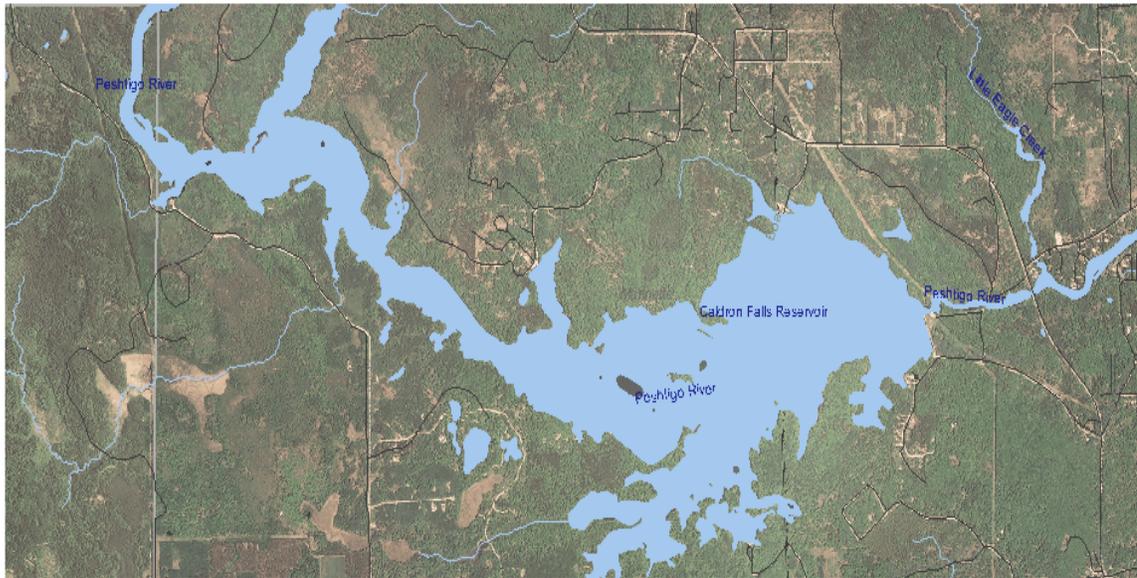


**Comprehensive Fisheries Survey of Caldron Falls Reservoir, Marinette
County Wisconsin 2005-2006**

Waterbody Identification Code 545400



Justine Hasz
Senior Fisheries Biologist
Wisconsin Department of Natural Resources
Peshtigo, WI
February, 2008

**Comprehensive Fisheries Survey of Caldron Falls Reservoir,
Marinette County, Wisconsin 2005-2006**

Report Approval signatures

Justine Hasz, Senior Fisheries Biologist, Date

Michael Donofrio, Fisheries Supervisor, Date

George Boronow, Regional Fisheries Supervisor, Date

Andy Fayram, Quantitative Fisheries Policy Specialist, Date

**Comprehensive Fisheries Survey of Caldron Falls Reservoir, Marinette County
Wisconsin 2005-2006**

Justine Hasz
Senior Fisheries Biologist
February, 2008

Executive Summary

A basic fisheries survey of Caldron Falls Reservoir was conducted during the 2005 field season and followed up with a more comprehensive fisheries survey that was implemented during the 2006 field season. The dominant game fish species in this reservoir are northern pike (population estimate = 983), walleye (population estimate = 844), muskellunge (population estimate = 285), largemouth bass (population estimate = 316) and smallmouth bass (population estimate 140). Bluegill is the most abundant panfish species with good numbers of rock bass, yellow perch, pumpkinseed and black crappies. The recommended management of Caldron Falls Reservoir is for muskellunge, northern pike, walleye, largemouth bass, smallmouth bass and panfish.

Lake and Location:

Caldron Falls Reservoir, Marinette County, T33N R18E Sec 10
Located in west central Marinette County, 12 miles northwest of Crivitz

Physical / Chemical attributes (Wisconsin DNR, 1975):

Morphometry: 1,018 acres, maximum depth 40 feet, mean depth 15 feet, shoreline 22.6 miles

Lake type: Impoundment on the Peshtigo River

Watershed: 482 square miles with 144 acres of adjoining wetlands

Basic Water Chemistry: Hard water drainage lake having a slightly alkaline clear water of high transparency, secchi disc – 15 feet (summer), pH 7.1, Conductance 265 mmhos.

Littoral Substrate: 60% sand, 15% gravel, 15% muck and 10% rock.

Aquatic Vegetation: Dense aquatic vegetation is found in several areas of the reservoir, including the invasive species Eurasian Water Milfoil.

Other Features: The majority of the shoreline is undeveloped and owned by the State of Wisconsin and forms part of the Peshtigo River State Forest and Governor Thompson State Park. The shoreline is primarily upland consisting of mixed hardwoods and conifers with limited areas of coniferous bog wetland. This impoundment is the upper most reservoir on the Peshtigo River.

Purpose of Survey: Assess the fishery status

Dates of fieldwork:

Mini-fyke netting (juvenile fish) – July 7 – 8 and 21-22, 2005

Electroshocking – October 17, 2005 and April 26, May 22 and June 5, 2006

Fyke netting (all species and ages) – April 10 – 23, 2006

BACKGROUND

Caldron Falls Reservoir has an undeveloped shoreline with only two properties located along the shoreline. The vast majority of the shoreline was recently been purchased by the State of Wisconsin from the Wisconsin Public Service Corporation. The purchase created part of the Peshtigo River State Forest and also Governor Thompson State Park. There are six public boat accesses on the Reservoir and all are owned and operated by the State of Wisconsin. The good access, undeveloped shoreline, and excellent fishery of Caldron Falls Reservoir make it a popular destination water. The number of people recreating on the reservoir is high and it is a multiple use water with anglers, waterskiers, personal watercraft and pleasure boaters.

Since 1985, the portion of Caldron Falls Reservoir up to the riverine section has been eligible for tribal off reservation spearing harvest. There have been no walleye or muskellunge harvested under this activity between 1985 and 2007.

Several fisheries surveys were previously conducted on Caldron Falls Reservoir. Annual fall boomshocking surveys were carried out from 1985 through 2003. Spring fyke netting and fall boomshocking surveys were performed in 1983, 1991 and 2000. We also conducted numerous fyke netting and boomshocking fishery surveys in the 1950's, 1960's and 1970's. Many of the previous surveys focused on evaluating the muskellunge population of Caldron Falls Reservoir and the Federal Energy Regulatory Commission (FERC) relicensing of the Caldron Falls Hydroelectric facility.

Wisconsin Public Service still owns and operates the Caldron Falls Hydroelectric facility. An annual drawdown in the late winter - early spring to accommodate spring run off is still operated to a maximum depth of 8 feet. The drawdown usually lasts until early May when the reservoir is brought back to full pool.

The fish stocking history for Caldron Falls Reservoir has varied over the last 35 years. Walleyes have been stocked about every 3 years since the early 1970's and are currently stocked every other year (Table 1). Largemouth bass were stocked by a private source in 1979. Muskellunge have been stocked since the early 1970's and are currently stocked on an annual basis (Table 1).

Table1. DNR and privately funded fish stocking 1974 through 2006 in Caldron Falls Reservoir, Marinette County, Wisconsin. All stockings are DNR unless otherwise stated.

Year	Species	Size (average)	Number
1974	Muskellunge	9 inches	2,500
1975	Muskellunge	11 inches	2,000
1976	Muskellunge	9 inches	2,000
	Walleye	3 inches	50,000
1977	Muskellunge	9 inches	2,000
1978	Muskellunge	8 inches	2,000
	Walleye	Fry	2,000,000
1979	Largemouth bass	Fry	10,000 (Private)
	Muskellunge	8 inches	2,000
1980	Muskellunge	7 inches	2,000
1982	Muskellunge	11 inches	835
	Walleye	4 inches	50,000
1983	Muskellunge	11 inches	2,227
	Walleye	Fry	2,000,000
1986	Muskellunge	13 inches	1,000
1987	Muskellunge	9 inches	3,000
1988	Muskellunge	10 inches	1,000
1989	Muskellunge	11 inches	1,000
1990	Muskellunge	8 inches	1,000
1991	Muskellunge	12 inches	747
1992	Muskellunge	11 inches	1,000
1993	Muskellunge	10.5 inches	1,004
	Walleye	2 inches	7,644
1995	Muskellunge	11 inches	908
1996	Muskellunge	11 inches	500
	Walleye	2 inches	18,692
1998	Walleye	2 inches	20,000
1999	Muskellunge	11 inches	1,000
	Walleye	1 inch	20,000
2000	Muskellunge	11 inches	850
2001	Muskellunge	11 inches	1,000
	Walleye	2 inches	30,000
2002	Muskellunge	10 inches	998
2003	Muskellunge	11 inches	1,000
	Walleye	1 inch	20,000
2004	Muskellunge	11 inches	999
2005	Muskellunge	11 inches	999
	Walleye	1 inch	24,905
2006	Muskellunge	11 inches	219
2007	Muskellunge	12 inches	667
	Walleye	8 inches	2,940 (Private)

METHODS

Six mini-fyke nets (1/4" stretch mesh with turtle exclusion targeting young-of-the-year fish) were set on July 7th, 2005 and lifted on July 8th and four mini-fyke nets were set on July 21st, 2005 and lifted on July 22nd (Appendix Figure 1). A Wisconsin DNR standard direct current full size electrofishing boat was used on October 17th 2005 along 6.0 miles of shoreline (Appendix Figure 2) and on April 26th 2006 along 2.2 miles of shoreline (Appendix Figure 3). Electroshocking surveys were also performed on May 22nd and June 5th, 2006 for a total of 12.89 miles of shoreline. Eleven standard fyke nets (3/4" stretch mesh) were set between April 10th 2006 and April 20th and lifted daily from April 11 -24, 2006 (Appendix Figure 4).

In the mini fyke netting survey, data collected included measuring the first 30 fish of each species and then a total count for each species. In the electroshocking run during October 2005, all species were collected in a 1/2 mile index station of shocking and game fish only were collected for an additional 1.5 mile station. Up to a total of 250 individuals of each species were randomly selected and measured to the nearest 0.1 of an inch and a total count of all fish was made for those surveys.

In the fyke netting survey during April 2006, all game fish were given a top caudal fin clip (for mark recapture population estimate). An ageing structure was collected from 5 fish per 0.5 inch group per sex with a length to the nearest 0.1 inch along with a weight to the nearest gram. An additional 250 individuals per species had length taken to the nearest 0.1 inch and all other fish were counted. An ageing structure was collected from 10 panfish per 0.5 inch group per species with a length to the nearest 0.1 inch and a weight to the nearest in gram. Ageing structures were not collected from northern pike as non-lethal scale samples have not proven reliable for ageing this species, especially in slow growing populations. An additional 250 lengths per species measured to the nearest 0.1 inch were collected and all additional fish were counted. The Schnabel population estimation technique was used for gamefish and was calculated using only the fyke net caught fish from spring 2006.

In the electroshocking run during April 2006, only game fish were sampled and a total of 2.2 miles of shoreline were shocked at this reservoir. All game fish were measured to the nearest 0.1 inch. The sex was determined when possible and each fish was checked for a fin clip. Length at age comparisons are for all lakes sampled with relevant species in northeast (NER) Wisconsin and Wisconsin State average. Those number were last updated in 2003. Those results served as comparisons for growth rates in this report as well as previous fish surveys on Caldron Falls Reservoir.

RESULTS AND DISCUSSION

Catch per unit effort results for all survey methods used in 2005 and 2006 are shown in Table 2. Ten game species were captured and detailed results for common species are written in this report. Numerous non-game species were also captured, but were not described beyond over all abundance.

Table 2. Catch per unit effort of game fish and panfish species during fishery surveys in 2005 and 2006 on Caldron Falls Reservoir Lake, Marinette County, Wisconsin. Panfish were not collected during April and June 2006 electroshocking.

Species	July 2005 Mini-fyke net (# / net night)	October 2005 Electrofishing (# / mile)	April 2006 Fyke net (# / net night)	April / June 2006 Electrofishing (# / mile)
Black bullhead	0.7	0.3		--
Black crappie	1.6	57.3	2.48	--
Bluegill	14.3	164	62.65	--
Largemouth bass	15.0	14.8	0.47	11.2
Northern pike	0.1	2.5	4.04	1.5
Muskellunge	0	4.2	1.55	0.8
Pumpkinseed	1.3	4.3	7.71	--
Rock bass	1.4	7	16.68	--
Smallmouth bass	0.8	0.17	0.33	0.7
Walleye	0	2.17	1.16	2.1
Yellow bullhead	0.8	0.3		--
Yellow perch	10.5	115.3	11.22	--

Muskellunge

During the summer 2005 mini fyke netting survey, no juvenile muskellunge were captured at this impoundment. Electroshocking during the fall of 2005, produced 4.2 muskellunge per mile and during the spring 2006 at a rate of 0.8 fish per mile. During the spring 2006 fyke netting survey, we captured one hundred and thirty eight muskellunge. Their size ranged from 11.7 to 48.5 inches in length (Figure 1) and averaged 35.3 inches, not counting the recaptured fish (42). The catch per effort was 1.55 muskellunge per net night. The total population estimate was 284.7 muskellunge with a 95% confidence interval of 213.8 to 426.1 fish for a density of 0.28 fish per acre. The population estimate for muskellunge over 30 inches was 244.7 with a 95% confidence interval of 194.7 to 329.5 fish for a density of 0.24 (Figure 1a). The population estimate of muskellunge over 32 inches was 232.1 with a 95% confidence interval of 183.8 to 315 fish for a density of 0.23 (Figure 1b).

In 1991, a total of one hundred and seventy eight muskellunge were captured ranging in size from 11.6 to 46.5 inches (Figure 1) and averaged 33.2 inches. The catch per effort was 0.46 muskellunge per net night. A population estimate for muskellunge over 30 inches was 521 with a 95% confidence interval of 129 to 915 fish (Figure 1a) for a density of 0.51 fish per acre. The population estimate for muskellunge over 32 inches was 292 with a 95% confidence interval of 242 to 368 fish (Figure 1b) for a density of 0.29 fish per acre.

In 1982, a total of one hundred and fifteen muskellunge were captured ranging in size from 11.0 to 49.9 inches (Figure 1). The catch per effort was 0.57 muskellunge per net night. A population estimate for muskellunge over 30 inches was 306 with a 95% confidence interval of 203 to 618 fish (Figure 1a) for a density of 0.3 fish per acre. The population estimate for muskellunge over 32 inches was 204 with a 95% confidence interval of 125 to 548 (Figure 1b) for a density of 0.2 fish per acre.

The length at age of muskellunge sampled in 2006 showed slower growth in all ages of muskellunge when compared to the NER average and both the 1982 and 1991 surveys (Table 3). In all three survey years, there was a good sample representation across many year classes of muskellunge. The sample size of aged muskellunge for 1982 was 107, 1999 was 151 and 2006 was 118 (Table 3).

Since 1970, all muskellunge fingerlings stocked into Caldron Falls Reservoir have been fin clipped. In 2006, 24.6% of the muskellunge captured were stocked fish. In 1991, 33% of the muskellunge captured were stocked fish. In 1982, 38% of the muskellunge captured were stocked fish.

Figure 1. Length Frequency of Muskellunge in Caldron Falls Reservoir, Marinette County, Wisconsin

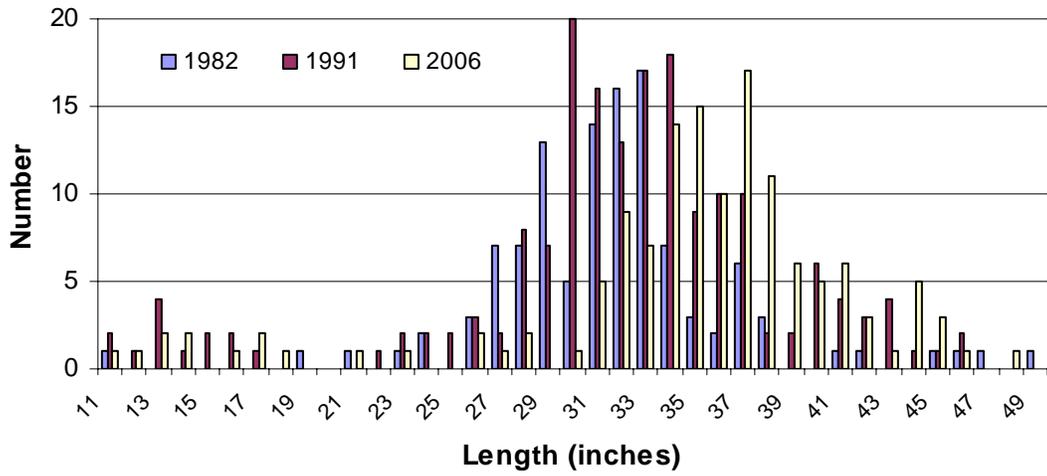
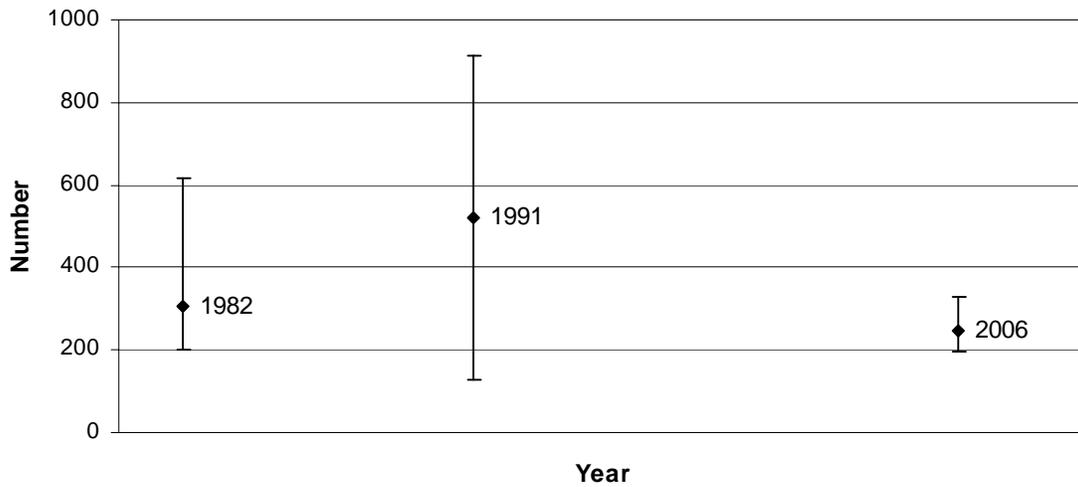


Figure 1a. Population Estimate of muskellunge over 30 inches Caldron Falls Reservoir, Marinette County, Wisconsin



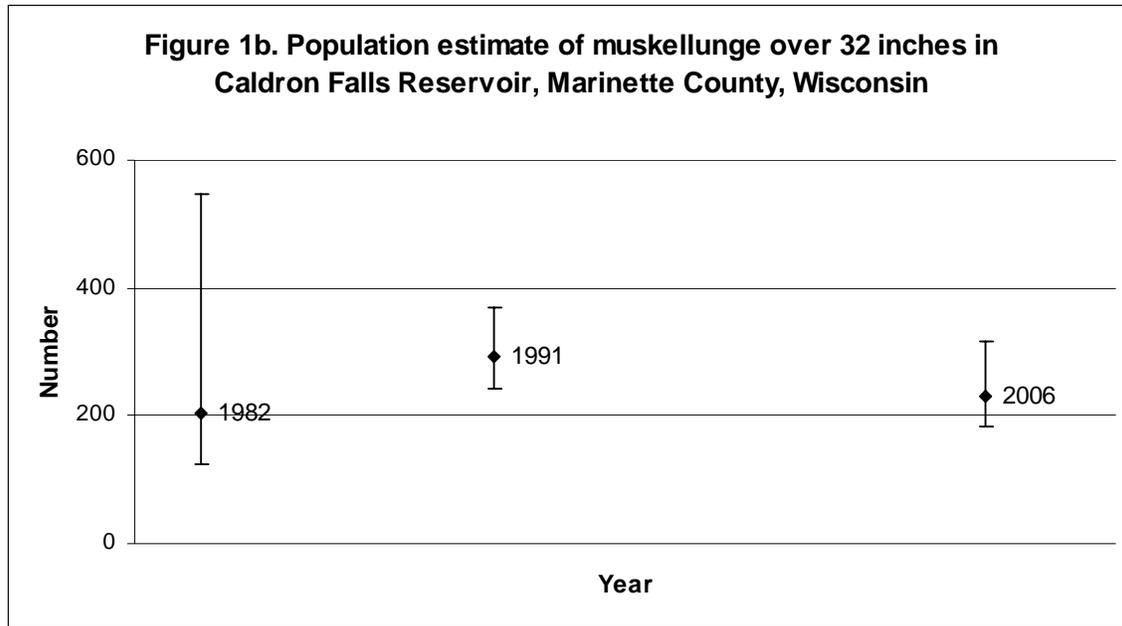


Table 3. 2006 Fyke net age- length distribution of muskellunge from Caldron Falls Reservoir, Marinette County Wisconsin compared to Northeast (NER) Wisconsin average length at age data, 1991 and 1982 survey information. N equals sample size.

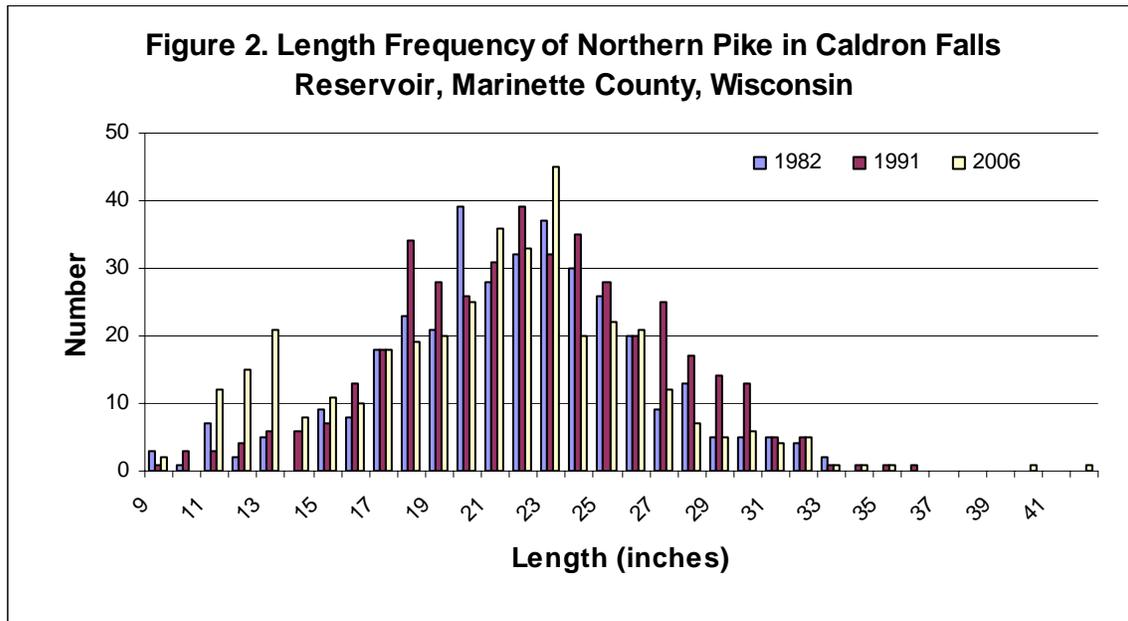
Age	1	2	3	4	5	6	7	8	9	10	11	12	13
NER Average	12.7	19.5	24.0	27.7	31.3	33.9	37.6	36.7	41.2	40.4	42.8	46.1	45.8
2006 Survey	12.7	17.0	22.4	27.2	27.6	32.1	34.3	36.8	38.1	39.5	38.2	43.5	42.1
N (2006)	4	5	2	2	2	12	18	29	21	18	11	2	2
1991 Survey	12.9	-	24.5	30.6	32.7	35.0	37.9	40.0	40.7	42.4	46.5	-	-
N (1991)	4	-	4	22	55	32	11	15	5	2	1	-	-
1982 Survey	11.8	-	23.0	27.8	29.7	32.9	34.5	39.2	38.4	-	47.0	46.9	-
N (1982)	1	-	4	13	19	32	27	4	2	-	1	4	-

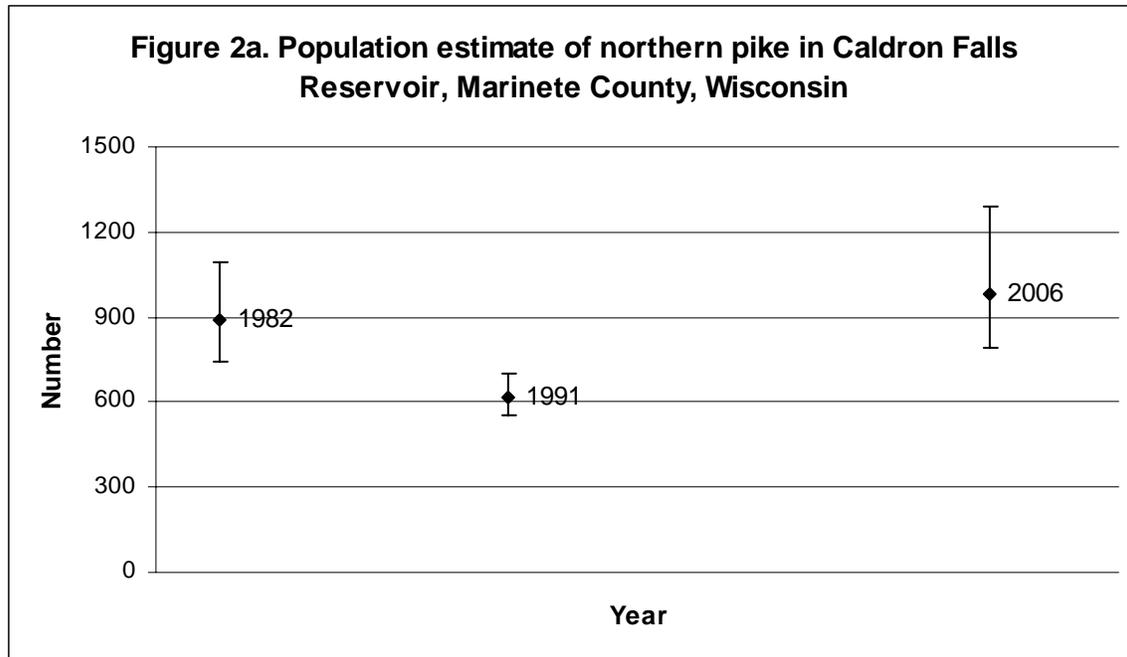
Northern Pike

During the summer 2005 mini fyke netting survey, one juvenile northern pike was captured in this reservoir. Electroshocking during the fall of 2005, produced 2.5 northern pike per mile. During the spring of 2006, that rate was 1.5 fish per mile. During the spring 2006 fyke netting survey, we captured three hundred and eighty five northern pike. They ranged in size from 9.9 to 42.0 inches in length (Figure 2) and averaged 21.5 inches, not counting the recaptured fish (84). The catch per effort was 4.04 northern pike per net night. A population estimate was 983 northern pike with a 95% confidence interval of 794.5 to 1,288.9 fish for a density of 0.97 fish per acre (Figure 2a).

In 1991, a total of four hundred and seventeen northern pike were captured ranging in size from 9.5 to 36.4 inches (Figure 2) and averaged 22.5 inches. The catch per effort was 1.07 northern pike per net night. A total population estimate of 620 northern pike with a 95% confidence interval of 557 to 699 fish (Figure 2a) for a density of 0.61 fish per acre. In 1982, a total of three hundred and fifty two northern pike were captured ranging in size from 9.0 to 33.9 inches (Figure 2). The catch per effort was 1.7 northern pike per net night. A total population estimate was 888 northern pike with a 95% confidence interval of 746 to 1095 fish (Figure 2a) for a density of 0.87 fish per acre.

No length at age data was collected during the 2006 survey due to the difficulty in aging the scales from the slow growing northern pike population of Caldron Falls Reservoir.





Walleye

During the summer 2005 mini fyke netting survey, no juvenile walleye were captured at Caldron Falls Reservoir. Electroshocking during the fall of 2005 produced 2.17 walleye per mile. In the spring 2006, we processed 2.1 fish per mile. During the spring 2006 fyke netting survey, we captured one hundred and twenty seven walleye. They ranged in size from 7.6 to 28.7 inches in length (Figure 3) and averaged 22.0 inches, not counting the recaptured fish (8). The catch per effort was 1.16 walleye per net night. The population estimate was 843.9 walleye with a 95% confidence interval of 498.8 to 2737.3 fish for a density of 0.83 fish per acre (Figure 3a).

In 1991, a total of one hundred and ninety nine walleye were captured ranging in size from 8.0 to 30.4 inches (Figure 3) and averaged 23.4 inches. The catch per effort was 0.51 walleye per net night. The total population estimate was 1,462 walleye with a 95% confidence interval of 1,073 to 2,294 fish (Figure 3a) for a density of 1.44 fish per acre. In 1982, a total of forty eight walleye were captured ranging in size from 19.5 to 24.4 inches (Figure 3) and averaged 22.1 inches. The catch per effort was 0.24 walleye per net night. A total population estimate could not be calculated due to the low number of fish caught and few recaptured fish.

The length at age of walleye sampled in 2006 showed slower growth in all ages of walleye when compared to the NER average and mixed growth rates when compared to the 1991 survey (Table 4). In the 2006 survey, there was a good representation across many year classes of walleye.

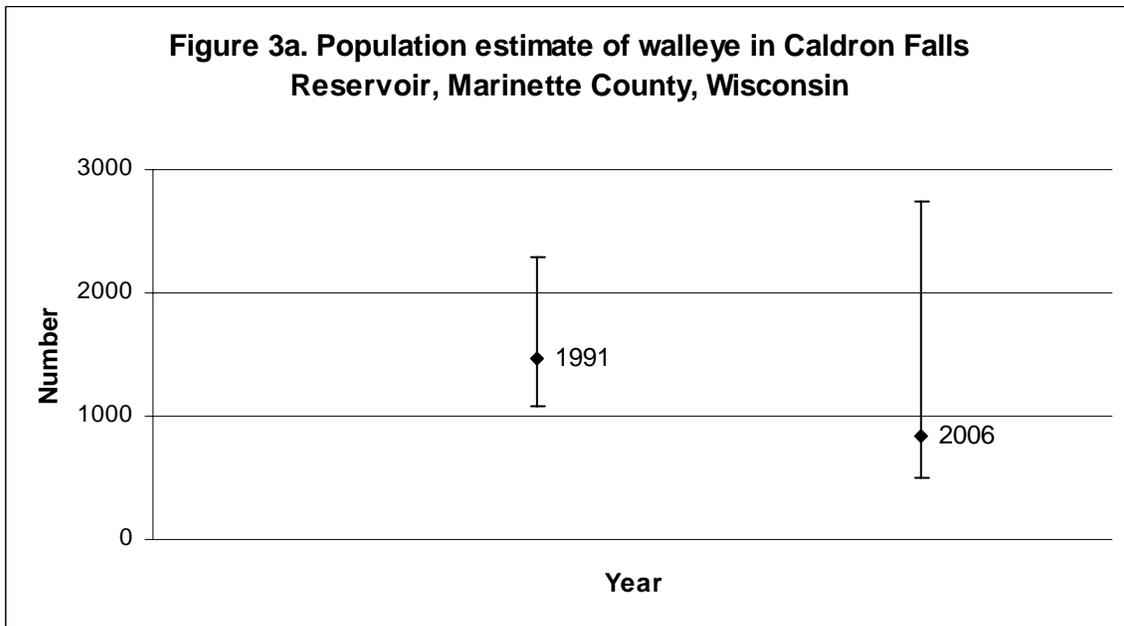
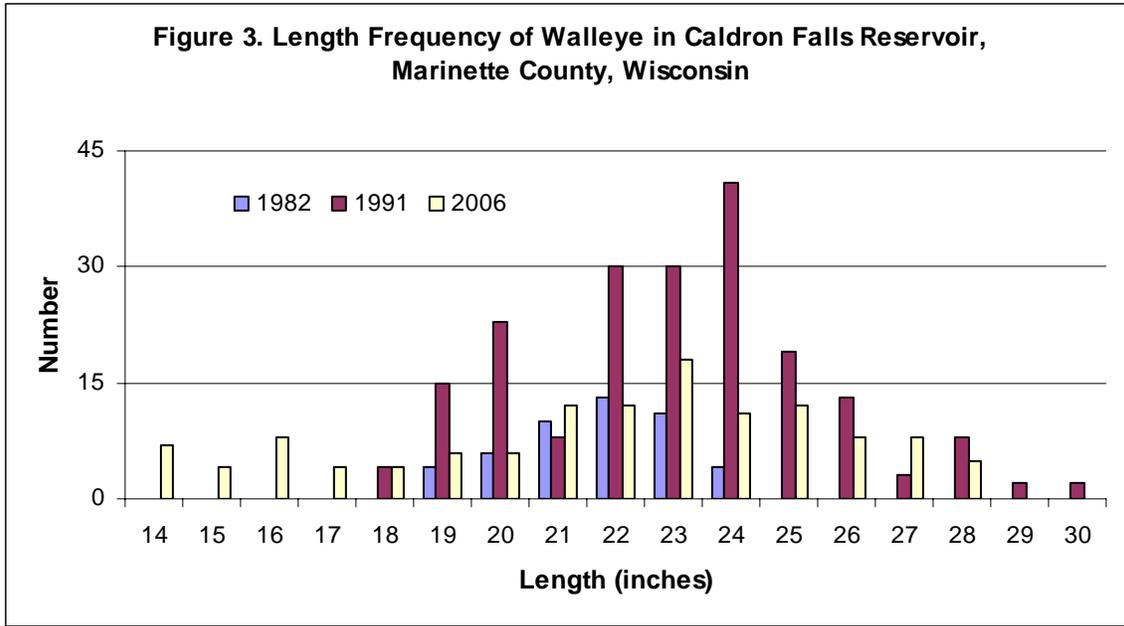


Table 4. 2006 Fyke net age- length distribution of walleye from Caldron Falls Reservoir, Marinette County Wisconsin compared to Northeast (NER) Wisconsin average length at age data and 1991 survey information. N equals sample size.

Age	1	4	5	6	7	8	10	11	12	13	14	15	16
NER Average	8.3	16.0	17.7	19.0	21.5	22.6	26.7	26.3	27.0	25.5	27.9	-	28.7
2006 Survey	7.6	12.9	17.4	16.6	18.3	22.9	25.3	22.9	24.2	25.1	-	25.8	26.3

N (2006)	1	1	19	2	14	31	5	4	2	35	-	5	3
1991 Survey	-	-	19.0	-	-	19.6	22.8	23.6	28.0	26.8	27.3	-	-
N (1991)	-	-	5	-	-	4	130	3	1	11	5	-	-

Largemouth bass

During the summer 2005 mini fyke netting survey, one hundred and fifty juvenile largemouth bass were captured at Caldron falls Reservoir. Electroshocking during the fall of 2005, produced 14.8 largemouth bass per mile and it was 11.2 fish per mile during the spring of 2006. During the spring 2006 fyke netting survey, we captured fifty two largemouth bass ranging in size from 5.5 to 19.4 inches in length (Figure 4). Those fish averaged 13.4 inches, not counting the recaptured fish (3). The catch per effort was 0.47 largemouth bass per net night. The population estimate was 316 largemouth bass with a 95% confidence interval of 161.8 to 6,731.2 fish for a density of 0.3 fish per acre. In 1991, a total of two hundred and fifty two largemouth bass were captured ranging in size from 6.0 to 21.4 inches (Figure 4) and averaged 12.4 inches. The catch per effort was 0.65 largemouth bass per net night. In 1982, a total of sixty six largemouth bass were captured ranging in size from 6.0 to 17.9 inches (Figure 4). The catch per effort was 0.33 largemouth bass per net night. Population estimates were not calculated for largemouth bass in 1991 and 1982.

The length at age of largemouth bass sampled in 2006 showed mixed growth rates. The growth rates were greater for ages 4 and 5 and lower for ages 2, 3 and 6 to 11 when compared to the NER average and 1991 and 1982 surveys (Table 5). In general, average length at age was less in 2006 when compared to the 1991 and 1982 surveys. In the 2006 survey, there was a good representation across many year classes of largemouth bass.

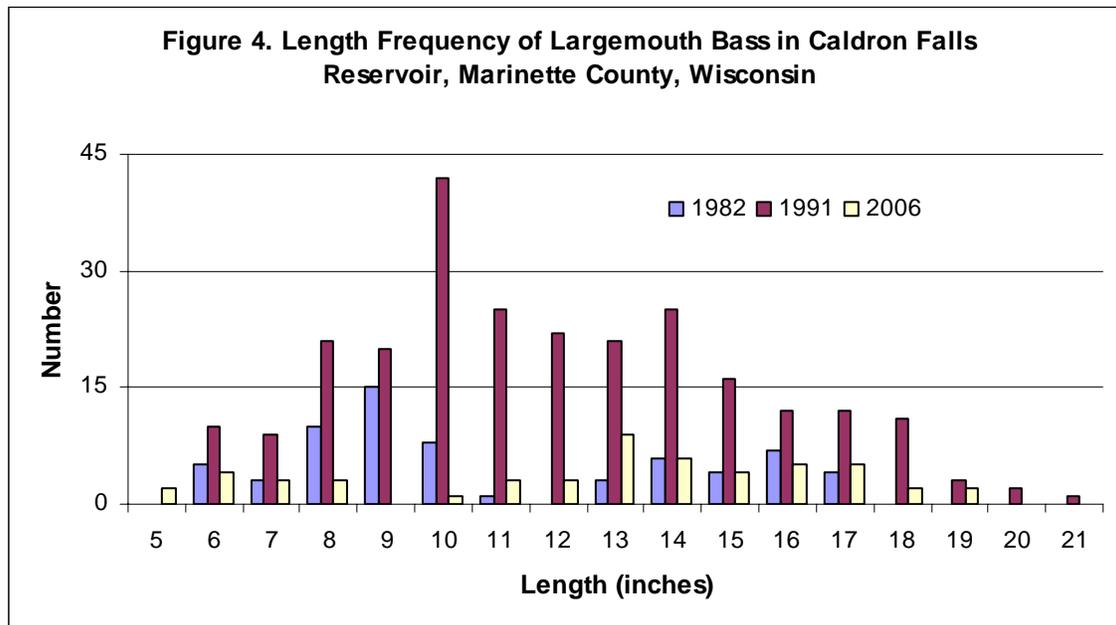


Table 5. 2006 Fyke net age- length distribution of largemouth bass from Caldron Falls Reservoir, Marinette County Wisconsin compared to Northeast (NER) Wisconsin average length at age, 1991 and 1982 survey information. N equals sample size.

Age	2	3	4	5	6	7	8	9	10	11
NER Average	7.2	9.5	11.3	13.3	15.0	16.6	18.0	17.8	18.7	19.6
2006 Survey	6.1	8.3	12.6	13.9	14.2	16.5	17.6	17.8	16	18.7
2006 (N)	5	9	3	9	3	5	2	3	1	3
1991 Survey	6.6	9.5	11.9	14.4	15.6	17.2	18.3	-	19.7	20.6
N (1991)	6	34	40	19	10	10	9	-	2	3
1982 Survey	6.8	9.3	13.3	14.0	15.3	17.1	-	-	-	-
N (1982)	5	36	1	5	9	8	-	-	-	-

Smallmouth bass

During the summer 2005 mini fyke netting survey, eight juvenile smallmouth bass were captured at this impoundment. Electroshocking during the fall of 2005, produced 0.17 smallmouth bass per mile. We caught 0.7 fish per mile during the spring of 2006. During the spring 2006 fyke netting survey, we captured thirty five smallmouth bass. They ranged in size from 9.2 to 20.6 inches in length (Figure 5) and averaged 15.2 inches, not counting the recaptured fish (3). The catch per effort was 0.33 smallmouth bass per net night. The population estimate was 140 smallmouth bass with a 95% confidence interval of 71.3 to 3,978.7 fish for a density of 0.14 fish per acre.

In 1991, a total of twenty two smallmouth bass were captured ranging in size from 7.5 to 19.4 inches (Figure 5) and averaged 13.1 inches. The catch per effort was 0.06 smallmouth bass per net night. In 1982, only one smallmouth was captured at 15.4 inches. Population estimates were not calculated for smallmouth bass in 1991 and 1982.

The average length at age of smallmouth bass sampled in 2006 showed slower growth rates for ages 3 to 9. However, higher growth rates for fish of age 10 and older when compared to the NER average and the 1991 survey, but sample sizes were small (Table 6). In the 2006 survey, there was a good representation across many year classes of smallmouth bass.

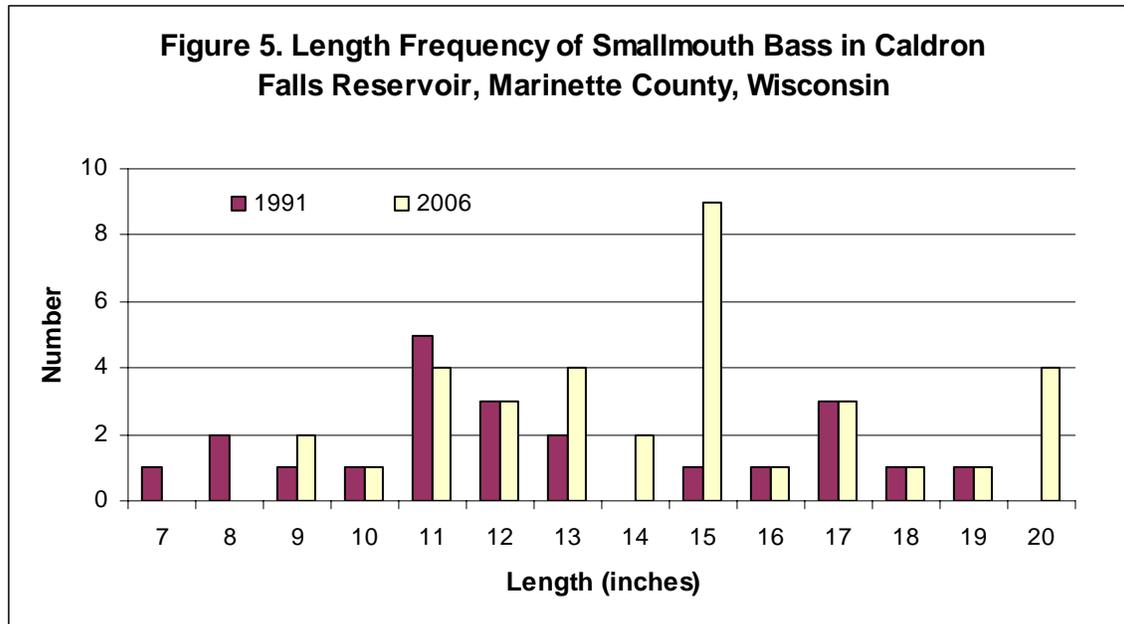


Table 6. 2006 Age- length distribution of smallmouth bass from Caldron Falls Reservoir, Marinette County Wisconsin compared to Northeast (NER) Wisconsin average length at age and 1991 survey information. N equals sample size.

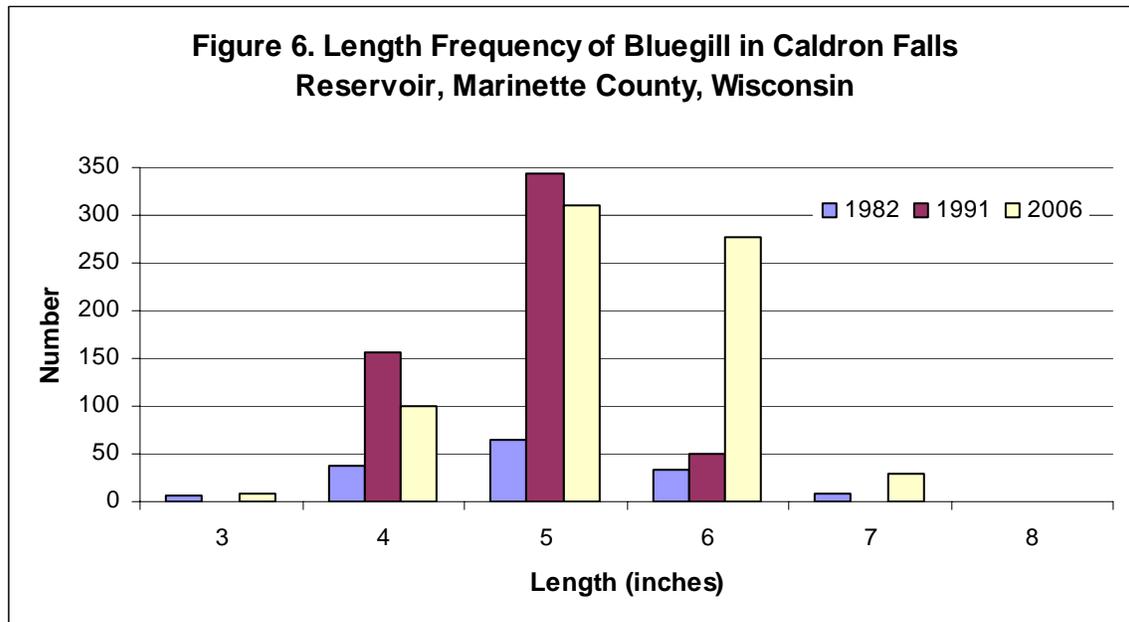
Age	3	4	5	6	7	8	9	10	11
NER Average	9.9	12.3	14.2	15.8	17.1	18.5	18.6	19.9	-
2006 Survey	9.2	11.5	12.1	14.6	15.5	15.4	17.3	20.4	20.0
N (2006)	1	3	4	5	5	4	6	3	1
1991 Survey	8.4	11.9	-	15.4	17.7	17.7	-	-	-
N (1991)	1	9	-	1	3	4	-	-	-

Bluegill

During the summer 2005 mini fyke netting survey, 14.3 bluegill per net night were captured at Caldron Falls. 14.0 fish per net night were juveniles under 3 inches ranging in size from 0.6 to 3.3 inches in length. Electroshocking during the fall of 2005 produced 114.7 bluegill per mile. They ranged in size from 1.4 to 7.2 inches. During the spring 2006 fyke netting survey, we captured a total of four thousand, eight hundred, and twenty four bluegill ranging in size from 3.4 to 8.6 inches (Figure 6) and averaged 5.75 inches. The catch per effort was 62.7 bluegill per net night.

In 1991, a total of five hundred and fifty one bluegill were captured ranging in size from 3.8 to 7.7 inches (Figure 6) and averaged 5.26 inches. The catch per effort was 29 bluegill per net night. In 1982, a total of one hundred and fifty one bluegill were captured ranging in size from 3.5 to 8.5 inches (Figure 6) no average length was calculated. The catch per effort was 25.2 bluegill per net night.

No ageing structures were collected during the 2006 survey of Caldron Falls Reservoir for bluegill.

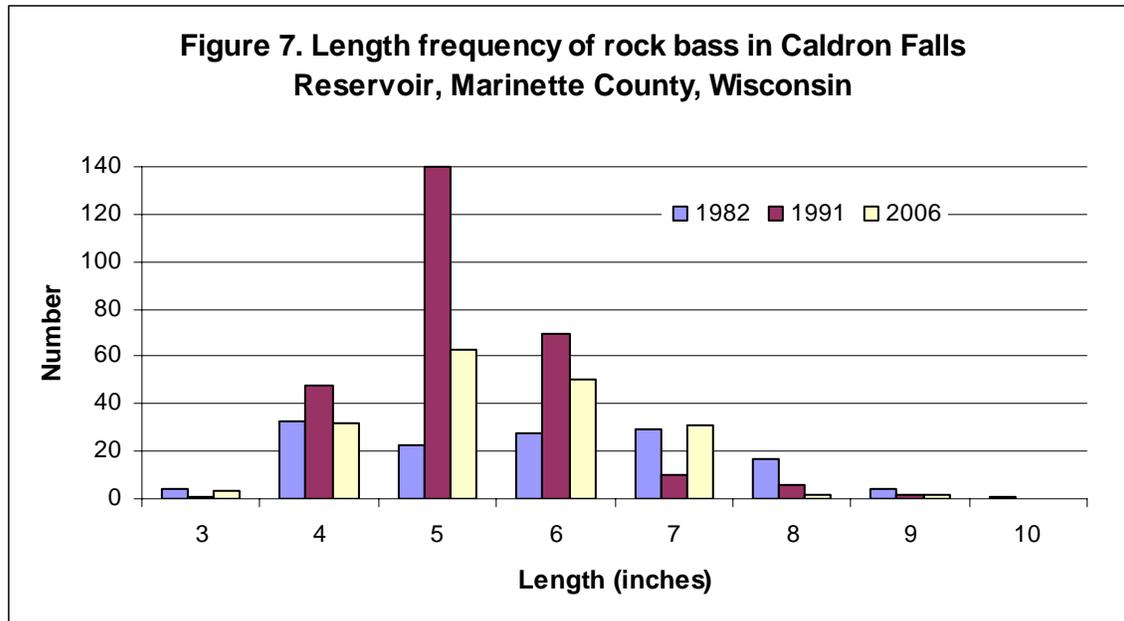


Rock bass

During the summer 2005 mini fyke netting survey, 1.4 rock bass per net night were captured at Caldron Falls. One fish per net night were juveniles under 3 inches ranging in size from 2.4 to 4.0 inches in length. Electroshocking during the fall of 2005 produced 4.7 rock bass per mile ranging in size from 2.4 to 8.9 inches. During the spring 2006 fyke netting survey, we captured a total of one thousand two hundred and eighty four rock bass ranging in size from 3.7 to 9.5 inches (Figure 7) and averaged 5.94 inches. The catch per effort was 16.68 rock bass per net night.

In 1991, a total of two hundred and seventy six rock bass were captured ranging in size from 3.9 to 9.7 inches (Figure 7) and averaged 5.68 inches. The catch per effort was 14.5 rock bass per net night. In 1982, a total of one hundred and thirty seven rock bass were captured ranging in size from 3.6 to 10.0 inches (Figure 7). The catch per effort was 22.8 rock bass per net night.

No ageing structures were collected during the 2006 survey of Caldron Falls Reservoir for rock bass.

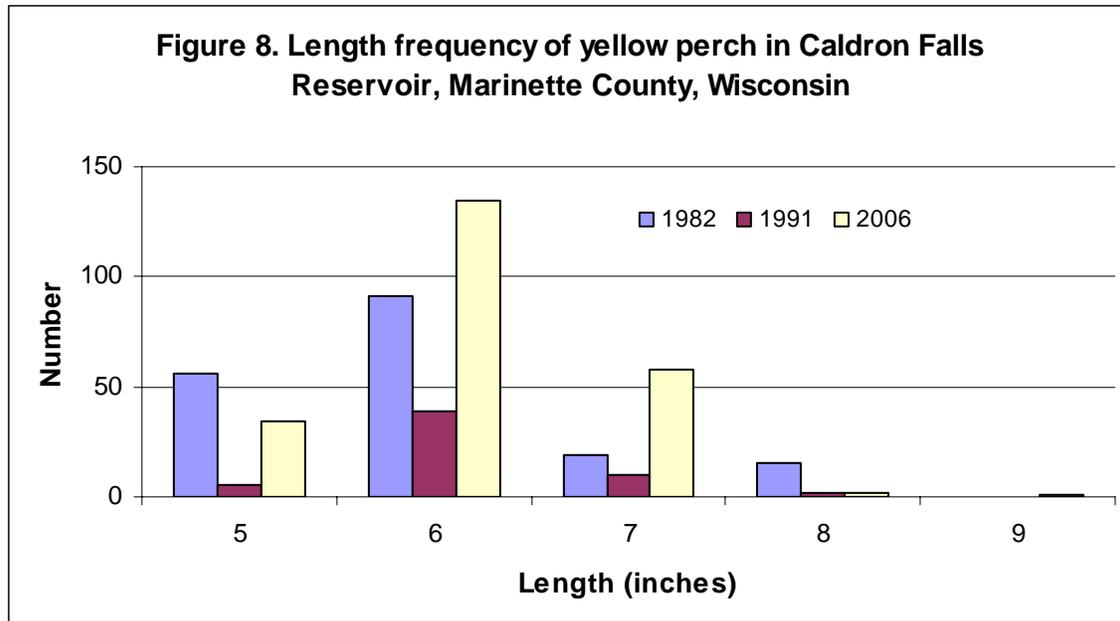


Yellow perch

During the summer 2005 mini fyke netting survey, 10.5 yellow perch per net night were captured and 10.4 fish per net night were juveniles under 3 inches ranging in size from 1.3 to 3.6 inches in length. Electroshocking during the fall of 2005 produced 177.3 yellow perch per mile ranging in size from 1.8 to 8.5 inches. During the spring 2006 fyke netting survey, we captured a total of eight hundred and seventy four yellow perch ranging in size from 5.2 to 9.2 inches (Figure 8). The catch per effort was 11.2 yellow perch per net night.

In 1991, a total of ninety one yellow perch were captured ranging in size from 5.2 to 8.6 inches (Figure 8) and a catch per effort of 4.8 yellow perch per net night. In 1982, a total of one hundred and eighty one yellow perch were captured ranging in size from 5.0 to 8.8 inches (Figure 8) and a catch per effort of 30.2 yellow perch per net night. No average lengths were calculated for yellow perch from the 1991 and 1982 surveys.

No ageing structures were collected during the 2006 survey of Caldron Falls Reservoir for yellow perch.

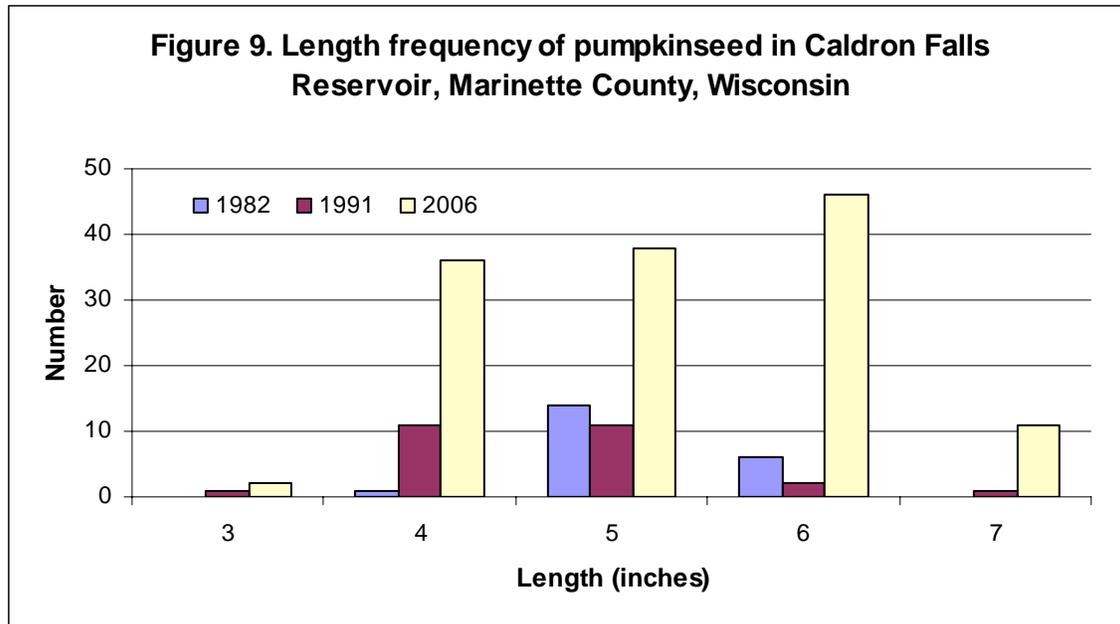


Pumpkinseed

During the summer 2005 mini fyke netting survey 1.3 pumpkinseed per net night were captured and all were juveniles under 3 inches ranging in size from 2.0 to 2.7 inches in length. Electroshocking during the fall of 2005 produced 3.3 pumpkinseed per mile and they ranged in size from 3.3 to 6.4 inches. During the spring 2006 fyke netting survey, we captured a total of five hundred and ninety four pumpkinseed ranging in size from 3.7 to 7.5 inches (Figure 9) and averaged 5.72 inches. The catch per effort was 7.7 pumpkinseed per net night.

In 1991, a total of twenty-five pumpkinseed were captured ranging in size from 3.9 to 7.5 inches (Figure 9) and averaged 4.77 inches. The catch per effort was 1.3 pumpkinseed per net night. In 1982, a total of twenty one pumpkinseed were captured ranging in size from 4.9 to 6.7 inches (Figure 9) no average length was calculated. The catch per effort was 3.5 pumpkinseed per net night.

No ageing structures were collected during the 2006 survey of Caldron Falls Reservoir for pumpkinseed.



Black crappie

During the summer 2005 mini fyke netting survey, 1.6 black crappie per net night were captured and all were juveniles under 3 inches ranging in size from 1.2 to 1.9 inches in length. Electroshocking during the fall of 2005 produced 114.7 black crappie per mile ranging in size from 2.8 to 9.1 inches. During the spring 2006 fyke netting survey, we captured a total of two hundred and forty black crappie ranging in size from 4.7 to 13.2 inches (Figure 10) and averaged 7.86 inches. The catch per effort was 2.5 black crappie per net night.

The length at age of black crappie sampled in the 2006 survey showed slower growth at age for all ages surveyed when compared to the NER average (Table 7). In the 2006 survey, there was a good representation across many year classes of black crappie.

In 1991, a total of eighty seven black crappie were captured ranging in size from 5.9 to 10.0 inches (Figure 10) and averaged 7.53 inches. The catch per effort was 4.6 black crappie per net night. In 1982, a total of fifty nine black crappie were captured ranging in size from 4.2 to 9.8 inches (Figure 10). The catch per effort was 9.8 black crappie per net night.

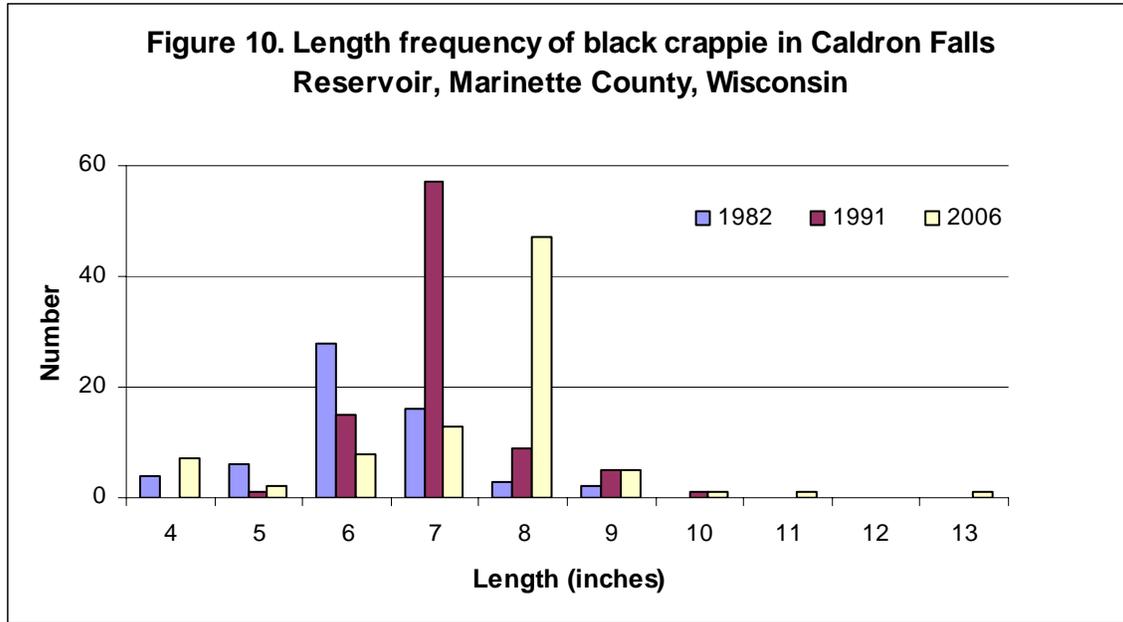


Table 7. 2006 Age- length distribution of black crappie from Caldron Falls Reservoir, Marinette County Wisconsin compared to Northeast (NER) Wisconsin average length at age data. N equals sample size.

Age	2	3	4	5	6	7	8
NER Average	5.4	7.2	8.6	9.6	10.4	11.2	12.2
2006 Survey	4.8	6.3	7.4	8.0	8.6	9.1	10.2
2006 N	5	7	4	12	11	1	2

Other fish species

Other species caught during the 2005 and 2006 surveys included: blackchin shiner, blackside darter, bluntnose minnow, common shiner, creek chub, golden shiner, Johnny darter, northern hog sucker, northern pike / muskellunge cross, pumpkinseed / bluegill cross and white sucker. Golden shiner, an important forage fish in Caldron Falls, were less abundant in 2006 when compared to other surveys. Other forage species (minnows, chub and other shiners) were relatively equal in number compared to other survey years.

CONCLUSIONS AND RECOMMENDATIONS

Caldron Falls Reservoir supports a vibrant and diverse fishery with natural reproduction of all the major species present. The muskellunge population in 2006 showed no significant difference between that year and surveys from 1982 and 1991 with the estimate of 0.24 muskellunge over 30 inches per acre and 0.23 Fish over 32 inches per acre in 2006. These population levels of musky are within the range expected for a healthy muskellunge population. The growth rates of muskellunge in Caldron Falls Reservoir appear to have decreased over the years as slower growth at age was observed when compared to the previous surveys in 1982, 1991 and the NER average. During the 2005 and 2006 surveys, staff noted that there was a decrease in the number of golden shiner captured. The golden shiner had been a source of food for muskellunge in previous surveys and their reduced abundance could be a partial reason for the reduced growth rates of the muskellunge. Other forage species were not noted to have declined during the most recent survey when compared to the surveys of 1991 and 1982.

The contribution of stocked muskellunge to the population has decreased over the survey years 1982, 1991 and 2006, with 38%, 33% and 25% contribution, respectively. The stocking effort was reduced by half after 1983 with the number of fish stock declining from 2,000 to 1,000 fingerlings per year. This reduced effort and the continued good survival of naturally reproduced muskellunge has likely led to the decrease in the contribution of the stocked muskellunge to the total population. There has been no correlation shown between stocking and native year class strengths in previous or this current survey. I recommend no changes in the current management of muskellunge. However, the future possibility of reducing or eliminating the stocking program with evaluation is a possibility.

The northern pike population in 2006 showed no significant difference between this year and the 1982 survey. However, the population in 2006 was significantly different than the 1991 survey, with an increase in the total population size. Growth rates were not calculated for northern pike as they are very difficult to age accurately. Previous surveys have indicated that they are slow growing in this reservoir. The percent of northern pike surveyed over the quality size of 21 inches increased from the 1982 (61.4%) to 1991 (64.3%) surveys but declined to 57.9% in 2006. The northern pike population is likely being affected by the amount of drawdown from the dam operations in the spring which affects the amount of available suitable spawning habitat. Since the primary management goal is the muskellunge population, the instability of the northern pike population is not a big concern. I do not recommend any change in the current management of northern pike or the drawdown pattern.

The walleye population in 2006 showed no significant difference between this year and the 1991 survey. The walleye population is more likely stronger than observed in our surveys due to the nature of the spawning run. It is likely that the walleye run into the more riverine section of the Peshtigo River upstream of Caldron Falls Reservoir during the spawning period and spawn in the rocky areas. All the female walleye caught during this survey were spent and had likely dropped back down into the reservoir proper after spawning upstream. Due to the nature of the gear used for sampling, we are limited from

accessing these upstream sites. The success of the natural reproduction within the reservoir is not clear as previous surveys, as well as this current survey, have shown very few young-of-year being collected during fall electroshocking surveys. However, during the 2006 survey, the frequency and number of age classes observed would suggest that natural reproduction is somewhat successful. This species is only stocked in odd years and the aged walleye represented in the fishery came from years not stocked, ranging from 1 to 16 years old. In the 1991 survey, 83% of the fish captured were from one age class and fewer age classes were represented than during the 2006 survey. Alternate year stocking of small fingerlings is used to supplement the walleye population in the reservoir. Better success may be seen if the walleye stocked were large fingerling versus the small fingerling currently stocked. In general, growth rates of the walleye showed that the population is slower growing than the NER average. This is common for Marinette County lakes with the northern climate and moderate fertility of the water. Continued alternate year stocking of walleye is recommend with the aim of stocking large fingerling over small fingerling when possible. I do not recommend any other change in walleye management.

The largemouth bass population remains at a moderate level in the reservoir. The catch rate of largemouth bass from the spring fyke net surveys showed variation. In the 2006 survey, the rate (0.47) was greater than the 1982 survey (0.33); but lower than the 1991 survey (0.65). The largemouth bass harvest regulation was changed between the 1991 survey and the 2006 survey with an increase in the minimum length limit from 12 inches to a minimum length limit of 14 inches. The percent of largemouth bass surveyed over the minimum length limit of 14 inches progressively increased from the 1982 survey (31.8%) to the 1991 survey (32.5%) and the 2006 survey (46.2%). The growth rates of the largemouth bass captured in the 2006 survey showed mixed growth rates. However, the growth rates were generally slower than the NER average and previous surveys. These growth rates are consistent with the slower growth rates of all the species found in the reservoir. I do not recommend any change in the current management of the largemouth bass population.

A low density smallmouth bass population continues to be present in Caldron Falls Reservoir. The population has shown an increase in size between survey years. The catch rate of smallmouth bass from the spring fyke net surveys increased from nearly zero in 1982 (only 1 fish captured), to 0.06 in 1991, and 0.33 in to 2006. The percent of smallmouth bass surveyed over the minimum length limit increased from the 1991 (31.8%) to the 2006 (60%) survey. The growth rates of the smallmouth bass captured in the 2006 survey showed mixed results. However, the growth rates were generally slower than the NER average and previous surveys. These growth rates were consistent with the slower growth rates of all the species found in the reservoir. The good representation across many age classes of smallmouth bass shows that natural reproduction is somewhat successful on an annual basis in the reservoir. I do not recommend any change in the current management of the smallmouth bass population.

The panfish fishery in Caldron Falls Reservoir is in good health with an abundant variety of species present including bluegill, rock bass, yellow perch, pumpkinseed, and black crappie that contribute greatly to the overall fishery of the reservoir.

The bluegill population is robust and the catch rate of bluegill from the spring fyke net surveys have increased over the years from 1982 (25.2) to 1991 (29), and in 2006 (62.7). The percent of bluegill surveyed of quality size (over 6 inches) decreased from the 1982 (42.3%) to the 1991 (9.1%) survey and increased again in the 2006 survey (42.3%). The rock bass population is also healthy with a catch rate from spring fyke net surveys fluctuating over the years from 1982 (22.8), to 1991 (14.5) and 2006 (16.7). The percent of rock bass surveyed of quality size (over 7 inches) also varied over the survey years from 1982 (36.7%), 1991 (6.5%) and in 2006 (19.1%). The yellow perch population has shown a decrease over the survey years with catch rates decreasing from 1982 (30.2), to 1991 (4.8), and in 2006 (11.2). The percent of yellow perch surveyed of quality size (over 8 inches) also decreased over the survey years from 1982 (8.3%), to 1991 (3.6%), and in 2006 (1.3%). The pumpkinseed population has shown an increase over the survey years with the catch rates increasing from 1982 (3.5), to 1991 (1.3) and in 2006 (7.7). The percent of pumpkinseed surveyed of quality size (over 6 inches) also increased over the survey years from 1982 (28.6%), in 1991 (11.5%), and in 2006 (42.9%). The black crappie population has shown a decrease over the survey years with the catch rates decreasing from 1982 (9.8) to 1991 (4.6) and in 2006 (2.5). The percent of black crappie surveyed of quality size (over 8 inches) increased over the survey years from 1982 (8.5%), in 1991 (17%) and in 2006 (64.7%). The growth rates of the black crappie are slower when compared to the NER average. This slow growth rate is consistent with the gamefish species and the fertility of the reservoir. I do not recommend any change in the current management of panfish species.

Caldron Falls Reservoir is a moderately fertile body of water that has the capability of sustaining a quality size fishery as seen in the data presented in this report. Although the growth rates for all the major gamefish species are slower when compared to the average for the region. However, the overall health of the fishery and the number of fish of quality size for all gamefish species surveyed were good. The control of the invasive plant Eurasian Water Milfoil in some areas of the lake is needed to help prevent areas of the lake from becoming choked and reducing public access to the shoreline. The reservoir has good natural habitat that should be protected for fisheries purposes. Coarse woody debris is present in many areas of the lake, but the addition of naturally falling trees and artificial introduction of shoreline tree drops is encouraged. The muskellunge have been seen to show preference for specific areas of the reservoir during the spawning run and these areas should have added protection from any development or water level variations. The areas of specific interest for muskellunge include: 1) the bay area in the NW corner (Crane Bay), 2) south shore from boat landing number 11 to opposite where boat landing 10 is located, and 3) the area known as the fingers located also on the south shore to the west of boat landing 13. In particular, the point bars going into the NW bay and the fingers area have shown significant muskellunge spawning activity. No fisheries regulation changes are recommended at this time as the fishery is supporting a good size and age range of all species surveyed.

Public access to Caldron Falls Reservoir is excellent with 6 boat landings available around the reservoir for access. However, on busy summer weekends, these access points can be very crowded as all the people using the lake have to bring a boat or personal watercraft with them as there are only two dwellings on the reservoir. I would recommend updating and repairing some of the current access sites, providing for better parking, more stable ramp access and adding additional disabled access fishing areas. I would suggest that as Caldron Falls Reservoir is designated as an exceptional resource water, that the development of the reservoir remain low and keep it in the natural aesthetic form that currently exists at this reservoir.

ACKNOWLEDGEMENTS

Greg Kornely, Ron Rhode and Cliff Sebero who completed the field work, age analysis and data entry. Mike Donofrio for editorial comments.

LITERATURE CITED

Carlson, H., Lloyd M. Andrews and C. W. Threinen. 1975 Surface waters of Marinette County. Department of Natural Resources, Madison, Wisconsin. 111 pages

Cover image and appendix maps courtesy of Webview and the Wisconsin Department of Natural Resources.

Kornely, Greg 1983. Investigational report on the fishery in Caldron Falls Reservoir, Marinette County, 1982. Wisconsin DNR Memo.

Kornely, Greg 1993. Report on the fishery in Caldron Falls Flowage, Marinette County, 1991. Wisconsin DNR Memo.

Appendix

- Figure 1. Location of 10 mini fyke nets for the baseline monitoring survey July 7 – 8 and 21-22, 2005.
- Figure 2. Location of the 6 mile baseline monitoring electroshocking survey on October 17th, 2005.
- Figure 3. Location of the 15 mile comprehensive electroshocking survey on April 26, May 22, June 5, 2006.
- Figure 4. Location of 11 standard fyke nets for the comprehensive fishery survey April 10 – 23, 2006.

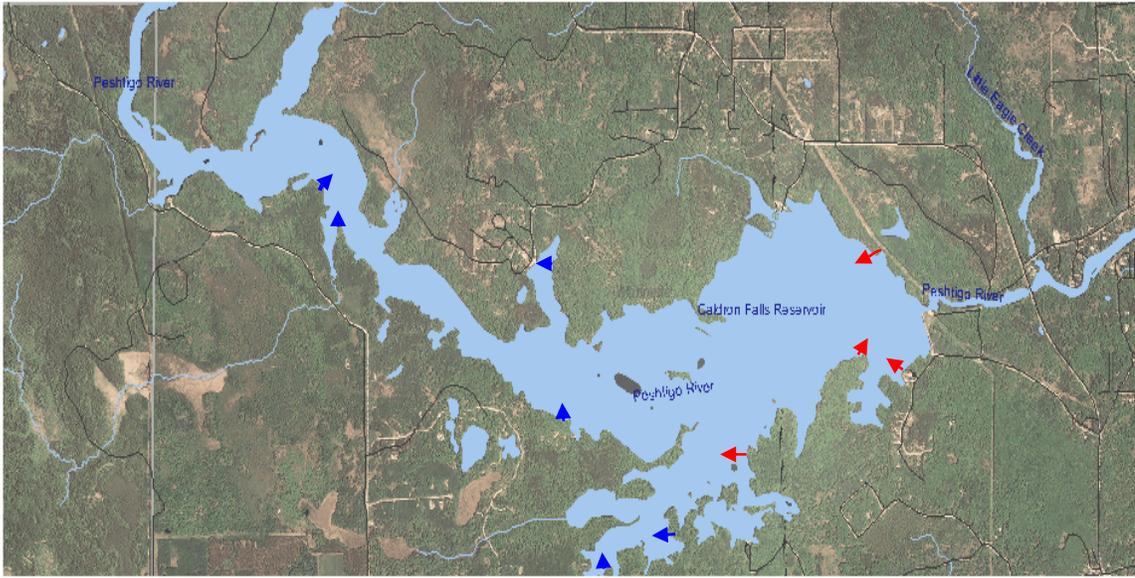


Figure 1. Location of 10 mini fyke nets for the baseline monitoring survey July 7 – 8 (blue arrows) and 21 – 22 (red arrows), 2005.

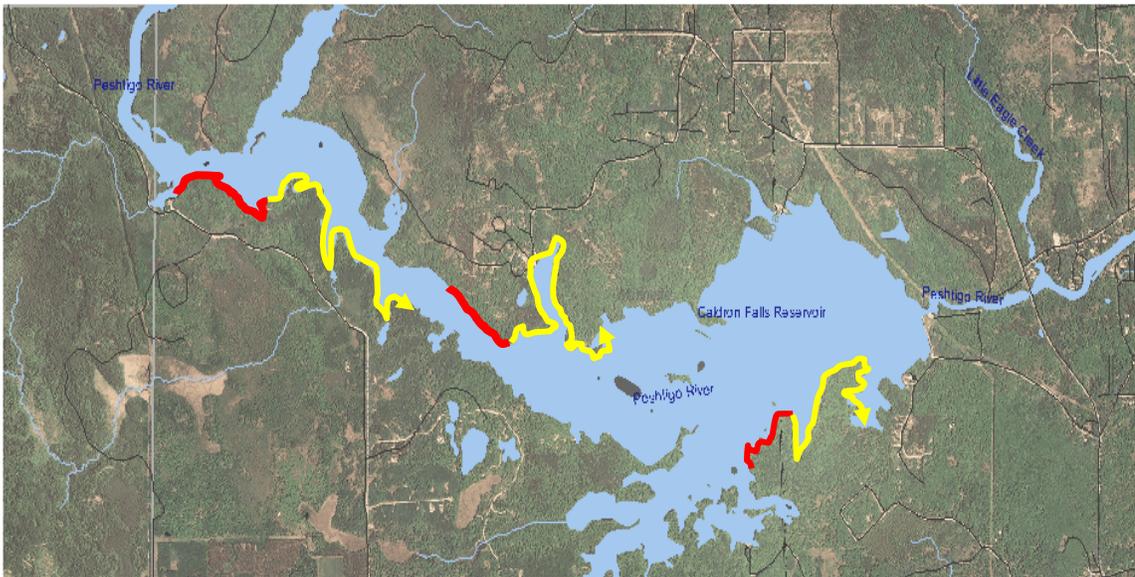


Figure 2. Location of the 6 mile baseline monitoring electroshocking survey on October 17th, 2005. Red denotes ½ mile panfish station and yellow denotes 1 ½ mile gamefish station, each combined are 2 mile sites.

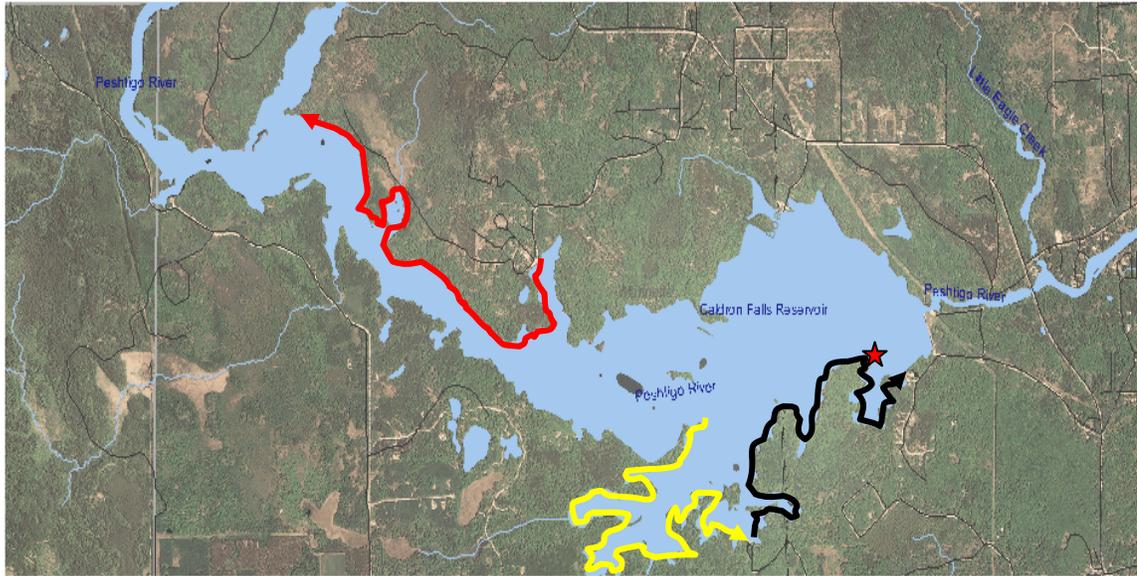


Figure 3. Location of the 15 mile comprehensive electroshocking survey on April 26 (red line), May 22 and June 5 (yellow and black lines, red star denotes ending on June 5), 2006.

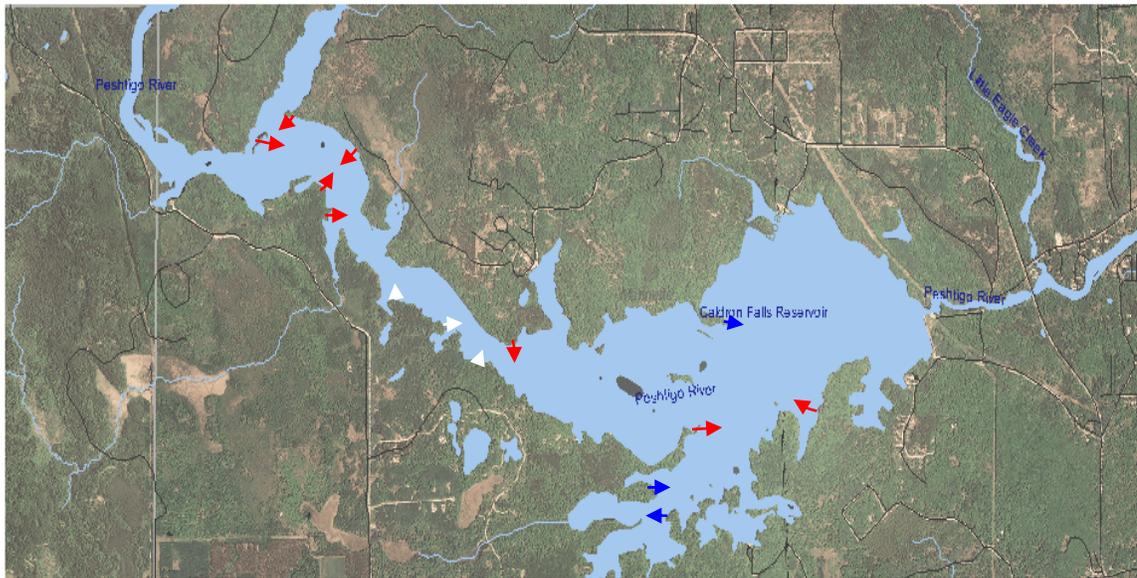


Figure 4. Location of 11 standard fyke nets for the comprehensive fishery Survey April 10 – 23, 2006. Red arrows denote nets that were set and not moved, white arrows note original net sets that were then moved to blue arrow locations.