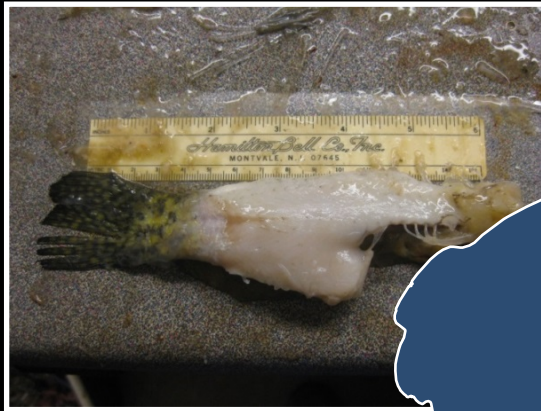


Mille Lacs Lake Predator Diet Study



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What is the problem?

Walleye population is declining

Why may this be occurring?

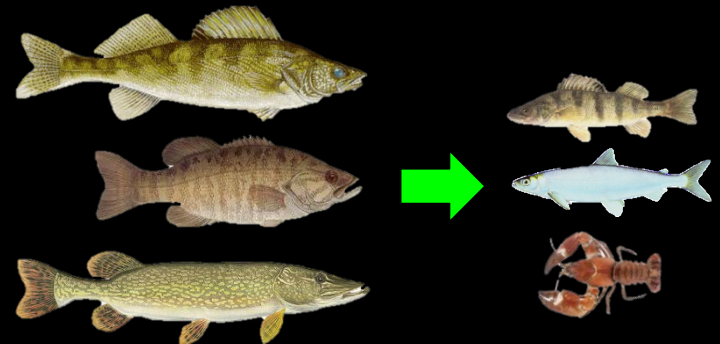
More young walleye are not surviving their first few years

What might be the cause?

Higher predation is one possibility

How can we find out?

Fish diet/bioenergetics study





Fish Diet/Bioenergetics Study

Objective 1: What do the predators in Mille Lacs Lake eat?

- Walleye
- Northern pike
- Smallmouth bass

Objective 2: How much food is consumed?

- Between species
- Between years

Objective 3: How many young walleye are consumed?

- Between species
- Between years

Objective 1: What do the predators in Mille Lacs Lake eat?



Photo courtesy of Deborah Rose, DNR

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***Objective 1:* What do the predators in Mille Lacs Lake eat?**



Photo courtesy of Deborah Rose, DNR

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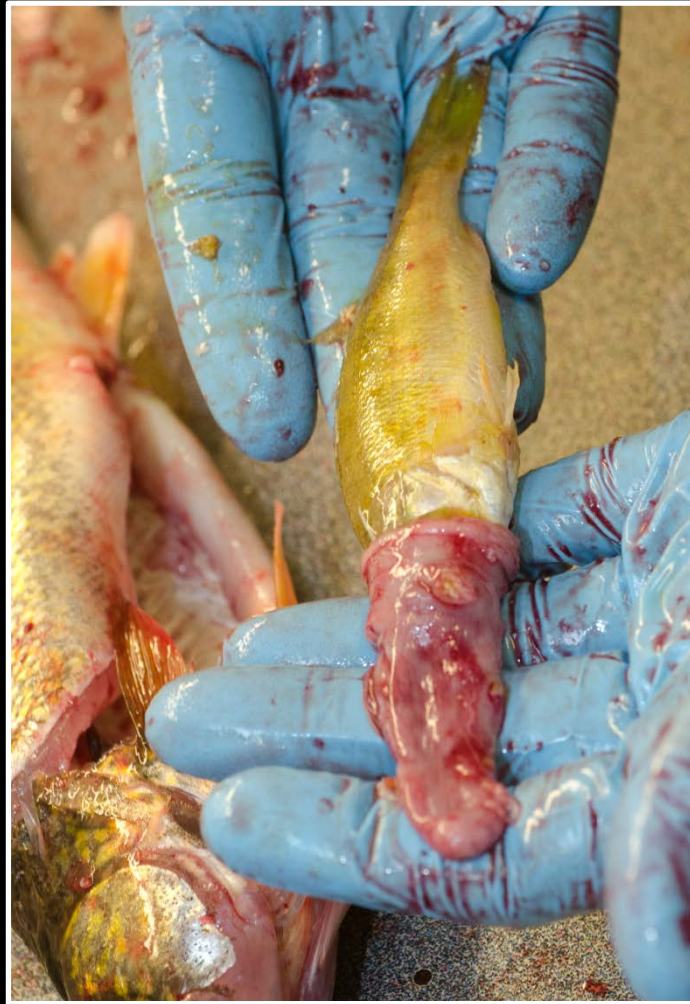


Photo courtesy of Deborah Rose, DNR

Objective 1: What do the predators in Mille Lacs Lake eat?

Crayfish



Photo courtesy of Deborah Rose, DNR

***Objective 1:* What do the predators in Mille Lacs Lake eat?**



Photo courtesy of Deborah Rose, DNR



***Objective 1:* What do the predators in Mille Lacs Lake eat?**



Objective 1: What do the predators in Mille Lacs Lake eat?





***Objective 1:* What do the predators in Mille Lacs Lake eat?**



Objective 1: What do the predators in Mille Lacs Lake eat?





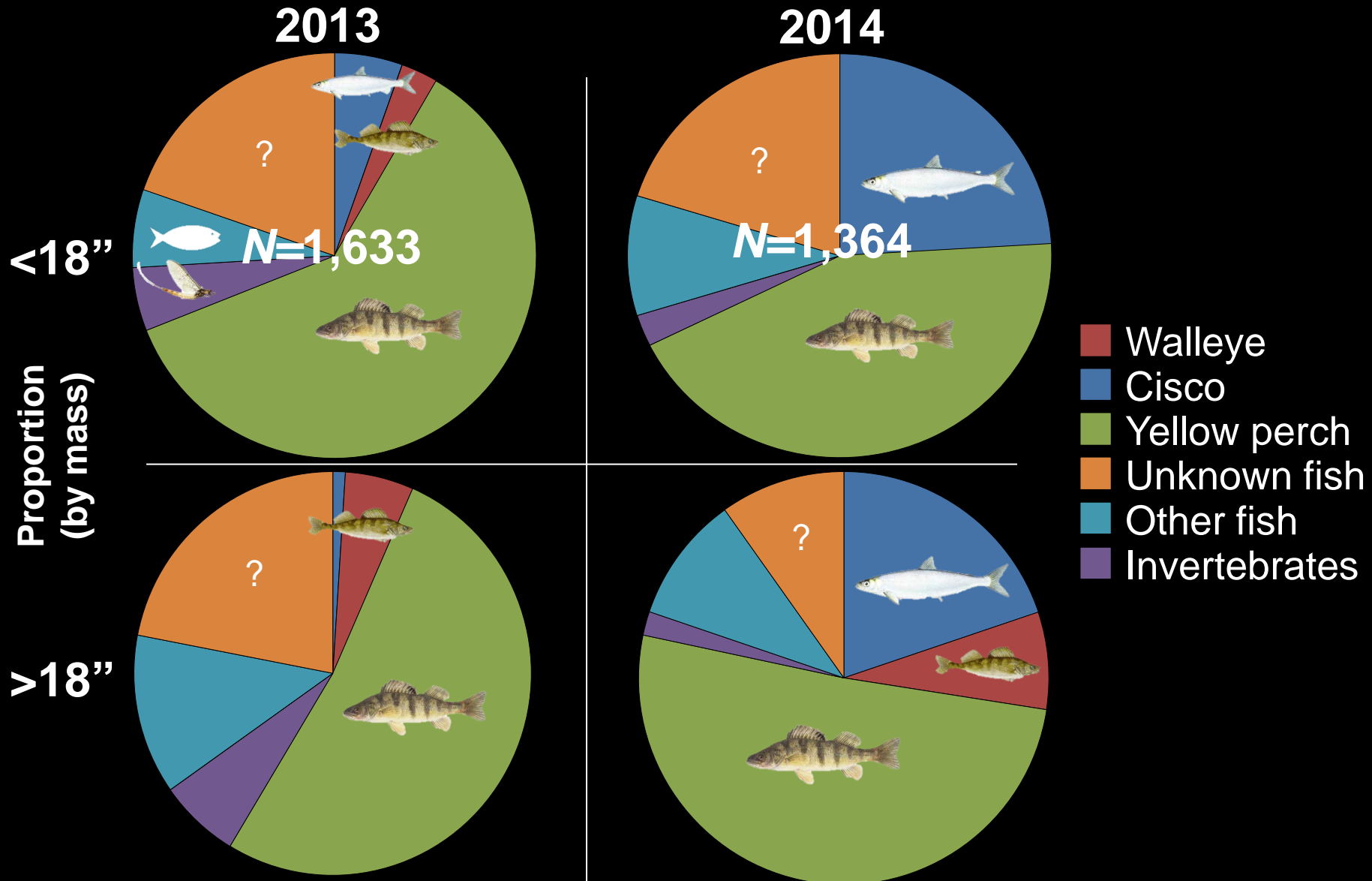
***Objective 1:* What do the predators in Mille Lacs Lake eat?**



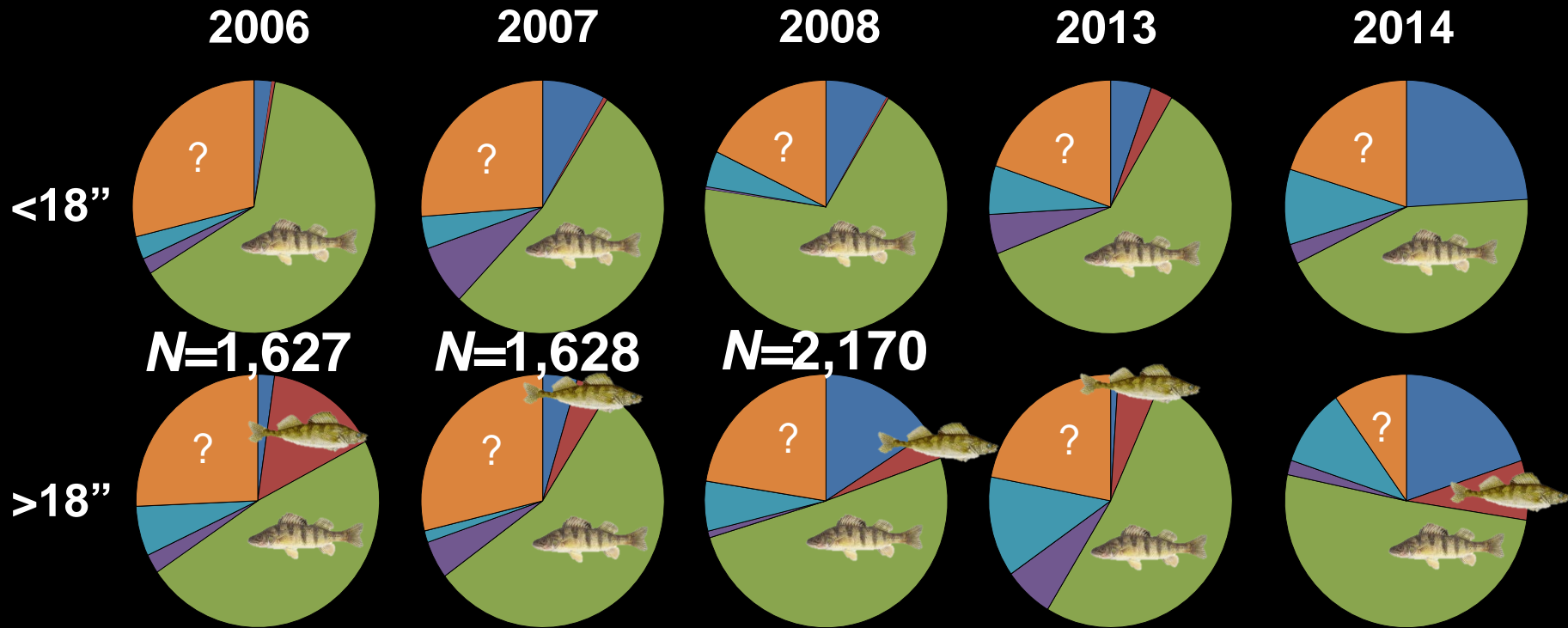
Objective 1: What do the predators in Mille Lacs Lake eat?



Walleye



Walleye

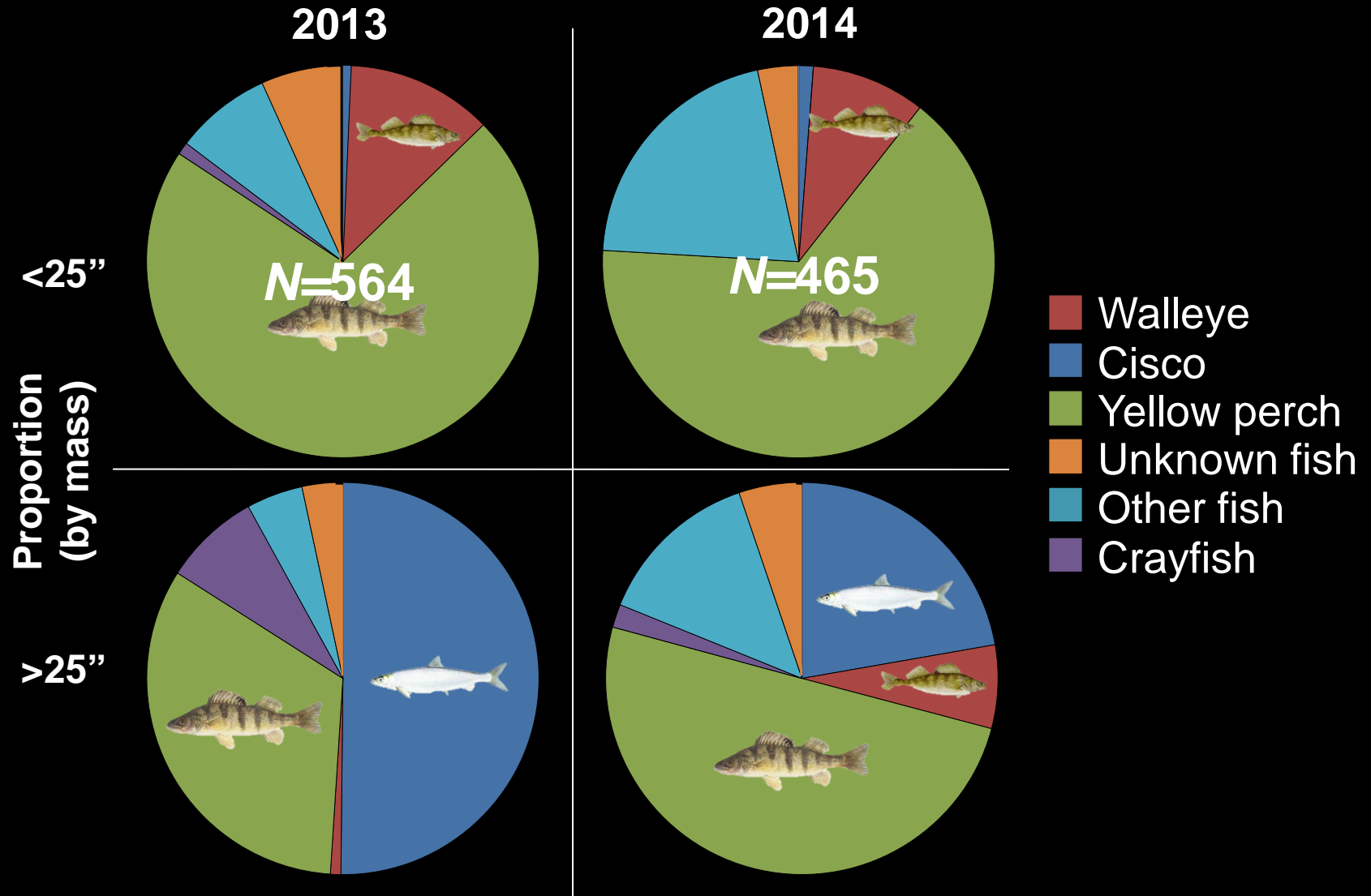
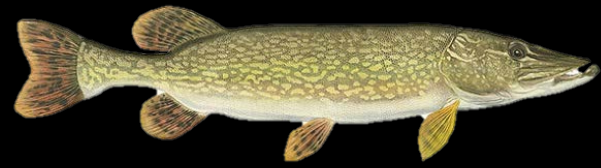


Walleye
Cisco

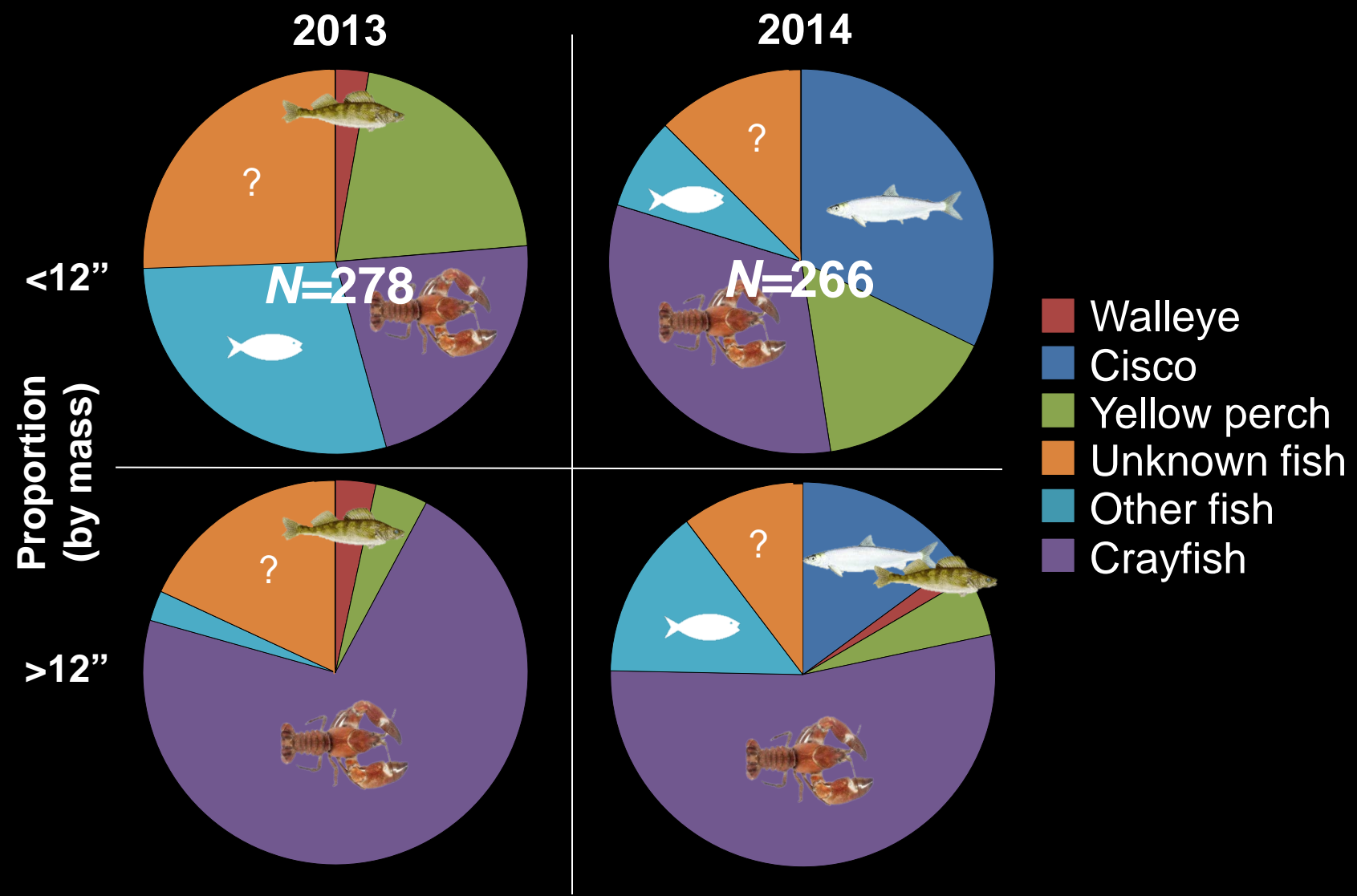
Yellow perch
Unknown fish

Other fish
Invertebrates

Northern pike



Smallmouth bass





Fish Diet/Bioenergetics Study

Objective 1: What do the predators in Mille Lacs Lake eat?

- **Walleye:** yellow perch
- **Northern pike:** yellow perch and cisco
- **Smallmouth bass:** crayfish and other fish

Objective 2: How much food is consumed?

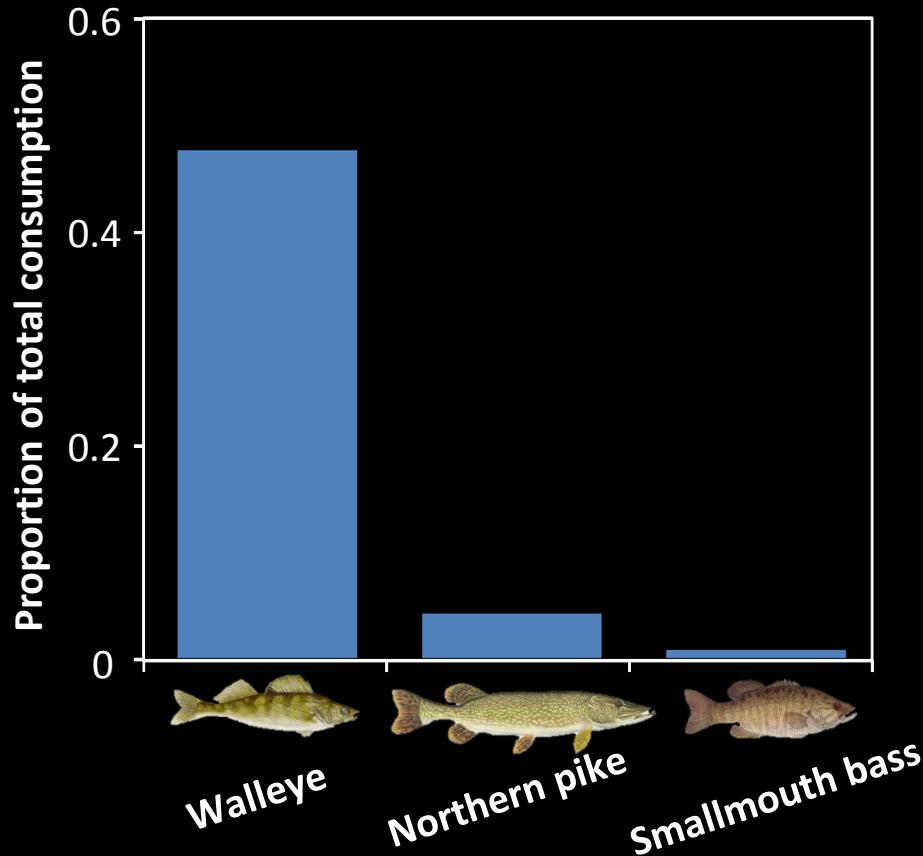
- **Between species**
- **Between years**

Objective 3: How many young walleye are consumed?

- **Between species**
- **Between years**

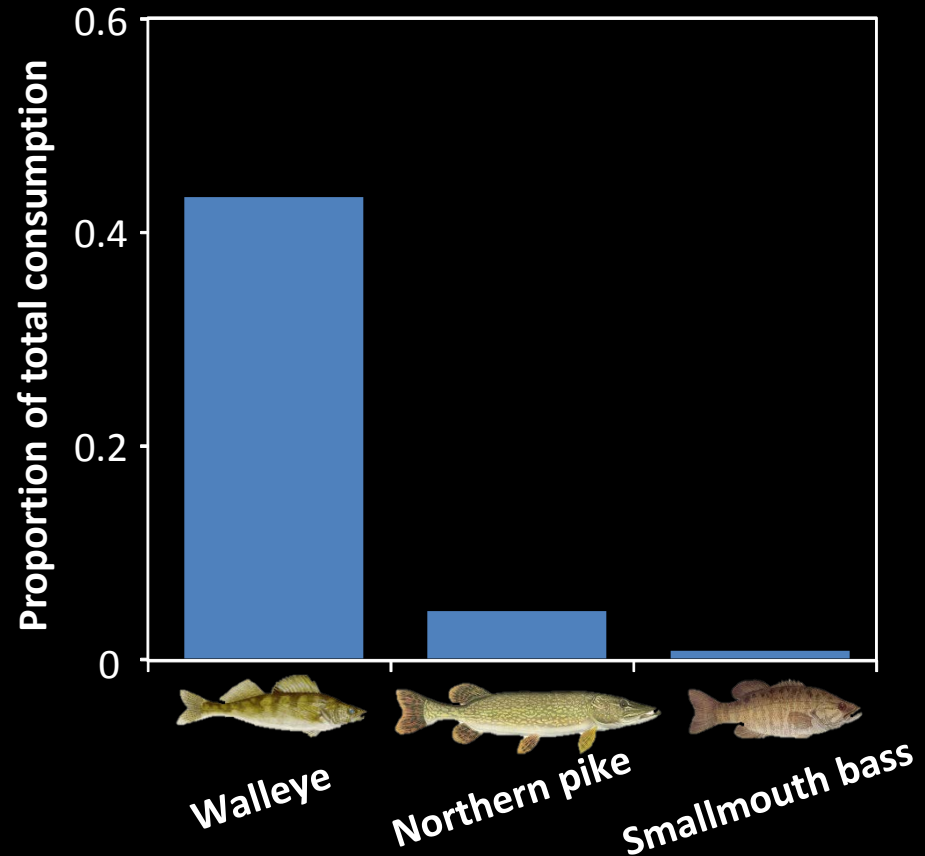
Objective 2: How much food is consumed by each species?

2012-2013



Population Size = 1,409,764 53,000 ?

2013-2014

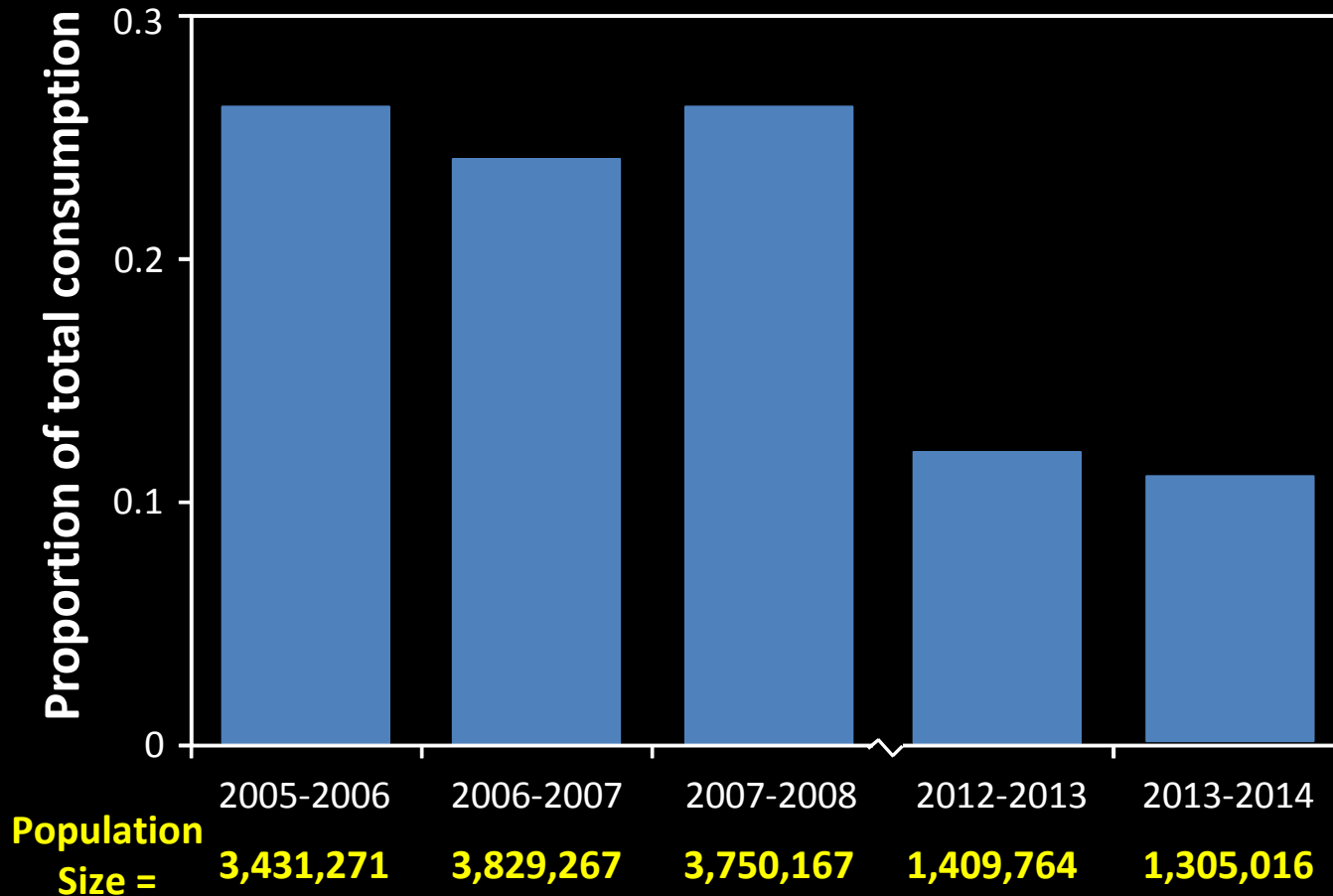


Population Size = 1,305,016 56,000 ?

Objective 2: How much food is consumed between years?



Walleye





Fish Diet/Bioenergetics Study

Objective 1: What do the predators in Mille Lacs Lake eat?

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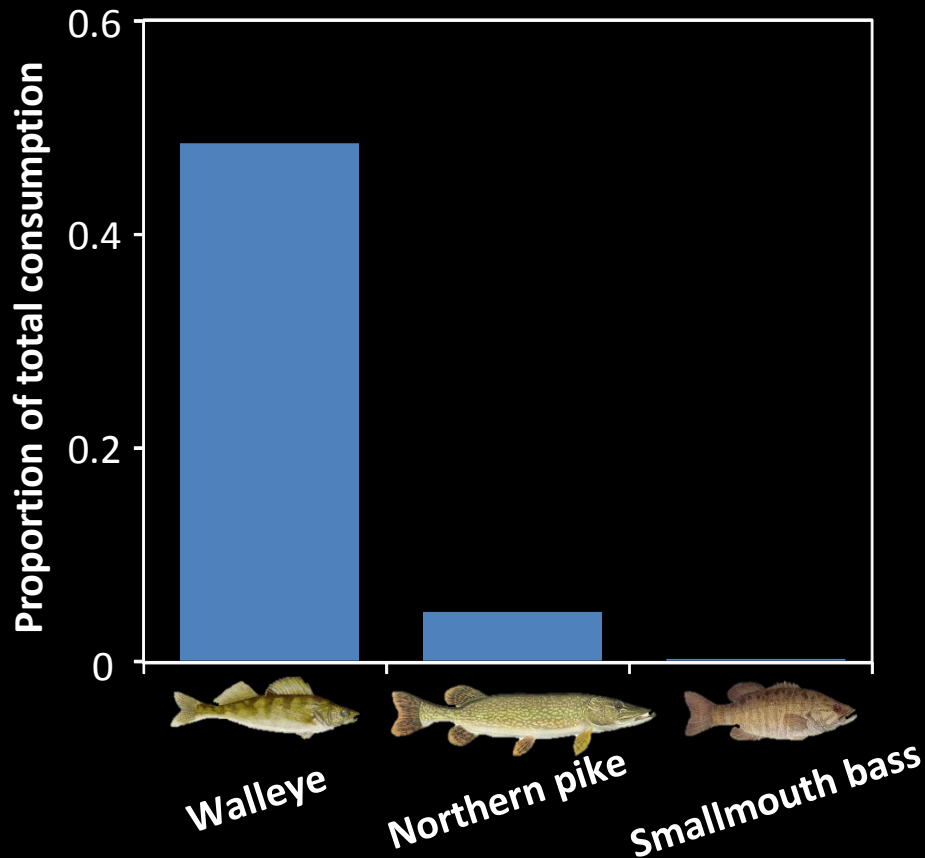
- **Between species:** walleye consume the most
- **Between years:** lower in 2013-2014 compared to 2006-2008

Objective 3: How many young walleye are consumed?

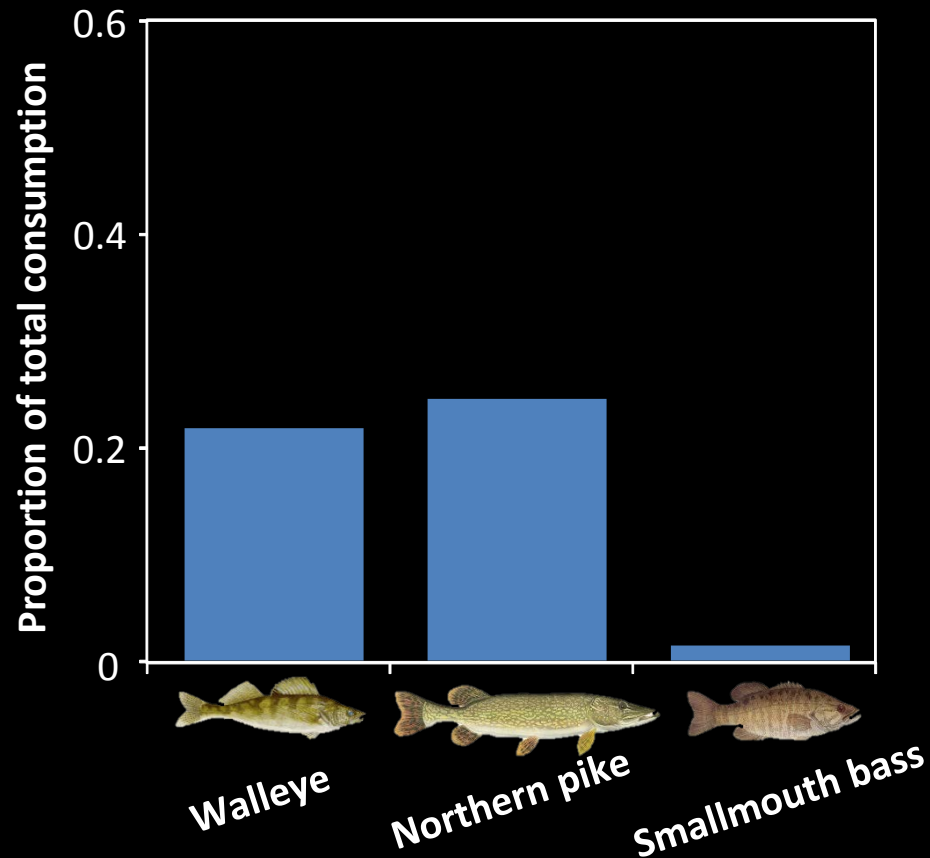
- **Between species**
- **Between years**

Objective 3: How many young walleye are consumed by each species?

2012-2013



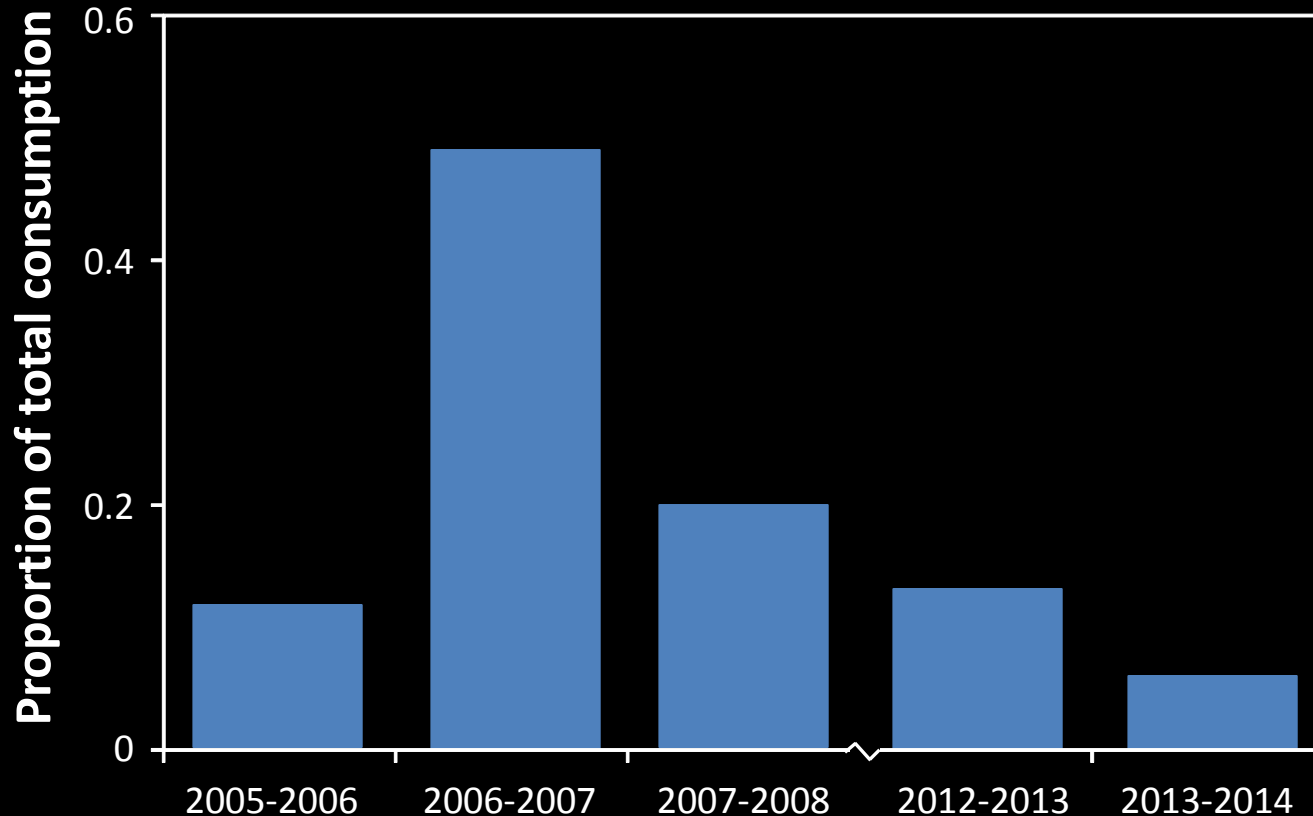
2013-2014



Objective 3: How many young walleye are consumed between years?



Walleye





Fish Diet/Bioenergetics Study

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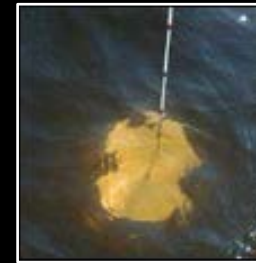
Objective 3: How many young walleye are consumed?

- **Between species:** walleye consume the most, followed by pike
- **Between years:** lower in 2013-2014 compared to 2006-2008

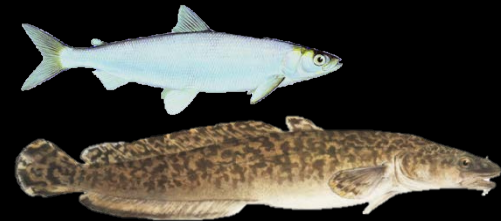
Conclusion

Survival of young walleye is reduced due to predator consumption, but there are likely other important factors

- Reduced productivity?



- Climate change?



- Invasive species?

Eurasian watermilfoil



Spiny waterflea



Zebra mussels



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Questions?