The State of the Lake Superior Fish Community in 2000

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The State of Lake Superior in 2000
In-lake Habitat in Good Condition
Lake Superior Binational Program
The State of Lake Superior in 2000

Habitat

Trophic
Phytoplankton Biovolume, Spring 1999

Biovolume (10^6 μm^3/ml)

- 2*10^6 μm^3/ml
- 1*10^6 μm^3/ml
- 5*10^5 μm^3/ml

Phytoplankton, Spring 1999
Abundance of *Diporeia* throughout Great Lakes, 1999
The State of Lake Superior in 2000

- Habitat
- Trophic
- Non-Native
Proportion of native and non-native fish species in the Great Lakes

Based on Mills et al. 1993, D.A. Jensen (manuscript in prep 2000)
Unintentionally Introduced Fish (9) in Lake Superior

- Ruffe
- Fourspine stickleback
- Threespine stickleback
- Round goby
- Tubenose goby
- White perch
- American eel
- Sea lamprey
- Alewife

ship ballast
ship ballast
ship ballast
ship ballast
ship ballast
ship ballast
canals
canals
canals/ballast
Non-Native Species

> Recent Invaders
> Sufficient Buffering Capacity
Present Fish Community
Estimated Lamprey Spawners - Lake Superior 1980 - 2001
Lamprey Marking of Lake Trout
Lake Superior, 1986-2000

Marks per 100 Lake Trout

- Canada
- U. S.
The State of Lake Superior in 2000
Waters of Lake Superior

- **Bays**
- 0-240 ft (0-80 meters)
- > 240 ft (> 80 meters)
Sports Fishery - Salmonids in Catch from Ontario Waters of Lake Superior 1987-1999

- Chinook Salmon: 13%
- Coho Salmon: 4%
- Rainbow Trout: 4%
- Brook Trout: 0.45%
- Lake Trout: 79%

- Lake Trout: 67%
- Coho Salmon: 17%
- Chinook Salmon: 8%
- Siscowet Lake Trout: 5%
- Brown Trout: 2%
- Rainbow Trout: 1%
Commercial Fishery Harvest 1970-2000

- Smelt
- Chubs
- Herring
- Whitefish
- Lake Trout
- All others
Summary Commercial Catch

1. Size of fishery declining
2. Primarily Native American fishery
3. Prices declining or stable
4. Gill net effort declining
5. Trap net effort increasing
6. Whitefish primary fishery, herring secondary
7. Lake trout harvest declining
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Lake Trout - Ontario Commercial Harvest

CPUE (kg/km) vs YEAR

The graph shows the trend of Lake Trout commercial harvest in Ontario from 1950 to 2000, with CPUE (catch per unit effort) values fluctuating over the years.
Lake Trout Stocking in Lake Superior

Millions Stocked

Year

Status of Lake Trout in Lake Superior 2000

- Wild lake trout abundance increasing MN & WI and ONT waters of Lake Superior
- Current abundance MI and Western ONT waters of Lake Superior is higher or comparable to historic values
- Growth rates continue to decline and began in 1970s
- Siscowet abundance high & may be increasing
- Sea lampreys kill more lake trout than the combined sport and commercial fisheries
Lake Whitefish - Total Lake Superior Harvest

CATCH (T)

YEAR

MI  MN  ON  WI

0  1000  2000  3000  4000  5000  6000  7000  8000  9000  10000

Status of Lake Whitefish in L. Superior 2000

- Abundance is high in most zones, likely a consequence of stocks rebuilding after removal of effort when lake trout fishery collapsed in 1950s
- Mortality below 60-65% guideline in most zones
- Harvest composed mainly of mature fish
- Average harvest weight has been increasing or is static in many zones
- Prognosis is good for lake whitefish in most areas
Sturgeon, Walleye, & Brook Trout Present

> Increasing in Abundance

> Sturgeon & Walleye widespread
Biomass of bloater, smelt, and herring in Lake Superior, 1978-2001

** = strong year class-lake herring
* = strong year class-smelt

YEAR

Canada
U. S.
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- Trophic
- Exotics
- Habitat
- Fisheries
- Research
- Fish Species
Future Research Needs/Issues

Fish Community Objectives 14 Recommendations

1. Sustainability of Lake Trout Populations
2. Food Web Dynamics
3. Rehabilitation of Depleted Native Species
4. Lower Trophic Level Monitoring
5. Effects of Introduced Species
The State of Lake Superior in 2000

Trophic
Exotics
Habitat
Fisheries
Future
Fish Species
Research
Future Fish Community

1. Brook trout, lake sturgeon and walleye populations resurge
2. Lake trout rehabilitation will continue
3. Whitefish stocks stabilized
4. Lake herring partially recovered
5. Habitat degradation will continue
6. Several new non-native species
Nipigon Brook Trout