NA-01570-01

FISHERIES MANAGEMENT PLAN (SUMMARY)

Lake Class 23

Region	Area	D.O.W. Number	County	Lake Name	Acreage
I	Walker	11-0283-00	Cass	**Baby**	Total 737 Littoral 248

Long Range Goals:

- Black Crappie: Gill net catch rate of 1-3 fish/net, PSD ≥ 70, RSD-P ≥ 30.
- Bluegill: Trap net catch rate of 15-40 fish/net, PSD ≥ 30, RSD-P ≥ 5.
- Cisco: Gill net catch rate ≥ 2.0 fish/net.
- Largemouth Bass: Spring electrofishing catch rate 20-50 fish/hour, PSD ≥ 50, RSD-P ≥ 10.
- Muskellunge: Population estimate of 0.20-0.30 fish/acre in Baby and Man lakes combined.
- Northern pike: Maintain a gill net catch rate at or below 5 fish/net, PSD ≥ 50, RSD-P ≥ 20.
- Smallmouth Bass: Spring electrofishing catch rate of 5-15 fish/hour, PSD ≥ 50, RSD-P ≥ 10.
- Walleye: Gill net catch rate ≥ 7 fish/net.
- Yellow perch: Gill net catch rate ≥ 5.0 fish/net.
- Protect or restore desirable aquatic and riparian habitats (eg. water quality, aquatic and riparian vegetation, and shoreline substrate) where appropriate.
- Invasive species: rusty crayfish

Operational Plan:

- **Base stocking:** Walleye: 2 lb/LA medium fingerlings during even-numbered years, known age-0, MIS strain.
- **Stocking contingency:** None.
- **Regulation(s):** Maintain spearing ban.
- **Surveys:** 2018, 2024 with spring Centrarchid assessments. Repeat Muskellunge population estimate in 2024 and creel survey in 2022. Pair all surveys with Man Lake when possible.
- **Evaluation(s):** Walleye stocking evaluation, repeat creel survey in 2022 if funding is available.
- **Habitat:** Identify critical habitat in need of protection and/or restoration and pursue as appropriate, especially Muskellunge spawning habitat.
- **Next plan revision:** 2025 (with Man Lake)

Potential Plan:

Repeat 12-lake creel (2022)	$	10,000
Centrarchid sampling	$	10,000
Muskellunge pop. est.	$	5,000
	TOTAL $	25,000

NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs; land acquisition; habitat development and protection; commercial fishery; stocking plans; other management tools; and evaluation plans)

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Entry Date: | **Year Resurvey:**

Stock Species - Size - Number per Acre

Schedule: | **Year Beginning**

Population Manipulation

YES _____ NO _____ YEAR _____

Primary Species Management	Secondary Species Management
Largemouth & Smallmouth Bass, Muskellunge, Walleye	Bluegill, Black Crappie, Cisco, Northern Pike, Yellow Perch

DEVELOPMENT

YES _____ NO _____ YEAR _____

Creel or Use Survey

YES _____ NO _____ YEAR _____

Area Supervisor's Signature:

Date: 3/18/2014

Regional Manager's Signature:

Date:

Other:

YEAR _____

FISHERIES MANAGEMENT PLAN (DETAILS)

General Information:

Baby Lake is a 737-acre, class 23 lake located approximately 8 miles east of Hackensack, MN. It is categorized as a hardwater mesotrophic lake with a mean total alkalinity of 143.1 ppm, an average Secchi reading of 10.5 feet approximating a TSI of 42, and a maximum depth of 69 feet. Baby Lake is moderately vegetated and has a diverse fish community due to a variety of fish habitat types. Both warm and cool-water species (cisco) are found in the lake. The Baby Lake chain consists of water flow from Kid and Kerr into Baby, Baby and Barnum into Man, Man into McKeown, and McKeown into Child Lake and the rest of the Boy River chain downstream from there. Variability in water levels (approximately 3 feet) is driven by precipitation; however a dam was constructed at the McKeown Lake outlet in 1937. The lake's primary boat access is located on the east shore. To date, Rusty Crayfish are the only known aquatic invasive species in the chain of lakes with the exception of Purple loosestrife in Child Lake.

Social Considerations:

The shoreline is well-developed, with approximately 130 lake homes/cabins counted in 1995. Based on summer surveys conducted in 2007 and 2011, Baby Lake receives considerable fishing pressure (18-19 angler-hours/acre). Lake residents and resort guests tended to target Black Bass (Largemouth and Smallmouth Bass), Walleye, panfish, and Northern Pike whereas anglers using the public access tended to target Muskellunge. Muskellunge (30%), Walleye (29%) and Black Bass (27%) were the most targeted species overall. Other types of water-based recreation, such as jet skis and pleasure boating, are also very popular on the lake (approximately 13.5 watercraft-hours/acre). There is an active lake association with a high interest in fish management, particularly Walleye and Muskellunge.

Survey History:

Baby Lake was initially surveyed in 1959 and re-surveyed in 1995. Fish population assessments were conducted in 1977, 1980, 1986, 1990, 2000, 2006, and 2012. Special assessments were completed in 1995 (spring trap netting; Muskellunge) and 1997 (spring electrofishing; Muskellunge, Largemouth Bass, Walleye).

Angler diaries kept by Muskellunge anglers were summarized for 1986-1989 and 1996-1998 (Younk and Cook 1992, Younk 1999).

A mark-recapture study evaluated Walleye fingerling stocking in Baby Lake and determined significant contribution of stocked Walleye to angler harvest (Gustafson 2000)

Summer fishing pressure was estimated on a number of area lakes using aerial boat counts in 2000 and average trip length and angler/boat statistics reported in the literature (Cook and Trenholm 2001); there was no creel survey accompanying this effort.

Roving summer creel surveys were completed in 2007 (Shavlik 2008) and 2011 (Shavlik 2012). Respectively, fishing pressure on Baby Lake increased from 18.18 hours/acre to 19.36 hour/acre but total Walleye harvest decreased (0.57 and 0.24 fish/acre). The most commonly sought species by anglers were Muskellunge, Walleye, and Black Bass.

A special Muskellunge assessment was completed on Baby and Man lakes during 2012 (Ward and Miller 2014). Muskellunge were sampled with spring trap nets and re-sampled with spring electrofishing and angler catch. Fish were marked (fin clip) and aged with anal fin rays, the population size and movement between Baby and Man lakes was estimated, and genetic ancestry was described. Shoepack ancestry in Baby Lake (0.11) was similar to 1995 and 2000 samples. Ancestry was also similar between lakes indicating substantial migration. Both mark-recapture approaches estimated a similar population size of approximately 0.28 fish/acre (350-360 fish; 95% CI: $\pm$ 70-80) that were 27.0 inches or longer.

Younk, J. and M. Cook. 1992. Applications of an angler diary for Muskellunge. Minnesota Department of Natural Resources, Investigational Report 420.

Younk, J. 1999. Unknown. Walker Area Fisheries Office, Department of Natural Resources, Walker,

Gustafson, S. 2000. Marked fish from a sample of angler-caught Walleye, Baby Lake, 1999. Walker Area Fisheries Office, Department of Natural Resources, Walker, MN.

Cook, M. and M. Trenholm. 2001. An aerial survey of angler and recreational watercraft use of 64 lakes in Beltrami, Cass and Hubbard counties. Fish Management Report 36, Minnesota Department of Natural Resources.

Shavlik, C. 2008. Walker area lakes creel survey, May 12 to September 30, 2007. Completion Report. F-29-R-27, Study 4, Job 779.

Shavlik, C. 2012. Walker area lakes creel survey, May 14 to September 30, 2011. Completion Report. F-29-R-30, Study 4, Job 861.

Ward, M. et. al. 2014 (pending). Ancestry assessment and genetic mark-recapture population estimation for Muskellunge in Baby and Man lakes. Walker Area Fisheries Office, Department of Natural Resources, Walker, MN.

Management History:

Stockings during the early- to mid-1900's consisted of Northern Pike, Black Crappie, Walleye, Smallmouth and Largemouth Bass, and one stocking of what are presumed to be Rainbow Trout. Although a native Muskellunge lake, Shoepack strain Muskellunge

fingerlings and yearlings were stocked annually from 1971 to 1979. Walleye fry were stocked every two to three years from 1970 to1980. Walleye stocking was discontinued until 1996 when marked fingerlings were stocked during 1996 and 1998 (Gustafson 2000). Mixed stockings of Walleye fingerlings, yearlings, and adults have been stocked during even-numbered years since 2000.

A spearing ban was implemented on Baby Lake in 1986 to afford additional protection for the Muskellunge population. The ban was recommended for continuation in 2013 (D. Schultz, personal communication) because of the significant potential for mis-identification of Muskellunge in Baby Lake based on their smaller average size relative to other Muskellunge populations in the state. At that time, the statewide regulation for Muskellunge harvest was a 48-inch minimum; no legal Muskellunge were sampled in Baby Lake during spring 2012 (TL range: 16 - 46 inches; median: 38 inches TL).

Walleye Stocking Evaluation:

Walleye fingerlings have been stocked into Baby Lake by MN DNR since 1996. Gill net assessments conducted since 1996 were used to evaluate stocking effects on recruitment, and a creel survey was conducted in 2007 and 2011 to measure changes, if any, to the creel. Recruitment indices based on the age-frequency data were calculated and compared on a relative scale. This evaluation addresses the stockings prior to 2012. Effective stocking translates to stronger year classes produced during stocked years relative to non-stocked years, which in turn should increase overall abundance and should also result in increased catch and harvest of Walleye by anglers following a change in stocking strategies. The return of fish to anglers is the overall goal of any stocking program for a recreational fishery.

A Walleye stocking evaluation (Weitzel, unpublished) is attached. With a sampling frequency of every six years, the "Age 1-6" time series is used for this evaluation when relevant. Non-stocked year classes have been poorly represented throughout the time series. Fingerling-stocked year classes at the 2.0 lb/LA rate (2008 and 2012) were of similar strength as previous year classes stocked at lower fingerling densities (1996-2005) or fingerling-yearling combinations (2005) with exception to the 2004 year class. This cohort was the strongest to date and was stocked with 542 lbs (2.18 lbs/LA) of fingerlings that were sampled at age-2 prior to a fall stocking of mixed adults that same year. This year class was the reason the Walleye gill net catch rate peaked during 2006.

Abundance of Yellow Perch has traditionally ranged from 8-11 fish/net during most years, and was at 8.6 fish/net in 2012. This statistic is, at this time, static despite the higher stocking densities.

Creel surveys were conducted before (2007) and after (2011) Walleye stocking rates were doubled on Baby Lake. Fishing effort in 2011 was 19.36 hours/acre, up slightly from the 18.18 hours/acre observed in 2007. Walleye catch observed in 2007 and 2011 (0.81 and 1.15 fish/acre, respectively) increased across surveys but harvest declined (0.57 and 0.24 fish/acre, respectively); catch and harvest rates followed a similar pattern. Of the harvested fish that were aged, only 50% corresponded to a stocked year class despite noticeably higher recruitment of stocked year classes.

The 2008 and 2010 Walleye fingerling stockings (2 lb/LA) provided no measurable increase in Walleye abundance at this time despite the doubled stocking density. Walleye abundance, recruitment, and harvest by anglers remained relatively static, although total Walleye catch by anglers did increase. Negative effects on the Yellow Perch population are not evident based on the 2012 assessment. However, Walleye growth, particularly that of younger Walleye, did slow from previous surveys. The Yellow Perch population, Walleye growth, and Walleye recruitment will be re-evaluated during the next assessment. At this time, the elevated stocking rate of 2.0 lbs/LA/even-numbered years will be continued because one of three higher stocking densities did produce significantly higher recruitment. However, if the current trends in Walleye growth and Yellow Perch abundance continue to decline, these would suggest density-dependence is occurring and the current stocking rate should be reduced to 1.0 lb/LA during even-numbered years. Furthermore, if the higher stocking density continues to fail at increasing Walleye recruitment over the 1.0 lb/LA rate, the current rate should be reduced because the inherent cost to produce relatively the same level of recruitment has doubled; twice the amount of fish have been stocked for a similar average production of fish to older ages.

Previous Management Plans (A = amendment; MP = management plan revision; R = regulation):

2008: MP. Walleye fingerling stocking was increased from 1.0 lb/LA/alternate years to 2.0/LA/alternate years. Overall, fingerling stocking during alternate years had been successful at increasing Walleye abundance. Conversely, the Black Crappie population was noted to have declined considerably since Walleye stocking was implemented. A spring Muskellunge assessment was scheduled for 2012. Other identified needs were Black Bass and Black Crappie assessments.

2004: A. The Walleye stocking rate during alternate years was increased from 1.0 lb/LA base stocking density to 1.5 lb/LA, pending availability, to accommodate an increase in statewide production goals. Other Area lakes receiving similar increases were Birch, Mabel, Upper Trelipe, and Vermillion.

2003: MP. Walleye fingerlings to be stocked at a rate of 240 lbs (1.0 lb/LA/event) during even-numbered years. Needs included a creel survey (completed in 2007 and 2011), and spring sampling targeting Muskellunge (completed spring 2012), Black Bass (completed spring 2012), and Black Crappie populations.

1997: MP. Stockings of marked Walleye fingerlings (240 lbs) during 1996 and 1998 to evaluate contribution. Needs included a creel survey and spring sampling for Muskellunge, Black Bass, and Black Crappie. A public access was purchased and developed in 1996.

1992: MP. Survey schedule of every five years. Potential plan included creel surveys, habitat acquisition, and eliminating Shoepack strain Muskellunge from the population.

1987: MP. Walleye fry stocking was determined to be unsuccessful at increasing recruitment; Walleye stocking was shifted to fingerlings (170 lbs. every 3 years) with the objective of increasing the gill net catch rate from 2.62 fish/net to 4.0 fish/net. Northern pike and Largemouth Bass populations were identified as being in good condition. Describing the influence of Shoepack strain on the Muskellunge population was identified as a management need.

Present Limiting Factors:

Despite considerable lakeshore development, overall habitat quality appears to be very good.

The presence of Shoepack strain Muskellunge is limiting the size potential of the population relative to native strain lakes (Ward and Miller 2014). However, the contribution of the Shoepack strain should continue to decline over time through natural reproduction. Shoepack ancestry in Baby Lake has declined from 13% (1995/2000 pooled samples; Miller et al. 2012) to 9% in 2012. Historical accounts detail that Baby Lake was known for smaller average Muskellunge while Man Lake tended to produce larger fish (Harlan Fierstine, personal communication). It is possible that most or all natural reproduction occurs in Baby Lake, and fish migrate into Man Lake over time; this would account for the differences in Muskellunge density between the two lakes (approximately three times higher in Baby Lake).

Walleye fingerling stocking is likely limiting Black Crappie production in Baby Lake. Successful co-management of both species in the same lake is rare.

Present Survey Needs:

Spring electrofishing for Black Bass should continue to be a part of future surveys and assessments. Walleye stocking/natural reproduction will be evaluated as outlined in the Operational Plan. Spring trap netting targeting Black Crappie should be considered, as sample sizes from other gears have been insufficient to provide reliable indices of the population.

Habitat Protection and/or Restoration Priorities:

The identification of point-source impacts and potential shoreland restoration or improvement projects should be pursued as appropriate. Existing critical habitat will be protected through permit reviews and coordination with other agencies, and acquisitions where appropriate. Efforts to identify critical Muskellunge spawning habitat should be identified and protection priorities pursued as appropriate. To date, rusty crayfish are the only identified aquatic invasive species in Baby Lake; AIS education, awareness, and prevention programs should be continued.

Existing state ownership includes the following:

Name	Size (acres)	Shoreline (ft)	Use	Acquisition date	Comments
Baby Lake AMA	7	3,400	General	3/23/1998	Island
Baby Lake AMA (2)	2	1,090	General	3/23/1998	Island

Sensitive shorelands have not been identified on Baby Lake.

Baby Lake has a 2,500 acre watershed that is primarily forested. It is within the Leech Lake River major watershed (854,640 acres) and Unnamed minor watershed (9,529 acres). The watershed health assessment score for the major at the time of this management plan was 69, indicating that while most of the watershed is in good to excellent condition, some additional habitat improvement or protection within the major watershed should pursued in key areas.

Management Objectives:

Black Crappie: Gill net catch rate of 1-3 fish/net, PSD $\geq$ 70, RSD-P $\geq$ 30. Consider targeted spring sampling with trap nets or electrofishing.

Bluegill: Trap net catch rate of 15-40 fish/net, PSD $\geq$ 30, RSD-P $\geq$ 5.

Cisco: Gill net catch rate $\geq$ 2.0 fish/net.

Largemouth Bass: Spring electrofishing catch rate 20-50 fish/hour, PSD $\geq$ 50, RSD-P $\geq$ 10.

Muskellunge: Population estimate of 0.20-0.30 fish/acre in Baby and Man lakes combined.

Northern Pike: Maintain a gill net catch rate at or below 5 fish/net, PSD $\geq$ 50, RSD-P $\geq$ 20. The Northern Pike population is currently in good condition, and may be benefitting from the spearing ban.

Smallmouth Bass: Spring electrofishing catch rate of 5-15 fish/hour, PSD $\geq$ 50, RSD-P $\geq$ 10.

Walleye: Gill net catch rate $\geq$ 7 fish/net.

Yellow perch: Gill net catch rate $\geq$ 5.0 fish/net.

Operational Plan:

Base Stocking: Continue with previous stocking strategy of 496 pounds (2 lbs/LA; 1 lb/LA annual equivalent) of medium Walleye fingerlings, known age-0, MIS strain, during even-numbered years with the objective of sustaining a Walleye gill net catch rate of 7.0 Walleye/net or higher. The higher gill net catch rate goal is in response to the increased stocking density; the previous fingerling stocking density of 1 lb/LA maintained a gill net catch rate of 4 fish/net or higher. If effective, higher stocking rates should translate to higher gill net catch rates.

Stocking Contingency: None. Fingerlings are already being stocked at an elevated rate and a stocking contingency would confound the on-going evaluation.

Regulations: Continue with spearing ban to protect Muskellunge population, which overlaps with Northern Pike and carries significant potential for misidentification (Spring 2012 Muskellunge TL range: 16-46 inches; median TL approximately 38 inches).

Surveys: Lake surveys conducted every six years (2018, 2024). Repeat Muskellunge spring sampling and population estimation in 2024. Repeat 12-lake creel survey in 2022.

Evaluations: Evaluate fingerling stocking as gill net assessments are completed. If declines in Yellow Perch abundance or Walleye growth rates are detected, the stocking rate should be reduced from 2 lb/LA/alternate years to 1 lb/LA/alternate years. Repeat 12-lake creel survey if funding is available.

Habitat: Identify shorelands providing critical aquatic habitat and pursue acquisition or shoreland restoration where appropriate.

Next plan revision: Next management plan revision in 2025. Amend Walleye stocking strategy as appropriate per the stocking evaluation results.

Sampling Considerations:

Largemouth/Smallmouth Bass, spring electrofishing

- Fish < 300 mm TL: collect otoliths/scales from 5 fish per 10 mm length group, determine sex/maturity of subsample
- Fish $\geq$ 300 mm TL: collect otoliths/scales from 10 fish per 25 mm length group, determine sex/maturity of subsample
- No structures collected from trap or gill net samples.

Muskellunge

- Live release: collect/record anal fin rays and scales from all sampled fish, sex/maturity determination when possible.
- Mortalities: collect/record anal fin rays, scales, cleithra, and sex/maturity determination.

Walleye

- Gill net: collect otoliths and scales and record sex/maturity from all sampled fish.
- Trap net: measure (TL) and release.

Bluegill

- Spring sampling: collect/record otoliths, scales, and sex/maturity from 5 fish per 10 mm length group.
- Trap net: Measure (TL) and release.
- Gill net: Measure (TL).

Black Crappie

- Spring sampling: collect/record otoliths, scales, and sex/maturity from 5 fish per 10 mm length group.
- Trap net: Measure (TL) and release.
- Gill net: Measure (TL).

Cisco

- Gill net: collect otoliths and scales and record sex/maturity from all sampled fish.

Northern Pike

- Gill net: collect cleithra and scales and record sex/maturity from all sampled fish. Fish will not be aged but structures will be archived.

Yellow Perch

- Gill net: collect/record otoliths, scales, and sex/maturity from a minimum of 10 representative fish per mesh per net up to a maximum total sample size of 100 fish.

Other Considerations:

The Muskellunge population is homogenous with Man Lake (Ward and Miller 2014). The genetic ancestry of both populations is nearly identical despite Shoepack stockings occurring into Baby Lake only, and movement between lakes was well-documented during 2012. Movement of other species between the lakes is assumed to be likely. Management planning and implementation should consider the effects of any action on the collective population within both lakes given this information. Man Lake does receive considerably less fishing pressure because its accessibility for the general public is limited to small watercraft moving through the channel connecting it to Baby Lake, and this is unnavigable when water levels are high. At its current status, Baby Lake provides a Muskellunge fishery with relatively high angler catch rates; this type of fishery is unique in the Walker Area.

The size structure of the Muskellunge population in Mantrap Lake (Park Rapids Area) improved following stockings of Leech Lake-strain Muskellunge fingerlings. While natural reproduction is clearly not limiting the Muskellunge population in Baby and Man lakes, Shoepack ancestry is limiting size quality. Introduction of Leech Lake strain Muskellunge into Baby Lake should be discussed with the lake association and other interested stakeholders and management actions pursued as appropriate. If Muskellunge are stocked, all should be marked with PIT tags and scale samples collected for genotyping prior to stocking; this would facilitate more detailed analyses during the 2024 Muskellunge population evaluation.

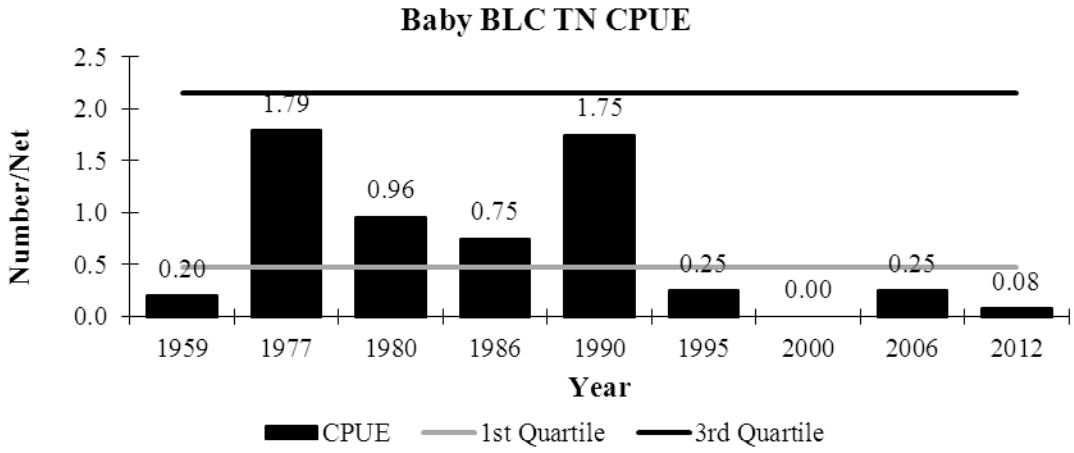
Management activities should be conducted simultaneously with connected Man Lake.

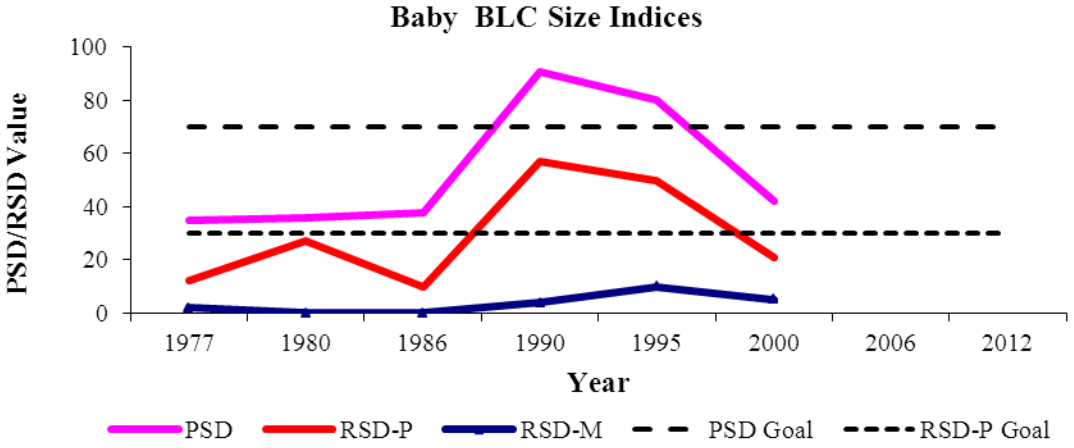
Attachments:

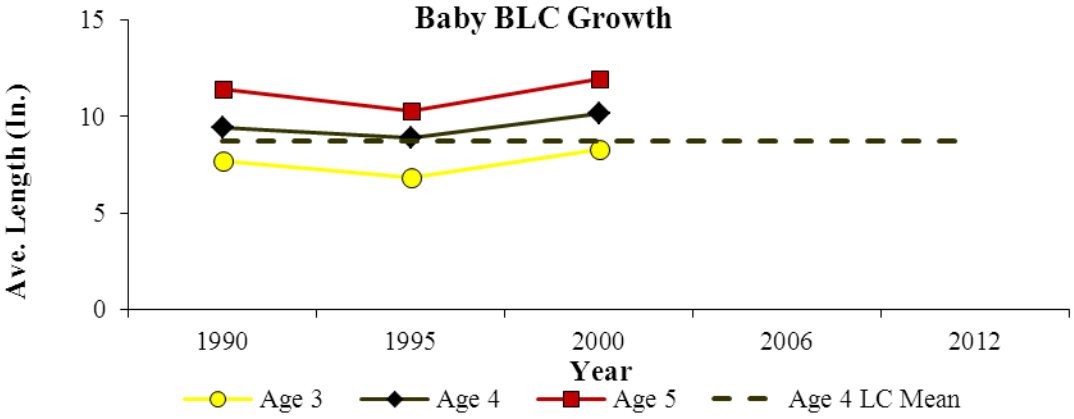
Baby BLACK CRAPPIE Catch Rates

Compared to other Lake Class 23 lakes

Management Objectives: GN catch rate of 1-3/net; PSD ≥70 and RSD-P ≥30.

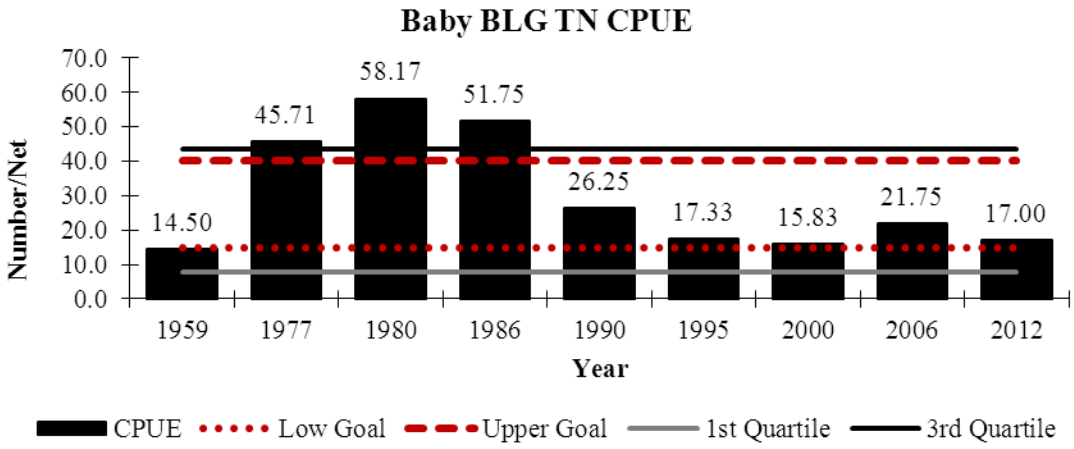


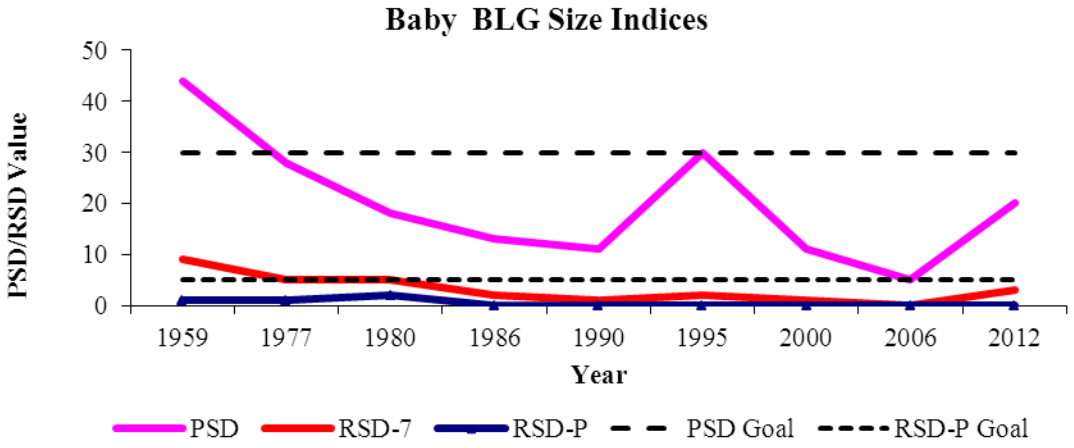


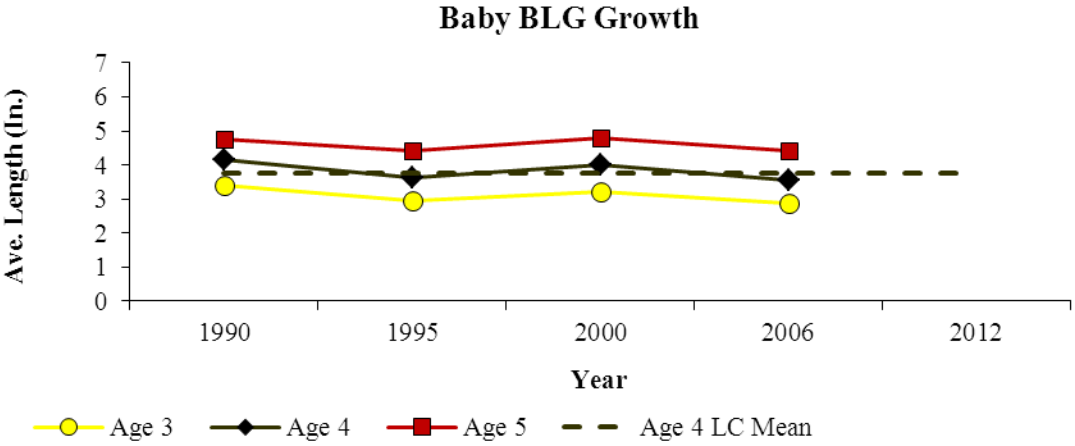


Baby BLUEGILL Catch Rates
Compared to other Lake Class 23 lakes

Management Objectives: TN catch rate of 15-40/net; PSD ≥30 and RSD-P ≥5.





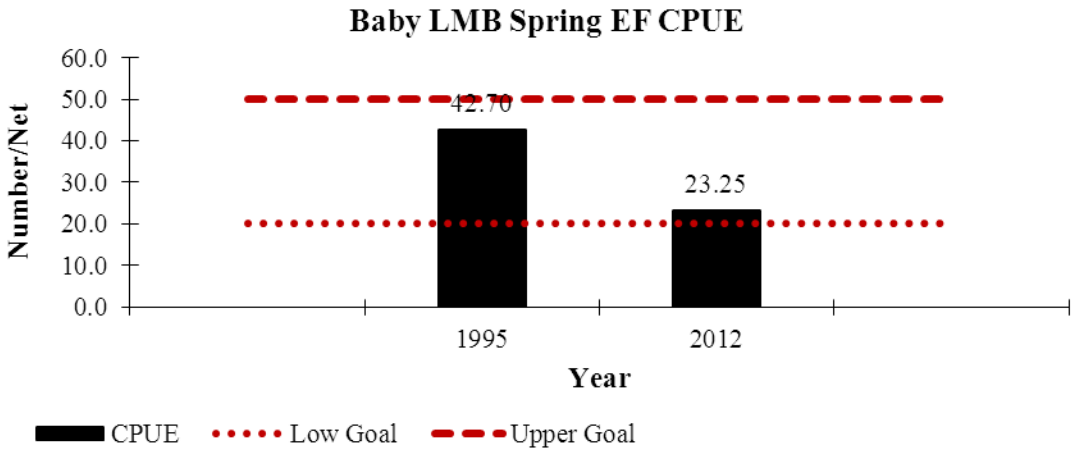


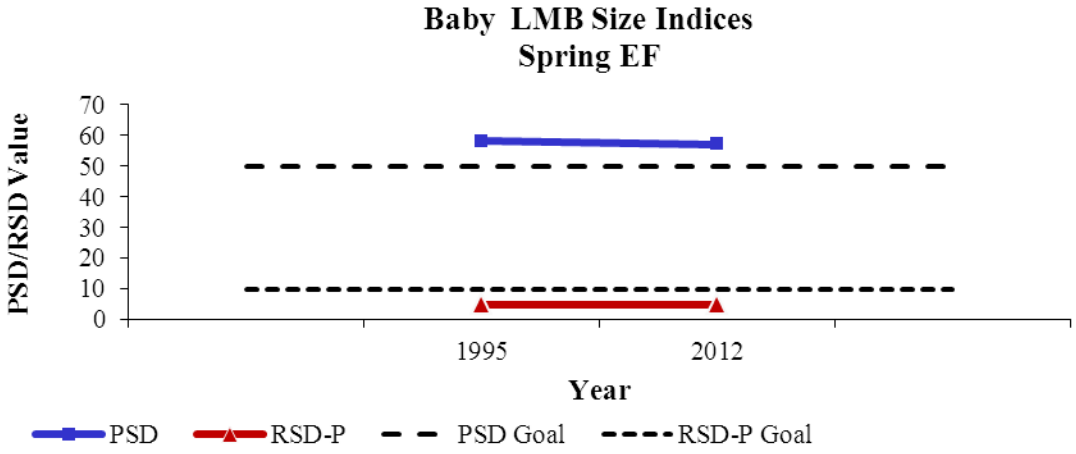
Note: Scale samples were not taken from BLG in 2012.

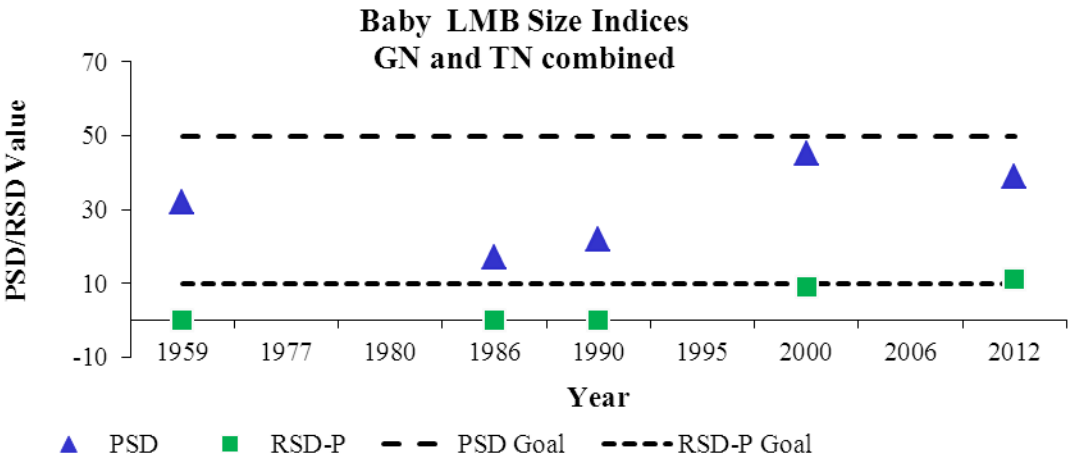
Baby LARGEMOUTH BASS Catch Rates

Compared to other Lake Class 23 lakes

Management Objectives: Spring EF catch rate of 20-50/hr with PSD ≥50 and RSD- P ≥10.



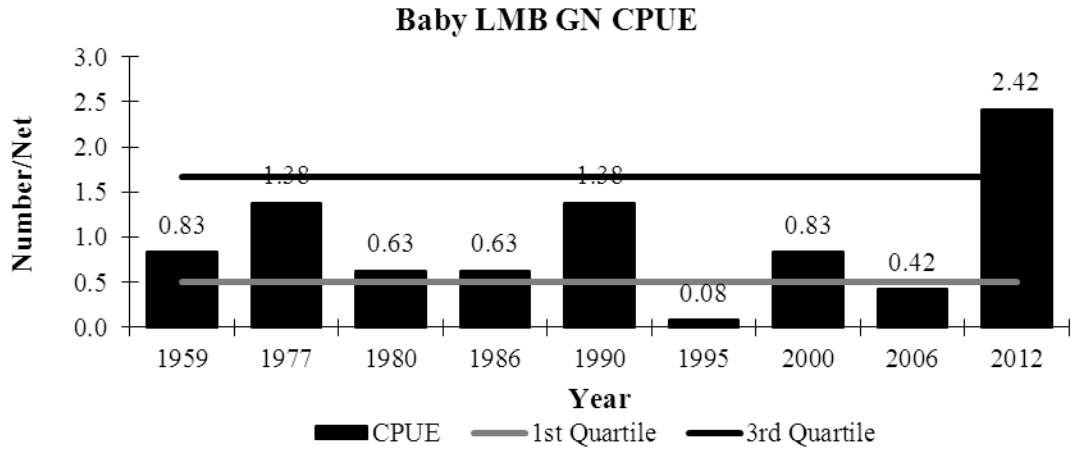


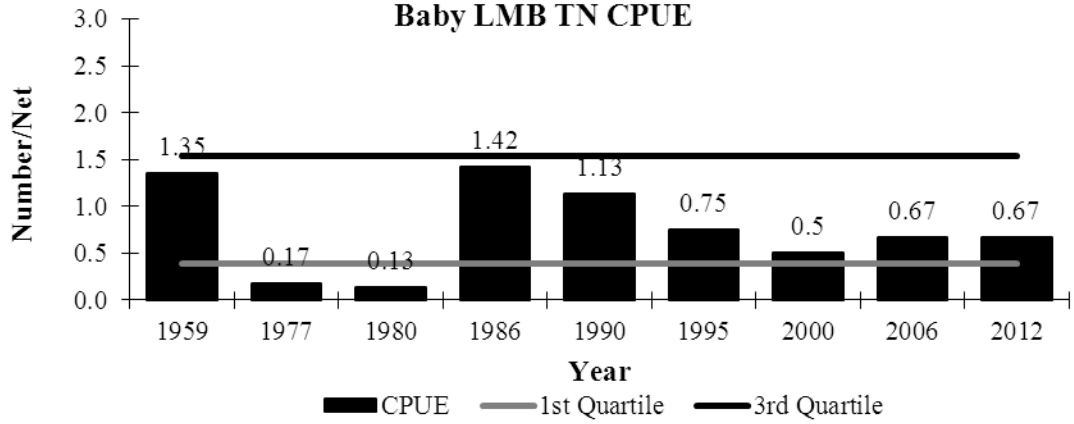


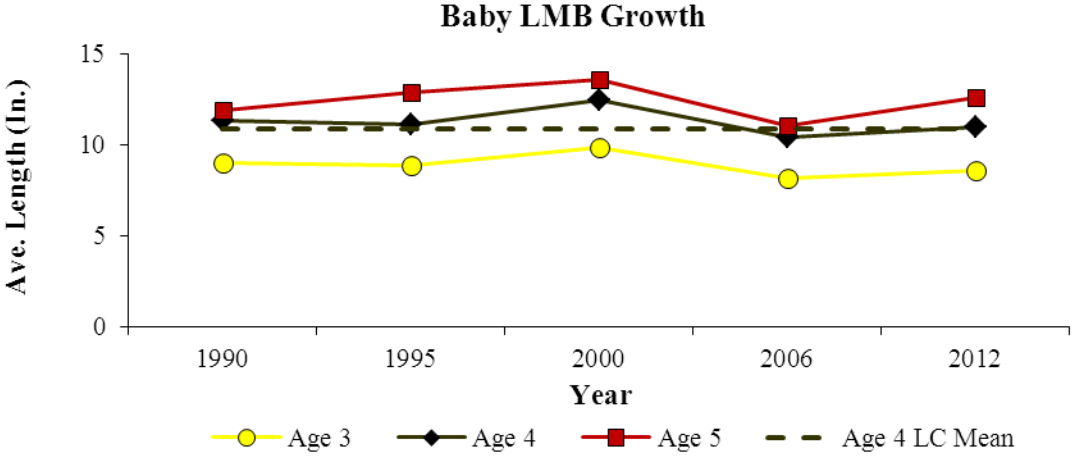
Baby LARGEMOUTH BASS Catch Rates

Compared to other Lake Class 23 lakes

Management Objectives: Spring EF catch rate of 20-50/hr with PSD ≥50 and RSD- P ≥10.



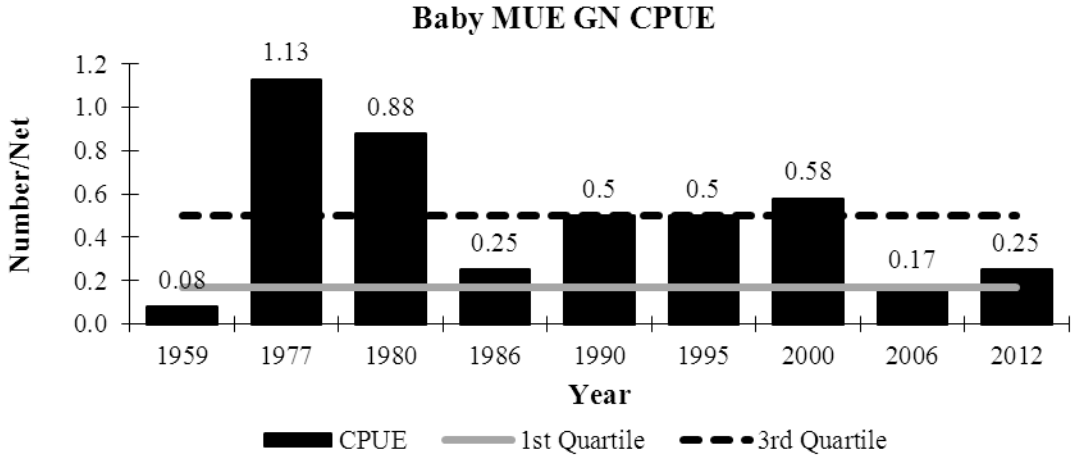


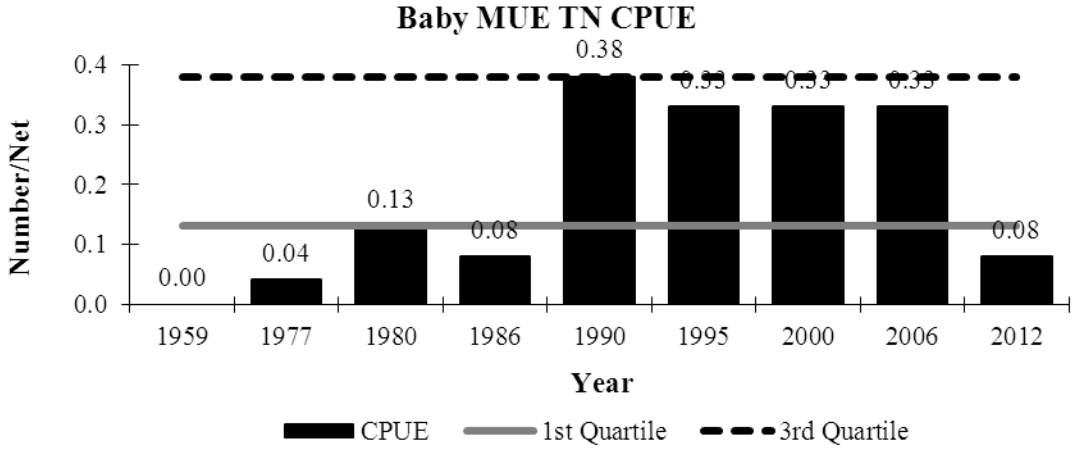


Baby MUSKELLUNGE Catch Rates

Compared to other Lake Class 23 lakes

Management Objectives: Population estimate of 0.20-0.30 fish/acre in Baby and Man lakes combined.





Baby MUSKELLUNGE Catch Rates
Compared to other Lake Class 23 lakes

Management Objectives: Population estimate of 0.20-0.30 fish/acre in Baby and Man lakes combined.

2012 MUE population estimates for Baby and Man lakes.

	Mark: TN Recapture: EF	Mark: TN Recapture: AN	Mark: TN and EF Recapture: AN
Baby	424*	427	374
Lower 95%	290	184	234
Upper 95%	558	671	514
Man	87	55*	62
Lower 95%	-4	39	38
Upper 95%	177	71	107
Baby and Man	527	381	406*
Lower 95%	370	270	310
Upper 95%	685	492	501

* indicates population estimates with least variability

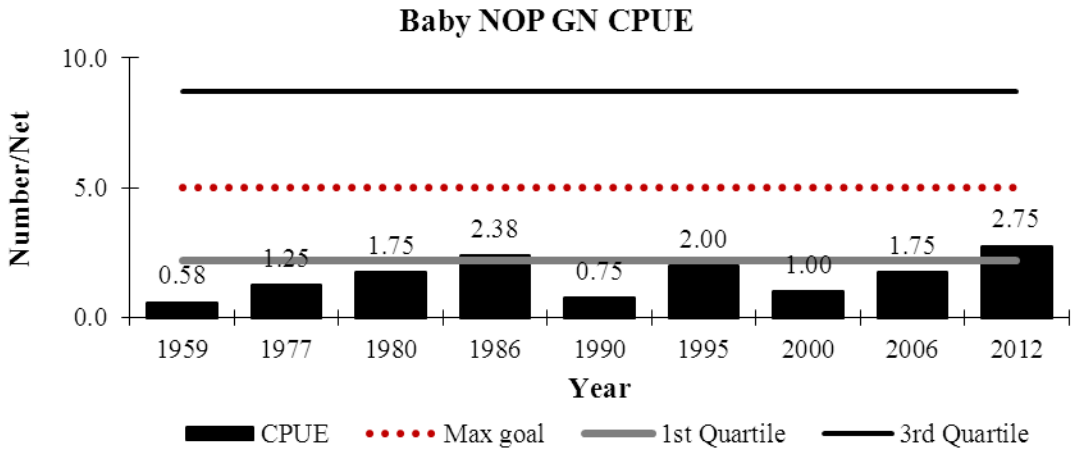
	PE	PE goal/acre	#/acre	#/LA
Baby	374		0.53	1.51
Man	62		0.14	1.38
Baby + Man	406	0.20-0.30	0.35	1.39

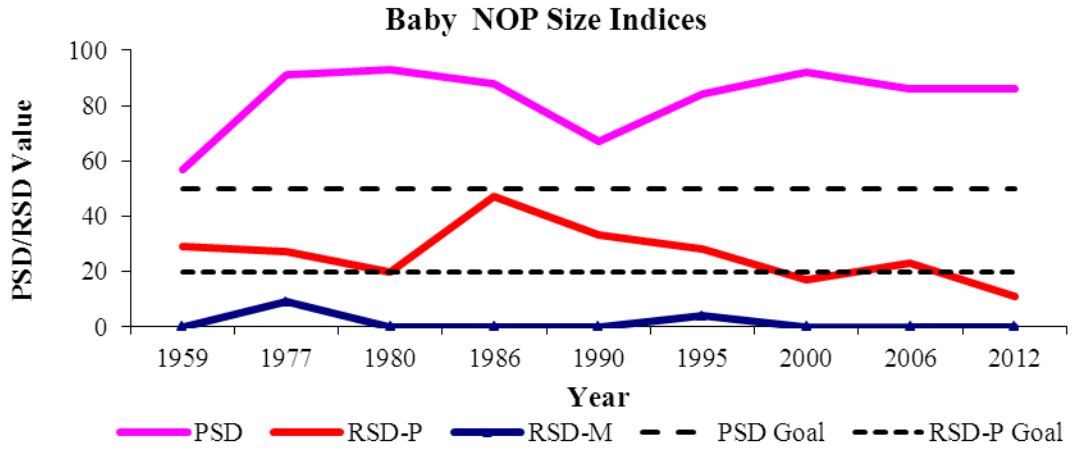
Capture method: TN = large trap net; EF = electrofishing; AN = angler

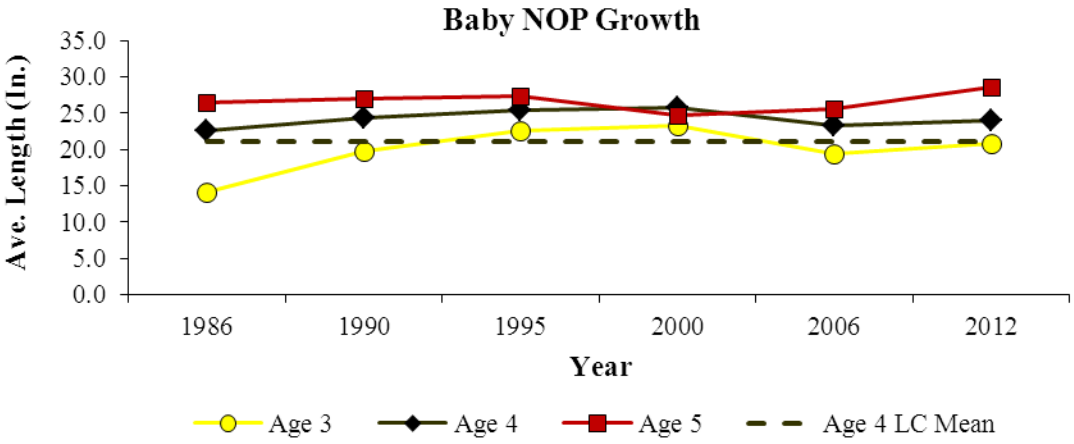
Baby NORTHERN PIKE Catch Rates

Compared to other Lake Class 23 lakes

Management Objectives: Gill net catch rate ≤5 fish/net. PSD ≥50 and RSD-P ≥20.



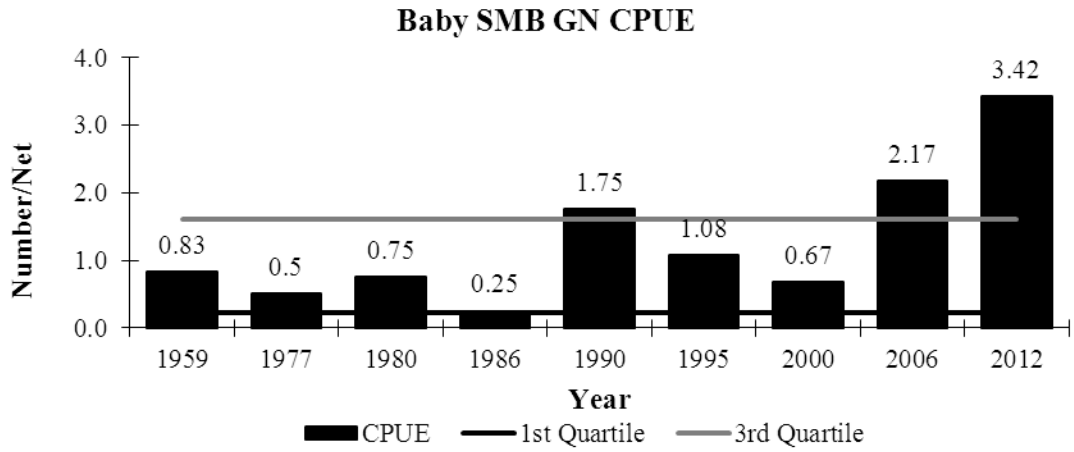


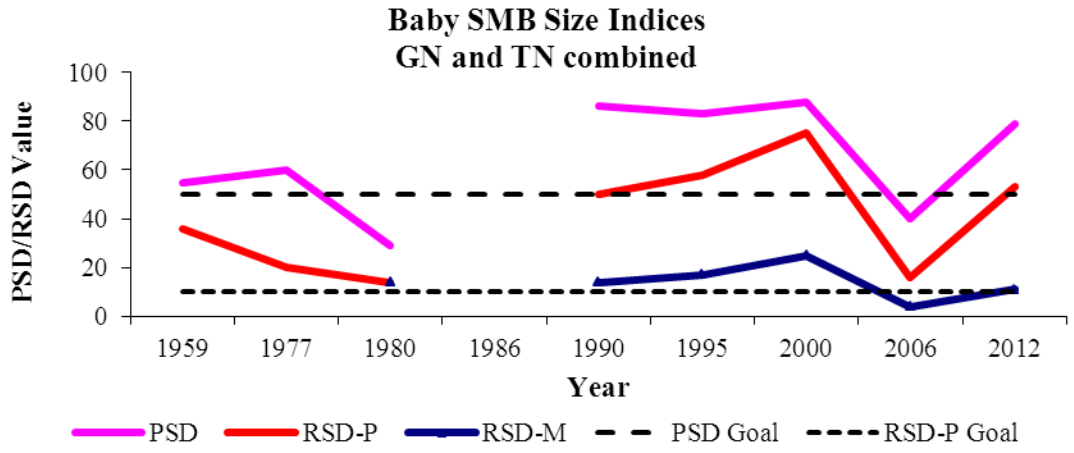


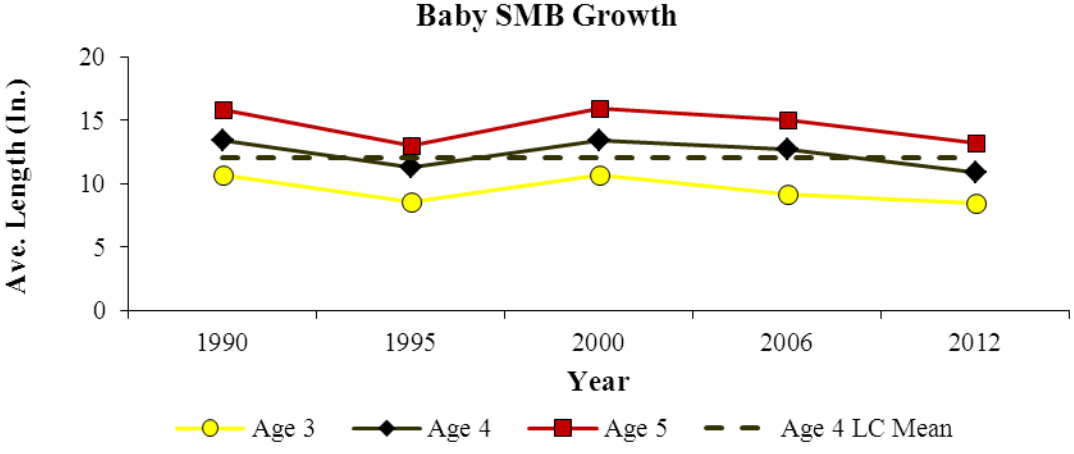
Baby SMALLMOUTH BASS Catch Rates
Compared to other Lake Class 23 lakes

Management Objectives: Spring EF catch rate of 5-15/hr with PSD ≥50 and RSD-P ≥10.

Spring EF Note: 2012 Spring EF catch rate: 28.5/hr. with PSD, RSD-P , and RSD-M values of 97, 71 and 18. No SMB were sampled from the 1995 spring EF assessment.



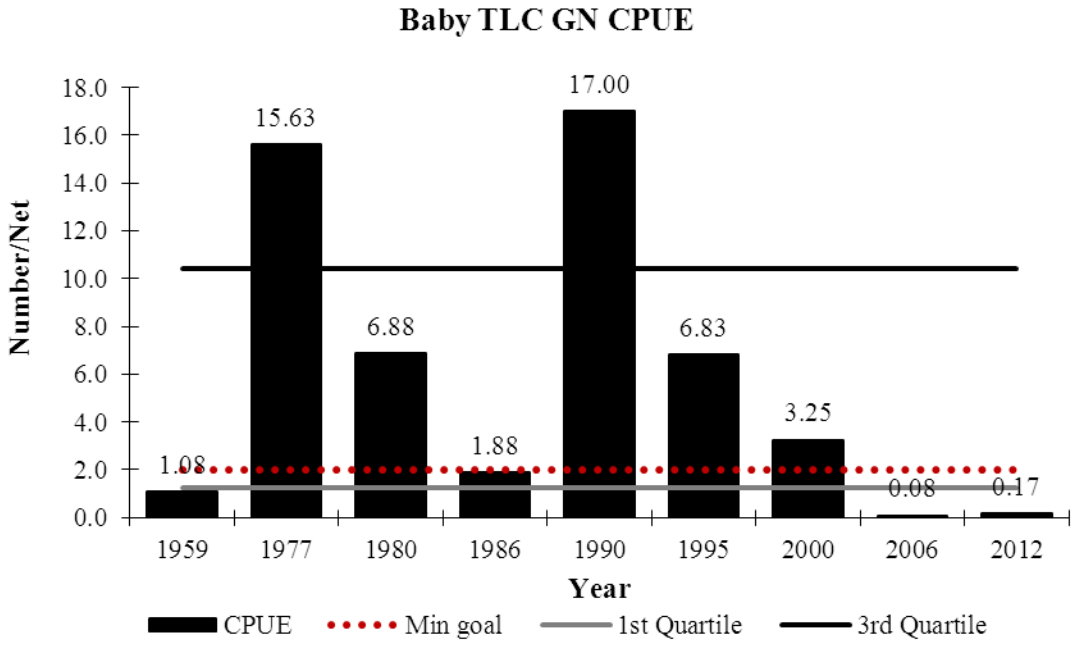




Baby TULLIBEE (Cisco) Catch Rates

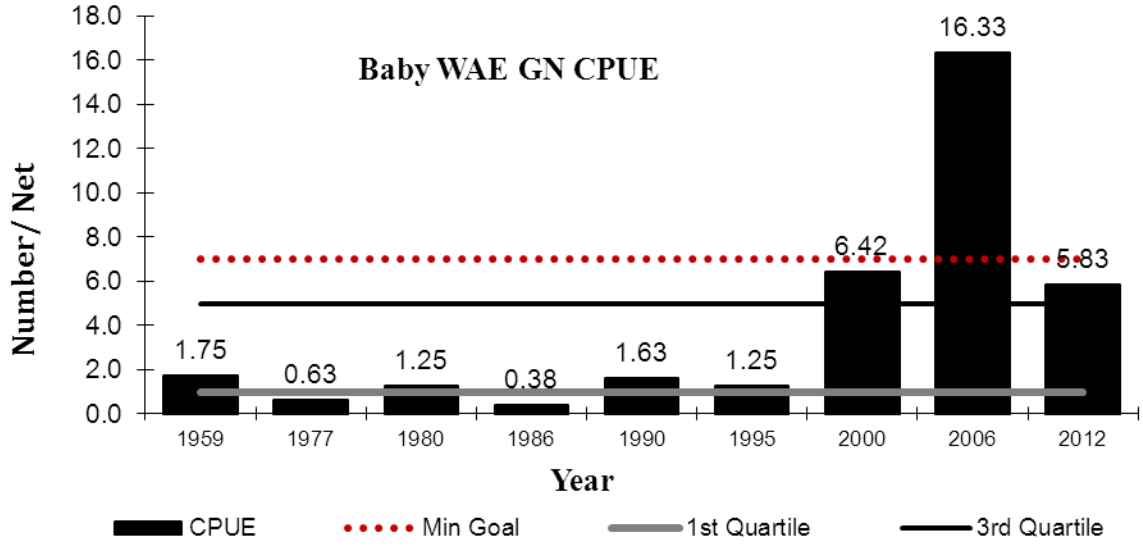
Compared to other Lake Class 23 lakes

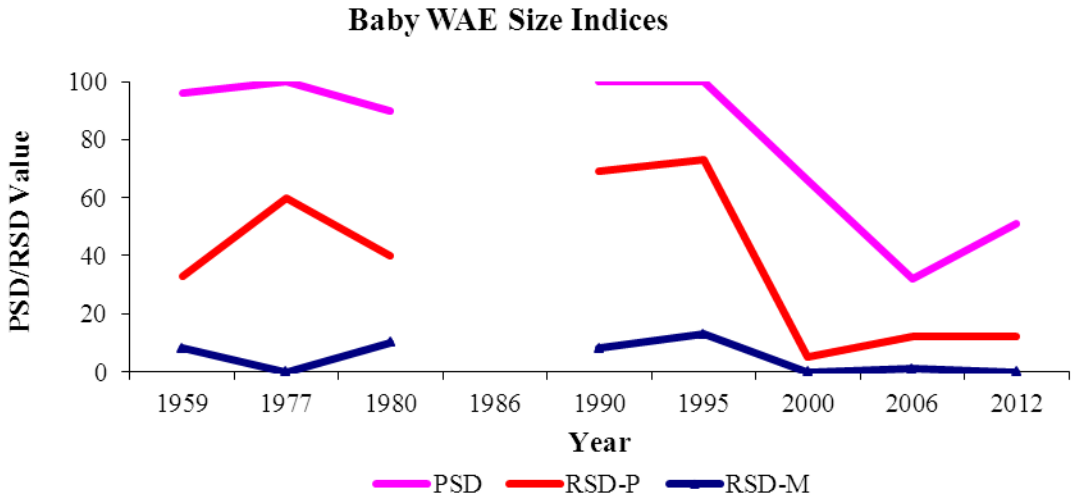
Management Objective: GN catch rate of ≥ 2.0/net.

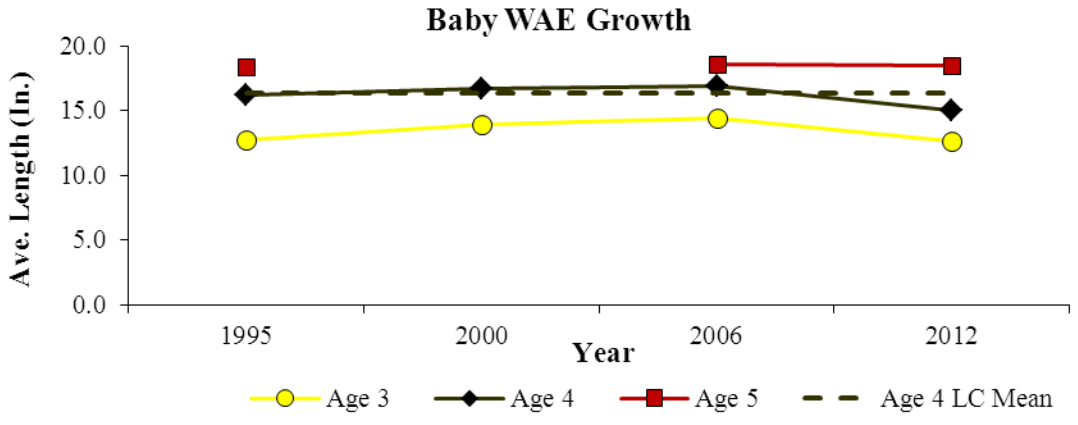


Baby WALLEYE Catch Rates
Compared to other Lake Class 23 lakes

Management Objectives: GN catch rate ≥ 7/net.

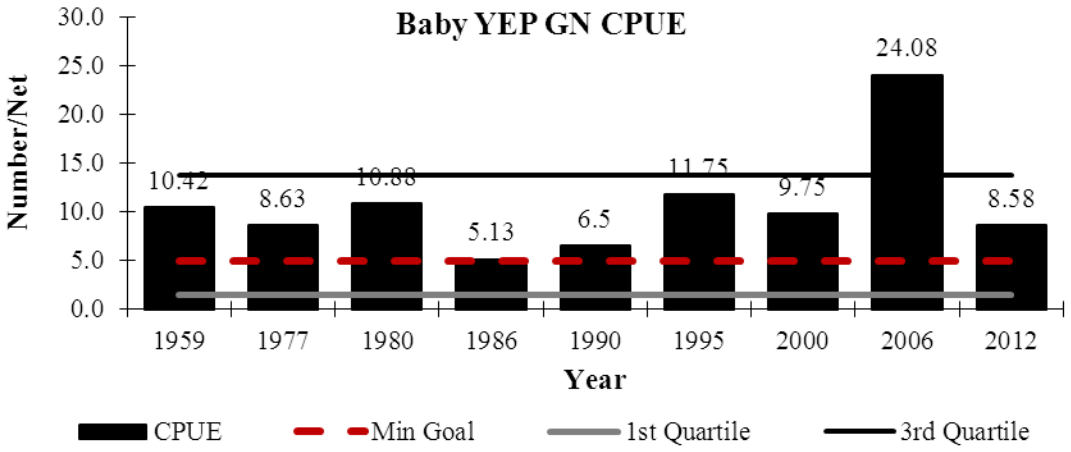


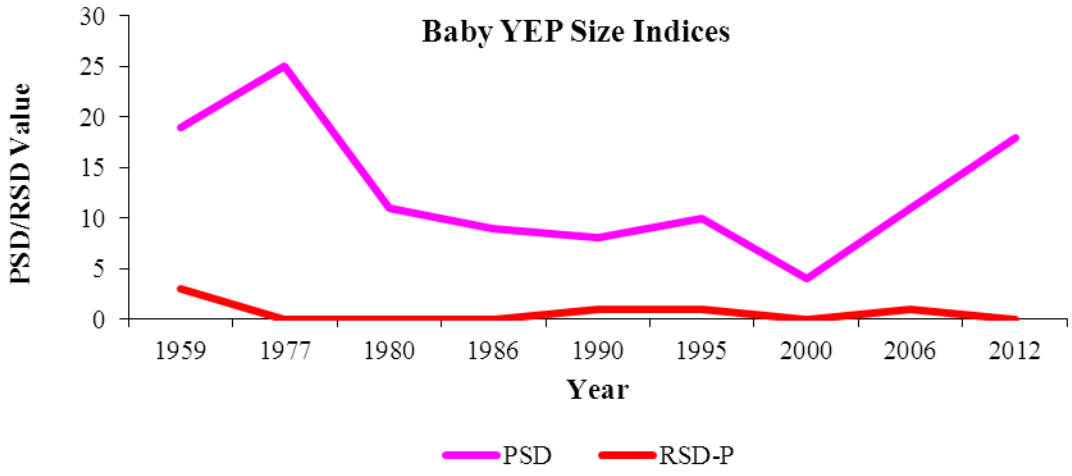


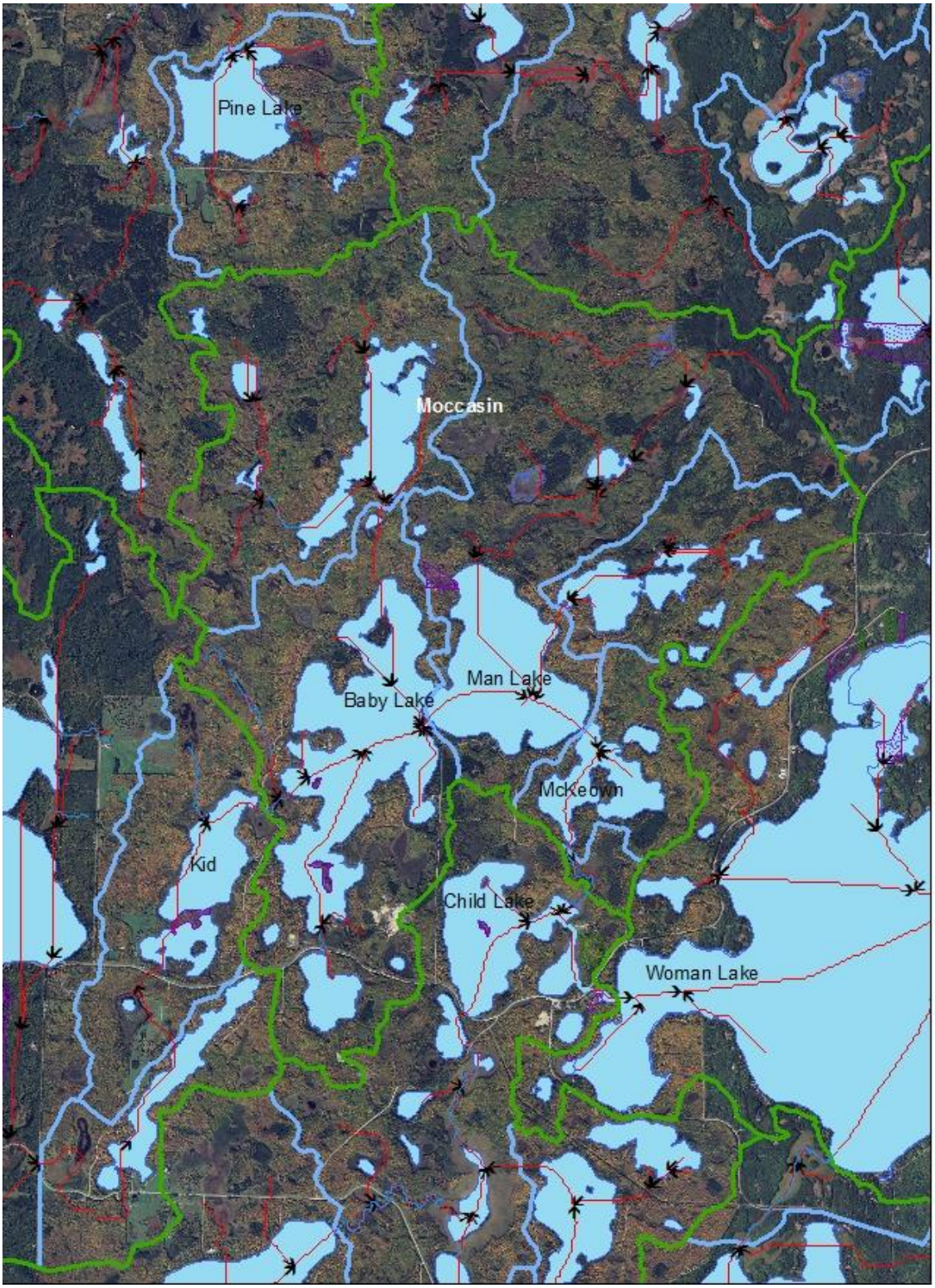


Baby YELLOW PERCH Catch Rates
Compared to other Lake Class 23 lakes

Management Objective: GN catch rates of ≥5 fish/net







Minor watershed for the Baby Lake chain (green boundary), lake-specific watershed (light blue boundary), hydrology between connected waters (red lines with arrows), and Aquatic Management Areas (purple-shaded parcels).

Creel Survey Summary Statistics (from Shavlik 2012)

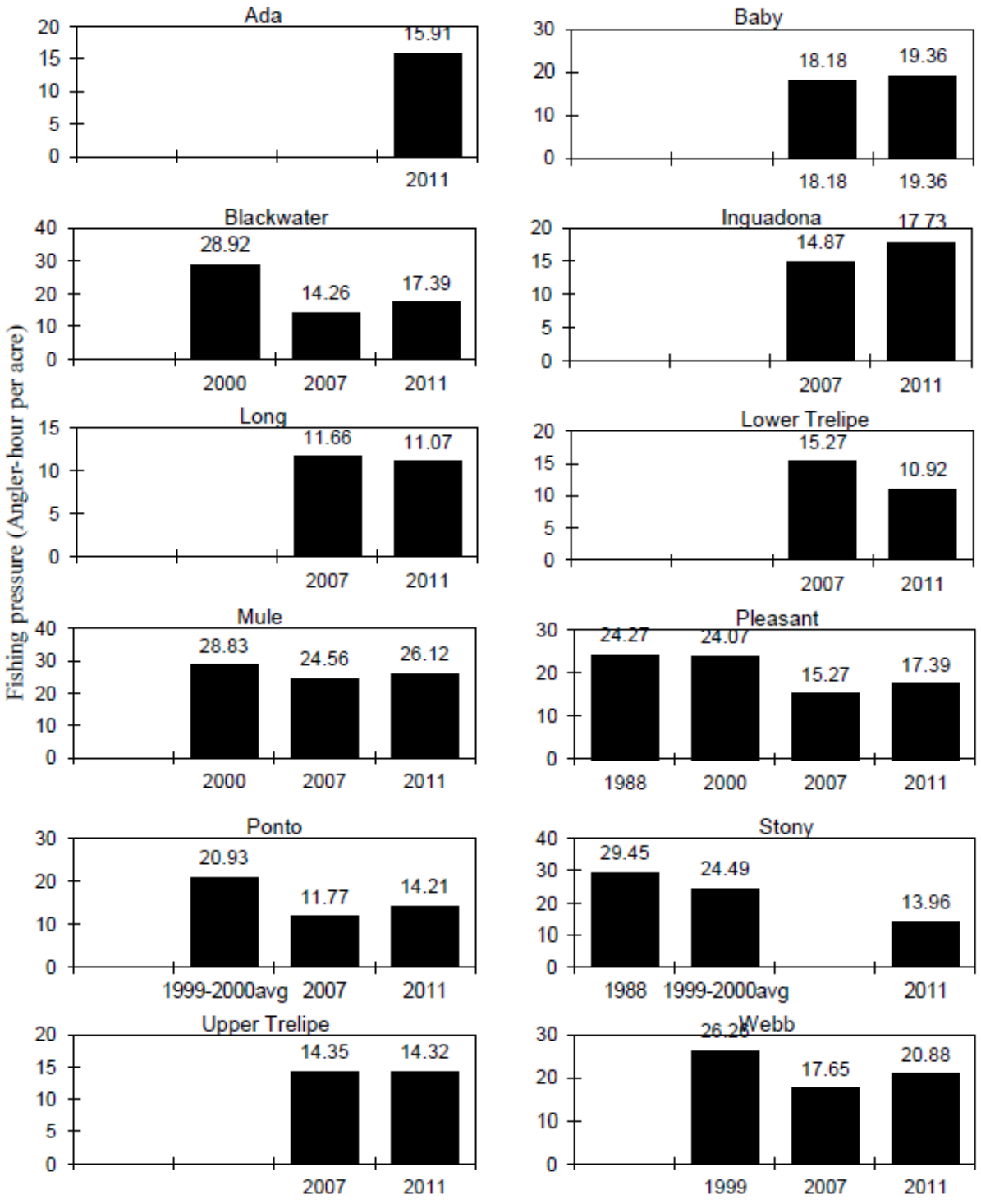


Figure 5. Comparison of fishing pressure for selected lakes in 2011 with previous creel surveys.

Creel, continued.

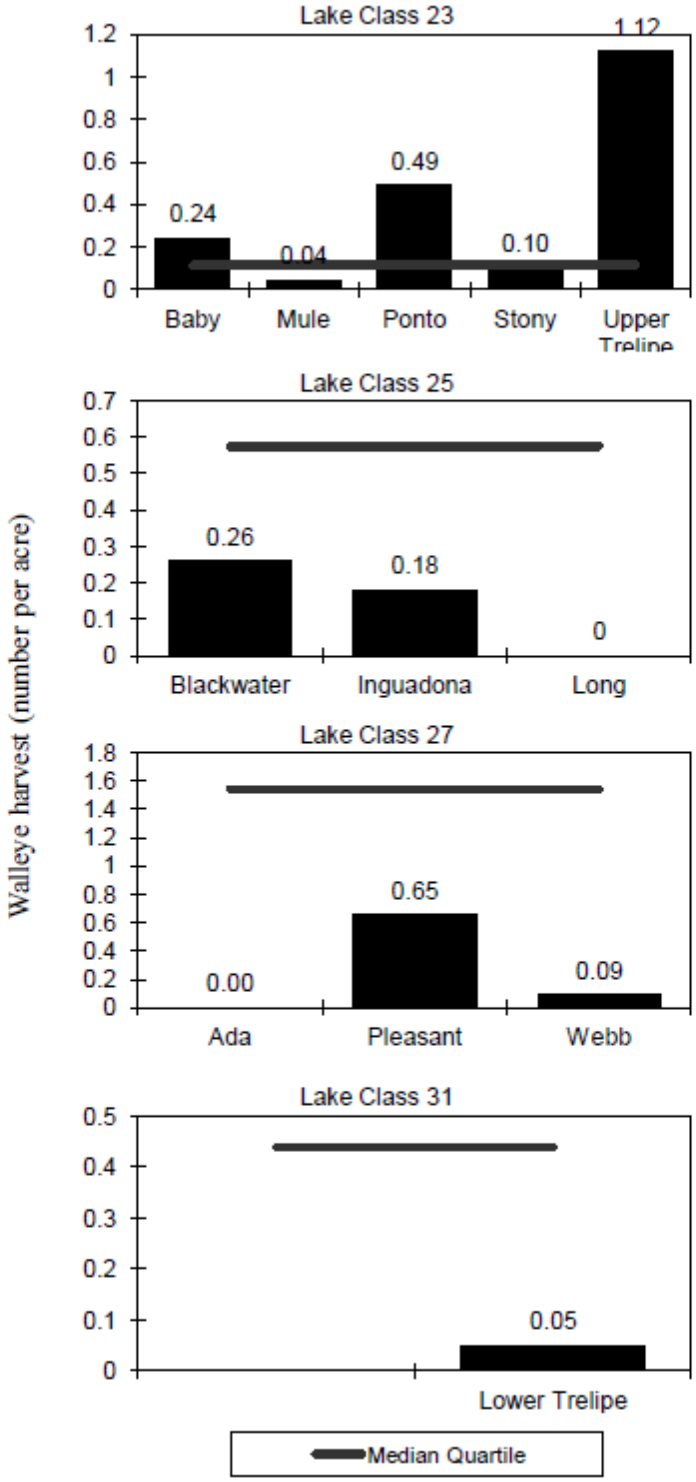


Figure 6. Walleye harvest (number per acre) on Cass County, Minnesota lakes relative to the median of walleye harvest observed on other Minnesota lakes having similar limnological characteristics

Creel, continued.

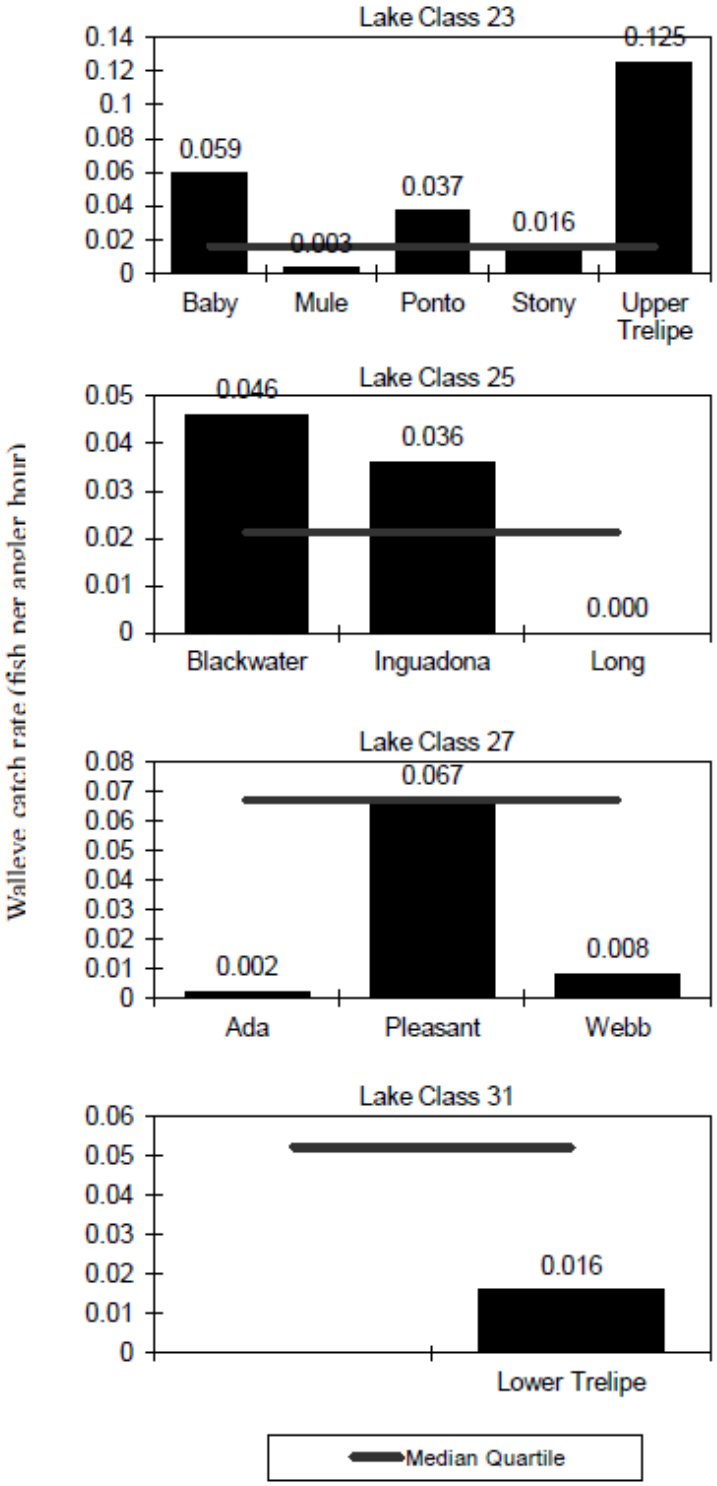


Figure 7. Walleye catch rates (fish per angler-hour) by all anglers on Cass County, Minnesota lakes relative to the median of walleye catch rates observed on other Minnesota lakes having similar limnological characteristics.

Creel, continued.

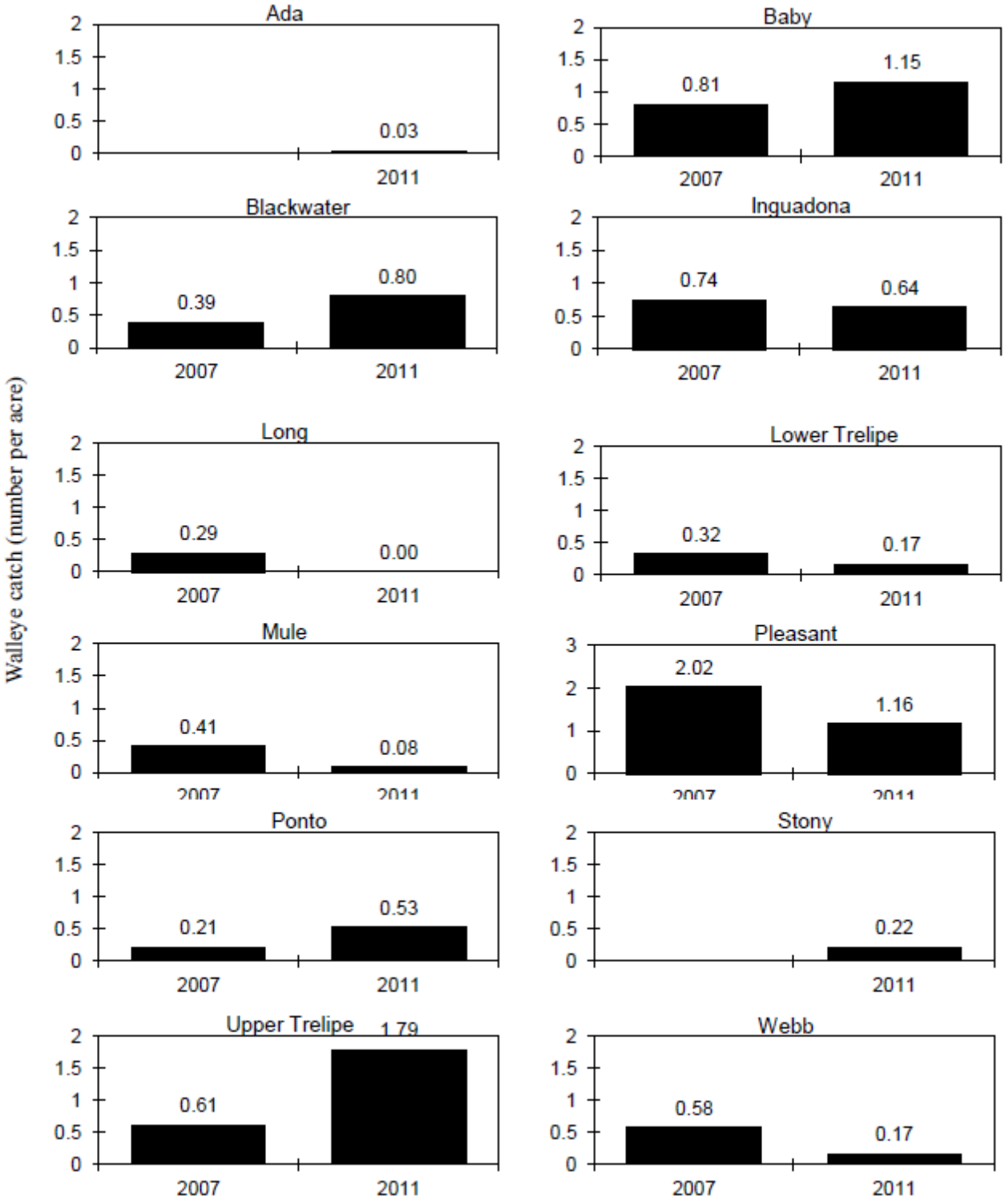


Figure 9. Walleye catch (number per acre) on Cass County, Minnesota lakes relative to the 2007 findings.

Creel, continued.

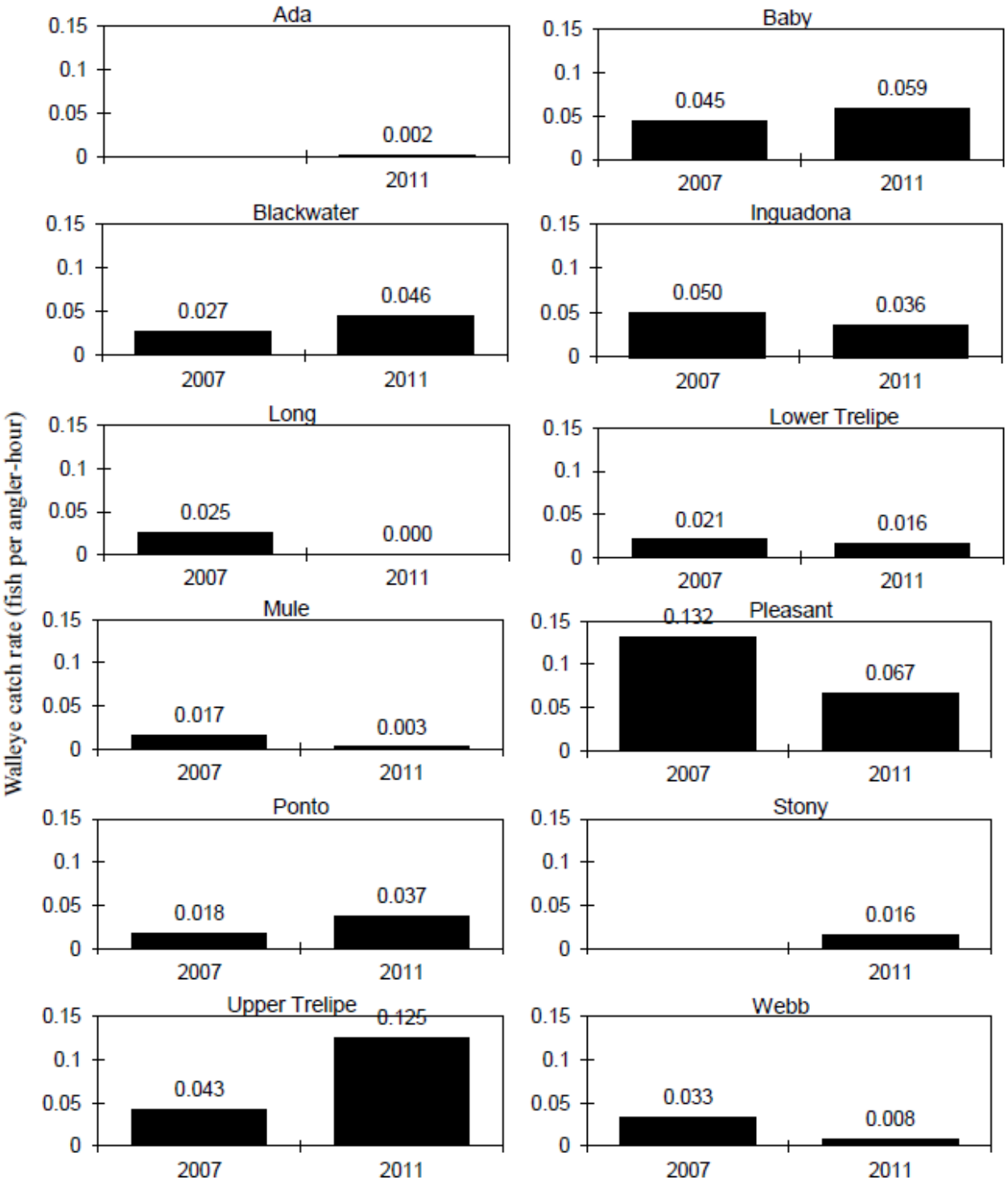


Figure 10. Walleye catch rates (fish per angler-hour) by all anglers on Cass County, Minnesota lakes relative to the 2007 findings

Creel, continued.

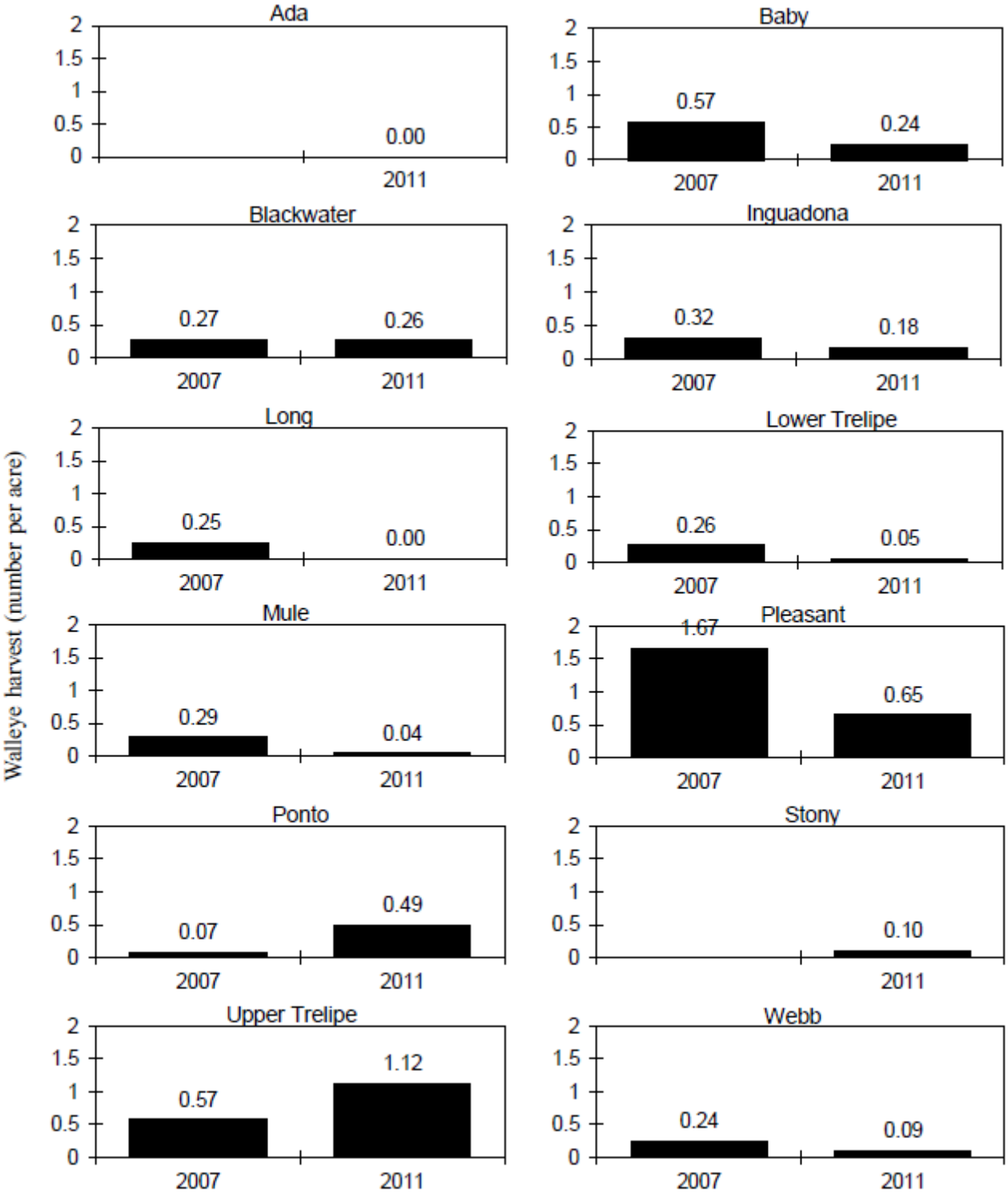


Figure 11. Walleye harvest (number per acre) on Cass County, Minnesota lakes relative to the 2007 findings.

Creel, continued.

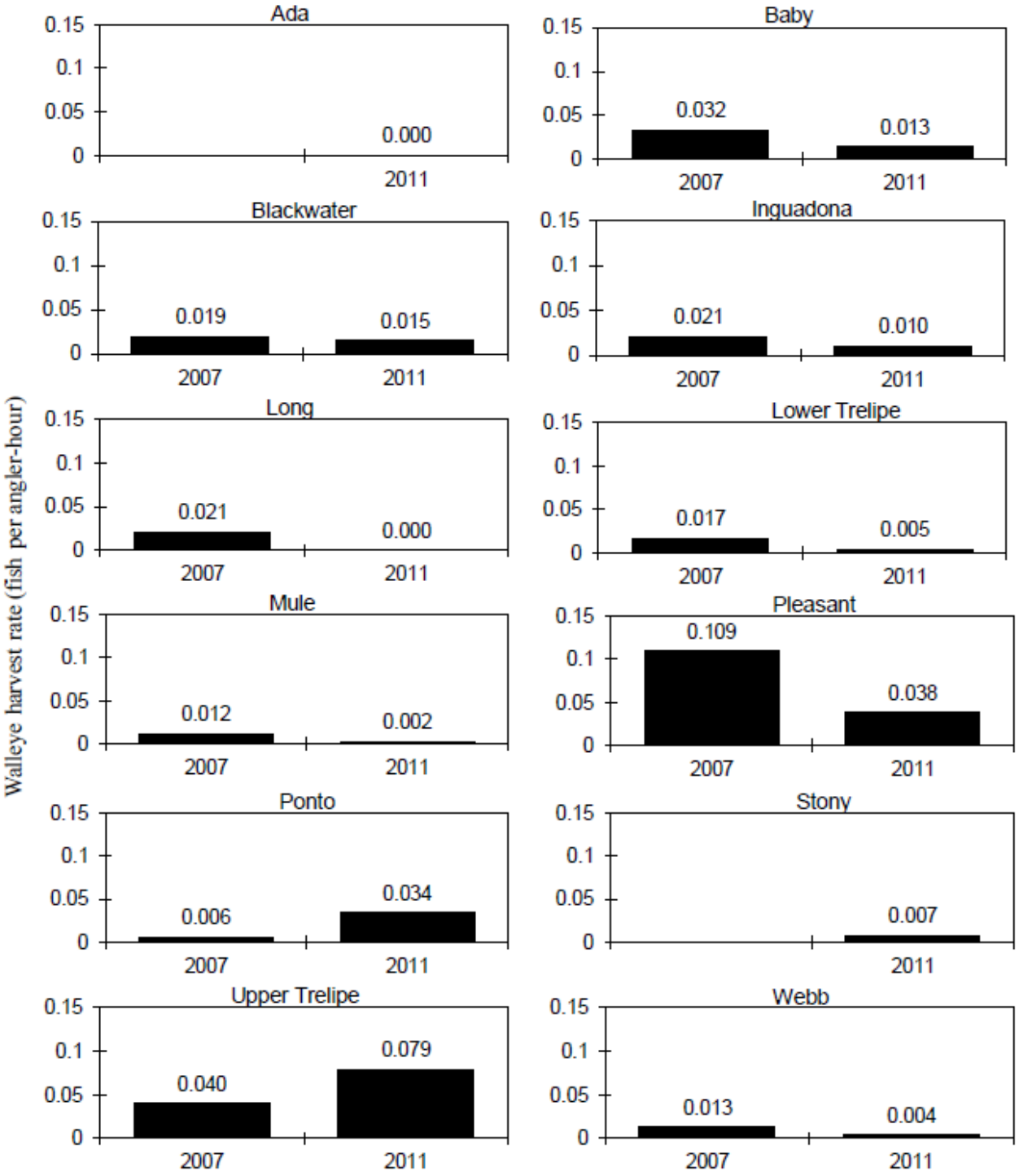


Figure 12. Walleye harvest rates (fish per angler-hour) by all anglers on Cass County, Minnesota lakes relative to the 2007 findings

Walleye Stocking Evaluation Workbook Summary Report

Lake/DOW Baby 11-0283 **LA** 248 **SA** 737 **Lake Class** 23

Walleye Stocking and Age 1-6 Catch Histories

GN CPUE for Year Class

	1959	1977	1980	1986	1995	2000	2006	2012	0	0	0	0	Stocking By Year-class** Pounds	Stocking By Year-class** Rate	FYA by Year Stocked Pounds	FYA by Year Stocked Rate	Fry Stocking Number	Notes Type**	Notes Comment
1953	1.6																	F	
1954	0.0																		
1955	0.0																	F	
1956	0.1																		
1957	0.0																		
1958	0.1																		
1959																			
1960																			
1961																			
1962																			
1963																			
1964																			
1965																			
1966																			
1967																			
1968																			
1969																			
1970																			
1971		0.0																	
1972		0.0															800,000	FRY	
1973		0.1																	
1974		0.0	0.4																
1975		0.0	0.5														200,000	FRY	
1976		0.0	0.0																
1977			0.0														200,000	FRY	
1978			0.0																
1979			0.1																
1980				0.1													700,000	FRY	
1981				0.0															
1982				0.0															
1983				0.0															
1984				0.0															
1985				0.0															
1986																			
1987																			
1988																			
1989					0.0														
1990					0.2														
1991					0.0														
1992					0.0														
1993					0.0														
1994					0.0	0.0													
1995						0.1													
1996						3.8							240	20.2	240	20.2		F	
1997						1.3													
1998						1.2							253	4.6	253	4.6		F	
1999						0.0													
2000							2.0						231	21.6	231	21.6		F	
2001							0.1						106	2.3					
2002							1.9						134	13.5	240	8.6		F	
2003							0.3												
2004							11.2						542	26.6	223	60.9		F	
2005							0.0						155	2.0					
2006								0.0							474	2.4		FA	
2007								0.5											
2008								2.0					496	26.0	496	26.0		F	
2009								0.3											
2010								2.4					496	20.9	496	20.9		F	
2011								0.2											
2012																			
2013																			

***Note - adult fish are considered age-2.*

Baby 11-0283

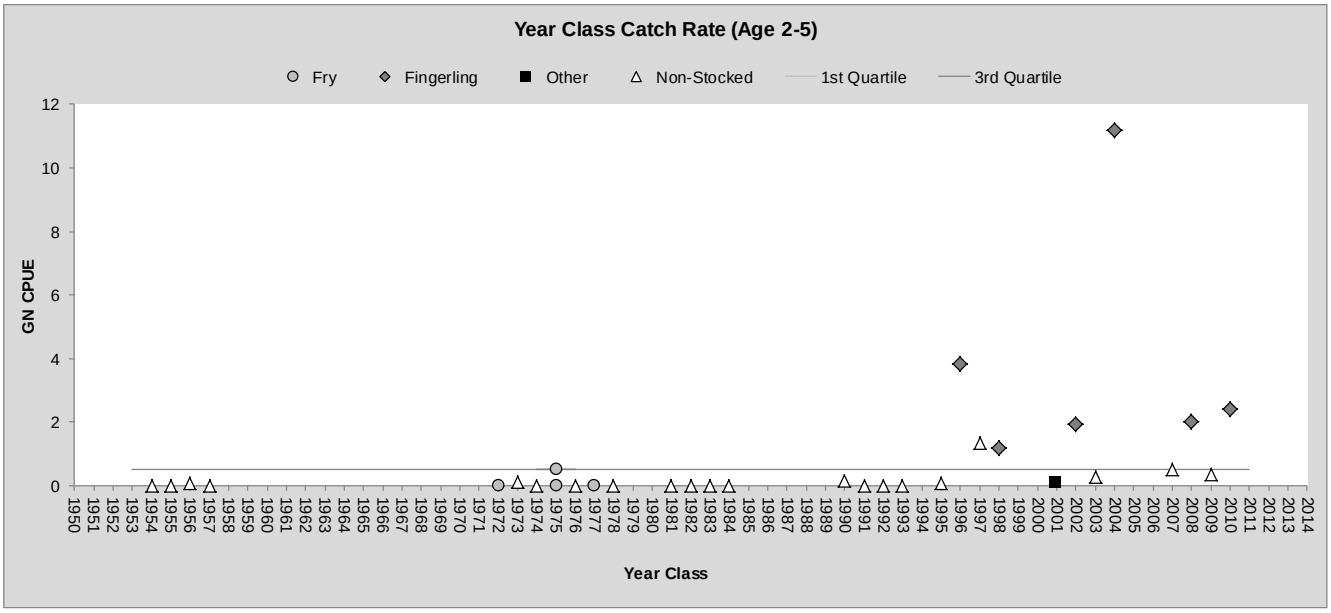
YEAR CLASS CATCH SUMMARY

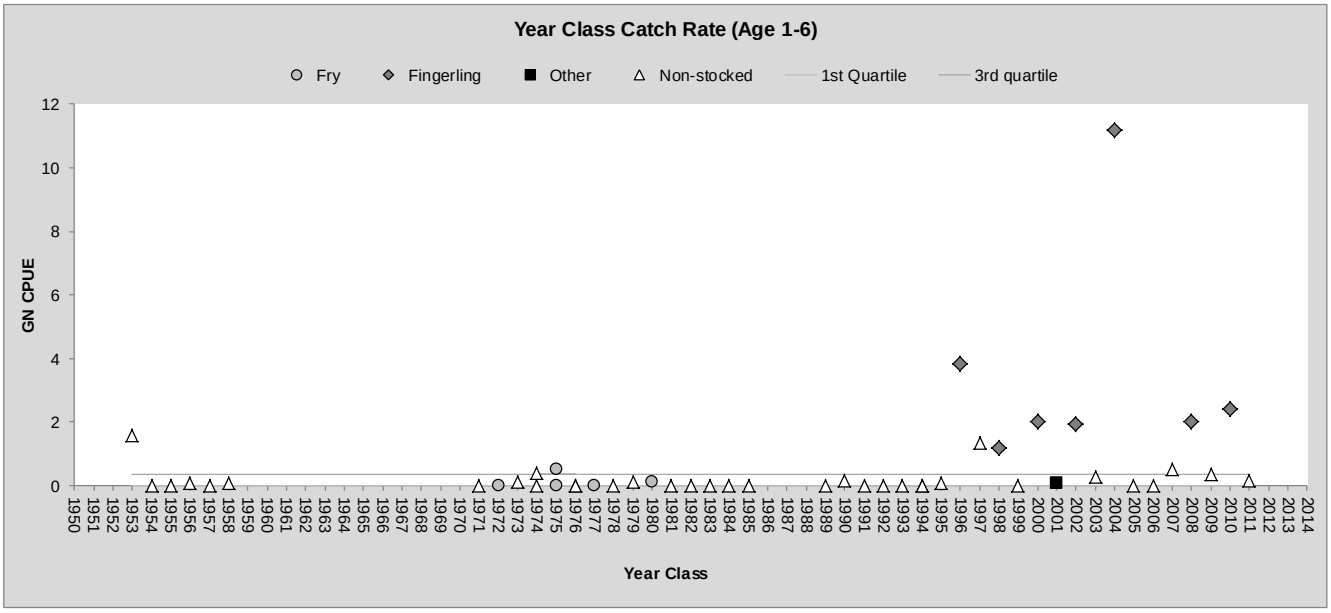
Age 2-5

	2-5 CPUE	CPUE (Stocked)	CPUE (Non-Stocked)
Count	32	11	21
Average	0.8	2.1	0.1
Minimum	0.00	0.00	0.00
1st Quartile	0.00	0.04	0.00
Median	0.04	1.17	0.00
3rd Quartile	0.50	2.21	0.13
Maximum	11.17	11.17	1.33

Age 1-6

	1-6 CPUE	CPUE (Stocked)	CPUE (Non-Stocked)
Count	48	13	35
Average	0.6	1.9	0.1
Minimum	0.00	0.00	0.00
1st Quartile	0.00	0.08	0.00
Median	0.00	1.17	0.00
3rd Quartile	0.34	2.00	0.13
Maximum	11.17	11.17	1.58

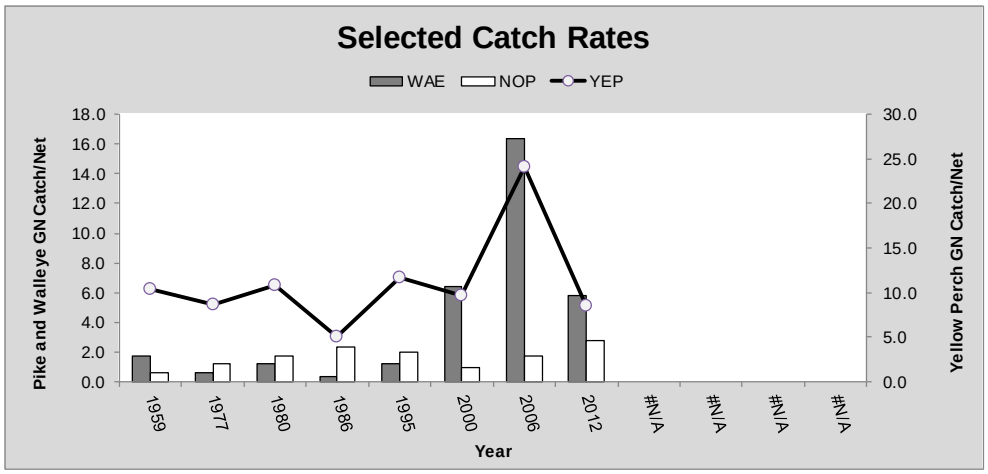




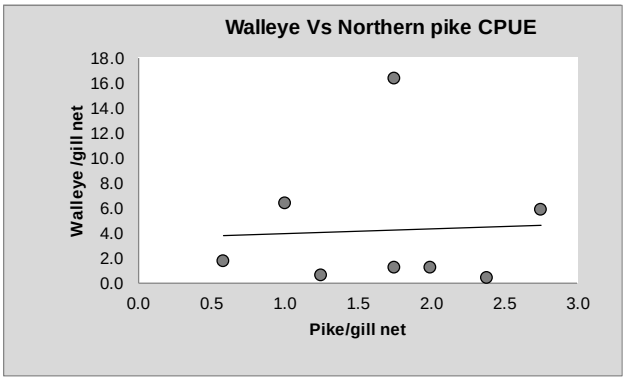
***Note- "Other" may include yearlings, adults, or a fry and FYA combination.*

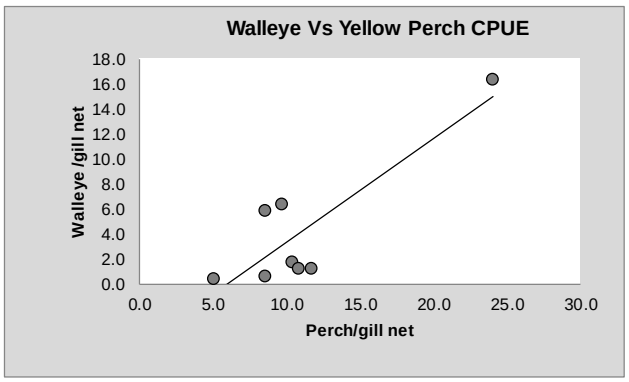
Baby 11-0283

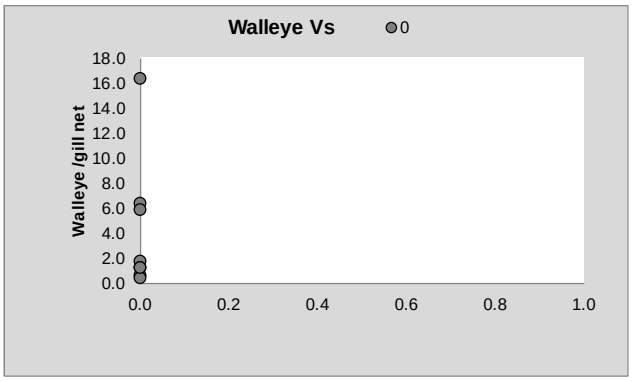
Selected Catch Rates for Walleye, Northern Pike, and Yellow Perch

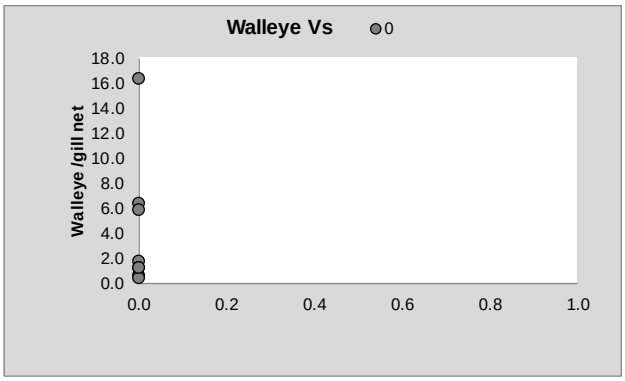


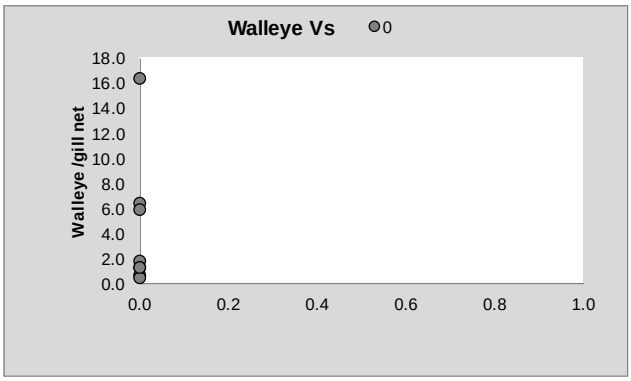
	SPP 1	*SPP*2	*SPP*3
	0	0	0
Gear	0	0	0







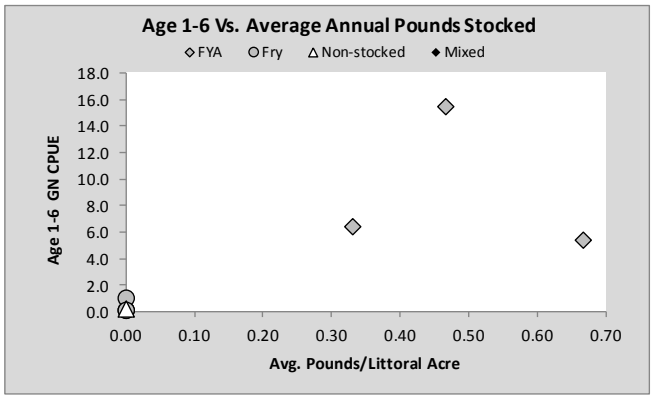


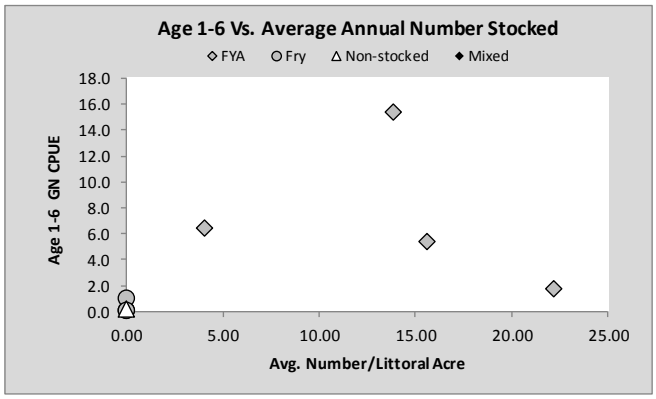


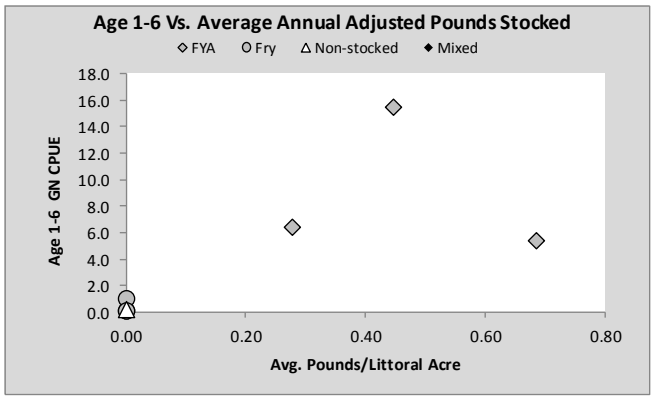
Baby 11-0283

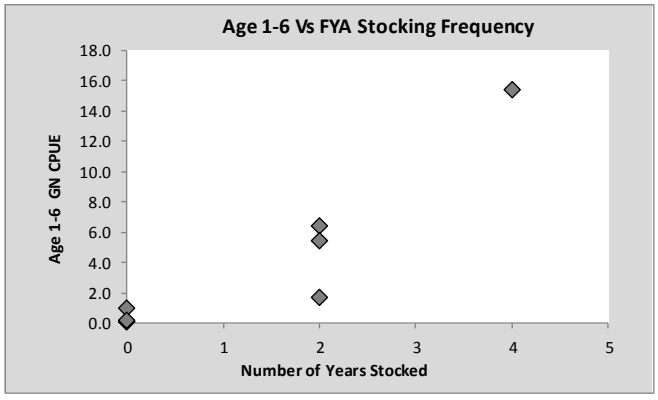
AGE 1-6 ANALYSIS RESULTS-FINGERLINGS, YEARLINGS, AND ADULTS (FYA)

Lake Name	Survey Year	Period			WAE GN CPUE Age 1-6	FINGERLING, YEARLING, ADULT Avg Lbs. /LA	Avg No. /LA	Avg Adjusted Lbs/LA	FRY Avg No. /LA	Avg No. /SA
Baby 11-0283	1959	1953	to	1958	1.8		22.2			
0	1977	1971	to	1976	0.1				672	226
0	1980	1974	to	1979	1.0				269	90
0	1986	1980	to	1985	0.1				470	158
0	1995	1989	to	1994	0.2					
0	2000	1994	to	1999	6.4	0.3	4.0	0.3		
0	2006	2000	to	2005	15.4	0.5	13.9	0.4		
0	2012	2006	to	2011	5.4	0.7	15.6	0.7		
0			to							
0			to							
0			to							
0			to							









***Note- Mixed stockings consist of both FYA and Fry stocking types.*

From Ward and Miller 2014. Population estimates for Muskellunge in Baby Lake and Man Lake comparing recaptures provided by electrofishing and anglers. M is the number of unique fish marked in trap nets; C is captures by electrofishing or anglers; R is the number of marked fish recaptured; N is the Lincoln-Peterson (with Chapman modification) population estimate and CI is the 95% confidence interval. Data were combined to form one overall estimate because individual genetic fingerprints indicated considerable movement between lakes. The number of angler recaptures in the combined estimate is greater than the sum of the lake recaptures because six fish marked in Baby Lake were recaptured by Man Lake anglers.

Lake and recapture method	M	C	R	N	CI +/-
Baby L					
efish	152	77	33	290	60.1
angler	152	26	9	344	148.1
Man L					
efish	38	10	5	64	28.0
angler	38	22	8	99	42.3
Combined					
efish	190	87	38	360	70.1
angler	190	48	23	352	88.2