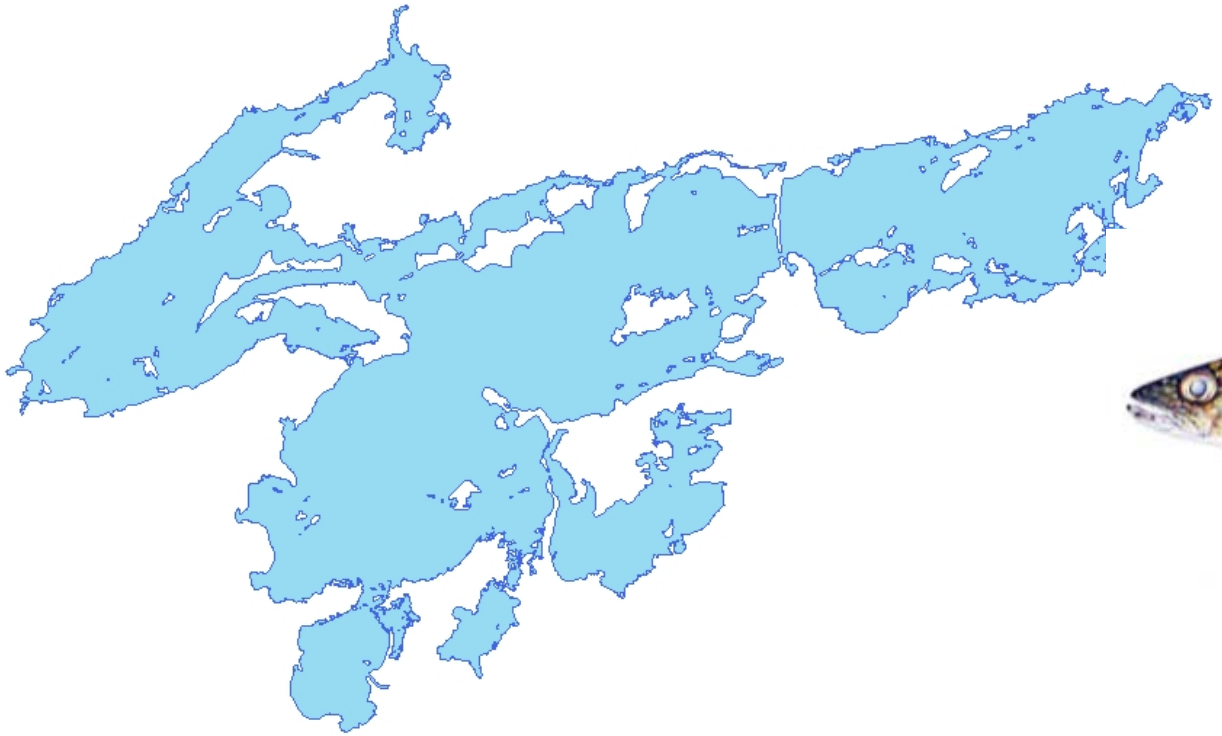
Update on Island Reservoir Fisheries Management



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Deserae Hendrickson| Area Fisheries Supervisor

Patrick Schmalz | Fisheries Research Supervisor

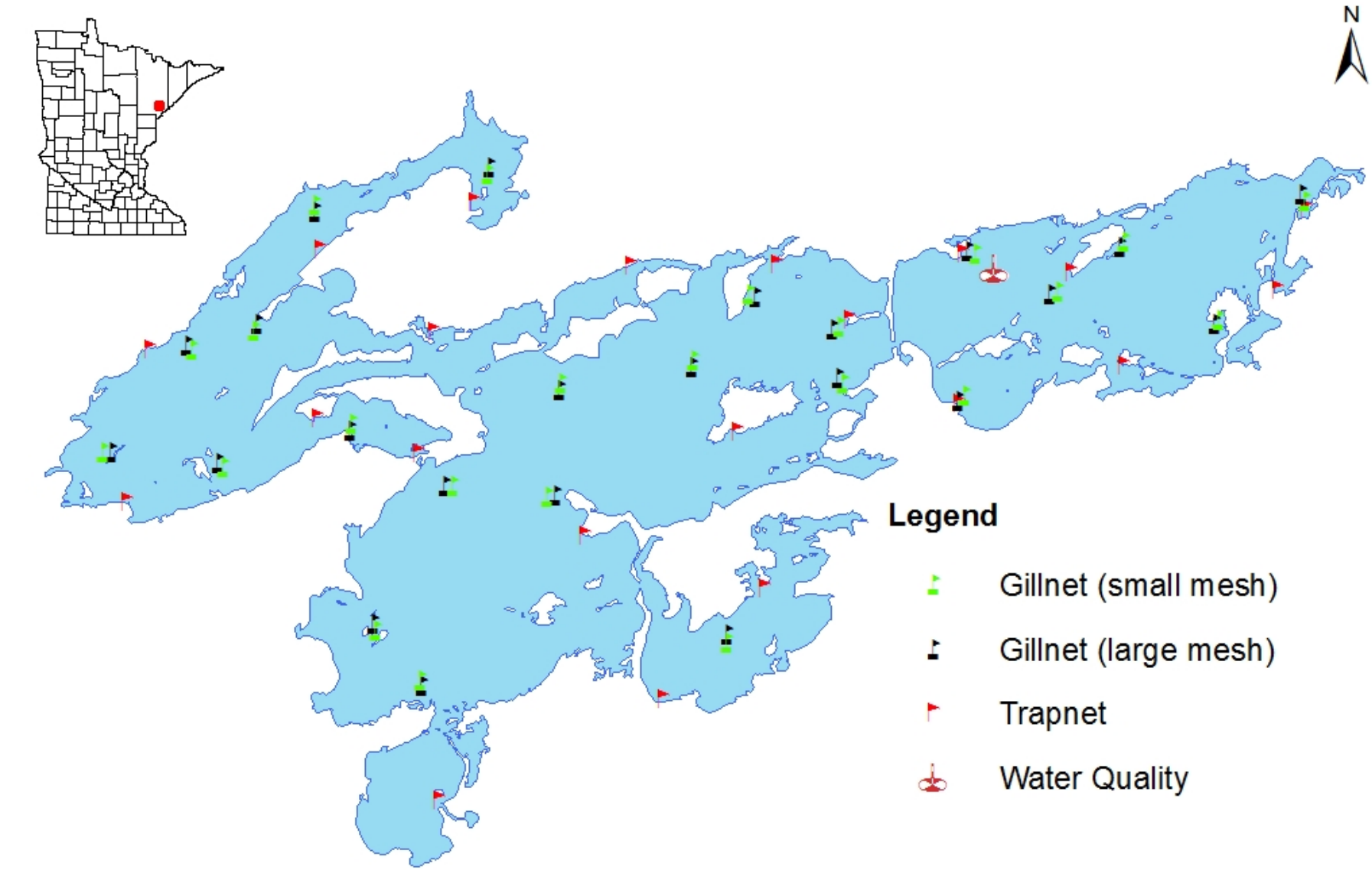
September 5th, 2019

DEPARTMENT OF NATURAL RESOURCES

Topics

- Review of historical DNR survey (fish netting) data
- Challenges to improving size structure of Walleye in Island Reservoir
- Introduction of a two-phase approach in an attempt to improve the problem
- Discussion

Photo: Eric Engbretson


N
Legend
Gillnet (small mesh)
Gillnet (large mesh)
Trapnet
Water Quality
0
0.75
1.5
3 Miles
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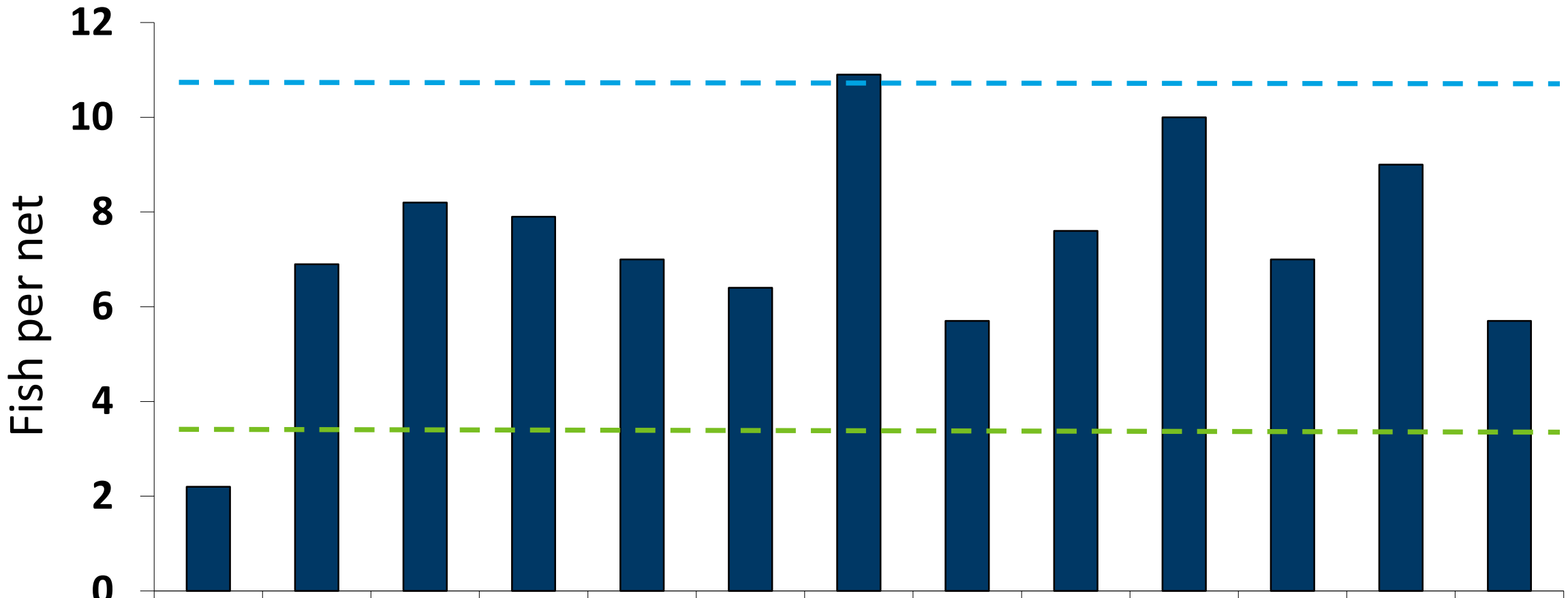
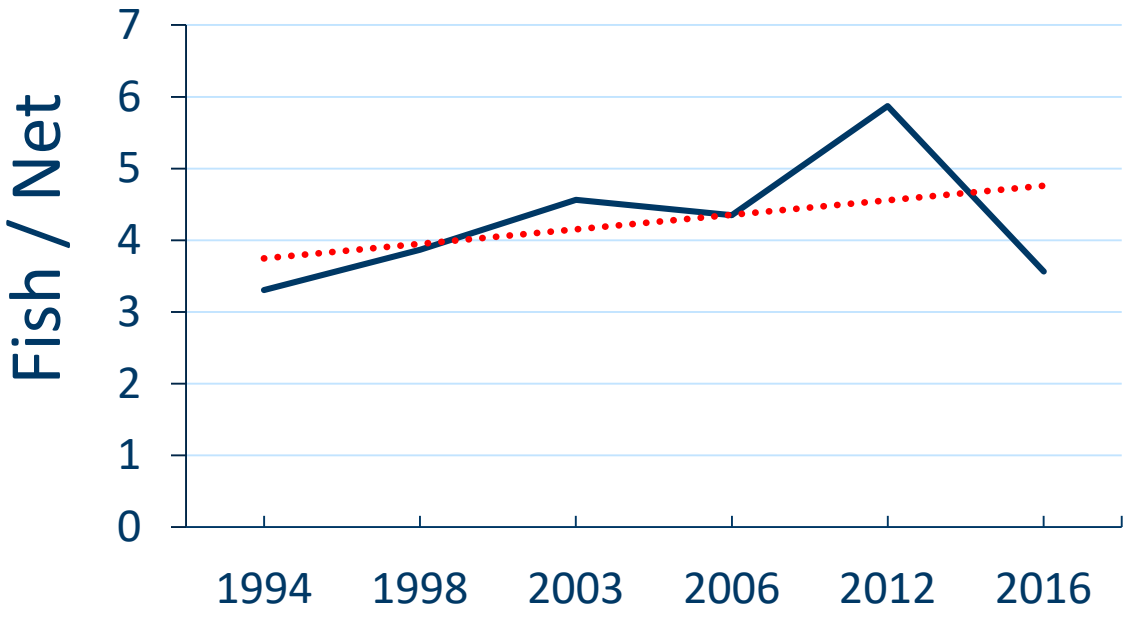
Island Lake Standard Survey – Walleye Gillnet Catch



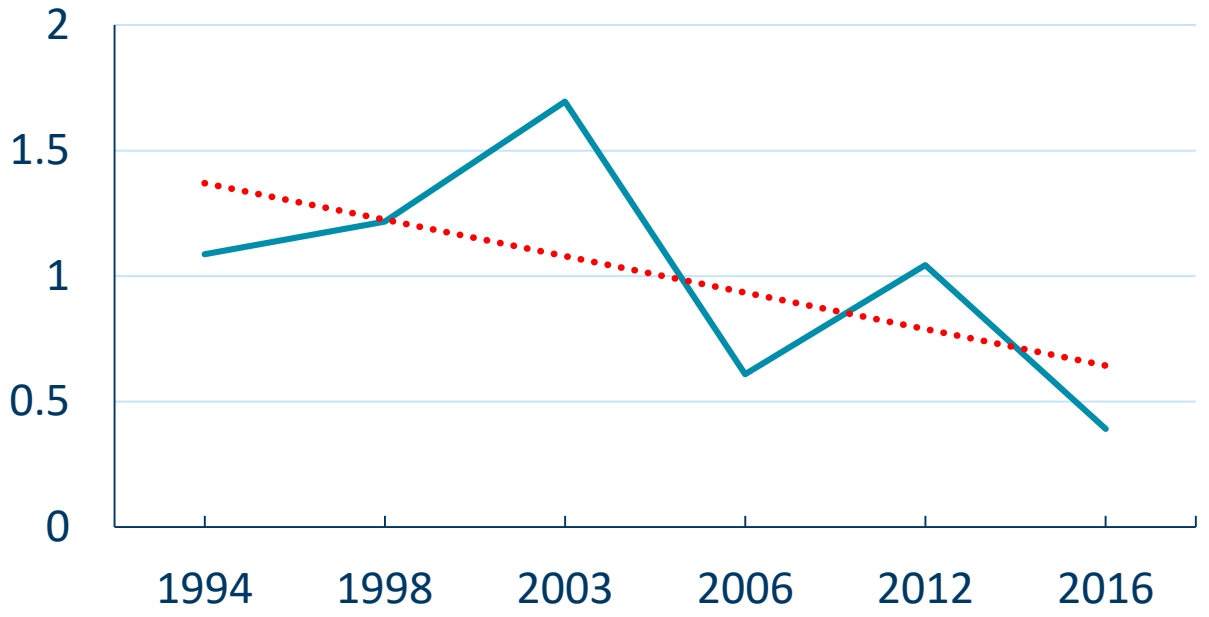
	1942	1954	1968	1978	1985	1986	1989	1994	1998	2003	2006	2012	2016
Walleye	2.2	6.9	8.2	7.9	7.0	6.4	10.9	5.7	7.6	10.0	7.0	9.0	5.7

Trends in Gillnet Catch Rates of Small and Large Walleye

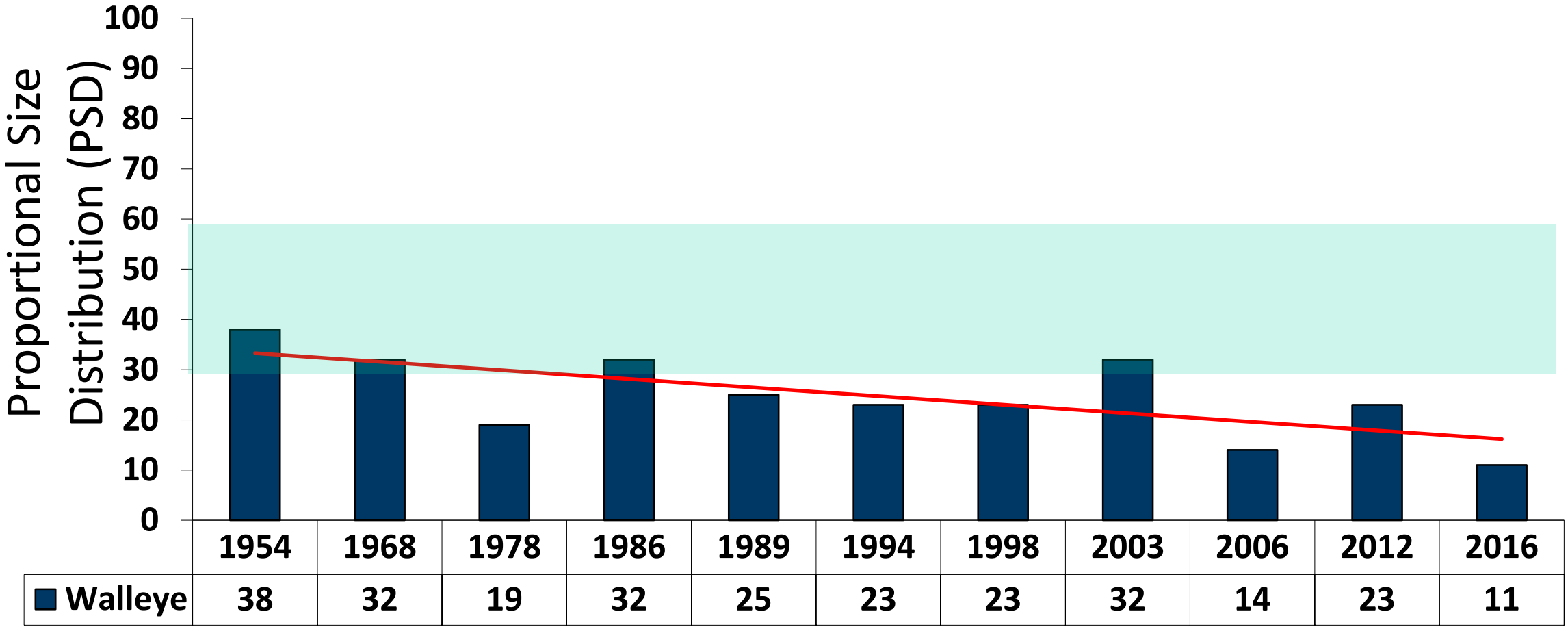
Walleye abundance less than 12"



Walleye abundance greater than 15"

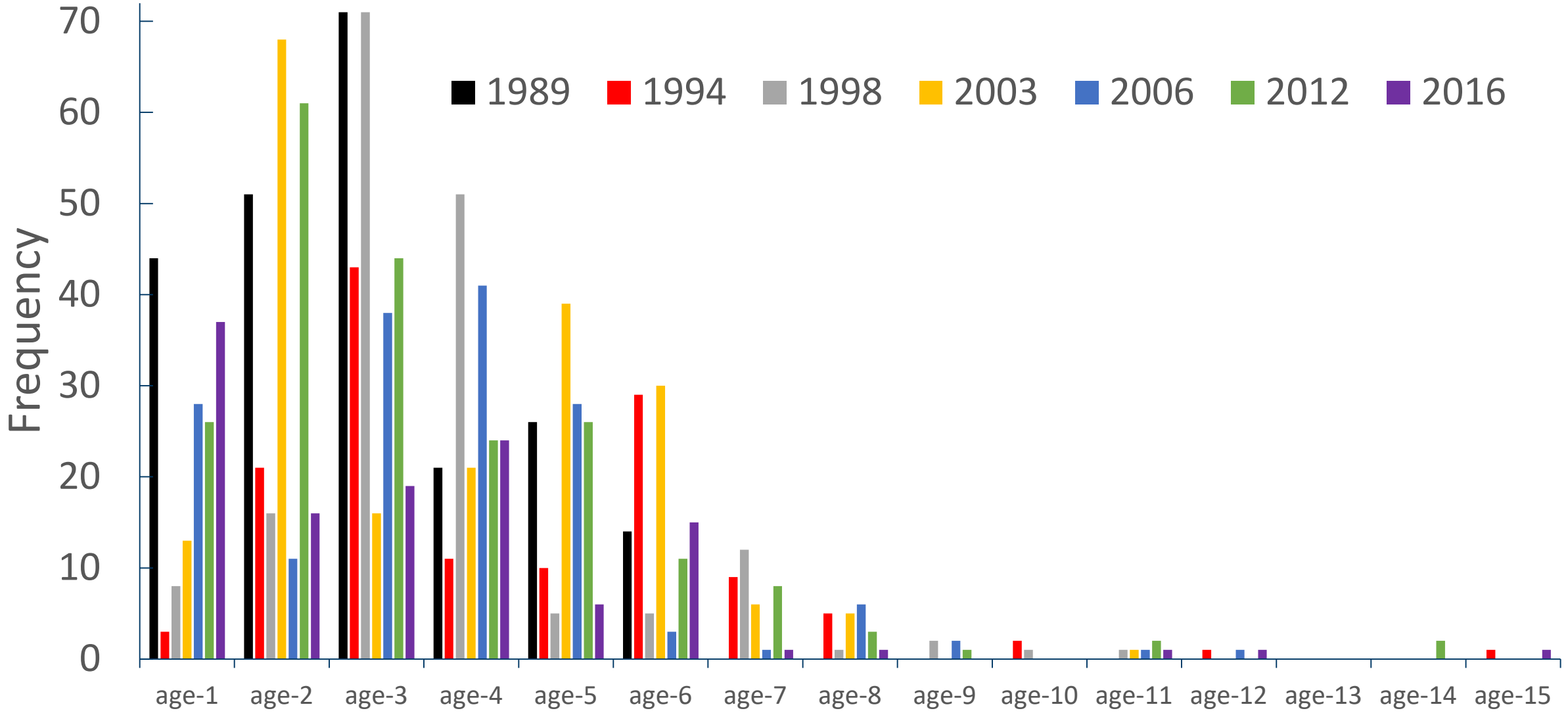


Historical Walleye Size Structure

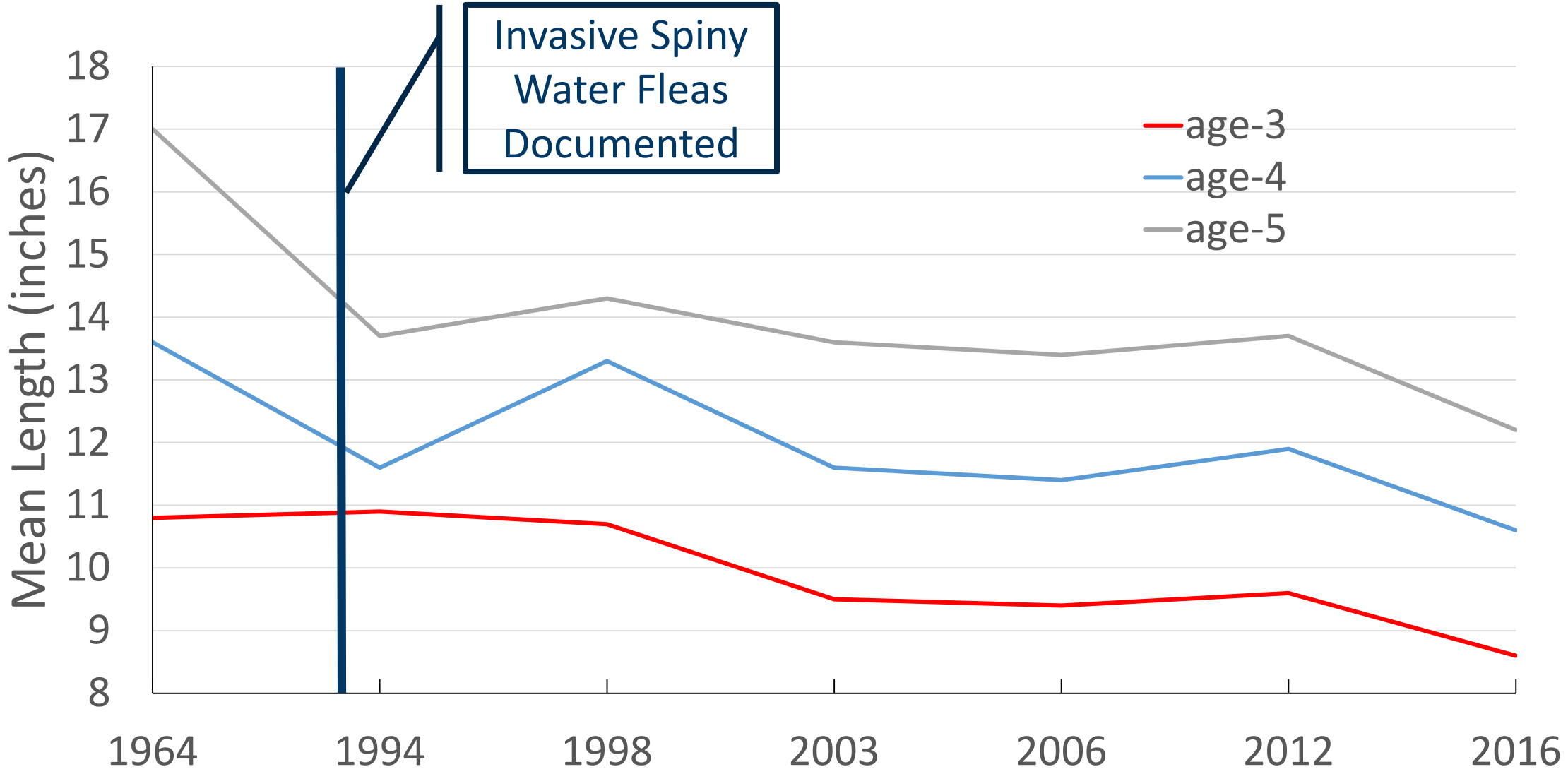


	1954	1968	1978	1986	1989	1994	1998	2003	2006	2012	2016
Walleye	38	32	19	32	25	23	23	32	14	23	11

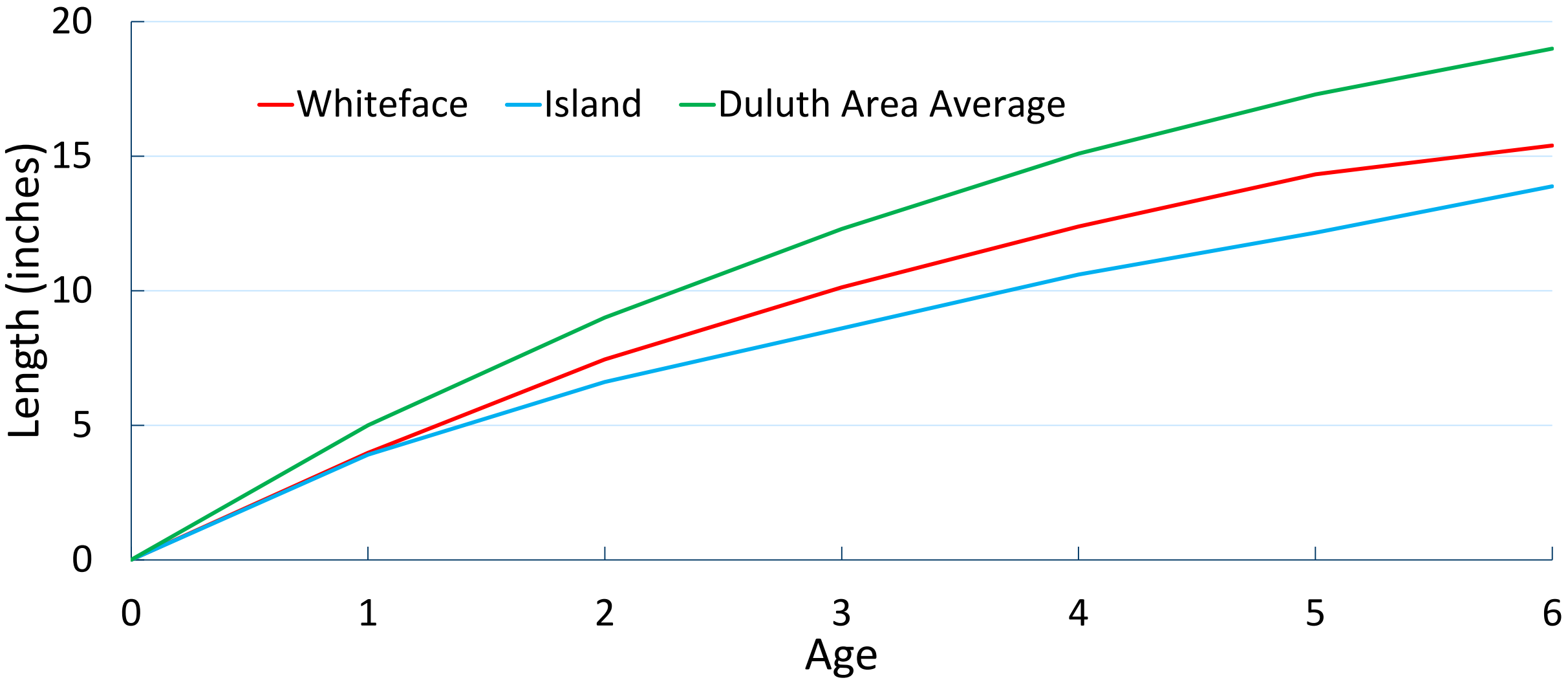
Historical Walleye Year-Class Contributions



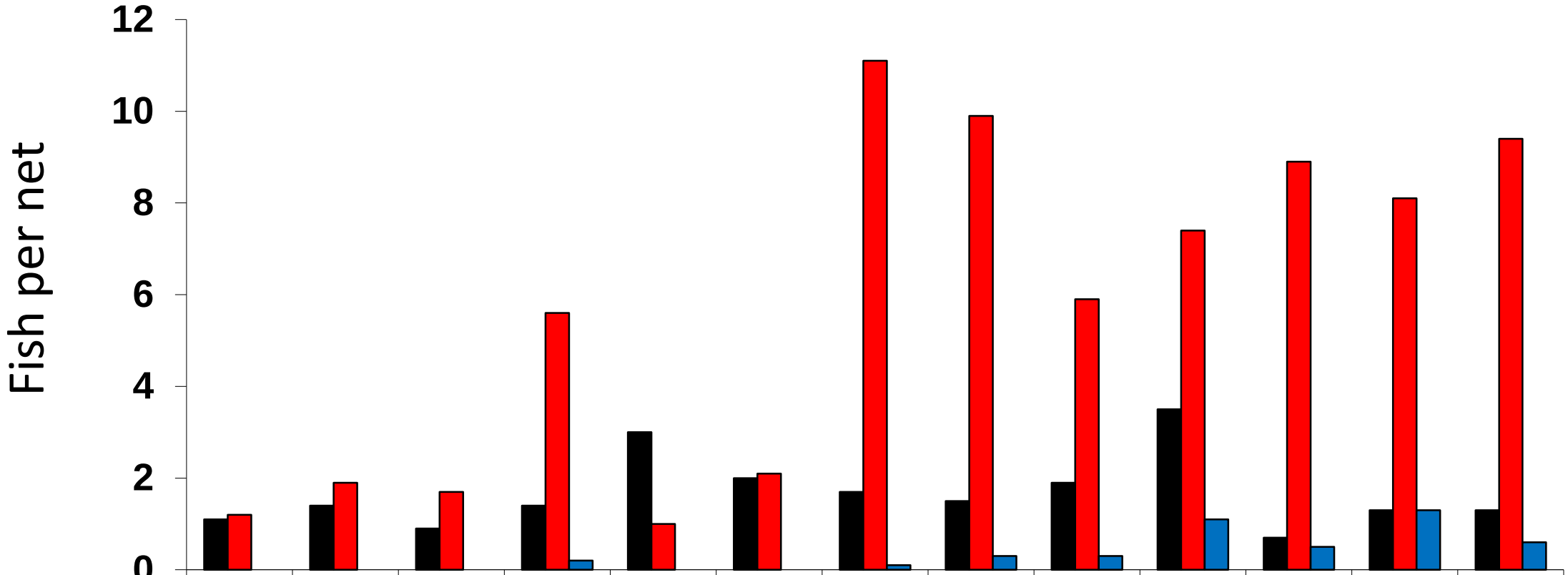
Historical Walleye Growth Rates



Current Walleye Growth Rates

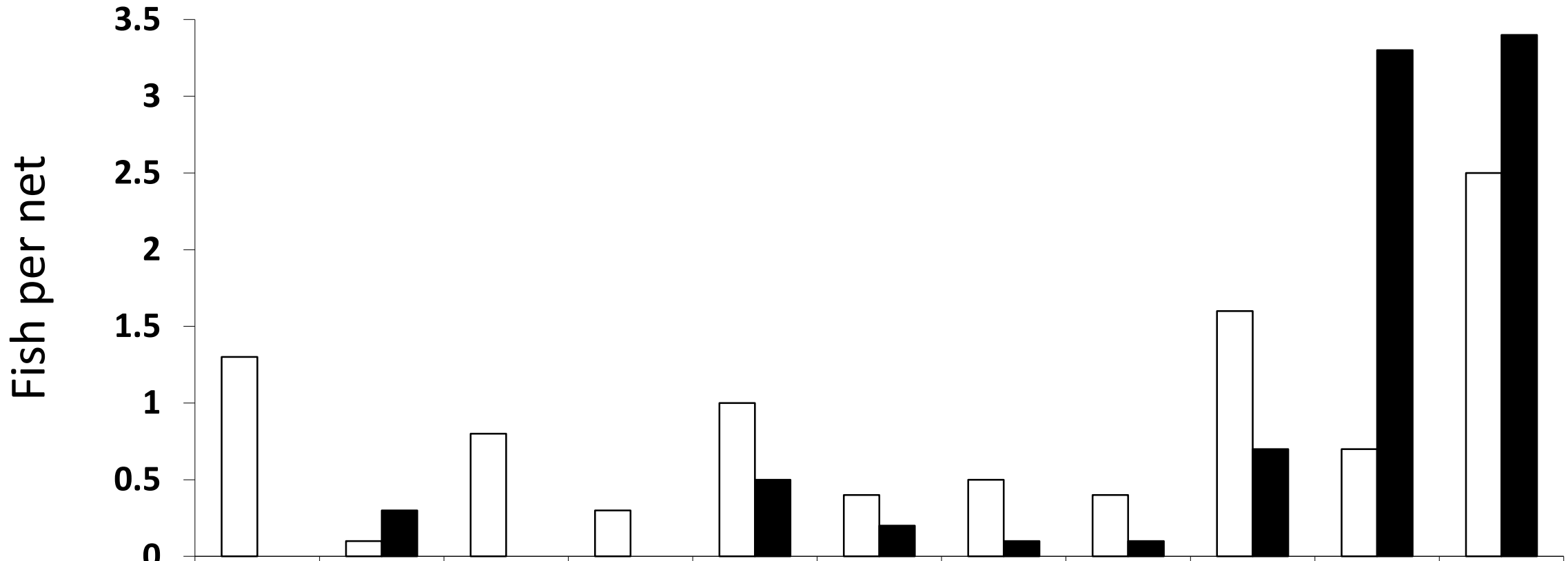


Island Lake Standard Survey – Gillnetting



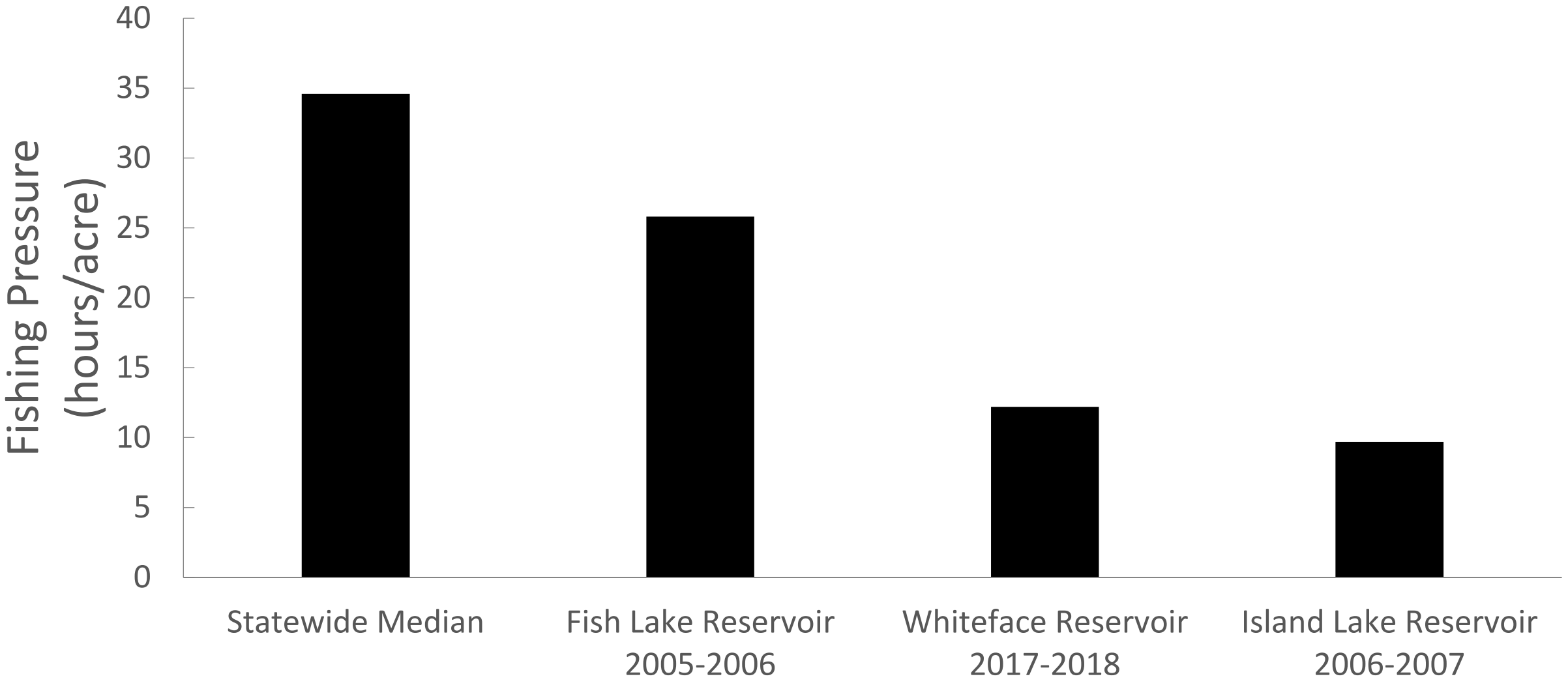
	1942	1954	1968	1978	1985	1986	1989	1994	1998	2003	2006	2012	2016
Northern Pike	1.1	1.4	0.9	1.4	3.0	2.0	1.7	1.5	1.9	3.5	0.7	1.3	1.3
Yellow Perch	1.2	1.9	1.7	5.6	1.0	2.1	11.1	9.9	5.9	7.4	8.9	8.1	9.4
Smallmouth Bass	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.3	0.3	1.1	0.5	1.3	0.6

Island Lake Standard Survey - Trapnetting

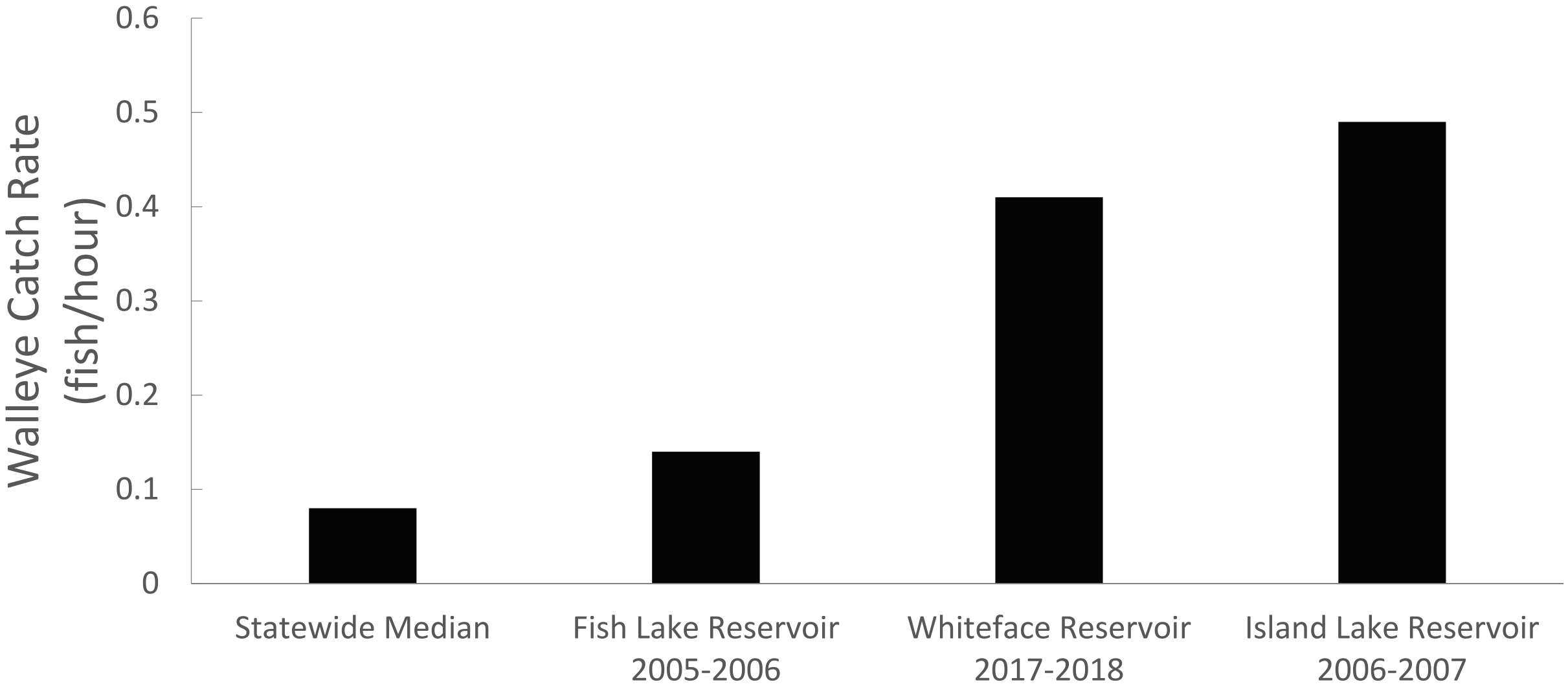


	1954	1968	1978	1986	1989	1994	1998	2003	2006	2012	2016
□ Black Crappie	1.3	0.1	0.8	0.3	1.0	0.4	0.5	0.4	1.6	0.7	2.5
■ Bluegill	0.0	0.3	0.0	0.0	0.5	0.2	0.1	0.1	0.7	3.3	3.4

Fishing Pressure – Regional Comparison



Walleye Catch Rates – Regional Comparison



Challenges to Improve Size Structure of Walleye at Island

Exceptional walleye natural reproduction

- Extremely slow growth
  - Sucker and perch abundance is average but most are too large for consumption by small walleye

Establishment of non-native spiny water flea (1990)

- Negative impacts to the base of the food chain (zooplankton and small fishes)
- Abundance of native spot-tail shiners and trout-perch appear to be in decline
  - 2019 small mesh vertical gillnet survey catch

Relatively low angling pressure and harvest

What about the Muskies, aren't they part of the problem?

Managed for low density, trophy size

- 2016 population estimate of about 400 adult muskies in Island
- 1 muskie for every 20 acres of water

Muskies prefer soft rayed, high fat content prey items

- In Island, this means white sucker and shorthead redhorse

Some of the best muskie fisheries in the state are also some of our best walleye lakes

- Vermilion, Leech, Lake of the Woods, Winni, Minnetonka, Rainy

Knapp et al. 2012

- Scientific analysis of the fish community of 41 Minnesota lakes before and after the introduction of muskie
- Zero evidence muskies had negative effects on 7 species studied regardless of lake type or fish community

Kerr 2016

- Broad review of scientific literature that found very little evidence of negative implications of muskies to other sport fish

Is the DNR going to try to do something or what?

Dual Phase Approach

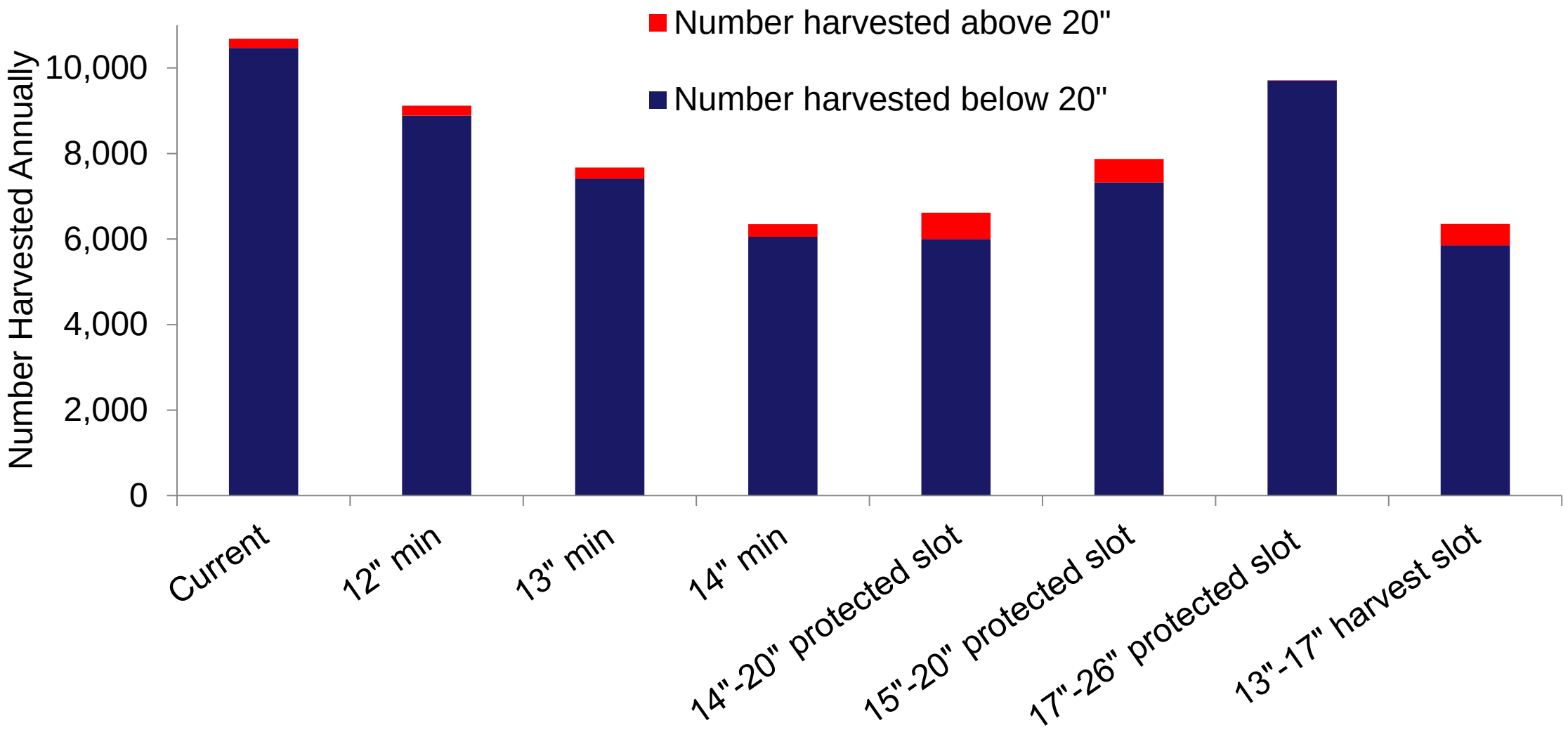
Phase I

- Investigate, model and propose to anglers a new novel fishing regulation that will concentrate walleye harvest on surplus small fish while sustaining mid-sized walleye

Phase II

- Address poor forage base and attempt to improve walleye growth rates by establishing a new, high quality forage species

Model Results Presented to the Public in 2010



Phase I – New Proposed Walleye Angling Regulation

Bag limit of 10 fish, with a 14-20” or 15-20” protected slot limit (PSL) not more than one over 20”

Implementation date: March 1, 2021

<u>Goals and Objectives:</u>

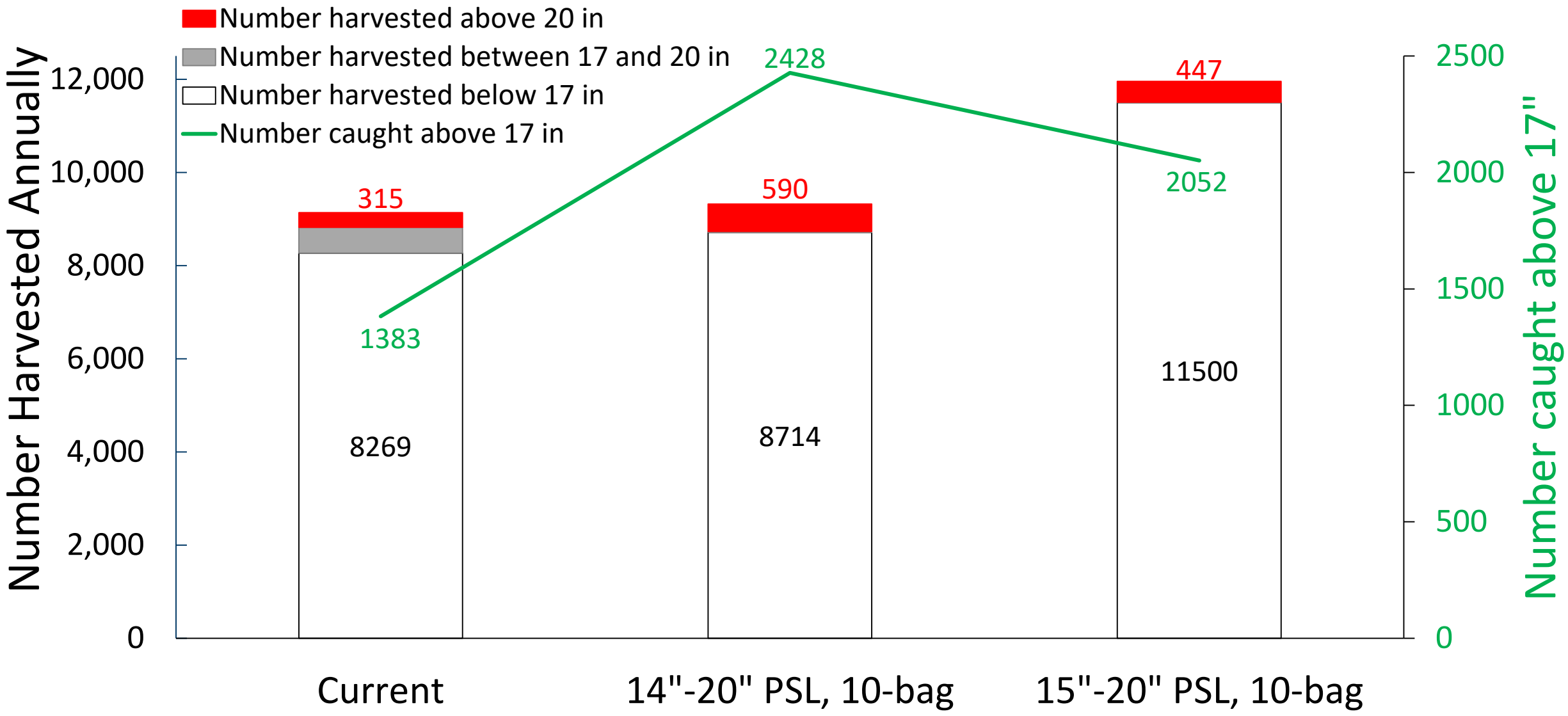
- Increase harvest of surplus small fish
- Decrease small walleye abundance
- Increase large walleye abundance
- Increase walleye growth rates
- Increase PSD to within 30-60 for balanced population
- Increase catch rates of walleye > 15”
- Increase harvest of walleye > 20”

How Fisheries Special Regulation Modeling Works

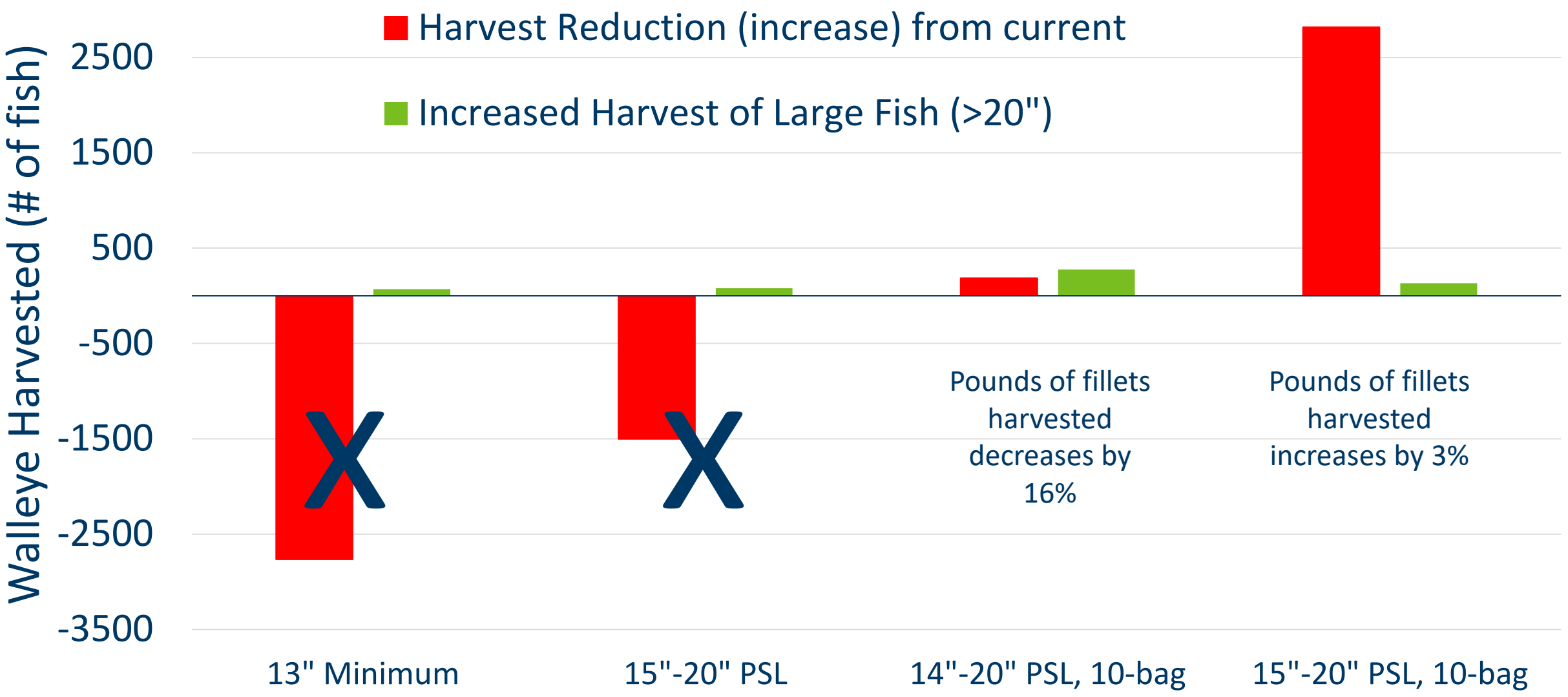
Island Lake fisheries data are used with modeling software to simulate impacts of various angling regulations on the walleye population over many decades

- Angling Pressure/Harvest (Creel from 2006-2007)
- Growth Rates (DNR surveys)
- Mortality (Creel and DNR surveys)
- Length/Weight Relationship (DNR surveys)
- Sex and Maturity (DNR surveys)

Alternative Regulation Model Results



Model Results – Reduction/Gain in Walleye Harvest



Managing Angler Expectations

Model results are founded on sound, scientific fisheries principals but…

…what we are proposing for Island has not been attempted on other systems and limits our understanding of potential outcomes

Some important variables are out of our control and result in significant uncertainties about what may actually happen if implemented:

- Angling Pressure
- Growth Rate Response
- Recruitment Response

Model Uncertainties

Potential Implication

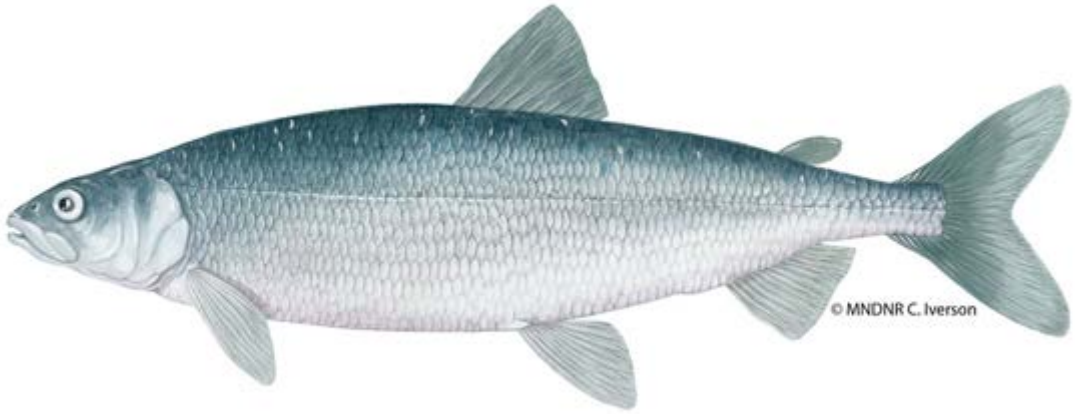
Pressure (fishing effort and related harvest)

- (+) Pressure increases as a result of a liberalized harvest of small walleye
- (−) Pressure does not increase, folks fish elsewhere
- (+) Pressure increases and anglers accept the idea of harvesting more small walleye
- (−) Pressure increases and anglers do not accept harvesting more small walleye

Growth Rate Response

- (+) Abundance of small fish is reduced by increasing harvest, remaining fish grow faster
- (−) Abundance of small fish is reduced by increasing harvest, remaining fish do not increase growth
- (+) Phase II – successful establishment of a new, high quality forage species

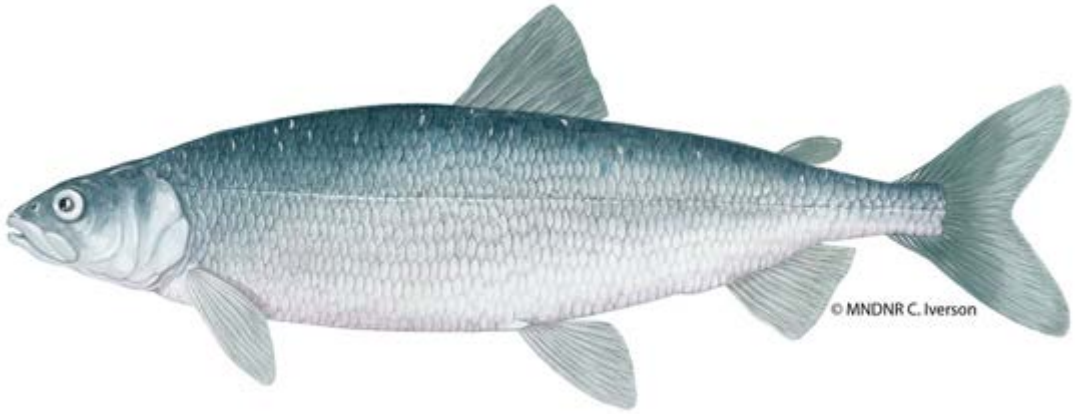
Increasing our odds of success (Phase II)



Habitat assessments conducted in 2018-2019 indicate sufficient oxy-thermal habitat is present in Island Lake to support a naturally reproducing cisco population

- Cisco are a fatty, high calorie species that walleye will readily prey upon
  - Potential implications for improving walleye growth rates
- Burbot (another cold-water fish species) is already well established in the lake and suggests success
- Cisco are also known to be successful predators on spiny water fleas

Increasing our odds of success (Phase II)



DNR intends to introduce cisco into the lake as soon as a suitable source lake has been identified and program logistics are finalized

- Native MN fish species that exists in large, deep natural lakes
- Important genetic/disease concerns to be addressed prior to implementation
- This will **not** be an endless bait stocking program! Cisco are expected to reproduce naturally.
- Cisco to be stocked for 5 consecutive years followed by an evaluation period

Island Take Home Messages

Walleye population is very stable with consistent recruitment of young fish but size structure is unbalanced and is composed of a large proportion of small fish

- Slow growth rates are the crux of the problem and limit the feasibility of most special regulations (i.e., traditional slot-limits common on some lakes)
- Special walleye regulations are biologically warranted but may be socially undesirable

DNR considering a novel approach to shift angler harvest towards small surplus fish

- We need your feedback on angler acceptance of the proposed regulations!

DNR will begin a cisco introduction program to address the poor forage base, increase walleye growth rates, decrease impacts of invasive fleas and increase the likelihood of overall success

Discussion

- Please provide written input about Island fisheries management on the forms supplied and return to one of us before departing
- Additional forms are available for those whom could not make this evenings meeting
- Thank you for attending and providing input about Island fisheries management!