

# Fisheries Management on Lake Vermilion

## 2014 Update



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## Introduction

Lake Vermilion is part of the statewide Large Lake Program, an intensive fisheries management program on the 10 largest lakes in Minnesota. The Large Lake Program was started in 1984 when it became apparent that more detailed biological information was needed to properly manage these important lakes. A Large Lake Specialist was assigned to each lake to manage the program at the area level. The Large Lake Program includes annual fish population assessments, annual water quality monitoring, and regularly scheduled creel surveys.

A variety of sampling gear is used during population assessments to collect the various fish species and life stages; including gill nets, trap nets, beach seines, and an electrofishing boat. Sampling for each gear type is conducted at the same time and place each year in order to determine population trends for the major species. Data is also collected on length, weight, age, and growth for each of the major species.

Creel surveys are scheduled on Lake Vermilion for two consecutive years out of every six years. Creel survey is a scientific method of estimating fishing pressure and fish harvest from a series of boat counts and angler interviews. A creel survey was conducted in 2014 and another is scheduled for 2015.

The results of the 2014 fish population assessment and 2014 creel survey are presented in the balance of this report. We encourage anyone with questions or comments to contact the Tower Fisheries office or stop by our office for a visit. We are located just west of Tower on Highway 169.



# 2014 Gillnet Assessment

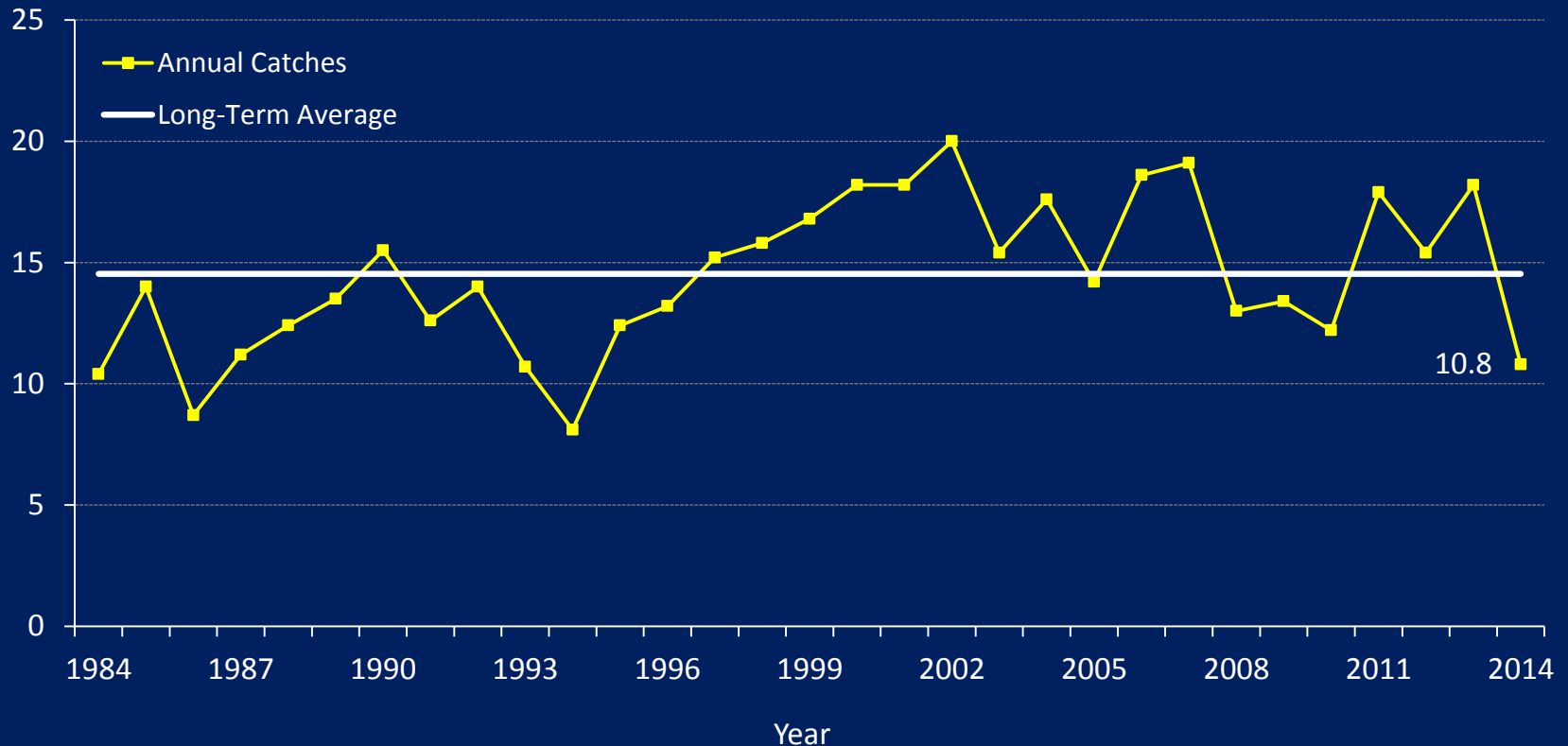




# Walleye Gillnet Catches, Lake Vermilion, 1984-2014

The walleye gillnet catch in 2014 was 10.8 fish/net, lower than catches have been in recent years. The lower walleye catch in 2014 was due in part to poor reproduction in 2009 and 2013, as well as lower than expected catches of the 2010 and 2011 year classes. Poor weather during part of the survey may have impacted the walleye gillnet catch as well.

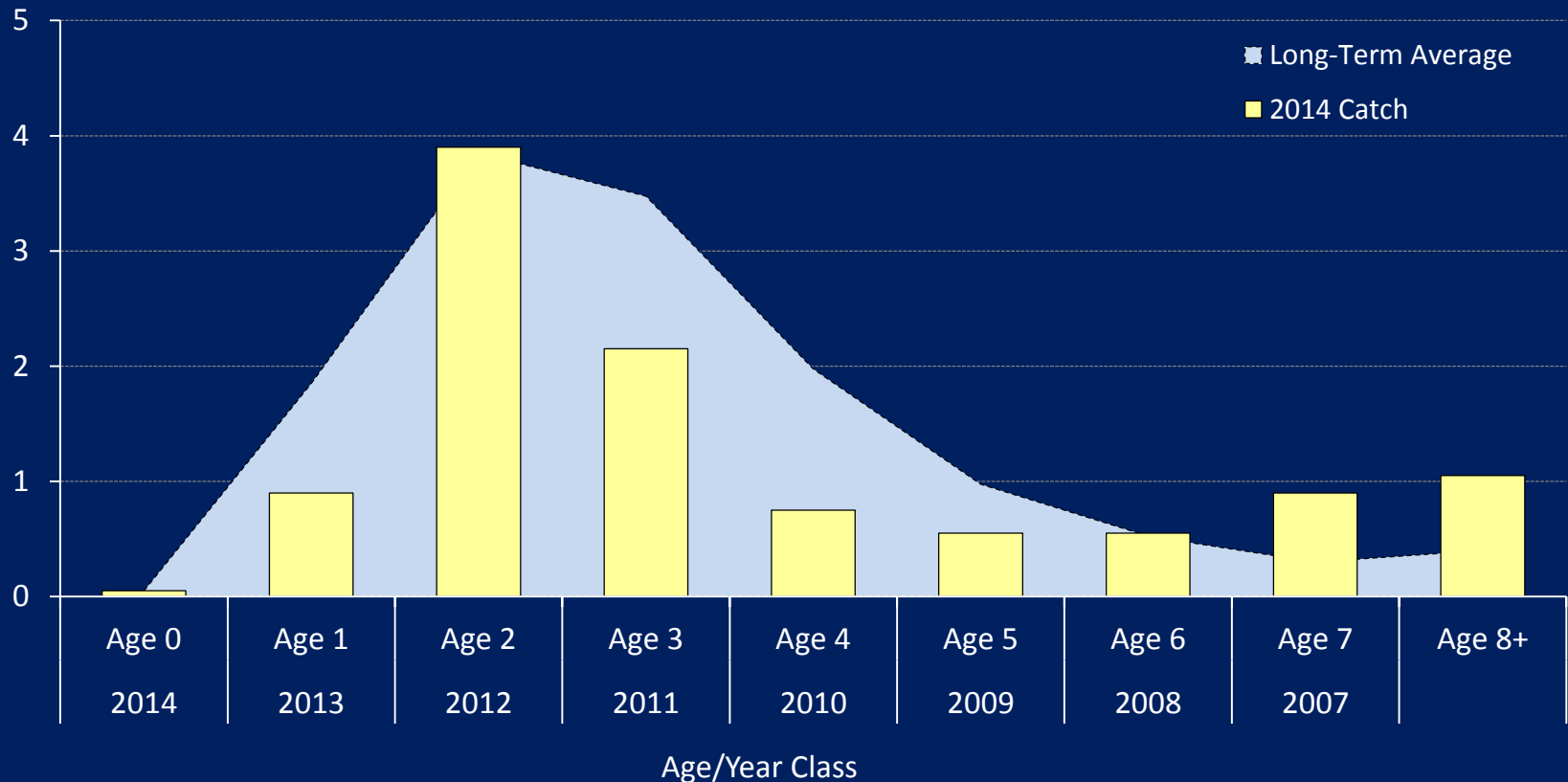
Number/Net



## 2014 Walleye Gillnet Catch by Age Group

Gillnet catches of age 1 walleye (2013 year class), age 3 walleye (2011 year class), age 4 walleye (2010 year class), and age 5 walleye (2009 year class) were all below average. Walleye experienced poor reproduction in both 2013 and 2009. Gillnet catches of the 2010 and 2011 year classes were considerably lower than they had been in previous assessments, possibly due in part to high angling mortality in 2014.

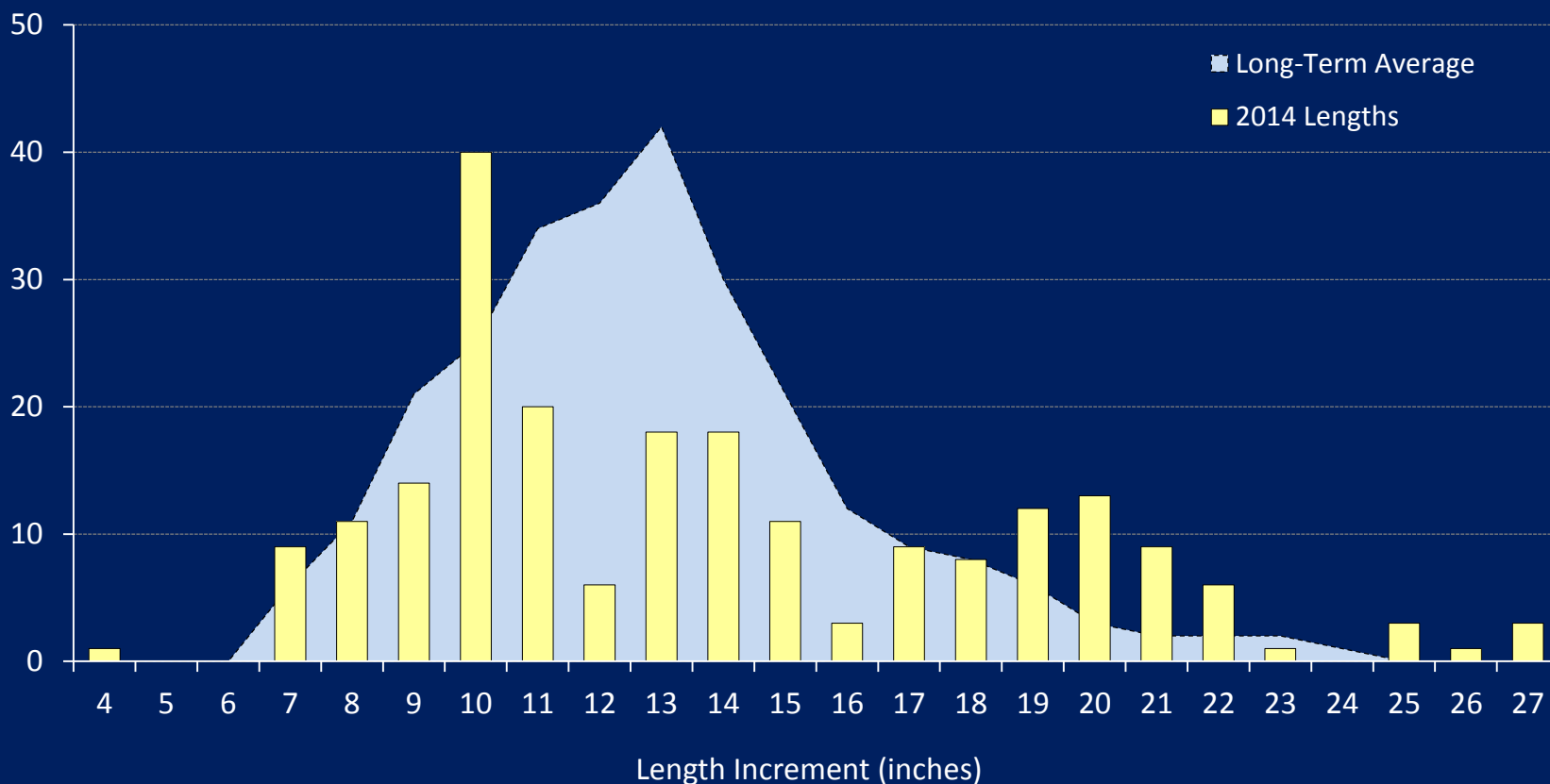
Number/Net



## 2014 Walleye Gillnet Catch by Length Group

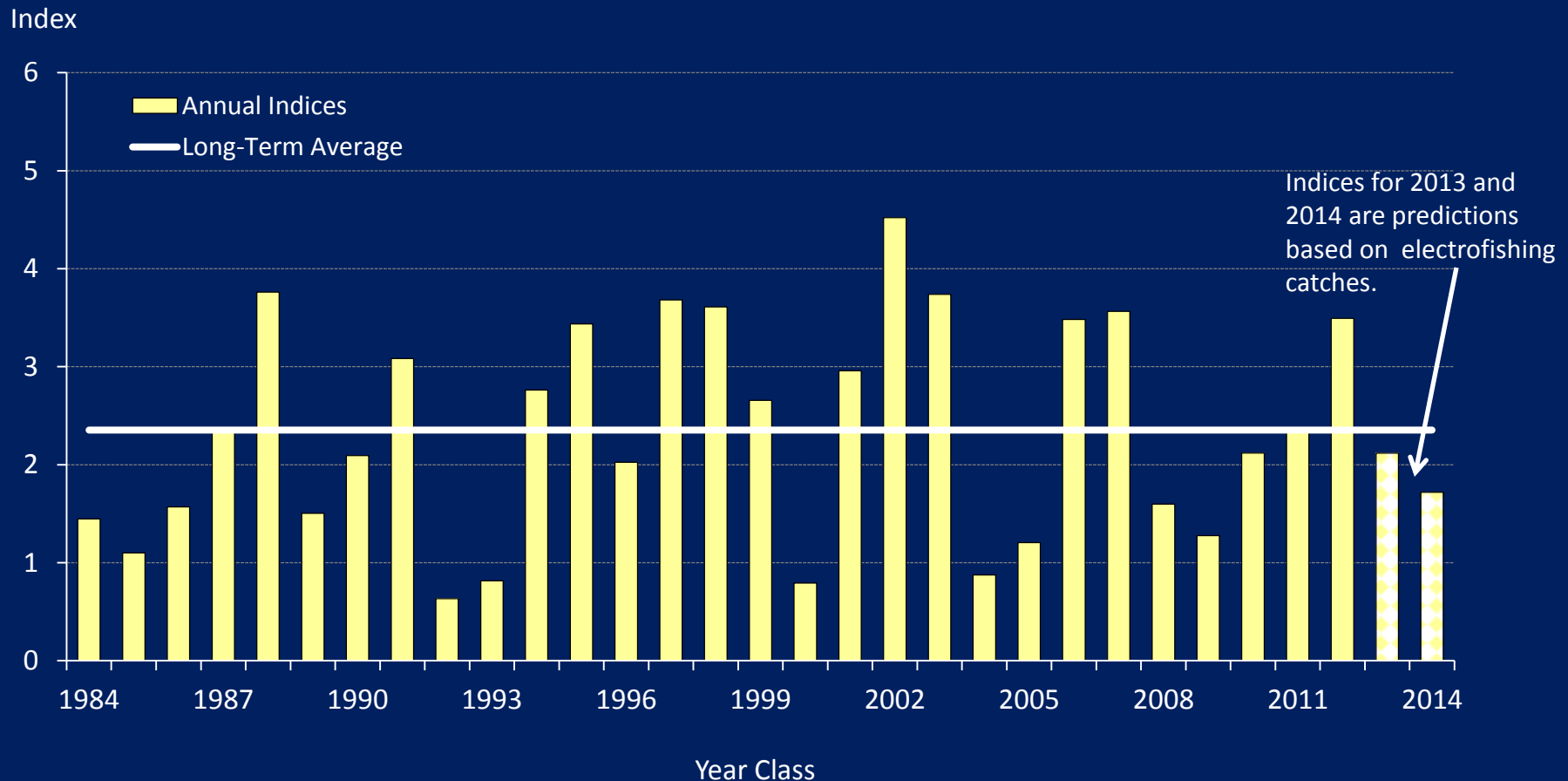
The gillnet catch of 11-16 inch walleye was below the long-term average for that length group, due to poor reproduction in 2009 and low catches of fish from the 2010 and 2011 year classes. The high catch of 10 inch walleye was due to a relatively strong 2012 year class. The gillnet catch of 19-22 inch fish was well above average. Many of these fish came from a strong 2007 year class on West Vermilion.

Number



# Walleye Year Class Strength Indices, 1984-2014

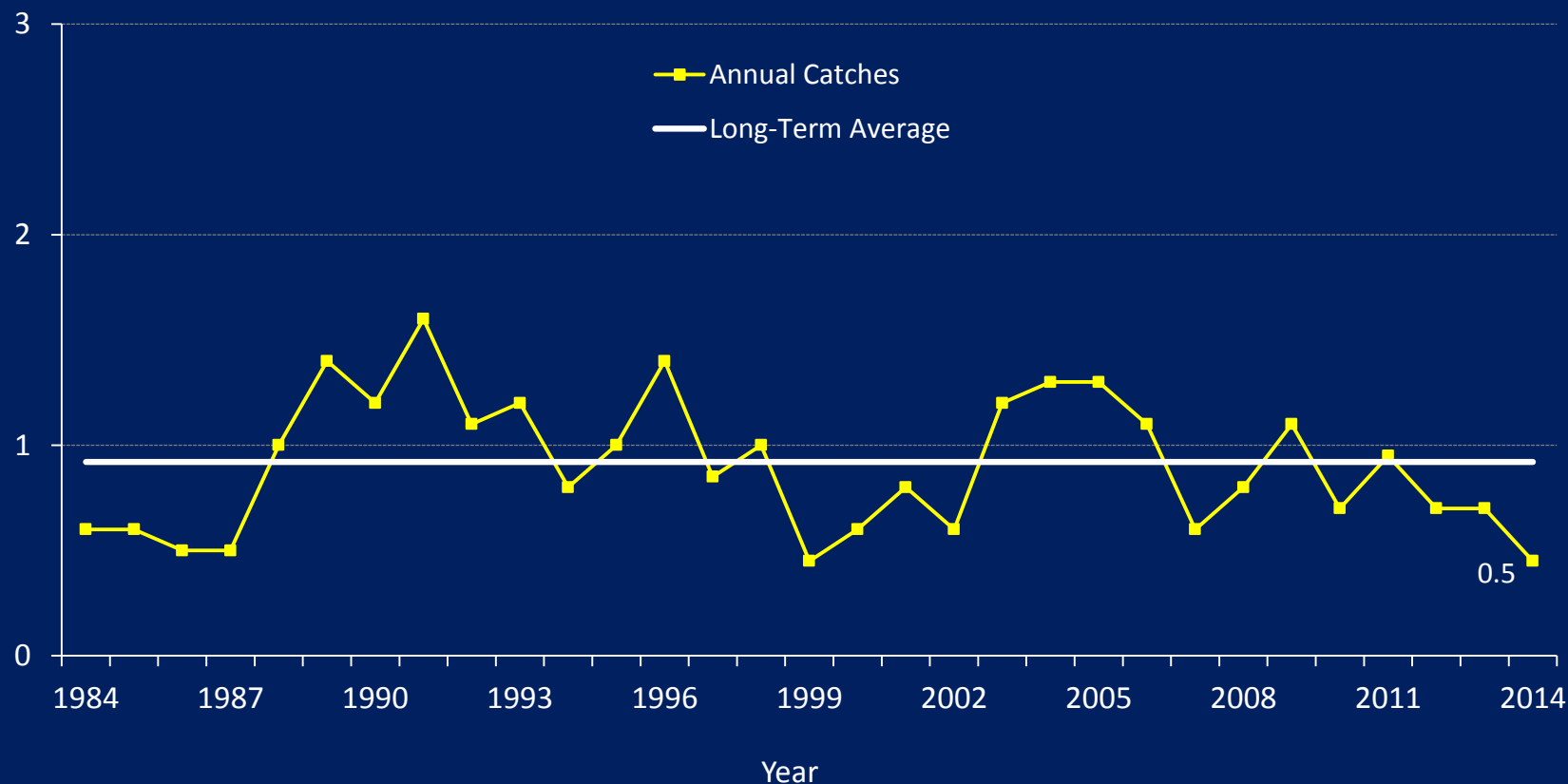
Walleye year class strength indices are calculated for each year class using several years of netting. High values represent strong year classes, while low values represent weak year classes. Strong year classes were produced in 2006, 2007, and 2012. Weak year classes were produced in 2008 and 2009. Predictions based on electrofishing catches and lengths suggest the 2013 and 2014 year classes may be weaker than average as well. High year to year variation in year class strength is a normal condition in large natural walleye lakes. Because lake productivity is limited, it is not possible for lakes to sustain strong year classes every year.



# Northern Pike Gillnet Catches, 1984-2014

The 2014 northern pike gillnet catch was 0.5 fish/net, slightly below the long-term average. It was the third consecutive year northern pike catches were below average. The northern pike population is relative low on Lake Vermilion, although some of the shallow weedy bays have higher numbers of fish, especially on West Vermilion.

Number/Net

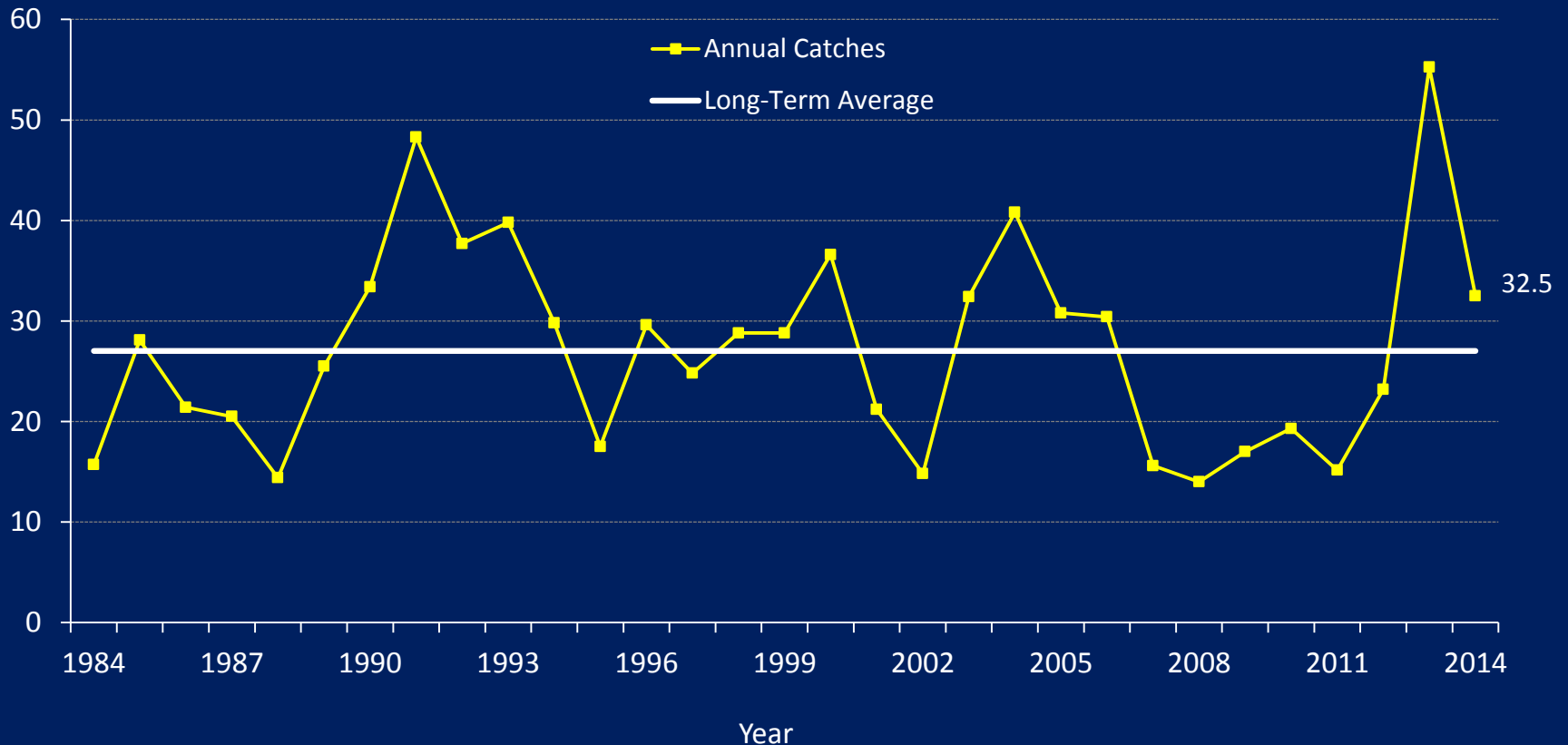




# Yellow Perch Gillnet Catches, 1984-2014

The 2014 perch gillnet catch was 32.5 fish/net, slightly above the long-term average. The perch catch declined substantially after an unusually high catch in 2013. Low perch gillnet catches from 2007 to 2012 were believed to be related to an expanding cormorant population on the lake. A cormorant control program was started in 2013.

Number/Net



# Night Electrofishing

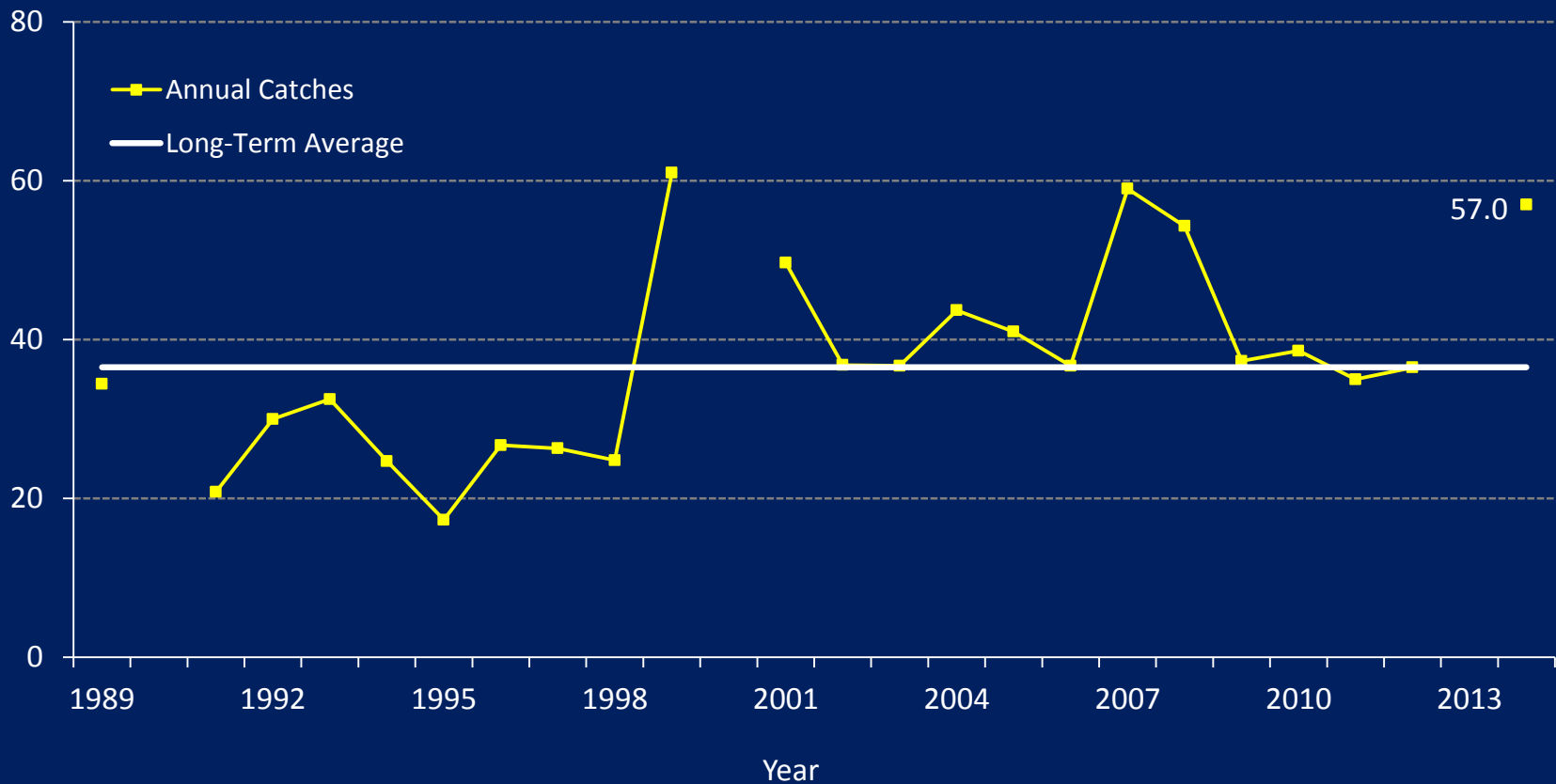
Night electrofishing is used to sample smallmouth bass and young-of-the-year walleye, which are not often caught in standard lake survey nets. Smallmouth bass are sampled in June, while young-of-the-year walleye are sampled in late September.



# Smallmouth Bass Electrofishing Catches, 1989-2014

The smallmouth bass electrofishing catch in 2014 was 57.0 fish/hour of electrofishing, well above the long-term average. All size categories were well represented in the electrofishing catch. Strong year classes were produced in 2005, 2006, 2010, and 2011. Weak year classes were produced in 2008 and 2009. No sampling for smallmouth bass was done in 1990, 2000, and 2013.

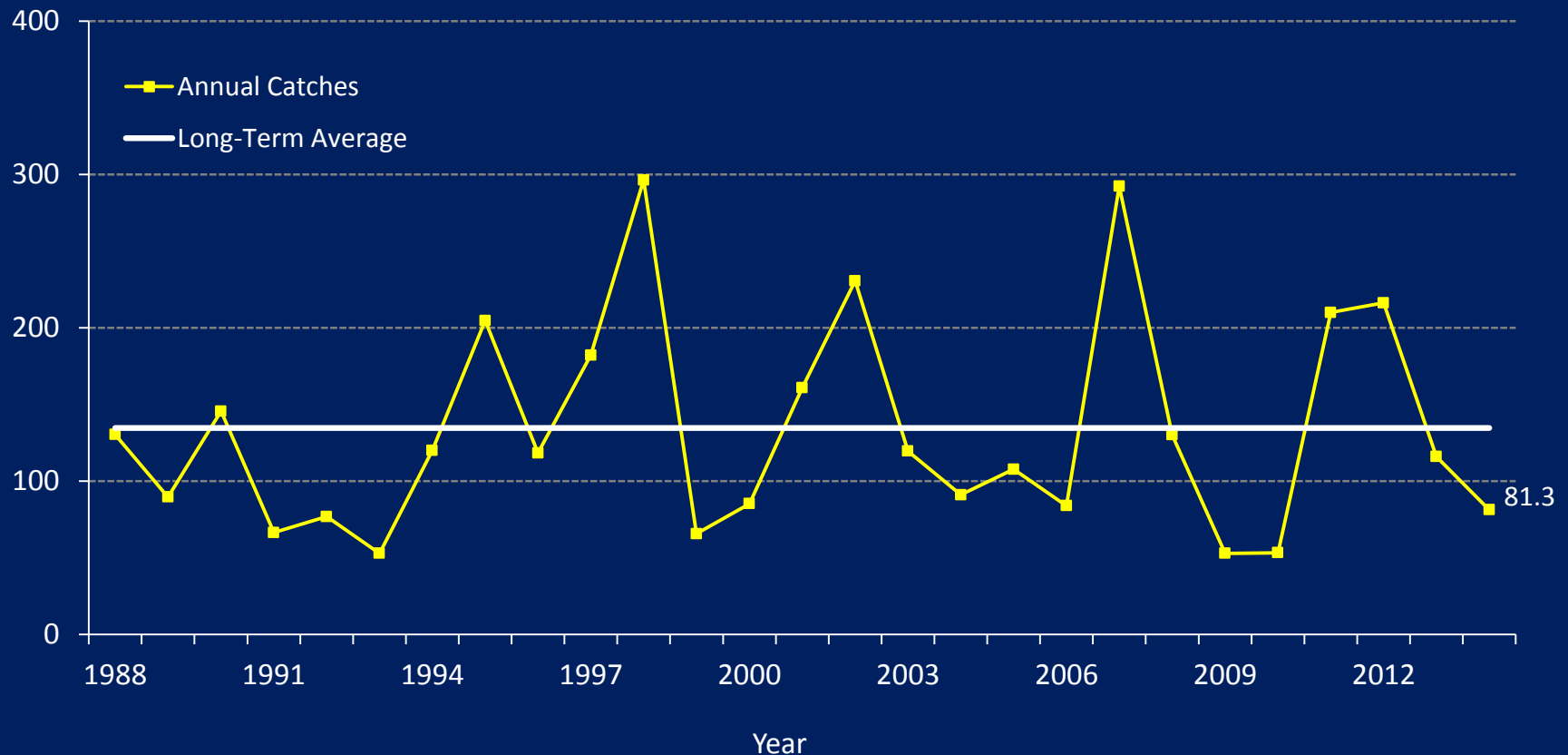
Number/Hour



# Young-of-the-Year Walleye Electrofishing Catches, 1988-2014

The young-of-the-year walleye electrofishing catch in 2014 was 81.3 fish/hour of electrofishing, slightly below the long-term average. Electrofishing catches have declined recently after relatively high catches in 2011 and 2012. The length that young-of-the-year walleye reach by fall is also important in determining year class strength. Large fish tend to produce strong year classes, while small fish produce weak year classes. The mean length in 2014 was 5.0 inches, slightly below the long-term average.

Number/Hour





## 2014 Lake Vermilion Creel Survey

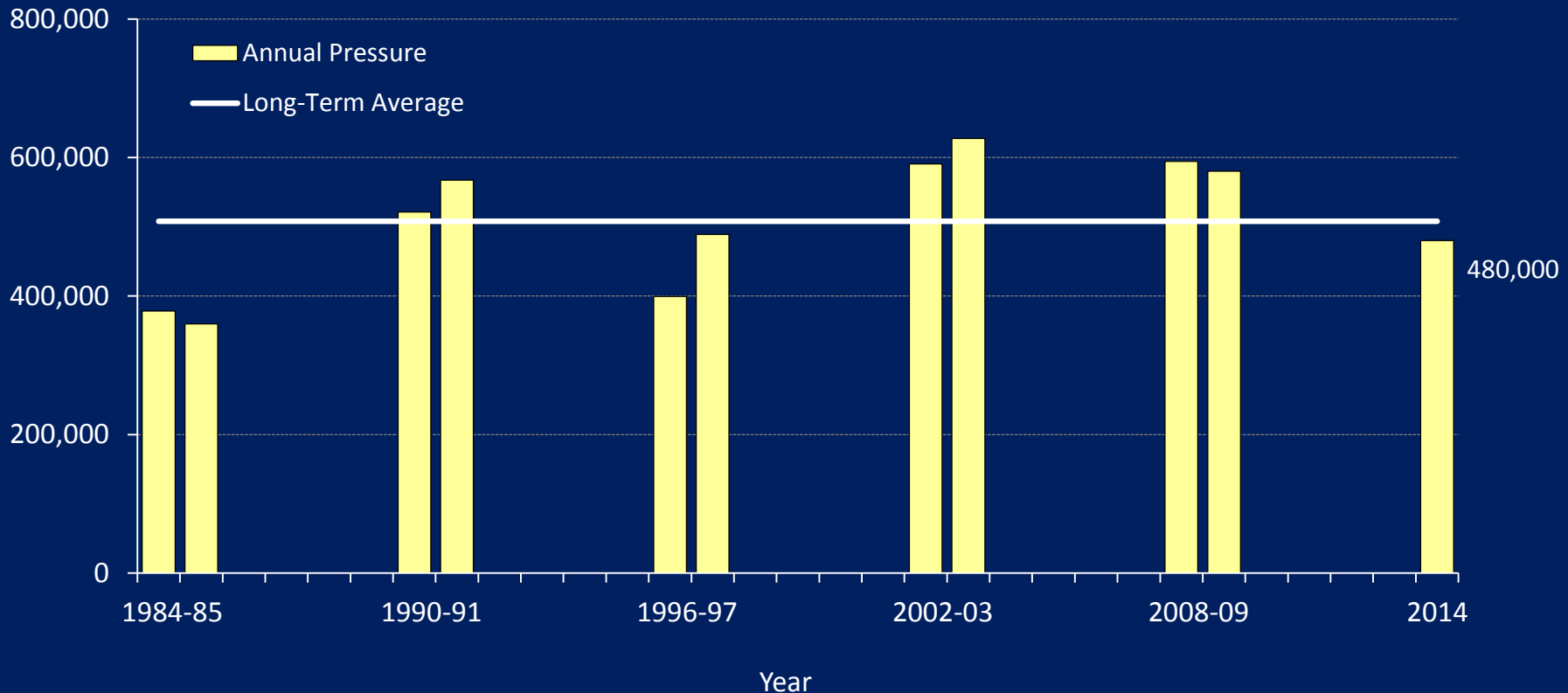
Creel survey is a scientific method of estimating fishing pressure and fish harvest from a series of boat counts and angler surveys. On Lake Vermilion, boat counts are done by DNR Enforcement pilots while angler interviews are done by creel survey clerks travelling the lake by boat. Creel surveys on Lake Vermilion are done two consecutive years out of every six years. Creel surveys on Lake Vermilion only include boat anglers fishing during daylight hours from opening day thru the end of September.



## Lake Vermilion Fishing Pressure, 1984-2014

There were an estimated 480,000 hours of fishing pressure on Lake Vermilion during the 2014 survey period, slightly below the long-term average. Lower fishing pressure in 2014 was due in part to ice cover on opening weekend and poor weather in May and June. Fishing pressure was well below average in May and June, near average in July, and above average in August and September.

Angler Hours

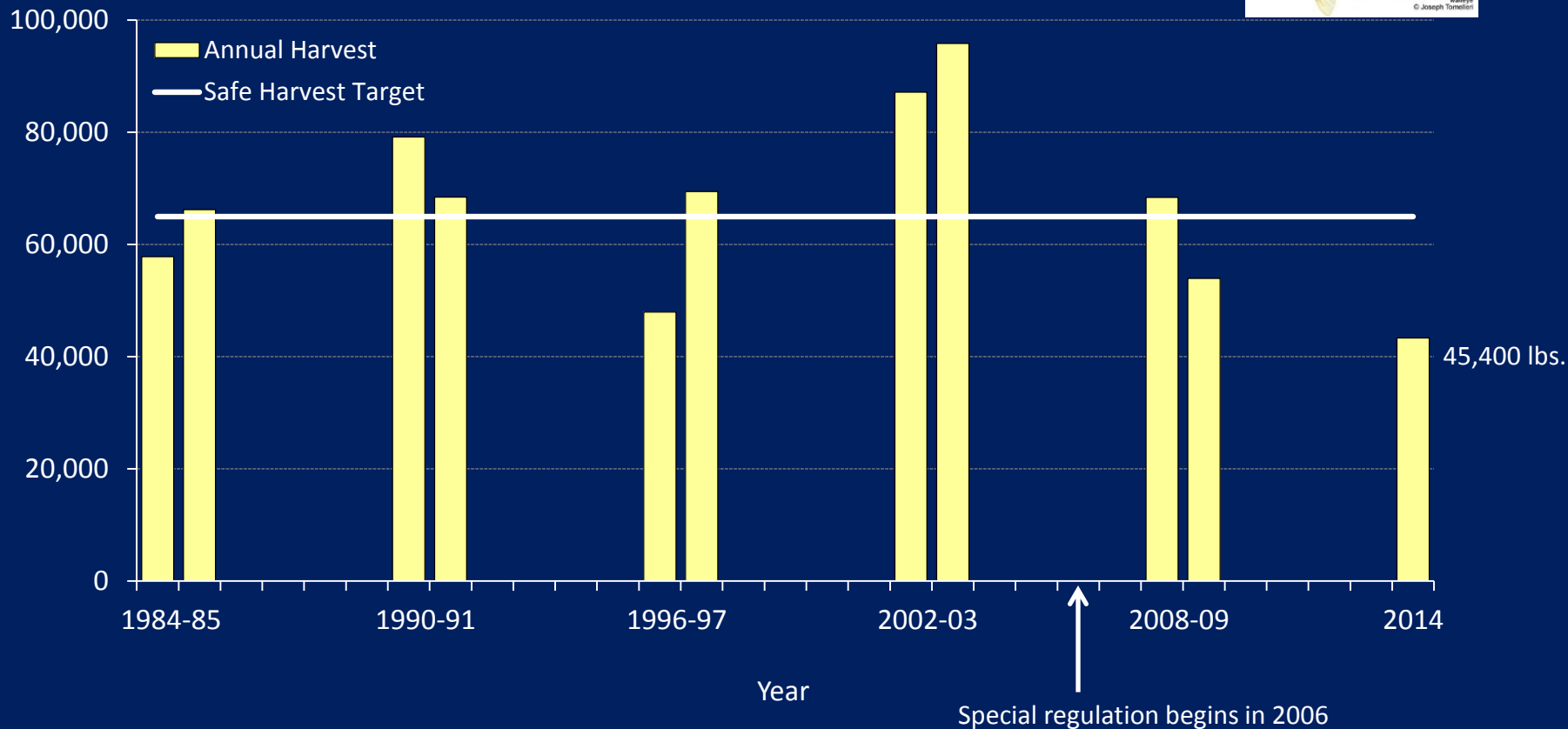


# Angler Harvest of Walleye - Pounds

An estimated 45,400 pounds of walleye were harvested during the 2014 survey period, well below both the long-term average and the safe harvest target established for the lake (65,000 pounds). The DNR uses fish harvest in pounds for most management planning. The low harvest was due to a number of factors, including low fishing pressure in May and June, a decline in the number of keeper-sized walleye in the population, and the protected slot regulation (18-26 inch protected slot with one fish allowed over 26 inches and a 4-fish bag limit). High walleye harvest in 2002 and 2003 prompted the special regulation that began in 2006.

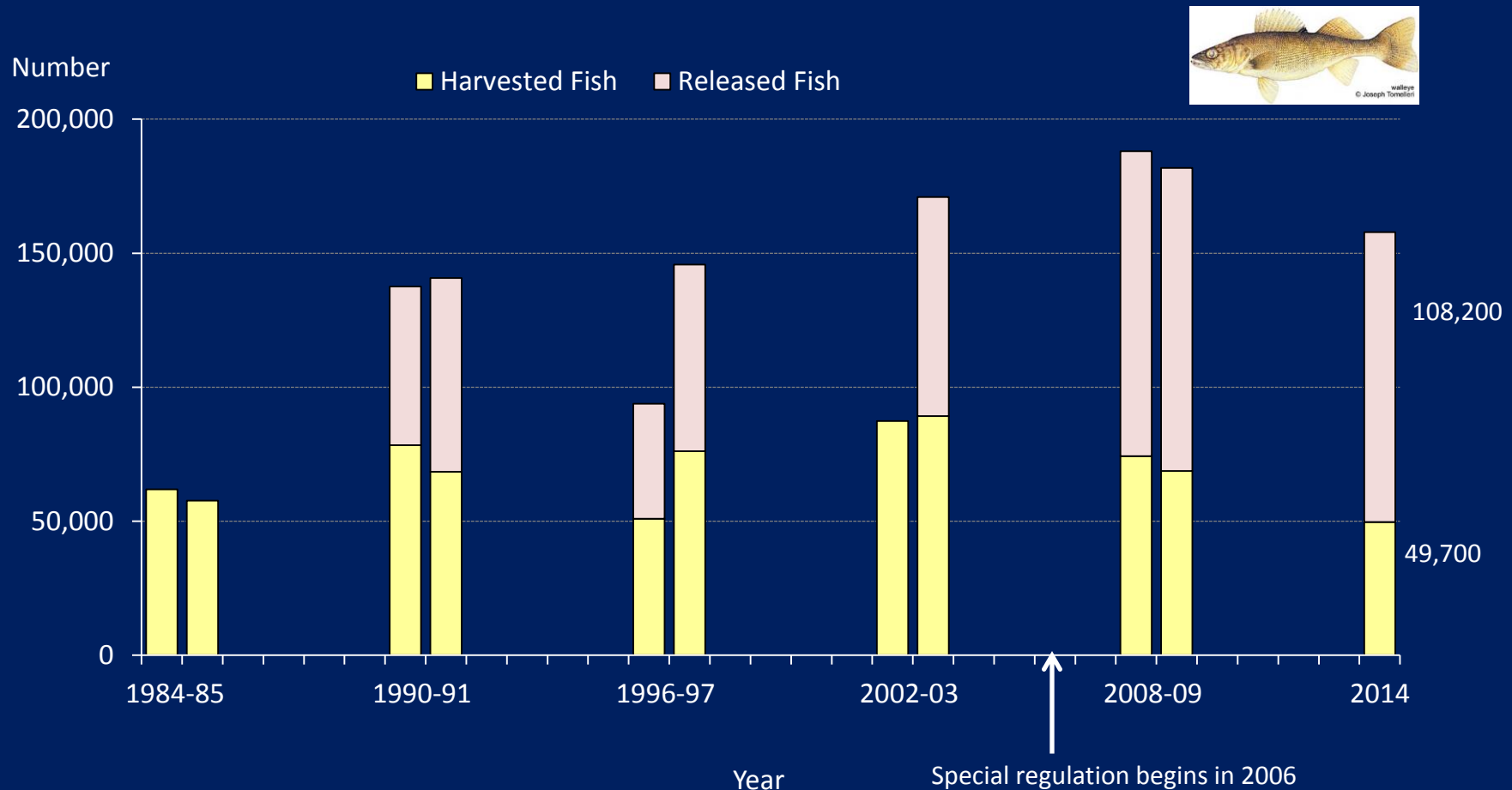


Harvest in Pounds



# Angler Harvest and Release of Walleye - Numbers

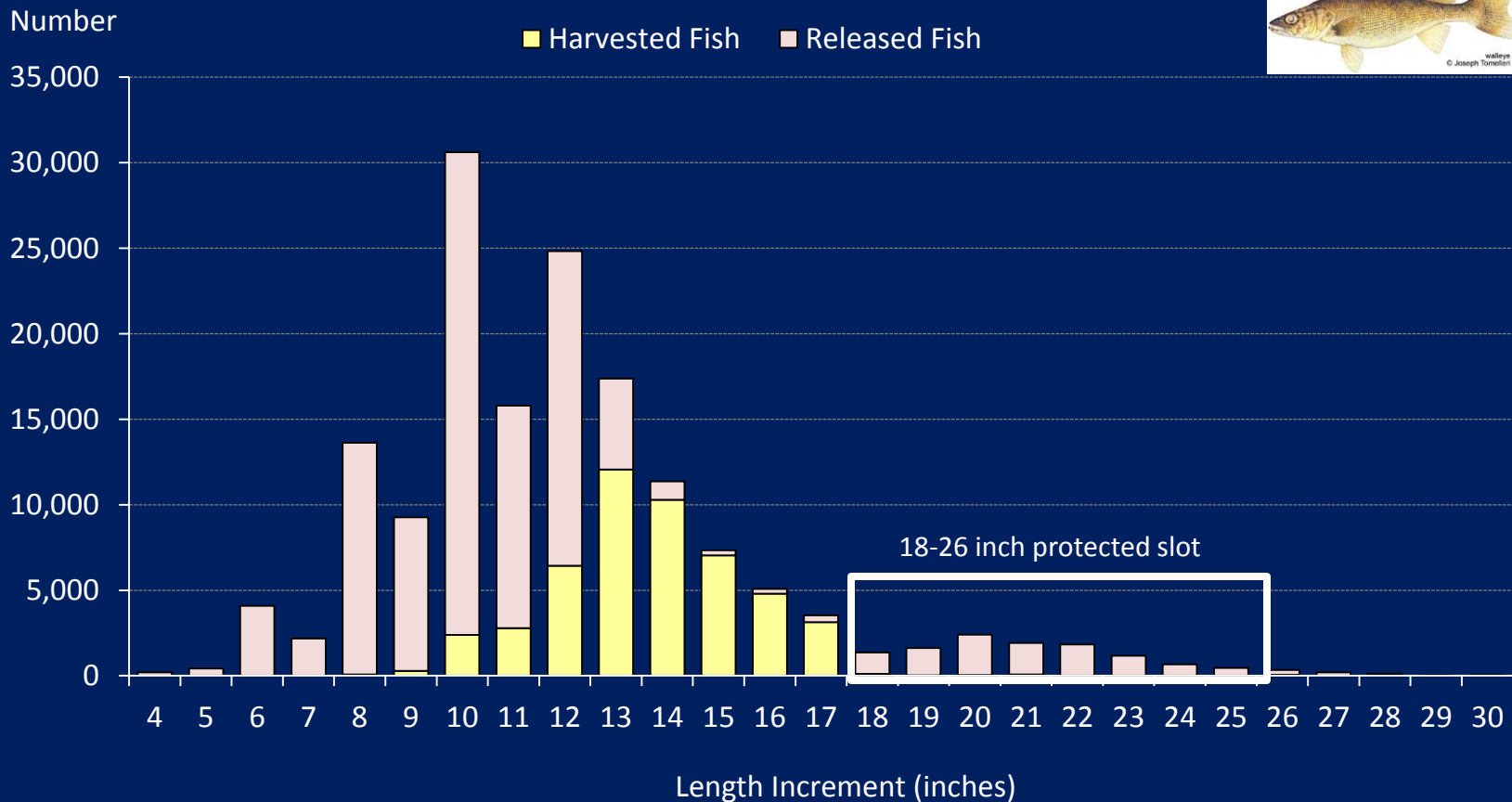
In terms of numbers of fish, anglers harvested an estimated 49,700 walleye during the 2014 survey period, with an additional 108,200 walleye caught and released. Nearly 60% of the walleye caught in 2014 were released, mostly because they were too small. An estimated 11,200 walleye were released because they were in the protected slot. Release estimates are not available for 1984, 1985, and 2002.





# 2014 Walleye Catch by Length Group

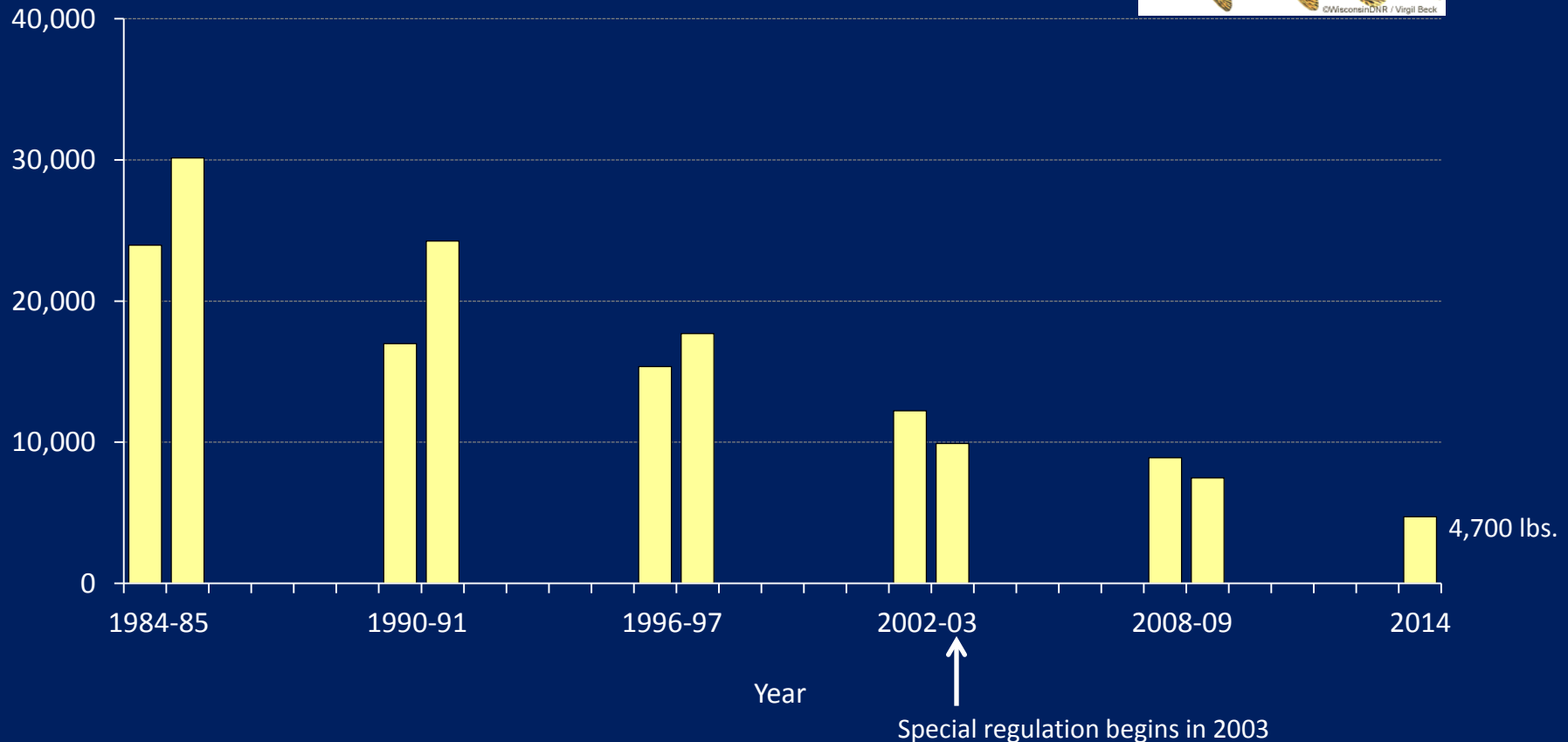
The angler catch of walleye in 2014 was dominated by small fish, with 64% of the walleye caught being less than 13 inches long. Many of these fish came from a strong year class produced in 2012. An estimated 11,200 walleye within the protected slot were caught and released, fish that would have been vulnerable to harvest had the protected slot regulation not been in place.



# Angler Harvest of Northern Pike - Pounds

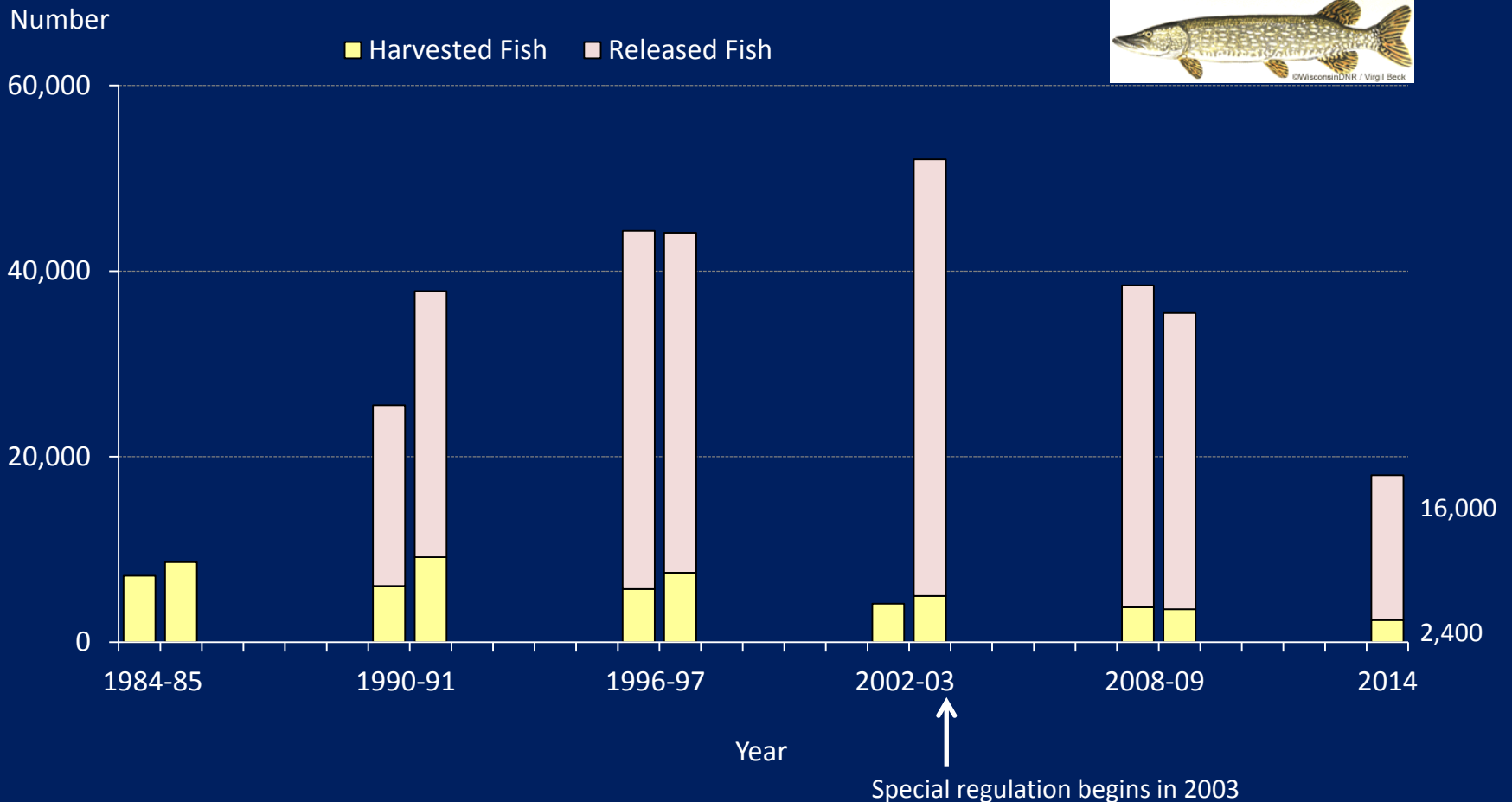
An estimated 4,700 pounds of northern pike were harvested during the 2014 survey period, the lowest northern pike harvest observed in any creel survey to date. Harvest of northern pike has been declining since the first creel survey in 1984, probably due to a combination of fewer anglers targeting northern pike, increased catch and release fishing, and restrictions from the special regulation for northern pike (24-36 inch protected slot with one fish allowed over 36 inches). The special regulation was implemented in 2003 and was part of a statewide initiative to improve the size structure of pike populations in a number of lakes in the state.

Harvest in Pounds



# Angler Harvest and Release of Northern Pike - Numbers

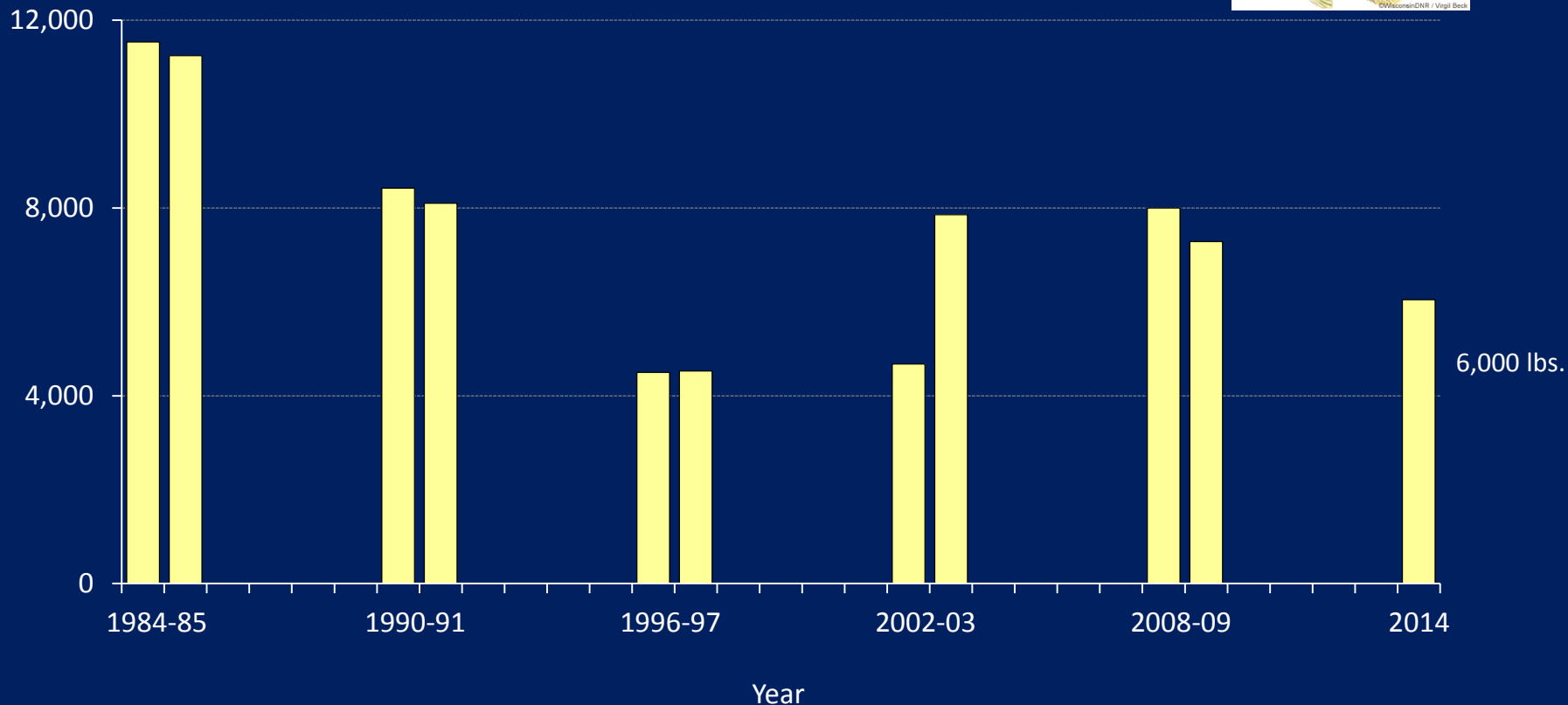
An estimated 2,400 northern pike were harvested during the 2014 survey period, with an additional 16,000 northern pike caught and released. It was the lowest total catch of northern pike observed in any creel survey to date. An estimated 5,400 northern pike within the protected slot were caught and released. Only 13% of the northern pike caught in 2014 were harvested. Release estimates are not available for 1984, 1985, and 2002.



# Angler Harvest of Smallmouth Bass - Pounds

An estimated 6,000 pounds of smallmouth bass were harvested during the 2014 survey period, slightly less than harvests observed in other recent creel surveys. Harvest of the smallmouth bass declined considerably after the first set of surveys in 1984 and 1985, probably due in part to more catch and release fishing.

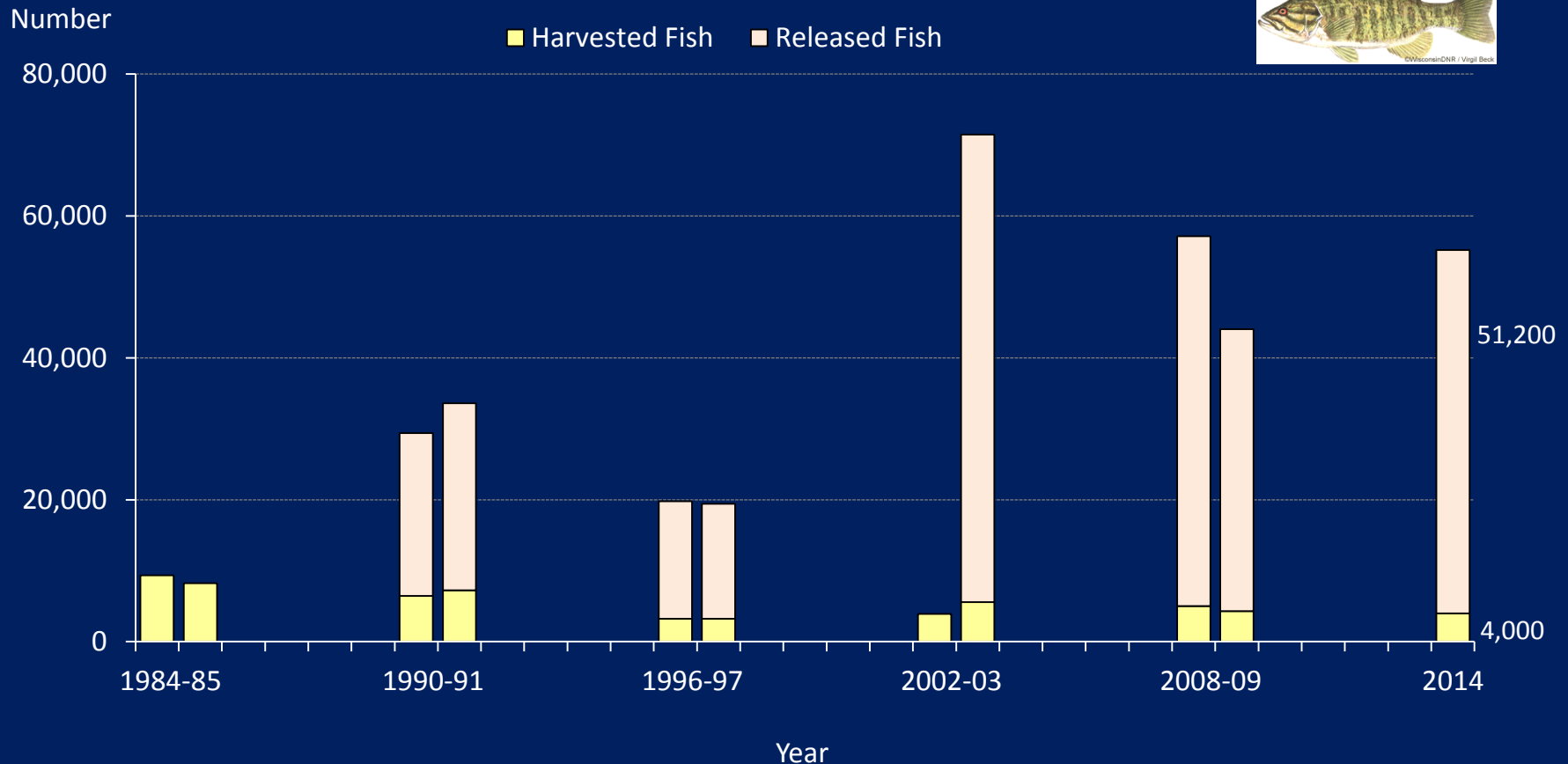
Harvest in Pounds





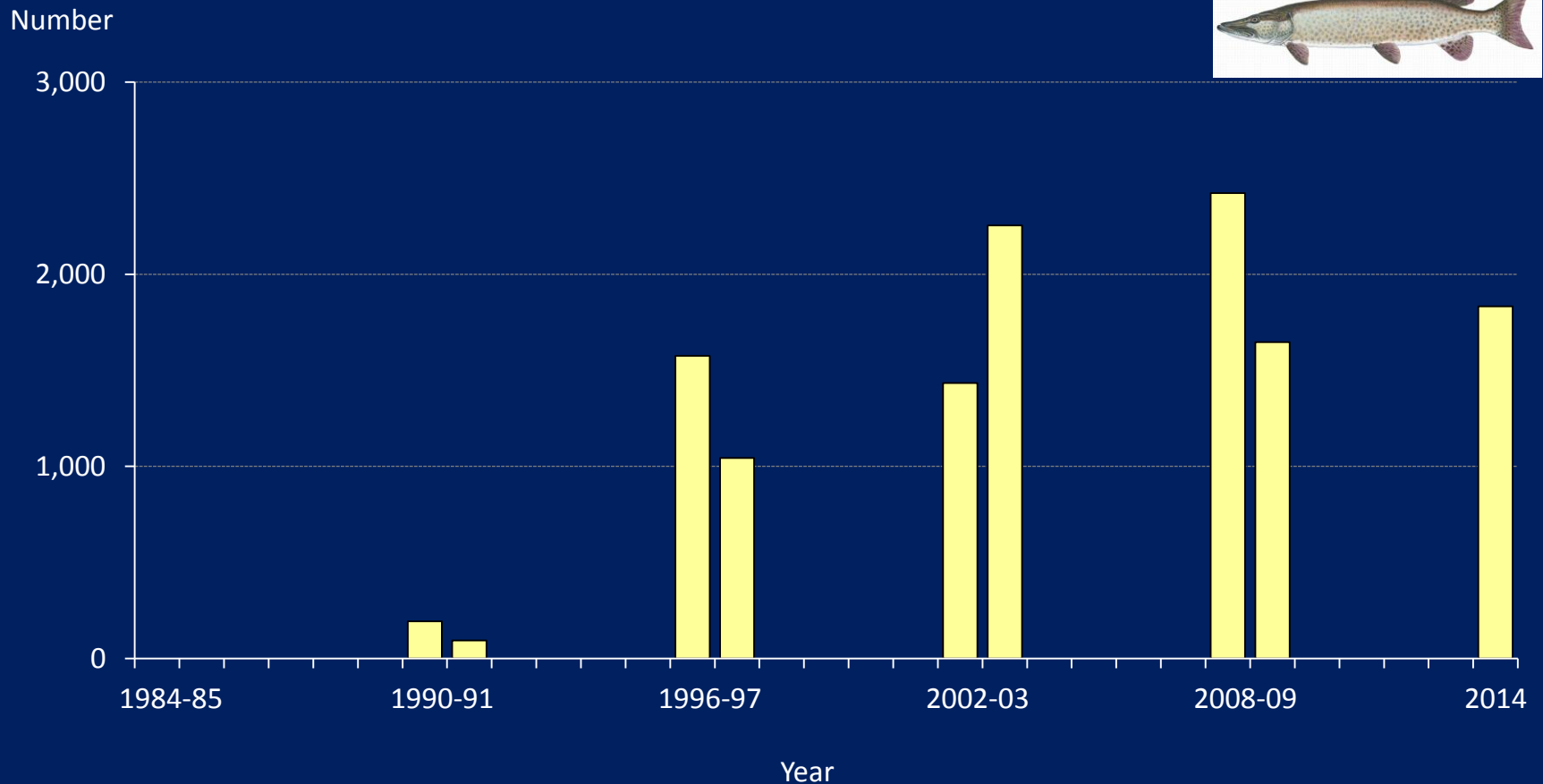
# Angler Harvest and Release of Smallmouth Bass - Numbers

An estimated 4,000 smallmouth bass were harvested during the 2014 survey period, with an additional 51,200 smallmouth bass caught and released. The total catch was similar to other recent creel surveys. Only 7% of the smallmouth bass caught in 2014 were harvested, reflecting the prevalence of catch and release fishing for this species. Release estimates are not available for 1984, 1985, and 2002.



# Angler Catch and Release of Muskie - Numbers

No muskie harvest was documented during the survey. There are occasional reports of muskie being harvested, but it is believed harvest is very low. An estimated 1,800 muskie were caught and released during the survey period, similar to the 2009 muskie catch. Muskie caught at night or after September 30 were not documented during this survey, although there are probably a substantial number of fish caught at these times.



# Cormorant Management on Lake Vermilion

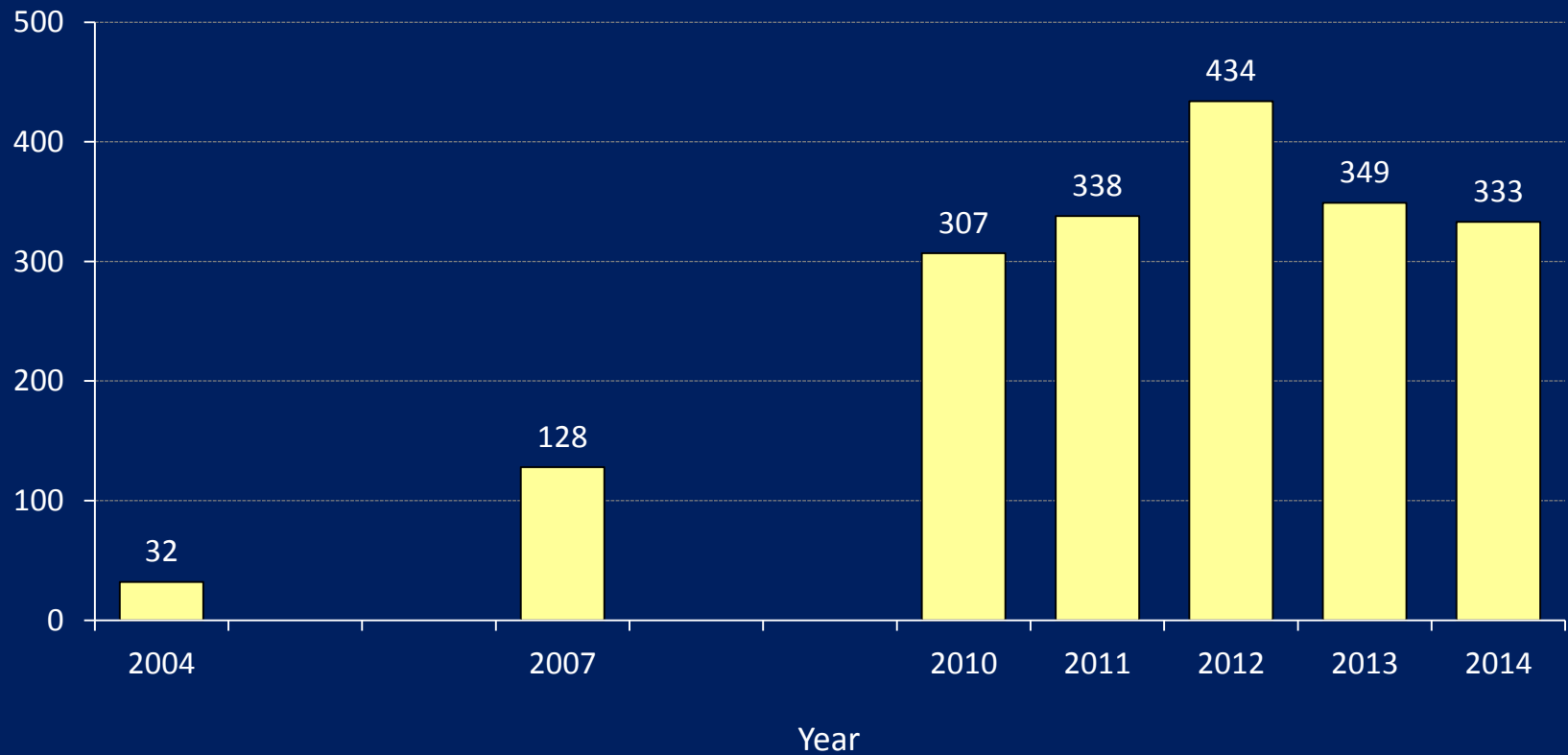




## Cormorant Nest Counts on Potato Island in Big Bay



Number Nests







## Cormorant Control Plan Developed in 2013



- Cormorants are federally protected and unregulated killing of these birds is illegal. Limited control may be allowed if there is evidence of damage.
- Based on low perch numbers from 2006 to 2012, the DNR developed a control plan in collaboration with USFWS.
- The goal of the control program is to reduce cormorant numbers to a level that allows the perch population to recover, while still maintaining a viable nesting colony.
- In 2013, 10% of adult birds were killed (70) and all eggs were oiled.
- In 2014, eggs were oiled in 265 of 333 nests. No adults killed.
- Future control based on response in fish populations.



## Fishing Tournaments in 2015



- Permits from the DNR are required for most fishing tournaments. The DNR regulates tournaments in a manner that will protect fish populations and minimize conflict with other lake users. To date, two permits have issued for fishing tournaments on Lake Vermilion in 2015:
- May 16: City Auto Glass Walleye Classic, 110 boats.
- August 15: Cabela's North American Bass Circuit, 40 boats.



## Aquatic Invasive Species



- Rusty crayfish are abundant in the eastern and middle areas of the lake. They have destroyed much of the aquatic vegetation in the areas they have colonized
- Curly-leaf pondweed is present in Stuntz Bay and Everett Bay. The Sportsmen's Club of Lake Vermilion sponsored a chemical treatment in Everett Bay in 2013 with the goal of reducing abundance and helping prevent spread to other areas of the lake.
- Chinese mystery snails have been found in the Head of the Lakes Bay. They sometimes become a nuisance when large die-offs occur.
- The DNR has stepped up enforcement and education efforts in recent years to help prevent the spread of invasive species. Boaters should always take preventative measures to avoid moving water, plants, or animals to other lakes. Boats and trailers should be thoroughly cleaned or dried before moving to other bodies of water. All bilges and live wells must be drained. All drain plugs must be removed and left out for transport.

## Fish Stocking



- The Minnesota DNR operates a walleye egg-take station and hatchery on Lake Vermilion at the mouth of the Pike River. Walleye produced at the hatchery are used for stocking programs in northeastern Minnesota and other areas of the state. A portion of the fry produced each year is stocked back into Lake Vermilion to mitigate egg removal from the lake. In recent years, 5-20 million walleye fry have been stocked into Lake Vermilion annually. There is also substantial natural reproduction of walleye in Lake Vermilion. While it is important to have sufficient walleye fry for producing good year classes, excessive stocking beyond that level is probably not productive and may actually be counter-productive by slowing growth and reducing survival.
- Leech Lake strain muskie fingerlings are stocked into Lake Vermilion to help maintain a quality fishery. The current stocking rate is 4,000 fingerlings every other year, plus surplus fish when available.

## Management Activities in 2015

- Governor's Opener on Lake Vermilion!
- Population assessments: including gillnetting, trapnetting, electrofishing, beach seining, zooplankton sampling, and water chemistry sampling.
- Creel survey in 2015.
- New statewide 54 inch minimum length regulation for muskie.
- The statewide September catch and release season for smallmouth bass has been dropped. The season is now the same as walleye and northern pike.



# Questions ?

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