Managing Trout and Salmon in the Belgrade Lakes, ME in the Presence of Invasive Species

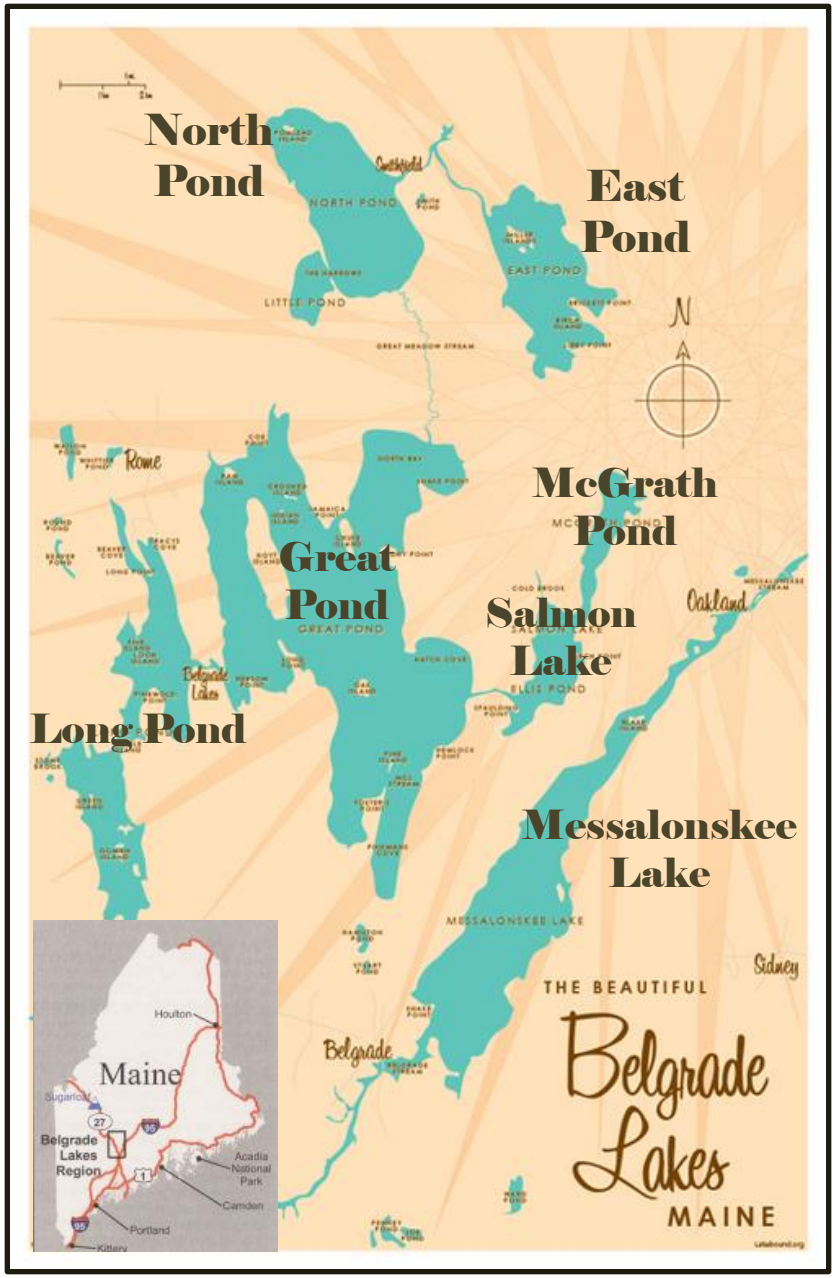
A Case Study on Long Pond

Maine Department of Inland Fisheries & Wildlife

Region B – Belgrade Lakes Region

Belgrades

The Belgrade Lakes



- 7 water bodies
- Artificially dammed system
- Combined acreage > 20,000
- Moderate-heavy development
- Water quality
- Invasive species abound

The Belgrade Lakes

The Fisheries

- 6 of 7 Belgrade Lakes stocked with trout or salmon.

- Brook trout: put-and-take (5/7 lakes)
- Brown trout: put-grow-take (4/7 lakes)
- Splake, lake trout, ll salmon: put-grow-take (2/7)
- Invasive species are becoming more popular than stocked fish (i.e. basses, northern pike, black crappie)

Long Pond Salmon Fishery

- A once nationally-renowned, “destination” salmon fishery
- ME Inland Fisheries collected salmon > 5 lbs. (up to ~8 lbs.)
- In the early 1990’s, anglers first complained about lower catch rates and size quality.
- Trap net returns from 1985 – present day reveal a precipitous decline in overall salmon abundance and survival
- A contingent still fish for salmon

Long Pond Stocking History

Landlocked Salmon:

- Began in 1939
- Stocked with ~2,000, 10-12” fall-yearlings annually
- Managed as a put-grow-and-take fishery (no wild fish)

*Small numbers of brook trout are stocked annually

* Long Pond also has brown trout, lake trout, splake from adjacent waters

Long Pond Fish Assemblage

1993 – (15 species)

- American eel
- Brook trout
- Brown bullhead
- Chain pickerel
- Golden shiner
- Landlocked salmon
- Largemouth bass
- **Northern pike - 1983**
- Pumpkinseed
- Rainbow smelt
- Slimy sculpin
- Smallmouth bass
- White perch
- White sucker
- Yellow perch

2014 – (22 species)

- **Black crappie - 1995**
- Brown trout
- **Landlocked alewives - 1998**
- Redbreast sunfish
- Splake
- Togue (Lake Trout)
- **Walleye - 1996**

Long Pond

Mudpuppies?

- Found throughout the Belgrade system.
- Feed on small fishes and eggs.
- Compete with native amphibians.

- Now found in other ponds in the central Maine area.
- Not our top concern, but still alter the ecosystem.

Long Pond Pike Population

- Present in the Belgrade Lakes since the 1970's (1983 - Long)
- Spring trapnetting indicates a robust northern pike population
- Many large adults (up to 30 lbs. & 50 inches)
- Pike scarring prevalent on salmon

Impacts to Wild and Native Brook Trout

- Many tributaries to Long Pond support wild brook trout.
- MDIFW studies documented invasion of pike into trout streams.
- Juvenile pike remain in stream throughout summer.
- By summer's end, other fishes are gone.

Long Pond Walleye Population

- Two separate age cohorts collected in Long (& Great Pond)
- Angler reports from Messalonskee Lake
- Spring trapnetting has not collected walleye since 2012
- Without suitable water chemistry, walleye likely phased out

Long Pond

Long Pond Forage Dilemma

Rainbow Smelt vs. Landlocked Alewives

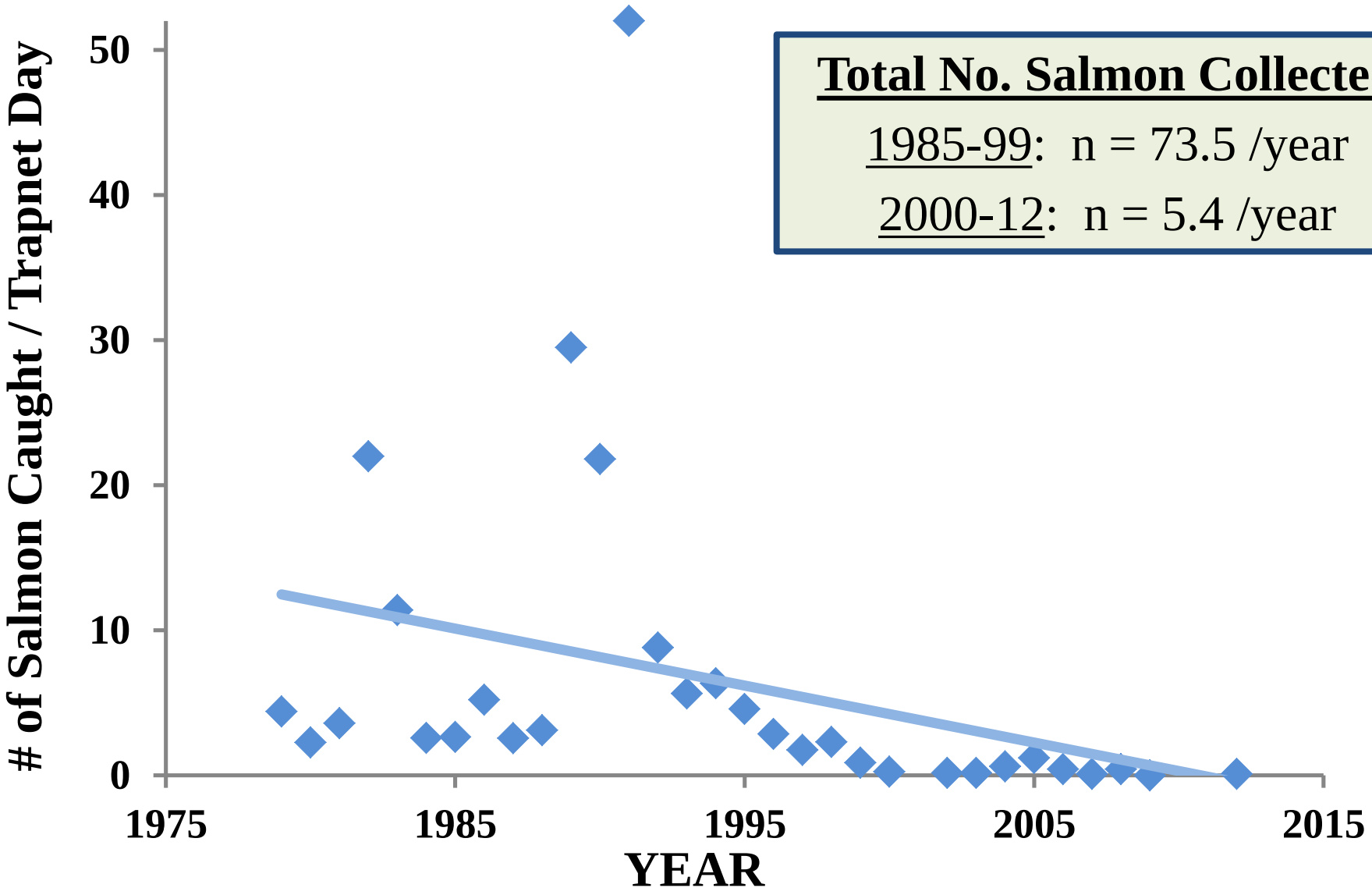
"It has been quite generally stated to be a fact that salmon introduced into waters where there are no smelt, do no thrive unless smelts are also introduced" **–Kendall, 1935**

- Springtime smelt run inspections show a considerable decline in population abundance
- Stomach samples indicate a new reliance on alewives as primary forage
- LL alewives now far outnumber smelt
- Smelt extirpation possible

Long Pond

Long Pond Trapnetting

Catch Rates



Total No. Salmon Collected

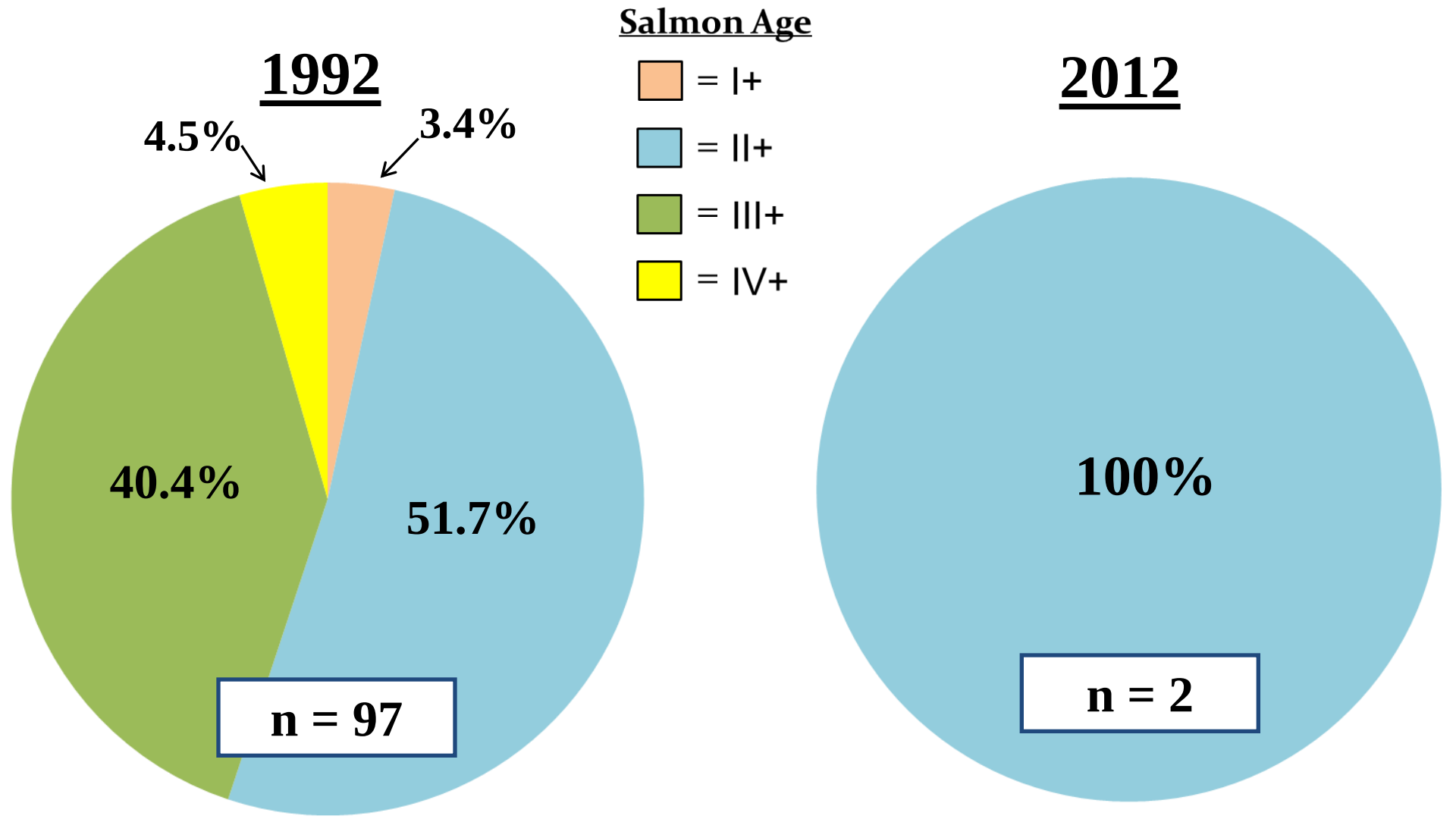
1985-99: n = 73.5 /year

2000-12: n = 5.4 /year

Long Pond

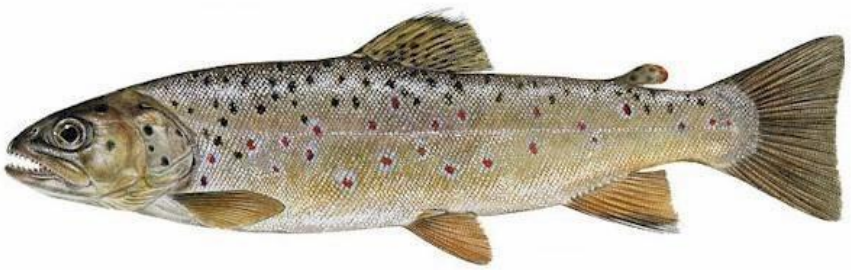
Long Pond Trapnetting

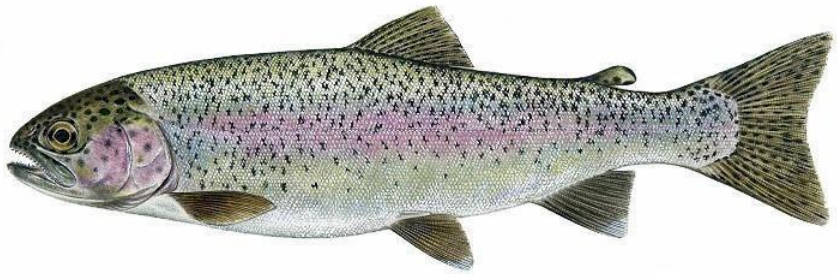
Salmon Survival



Long Pond Salmon Fishery

- Long Pond was once a renowned landlocked salmon fishery
- Castle Island Camps - destination for salmon anglers for years
- Despite near program collapse, some anglers don't want change and are happy with a put-and-take salmon fishery
- MDIFW has researched several options to provide anglers with a suitable and successful cold water fishery.
- Develop a comprehensive Long Pond fishery plan with public meeting summer 2015.





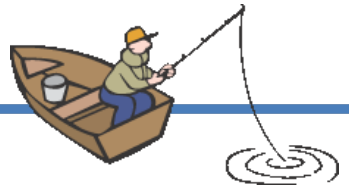
Long Pond – A Case Study

- 2,557 acres
- Mesotrophic
  - Thermally stratifies
  - Some recent DO deficiency
- Rich fish species assemblage
- Major inlet from Great Pond
- Outlet is Belgrade Stream
  - Flows into Messalonskee Lake

Long Pond - Water Quality

- **North Basin:**
  - Max depth = 60 ft.
  - More development
  - WQ marginal for trout/salmon
- **South Basin:**
  - Max depth = 106 ft.
  - Less development
  - WQ marginal but better for trout/salmon
- Phosphorous levels trending upward
- Secchi disk readings trending downward
- Nuisance algal blooms on the rise
- D.O./temp window shrinking

Lake Stratification

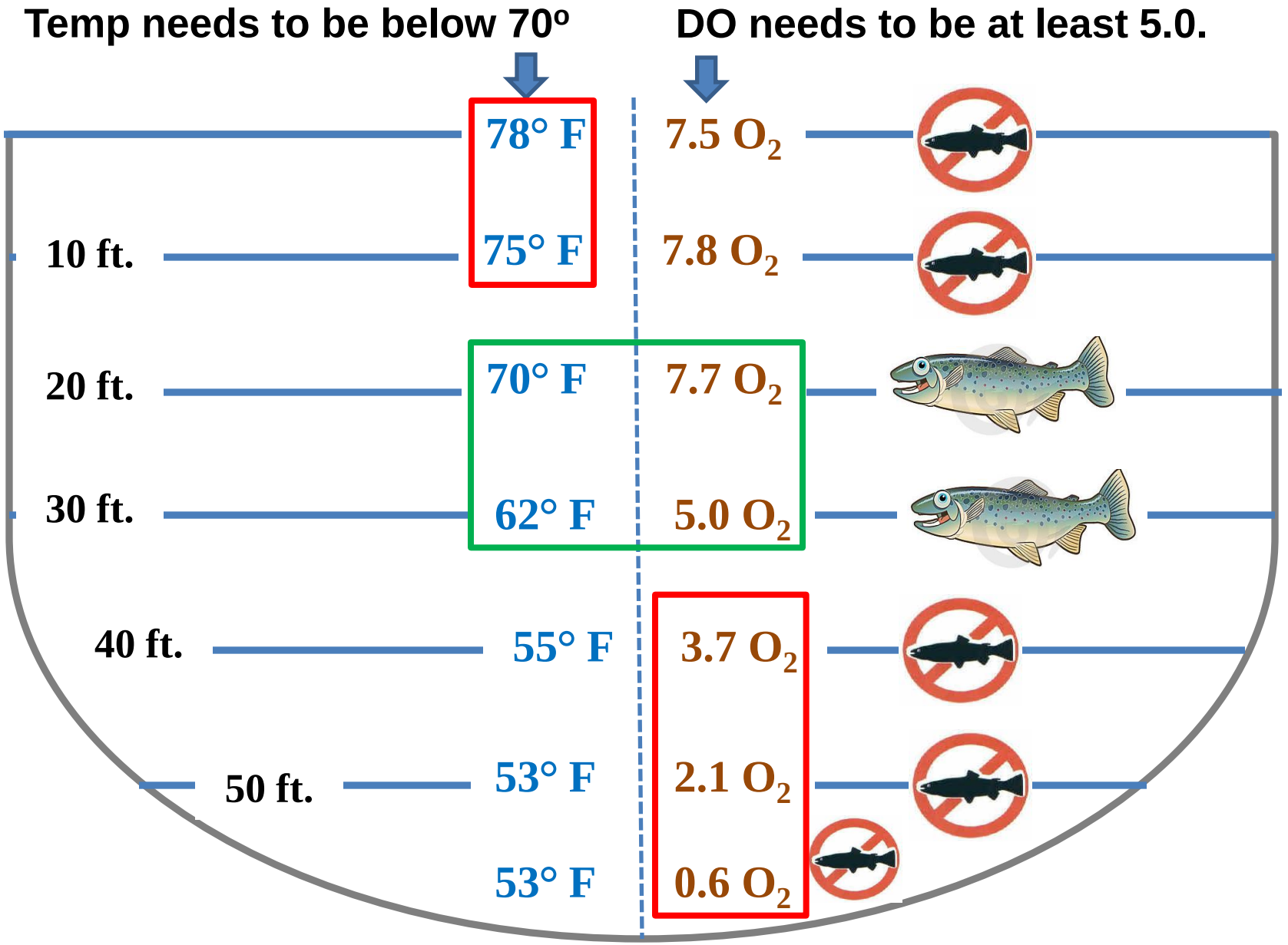


Warm water
(Epilimnion)

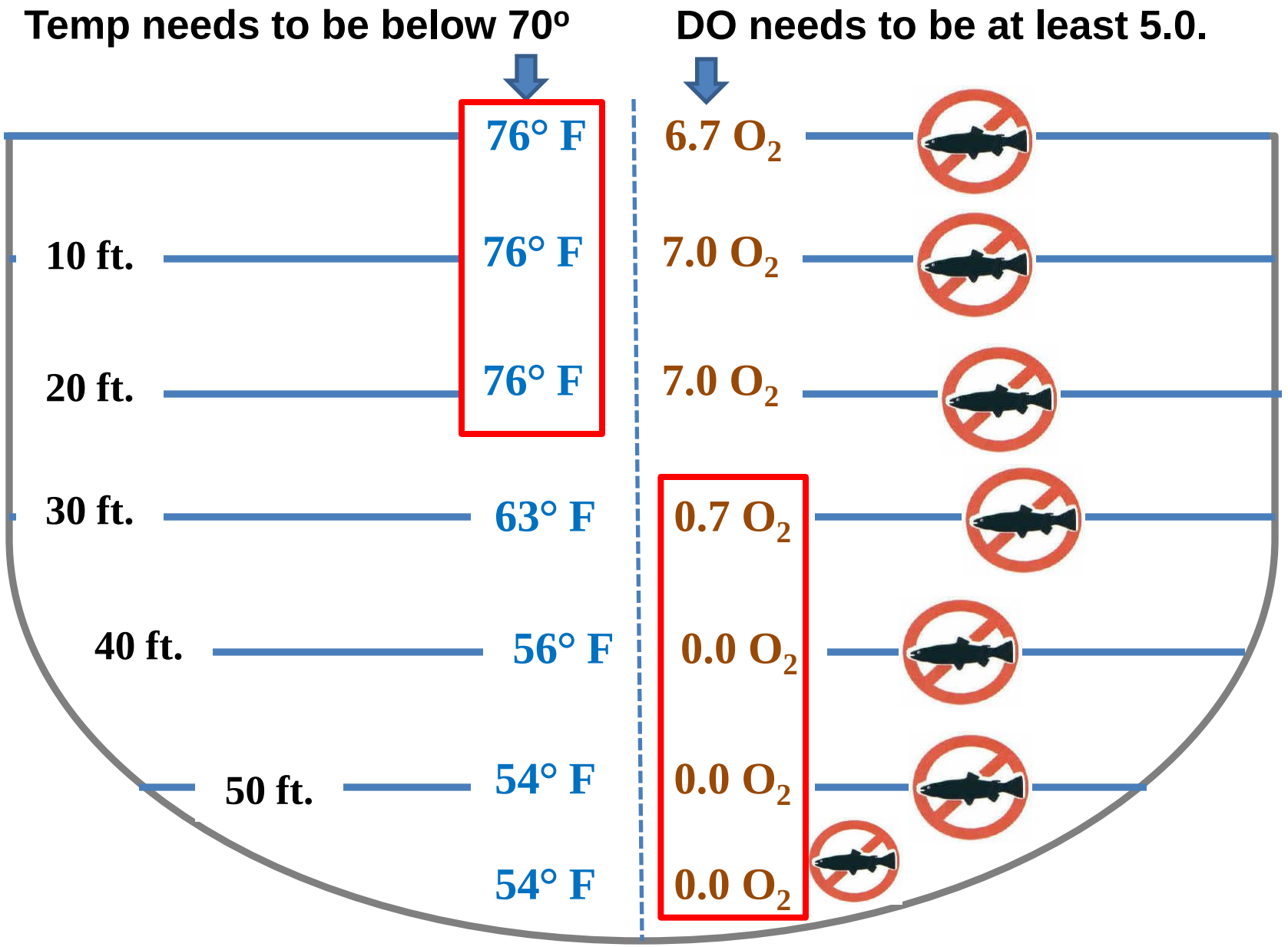
Thermocline

Cold water
(Hypolimnion)

Long Pond - Temperature and DO on 7/12/12



Long Pond - Temperature and DO on 8/22/12



Water Quality - What Can Be Done?

- Buffers, Buffers, and more Buffers!
  - Lakeshore is important, but…….
  - Don't forget nearby streams!

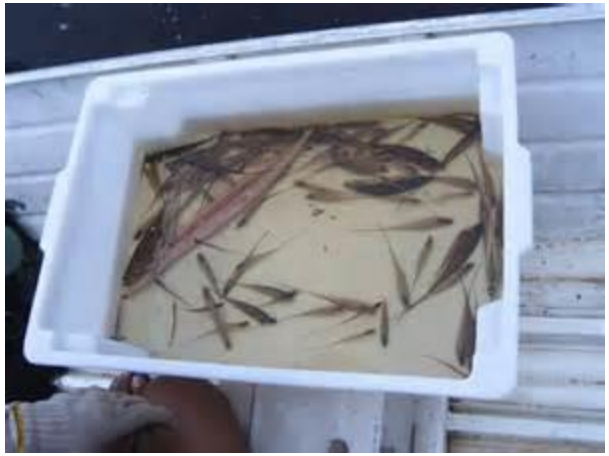
- Maintain camp roads.
  - Proper ditching
  - Water bars
- Refrain from fertilizing lakefront lawns.
- Ensure properly functioning septic systems.

Long Pond

Stopping Invasive Fishes

- Continue public outreach and education.

- BRCA and lake associations have many "boots on the ground."
  - Encourage CBI's to report suspicious behavior.
    - People keeping live sportfish (bass, pike, etc)
    - Provide them with educational materials (IFW).



The End.

Thank you.