Comprehensive Fisheries Survey of Spring Lake,
Columbia County, Wisconsin 2011.

Waterbody Identification Code: 180000

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February 2014

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EXECUTIVE SUMMARY

A comprehensive fisheries survey was conducted on Spring Lake during the spring of 2011. Panfish, specifically bluegill and black crappie, were the most abundant species, while gamefish were present in relatively low abundances. The same was generally true during the 1978 survey. Walleye was the most common gamefish species present in 2011, followed by largemouth bass, northern pike, and muskellunge. Bluegill size structure was poor and growth appears to be slow. Black crappie size structure was better, and most fish ranged from 7.5 to 10.9 inches in length, with individuals up to 11.7 inches. Largemouth bass abundance was low, but about 40% of the largemouth bass present were larger than the 14 inch minimum length limit. Additional panfish that were present included yellow perch and pumpkinseed. Yellow perch abundance in 2011 was similar to 1978, while pumpkinseeds were common in the 1978 survey but were only present in low numbers in 2011. Green sunfish were common in 1978 but were not collected in the 2011 survey. Detrimental rough fish including common carp and gizzard shad were common in the 2011 survey and their presence contributes to the turbid state of the lake. Other non-game species collected in 2011 included bigmouth buffalo, bowfin, freshwater drum, golden shiner, highfin carpsucker, quillback carpsucker, white sucker, yellow bass, and yellow bullhead.

Lake and location:
Spring Lake, north-central Columbia County, T12N R10E, Sections 3 and 4. Spring Lake is in the town of Wyocena, in the Village of Pardeeville, approximately 8 miles east of Portage. Spring Lake is part of the Lake Michigan drainage, and specifically the Fox River watershed. It is a drainage lake that receives water via discharge from a small hydroelectric power dam located on the southwest corner of Park Lake, immediately above Spring Lake on the east side of State Highway 22. Spring Lake drains to the Fox River, which flows out of a second small dam on the northwest corner of Park Lake; the second dam operates on a stop-log gate system. Spring Lake also receives water inputs from springs. Spring Lake has no dam structure controlling its outflow, and fish are free to move in and out of Spring Lake from Swan Lake, a natural impoundment of the Fox River located approximately two miles downstream.

Physical/Chemical attributes:
Morphometry: 24 acres, maximum depth of 32 feet, mean depth of 14 feet, and 1.29 miles of shoreline (1970 WDNR Lake Map)
Watershed: 57 square miles, including 10 acres of adjoining wetland (Poff and Threinen 1965)
Lake type: Drainage, seepage
Water clarity: Turbid
Littoral substrate: 65% muck, 35% sand
Aquatic vegetation: Eurasian water milfoil present (1995 voucher), 7 other species present (1978 survey)
Winterkill: Infrequent
Boat landing: One paved ramp with parking for up to five vehicles with trailers; electric trolling motors only, no gas engines permitted on the lake.
Other features: Fishing regulations follow general statewide regulations for panfish and gamefish (Table 1).

Purpose of Survey
Tier 1assessment baseline lake survey

Dates of fieldwork
Fyke netting survey conducted April 6 through April 14, 2011 (SNI). Electrofishing survey conducted May 16, 2011 (SEII).

Fishery
Bluegill and black crappie are common. Walleye, yellow perch, northern pike, largemouth bass, pumpkinseed, muskellunge, and channel catfish are present. Other non-sportfish species included bigmouth buffalo, bowfin, common carp, freshwater drum, gizzard shad, golden shiner, highfin carpsucker, quillback carpsucker, white sucker, yellow bass, and yellow bullhead.

BACKGROUND

In 1970, Spring Lake was chemically treated for carp with rotenone as part of the Fox River Project, with a total of 1,650 lbs. of carp removed. In addition, 750 lbs. of suckers and 5,200 lbs. of panfish and gamefish were also removed. Spring Lake was restocked with panfish and gamefish in 1970 and 1971, including northern pike, walleye, yellow perch, bluegill, "sunfish", and largemouth bass (Table 2). More recent stockings included 100 fingerling tiger muskellunge (northern pike x muskellunge hybrid) in 1988, 250 large fingerling smallmouth bass in 1996, 50 large fingerling channel catfish and 50 large fingerling northern pike in 2012 (Table 2).

Nutrient input from the Pardeeville sewage treatment plant was identified as having a detrimental effect on water quality in Spring Lake in the late 1970s, specifically contributing to high biological oxygen demand (BOD). This effect was most pronounced in summer when areas of the lake as shallow as 10 feet in depth became anoxic. Efforts were made to require the Village of Pardeeville to maintain a constant flow of water through the hydroelectric generation unit on Park Lake to provide a constant supply of oxygenated water flowing into Spring Lake.

A fisheries survey consisting of late spring fyke netting and electrofishing was conducted in late May and early June 1978. The lake was dominated by panfish; three nights of fyke netting with 5 nets, along with 1.8 hours of night electrofishing produced a catch of 563 bluegill, 378 pumpkinseed, 265 green sunfish, 164 black crappie, and 45 yellow perch. Predatory game fish were present in relatively low abundance, with 28 largemouth bass, 10 northern pike, and one walleye caught. Black bullheads were common, while bowfin, brown bullhead, common carp, golden shiner, longnose gar, rock bass, warmouth, white sucker, yellow bass, and yellow bullhead were present. Seven aquatic plant species were identified during the 1978 survey. *Elodea* and *Ceratophyllum* (coontail) were abundant, *Nymphaea* (water lily), *Lemna* (duckweed), and *Potamogeton crispus* (curly-leaf pondweed) were common, and *Typha* (cattail) and *Juncus* (rushes) were scarce.

A single night of electrofishing with a mini boomshocker on September 28, 2004 was conducted to investigate effects of a possible winterkill the previous winter. While it was noted that the lake was "alive with fish, too many to collect", relatively few fish were actually collected. The catch included 89 bluegill, 16 largemouth bass, eight walleye, and a single northern pike. Also present

in low abundance were black crappie, bowfin, common carp, freshwater drum, gizzard shad, golden shiner, pumpkinseed, quillback carpsucker, white sucker, yellow bass, and yellow perch. Age and growth analysis concluded that bluegill exhibited average growth to age 3 (5.3 inch average), but were below average growth at age 5 (6.0 inch average). The small sample of largemouth bass indicated average growth to about 12 inches by age 4, with a 20.5 inch individual aged at 10 years.

METHODS

Data collection

Following ice-out, 3 standard 3 foot hoop fyke nets with 0.7 inch bar, 1.4 inch stretch mesh were set on April 6, 2011, and a fourth net was set on April 7, 2011; fyke nets targeted northern pike and walleye. Fyke net locations (GPS coordinates) can be found in Table 3. All 4 nets were run and pulled on April 8 and 3 nets were re-set on April 10. Only 2 nets were run on April 11 due to time constraints. All three nets were run on April 12, 13, and 14, with one of the nets run on April 12 being a 48 hour set (2 net nights). The nets were pulled on April 14, 2011; total fyke netting effort was 19 net nights. All of the captured fish were identified to species and enumerated each day. All gamefish and panfish were measured to the nearest 0.1 inch, and sex was recorded when evident for northern pike, walleye, and yellow perch. Aging structures were not taken due to the small size of the lake, and also the fact that aging structures were taken from fish collected immediately downstream on Swan Lake in 2009, and immediately upstream on Park Lake in 2011. Walleye and northern pike were given a top caudal fin clip to avoid measuring the same fish on multiple occasions in the event the fish was recaptured. The markings could have been used for the purpose of a mark-recapture population estimate, but few walleye and northern pike were collected. Additionally, walleye population estimates were completed on two higher profile stocked lakes in the immediate vicinity in the same system in 2009 (Swan Lake) and 2011 (Park Lake), making a walleye population estimate on Spring Lake of lesser value.

A WDNR standard direct current (DC) boomshocker boat was used to sample fish on the night of May 16, 2011. The entire shoreline (1.3 miles) was sampled and all panfish and gamefish were collected. Rough fish and other non-sport fish were observed and counted, but not dip netted. All gamefish and panfish were measured to the nearest 0.1 inch. Aging structures were not taken.

Data analysis

Total catch and catch per unit of effort (CPUE) was calculated by gear type for all species. Data for both gear types was then combined, and length frequency distributions were generated for panfish and gamefish species with 30 or more individuals collected. Length range, median length, and mean length were calculated for species with fewer than 30 individuals collected. Proportional stock density (PSD), and relative stock density of preferred length fish (RSD-P) were calculated for all panfish and gamefish species with more than 100 individuals collected (Anderson and Neumann 1996). Length designations for stock, quality, preferred, memorable, and trophy sizes of the panfish and gamefish species collected from Spring Lake can be found in Table 4 (Anderson and Neumann 1996).

RESULTS AND DISCUSSION

A total of 1,479 fish representing 20 different species from 10 families were collected during spring fyke netting and electrofishing in 2011. Catch by gear type are shown for each species collected (Table 5). Bluegill and black crappie were both abundant. Common carp, gizzard shad, walleye, yellow perch, and quillback carpsucker were common. Largemouth bass, pumpkinseed, yellow bullhead, bigmouth buffalo, northern pike, white sucker, muskellunge, bowfin, yellow bass, freshwater drum, channel catfish, highfin carpsucker, and golden shiner were present.

Bluegill

A total of 553 bluegills were collected; the catch rates were 23.1 per net night during fyke netting and 87.7 per mile of shoreline during electrofishing (Table 5). The spring electrofishing II catch rate for bluegills placed Spring Lake in the 49th percentile statewide. Lengths ranged from 2.3 to 9.5 inches, and the average and median lengths were both 5.2 inches (Table 6). Bluegill size structure was poor as evidenced by the length frequency distribution which shows the most common fish around 5.0 inches (Figure 1). Of the bluegill 3 inches and larger (stock size), relatively low proportions of the fish were 6 inches and larger (PSD = 23), or 8 inches and larger (RSD-P = 1). The relatively high abundance of fish 3 to 6 inches in length indicates that recruitment is likely not a problem, but growth is probably slow. One possible explanation for poor bluegill growth in Spring Lake could be competition with gizzard shad for food resources. Taking aging structures from these fish would have allowed us to better quantify growth and

compare it to region and state averages. The same holds true for all panfish and gamefish species collected during the survey.

Black Crappie

In total, 491 black crappies were collected; the catch rates were 24.5 per net night during fyke netting and 19.2 per mile of shoreline during electrofishing (Table 5). The spring electrofishing II catch rate for black crappie placed Spring Lake in the 74th percentile statewide. Lengths ranged from 3.2 to 11.7 inches, and the average and median lengths were both 9.0 inches (Table 6). The length frequency distribution for black crappie shows a mode at around 8.5 inches, with most of the fish being between 7.5 and 10.5 inches (Figure 2). Very few larger or smaller fish were present. Of the black crappie greater than 5 inches in length (stock size), fish 8 inches and larger were common (PSD = 89), and fish 10 inches and larger were present in lower numbers (RSD-P = 16). Crappie recruitment can be variable, and as little as one good year class can sustain a fishery for several years. Although aging structures were not taken, it is likely that the black crappie population in Spring Lake is composed mostly of 2, 3, and 4 year old fish. This is based on regional average lengths at age for age 2, 3, and 4 black crappies sampled during January through May, which are 8.4, 9.1, and 10.2 inches, respectively. These fish would have been produced in 2007, 2008, and 2009. The lack of small individuals is a possible indicator of a poor year class produced in 2010. However it is also possible that these fish were not fully vulnerable to the sampling gear. Numbers of black crappie decline steadily after 8.5 inches likely because these fish are large enough to be acceptable to anglers for harvest.

Yellow Perch

A total of 60 yellow perch were collected; catch rates were 2.4 per net night during fyke netting and 11.7 per mile of shoreline during electrofishing (Table 5). Lengths ranged from 2.7 to 9.3 inches, and the average and median lengths were 5.7 and 5.6 inches, respectively (Table 6). The most common length (mode) collected was 5.4 inches, and very few large individuals were present (Table 6, Figure 3). Yellow perch are not stocked into Spring Lake, Swan Lake, or Park Lake. These individuals represent a low density naturally reproducing population. Low numbers and poor size structure are probably less due to angler harvest than to natural mortality resulting from predation by walleye, northern pike, and muskellunge. Numbers of yellow perch are relatively close to what they were in 1978.

Walleye

In total, 64 walleyes were collected (not including recaptures). Catch rates were 2.3 per net night during fyke netting and 16.2 per mile of shoreline sampled during electrofishing (Table 5). The spring electrofishing CPE15 for walleye was 4.8 per mile, placing Spring Lake in the 61st percentile statewide. Walleye were much more abundant in 2012 compared to 1978. Lengths ranged from 6.5 to 25.2 inches, and the average length was 15.5 inches (Table 6). The median and mode lengths were both 15.7 inches (Table 6). The length frequency distribution for walleye is represented in Figure 4. A natural break in the distribution following the 10.0 inch group indicates that fish measuring 6.5 to 10.4 inches in length are likely age-1 fish produced from fish stocked or naturally produced in 2010. Further interpretation of the walleye age structure of Spring Lake is not possible without actual age data. A total of 58% (N = 37) of the walleye sampled were larger than the 15 inch minimum size limit. Based on this value alone, the population of adult walleyes ≥ 15 inches is approximately 1.5 fish per acre. Sex and maturity status was evident for 73% (N =35) of the walleyes that were 12.9 inches and larger. A total of 22 males ranged from 12.9 to 23.9 inches in length, averaging 16.8 inches. A total of 13 females ranged from 17.5 to 25.2 inches in length, averaging 21.3 inches.

Spring Lake is not stocked with walleye, and natural reproduction is probably minimal at best. The individuals collected during the 2011 survey were most likely stocked into Swan Lake and made their way upriver into Spring Lake. It is also possible that walleye could have passed downstream from Park Lake into the Fox River, and then into Spring Lake. It is highly unlikely that any walleye survived the passage from Park Lake through the outlet at the hydroelectric generator, and into Spring Lake. Walleye represent a bonus opportunity for anglers fishing on Spring Lake.

Largemouth Bass

A total of 27 largemouth bass were collected; catch rates were 0.1 per net night during fyke netting and 20.0 per mile of shoreline sampled during electrofishing (Table 5). The catch rate of fish 8 inches and larger during electrofishing was 16.2 per mile of shoreline sampled, placing Spring Lake in the 83rd percentile in a comparison of several Wisconsin drainage basins. This is still below the goal of 20 to 30 per mile ≥ 8 inches. Largemouth bass densities were very similar

to what they were in the 1978 survey. Lengths ranged from 6.0 to 19.4 inches, the average length was 12.1 inches, and the median and mode lengths were both 12.8 inches (Table 6). A total of 41% (N = 11) of the largemouth bass sampled were larger than the 14 inch minimum size limit.

Northern Pike

A total of 15 northern pike were collected; catch rates were 0.6 per net night during fyke netting and 3.1 per mile of shoreline during electrofishing (Table 5). Lengths ranged from 11.6 to 29.2 inches, the average length was 22.9 inches, and the median length was 23.5 inches (Table 6). A total of 20% (N = 3) of the northern pike sampled were larger than the 26 inch minimum size limit. Northern Pike have been stocked into Spring Lake only on rare occasions prior to this survey, including 1970, 1971, and 2006. Northern pike exist at low densities but have not been stocked into Swan Lake since 1986 (musky are stocked instead). Northern pike are present at low densities and are regularly stocked into Park Lake. The low density northern pike population in Spring Lake appears to be similar to what it was in 1978, and is maintained by a combination of natural reproduction, as well as fish that come from elsewhere in the system (Swan and Park Lake). Northern pike represent a bonus opportunity for anglers fishing on Spring Lake.

Muskellunge

In total, 6 muskellunge were collected (not including the single recapture). All muskies were caught in fyke nets; the catch rate was 0.3 per net night (Table 5). Lengths ranged from 26.2 to 47.2 inches, and the average length was 38.8 inches (Table 6). A total of 50% (N = 3) of the muskies sampled were larger than the 40 inch minimum size limit. Spring Lake is not stocked with musky; the individuals collected in 2011 were stocked into Swan Lake and moved up the system into Spring Lake. Musky represent a bonus opportunity for anglers fishing on Spring Lake.

Other panfish and gamefish species

Pumpkinseed and channel catfish were present in low abundances and merely offer an incidental catch opportunity for anglers. Catch per unit effort data for pumpkinseed and channel catfish can be found in Table 5, while descriptive statistics for lengths of these species can be found in Table 6.

Detrimental Rough Fish

In total, 103 common carp were collected or observed; the catch rate was 3.1 per net night during fyke netting and 34.6 observed per mile of shoreline during SEII. Fifty-eight common carp collected during fyke netting were measured. Lengths ranged from 13.2 to 26.6 inches, and the average length was 18.7 inches. The median and mode lengths were 17.7 and 17.4 inches, respectively. This length range represents several year classes of common carp present in Spring Lake.

Only 5 gizzard shad were collected and measured; lengths ranged from 10.7 to 14.5 inches and the average length was 12.3 inches. Gizzard shad are underrepresented in the catch data; an additional 100-200 gizzard shad were observed during electrofishing but were not dip netted. Gizzard shad are present and reproducing in Spring Lake, and are competing with centrarchids for food resources. The presence of common carp and gizzard shad contributes to the turbid state of the lake.

CONCLUSIONS AND RECOMMENDATIONS

The fish assemblage in Spring Lake includes panfish and gamefish species typical of lakes in southern Wisconsin. It also includes several species of fish typical of the larger river systems of the State because of its connection to the Fox River.

Panfish were present in the greatest abundance and bluegill was the most abundant species. Recruitment of bluegill is not a limiting factor and size structure is poor; the population is dominated by fish 6 inches and smaller. Data from past surveys indicated bluegill growth was average to below average, and this is still likely the case although without age data, accurately quantifying growth is not possible. Gizzard shad are common in Spring Lake, and compete with both larval/juvenile and adult bluegill for food which can lead to reduced growth rates throughout life (Aday et al. 2003). Additionally, bass predation on bluegill, often a driver of bluegill size structure, was likely reduced due to the low number of largemouth bass present, as well as an abundance of alternative prey in the form of gizzard shad (Storck 1986, Guy and Wills 1990). Black crappies were common, but few small or very large individuals were sampled. The lack of

small individuals could have been a sampling issue in that small black crappies were perhaps not vulnerable to the gear used. Another possible solution is that crappie recruitment can be highly variable and one or two poor year classes of crappie may have been produced 1 to 2 years prior to the survey. Numbers of crappie declined for fish larger than 8.5 inches and this is likely due to the fact that anglers find crappie larger than 8.5 inches acceptable for harvest.

Largemouth bass abundance was low; 16.2 largemouth bass ≥ 8 inches per mile is lower than the recommended goal of 20-30 per mile. Too few individuals were collected to calculate meaningful PSD and RSD-P values, but nearly half of the largemouth bass collected were of legal harvest size.

Walleye, northern pike, and muskellunge are not stocked, but are present due to low levels of natural reproduction or connections to other stocked waters in the Fox River watershed, specifically Swan and Park lakes. These species provide bonus opportunities for anglers. Very few muskellunge were sampled, but half of those that were collected were of legal harvest size and one fish was nearly 50 inches long. Also, for such a small lake, Spring Lake actually contains a fair number of walleyes; 64 different walleyes were captured in a lake of only 24 surface acres, and 37 of these were larger than 15 inches. This translates to roughly 1.5 adult walleyes ≥ 15 inches per acre, and 2.7 total walleyes per acre, regardless of size. However, this estimate is not derived from recognized mark-recapture sampling methods.

Spring Lake is rarely stocked by the WDNR, and intensive stocking is not necessary to maintain the fishery in Spring Lake. Fish are free to move up from Swan Lake and may pass downstream from Park Lake, and these fish do a good job of populating Spring Lake with bonus gamefish. The Pardeeville Lakes Management District has funded gamefish stockings in the past, most recently plantings of northern pike and channel catfish in 2012. Such privately funded stockings can continue in the future, so long as stockings follow State guidelines and the PLMD works with the WDNR fishery biologist to make the best possible decisions on fish stocking.

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TABLES AND FIGURES

Table 1. Fishing regulations for Spring Lake, Columbia County, Wisconsin for the 2012-2013 fishing season.

Species	Season Dates	Length and Bag Limits
Catfish	Open All Year	No minimum length limit and the daily bag limit is 10.
Panfish (bluegill, pumpkinseed, sunfish, crappie, and yellow perch)	Open All Year	No minimum length limit and the daily bag limit is 25.
Largemouth bass and smallmouth bass	May 5, 2012 to March 3, 2013	The minimum length limit is 14" and the daily bag limit is 5.
Muskellunge and hybrids	May 5, 2012 to December 31, 2012	The minimum length limit is 40" and the daily bag limit is 1.
Northern pike	May 5, 2012 to March 3, 2013	The minimum length limit is 26" and the daily bag limit is 2.
Walleye, sauger, and hybrids	May 5, 2012 to March 3, 2013	The minimum length limit is 15" and the daily bag limit is 5.
Bullheads	Open All Year	No minimum length limit and the daily bag limit is unlimited.
Rough fish	Open All Year	No minmum length limit and the daily bag limit is unlimited.

Table 2. Fish stocking history of Spring Lake, Columbia County, Wisconsin.

Year	Species	Strain (Stock)	Age Class	Number Fish Stocked	Average Length (inches)	Source Type
1970	NORTHERN PIKE	UNSPECIFIED	Yearling and Adult	149	15	
1970	WALLEYE	UNSPECIFIED	Yearling	549	9	
1970	YELLOW PERCH	UNSPECIFIED	Yearling and Adult	31	9	
1971	NORTHERN PIKE	UNSPECIFIED	Yearling	450	12	FIELD TRANSFER
1971	NORTHERN PIKE	UNSPECIFIED	FRY	75,000		DNR HATCHERY
1971	YELLOW PERCH	UNSPECIFIED	ADULT	22,140	4	FIELD TRANSFER
1971	BLUEGILL	UNSPECIFIED	ADULT	765	4	FIELD TRANSFER
1971	SUNFISH	UNSPECIFIED	ADULT	525	4	FIELD TRANSFER
1971	WALLEYE	UNSPECIFIED	FRY	150,000		DNR HATCHERY
1971	LARGEMOUTH BASS	UNSPECIFIED	FRY	6,000	1	
1988	NOP X MUE	UNSPECIFIED	FINGERLING	100	9	DNR COOP PONDS
1996	SMALLMOUTH BASS	UNSPECIFIED	LARGE FINGERLING	250	4	PRIVATE HATCHERY
2006	NORTHERN PIKE	UNSPECIFIED	LARGE FINGERLING	150	13	PRIVATE HATCHERY
2012	CHANNEL CATFISH	UNSPECIFIED	LARGE FINGERLING	50	5	PRIVATE HATCHERY
2012	NORTHERN PIKE	UNSPECIFIED	YEARLING	50	11	PRIVATE HATCHERY

Table 3. Locations of fyke nets set during the 2011 comprehensive fishery survey of Spring Lake, Columbia County, Wisconsin.

Net Number	Latitude	Longitude
1	43.53836	-89.30200
2	43.53982	-89.30123
3	43.54210	-89.30981
4	43.54143	-89.30588

Table 4. Length categories that have been proposed for various fish species measured in inches (Anderson and Neumann 1996).

Species	Stock	Quality	Preferred	Memorable	Trophy
Black crappie	5	8	10	12	15
Bluegill	3	6	8	10	12
Channel catfish	11	16	24	28	36
Largemouth bass	8	12	15	20	25
Muskellunge	20	30	38	42	50
Northern pike	14	21	28	34	44
Walleye	10	15	20	25	30
Yellow perch	5	8	10	12	15

Table 5. Catch and catch per unit effort (CPUE) data for 2011 comprehensive fishery survey of Spring Lake, Columbia County, Wisconsin.

Species	SNI Catch	SEII Catch	Total Catch	Percent of Total Catch	SNI Catch Per Net Night	SEII Catch Per Hour	SEII Catch Per Mile
Bluegill	439	114	553	37.4%	23.1	166.8	87.7
Black Crappie	466	25	491	33.2%	24.5	36.6	19.2
Common Carp	58	45	103	7.0%	3.1	65.9	34.6
Walleye	43	21	64	4.3%	2.3	30.7	16.2
Yellow Perch	45	15	60	4.1%	2.4	22.0	11.5
Quillback Carpsucker	24	32	56	3.8%	1.3	46.8	24.6
Largemouth Bass	1	26	27	1.8%	0.1	38.0	20.0
Pumpkinseed	15	9	24	1.6%	0.8	13.2	6.9
Yellow Bullhead	23	-	23	1.6%	1.2	-	-
Bigmouth Buffalo	14	1	15	1.0%	0.7	1.5	0.8
Northern Pike	11	4	15	1.0%	0.6	5.9	3.1
White Sucker	3	8	11	0.7%	0.2	11.7	6.2
Muskellunge	6	-	6	0.4%	0.3	-	-
Bowfin	4	2	6	0.4%	0.2	2.9	1.5
Yellow Bass	1	5	6	0.4%	0.1	7.3	3.8
Freshwater Drum	2	3	5	0.3%	0.1	4.4	2.3
Channel Catfish	4	-	4	0.3%	0.2	-	-
Highfin Carpsucker	4	-	4	0.3%	0.2	-	-
Gizzard Shad	3	2	5	0.3%	0.2	-	-
Golden Shiner	-	1	1	0.1%	-	1.5	0.8
Panfish Aggregate	965	163	1,128	76.3%	50.8	238.5	125.4
All Species	1,166	313	1,479	100.0%	61.4	458.0	240.8

Table 6. Descriptive statistics for lengths of panfish and gamefish collected from Spring Lake, Columbia County, Wisconsin during the 2011 comprehensive fishery survey.

Species	N	Minimum Length	Maximum Length	Mean Length	Median Length	Mode Length	PSD	RSD-P
Bluegill	553	2.3	9.5	5.2	5.2	5.7	23	1
Black Crappie	491	3.2	11.7	9.0	9.0	8.5	89	16
Walleye	64	6.5	25.2	15.5	15.7	15.7	-	-
Yellow Perch	60	2.7	9.3	5.7	5.6	5.4	-	-
Largemouth Bass	27	6.0	19.4	12.1	12.8	12.8	-	-
Pumpkinseed	24	2.4	6.6	5.0	5.0	3.8	-	-
Northern Pike	15	11.6	29.2	22.9	23.5	23.1	-	-
Muskellunge	6	26.2	47.2	38.8	-	-	-	-
Channel Catfish	4	14.0	24.3	18.8	-	-	-	-

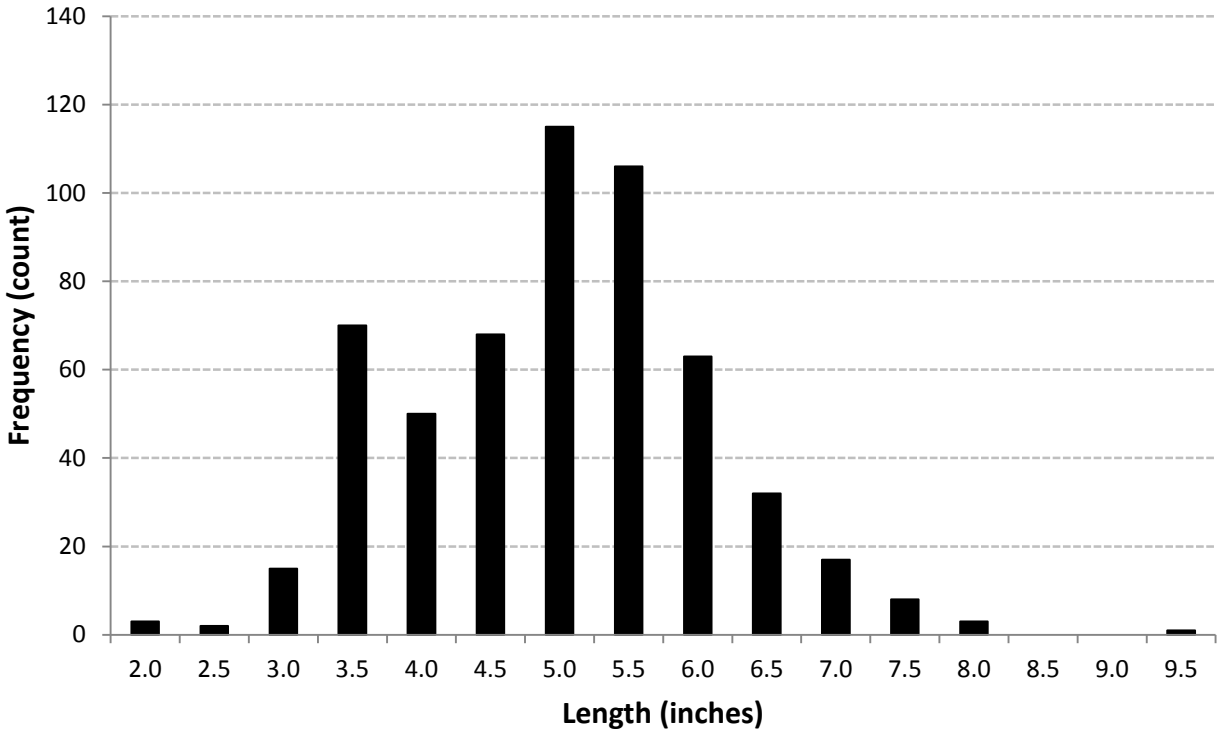

Figure 1. Bluegill length frequency distribution from 2011 comprehensive fishery survey of Spring Lake, Columbia County, Wisconsin.

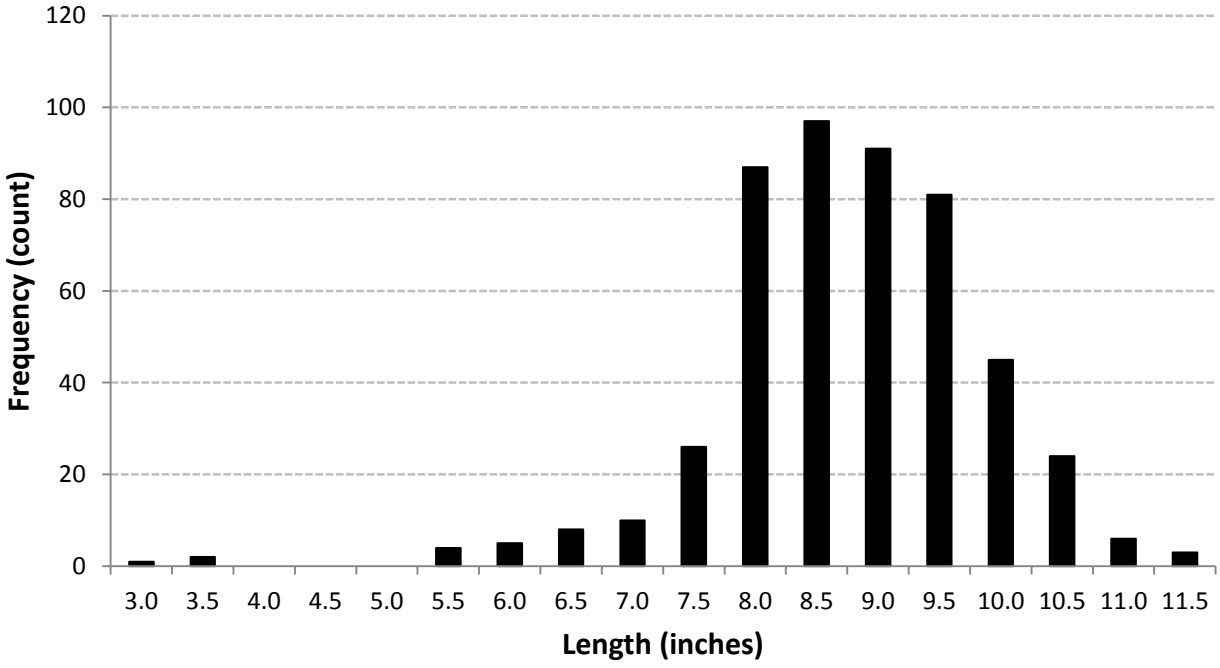

Figure 2. Black crappie length frequency distribution from 2011 comprehensive fishery survey of Spring Lake, Columbia County, Wisconsin.

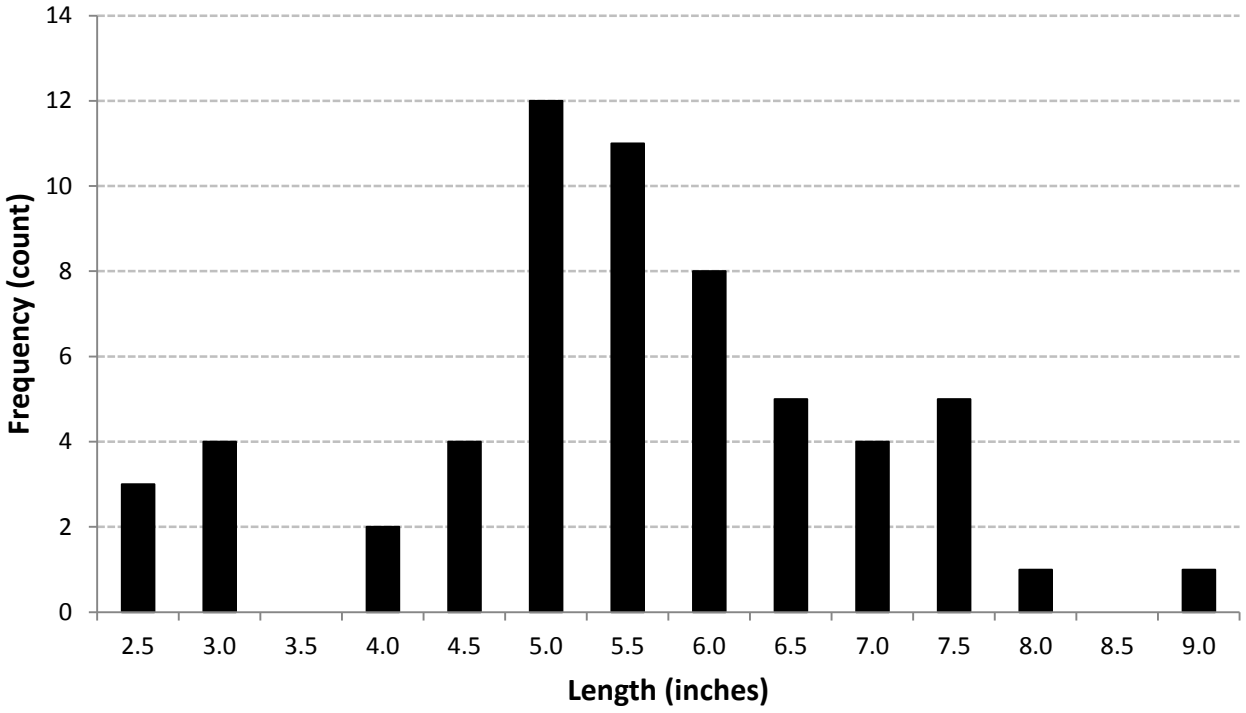

Figure 3. Yellow perch length frequency distribution from 2011 comprehensive fishery survey of Spring Lake, Columbia County, Wisconsin.

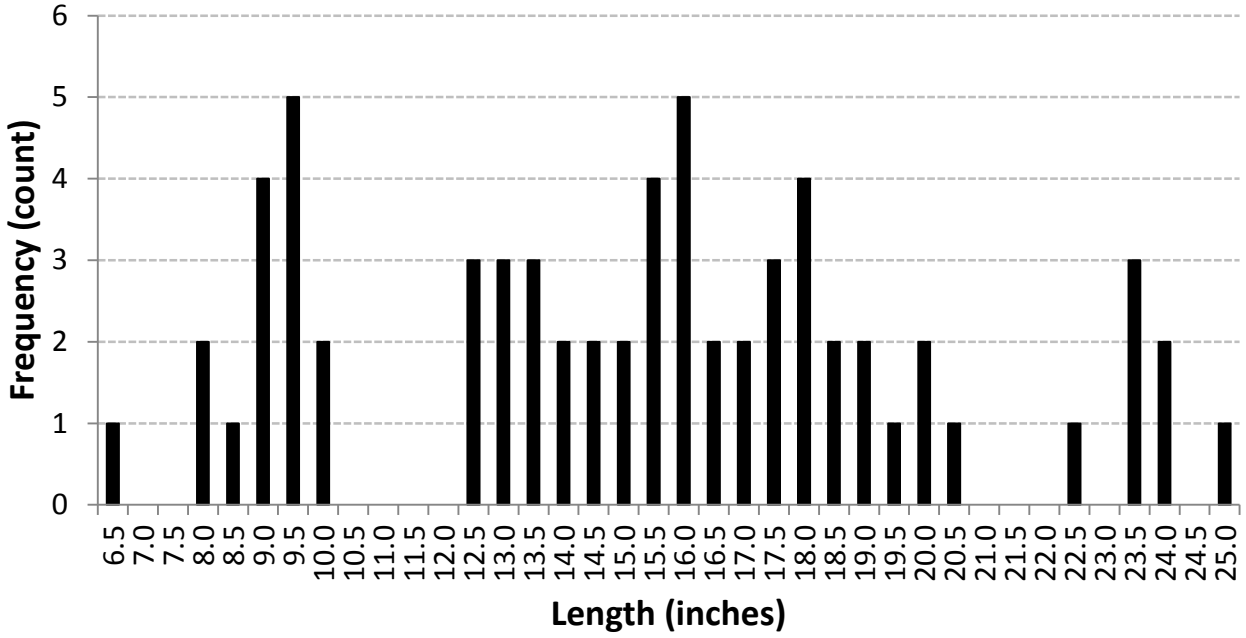

Figure 4. Walleye length frequency distribution from 2011 comprehensive fishery survey of Spring Lake, Columbia County, Wisconsin.