Northwest **Power** and **Conservation** Council

July 1, 2014

MEMORANDUM

TO: Council Members

FROM: Jeff Allen
Idaho Council Staff

SUBJECT: Presentation by Jim Fredericks, Regional Fishery Manager, Idaho Department of Fish and Game

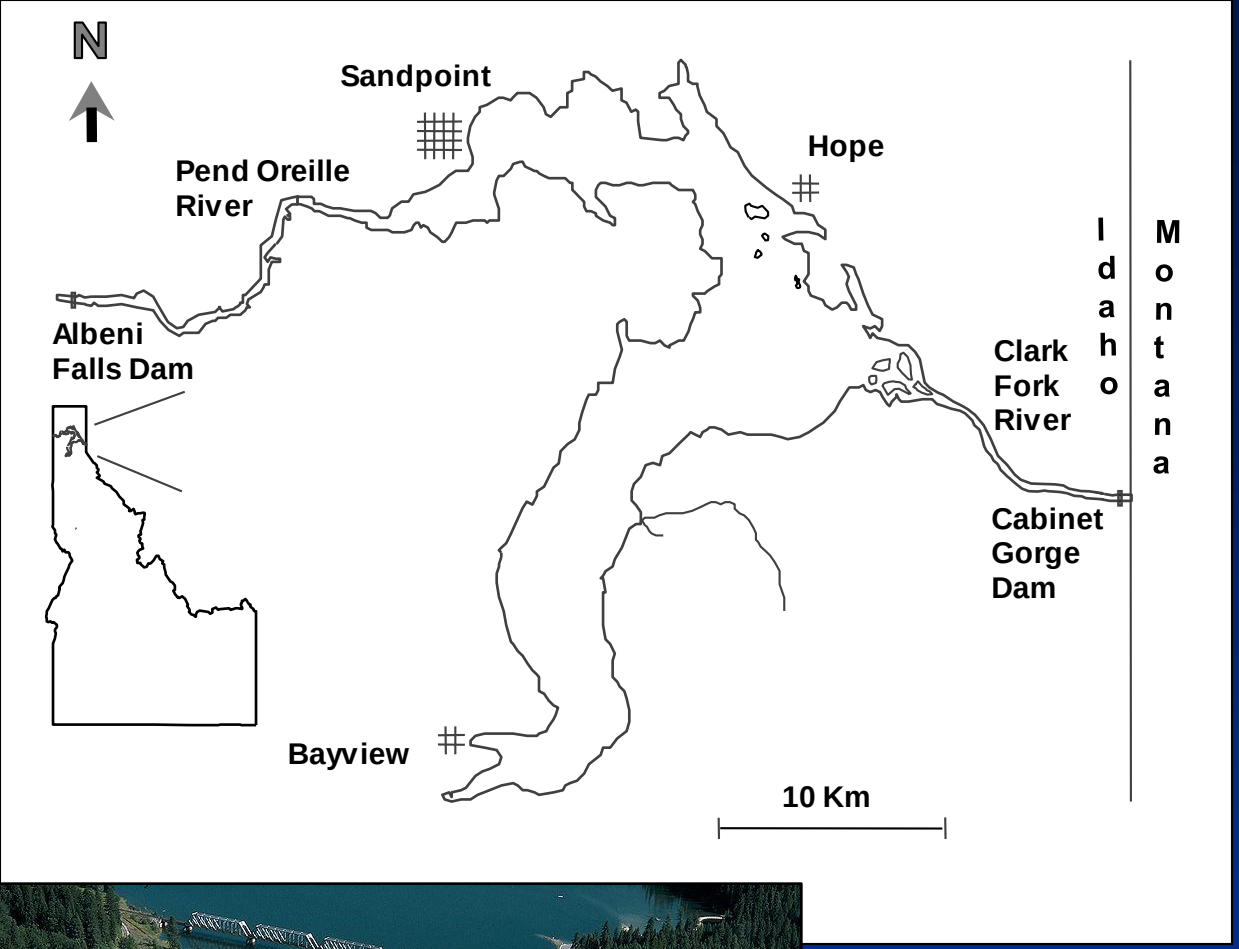
Mr. Fredericks will provide an overview of the lake trout suppression program in Lake Pend Oreille. Idaho's largest and deepest lake, Pend Oreille once provided the most productive kokanee fishery in the state, with an average harvest of a million fish per year. Kokanee also served as the prey base for world class trophy rainbow and bull trout fisheries. Though several factors contributed to a decline in the kokanee population, including hydropower facilities both upstream and downstream of the lake and the subsequent introduction of Mysis shrimp, excessive predation by lake trout became the predominant threat in the early 2000s. Assessments between 1999 and 2006 showed an exponentially expanding population of lake trout, prompting concerns about a collapse of the kokanee population and the subsequent collapse of the lake's trophy rainbow fishery and federally protected bull trout population.

In response to the dramatic declines in abundance, the kokanee fishery was closed in 2000, and a large-scale lake trout suppression effort was initiated in 2006. The two-pronged effort, funded in large part by Bonneville, consists of 1) a financial incentive to encourage anglers to harvest lake trout and 2) an extensive netting effort using contracted commercial fishermen from Lake Michigan. In the eight years since the program began, nearly 170,000 lake trout have been removed, and the population has declined an estimated 70-80% from its peak in 2006. The kokanee population has

responded. Over 1.25 million kokanee survived to spawn in 2013, compared with less than 10,000 in 2007. The increase in the kokanee population provided an opportunity to re-open a kokanee fishery in 2013. Though initially somewhat contentious, most stakeholders now regard the program as a major success. The kokanee fishery has been restored, the trophy rainbow fishery is rapidly improving, and the bull trout population has remained strong throughout the netting effort.

Lake Pend Oreille Fishery Recovery Program

Jim Fredericks and Andy Dux
Idaho Department of Fish and Game



Lake Pend Oreille

Largest lake in Idaho - 36,400 ha

5th deepest natural lake in U.S.
- Avg. depth 164 m
- Max. depth 351 m

Upper 3.5 m regulated by Albeni Falls Dam

Clark Fork River regulated by Cabinet Gorge Dam

Albeni Falls Dam on Pend Oreille River

Lake Pend Oreille Fishery

- Kokanee – established in 1930s; keystone species
  - Historically supported most popular fishery in Idaho
  - Primary prey source for predators
- Bull trout – native (ESA listed)
- Gerrard rainbow trout – introduced in 1941
- Lake trout – introduced in 1925; extremely low abundance until late-90s

1949 world-record bull trout, 32 lbs.

1947 world-record rainbow, 37 lbs.

2010 derby-winning rainbow, 25 lbs.

Growth of the Lake Trout Population

- Introduction of *Mysis diluviana* (1966-69) increased juvenile lake trout survival
- Additional predation from LKT reduced survival for already depressed kokanee population
  - Kokanee fishery closed in 2000
- Threat to native bull trout population
- Options: Suppress lake trout or risk complete loss of kokanee, bull trout and trophy rainbow fishery

Lake Trout Biology

- Live entire life in lake, unlike native trout
- Highly piscivorous, but can live off of entirely invertebrate diet
- Late maturing
- Much longer life-span than most native freshwater fish (oldest recorded 65 yrs)
- Low fecundity

Great Bear Lake, NWT – Courtesy Mike Hansen

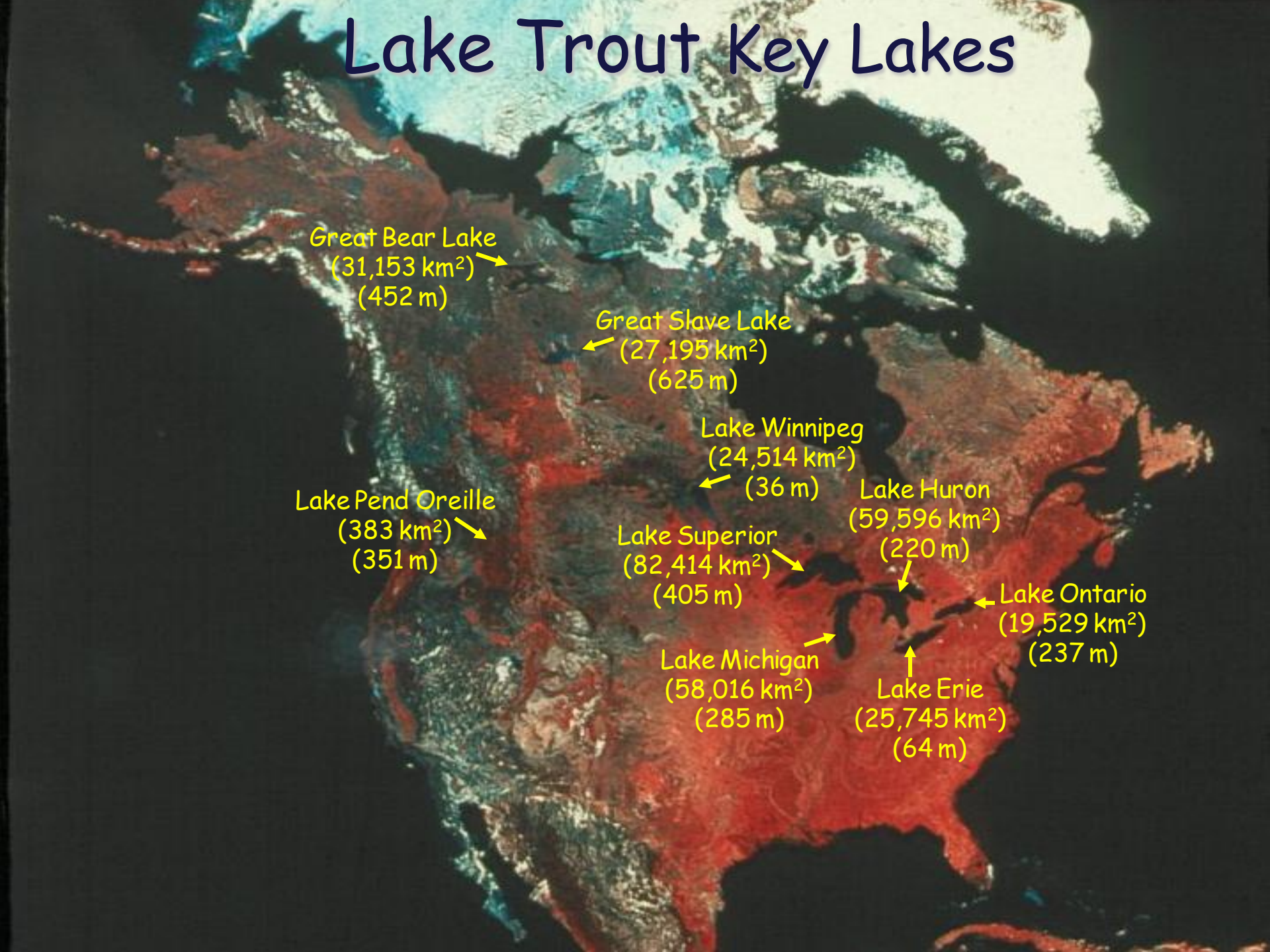
Vulnerable to over-fishing

Commonly overharvested in native range

Great Lakes

- Fishing mortality caused stocks to decline during late 1800s and early 1900s.
- Sea lamprey invasion added to total annual mortality in 1950s.
- Stocks declined steadily for 50 years and then collapsed quickly in 5–10 years.

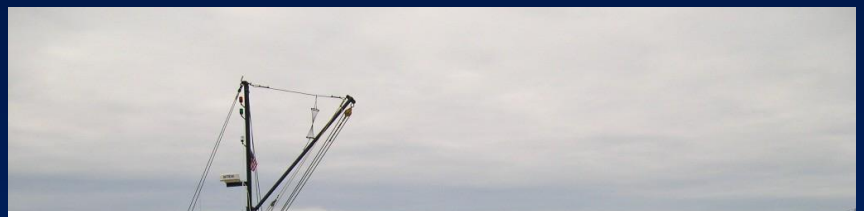
Lake Trout Key Lakes

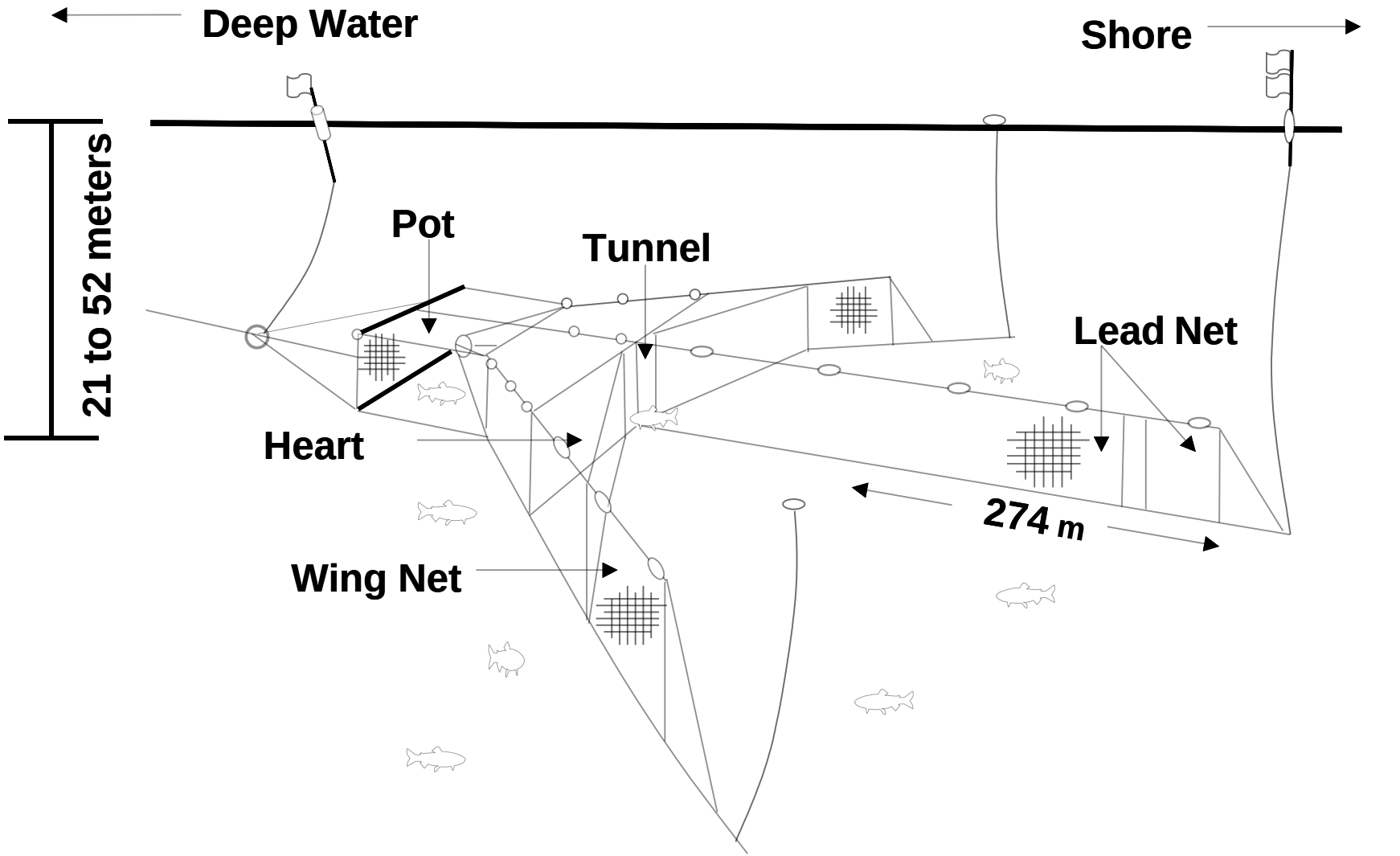


Lake Trout Suppression Methods

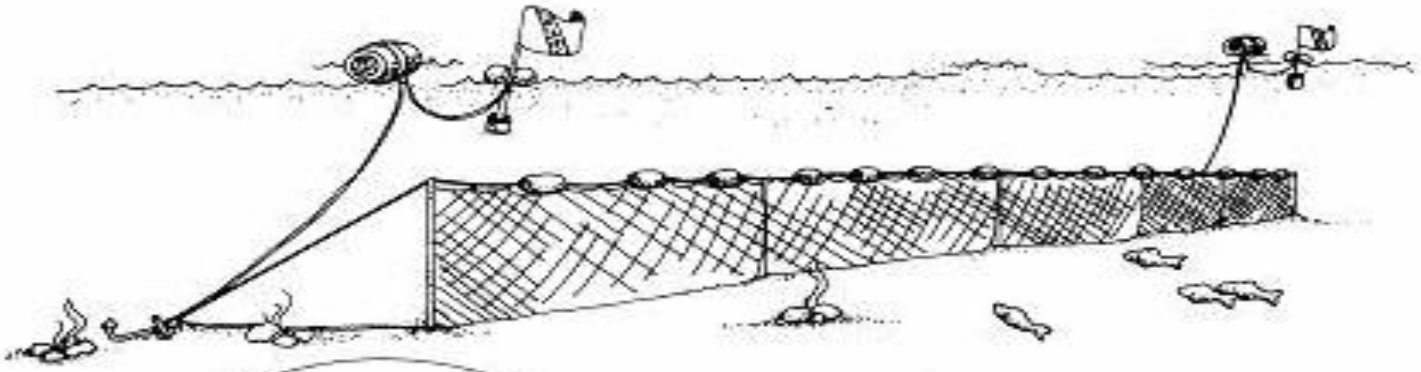
- Contracted commercial fishing company (Hickey Bros. Fisheries)
- Angler Incentive Program ($15/fish) to remove LKT
- Removals began in 2006
- Funded by Avista and BPA
  - Annual cost around $1 million
- Research to guide and evaluate removal
  - Telemetry, population estimates, etc.

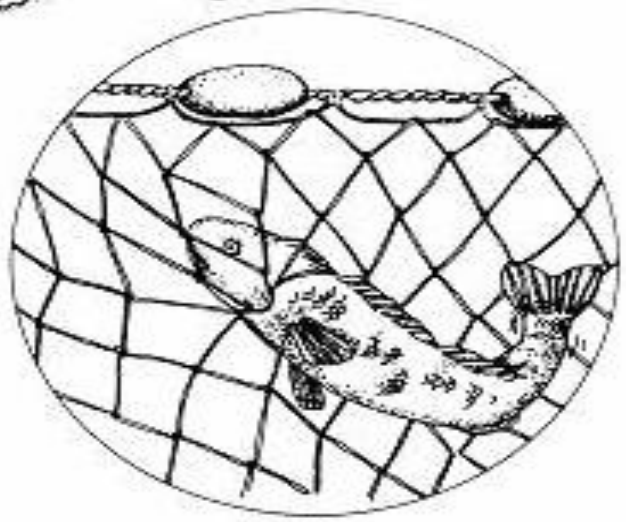
Commercial Equipment--Trapnets





Commercial Equipment--Gillnets





Gill Net

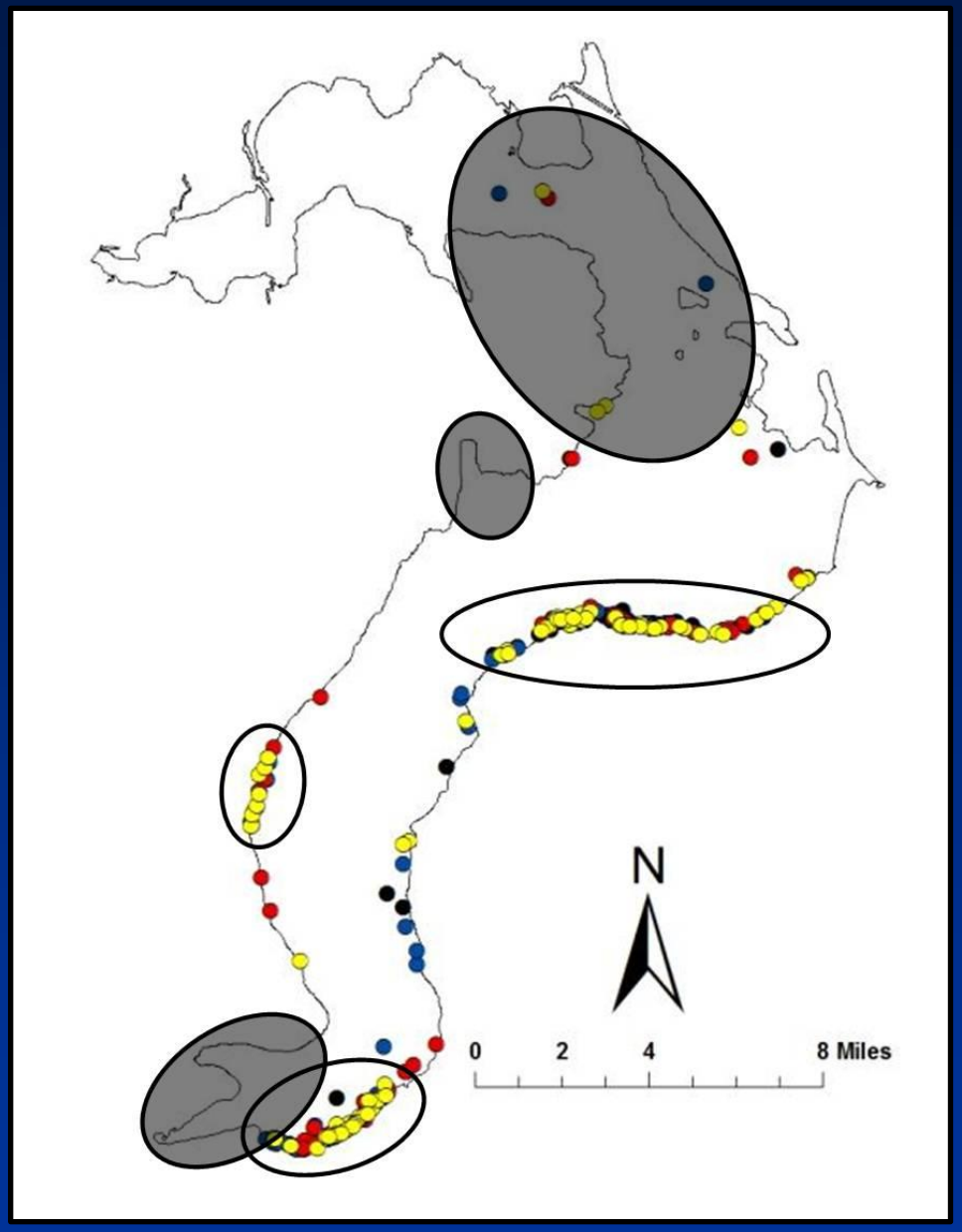
305 m long

3 m high

Multiple panels of different stretch measure (2.0, 2.5, 3.0, 3.5, 4.0, 4.5, and 5 inch)

Netting Strategy

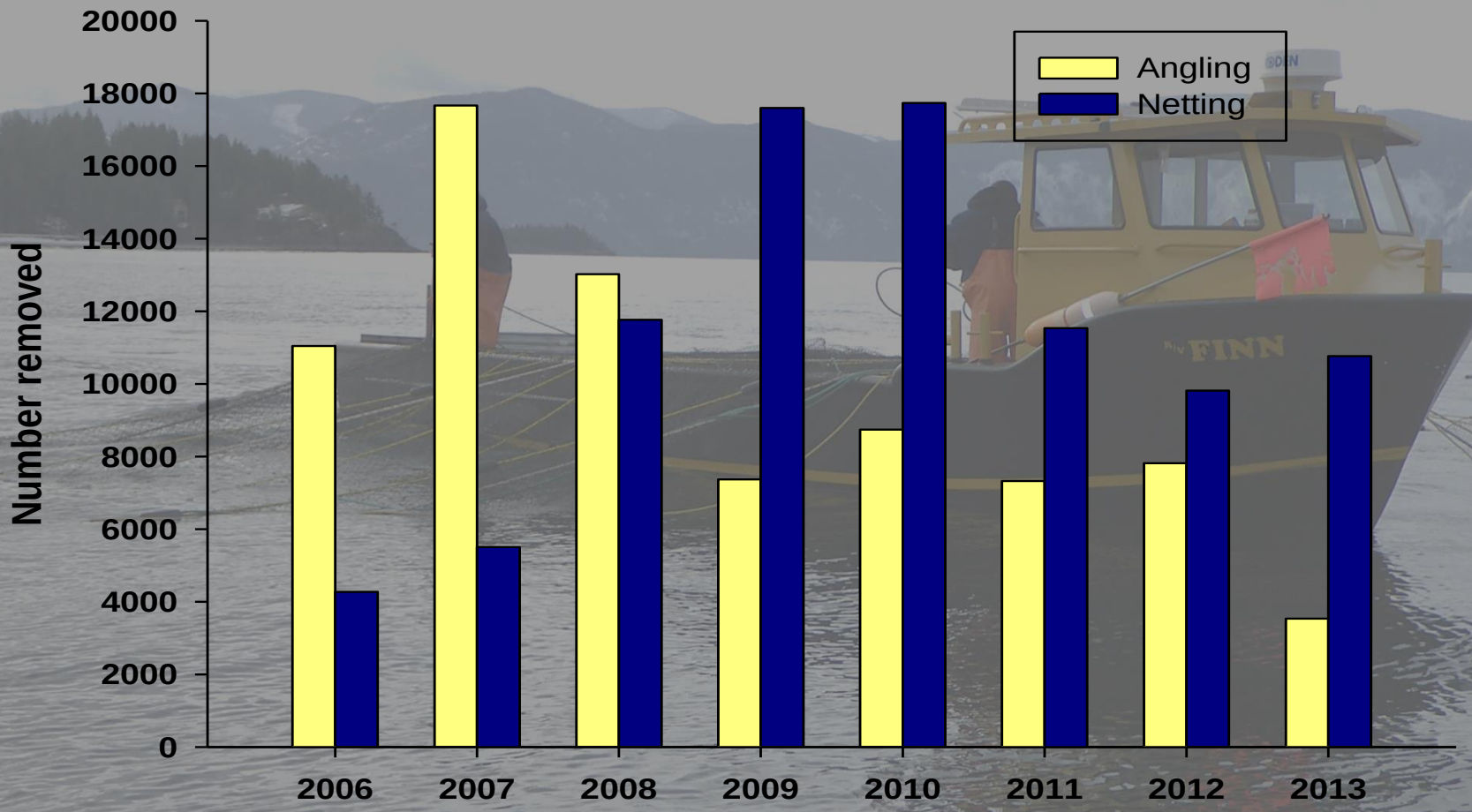
- Sept. – April netting
  - 30 weeks/yr
  - Gill nets (up to 614 km set annually)
  - Deepwater trap nets
- Target spawning areas
  - 5 weeks in fall
- Target "nursery" areas
  - 25 weeks/yr



Lake Trout Population Status

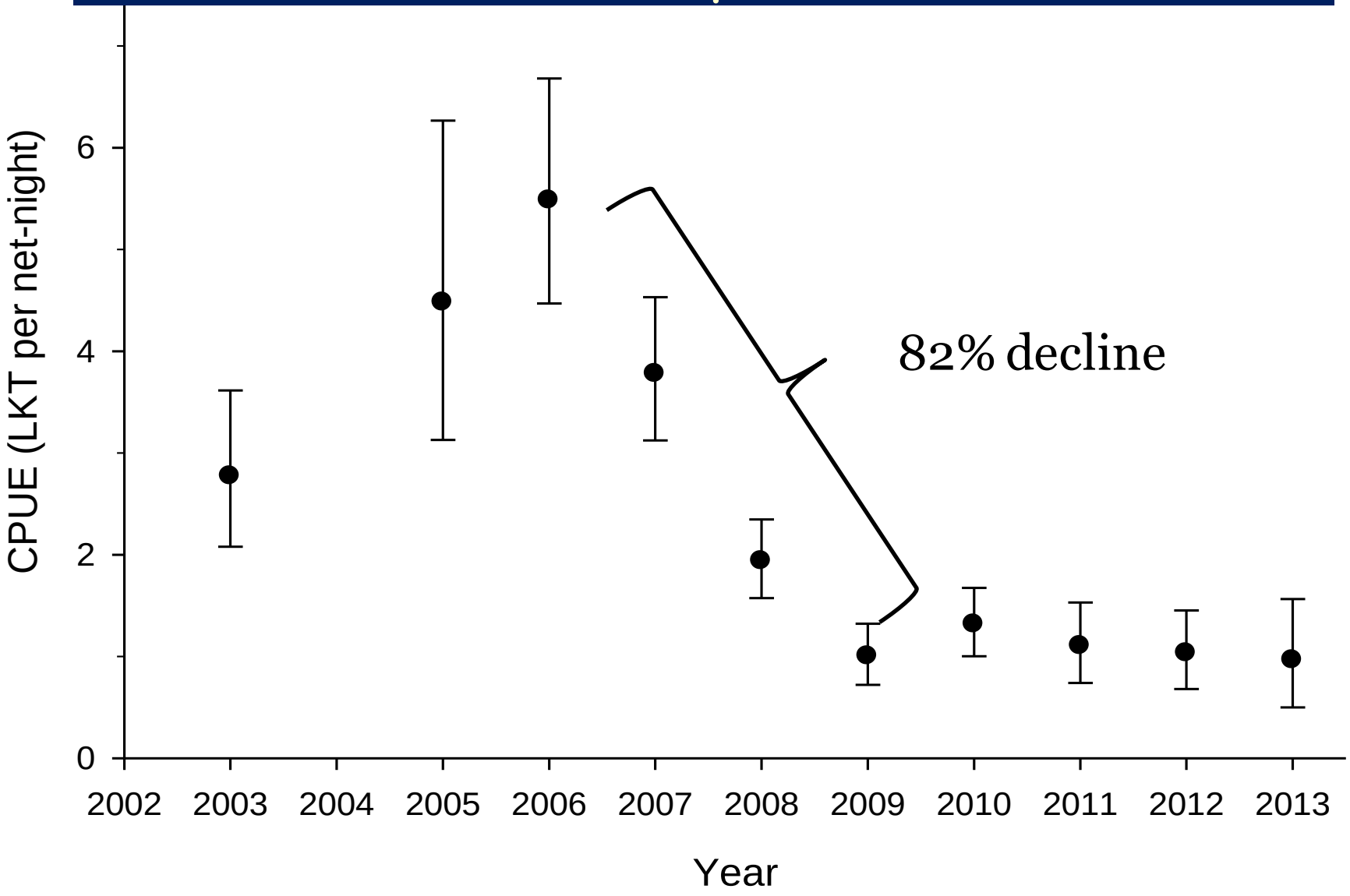
Total Lake Trout Removed

Total Angling = 76,506
Total Netting = 88,981
Grand Total = 165,487

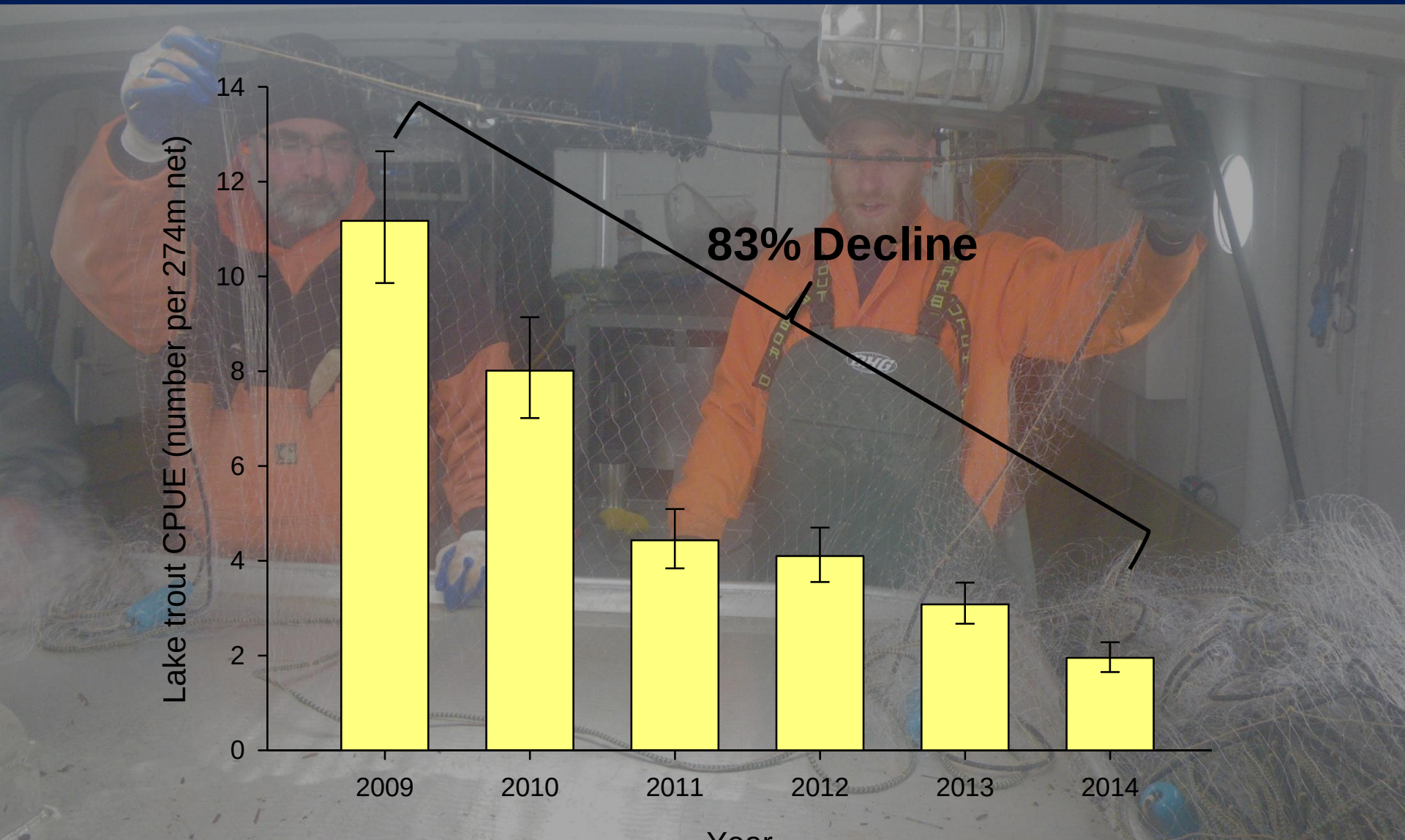


Adult Lake Trout Trend

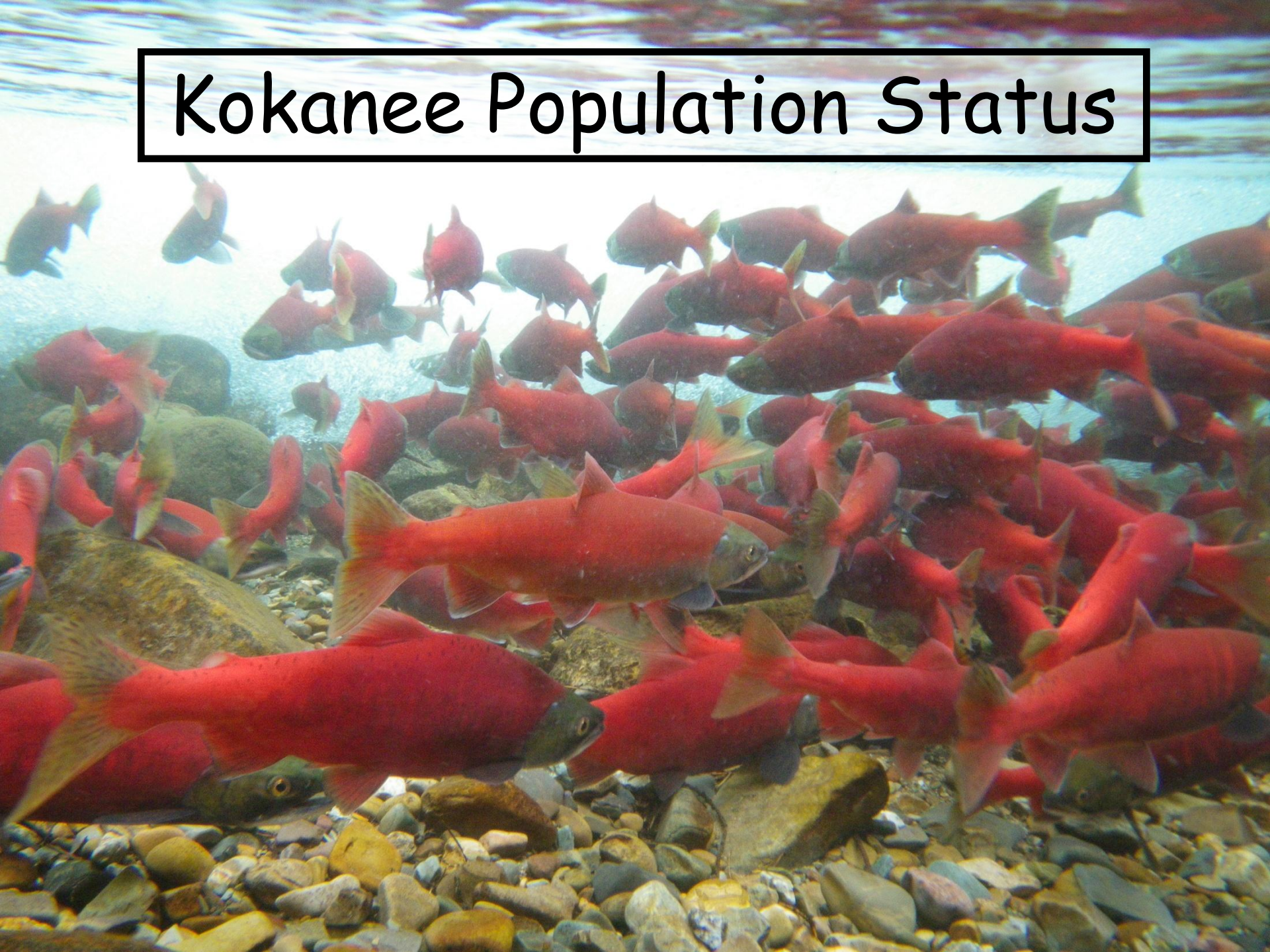
Standardized Trap Net Catch Rate



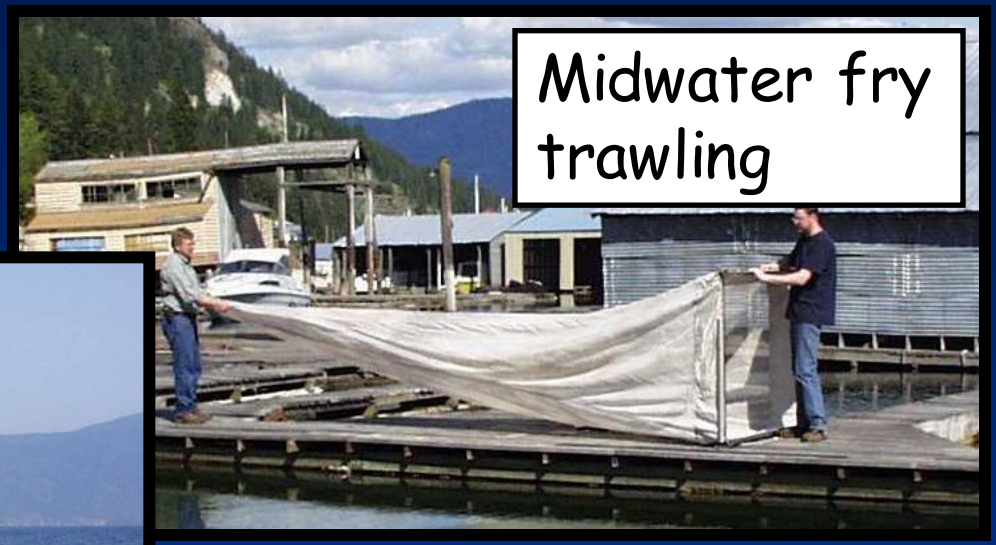
Juvenile Lake Trout Trend

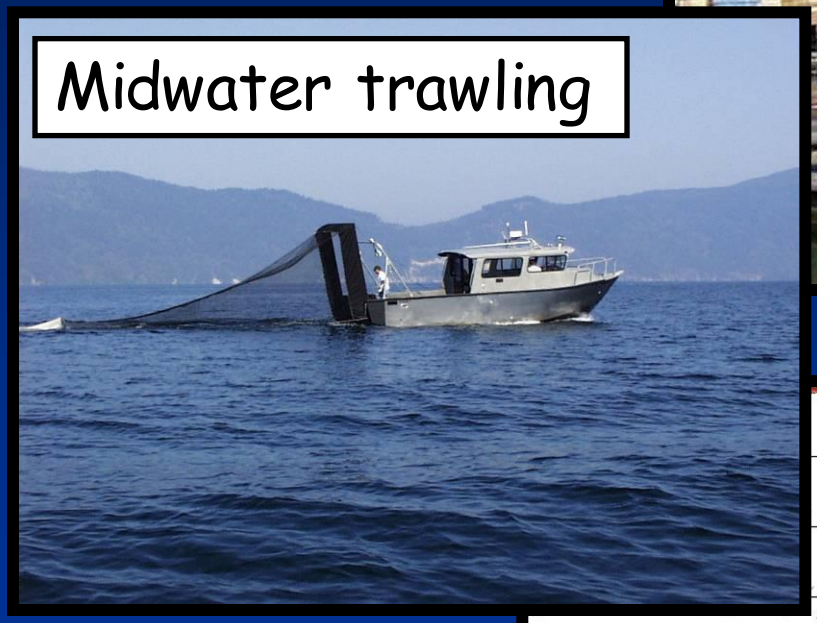


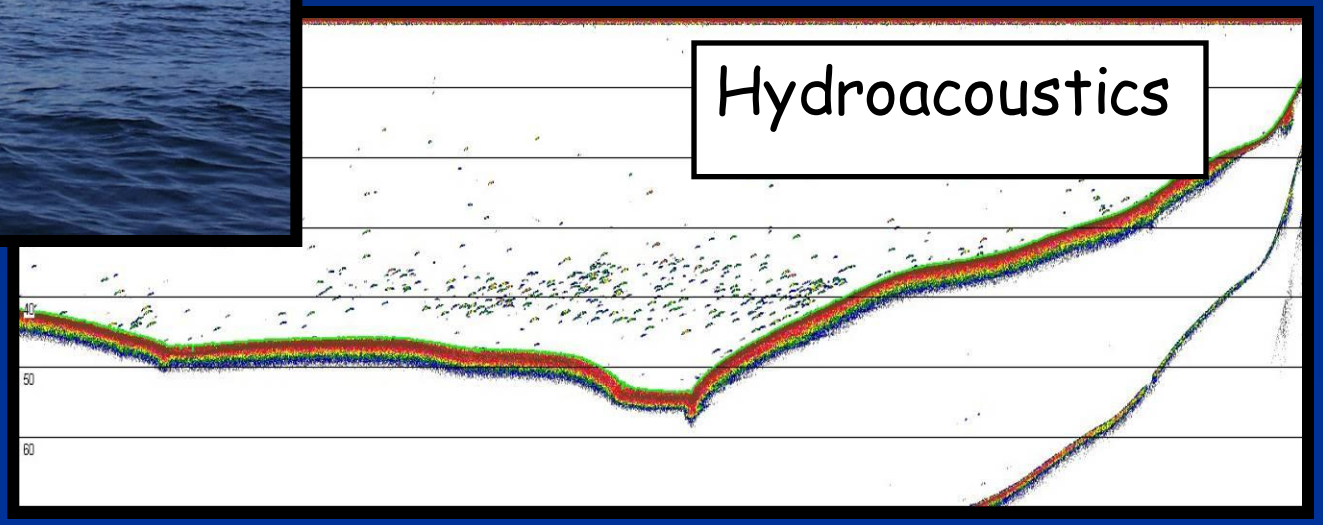
Kokanee Population Status



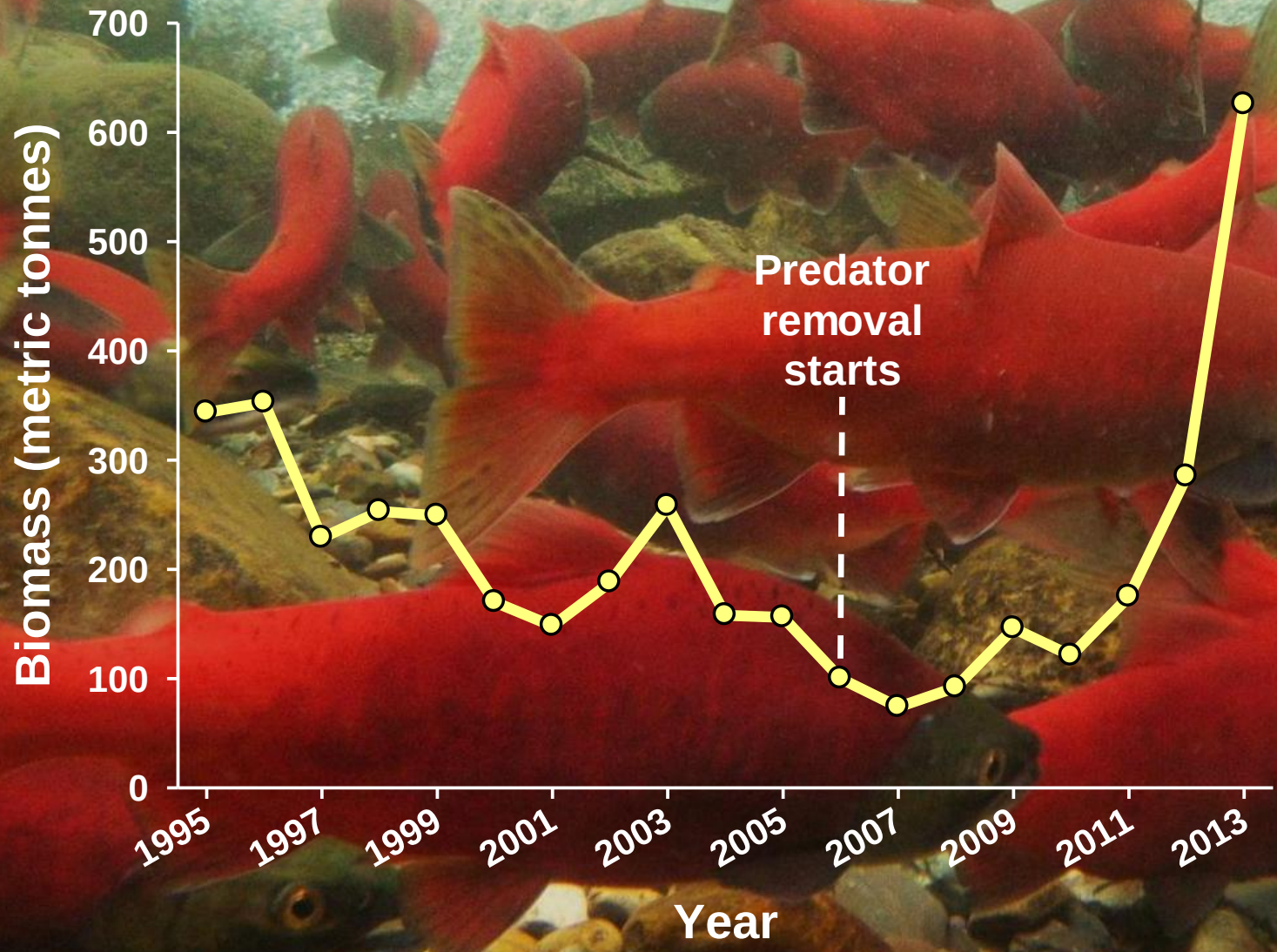
Kokanee Monitoring



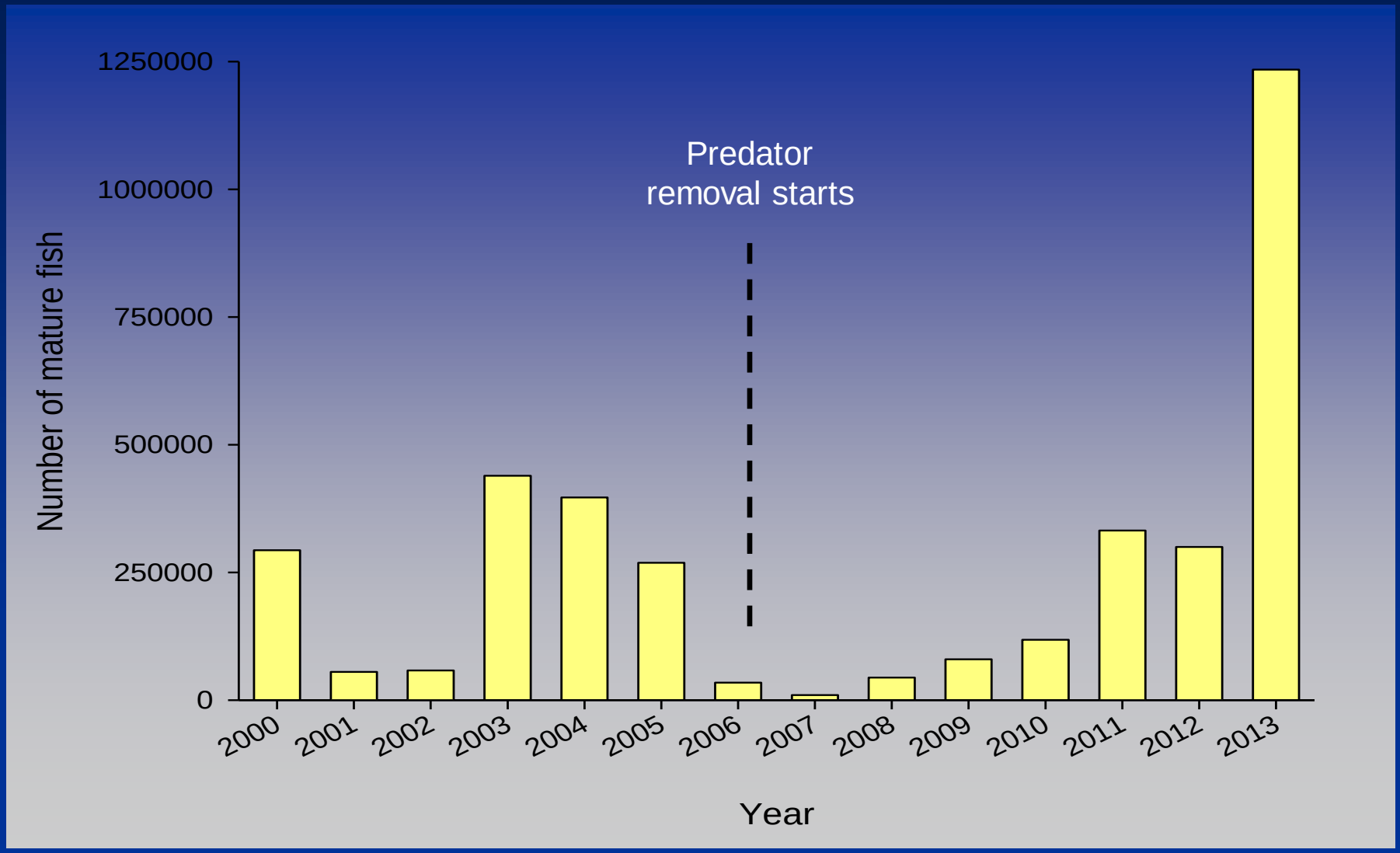




Kokanee Response

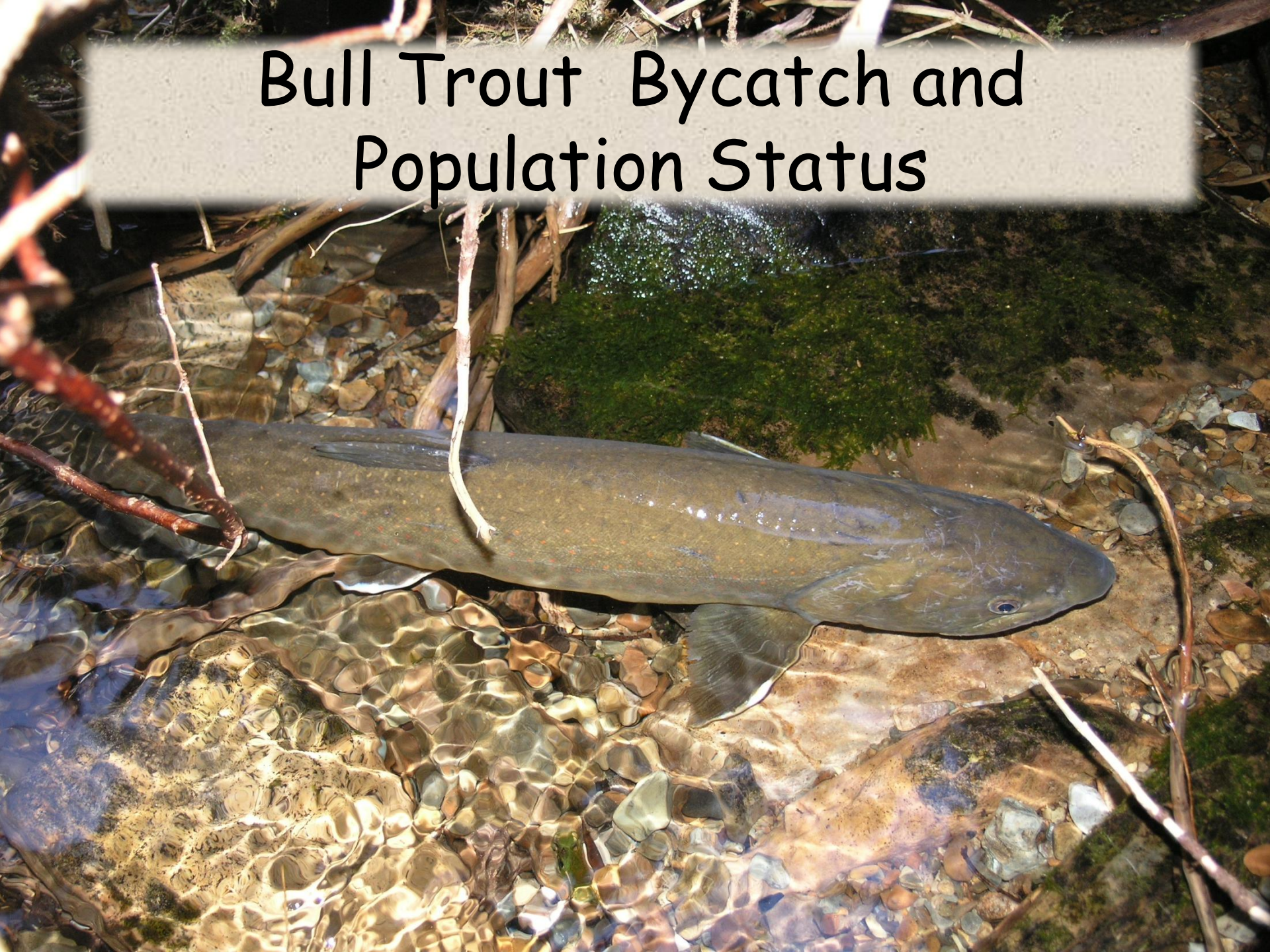


Adult Kokanee Abundance



Rainbow Trout Response

Bull Trout Bycatch and Population Status



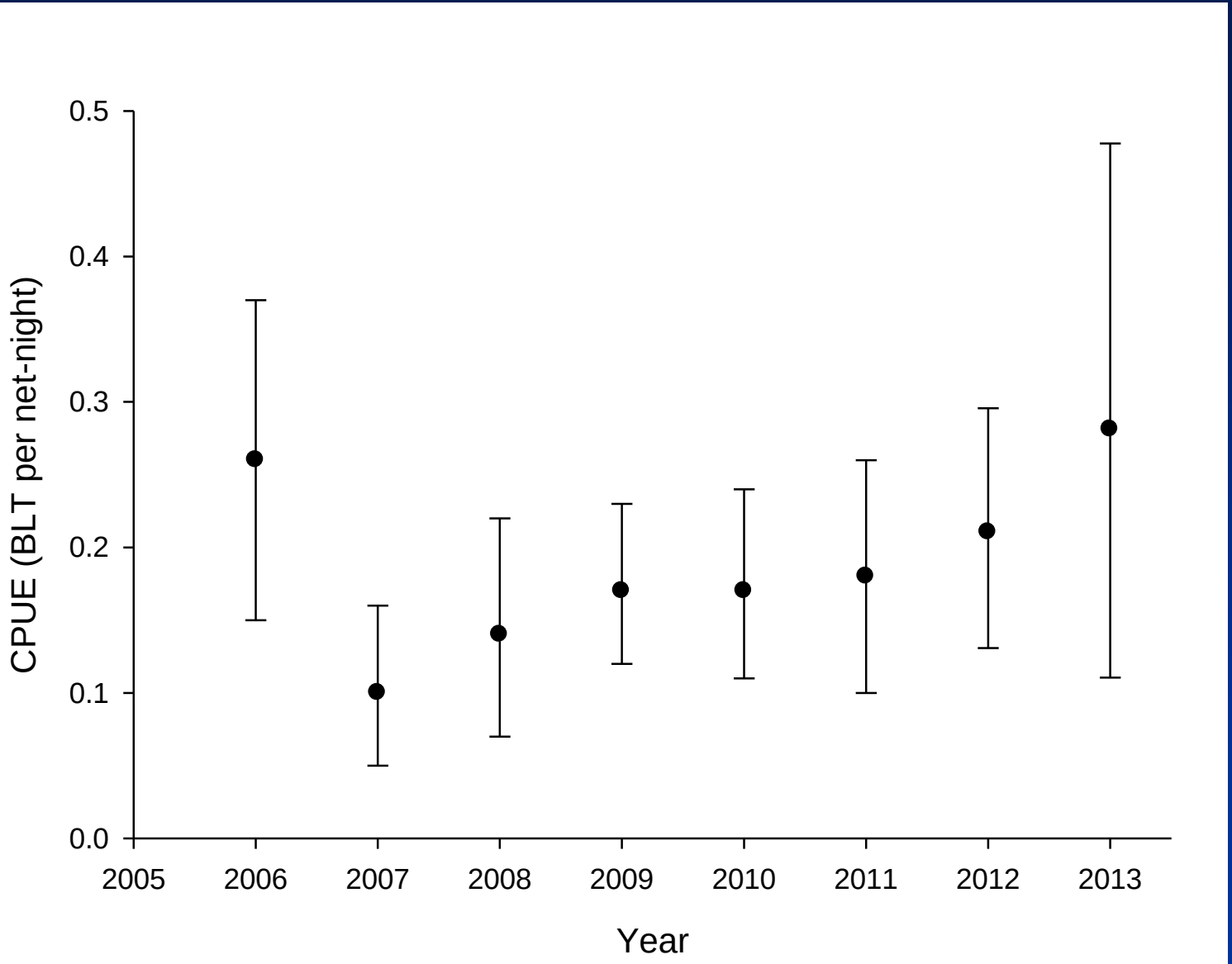
2013 Bycatch

- Gill netting:
  - 1,748 caught (500 morts)
  - 28% direct mortality rate
- Trap netting
  - 90 caught (25 morts)
  - 28% direct mortality rate

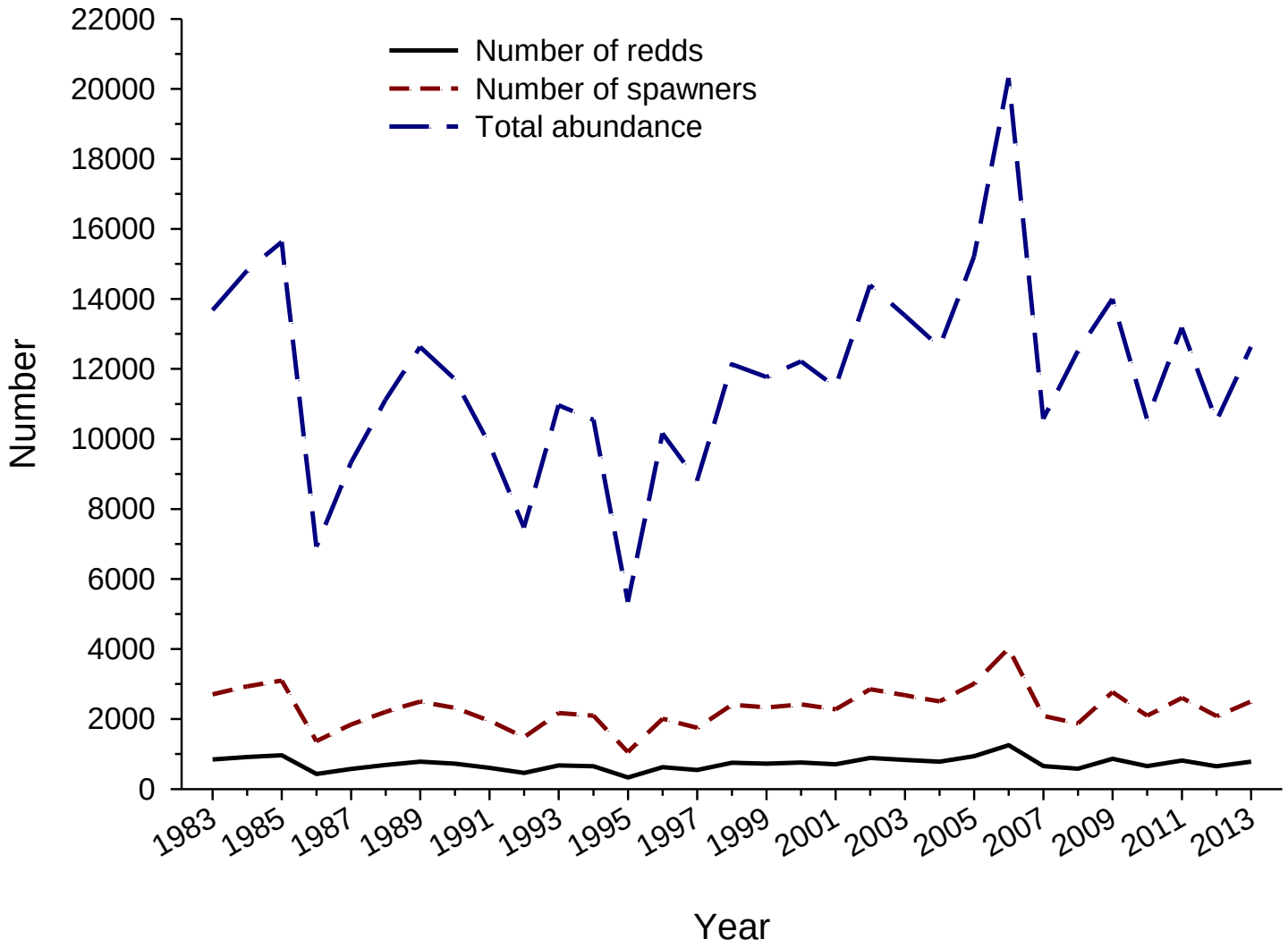
Population-Wide Effects on Bull Trout

- population estimate (over 18") = 5,721 (3,196-11,138)
  - 261 BLT morts (over 18") in 2013
  - 5% of population
- 987 BLT caught (over 18") in 2013
  - 17% of population

Fall Standardized Trap Net BLT Catch Rates



Bull Trout Trend



Fishery Recovery: Where Are We?

- Lake trout suppression is working
  - Population dramatically reduced since 2006
  - Adaptive approach and research to guide efforts is essential
  - Sustained effort needed; maintenance plan being developed
- Kokanee population has responded
  - Rebounded to pre-2000 levels (when fishery was closed)
  - Harvest fishery re-opened in 2013 (6 fish limit)
  - Increased to 15 fish limit in May
- Bull trout population stable or increasing
  - Reduced threat from lake trout; more kokanee prey
- Rainbow trout growth rates increasing
  - More kokanee prey improving trophy fishery