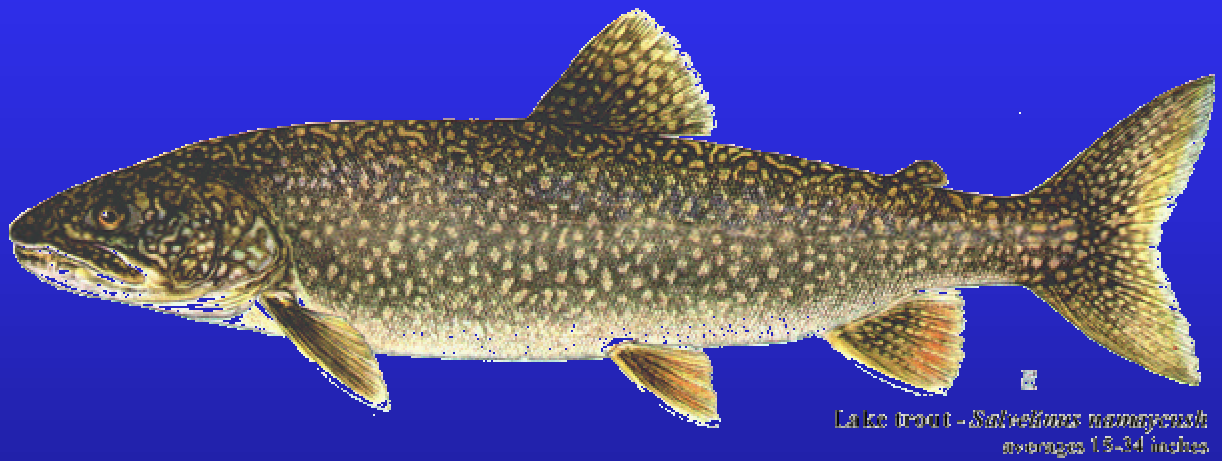
The State of Lake Ontario



Lake Trout Rehabilitation

Lake Trout

- Only salmonine native to all 5 lakes
- Apex predator
- Requires oligotrophic conditions
- Requires clean spawning substrate
- Long life span
- Diversity within specie
- Integrates many ecosystem components

Lake Ontario Committee
Lake Trout Rehabilitation Goal

To rehabilitate the lake trout population of Lake Ontario such that the adult spawning stock(s) encompasses several year classes, sustains itself at a relatively stable level by natural reproduction, and produces a usable annual surplus

Proposed Lake Ontario LaMP / SOLEC Lake Trout Indicator

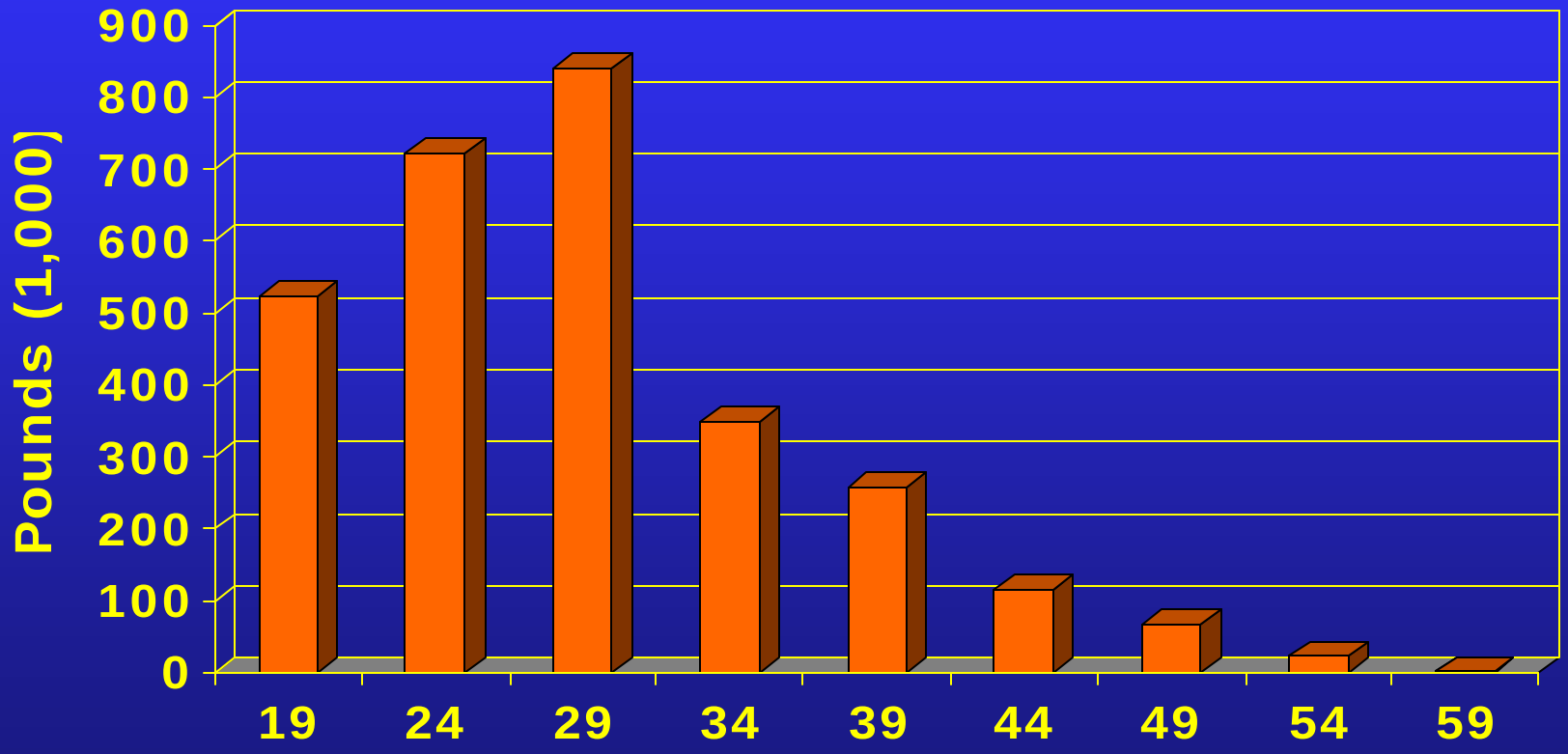
Objective: Healthy lake trout populations sustained through natural reproduction

Native lake trout were extirpated from all* of the lakes except Lake Superior

WHY?

Fishing

Lake Ontario Lake Trout Commercial Landings



Source: Baldwin et al. 1979

Habitat Loss

Sea Lamprey

Other Invasive Species

Contaminants

- Contamination by dioxin-like chemicals began in 1930s and peaked in late 1960s
- Levels may have been high enough for 100% fry mortality from 1945 – 1975 (blue sac syndrome)
- Levels below threshold for adverse effects after 1991

Research by P. Cook, P. Guiney, R. Peterson, L. Burkhard and others

Proposed Measures Lake Ontario LaMP

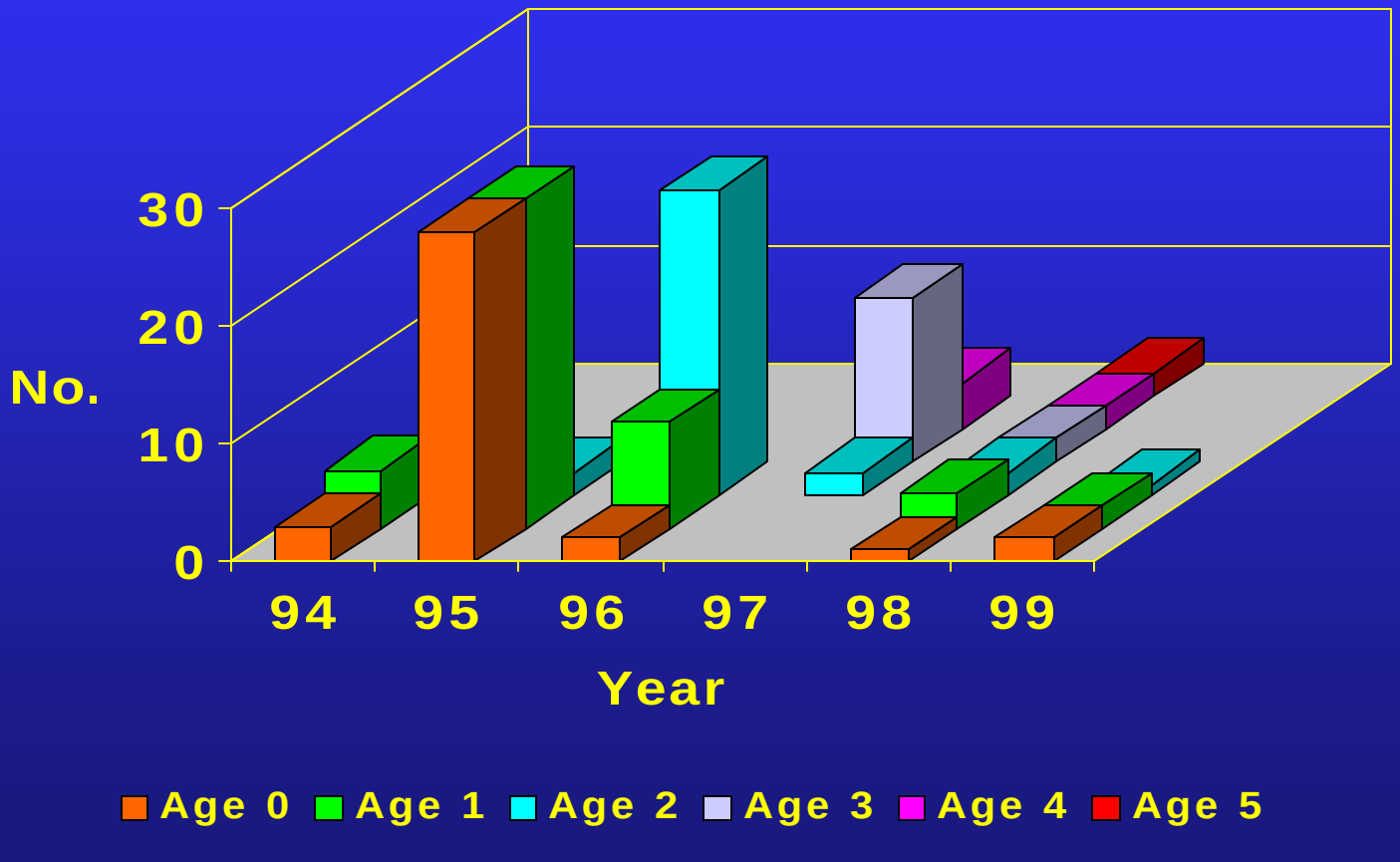
- Abundance of naturally produced lake trout
- Mature, naturally produced females
- Number of lake trout harvested
- Lamprey wounding

Proposed Measure:

Abundance of naturally produced lake trout

26 wild age 2 lake trout in summer bottom trawls in N.Y. waters

Naturally-spawned Lake Trout Captured in Trawls



Data Source: USGS and NYSDEC

Proposed Measure:

Abundance of mature, naturally produced females

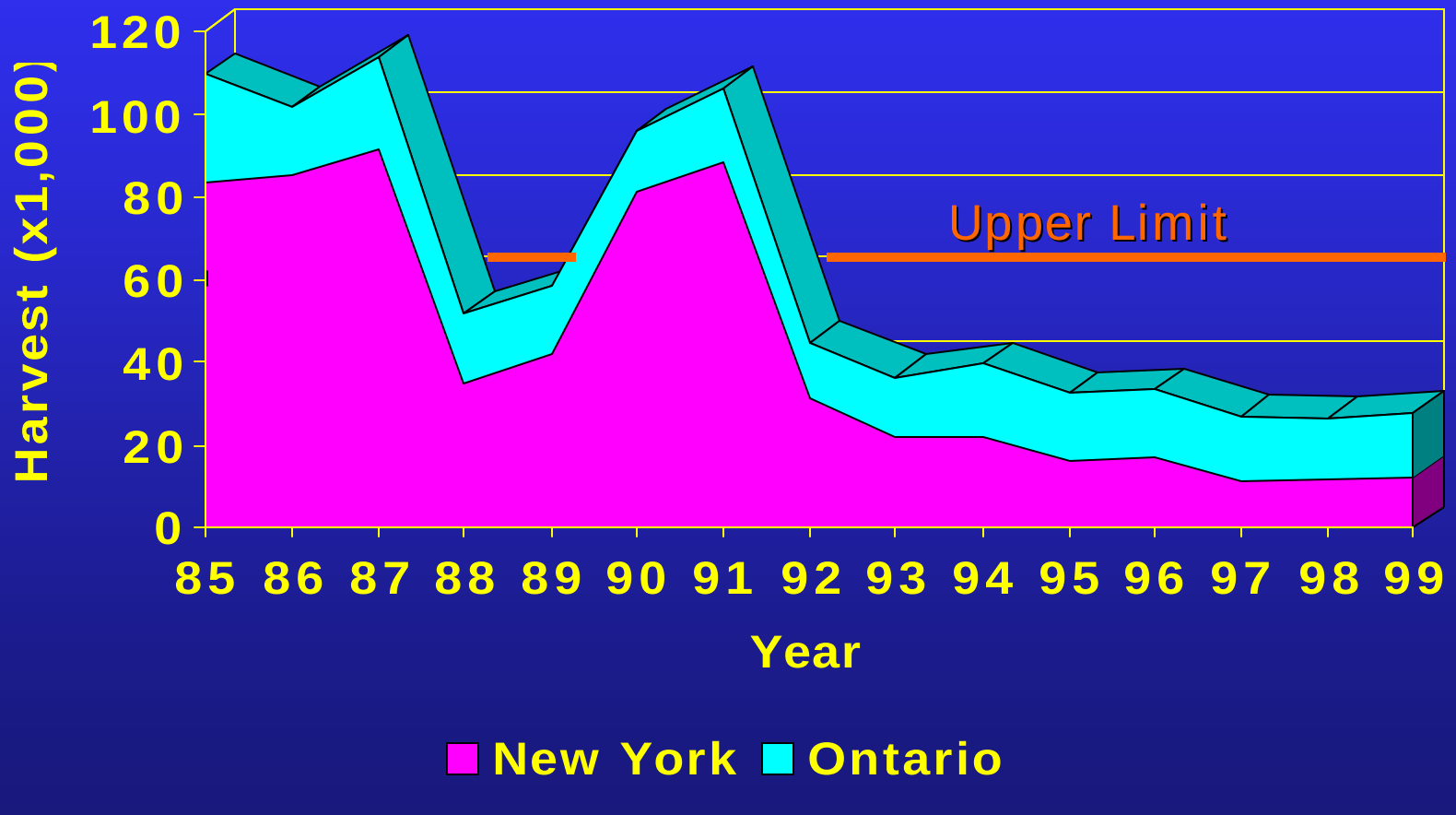
Minimum catch per unit effort (CPUE) in assessment nets

Proposed Measure:

Number of lake trout harvested

Maximum 30,000 per country

Lake Trout Sport Harvest



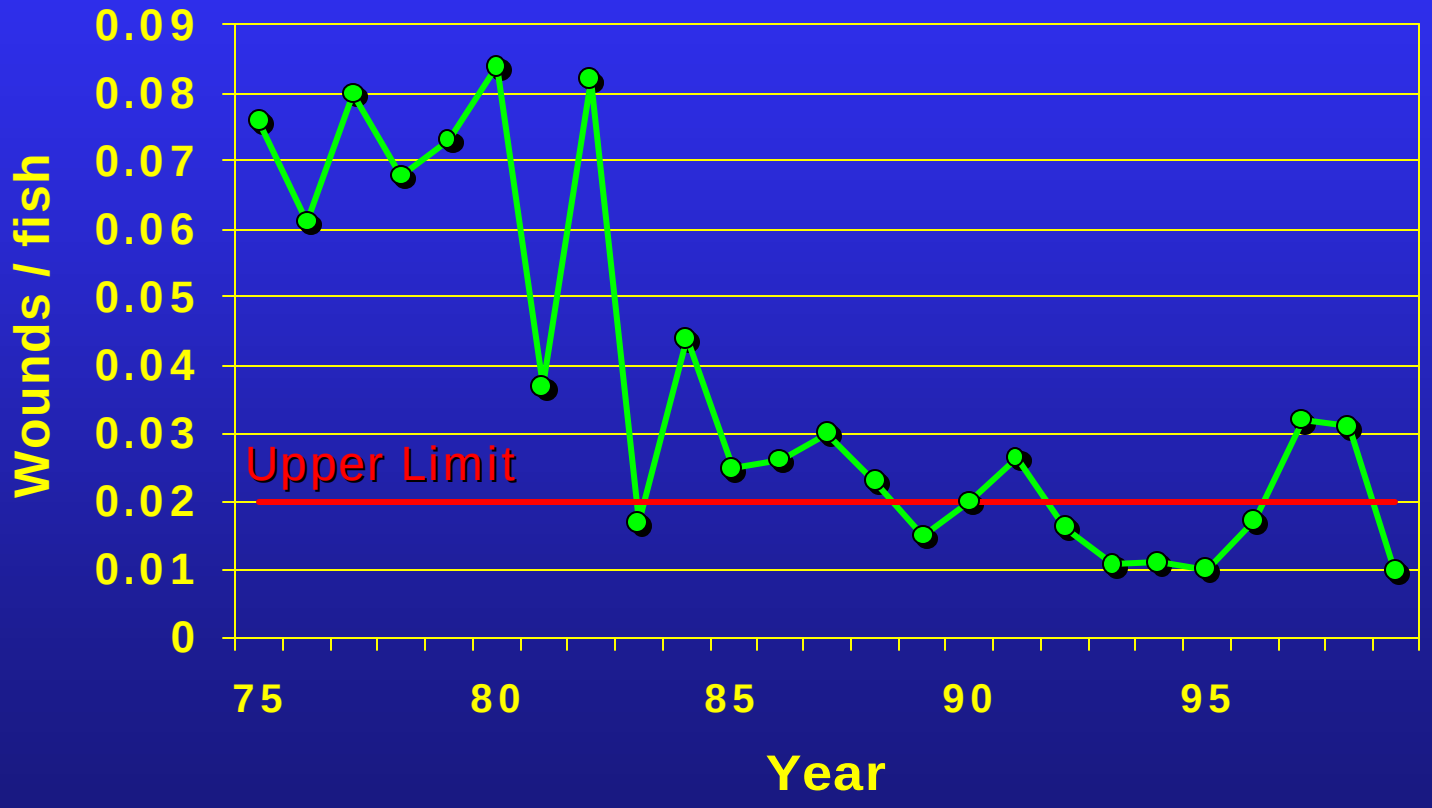
Data Sources: NYSDEC and OMNR

Proposed Measure

Sea Lamprey Wounding

Maximum two A1 wounds per 100 fish

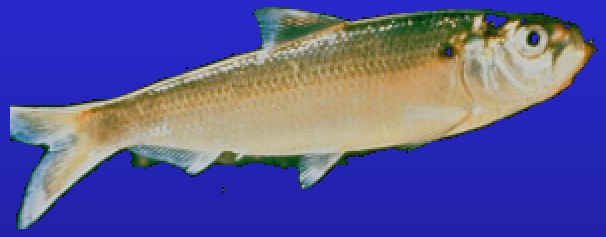
Sea Lamprey Wounds on Lake Ontario Lake Trout



Data Source: USGS and NYSDEC

The Alewife Paradox

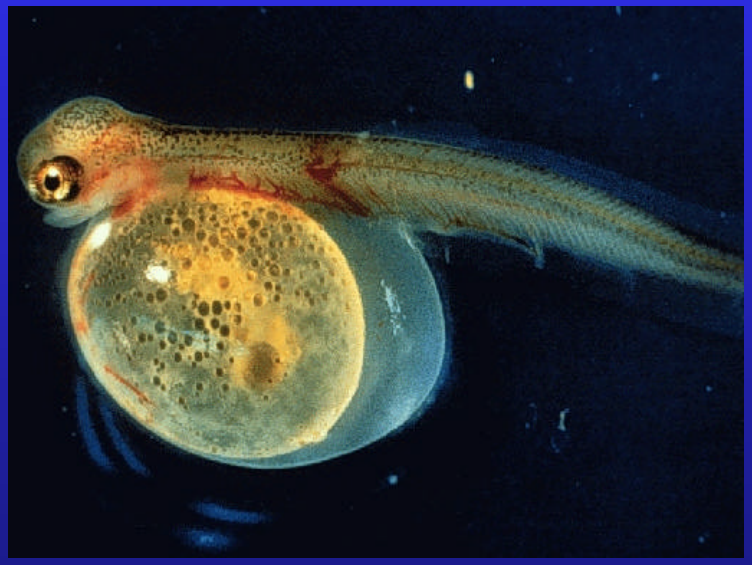
- Dominant dietary item for lake trout (and all other trout and salmon)



- BUT, alewives prey on lake trout fry
- Probable linkage with Early Mortality Syndrome

Early Mortality Syndrome

- Caused by thiamine (vitamin B1) deficiency
- Up to 100% mortality of fry
- Linked to diet rich in alewives (thiaminase)



A Fisheries Management Dilemma…

The prey species that supports an economically valuable fishery…

Inhibits the recruitment of lake trout and other native species

Status of Lake Trout Rehabilitation

- Natural reproduction since 1985
- Recruitment of older ages since 1994
- Widespread distribution of naturally produced fish
- Average age of mature females increasing
- Low fishing mortality
- Sea lamprey under control

- Decreasing survival of stocked lake trout
- No increase in wild fish abundance
- Diet mostly alewives
- Early Mortality Syndrome still a problem

Keys to Future Success

- Improved survival of stocked lake trout
- Diversification of diet (bloaters?)
- Continued effective sea lamprey control
- Habitat protection
- Restrictive angling regulations
- Low contaminant levels

Proposed Lake Ontario LaMP Ecosystem Indicators

Critical Pollutant Indicators	Open Water YoY Fish Herring Gull Eggs Lake Trout
Lower Foodweb Biological Indicators	Nutrients Zooplankton Preyfish
Upper Foodweb Biological Indicators	Herring Gull Lake Trout Mink and Otter Bald Eagle