources of nutrients.

General Strategy:

The primary sources of excess nutrients are lawn fertilizers in residential and commercial developments, agricultural fertilizers, and poorly functioning septic systems. Reducing nutrient loads can be achieved on two fronts. One is through outreach, which includes creating awareness about the effects of fertilizers on water quality and offering alternatives to fertilization practices that lead to the greatest amount of nutrient loading in nearby waterbodies. Best management practices can be developed for property owners with a focus on reducing runoff, minimizing or eliminating fertilizer use, and landscaping in a way that reduces the need for fertilization. In the case of septic failure, shoreline property owners with older septic systems can be targeted with incentives for upgrading. The second front is legislative. Laws that set limits on fertilizer use and require upgrades to septic systems will have long term benefits on water quality throughout the developed watersheds of southern New Hampshire. Requirements for new septic systems have greatly improved in recent years. The challenge is identifying and upgrading older systems that were constructed before septic systems were required to meet modern standards.

Political Location:

Watershed Location:

Map spawning habitat

Objective:

Map the distribution of coldwater fish spawning habitat in deep water lakes.

General Strategy:

Although some important spawning reefs have been well documented, the extent of spawning habitat for coldwater fish species remains undocumented in most lakes where they occur. Acoustic

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or radio telemetry, gill or fyke net surveys, underwater cameras, and visual observations are potential methods for identifying important spawning areas. Depth recordings at spawning areas will help inform water level management policy.

Political Location:

Watershed Location:

Population assessment

Objective:

Assess the status of lake whitefish populations in New Hampshire.

General Strategy:

Explore methods for assessing the populations of lake whitefish in lakes where they are known to occur. Confirm and update the current distribution of the species in New Hampshire.

Political Location:

Watershed Location:

References, Data Sources and Authors

Data Sources

Peer-reviewed literature was used to define the species' distribution and habitat. NHFG unpublished data, published literature, and personal communications with a NHFG conservation officer and fisheries biologist were used to define statewide distribution.

There are very few recent records of lake whitefish, other than incidental catches during surveys for lake trout and salmon as well as anecdotal reports from anglers.

Data Quality

Recent data for the species are scarce, with the majority of information available dating to the 1930s. Population distribution data are based on historical sampling data and recent angler reports to biologists and conservation officers. Data should be treated cautiously, for the round whitefish (*Prosopium cylindraceum*) may have been misidentified as the lake whitefish (Normandeau 1963).

NHFG biologists have attempted to survey for lake whitefish using gill nets and fyke nets on potential spawning reefs and summering grounds on Squam Lake and Lake Winnepesaukee. The surveys have so far been unsuccessful. These methods require a significant time commitment, which is beyond the current capacity of NHFG staff. Other methods, such as angling, should be tested.

There is a lack of information on which to evaluate the population status of lake whitefish. NHFG biologists have conducted gill net and fyke net surveys targeting the species, but they have so far been unsuccessful.

2015 Authors:

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2005 Authors:

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Literature

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