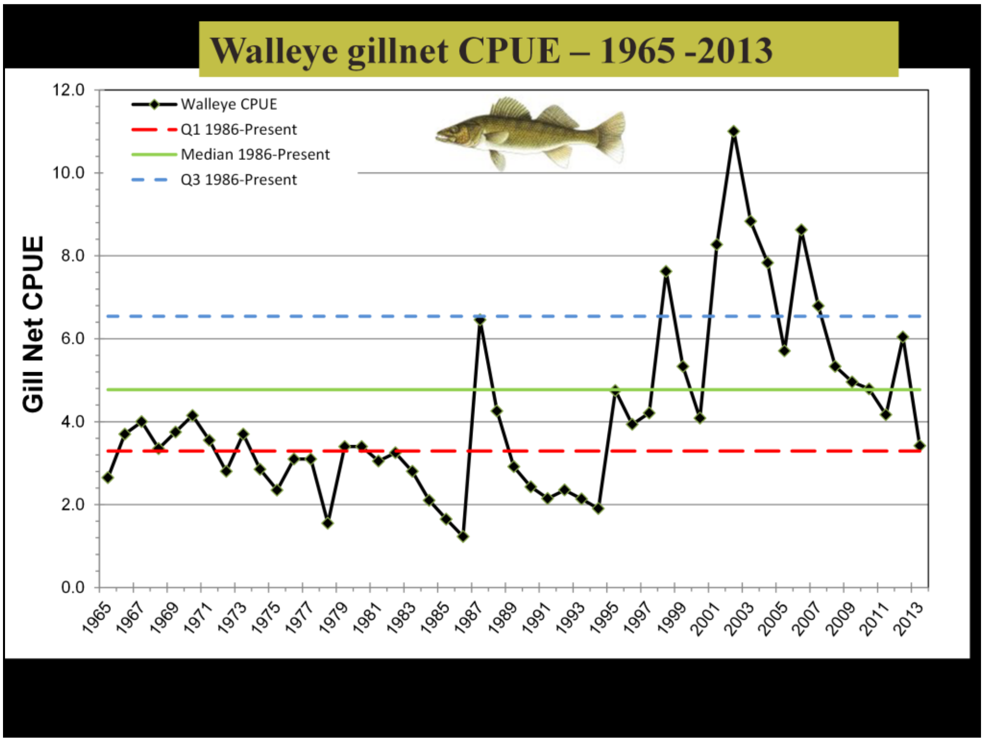
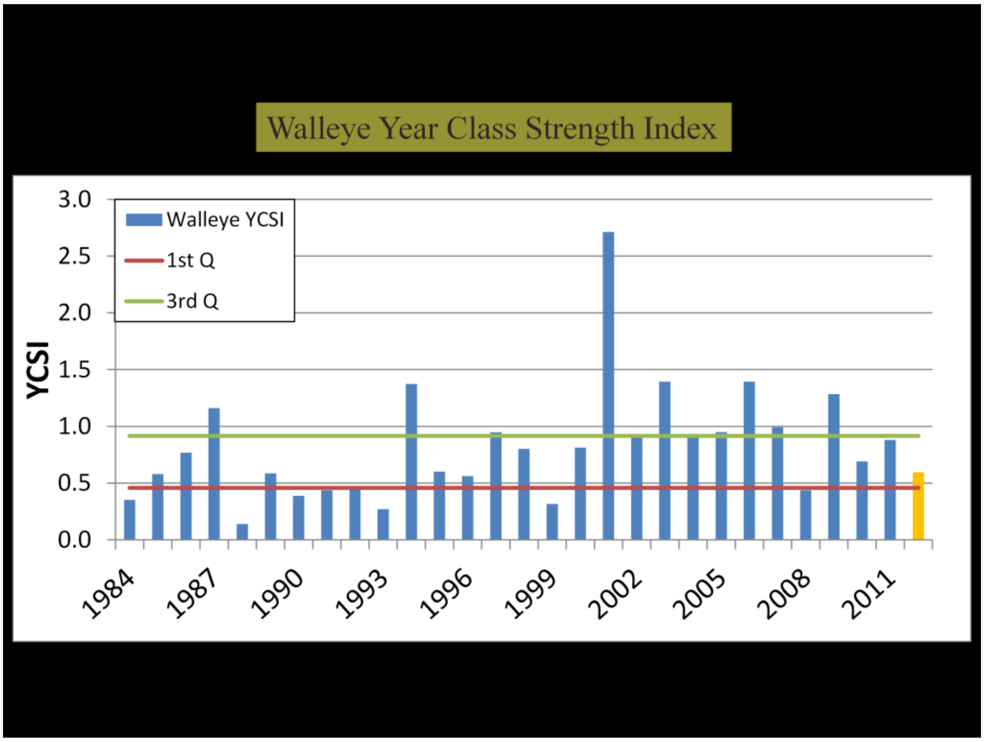

Lake Pepin / Pool 4
2013 Update
Minnesota
DEPARTMENT OF
NATURAL RESOURCES
Large Lake Specialist: Nick Schlesser
Courtesy of Bill Lindner Photography



Catch per Unit Effort (CPUE) represents the average number of fish captured per net. Annually as part of the large lake survey 24 gill nets are set for ~24 hour periods in the first week of October. These gillnets provide a cross section look at the adult populations of some of the most popular gamefish in our lakes (Walleye, Sauger, Yellow Perch, etc). It should be noted that some gamefish like Largemouth and Smallmouth Bass are poorly sampled using this type of gear. In 2013 our first set of gillnets which is set near the head of the lake was squeezed between shallow water and a shifting commercial channel. We believe this led to some poor net lifts (one had only 3 fish) that may not have been as representative of fish communities as we would have liked. These low catches contributed to a decline in CPUE for a number of species including Walleye and Sauger.

This figure shows a substantial drop in the CPUE for Walleye in 2013 from 2012 in two slides I will show you the size distribution from 2012 and then the distribution from 2013. You will notice in 2012 a strong surplus (over our median value) of 17” Walleye. These fish should have shown up in the 2013 nets as abundant 18-20” fish, but when you look at the length frequency distribution for 2013 the 18-20” fish are actually below the median. While you would expect harvest and natural mortality to bring down the abundance of a year class from year to year once it is fully recruited to the gill nets (hence the declining trend in the median curve on the right side of the figures), such a strong decline seems unlikely.

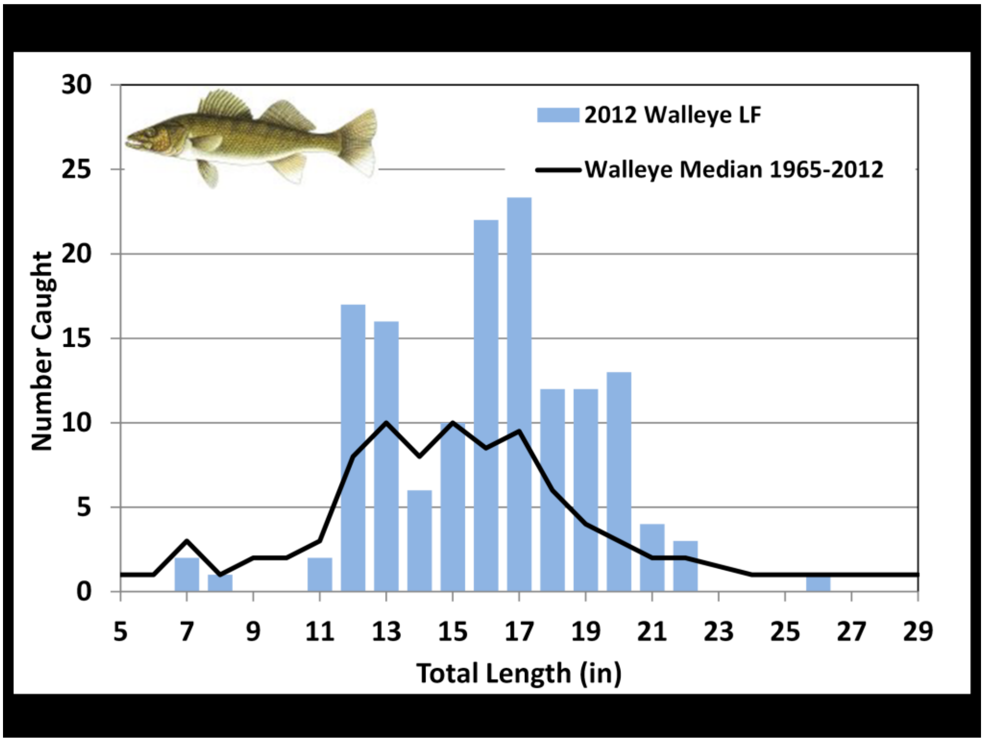
The take home message is that while every data point is important, I am cautiously optimistic that catches of a number of game fish species, Walleye and Sauger among them, may not have fully represented the fish in the system.



Year class strength Index (YCSI) is a normalized way of representing how important the contributions of a particular years hatch of a species is to the population in a body of water by looking at the contribution of the year class at ages 1 and 2 to the gill net catch. Note 2012 is looking like a average to weak year class, but only has one year of sampling so far and may be adjusted up or down depending on the catch of 2012 walleyes at age 2 in the fall of 2014.

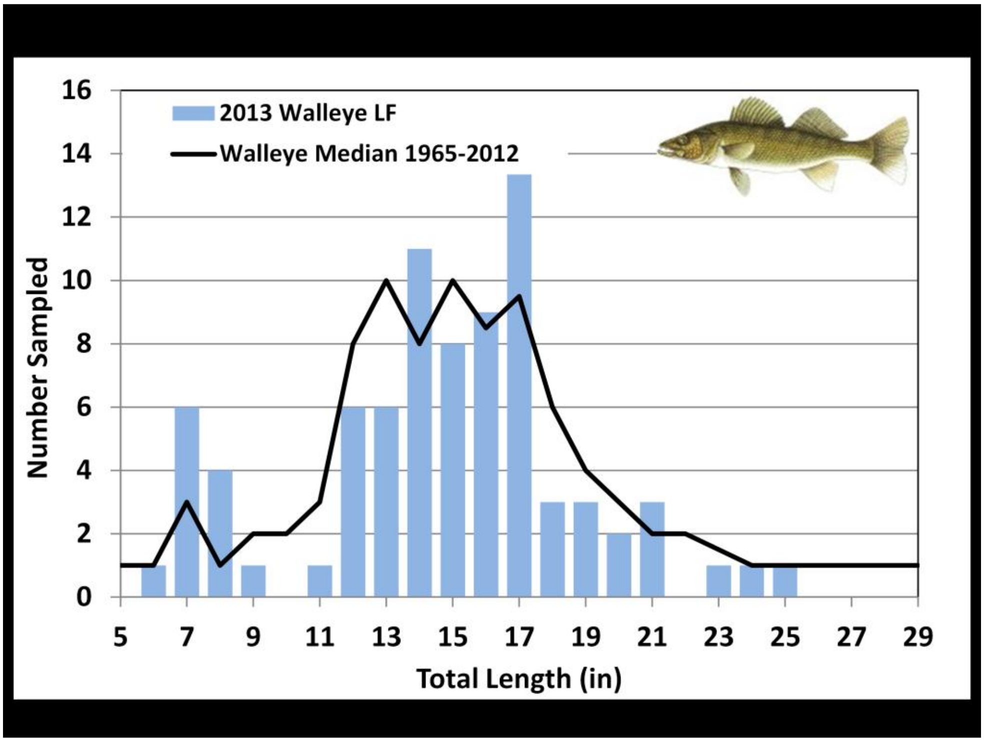
Actually I was surprised that the 2012 year class looks as good as it does in this figure. Last years sampling in the fall was very poor for young of year Walleye and Sauger (likely due to low water levels in the spring of 2012) and my initial thought was that it might rank down near where the 1999 year class is. Hopefully the low numbers of fish from 2012 were able to grow faster and survive better than anticipated. The 2013 year class of Walleye was sampled in high numbers in the seine and trawl, but seemed to fall off during our nighttime electrofishing in mid-November. This may have been a result of water temps near freezing and an effort by the fish to seek warmer (deeper) water. We will continue to monitor in 2014 and should have a good idea where the year class will stack up by next year.

In this case the incredibly strong 2001 Walleye year class is very obvious. Typically we consider a year class to be “strong” if it is above the green line and “weak” if it falls below the red line. As you can see the strong year class from 2009 is contributing to good numbers to the current fishery. See slides 4 and 5 for more information on the 2009 year class.



This slide represents the number of Walleyes from each 1 inch size group that was captured in the 2012 gillnets (blue bars) and the long term median for the same information from 1965-2012 represented by the black line.

As you can see the 2011 year class is represented here primarily by the 12-13 inch range and seems to be over performing the long term median as indicated in the YCSI slide. Also the 16-22" fish are present in higher than average numbers due primarily to the 2009 year class.



This slide represents the number of Walleyes from each 1 inch size group that was captured in the 2013 gillnets (blue bars) and the long term median for the same information from 1965-2012 represented by the black line.

As you can see the 2012 year class is represented here primarily by the poorly performing 11-13 inch range. Also the 16-22" fish are present in lower than average numbers (as I noted in slide 1).

Note the strong contribution of YOY Walleyes (6-9") to the gillnet catch compared to the 2012 data (previous slide).

Length Group	Sample size	Subsample size		Age 0	1	2	3	4	5	6	7	8	9	10
1.0 - 1.9	0	0												
2.0 - 2.9	0	0												
3.0 - 3.9	0	0												
4.0 - 4.9	0	0												
5.0 - 5.9	0	0												
6.0 - 6.9	1	0	*											
7.0 - 7.9	6	1		6										
8.0 - 8.9	4	2		4										
9.0 - 9.9	1	1			1									
10.0 - 10.9	0	0												
11.0 - 11.9	1	0	*											
12.0 - 12.9	6	6			6									
13.0 - 13.9	6	6			6									
14.0 - 14.9	11	11			8	3								
15.0 - 15.9	8	8				8								
16.0 - 16.9	9	9				7	1	1						
17.0 - 17.9	15	15				11	1	3						
18.0 - 18.9	3	3				1		2						
19.0 - 19.9	3	3					3							
20.0 - 20.9	2	2					1	1						
21.0 - 21.9	3	3					1	2						
22.0 - 22.9	0	0												
23.0 - 23.9	1	1							1					
24.0 - 24.9	1	1							1					
25.0 - 25.9	1	1												1
26.0 - 26.9	0	0												
27.0 - 27.9	0	0												
Totals	82	73		10	21	30	7	9	2	0	0	0	0	1
Percent				12.5	26.3	37.5	8.8	11.3	2.5	0.0	0.0	0.0	0.0	1.3
	Mean Length (in)			8.2	13.3	16.4	19.2	19.0	23.9					25.6
	Standard Deviation			0.39	1.24	1.09	1.54	1.92	0.72					
	Minimum Length (in)			7.8	9.2	14.6	16.7	16.7	23.4					25.6
	Maximum Length (in)			8.6	14.7	18.1	21.1	21.9	24.4					25.6

* Unable to age fish in this group.

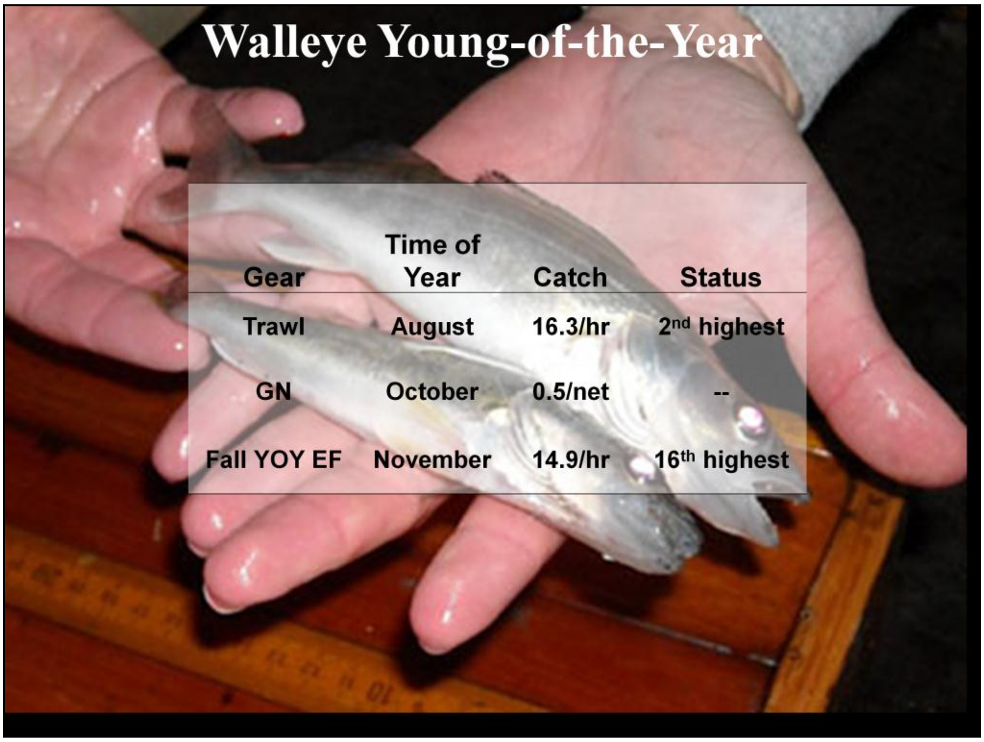
This is an Age-Length Frequency table that shows how many Walleye of each age group were captured in the gillnets in 2013 by one inch increments. For example there were 8 Age-1 Walleye (hatched in 2012) that were between 14.0 and 14.9 inches in length. There were also 3 Age-2 Walleye (hatched in 2011) that fell into that length category. The sample size column represents the total number of Walleye sampled from that length group in the gill nets in 2013. The subsample size column represents the number of fish for each size group that I aged by removing a bone called an otolith (ear stone) from inside the fish's head. This bone can then be cracked in half, toasted over a candle flame, and looked at under a microscope where the heat from the candle causes distinct light and dark annual rings to emerge much like those found on a cross section of a tree. When all of the fish in a size group are not aged the unaged fish are proportionally distributed across the represented ages indicated by those fish that were aged.

One important thing to note when looking at Age-Length Frequencies, particularly for Lake Pepin, is the speed at which the fish, Walleyes in this case, are growing. This growth is much faster than most other bodies of water in Minnesota when combined with what is also a relatively short lifespan (typically <10 years in Lake Pepin and potentially >20 in the northern lakes in MN) and represents some interesting management and regulation challenges.

Last year this presentation included the following text:

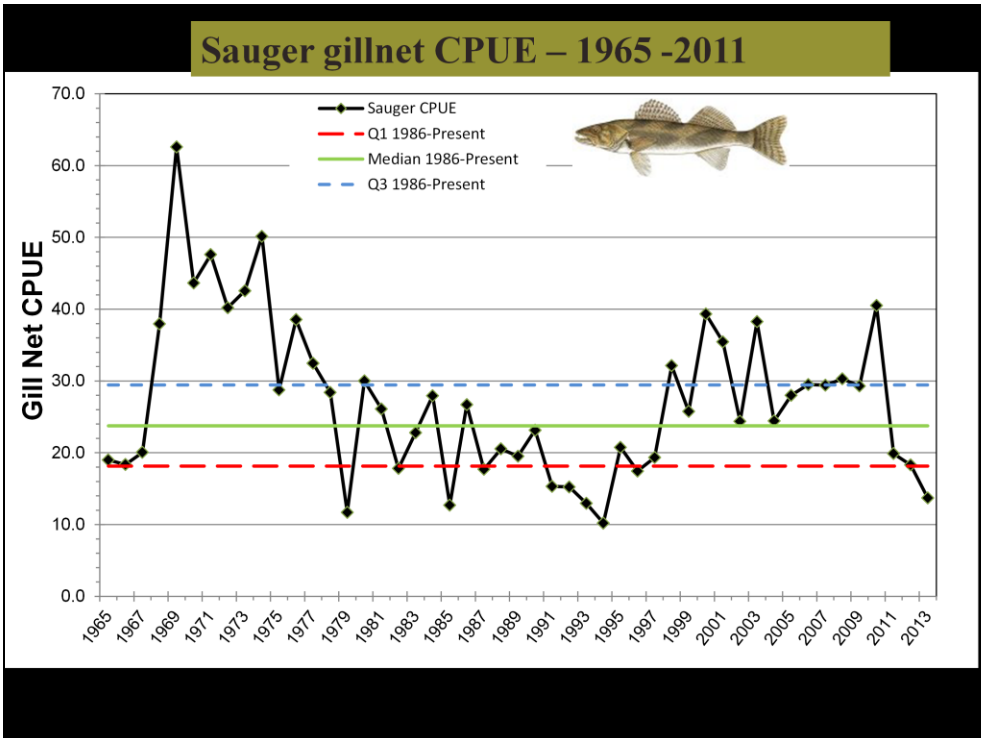
> "Also important to note on Walleye in particular the 2006 year class (Age-6) appeared strong in the YCSI figure, but only one individual was captured in the 2012 gill nets. This may be due to the potential for Walleye to outgrow our nets (get too big to be sampled effectively by our gear), it may be due to the fact that they have been in the harvestable size for four years and have likely experienced considerable angling pressure, or it may be due to natural mortality from old age or in the case of 2012 an extended period of time with water temperatures near or above 90 °F. Most likely it is some combination of the three factors that has affected that particular year class."

If you look for that same year class (2006) this year (now Age-7) you will see that no representatives were captured. This once again highlights all three explanations I put forward last year.



Our efforts to identify strong year classes of Walleye and Sauger in particular start in their first year of life when we monitor their numbers and growth from July (seining), through August (trawling) and October (gill netting), and into November (nighttime electrofishing). Our most accurate estimates of the years reproduction come during November when many hours of electrofishing are done on cold nights to capture and count young of year (YOY) Walleye and Sauger. The high water levels in the spring of 2013 seem to have contributed to relatively good reproduction for Walleye and Sauger this year, however as I mentioned earlier our November sampling was pushed back by strong winds to a point where water temperature may have been affecting where YOY Walleyes were located leading to lower catch rates.

Most anglers are familiar with fishing in shallow bays early in the spring where water warms more quickly due to the sun. A similar, but opposite effect occurs in the fall when on cold clear nights temperatures in these same shallow areas can drop rapidly particularly if stirred by wind or wave action. This rapid change in temperature is difficult for fish to handle and many evacuate these areas al least until consistent temperatures return under ice cover.

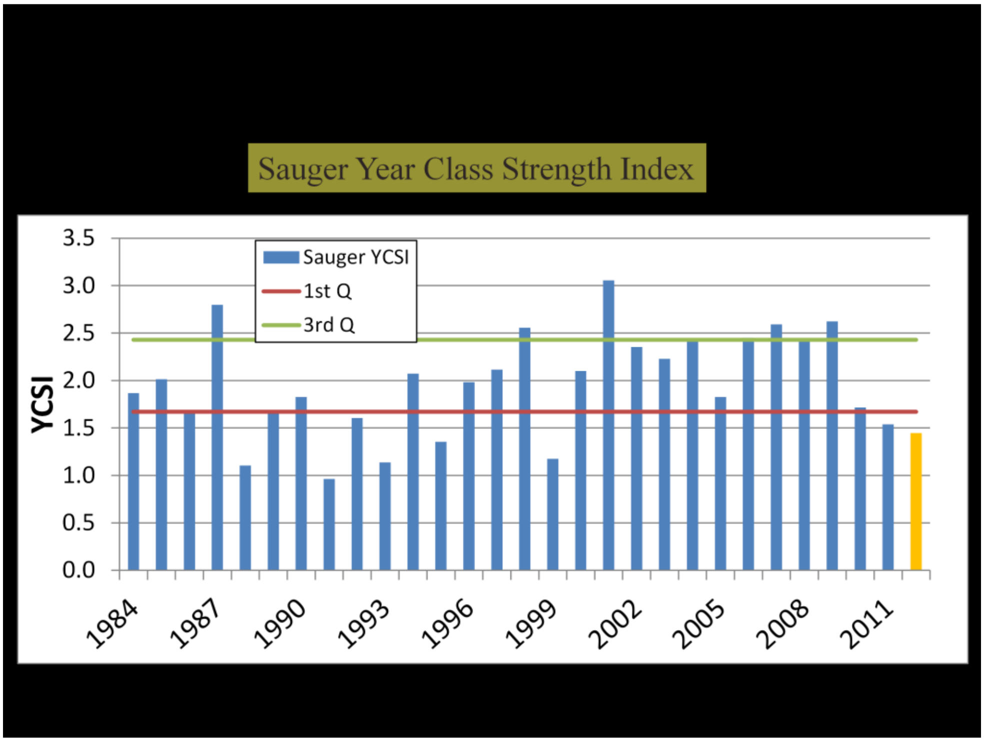


See Slide 2 for more complete description of this type of figure.

This figure shows that Lake Pepin's Sauger population is down from recent high levels driven by the incredibly strong 2001 year class and a series of strong year classes in the late 2000s.

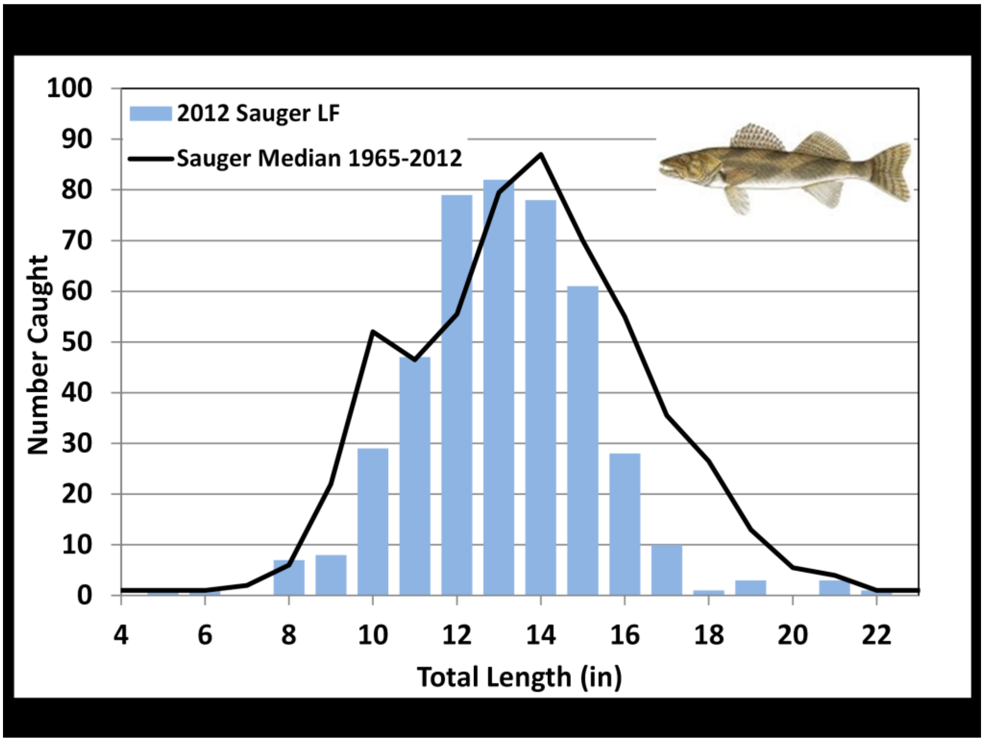
While the catch number has fallen to below the 1st quartile for the 1986-Present dataset it remains high compared to most other lakes in MN. The dramatic drop between 2010 and 2011 remains a bit of a mystery, but may be partially due to high water and open dams allowing fish populations to freely move around the river system. After the presentation I looked a bit more closely at this drop and confirmed an increase in Sauger numbers in the Xcel Energy – Prairie Island annual monitoring data set. Regardless, the relatively low YCSI for Sauger in 2010, 2011, and likely 2012 have not produced an abundance of surplus fish to rapidly increase net catch.

The decrease in 2013 came as a bit of a surprise to me. As I noted earlier in this presentation we had issues with some of our nets, but as I note in the previous paragraph recent poor year classes were not going to immediately rebound the net catches. I was expecting 2013 to be essentially flat with maybe a slight increase as more of the Age-1 fish recruited to the nets. The bright spot for Sauger in 2013 is the strong showing in all YOY sampling gears indicating that 2013 might produce a strong year class.



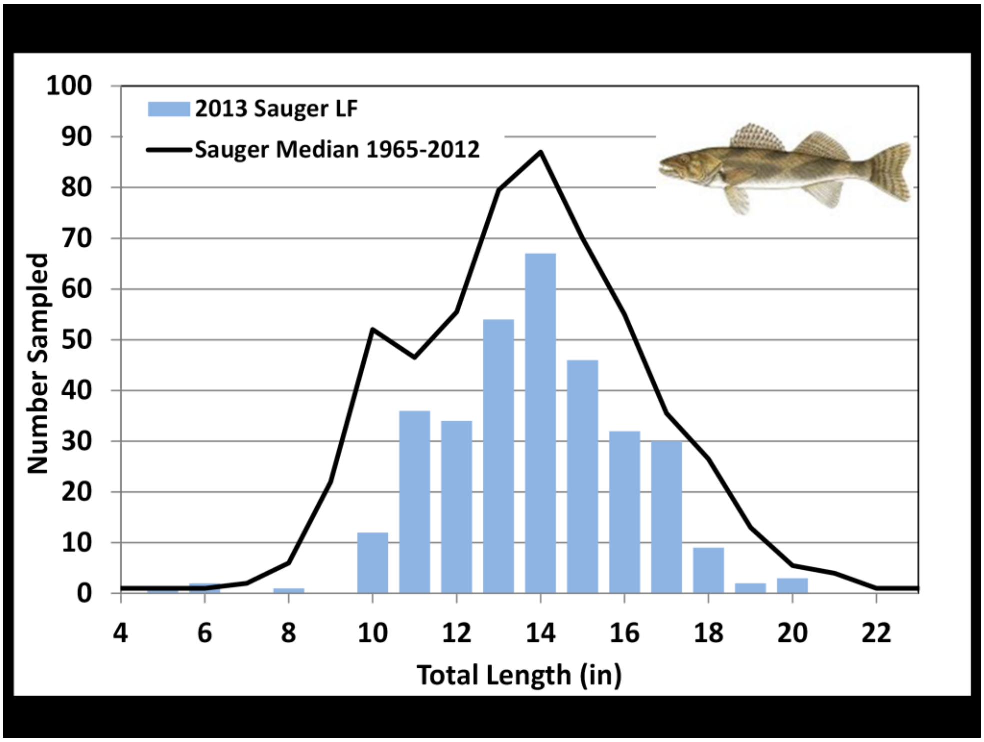
Lake Pepin Sauger had been incredibly consistent in their reproduction over the last decade or so, with no year class until potentially the 2011 year class being considered weak. While it is important to get another good year class before too long in a system where Sauger rarely live longer than 10 years one important thing to consider is the effect of long term high production on expectations and metrics. Continued strong production shifts both angler expectations and averages (net catch, YCSI, etc) higher such that what was once considered good might now be considered average.

That being said 3 relatively weak year classes in a row will likely prevent rapid increases in net catches for the next year or two. The bright spot for Sauger in 2013 was the apparent production of a good year class of YOY Sauger this past spring.



See Slide 4 for a more complete description of this figure.

The Sauger catch in 2012 was below average at both the small and large ends of the size range, including the conspicuous absence of fish in the 17-20 inch range.



See Slide 4 for a more complete description of this figure.

The Sauger catch in 2013 was well below average across the entire size range (See also explanation from Walleye slides about 2013 net

Length Group	Sample size	Subsample size	Age 0	1	2	3	4	5	6	7	8	9	10
1.0 - 1.9	0	0											
2.0 - 2.9	0	0											
3.0 - 3.9	0	0											
4.0 - 4.9	0	0											
5.0 - 5.9	1	0	*										
6.0 - 6.9	2	2	2										
7.0 - 7.9	0	0											
8.0 - 8.9	1	1				1							
9.0 - 9.9	0	0											
10.0 - 10.9	12	11		11	1								
11.0 - 11.9	36	27		33	3								
12.0 - 12.9	34	26		16	17	1							
13.0 - 13.9	54	26			48	6							
14.0 - 14.9	67	39			40	21	5	2					
15.0 - 15.9	46	27			12	14	17	3					
16.0 - 16.9	32	23				15	13	4					
17.0 - 17.9	30	25				8	19	1	1				
18.0 - 18.9	9	9					5	1	3				
19.0 - 19.9	2	2						2					
20.0 - 20.9	3	3							2		1		
21.0 - 21.9	0	0											
22.0 - 22.9	0	0											
23.0 - 23.9	0	0											
24.0 - 24.9	0	0											
25.0 - 25.9	0	0											
26.0 - 26.9	0	0											
27.0 - 27.9	0	0											
Totals	329	221	2	60	120	66	59	13	6	0	1	0	0
Percent			0.6	18.3	36.6	20.3	18.0	4.1	1.9	0.0	0.3	0.0	0.0
Mean Length (in)			6.2	11.5	13.7	15.4	16.7	17.0	18.9		20.2		
Standard Deviation			0.25	0.60	1.04	1.58	1.23	1.58	1.29				
Minimum Length (in)			6.1	10.2	10.5	8.9	14.2	14.6	17.4		20.2		
Maximum Length (in)			6.4	12.6	15.7	17.5	18.8	19.4	20.8		20.2		

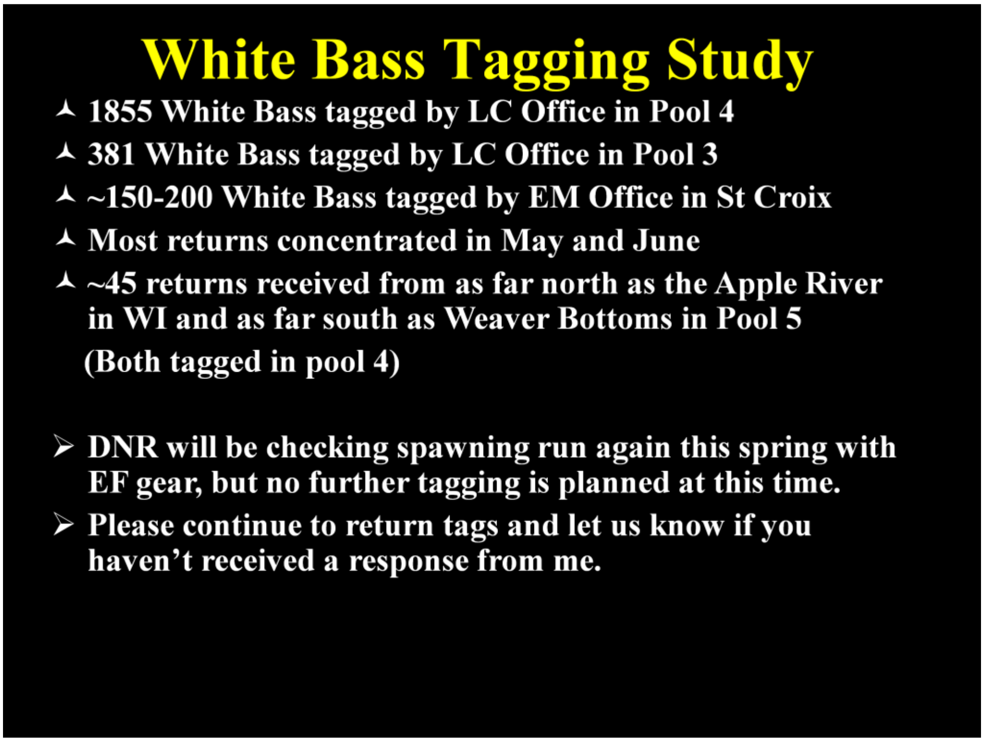
* Unable to age fish in this group.

See Slide 5 for a more complete explanation of this figure.

Of note is the relatively low numbers of fish from the 2006 (Age-7), 2007 (Age-6), and 2008 (Age-5) year classes. All of these year classes were considered ”strong”, but have disappeared from the gill net catch earlier and at a faster rate than expected.

See Explanation from Slide 7

The YOY Sauger population was sampled well in both the trawl and fall electrofishing. Hopefully, good winter survival into 2014 will lead to the 2013 year class becoming well established as a strong year class.

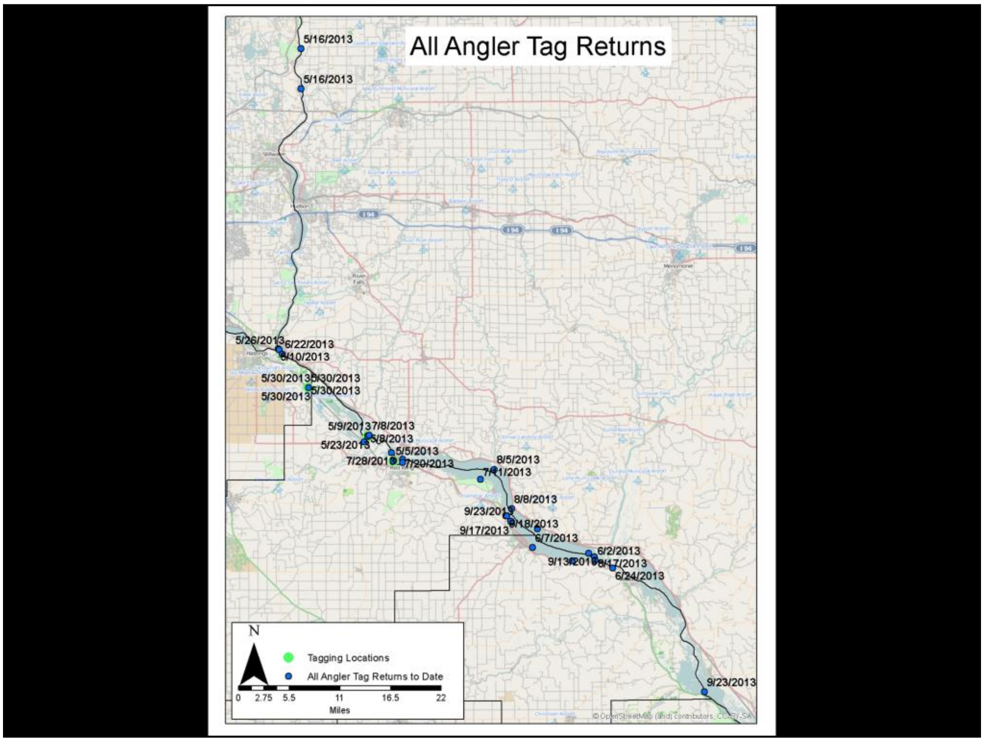


In 2013, the Lake City and East Metro DNR Fisheries Offices began a tagging project designed to gather some preliminary data about White Bass populations in the Pools 3 & 4 of the Mississippi River and in the St. Croix River. It was hoped that we could determine a number of things from this initial tagging effort.

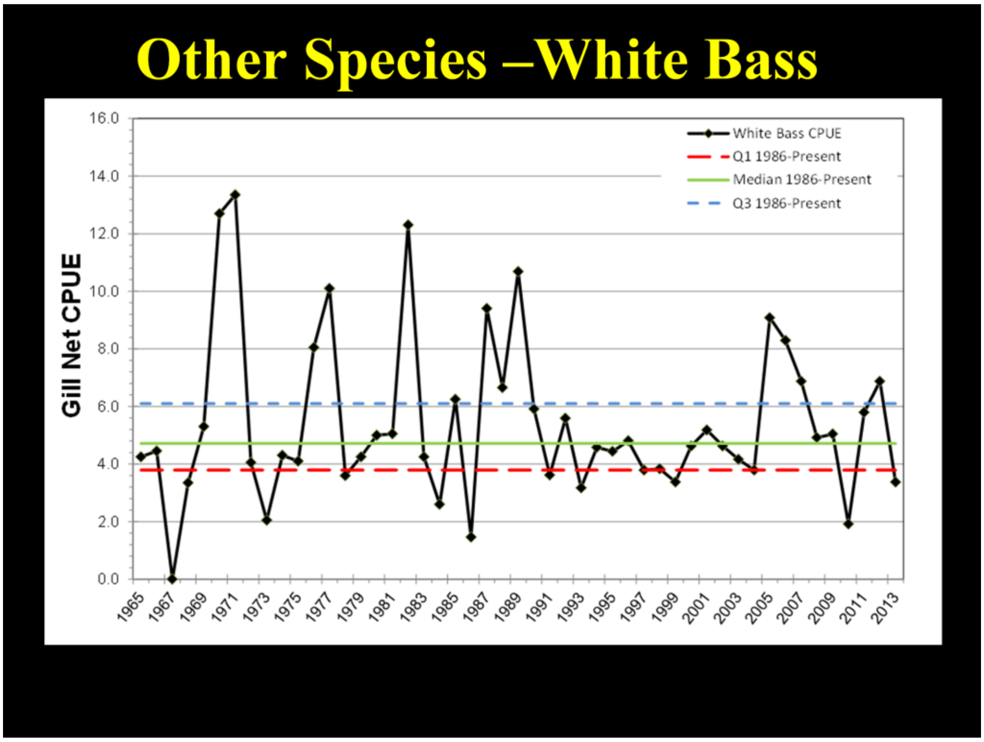
1) Viability of a tagging project from an effort perspective.
    - Could we capture and tag enough fish to achieve our goals?
    - How much effort was required with what gear type?
2) Dispersal of what has been monitored as a Pool 4 or in the case of East Metro a St Croix Fishery.
    - Were fish moving between Pools or River systems?
    - If so how often and how far?
    - This will let us know how big a potential population survey would have to be on a number of fish tagged and a number of pools sampled basis.
3) A real world trial of tag loss in White Bass.
    - Every tagging method has some amount of tags that fall out for one reason or another.
    - We tagged ~5% of the White Bass in this study with 2 tags so that

if DNR personnel or an angler encountered a fish with only 1 tag that had been given 2 we could calculate a rate of tag loss for the whole study.

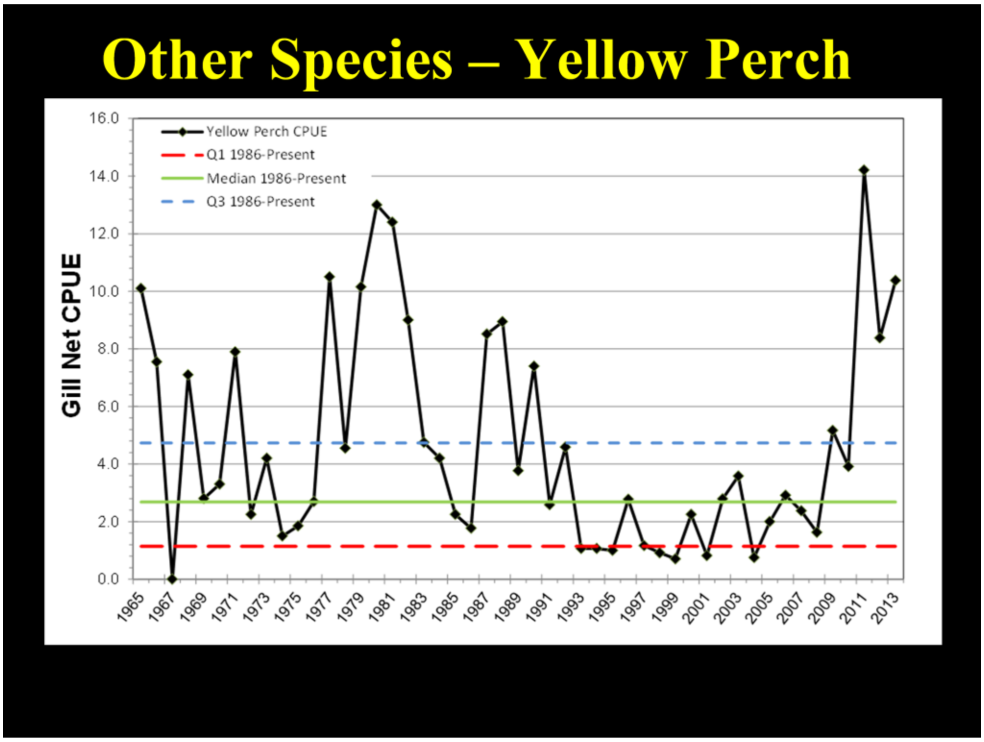
- It is important if you are reporting a tagged fish as an angler that you note and report if the fish has a second tag and any numbers that are present on the second tag.
- Tagged fish can be reported here: http://www.dnr.state.mn.us/fisheries/tagged_fish_reporting/index.html



Map showing all White Bass tag returns to date. Note: Some returns came from similar or identical locations so the number of markers may not match reported tag returns.



White Bass have always fluctuated in our gill net catches quite a bit. Some of this is due to the vulnerability of YOY White Bass to the smaller meshes of our gill nets (~50% of the White Bass catch in 2012 was YOY fish). As pelagic fish that often roam open water and are not always cover related it seems that annual variations in water temperatures, levels, etc likely change White Bass locations enough to either bring them in contact with or away from our net locations.

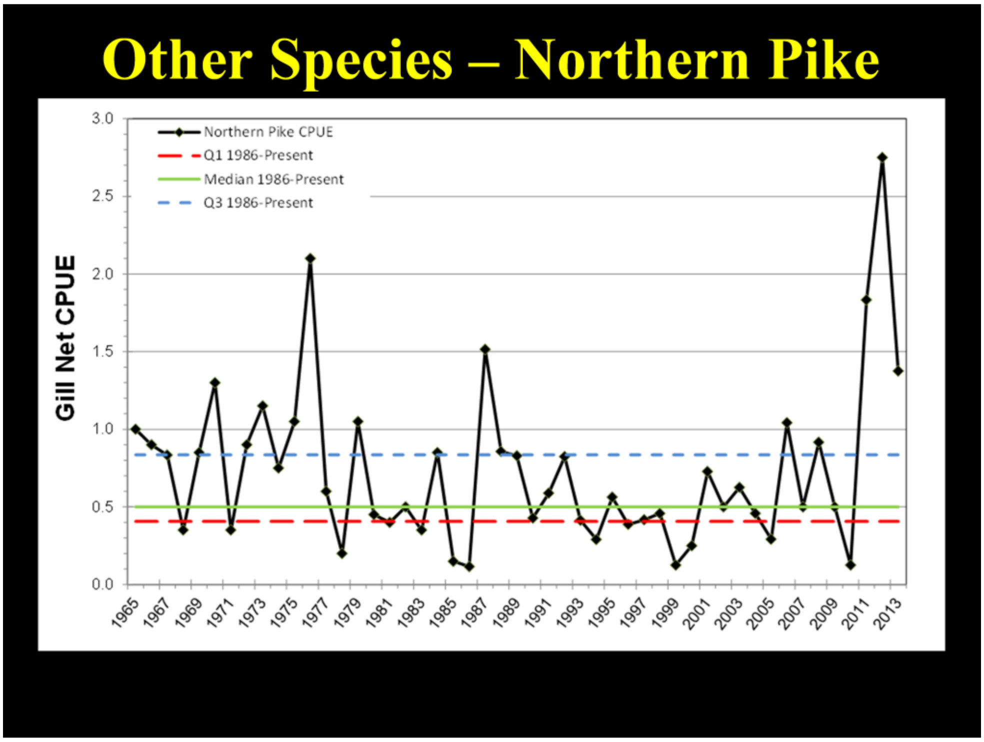


Continued excellent opportunities exist for individuals interested in targeting Yellow Perch on Pool 4.

Interestingly the number of Yellow Perch >10” in length per net was the same in 2011 and 2013.

Similar good opportunities for Black Crappie and Bluegill exist in Pool 4.

Better water clarity and more abundant submerged vegetation in the past few years have contributed to excellent year classes for these panfish species. Black Crappies in particular have benefitted with 2 near record setting year classes in the past two years, while the 2011 year class of Bluegill remains by far the biggest we have ever documented in our early sampling and should be reaching 7-8 inches in the next year or two.



Northern Pike have also experienced a recent boom on Pool 4 likely due to increased vegetation for spawning. Though populations appear to have declined in 2013 we are still well above the 3rd Quartile for CPUE and excellent opportunities remain for these toothy predators.

2013 Seining Results

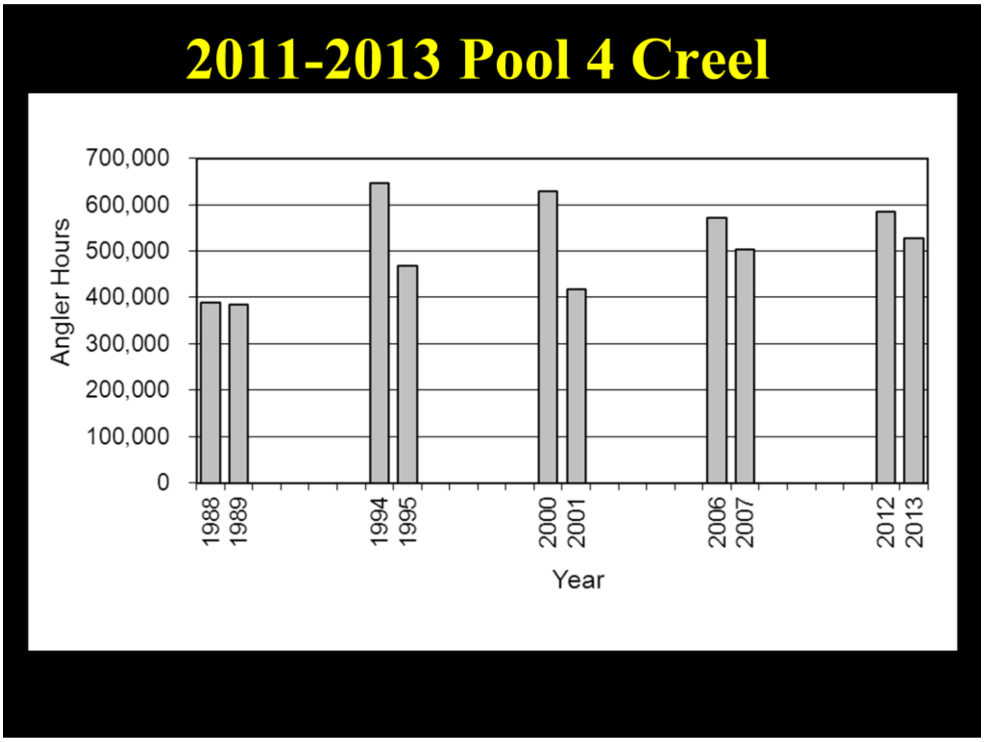
Year		2009	2010	2011	2012	2013	1986-2012
# Hauls		220	209	28	38	45	4,315
black crappie	N	0	190	5	608	1,291	6,118
	Mean	0.00	0.91	0.18	16.00	28.69	1.42
bluegill	N	242	1699	399	712	2144	11308
	Mean	1.10	8.13	14.25	18.74	47.64	2.62
channel catfish	N	0	1	0	1	0	17
	Mean	0.00	0.00	0.00	0.03	0.00	0.00
common carp	N	25	2	0	0	0	1,926
	Mean	0.11	0.01	0.00	0.00	0.00	0.45
emerald shiner	N	0	0	176	0	0	176
	Mean	0.00	0.00	6.29	0.00	0.00	0.04
freshwater drum	N	68	7	0	26	50	2,875
	Mean	0.31	0.03	0.00	0.68	1.11	0.67
gizzard shad	N	19,556	17,216	4,682	8,791	46,145	651,193
	Mean	88.89	82.37	167.21	231.34	1025.44	150.91
green sunfish	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Mean	0.00	0.04	0.00	0.00	0.00	0.01
largemouth bass	N	169	165	7	70	244	2,615
	Mean	0.77	0.79	0.25	1.84	5.42	0.61
logperch	N	0	0	0	0	2	6
	Mean	0.00	0.00	0.00	0.00	0.04	0.00
longnose gar	N	6	16	0	3	14	129
	Mean	0.03	0.08	0.00	0.08	0.31	0.03
northern pike	N	4	19	0	0	11	578
	Mean	0.02	0.09	0.00	0.00	0.24	0.13
orangespotted sunfish	N	0	1	0	0	0	1
	Mean	0.00	0.00	0.00	0.00	0.00	0.00
quillback	N	0	81	11	0	3	93
	Mean	0.00	0.39	0.39	0.00	0.07	0.02
redhorse	N	69	0	0	0	0	603
	Mean	0.31	0.00	0.00	0.00	0.00	0.14
river carpsucker	N	0	0	0	2	0	2
	Mean	0.00	0.00	0.00	0.05	0.00	0.00
rock bass	N	2	4	0	0	0	66
	Mean	0.01	0.02	0.00	0.00	0.00	0.02
sauger	N	188	1	0	1	22	1,864
	Mean	0.85	0.00	0.00	0.03	0.49	0.43
shorthead redhorse	N	0	3	0	0	1	7
	Mean	0.00	0.01	0.00	0.00	0.02	0.00
shortnose gar	N	0	2	0	0	0	3
	Mean	0.00	0.01	0.00	0.00	0.00	0.00
smallmouth bass	N	35	83	8	22	59	678
	Mean	0.16	0.40	0.29	0.58	1.31	0.16
smallmouth buffalo	N	1	0	0	3	0	1,283
	Mean	0.00	0.00	0.00	0.08	0.00	0.30
tadpole madtom	N	0	0	0	1	0	1
	Mean	0.00	0.00	0.00	0.03	0.00	0.00
walleye	N	313	1	0	6	13	1,632
	Mean	1.42	0.00	0.00	0.16	0.29	0.38
white bass	N	860	110	17	110	39	72,744
	Mean	3.91	0.53	0.61	2.89	0.87	16.86
white crappie	N	0	3	1	1	0	308
	Mean	0.00	0.01	0.04	0.03	0.00	0.07
yellow perch	N	472	111	3	63	109	5,567
	Mean	2.15	0.53	0.11	1.66	2.42	1.29

The important thing to note about this slide is the abundance of Gizzard Shad sampled in 2013 in the seine. With an average of over 1000 per net haul there was enough food in the system to potentially reduce angler success rates. Particularly when combined with potentially lower fish populations.

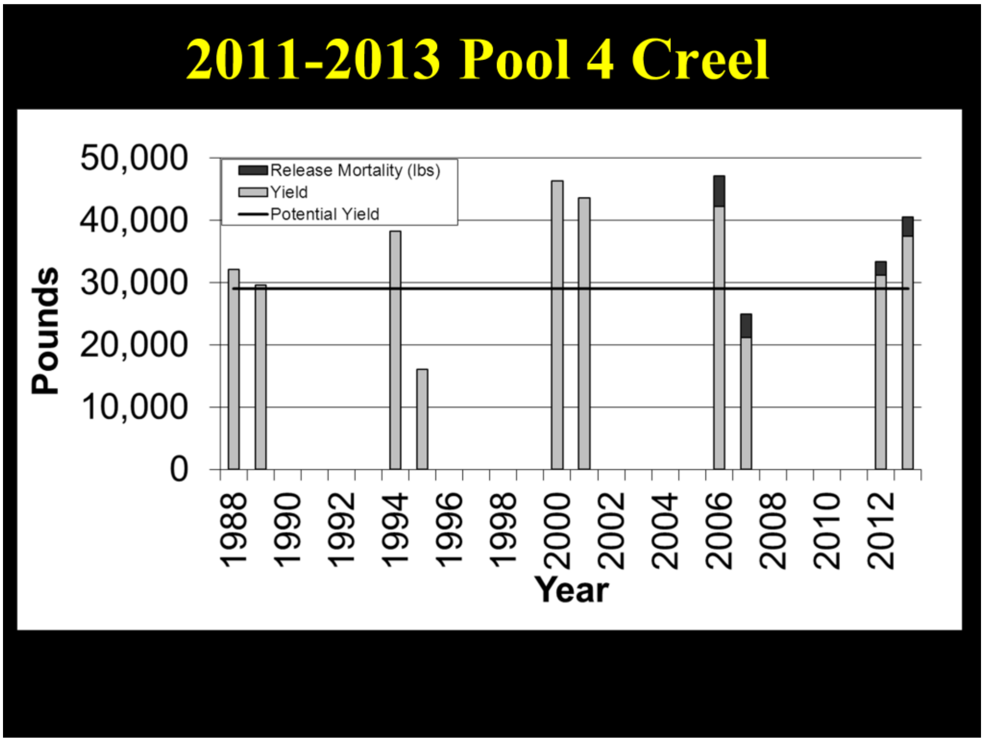
2011-2013 Pool 4 Creel

- 24 month creel completed Oct 31, 2013
- Report will be out early this summer.
- Quick run through of preliminary results:
  - Pressure similar to last 2 creel cycles
  - Walleye and Sauger catch and catch rates lower than past surveys.
  - Average trip length ~20% higher than previous creel cycles

A quick overview of some of the findings from our 2011-2013 open water creel on Pool 4.



Number of angler hours estimated for each year in the past five open water creel cycles on Pool 4. Note each year included the November and December from the prior year due to scheduling with ice creels.



This figure represents harvest (lbs) and estimated hooking mortality (lbs) for Walleye in Pool 4.

Note that we only started including estimates of hooking mortality in 2006.

Also, the hooking mortality estimate for 2012 is relatively small. This is primarily due to very poor fishing during the extremely hot late summer period when we experienced ~2 weeks of 90+ degree water temps. At those temperatures if the fishing had been good hooking mortality would have added up very rapidly due to increased stress on Walleye in water that warm.

Harvest (N)

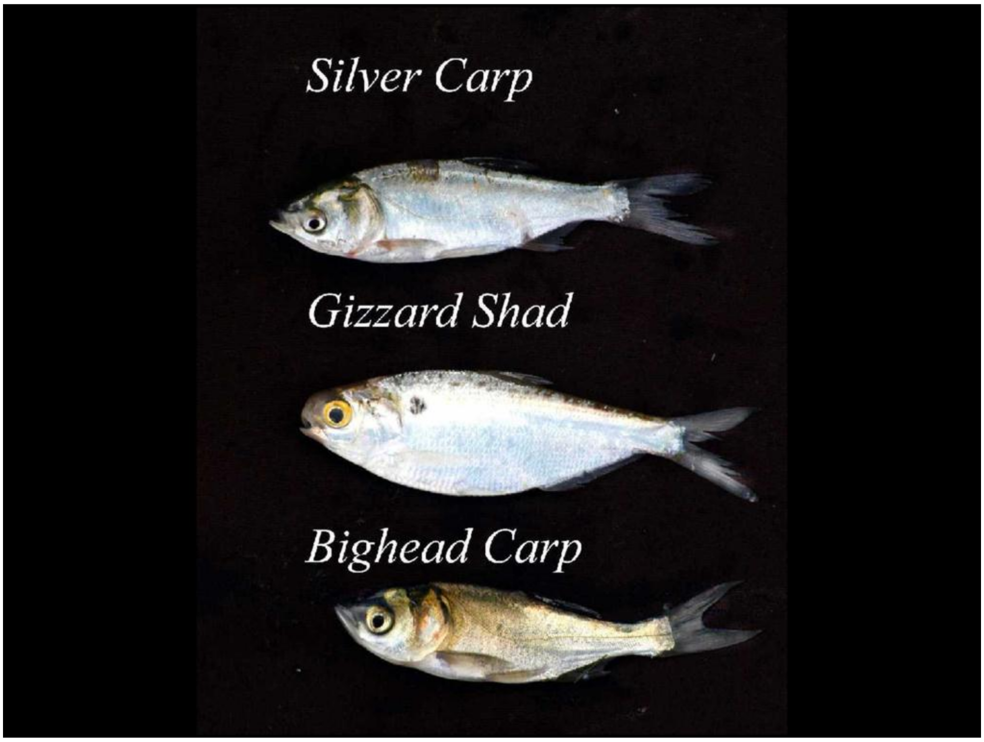
Species	Harvest (N)	%
Walleye	17,811	9.7%
Sauger	54,833	29.8%
Yellow Perch	8,157	4.4%
White Bass	31,194	17.0%
Bluegill	36,531	19.9%
Smallmouth Bass	832	0.5%
Largemouth Bass	2,583	1.4%
Black Crappie	26,087	14.2%
White Crappie	29	0.02%
Northern Pike	1,445	0.8%
Channel Catfish	2,177	1.2%
Flathead Catfish	100	0.05%
Freshwater Drum	1,163	0.6%
Bigmouth Buffalo	112	0.06%
Black Bullhead	41	0.02%
Bowfin	95	0.05%
Common Carp	24	0.01%
Mooneye	645	0.4%
Pumpkinseed	19	0.01%
Smallmouth Buffalo	79	0.04%
Total	183,957	

Species	Harvest (N)	%
Walleye	20,301	15.2%
Sauger	37,826	28.3%
Yellow Perch	11,940	8.9%
White Bass	13,153	9.9%
Bluegill	30,622	22.9%
Smallmouth Bass	569	0.4%
Largemouth Bass	799	0.6%
Black Crappie	9,316	7.0%
Northern Pike	2,644	2.0%
Channel Catfish	3,113	2.3%
Flathead Catfish	13	0.01%
Freshwater Drum	2,332	1.7%
Lake Sturgeon	192	0.1%
Bowfin	66	0.05%
Common Carp	67	0.05%
Gizzard Shad	7	0.01%
Mooneye	270	0.2%
Pumpkinseed	118	0.09%
Rock Bass	19	0.01%
Smallmouth Buffalo	67	0.05%
Total	133,434	

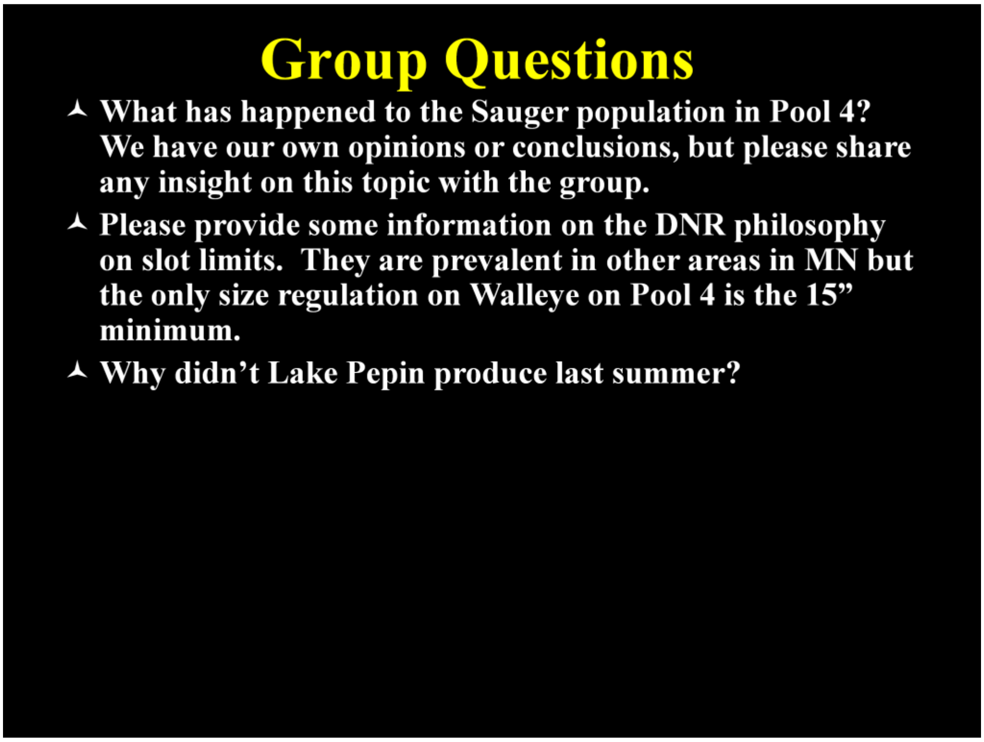
These are preliminary open water harvest estimates from the 2011-2012 (left) and 2012-2013 (right) open water creels on Pool 4.

Asian Carp

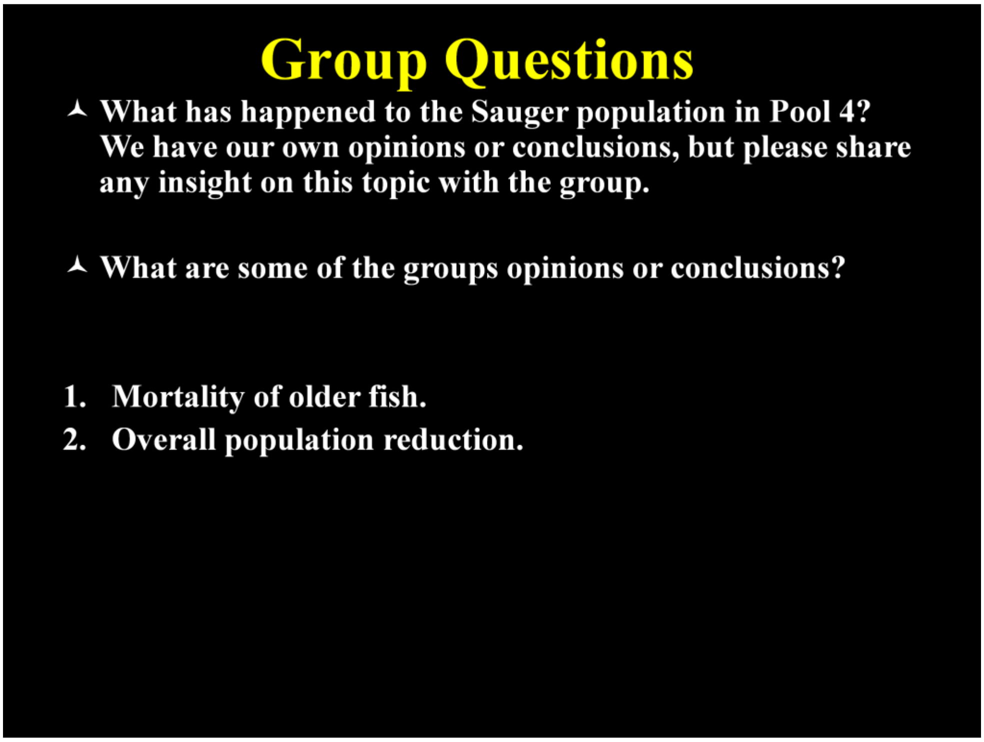
- Bighead and Silver carp monitoring will continue
- No reproduction has been identified in our area at this time



The similarities of YOY Asian Carp and Gizzard Shad means extra diligence is necessary when doing our young of the year monitoring on Pepin to watch for these invaders. As of the end of 2013 we have not identified any reproduction of the invasive carp species in Minnesota waters of the Mississippi River.



When the Walleye Searchers approached us about presenting for their group we asked if there were specific questions that they wanted addressed so we could do our best to pass on meaningful information. These were the three questions we felt were within our purview to answer though we also addressed a question about inexpensive licenses for kids under 18 (http://www.dnr.state.mn.us/licenses/fishing/index.html?type=fishing   See Youth License), and offered to help identify someone who could present on the sediment issues and the filling in at the head of Lake Pepin.



We asked to get some of the opinions of the group about reductions in the Sauger population. Harvest of small fish and poor spawning were raised as potential concerns.

I then laid out my interpretation of the decline based on the data we have available, which will play out over the next several slides.

The first two factors I pointed out were mortality of older fish and an overall reduction in the population. The following slides are age length frequencies from 2010 our most recent Sauger peak and 2013 our most recent Sauger low net catch. The red circles indicate that there has been a real drop in older fish in the population as some of the large year classes from the early 2000s have started to die off. Remember Sauger in Pool 4 rarely live beyond age 10 and the females typically begin to disappear around Age-8 or Age-9. The Blue ovals show the overall net catch for that year and has been greatly reduced likely due in part to poor year classes which I will touch on in a few slides.

2010 Sauger Age Length Frequency

Length Group	Sample size	Subsample size	Age 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.0 - 1.9	0	0															
2.0 - 2.9	0	0															
3.0 - 3.9	0	0															
4.0 - 4.9	0	0															
5.0 - 5.9	0	0															
6.0 - 6.9	0	0															
7.0 - 7.9	4	4		4													
8.0 - 8.9	38	16		38													
9.0 - 9.9	75	19		75													
10.0 - 10.9	159	29		154	5												
11.0 - 11.9	125	25		125													
12.0 - 12.9	44	16		25	19												
13.0 - 13.9	64	18			43	21											
14.0 - 14.9	138	33			125	13											
15.0 - 15.9	148	34			96	52											
16.0 - 16.9	62	17			26	33	4										
17.0 - 17.9	44	18			5	24	10	2			2						
18.0 - 18.9	27	17			3	8	6	5	2	3							
19.0 - 19.9	11	11					3		2	3			2				1
20.0 - 20.9	14	14					6	2	2	1	1	1	1				
21.0 - 21.9	12	12					1		5	5	1						
22.0 - 22.9	7	7							1	1	2	1	2				
23.0 - 23.9	0	0															
24.0 - 24.9	0	0															
Totals	972	290	0	420	322	151	30	9	12	13	6	2	5	0	0	0	1
Percent			0.0	43.2	33.1	15.6	3.1	0.9	1.2	1.4	0.7	0.2	0.5	0.0	0.0	0.0	0.1
Mean Length (in)				10.3	14.7	16.1	19.0	19.2	20.7	20.4	20.9	21.3	20.7				19.8
Standard Deviation				1.24	1.29	1.58	1.39	1.30	1.25	1.35	1.84	1.22	1.39				
Minimum Length (in)				7.9	10.7	13.1	16.9	18.0	18.7	18.1	17.8	20.4	19.1				19.8
Maximum Length (in)				12.6	18.1	18.9	21.5	20.9	22.8	22.0	22.2	22.1	22.2				19.8

* Unable to age fish in this group.

2013 Sauger Age Length Frequency

Length Group	Sample size	Subsample size	Age 0	1	2	3	4	5	6	7	8	9	10
1.0 - 1.9	0	0											
2.0 - 2.9	0	0											
3.0 - 3.9	0	0											
4.0 - 4.9	0	0											
5.0 - 5.9	1	0	*										
6.0 - 6.9	2	2	2										
7.0 - 7.9	0	0											
8.0 - 8.9	1	1				1							
9.0 - 9.9	0	0											
10.0 - 10.9	12	11		11	1								
11.0 - 11.9	36	27		33	3								
12.0 - 12.9	34	26		16	17	1							
13.0 - 13.9	54	26			48	6							
14.0 - 14.9	67	39			40	21	5	2					
15.0 - 15.9	46	27			12	14	17	3					
16.0 - 16.9	32	23				15	13	4					
17.0 - 17.9	30	25				8	19	1	1				
18.0 - 18.9	9	9					5	1	3				
19.0 - 19.9	2	2						2					
20.0 - 20.9	3	3							2		1		
21.0 - 21.9	0	0											
22.0 - 22.9	0	0											
23.0 - 23.9	0	0											
24.0 - 24.9	0	0											
25.0 - 25.9	0	0											
26.0 - 26.9	0	0											
27.0 - 27.9	0	0											
Totals	329	221	2	60	120	66	59	13	6	0	1	0	0
Percent			0.6	18.3	36.6	20.3	18.0	4.1	1.9	0.0	0.3	0.0	0.0
Mean Length (in)			6.2	11.5	13.7	15.4	16.7	17.0	18.9		20.2		
Standard Deviation			0.25	0.60	1.04	1.58	1.23	1.58	1.29				
Minimum Length (in)			6.1	10.2	10.5	8.9	14.2	14.6	17.4		20.2		
Maximum Length (in)			6.4	12.6	15.7	17.5	18.8	19.4	20.8		20.2		

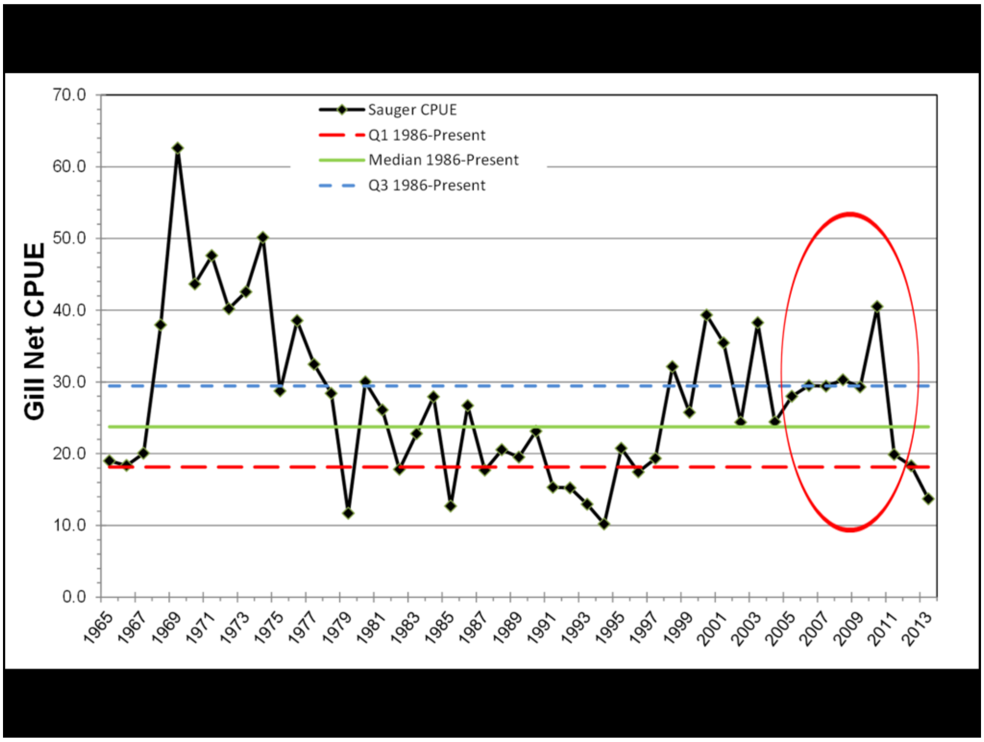
* Unable to age fish in this group.

Group Questions

- What has happened to the Sauger population in Pool 4? We have our own opinions or conclusions, but please share any insight on this topic with the group.

- What are some of the groups opinions or conclusions?

1. Mortality of older fish.
2. Overall population reduction.
3. Drastic drop in 2011.



This drastic drop in net catch of Sauger between 2010 and 2011 still remains a mystery. Though clearly natural mortality (particularly amongst relatively abundant older year classes) and angling were both acting on this population such a severe decline due to those factors alone seems unlikely. Another factor that may have played a role in the decline was an extended period of high water and "Open" river conditions. The Lock and Dam at Red Wing, MN (LD 3) was only closed for ~8 days in the summer of 2011, and similar open situations existed elsewhere in the river allowing many fish to easily bypass these barriers. We do not have annual sampling however in Pool 3 or Pool 5 to determine if our drop in Sauger population was accompanied by a corresponding increase in an adjacent population.

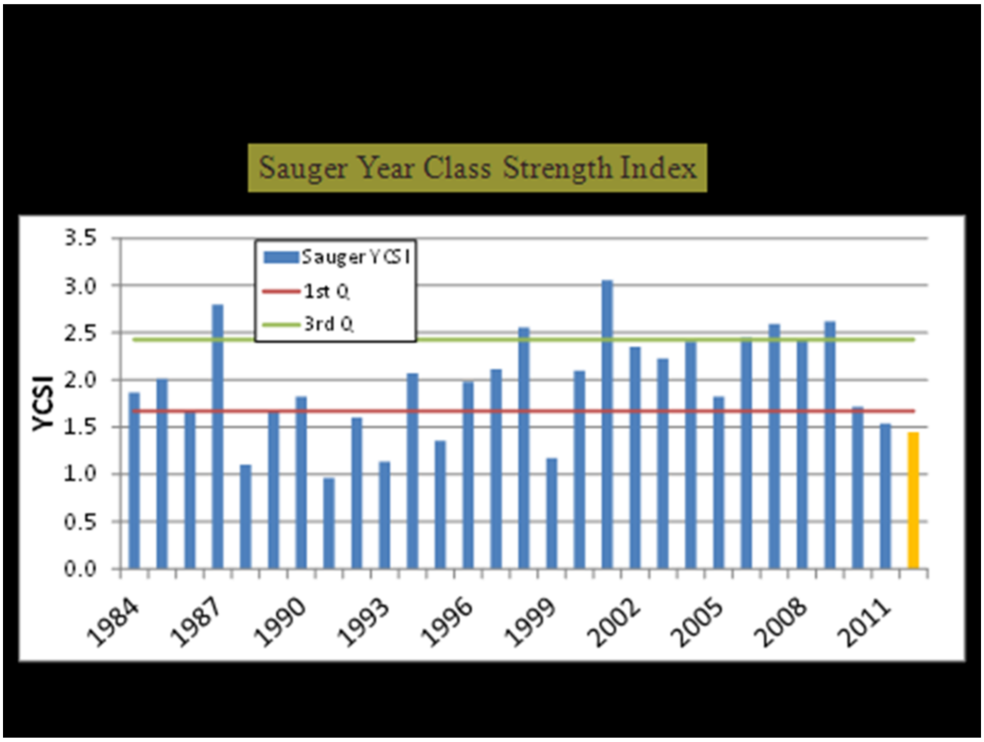
After the meeting it occurred to me that Xcel Energy does some monitoring on lower Pool 3 and upper Pool 4. Biologists from Xcel monitor lower Pool 3 and upper Pool 4 using electrofishing gear on a monthly basis in the summer. Some quick checks of the data showed an increase in BOTH Walleye and Sauger in the two Sectors of Pool 3 that the Xcel biologists monitor. The portion of Pool 3 directly above LD 3 saw CPUE (catch per unit effort – in this case number per hour of electrofishing) for both species more than double between 2010 and 2011. Sampling stations farther upstream in Pool 3 also saw increases though smaller than those immediately upstream from LD 3.

Group Questions

- What has happened to the Sauger population in Pool 4? We have our own opinions or conclusions, but please share any insight on this topic with the group.

- What are some of the groups opinions or conclusions?

1. Mortality of older fish.
2. Overall population reduction.
3. Drastic drop in 2011.
   - Still somewhat of a mystery.
   - Maybe lost fish through dam to high water.
4. Series of weak year classes.



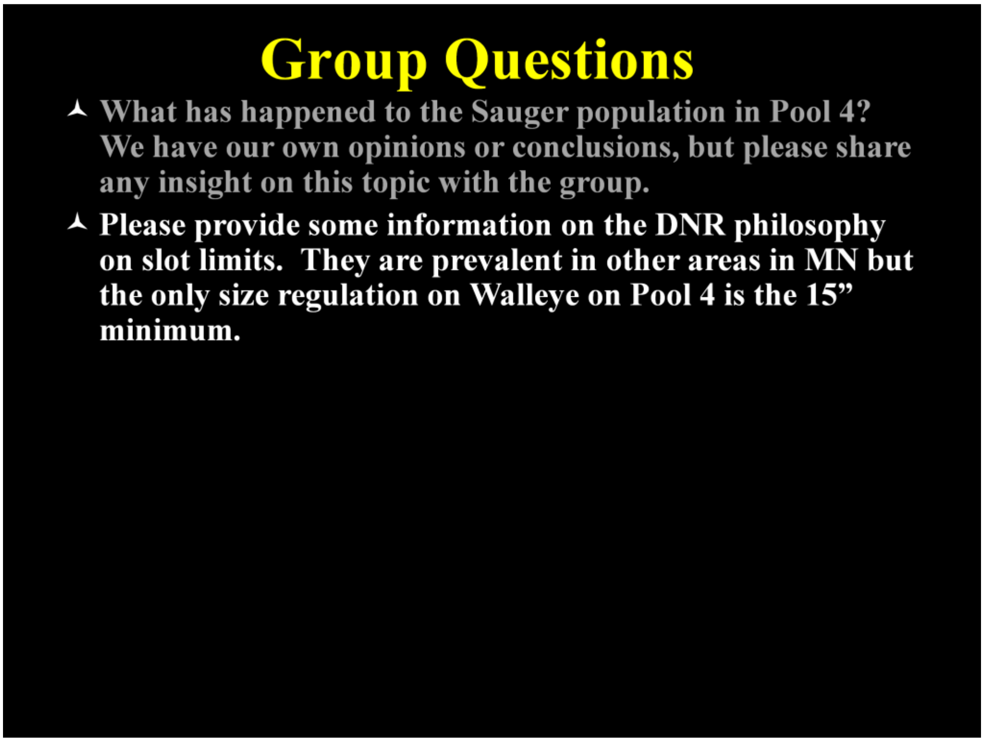
As noted earlier 3 relatively weak year classes in a population made up almost entirely of fish less than 6 years old means that your overall population size will likely decrease accordingly.

Group Questions

- What has happened to the Sauger population in Pool 4? We have our own opinions or conclusions, but please share any insight on this topic with the group.

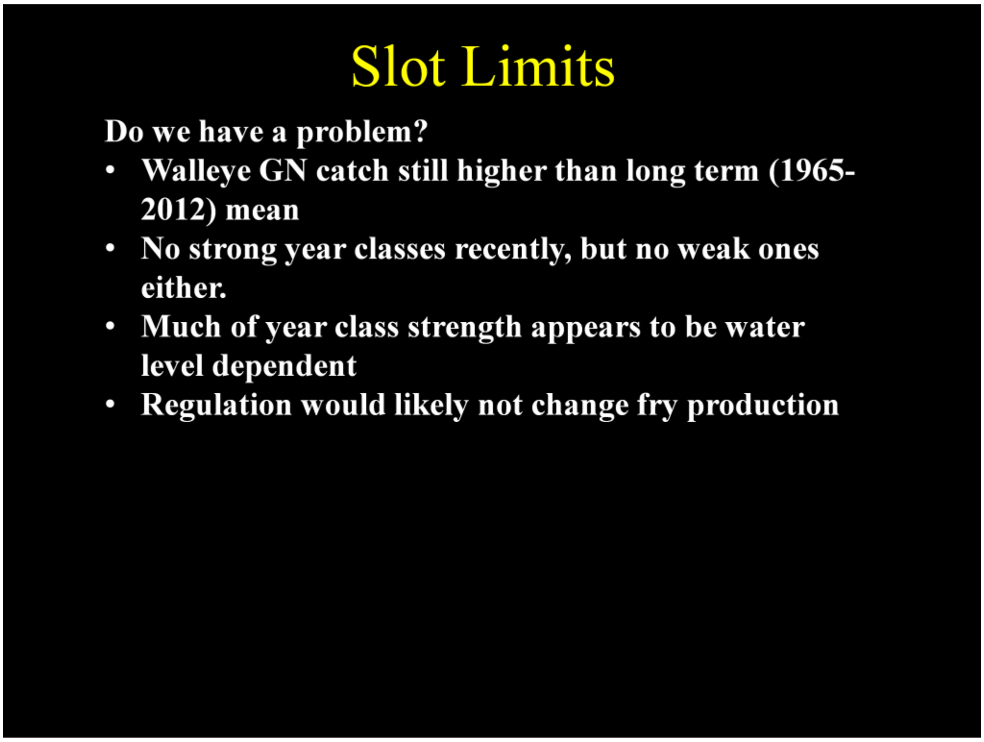
- What are some of the groups opinions or conclusions?

1. Mortality of older fish.
2. Overall population reduction.
3. Drastic drop in 2011.
   - Still somewhat of a mystery.
   - Maybe lost fish through dam to high water.
4. Series of weak year classes.
   - Good news here
   - The early numbers look very good for the 2013 year class


Group Questions
What has happened to the Sauger population in Pool 4? We have our own opinions or conclusions, but please share any insight on this topic with the group.
Please provide some information on the DNR philosophy on slot limits. They are prevalent in other areas in MN but the only size regulation on Walleye on Pool 4 is the 15" minimum.

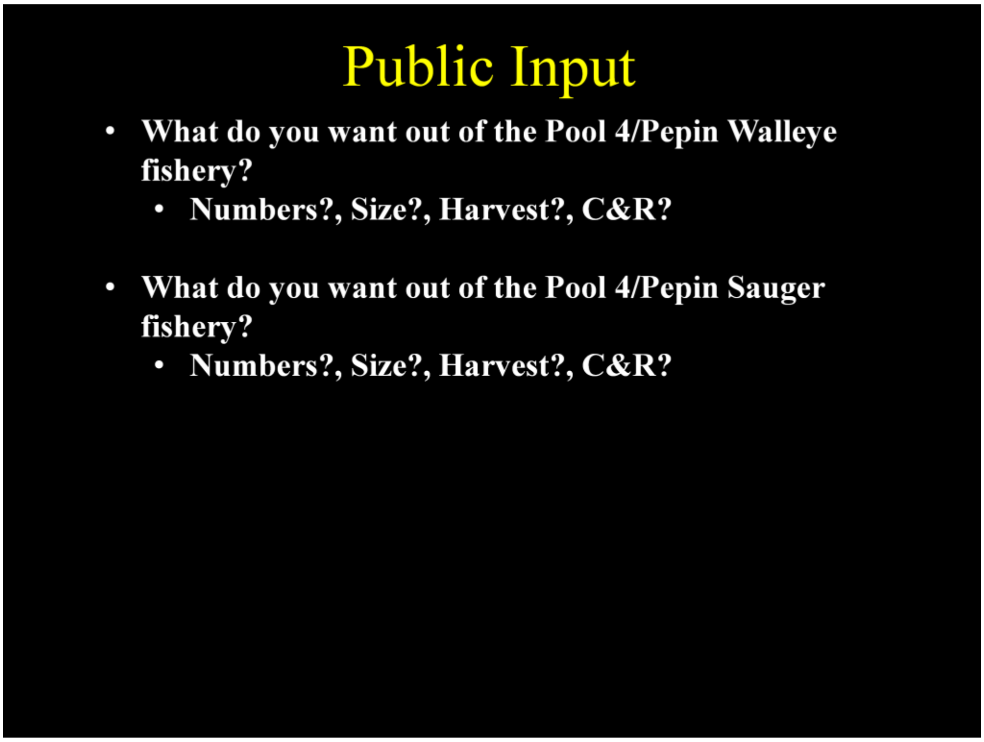
This slide provides a basic overview of why slot limits are used on various bodies of water.

My take away message to the group for this slide after presenting the data was that the extremely fast growth of Pool 4 Walleyes and Sauger makes slot limits difficult to justify. Fish grow too rapidly to stay in a harvest slot for more than a few months and either grow through a protected slot quickly if it is narrow or begin to suffer high rates of natural mortality from old age while they are still in it if it is made wider.



I ran through a quick look at the Walleye population on Pool 4 asking the group if they considered it to have problems.

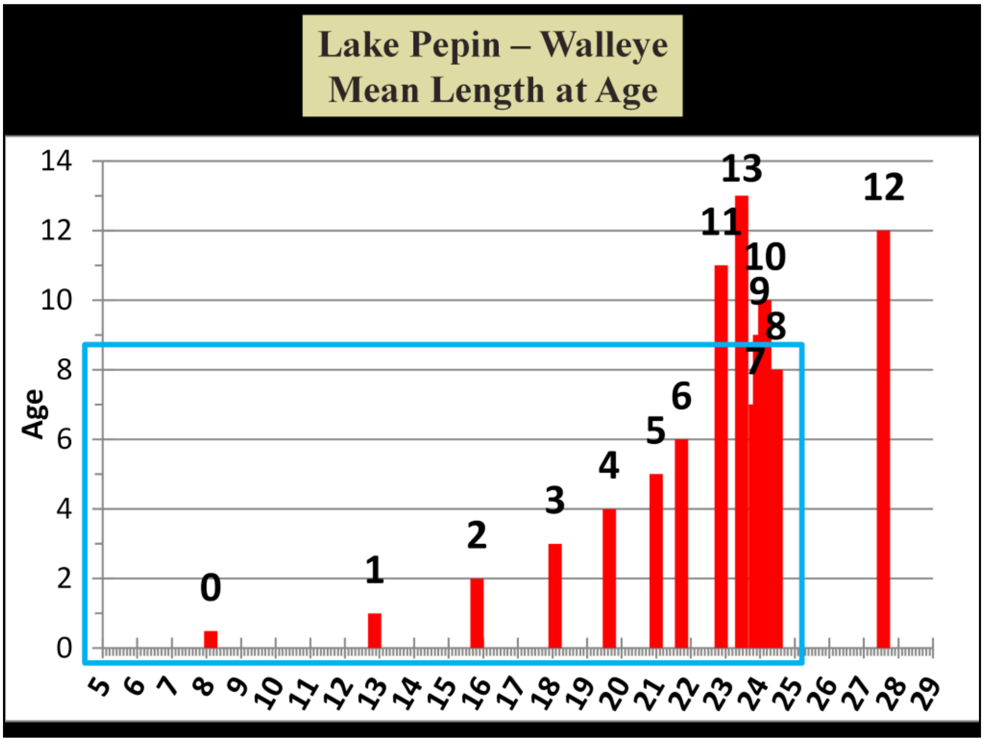
The group indicated that they thought the Walleye population was in pretty good shape, but expressed concern about the Sauger population.



We tried to have an open conversation about what the goals should be in managing the Walleye and Sauger populations. We are always seeking this kind of public input so that we have a better understanding of what the various groups that utilize the river resources want.

Please feel free to submit comments to our Lake City Fisheries e-mail address: lakecity.fisheries@state.mn.us

Please understand that we receive hundreds of comments annually from many groups of anglers and individuals each with slightly unique views about management of our river resources. Know that each of these comments is considered and used to help us evaluate what goals the public wants to achieve with the river fishery, but as individuals we would ask that you understand that we have to seek not only the policies that can best meet the needs or wants of our anglers, but also those that protect the long term health of our fisheries resources and are achievable within Minnesota's rule making process. Additionally, with the border waters we must seek to find common ground with bordering states and their unique constituent groups and rule making processes as well



For this slide and the three that follow it I must first give a bit of information about how we look at fish ages.

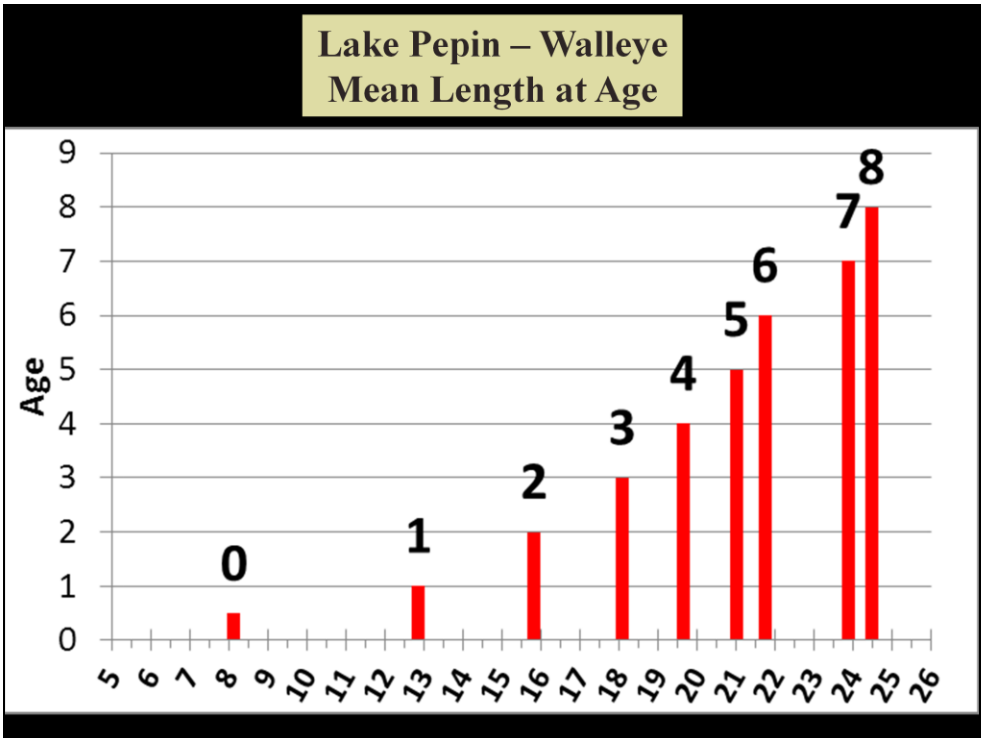
Note: The data in these slides is a compilation of many years of data in order to adequately represent every age group and therefore may not exactly match the lengths at age given earlier in this presentation.

From the standpoint of a fisheries manager every fish shares the same "birthday", January 1st. Therefore fish that spawn on April 1st would become Age-1 fish at only 9 months old. Because we use annual rings (annuli) which are laid down during periods of low growth (in northern climates this is typically winter) what we are really counting is the numbers of winters the fish has lived through. It is important to consider when you are sampling your fish because the outermost ring is often not apparent until late June or early July so if you sample a fish in May you need to add 1 to the fishes age to account for the ring that is not yet visible.

Luckily, our gillnet fish are sampled in October so all the annuli are typically very easy to count. The following figures all show the average length of Walleye (red) or Sauger (blue) at a particular age (the number above the bar) in October when the fish was sampled. This means that the fish actually have 1 extra summer of growth than their age would suggest thus an Age-0 fish has lived through 1 summer of growth and Age-1 fish 2 summers etc.

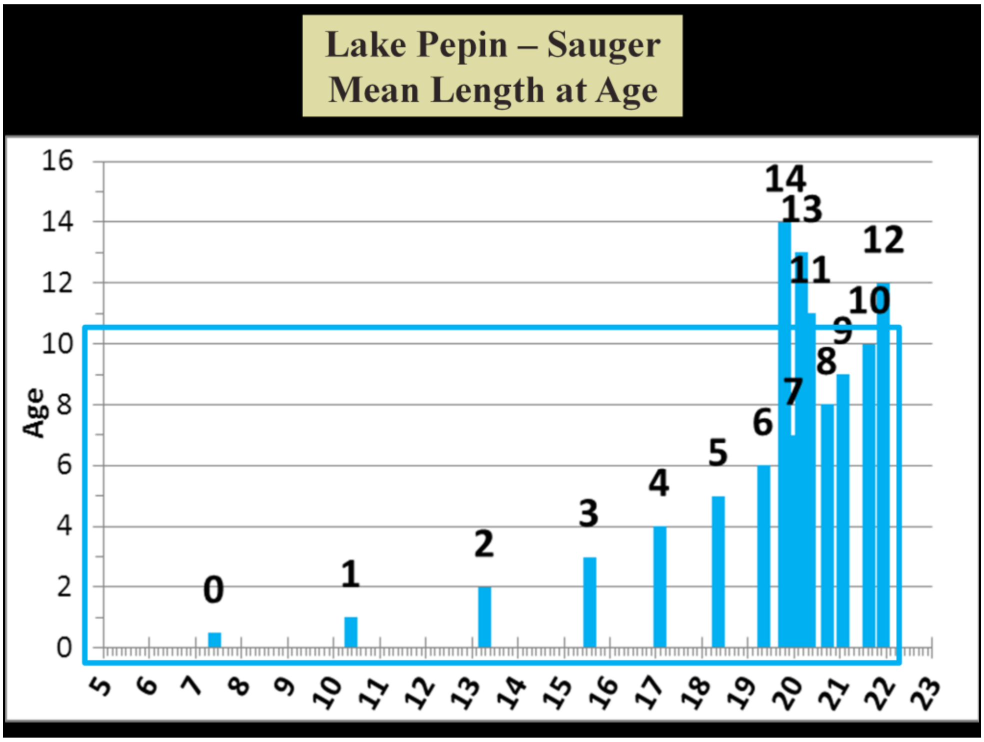
Due to the October sampling period most of the annual growth for the fish will be complete. This allows us to assume that at the start of their 3rd summer (Spring after Age-1 annuli was laid down) an average Walleye is about 13” in length (not legal for harvest on the border waters with a 15” minimum), but by July or August of that same year it is likely that the fish would have grown to just over the 15” minimum on its way to a fall length of ~16”. Figures like this, combined with information about what age fish become sexually mature at, and angler harvest preferences allow fisheries managers to evaluate the effects of various regulations on fish populations.

You may notice that at older ages both the Walleye and Sauger average size actually goes down. There are two reasons for this. 1) The sample size is fairly small because we rarely encounter fish older than Age-10, and 2) These species exhibit sexually dimorphic growth (one sex grows faster than the other, in this case females grow faster). When the females from a particular year class die at a younger age due to years of spawning stress or because they have been vulnerable to anglers longer due to their faster growth the average length at age tends to decrease because there are proportionally more of the shorter males remaining in that year class. Because this reduction in average growth makes reading the figure more difficult I have removed the older fish from the second figure in each series to make them easier to interpret.

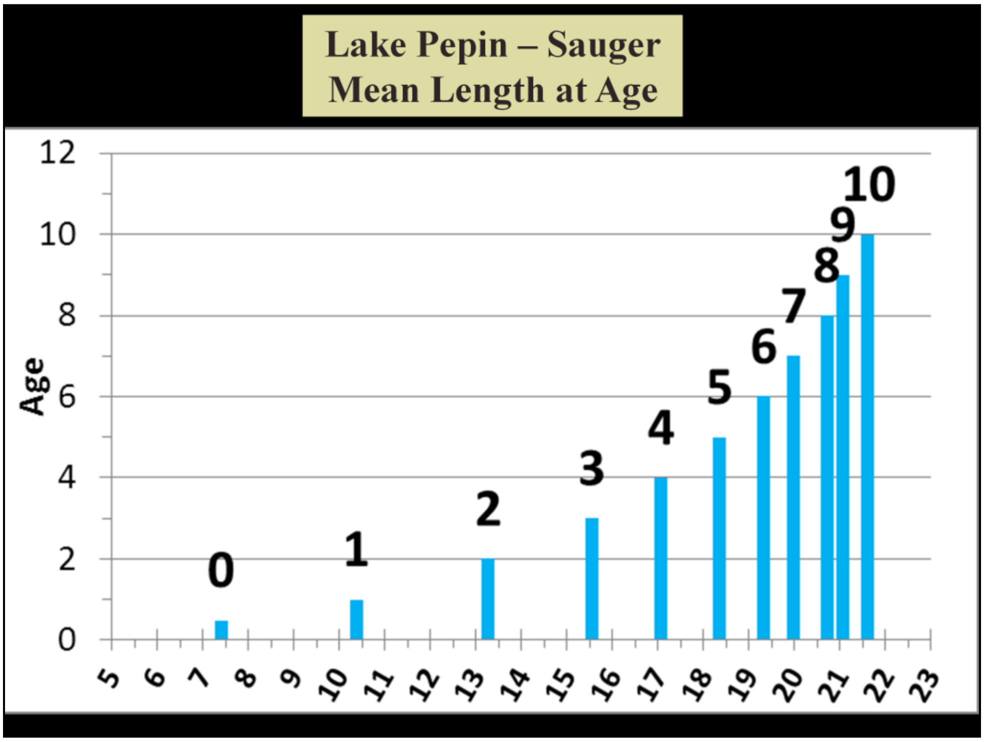


See previous slide for explanation.

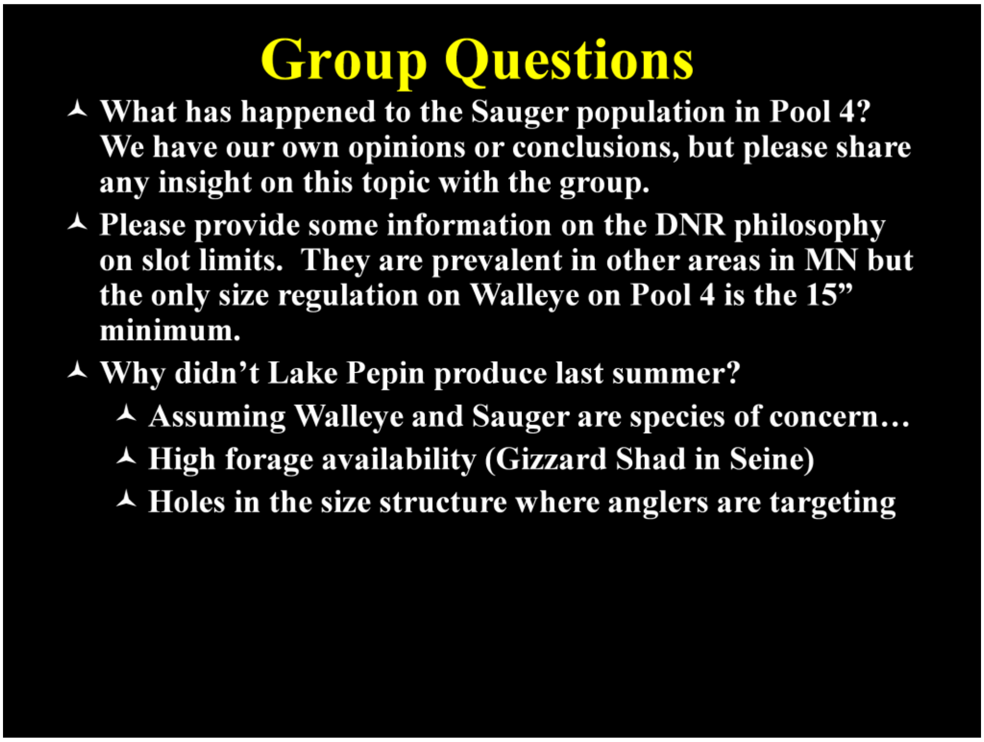
Older fish removed for easier interpretation.



See similar Walleye slide for explanation.

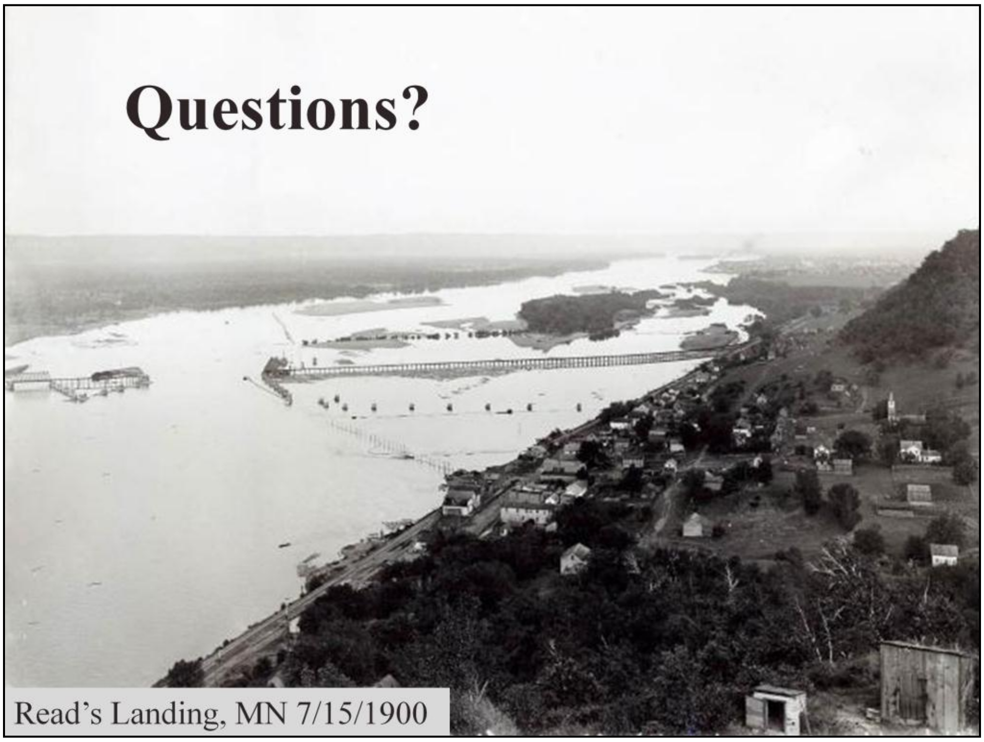


Older fish removed for easier interpretation.



Addressing the last question posed by the Walleye Searchers group we briefly discussed the fact that high forage (Gizzard Shad) availability and anglers preference for sizes of fish that are missing from our size structure due to poorer year classes etc. lead to the perception that Lake Pepin didn't produce this year for Walleye and Sauger. Preliminary creel data actually showed a slight increase in Walleye harvest in 2013 over 2012, but did show a larger drop in harvest for Sauger.

Other species like Black Crappie showed relatively robust harvest, and Largemouth and Smallmouth Bass which are not typically harvested by anglers showed good numbers of fish caught but with little overall harvest as expected.



I'll leave you with a picture from our historic photo archive showing Reads Landing from the bluff overlooking town. The bridge crossing the river was a railroad bridge with a hinged section to allow paddle wheelers to steam through and many of the dots above the rail road tracks are cribs for catching and sorting rafts of logs sent down the Mississippi and Chippewa Rivers. I find it interesting to see the islands in the main channel down stream of this crossing during a time before channelization and locks and dams.

If you have questions about this presentation or the fishery on Lake Pepin/Pool 4 feel free to contact me at the information provided below. I will do my best to get back to anyone who asks a question as soon as possible.

Thanks,

Nick Schlesser

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