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Completion Report

Creel Survey on Farm Island Lake

Aitkin County, MN

May 11 – September 30, 2024

By

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Abstract

A stratified random creel survey was conducted from May 11 to September 30, 2024 on Farm Island Lake (DOW # 01-0159-00) in Aitkin County. Stratification was by month and day type. The survey objectives were to provide current angling and recreational activity information, while allowing for comparisons to previous creel surveys (1994, 1995, 2003, 2004). During the sampling period, total recreational activity was estimated at 27,496 boat hours, of which 15,512 hours (56%) were angling activity, 10,000 hours (36%) were power boating, 1,240 boat hours (5%) were personal watercraft activity, and 744 boat hours (3%) were non-power boating activity. Angling activity decreased from levels observed in the most recent creel survey (2004; 88%).

The estimated seasonal angling pressure of boat anglers was 34,849 angler-hours (16.97 angler hours/acre). Boat angling activity was highest during the month of May (8,601 angler-hours) followed by July (8,011 angler-hours), June (7,500 angler-hours), August (5,843 angler-hours), and September (4,895 angler-hours). Based on methods of previous creel surveys on Farm Island Lake, angling pressure and catch statistics from shore anglers were not recorded. Total seasonal angling activity, in 2024, was below previous pressure estimates from 1994 (39,262 angler-hours), 1995 (52,580 angler-hours), 2003 (37,630 angler-hours) and 2004 (41,714 angler-hours). Some of the decline in fishing activity from previous surveys may be attributed to a more restrictive Walleye regulation (16-19” protected slot) implemented in 1996, or that in general, more users are now favoring alternate recreational opportunities as opposed to fishing.

Most of the total angling pressure was directed toward Walleye (69.2%), with the remainder of pressure being directed toward Bluegill (18.5%), Largemouth Bass (17.9%), Smallmouth Bass (13.7%), “no particular species” (7.8%), Northern Pike (7.4%), Pumpkinseed (0.4 %), and Rock Bass (0.1%). A total of 13 species were reported in the catch, eight of which were harvested. The three most commonly caught species were Bluegill with 9,836 caught (2,589 pounds) and 3,175 fish harvested (1,366 pounds); Walleye with 7,274 caught (12,311 pounds) and 1,697 fish (2,601 pounds) harvested, and Northern Pike with 7,023 fish caught (7,842 pounds) and 287 fish (402 pounds) harvested.

Walleye catch rate more than doubled from 2004, and increased 1.8 times from 1994, 1995, and 2003. Walleye harvest rates increased 57.6 percent from 2004, decreased 16.5 percent from 2003, and were still well below levels observed in surveys prior to the special Walleye regulation (1994 & 1995). Angler’s total catch rate (all species combined) was 1.10 fish per angler hour, with a catch rate for Walleye of 0.21 fish per angler-hour, 0.28 for Bluegill, 0.20 for Northern Pike, 0.03 for Black Crappie, 0.16 for Largemouth Bass, and 0.12 for Smallmouth Bass. Anglers targeting Walleye achieved a catch rate of 0.26 fish per angler-hour, and a harvest rate of 0.07 fish per angler-hour. Targeting catch and harvest rates for other species were, respectfully: 1.29, 0.48 – Bluegill; 0.39, 0.11 – Northern Pike; 0.27, 0.15 – Black Crappie; 0.53, 0.03 – Largemouth Bass; 0.3, 0.01 – Smallmouth Bass.

While targeting Bluegill, Largemouth Bass, Northern Pike, Smallmouth Bass, and Walleye, parties equipped with forward facing sonar appeared to have higher total catch rates than parties not equipped with forward facing sonar. However, statistical analyses only indicated significant differences in catch rates for Walleye (Welches two sample t-test, $p = 0.0017$) and when all species were combined (Welches two sample t-test, $p = 0.0126$).

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Introduction

Farm Island Lake is located in east-central Minnesota, about seven miles south of Aitkin, in southwestern Aitkin County. It is a popular lake for angling as well as a variety of water-oriented recreation. The Lake is heavily developed with 2 public accesses, 2 resorts, and hundreds of lake homes and cabins.

Farm Island Lake has a long history of fisheries management including many surveys, assessments, and stocking regimes. Farm Island Lake used to be stocked with Northern Pike at various quantities, frequencies, and sizes from 1947 through 1979, but has an even longer history of Walleye stocking dating back to 1922. Fall electrofishing and gill net assessments have shown low recruitment of natural Walleye in comparison to fry stocked year classes, suggesting natural reproduction of Walleye is inadequate to maintain the fishery at the desired level. Therefore, the current management strategy calls for annual stocking of Mississippi River strain Walleye fry at a rate of 1000 fry per littoral acre (883,000 fry).

There are special harvest regulations for Walleye (bag limit of 6, 16-19” protected slot, with one over 20” allowed) on Farm Island Lake, which began in 1996 to help improve and subsequently maintain Walleye catch rates. However, anecdotal observations had suggested fishing effort and harvest have increased significantly since nearby Mille Lacs Lake regulations have become exceedingly conservative. Furthermore, gill net catch rates of Walleye on Farm Island Lake have appeared to decrease in the last decade (~8/net from 1998-2010 to ~6/net from 2013-2020) suggesting that exploitation may have increased.

The primary objectives of this project were to 1) estimate current angler dynamics of the Walleye fishery; 2) determine if Walleye catch and harvest rates have increased from the most recent surveys (2004); and 3) determine if potential changes in Walleye catch and harvest rates are minimizing positive effects of the 1996 experimental regulation (16 – 19” protected slot). Additionally, information on technology use, fishing pressure, catch rates, harvest rates, and size structure of all angled fish species were estimated. These data will be used in conjunction with other sampling indices to assess management and regulation of the fishery.

Study Area

The creel survey was conducted on Farm Island Lake (DOW No. 01-0159-00; Figure 1), which has a surface area of 2,054 acres, of which 43 percent is less than 15.0 feet deep, with a maximum depth of 56.0 feet (Table 1). The lake has relatively clear water with secchi disc readings around 14.0 feet in 2023 and 15.0 feet in 2024 (MNDNR: 8/01/2023 standard survey, 8/05/2024 targeted survey). Improved water clarity in recent years is likely due to dry conditions and recent establishment of Zebra Mussels (2020). Prior to 2020, secchi disc readings have ranged from 3.6 feet in 2007 to 10.7 feet in 1998. Sand is the primary substrate around much of the lake, but scattered muck, silt, gravel, and rubble areas create diverse aquatic habitats. Aquatic vegetation is also diverse with a variety of emergent, floating-leaf, and submerged species present. Invasive Curly-Leaf Pondweed is also present.

The Ripple River flows through Farm Island Lake with the inlet on the south end and outlet on the northeast end. After leaving Farm Island Lake, the Ripple River travels 36 river-miles, flowing through 7 other lakes before reaching the Mississippi River. Fish passage from Farm Island Lake to the Mississippi River or vice versa may be limited at times by natural barriers such as beaver dams. Farm Island Lake is classified as a moderately hard water Walleye Lake of the Ecological Lake Classification 22 (Schupp 1992). In six previous creel surveys (Table 2), Walleye were the primary species sought by anglers. Of the six previous creel surveys, four (1994, 1995, 2003, 2004) were conducted during summer and two (1987, 1995)

were conducted during winter (Van Epps 1988; Van Epps 1994: Van Epps 1995; Van Epps 2003; Van Epps 2004).

Methods

The open water (May 11 to September 30, 2024) creel survey on Farm Island Lake used a roving, incomplete trip, stratified random sampling design. The creel started on May 11, the opening day of fishing season, and lasted until September 30. The creel design was in accordance with Malvestuto (1983) for a roving, stratified, random, uniform probability, incomplete trip survey. The open water season was stratified by month (Table 3). Each monthly stratum was further stratified into day types, weekday and weekend day/holidays, where Fridays were also counted as weekend days. Each day type was stratified into work shifts, an early shift and a late shift. For all strata, May through September, the early shift was from 6:00 A.M. until 2:00 P.M. and the late shift was from 2:00 P.M. until 10:00 P.M. Two instantaneous activity counts were conducted during each work shift for the May through September strata. The first instantaneous activity count was randomly selected for each day from between the starting time and 3.5 hours later, with the subsequent activity count 3.5 hours later. This was to ensure adequate time was available (~30 minutes) to conduct the second instantaneous count during the shift.

The clerk started each count from wherever they happened to be on the lake. Direction of travel was assigned randomly, previously selected, and indicated on the clerk's schedule. Each instantaneous activity count consisted of fishing boat count, motorized recreational activity count (runabouts, pontoons, and personal watercraft), and non-powered recreational activity count (canoeing, sailing, paddle boats).

During the remainder of the day angler interviews were conducted. Questions asked during an interview were divided into four groups. The first was general trip information including date, time of day, trip time start, number of anglers in the party, primary and secondary species sought, whether the trip was complete, and if anglers were equipped with forward-facing sonar. The second was specific angler demographics including sex, age, and home ZIP code. The third was catch information including species and whether it was kept or released. Length of released fish were estimated by the angler to the nearest tenth of an inch and recorded. Individual fish that were harvested were measured to the nearest tenth of an inch by the clerk and recorded. The fourth group was additional questions. Anglers were asked two additional questions 1) if they supported the special Walleye regulation on Farm Island Lake that protects 16 to 19 inch fish, and 2) what 2 other lakes in Minnesota the angler/s fished most often.

Creel pressure and catch estimates were calculated using MN DNR Creel Survey Application (CSM) Version 1.0.4-L. Welch's two sample t-tests were performed in Program R (Version 4.3.3) to compare catch rates, harvest rates, and release rates between angling parties with and without Forward-Facing sonar using interviews as replicates for various targeted species (i.e. Walleye, Largemouth Bass, Smallmouth Bass, Bluegill, and Black Crappie). If a targeted species had less than 10 Forward-Facing sonar users throughout the season, then statistical analysis was not executed due to low sample size (e.g. Northern Pike). Additionally, an angler-shed heat map was generated in ArcGIS Pro (Version 3.1.2) to help visualize where users of the Farm Island Lake fishery were travelling from. ArcMap (Version 10.8.2) was used to construct a lake map illustrating Farm Island Lake, its' location within Minnesota, and the route taken for instantaneous boat counts.

Results

Total recreational activity was stratified into two categories, angling and non-angling (Table 4). Of the estimated 27,496 total boat-hours of recreational activity, 15,512 hours (56%) were angling related. Angling related recreational as a monthly percentage of total recreational activity varied from a high of 84% in June to a low of 39% in July. Non-angling activity was stratified into three categories, power boating, non-power boating, and personal watercraft activity. Eighty-three percent of the non-angling recreational activity was power boating and was most popular in July. The remaining 17% of non-angling recreational activity was non-powered boating (7%) and personal watercraft (10%).

Fishing activity accounted for 34,849 angler hours of effort during the 2024 open water season on Farm Island Lake (Table 5). The pressure estimate was the highest in May (8,601 angler-hours) and lowest in September (4,895 angler-hours). Angler pressure decreased by 1,101 angler-hours from May to June, then increased by 511 angler-hours from June to July. Angler-hours gradually decreased from July through September.

During the 2024 open water season, an estimated total of 38,192 fish were caught with 6,277 fish harvested, equating to 5,539 pounds or 2.70 pounds per acre of harvest (Tables 6 & 7). The catch rate for all species combined was around 1.10 fish per angler-hour and the harvest rate was 0.18 fish per angler-hour (Table 8). Walleye were the primary species sought by anglers (Table 9). Sixty-nine percent of the 1,155 parties interviewed were fishing for Walleye as a primary or secondary species, followed by Bluegill (18.5%), Largemouth Bass (17.9%), Smallmouth Bass (13.7 percent), “no particular species” (7.8%), Northern Pike (7.4%), Pumpkinseed (0.4%), and Rock Bass (0.1%). Analysis of the data by monthly strata showed that Walleye remained the primary species targeted during every month, yet the second most sought after species varied throughout the survey. The second most sought after species by monthly strata was Black Crappie in May, Bluegill in June and July, and Largemouth Bass in August and September. For the first time among Farm Island creel surveys, Smallmouth Bass was a sought after species due to their recent establishment and growing population. Proportions of parties targeting Smallmouth Bass by monthly strata ranged from 9.3% in May to 21.3% in August.

Walleye

Walleye were the second most common species caught and harvested during the open water season (Tables 6 & 8). Anglers caught 7,274 Walleye of which 1,697 were harvested, weighing 2,601 pounds or 1.27 pounds per acre (Tables 6 & 7). Walleye ranged in length from 8.0 to 30.5 inches in total length (Table 10). Harvested Walleye ranged from 11.5 to 24.5 inches. Note that most fish were harvested legally outside the 16.0 to 19.0 inch protected slot, however the clerk did encounter two illegally harvested fish on separate occasions between 18.0 and 18.5 inches. One of the anglers reported that the fish died from being “gut hooked” and they “did not want to waste it”, while the other angler reported they were “not aware of the protected Walleye regulation”. Illegal fish accounted for less than 1 percent of all Walleye harvested. The length frequency distribution of Walleye harvested by strata shows little change in the size of fish harvested from May through September (Table 11). The most frequent size range of Walleye harvested across monthly strata was 14.0 to 14.9 inches, except in September when 15.0 to 15.9 inch Walleye were harvested slightly more.

For all anglers combined, Walleye were caught at a rate of 0.21 fish per angler-hour and harvested at a rate of 0.05 fish per angler-hour (Table 8). Anglers targeting Walleye had a catch rate of 0.26 fish per angler-hour and a harvest rate of 0.07 fish per angler-hour (Table 12). In 2024, approximately 80% of parties

targeting Walleye kept zero Walleye, while 11% kept one, and 5% kept two. Around 3% of parties targeting Walleye kept three or more Walleye (Table 13). Seventy-six percent of the total Walleye catch was released, with 57% of that catch falling into the 16.0 to 19.0 inch protected slot.

Northern pike

Northern Pike were the third most common species anglers caught yet had the highest release rates (Tables 6 and 8). Anglers caught 7,023 Northern Pike, released 6,736, and harvested 287. The estimated weight of harvested Northern Pike was 402 pounds, or 0.20 pounds per acre (Table 7). Northern Pike ranged in length from 10.0 to 30.0 inches in length (Table 10). Harvested Northern Pike ranged from 16.5 to 24.0 inches with a mean length of 19.0 inches. Pike are managed under the statewide regulation with a protected slot between 22.0 to 26.0 inches in the North-Central zone. The creel clerk measured 2 illegal length fish harvested by anglers, equating to 5% of the Northern Pike harvest. The length frequency distribution of angler caught Northern Pike suggests mostly small fish were caught. The most frequent size of harvested Pike ranged from 19.0 to 19.9 inches, while the most frequent size caught ranged from 20.0 to 20.9 inches.

Anglers who caught Northern Pike primarily practiced catch and release (Table 8 and 12), even if they were targeting Pike specifically. When combing all anglers, Northern Pike were caught at a rate of 0.20 fish per angler-hour and harvested at a rate of < 0.01 fish per angler-hour. Anglers targeting Northern Pike had a total catch rate of 0.39 fish per angler-hour with a harvest rate of 0.11 fish per angler-hour. When all anglers were combined, 96% of Northern Pike caught were released, while anglers targeting Northern Pike released 93% of their catch.

Largemouth Bass

Largemouth Bass were the fourth most common species caught by anglers and most fish were released (Tables 6 & 8). Anglers caught 5,729 Largemouth Bass, released 5,513 and harvested 216, which equates to a total weight of 386 pounds harvested, or 0.19 pounds harvested per acre (Tables 6 & 7). Anglers reported Largemouth Bass ranging in length from 3.0 to 24.0 inches (Table 10). Harvested Largemouth Bass ranged in length from 9.0 to 17.5 inches, with a mean of 14.5 inches. The length frequency distribution of angler-caught fish suggests a quality Largemouth Bass fishery exists in Farm Island Lake, with 86% of fish measuring between 12.0 and 18.9 inches and 2% that were 19.0 inches or greater.

Anglers who caught Largemouth Bass primarily practiced catch and release (Table 8 and 12), regardless of if they were targeting Largemouth Bass specifically. When all anglers were combined, Largemouth Bass were caught at a rate of 0.16 fish per angler-hour, released at a rate of 0.16 fish per angler-hour, and harvested at a rate of < 0.01 fish per angler-hour. Anglers targeting Largemouth Bass had a catch rate of 0.53 fish per angler hour, release rate of 0.52 fish per angler-hour, and a harvest rate of 0.03 fish per angler-hour. Ninety-six percent of Largemouth Bass caught were released by anglers, even if they were specifically targeting Largemouth Bass.

Smallmouth Bass

Smallmouth Bass were the fifth most common species caught by anglers and rarely harvested (Tables 6 & 8). Anglers caught 4,323 Smallmouth Bass, released 4,162, and harvested 161, equating to 240 pounds, or 0.12 pounds harvested per acre (Tables 6 & 7). Anglers reported Smallmouth Bass ranging in length from 3.0 to 22.0 inches (Table 10). Harvested Smallmouth Bass ranged from 8.0 to 19.2 inches, with a mean length of 13.6 inches. The length frequency distribution of angler-caught fish suggests a quality Smallmouth Bass

fishery exists in Farm Island Lake, with 80% of the catch measuring between 12 to 18.9 inches and 5% that were 19 inches or greater.

When all anglers were combined Smallmouth Bass were caught at a rate of 0.12 fish per angler-hour, released at a rate of 0.12 fish per angler-hour, and harvested at a rate < 0.01 fish per angler-hour (Table 8). Anglers targeting Smallmouth Bass had a catch rate of 0.30 fish per angler-hour, release rate of 0.29 fish per angler-hour, and a harvest rate of 0.01 fish per angler-hour. When all anglers were combined, 96% of Smallmouth Bass caught were released, while anglers targeting Smallmouth Bass released 98% of their catch.

Bluegill

Bluegill were the most common species caught and harvested by anglers (Tables 6 & 8). Anglers caught 9,836 Bluegill, released 6,661, and harvested 3,175 (Table 8). Anglers harvested approximately 1,366 pounds of Bluegill, or 0.66 pounds of Bluegill per acre (Table 7). Anglers reported Bluegill ranging from 3.0 to 10.5 inches in total length (Table 10). Harvested Bluegill ranged from 5.0 to 10.0 inches with a mean length of 8.0 inches. The length frequency distribution of angler-caught fish suggests a quality Bluegill fishery exists in Farm Island Lake, as 20% of the catch and approximately 47% of the harvest were between 8.0 and 8.9 inches.

Anglers had the highest success catching and harvesting Bluegills compared to all other species. When all anglers were combined, Bluegill were caught at a rate of 0.28 fish per angler-hour, released at a rate of 0.19 fish per angler-hour, and harvested at a rate of 0.09 fish per angler-hour (Table 8). Anglers targeting Bluegill had a catch rate of 1.3 fish per angler-hour, release rate of 0.81 fish per angler-hour, and a harvest rate of 0.48 fish per angler-hour (Table 12). When combining all anglers, roughly 70% of the total Bluegill catch was released, while parties specifically targeting Bluegill released about 64% of their total catch.

Black Crappie

Black Crappie were the third most common species harvested, despite ranking as the seventh most common species caught (Tables 6 & 8). Anglers caught 903 Black Crappie, released 349, and harvested 554, weighing 443 pounds or 0.22 pounds harvested per acre (Tables 6 & 7). Anglers reported Black Crappie ranging in length from 7.0 to 15.0 inches. Harvested Black Crappie ranged in length from 9.0 to 14.0 inches, with a mean of 11.1 inches (Table 10). Analysis of the data by monthly strata suggests low angling success throughout most of the open water season, as 79% of the total catch and 86% of the total harvest occurred in May.

Throughout the season, when combining all anglers, Black Crappie were caught at a rate of 0.03 fish per angler-hour, released at a rate of 0.01 fish per angler-hour, and harvested at a rate of 0.02 fish per angler hour (Table 8). Anglers targeting Black Crappie had a catch rate of 0.27 fish per angler-hour, release rate of 0.18 fish per angler-hour, and a harvest rate of 0.15 fish per angler-hour (Table 12). When combining all anglers, 61% of the total Black Crappie catch was harvested, while anglers targeting Black Crappie harvested 64% of their total catch.

Other Species

Anglers caught a total of seven other species on Farm Island Lake in 2024 (Table 9). The list includes: Bowfin, Bullhead, Channel Catfish, Hybrid Sunfish, Pumpkinseed, Rock Bass, and Yellow Perch. Anglers caught (harvested) an estimated 22 (0) Bowfin, 6 (0) Bullhead spp., 8 (0) Channel Catfish, 10 (0)

Hybrid Sunfish, 358 (90) Pumpkinseed, 2,522 (97) Rock Bass, and 178 (0) Yellow Perch. This was the first observation of Channel Catfish in Farm Island Lake.

Forward-Facing Sonar (FFS)

As mentioned previously, the creel clerk recorded if angling parties had forward-facing sonar (FFS) during their fishing trip. Of 1,157 parties interviewed, 235 (20%) indicated they had FFS (Table 14). The percentage of parties equipped with FFS ranged from 17 to 23 percent across all strata, was lowest in July, and was highest in August.

With one exception (Black Crappie), targeting parties equipped with FFS appeared to have higher total catch rates and higher total release rates than targeting parties without FFS (Table 15). Alternatively, targeting parties not equipped with FFS appeared to have higher total harvest rates than targeting parties equipped with FFS, except for Walleye and Smallmouth Bass, where total harvest rates were similar.

FFS - All Species combined

The clerk observed a total of 6,375 fish caught, 1,035 fish harvested, and 5,340 fish released by targeted anglers throughout the season (Table 16). Approximately 28% of the total catch, 16% of the total harvest, and 31% of all fish released were by parties using FFS. The percentage of fish harvested by parties with FFS across monthly strata ranged from 9 to 24 percent, was lowest in July and highest in June. The percentage of fish released by parties with FFS across monthly strata ranged from 26 to 34 percent of fish, was lowest in June and highest in September.

Targeting anglers using FFS appeared to have a higher total catch rate, a higher total release rate, but a lower total harvest rate compared to targeting anglers without FFS when all species were combined (Table 15). Parties equipped with FFS had a total catch rate of 1.46 fish per angler-hour, total release rate of 1.32 fish per angler-hour, and total harvest rate of 0.13 fish per angler hour. Parties not equipped with FFS had a total catch rate of 1.01 fish per angler hour, total release rate of 0.82 fish per hour, and a total harvest rate of 0.19 fish per hour. Total harvest rates for parties equipped with FFS ranged from 0.07 to 0.15 fish per angler hour across all strata, was lowest in July, and was highest in June. Total release rates for parties equipped with FFS ranged from 0.90 to 1.34 fish per angler-hour across all strata, was lowest in September and highest in July. Total harvest rates for parties not equipped with FFS ranged from 0.11 to 0.15 fish per angler-hour across all strata, was lowest in July and highest during May and June. Total release rates for parties not equipped with FFS ranged from 0.51 to 0.70 fish per angler-hour across all strata, was lowest in August and highest in June.

A Welch's two sample t-test ($\alpha = 0.05$) was performed to compare catch rates, harvest rates, and release rates between angling parties with forward-facing sonar and without forward-facing sonar (Table 17). Catch rates between parties with FFS (mean = 1.68 fish per angler-hour, SD = 2.42) and parties without FFS (mean = 1.25 fish per angler-hour, SD = 1.89) were significantly different ($df = 309$, $t = 2.51$, $p = 0.0126$). Conversely, there was no significant difference in harvest rates between parties with FFS (mean = 0.17 fish per angler-hour, SD = 0.45) and parties without FFS (mean = 0.25 fish per angler hour, SD = 0.76; $df = 615$, $t = -1.94$, $p = 0.0527$). Finally, release rates between parties with FFS (mean = 1.51 fish per angler-hour, SD = 2.24) and parties without FFS (mean = 1.01 fish per angler-hour, SD = 1.49) were significantly different ($df = 287$, $t = 3.25$, $p = 0.0013$).

FFS – Walleye

The clerk interviewed 801 parties targeting Walleye during the 2024 season, with 190 (24%) equipped with FFS (Table 17). The clerk observed a total of 1,084 Walleye caught, 823 released, and 261 harvested by parties targeting Walleye (Table 16). Among targeting parties, approximately 37% of the Walleye catch, 29% of the harvest, and 40% of released Walleye were from parties equipped with FFS. The percentage of Walleye harvested by parties equipped with FFS across monthly strata ranged from 13 to 53 percent, was lowest in July and highest in August. The percentage of Walleye released by targeting parties equipped with FFS across monthly strata ranged from 33 to 56 percent, was lowest in May and highest in August.

Parties targeting Walleye equipped with FFS appeared to have a higher total catch rate, higher total release rate, and a similar harvest rate when compared to parties not equipped with FFS (Table 15). Parties equipped with FFS had a total catch rate of 0.44 fish per angler hour, total release rate of 0.36 fish per angler hour, and a total harvest rate of 0.08 fish per angler hour. Parties not equipped with FFS had a total catch rate of 0.25 fish per angler-hour, release rate of 0.18 fish per angler-hour, and a harvest rate of 0.07 fish per angler-hour. Total release rates for parties equipped with FFS across monthly strata ranged from 0.21 to 0.57 fish per angler hour, was lowest in August and highest in June. Total harvest rates for parties equipped with FFS across monthly strata ranged from 0.03 to 0.12 fish per angler-hour, was lowest in July and highest in June. Total release rates for parties not equipped with FFS across monthly strata ranged from 0.09 to 0.28 fish per angler-hour, was lowest in August and highest in June. Total harvest rates for parties not equipped with FFS across monthly strata ranged from 0.04 to 0.11 fish per angler-hour, was lowest in August and highest in July.

A Welch's two sample t-test ($\alpha = 0.05$) was performed to compare Walleye catch rates, harvest rates, and release rates between angling parties targeting Walleye with forward-facing sonar and without forward-facing sonar (Table 17). There was a significant difference in catch rates between parties with FFS (mean = 0.57 fish per angler-hour, SD = 0.82) and parties without FFS (mean = 0.36 fish per angler-hour, SD = 0.75; df = 293, t = 3.16, p = 0.0017). Conversely, there was no significant difference in harvest rates between parties with FFS (mean = 0.11 fish per angler-hour, SD = 0.27) and parties without FFS (mean = 0.09 fish per angler hour, SD = 0.27; df = 314, t = 0.98, p = 0.3305). Finally, there was a significant difference in release rates between parties with FFS (mean = 0.46 fish per angler-hour, SD = 0.75) and parties without FFS (mean = 0.27 fish per angler-hour, SD = 0.62; df = 274, t = 3.16, p = 0.0017).

FFS - Largemouth Bass

The clerk interviewed 207 parties targeting Largemouth Bass during the 2024 season, with 41 (20%) equipped with FFS (Table 14). The clerk observed a total of 674 Largemouth Bass caught, 649 released, and 25 harvested by parties targeting Largemouth Bass (Table 16). Approximately 26% of the total Largemouth Bass catch, 0% of the harvest, and 27% of released Largemouth Bass were from targeting parties equipped with FFS. The clerk observed that parties equipped with FFS harvested 0 Largemouth Bass throughout the season, while parties not equipped with FFS harvested a total of 25 Largemouth Bass. The number of Largemouth Bass harvested by targeting parties across monthly strata ranged from 0 to 17, was lowest in both May and September and highest in July. The percentage of Largemouth Bass released by targeting anglers equipped with FFS across monthly strata ranged from 8 to 47 percent, was lowest in June and highest in May.

Parties targeting Largemouth Bass equipped with FFS appeared to have a higher total catch rate, higher total release rate, and a lower harvest rate when compared to parties not equipped with FFS (Table 15).

Parties equipped with FFS had a total catch rate of 0.72 fish per angler hour, total release rate of 0.72 fish per angler hour, and a total harvest rate of 0.00 fish per angler hour. Parties not equipped with FFS had a total catch rate of 0.46 fish per angler-hour, total release rate of 0.43 fish per angler-hour, and a total harvest rate of 0.03 fish per angler-hour. Total release rates for parties equipped with FFS across monthly strata ranged from 0.41 to 0.79 fish per angler hour, was lowest in June and highest in July. Total release rates for parties not equipped with FFS across monthly strata ranged from 0.28 to 0.59 fish per angler-hour, was lowest in May and highest in September. Total harvest rates for parties not equipped with FFS across monthly strata ranged from 0.00 to 0.06 fish per angler-hour, was lowest in May and September and was highest in July.

A Welch's two sample t-test ($\alpha = 0.05$) was performed to compare Largemouth Bass catch rates, harvest rates, and release rates between angling parties targeting Largemouth Bass with forward-facing sonar and without forward-facing sonar (Table 17). There was no significant difference in catch rates between parties with FFS (mean = 0.99 fish per angler-hour, SD = 1.83) and parties without FFS (mean = 0.58 fish per angler-hour, SD = 1.03; df = 46, t = 1.39, p = 0.1723). Conversely, there was a significant difference in harvest rates between parties with FFS (mean = 0.00 fish per angler-hour, SD = 0.00) and parties without FFS (mean = 0.03 fish per angler hour, SD = 0.19; df = 165, t = -2.36, p = 0.0195). Finally, there was no significant difference in release rates between parties with FFS (mean = 0.99 fish per angler-hour, SD = 1.83) and parties without FFS (mean = 0.54 fish per angler-hour, SD = 1.01; df = 46, t = 1.50, p = 0.1396).

FFS - Smallmouth Bass

The clerk interviewed 158 parties targeting Smallmouth Bass during the 2024 season, with 42 (27%) equipped with FFS (Table 14). The clerk observed a total of 342 Smallmouth Bass caught, 336 released, and 6 harvested by parties targeting Smallmouth Bass (Table 16). Approximately 43% of the total Smallmouth Bass catch, 0% of the harvest, and 44% of released Smallmouth Bass were from targeted parties equipped with FFS. The clerk observed parties equipped with FFS harvested 0 Smallmouth Bass throughout the season, while parties not equipped with FFS harvested a total of 6 Smallmouth Bass. The percentage of Smallmouth Bass released by parties equipped with FFS across monthly strata ranged from 20 to 56 percent of the Smallmouth Bass released by targeted parties, was lowest in May and was highest in August.

Parties targeting Smallmouth Bass equipped with FFS appeared to have a higher total catch rate and a higher total release rate when compared to parties not equipped with FFS (Table 15). Parties equipped with FFS had a total catch rate and release rate of 0.58 fish per angler hour, with zero fish harvested. Parties not equipped with FFS had a total catch rate of 0.28 fish per angler-hour, total release rate of 0.27 fish per angler-hour, and a total harvest rate of 0.01 fish per angler-hour. Total release rates for parties equipped with FFS across monthly strata ranged from 0.18 to 2.63 fish per angler-hour, was lowest in September, and was highest in June. Total release rates for parties not equipped with FFS across monthly strata ranged from 0.09 to 0.61 fish per angler-hour, was lowest in September and was highest in May.

A Welch's two sample t-test ($\alpha = 0.05$) was performed to compare Smallmouth Bass catch rates, harvest rates, and release rates between angling parties targeting Smallmouth Bass with forward-facing sonar and without forward-facing sonar (Table 17). There was no significant difference in catch rates between parties with FFS (mean = 0.90 fish per angler-hour, SD = 1.72) and parties without FFS (mean = 0.36 fish per angler-hour, SD = 0.56; df = 44, t = 2.00, p = 0.0517). Additionally, there was not a significant difference in harvest rates between parties with FFS (mean = 0.00 fish per angler-hour, SD = 0.00) and parties without FFS (mean = 0.02 fish per angler hour, SD = 0.12; df = 115, t = -1.76, p = 0.0803). Finally, there was a significant

difference in release rates between parties with FFS (mean = 0.90 fish per angler-hour, SD = 1.72) and parties without FFS (mean = 0.34 fish per angler-hour, SD = 0.56; df = 44, t = 2.06, p = 0.0450).

FFS – Bluegill

The clerk interviewed 215 parties targeting Bluegill during the 2024 season, with 32 (15%) parties equipped with FFS (Table 14). The clerk observed a total of 1,396 Bluegill caught, 889 released, and 507 harvested by parties targeting Bluegill (Table 16). Approximately 26% of the total Bluegill catch, 15% of the harvest, and 32% of released Bluegill were from targeting parties equipped with FFS. The percentage of Bluegill harvested by targeted parties equipped with FFS across monthly strata ranged from 0 to 30 percent, was lowest in May and highest in June. The percentage of Bluegill released by parties equipped with FFS across monthly strata ranged from 11 to 52 percent of the Bluegill released by targeted parties, was lowest in June and highest in September.

Parties targeting Bluegill equipped with FFS appeared to have a higher total catch rate, higher total release rate, and a slightly lower harvest rate compared to parties not equipped with FFS (Table 15). Parties equipped with FFS had a total catch rate of 1.82 fish per angler hour, a total release rate of 1.44 fish per angler hour, and a total harvest rate of 0.38 fish per angler hour. Parties not equipped with FFS had a total catch rate of 1.17 fish per angler-hour, total release rate of 0.68 fish per angler-hour, and a total harvest rate of 0.49 fish per angler-hour. Total release rates for parties equipped with FFS across monthly strata ranged from 0.11 to 4.16 fish per angler hour, was lowest in June and highest in September. Total harvest rates for parties equipped with FFS across monthly strata ranged from 0.00 to 1.00 fish per angler-hour, was lowest in May and highest in August. Total release rates for parties not equipped with FFS across monthly strata ranged from 0.14 to 0.92 fish per angler-hour, was lowest in May and highest in August. Total harvest rates for parties not equipped with FFS across monthly strata ranged from 0.13 – 0.88 fish per angler-hour, was lowest in May and highest in July.

A Welch's two sample t-test ($\alpha = 0.05$) was performed to compare Bluegill catch rates, harvest rates, and release rates between angling parties targeting Bluegill with forward-facing sonar and without forward-facing sonar (Table 17). There was no significant difference in catch rates between parties with FFS (mean = 1.93 fish per angler-hour, SD = 4.37) and parties without FFS (mean = 1.66 fish per angler-hour, SD = 2.94; df = 36, t = 0.34, p = 0.7344). Additionally, there was no significant difference in harvest rates between parties with FFS (mean = 0.43 fish per angler-hour, SD = 0.87) and parties without FFS (mean = 0.62 fish per angler hour, SD = 1.43; df = 64, t = -1.03, p = 0.3091). Finally, there was no significant difference in release rates between parties with FFS (mean = 1.50 fish per angler-hour, SD = 3.87) and parties without FFS (mean = 1.04 fish per angler-hour, SD = 1.98; df = 34, t = 0.67, p = 0.5095).

FFS - Black Crappie

The clerk interviewed 126 parties targeting Black Crappie during the 2024 season, with 20 (16%) equipped with FFS (Table 14). The clerk observed a total of 103 Black Crappie caught, 37 released, and 66 harvested by parties targeting Black Crappie (Table 16). Approximately 10% of the total Black Crappie catch, 3% of the harvest, and 22% of released Black Crappie were from targeted parties equipped with FFS. The percentage of Black Crappie harvested by parties equipped with FFS across monthly strata ranged from 0 to 100 percent of the Black Crappie harvested by targeted parties. The percentage of Black Crappie released by

parties equipped with FFS across monthly strata ranged from 0 to 28 percent of the Black Crappie released by targeting parties.

Parties targeting Black Crappie that were equipped with FFS appeared to have a lower total catch rate, a similar total release rate, and much lower harvest rate compared to parties not equipped with FFS (Table 15). Parties equipped with FFS had a total catch rate of 0.07 fish per angler-hour, a total release rate of 0.06 fish per angler-hour, and a total harvest rate of 0.01 fish per angler-hour. Parties not equipped with FFS had a total catch rate of 0.18 fish per angler-hour, total release rate of 0.05 fish per angler-hour, and a total harvest rate of 0.12 fish per angler-hour. Total release rates for parties equipped with FFS across monthly strata ranged from 0.0 to 0.35 fish per angler hour. Total harvest rates for parties equipped with FFS across monthly strata ranged from 0.00 to 0.03 fish per angler-hour. Total release rates for parties not equipped with FFS across monthly strata ranged from 0.00 to 0.13 fish per angler. Total harvest rates for parties not equipped with FFS across monthly strata ranged from 0.00 to 0.22 fish per angler-hour.

A Welch's two sample t-test ($\alpha = 0.05$) was performed to compare Black Crappie catch rates, harvest rates, and release rates between parties targeting Black Crappie with forward-facing sonar and without forward-Facing sonar (Table 17). There was no significant difference in catch rates between parties with FFS (mean = 0.09 fish per angler-hour, SD = 0.39) and parties without FFS (mean = 0.19 fish per angler-hour, SD = 0.55; df = 35, t = -0.98, p = 0.3336). Conversely, there was a significant difference in harvest rates between parties with FFS (mean = 0.01 fish per angler-hour, SD = 0.02) and parties without FFS (mean = 0.13 fish per angler hour, SD = 0.43; df = 108, t = -3.03, p = 0.0031). Finally, there was no significant difference in release rates between parties with FFS (mean = 0.09 fish per angler-hour, SD = 0.39) and parties without FFS (mean = 0.06 fish per angler-hour, SD = 0.25; df = 22, t = 0.31, p = 0.7615).

FFS - Northern Pike

The clerk interviewed 85 parties targeting Northern Pike during the 2024 season, with only 6 (7%) equipped with FFS (Table 14). The clerk observed a total of 179 Northern Pike caught, 166 released, and 13 harvested by parties targeting Northern Pike (Table 16). Approximately 11% of the total Northern Pike catch, 0% of the harvest, and 11% of released Northern Pike were from targeted parties equipped with FFS. Targeted parties equipped with FFS harvested 0 Northern Pike throughout the season, while parties not equipped with FFS harvested a total of 13. The percentage of Northern Pike released by parties equipped with FFS across monthly strata ranged from 0 to 25 percent, was lowest in July and September and highest in August.

Parties targeting Northern Pike that were equipped with FFS appeared to have a higher total catch rate and higher total release rate compared to parties not equipped with FFS; however, significant differences could not be determined due to low sample size of parties targeting Northern Pike with FFS (Table 14). Parties equipped with FFS had a total catch rate and release rate of 0.48 fish per angler hour with a mean catch and release rate of 0.92 fish per angler-hour (SD = 1.25). Parties not equipped with FFS had a total catch rate of 0.35 fish per angler-hour (mean = 0.45 fish per angler-hour, SD = 0.76), total release rate of 0.32 fish per angler-hour (mean = 0.40 fish per angler-hour, SD = 0.70), and a total harvest rate of 0.03 fish per angler-hour (mean = 0.04 fish per angler-hour, SD = 0.20).

Angler-shed

An "angler-shed Map" illustrating the geographic areas where Farm Island Lake anglers reside is included in this report (Figure 2). The highest concentrations of anglers were from the Twin Cities, Aitkin area, and Crow Wing County (Deerwood & Brainerd areas). Approximately 27% of anglers had a hometown

distance of 0 to 49 miles from Farm Island Lake, while 34% of anglers lived 50 to 99 miles away, and 22% lived 100 to 149 miles away (Table 18). In total, anglers from 28 states and 1 European country (United Kingdom) were interviewed and recorded fishing on Farm Island Lake during the 2024 season. The 28 states included Alaska, Alabama, Arkansas, Arizona, Colorado, Florida, Georgia, Iowa, Illinois, Kansas, Kentucky, Minnesota, Missouri, Montana, North Carolina, North Dakota, Nebraska, New Hampshire, New York, Ohio, Oklahoma, Oregon, South Carolina, South Dakota, Texas, Virginia, Washington, and Wisconsin.

Additional Questions

Anglers were also asked during their interview if they supported the current Walleye regulation (16 to 19 inch protected slot). Eighty percent of parties reported that they supported the current regulation, while 20 percent did not support it (Table 19). Anglers in favor of the regulation often stated they supported the regulation because they believed fishing pressure and Walleye harvest have increased, primarily due to guided fishing trips and anglers looking for alternate options from Mille Lacs Lake. Anglers supporting the regulation also stated they enjoyed catching Walleye more than harvesting. Most anglers not in favor of the regulation stated they would like to harvest more Walleye, and the regulation should be modified, eliminated, or shifted towards different fish sizes, since most of their Walleye catch was within the protected slot and had to be released.

Additionally, anglers were asked “what are two other lakes in Minnesota you fish most often?” A total of 268 different lakes were mentioned by anglers, with Mille Lacs Lake being the most popular response (21%), followed by Lake of the Woods (3%) and Leech Lake (3%; Table 20).

Discussion

Angling pressure

Angling pressure in 2024 (34,849 angler hours) was the lowest ever recorded for an open water creel survey on Farm Island Lake (Table 1). However, previous surveys in 1994 (39,262 angler-hours), 1995 (52,580 angler-hours), 2003 (37,630 angler-hours), and 2004 (41,714 angler-hours) sampled through mid-October, while the 2024 survey only sampled through the end of September. The September strata in 2024 accounted for 4895 angler-hours, while historically the September through mid-October strata accounted for roughly 4930 angler-hours per year (range = 3112 to 7310 angler-hours), therefore little of the fishery was missed during the 2024 late season strata. Although the current survey had slightly lower angling pressure than historic surveys, it is still comparable to historic pressure estimates, with the exception of 1995. Most of the additional pressure in 1995 was directed to Bluegill, rather than Walleye.

Walleye

The catch rate for Walleye in 2024 (0.21 fish per angler hour) was much higher (135%) than levels observed historically. The Walleye catch rate in 2024 increased 2.35 times compared to the previous creel survey in 2004 (0.09 fish per angler-hour), and approximately 1.8 times (76 to 82%) when compared to the surveys from 1994 (0.12 fish per angler-hour), 1995 (0.12 fish per angler-hour), and 2003 (0.12 fish per angler-hour). Similarly, gill net catch rates during the 2023 standard survey (8.0 Walleye per gill net) increased 1.7 times (66%) from the 1995 Standard Survey (4.83 Walleye per gillnet). In contrast to the 2004 and 2024 angler catch rate comparisons, gillnet catch rates were similar in 2004 (7.5 Walleye per gill net) and 2023 (8.0 Walleye per gill net).

Walleye harvest rates in 2024 (0.05 fish per angler-hour) increased 58% from 2004 (0.03 fish per angler-hour), and decreased 17% from 2003 (0.06 fish per angler-hour). Not surprisingly, Walleye harvest rates were greater prior to the implementation of the protected slot, with 0.10 fish per angler hour in 1994, and 0.07 fish per angler hour in 1995.

The length frequency distribution for Walleye harvested was much different compared to the 1994 and 1995 creel seasons. In 1994 and 1995, 48% and 20% of the Walleye harvested, respectively, were between 16 and 19 inches in length. In 2003, 2004, and 2024, only 7%, 5%, and 0.7% of the Walleye harvested were between 16 and 19 inches by anglers who either were unaware of the regulation or decided to keep fish against the regulation.

Evaluation of experimental Walleye regulation

The objective of the experimental regulation was to increase Walleye catch rates for fish within the protected slot by 1.5 to 2 times. Based on results of the 2024 creel survey, those expectations have been met. The average catch rate for Walleye within the 16 to 19 inch protected slot for the 1994 and 1995 creel surveys was 0.06 fish per angler-hour. For the 2003 and 2004 creel surveys, the average catch rate for fish within the protected slot was 0.09 fish per angler-hour, an increase of 1.5 times. The catch rate of Walleye in the protected slot during the 2024 creel survey was 0.12 fish per angler-hour, double that from 1994 and 1995 averages, and a 1.3-time increase from the 2003 and 2004 averages. Additionally, 80% of parties from the 2024 creel survey reported that they supported the regulation. It was not evaluated in the 2003 and 2004 surveys whether or not anglers were in favor of the regulation.

Northern Pike

In 2024, Northern Pike harvest was observed at an all-time low of 287 fish, and it appears a shift has occurred in angler's preference to harvest Northern Pike. Combined harvest for all anglers was a total of 1,080 Northern Pike in 1994, 1,752 in 1995, 1,687 in 2003, and 2,835 in 2004. The total number of Northern Pike caught in 2024 was 7,023 and was comparable to the catches in 1995 (7,275 fish) and 2003 (8,108 fish), while the lowest catch was in 1994 (2,769 fish) and the highest catch was in 2004 (11,480 fish).

Harvest rates of Northern Pike had displayed a steady upward trend throughout survey years, (0.028 fish per angler-hour in 1994, 0.033 fish per angler-hour in 1995, 0.045 fish per angler-hour in 2003, and 0.068 fish per angler-hour in 2004) before dropping substantially to <0.01 fish per angler-hour in 2024 (Table 2). Approximately 96% of Northern Pike were released in this year's creel survey, comparable to the 2021 and 2022 creel surveys conducted on Big Sandy Lake in Aitkin County, Minnesota, where 93% of the Northern Pike catch was released (Berg 2023). In previous Farm Island Lake Creel surveys (1994-2004), 61 to 79 percent of Northern Pike were released. Although there is a high abundance of legal-sized fish in the system, Farm Island Lake is not a popular destination for Northern Pike angling. Only 7% of anglers throughout the 2024 season reported that they were targeting Northern Pike, which was similar to historic pressure estimates (5-11%).

Largemouth Bass

Anglers caught an estimated 5,729 Largemouth Bass in 2024, which was lower than estimates in 1995 (6,227 fish), 2003 (7,364 fish), and 2004 (10,643 fish). In 2024, the Largemouth Bass catch rate (0.16 fish per angler-hour) increased from 1994 (0.05 fish per angler-hour) and 1995 (0.12 fish per angler hour), but decreased slightly from 2003 (0.20 fish per angler-hour) and 2004 (0.26 fish per angler-hour). Harvest rates of Largemouth Bass in 2024 (< 0.01 fish per angler-hour) was the lowest on record. Since 1995, release rates of

Largemouth Bass have been increasing. In 2024, 96% of the Largemouth Bass catch was released, up from 80% in 1994, 60% in 1995, 78% in 2003, and 82% in 2004.

In 2024, the mean length of Largemouth Bass in anglers' catch was approximately 14.0 inches, while the mean length of Largemouth Bass captured during the 2023 standard survey ranged between 12.0 and 13.0 inches depending on gear type (gill nets, trap nets, electro-fishing). Length frequency distributions among historic creel surveys were not well recorded; however, the current size structure of Largemouth Bass appears similar among historic DNR lake assessments and sampling events.

Smallmouth Bass

Smallmouth Bass are a recently established species in Farm Island Lake and received a reasonable amount of angling pressure in the 2024 creel survey. Smallmouth Bass were first documented in Farm Island Lake during the 2013 standard lake survey and have since established a population. The 2024 creel survey is the first time angler catch statistics have been recorded for Smallmouth Bass in Farm Island Lake. Approximately 14% of parties were targeting Smallmouth Bass during the 2024 season, with 96% of the catch released by anglers. In the two previous gill net assessments (2020 & 2023) on Farm Island Lake, Smallmouth Bass have outnumbered Largemouth Bass; however, it's important to note that gill net assessments generally do not provide an accurate index of Largemouth Bass due to poor catchability. Electro-fishing is the recommended method for sampling Largemouth Bass, while gill nets are preferred for sampling Smallmouth Bass. Variable catchability of *Micropterus* spp. in differing gear types can make comparisons of relative abundance difficult. Nevertheless, Smallmouth Bass abundance continues to increase in Farm Island Lake and will likely lead to increases of catch rates and angling pressure over time. Berg (2023) found that anglers had higher catches and increased interest in Smallmouth Bass over time as their population increased in Big Sandy Lake, Aitkin County, Minnesota.

Bluegill

Bluegill have always been a popular species for Farm Island Lake anglers. An estimate of 9,836 Bluegill were caught in 2024 compared to 6,194 fish in 1994, 16,817 fish in 1995, 9,703 fish in 2003, and 7,380 fish in 2004. Although variability exists in the number of Bluegill caught over the years, harvest rates have remained quite similar, with the exception of 1995 (0.20 Bluegill harvested per angler hour). Harvest rates were 0.10 fish per angler hour in 2004 and 0.09 fish per angler hour in 1994, 2003, and 2024. Mean length of Bluegill harvested in 2024 was 8.0 inches, while in 1994 it was 6.9 inches. Mean lengths of harvested Bluegills were not reported in the 1995, 2003, or 2004 Farm Island Lake creel reports. However, it appears that the size structure of Bluegill has improved in the last decade. The average gill net catch of Bluegill greater than 8.0 inches between the 1995 and 2010 standard lake surveys (6 assessments) was 0.36 per net, while the average catch greater than 8.0 inches from the surveys between 2013 and 2023 was 1.0 Bluegill per net.

Black Crappie

Black Crappie were not common in the 2024 catch, but generally were of acceptable size when caught, as 61% of Black Crappie caught were harvested. Historically, anglers have harvested anywhere from 74 to 88 percent of the Black Crappie catch. In 2024, 903 Black Crappies were estimated to have been caught. This estimate was similar to the 1994 survey (838 fish), lower than the 1995 survey (2,165 fish), and an increase from the 2003 (258 fish) and 2004 (270 fish) surveys. Black Crappie catch rates have always been relatively low, with 0.02 fish per angler hour in 1994, 0.05 fish per angler hour in 1995, 0.01 fish per angler hour in 2003 and 2004, and 0.03 fish per angler hour in 2024. Harvest rates in 2024 (0.02fish per angler-hour)

were identical to 1994, down from 1995 (0.20 fish per angler-hour) and up from 2003 and 2004 (<0.01 fish per angler-hour).

The mean length of Black Crappie harvested was 11.1 inches in 2024, compared to 9.0 inches in 1994. Unfortunately, the 1995, 2003, and 2004 Farm Island Lake creel surveys did not report mean lengths of the Black Crappie. In contrast to the larger-sized fish harvested by anglers in 2024, the mean, minimum, and maximum lengths of gillnet caught Black Crappie have been declining since 2000 (9 assessments). In the 2000 gill net assessment, Black Crappie ranged from 9.5 to 13.7 inches in length with a mean of 12.3 inches, compared to the 2023 gillnet assessment where Black Crappie lengths ranged from 4.7 to 10.6 inches with a mean of 8.6 inches. Additionally, gill net catches of Black Crappie greater than 10.0 inches through 1995 and 2010 (6 assessments) averaged 0.40 per net, while catches from 2013 through 2023 (5 assessments) averaged 0.24 per net. The continuous low abundance of Black Crappies in gill net catches is maybe related to high Walleye abundance. Other Walleye lakes in Aitkin County that have experienced a similar negative relationship between Black Crappie abundance and Walleye abundance are Big Sandy Lake (natural Walleye reproduction), Esquagamah Lake (fingerling Walleye stocking), and Hill Lake (fry Walleye stocking).

Forward Facing Sonar (FFS)

The most recent creel survey on Farm Island Lake appeared that FFS users had higher total catch rates (fish per angler-hour) compared to parties without FFS when targeting Bluegill, Largemouth Bass, Smallmouth Bass, Walleye, and when all species were combined. However, statistical analysis only indicated significant differences in catch rates for Walleye and when all species were combined. Initial studies have not shown significant differences in catch or harvest rates between anglers with and without FFS during controlled experiments (Neely et al. 2021, Neely et al. 2023), nor in summer creel surveys (Rydell 2023 and 2024 MNDNR unpublished data, Kerkhove et al. 2024). However, analysis of roving winter creel surveys in Minnesota indicated FFS users had higher catch rates than anglers without FFS for Walleye and Black Crappie, higher harvest rates of Black Crappie, and lower harvest rates of Bluegill (Rydell 2024 MNDNR unpublished data).

This study also found that targeting anglers not equipped with FFS had significantly higher harvest rates for Largemouth Bass and Black Crappie in Farm Island Lake. It was observed that FFS users harvested 0 Largemouth Bass throughout the season, likely influencing these results. Furthermore, Black Crappie numbers have historically been low in Farm Island Lake, both in angler catches and standard sampling gear (i.e. gill nets and trap nets). Seventy-nine percent of the Black Crappie catch was in May, and 100 percent of the May harvest was by anglers without FFS. It's likely that these fish were harvested in historically productive spring fishing locations (shallow bays and/or spawning grounds) when Black Crappie can be the most vulnerable to anglers. Conversely, the 2022 Big Sandy Lake creel survey observed that boat parties with FFS had double the total harvest rates of Black Crappie than boat parties without FFS (Berg 2023).

Pressure directed from Mille Lacs

As previously mentioned, anecdotal evidence suggested increased fishing pressure on Farm Island Lake, possibly due to more restrictive regulations on Mille Lacs Lake. However, this was not the case, as angling pressure estimates were the lowest observed for a Farm Island Lake open water creel survey. In 2024, Farm Island Lake anglers were asked what two other lakes they most often fish in Minnesota. Mille Lacs Lake was the most common response (21%), as it was from the same question asked of Big Sandy Lake anglers during a 2016 creel survey (12%; Berg 2017). Historically, Farm Island Lake has always had a handful of fishing guides as well as additional anglers forced off Mille Lacs Lake by high wind and rough water, so it's

no surprise that fishing pressure had not increased from previous estimates given that overall fishing effort on Mille Lacs in the 2024 open water season was so low (Painovich in prep).

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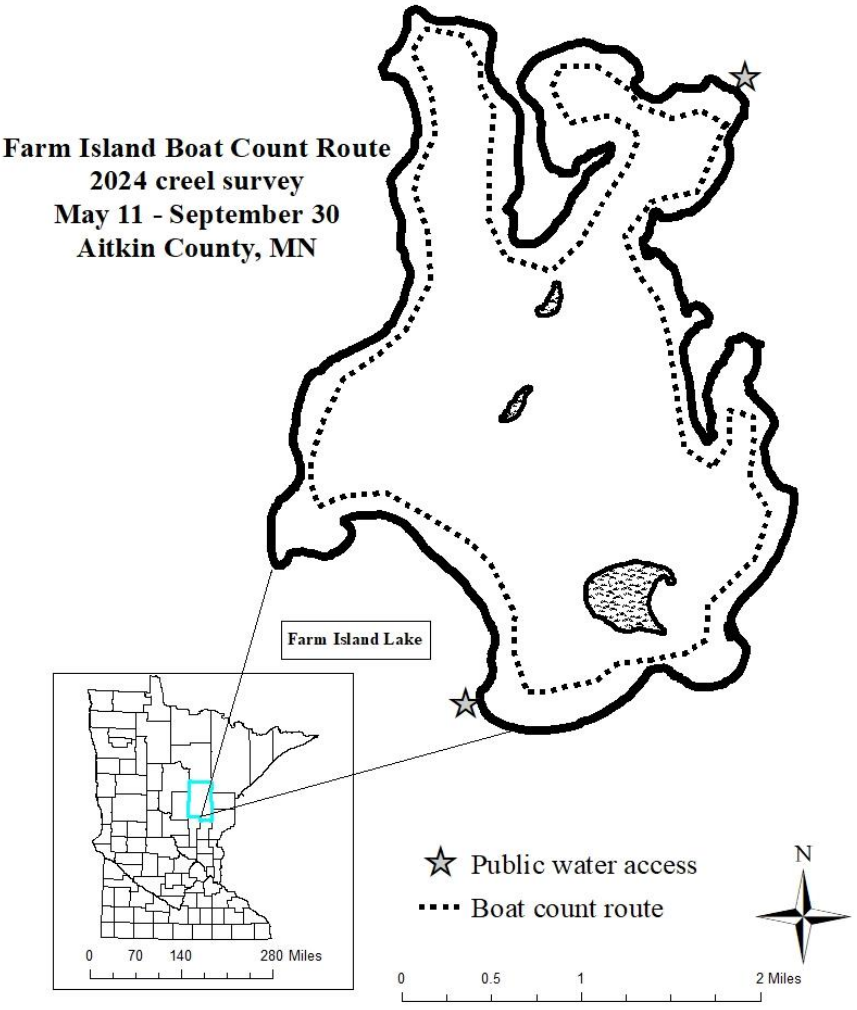

Figure 1. Study area with instantaneous boat count route for 2024 Farm Island Lake Creel Survey in Aitkin County, Minnesota.

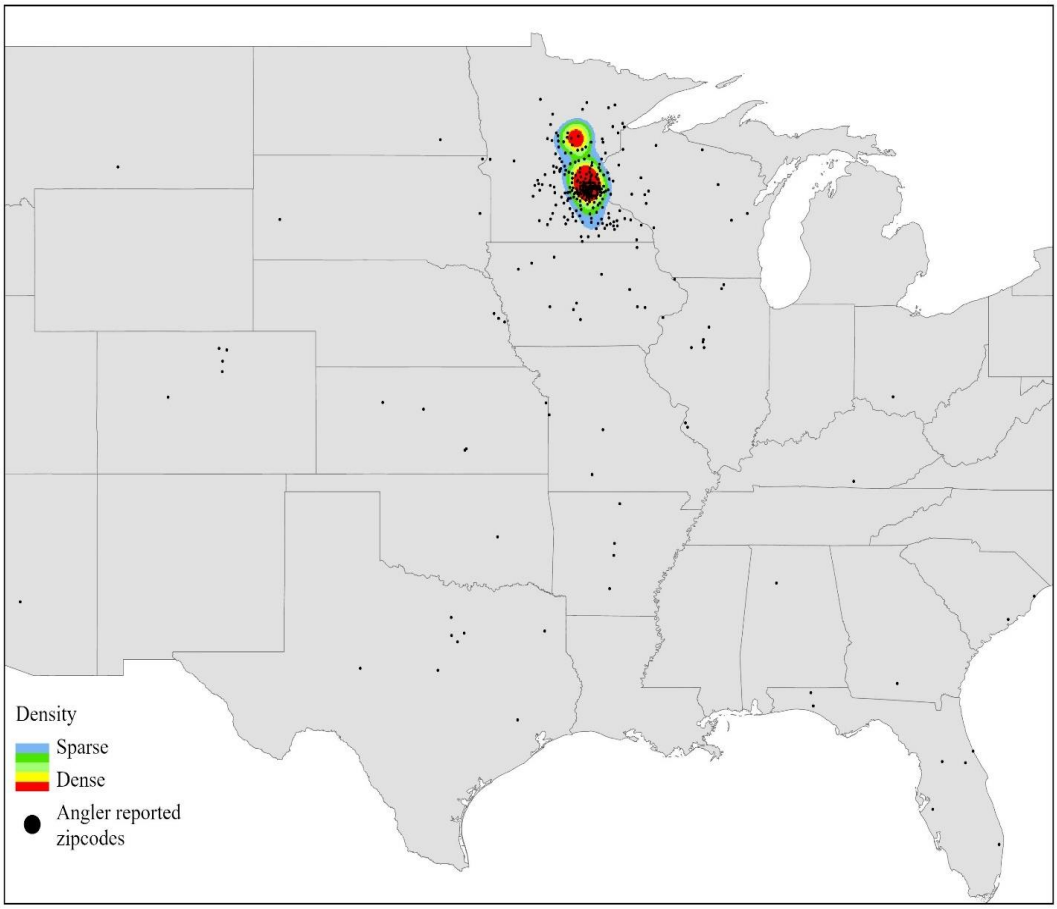

Figure 2. Angler-shed heat map. Location and density of angler reported zip codes. Two locations clipped from map include Alaska and Great Britain.

Table 1. Lake characteristics and water quality parameters from the 2023 lake survey, Farm Island Lake, Aitkin County, Minnesota.

Characteristic	
D.O.W. Identification Number	01-0159-00
Surface area (acres)	2,054
Percent littoral area	43
Maximum depth (ft.)	56
Shoreline length (mi.)	15
Secchi disk transparency (ft.)	14
Total alkalinity (ppm)	97
Total dissolved solids (ppm)	108
Total phosphorus (ppm)	0.015
Ecological lake class	22
Primary management species	Walleye
Secondary management species	Northern Pike, Black Crappie, Bluegill, Largemouth Bass, *Smallmouth Bass
Major predator species present	Walleye, Northern Pike, Largemouth Bass, Smallmouth Bass
Major forage species present	Yellow Perch, Spottail Shiner

*Smallmouth Bass will likely be added as a secondary management species in the future lake management plan

Table 2. Historical Creel Survey estimates for Farm Island Lake, Aitkin County, Minnesota.

	Winter 1987-88 12/15 - 3/15	Summer 1994 5/14 - 10/15	Summer 1995 5/13 - 10/15	Winter 1995 12/1 - 12/31	Summer 2003 5/10 - 10/14	Summer 2004 5/15 - 10/15	Summer 2024 5/11 - 9/30
Pressure (Angler-hours)	*6,832	39,262	52,580	*4,341	37,630	41,714	34,849
Angler-hours per Acre	3.30	19.10	25.60	2.10	18.30	20.31	16.97
Pressure (Spear anglers)	261	NA	NA	569	NA	NA	NA
Angler-hours per Acre	0.1	NA	NA	0.3	NA	NA	NA
Number of Fish Harvested							
Walleye	175	3,781	3,752	310	2,210	1,311	1,697
Northern Pike (Anglers)	199	1,080	1,752	278	1,687	2,835	287
Northern Pike (Speared)	78	NA	NA	118	NA	NA	NA
Black Crappie	469	639	2,099	59	227	234	554
Bluegill	1,031	3,567	10,266	0	3,432	3,999	3,175
Yellow Perch	151	22	95	52	13	0	0
Pumpkinseed	-	811	1,899	0	366	0	90
Rock Bass	-	285	2,413	4	1,282	2,175	97
Largemouth Bass	-	429	2,486	4	1,584	1,874	216
Smallmouth Bass	-	0	0	0	0	0	161
Number of Fish Released							
Walleye	0	942	2,475	101	2,133	2,457	5,577
Northern Pike (Anglers)	64	1,689	5,523	327	6,421	8,645	6,736
Northern Pike (Speared)	0	NA	NA	8	NA	NA	NA
Black Crappie	0	199	744	0	31	36	349
Bluegill	644	2,627	6,551	0	6,271	3,381	6,661
Yellow Perch	61	869	871	142	611	628	178
Pumpkinseed	-	1,433	739	0	61	0	268

Table 2 Continued.

	Winter 1987-88 12/15 - 3/15	Summer 1994 5/14 - 10/15	Summer 1995 5/13 - 10/15	Winter 1995 12/1 - 12/31	Summer 2003 5/10 - 10/14	Summer 2004 5/15 - 10/15	Summer 2024 5/11 - 9/30
Number of Fish Released							
Rock Bass	-	3,563	15,064	4	5,724	7,940	2,425
Largemouth Bass	-	1,727	3,741	0	5,780	8,769	5,513
Smallmouth Bass	-	0	0	0	0	0	4,162
Pounds of Fish Harvested							
Walleye	333	6,621	4,841	395	3,145	2,573	2,601
Pounds per Acre	0.20	3.22	2.36	0.19	1.53	1.25	1.27
Northern Pike (Anglers)	776	3,037	3,403	456	3,371	5,664	402
Pounds per Acre	0.04	1.47	1.66	0.22	1.64	2.76	0.20
Northern Pike (Speared)	273	NA	NA	461	NA	NA	NA
Pounds per Acre	0.10	NA	NA	0.22	NA	NA	NA
Black Crappie	375	256	928	38	178	113	443
Pounds per Acre	0.20	0.12	0.45	0.02	0.09	0.05	0.22
Bluegill	503	871	2,592	0	950	1,018	1366
Pounds per Acre	0.20	0.42	1.26	0.00	0.46	0.50	0.66
Yellow Perch	44	5	23	6	3	0	0
Pounds per Acre	0.02	0.00	0.10	0.00	0.00	0.00	0.00
Pumpkinseed	-	206	496	0	97	0	35
Pounds per Acre	-	0.10	0.24	0.00	0.05	0.00	0.02
Rock Bass	-	143	1,153	2	1,089	1,678	66
Pounds per Acre	-	0.06	0.56	0.00	0.53	0.36	0.03
Largemouth Bass	-	1,040	3,264	8	2,284	4,658	386
Pounds per Acre	-	0.50	1.59	0.00	1.11	2.27	0.19
Smallmouth Bass	-	0	0	0	0	0	240
Pounds per Acre	-	0.00	0.00	0.00	0.00	0.00	0.12

Table 2 continued.

	Winter 1987-88 12/15 - 3/15	Summer 1994 5/14 - 10/15	Summer 1995 5/13 - 10/15	Winter 1995 12/1 - 12/31	Summer 2003 5/10 - 10/14	Summer 2004 5/15 - 10/15	Summer 2024 5/11 - 9/30
Harvest Rates (Fish per hour)							
Walleye	0.030	0.096	0.071	0.071	0.059	0.031	0.049
Northern Pike (Anglers)	0.070	0.028	0.033	0.064	0.045	0.068	0.008
Northern Pike (Speared)	0.300	NA	NA	0.027	NA	NA	NA
Black Crappie	0.070	0.016	0.040	0.014	0.006	0.006	0.016
Bluegill	0.150	0.091	0.195	0.000	0.091	0.096	0.091
Yellow Perch	0.020	0.001	0.002	0.012	0.000	0.000	0.000
Pumpkinseed	-	0.021	0.036	0.000	0.010	0.000	0.003
Rock Bass	-	0.007	0.046	0.001	0.034	0.052	0.003
Largemouth Bass	-	0.011	0.047	0.001	0.042	0.045	0.006
Smallmouth Bass	-	0.000	0.000	0.000	0.000	0.000	0.005
Catch Rates (Fish per hour)							
Walleye	0.030	0.120	0.118	0.095	0.115	0.090	0.209
Northern Pike (Anglers)	0.300	0.071	0.138	0.139	0.215	0.275	0.202
Northern Pike (Speared)	0.080	NA	NA	0.029	NA	NA	NA
Black Crappie	0.070	0.021	0.054	0.014	0.007	0.006	0.026
Bluegill	0.240	0.158	0.320	0.000	0.258	0.177	0.282
Yellow Perch	0.030	0.023	0.018	0.045	0.017	0.015	0.005
Pumpkinseed	-	0.057	0.050	0.000	0.011	0.000	0.010
Rock Bass	-	0.098	0.332	0.002	0.186	0.242	0.072
Largemouth Bass	-	0.055	0.118	0.001	0.196	0.255	0.164
Smallmouth Bass	-	0.000	0.000	0.000	0.000	NA	0.124

****Pressure refers to all anglers in winter creel excluding spearing effort.***

Table 3. Summary statistics by stratum, for 2024 creel survey of Farm Island Lake, Aitkin County, MN, May 11 – September 30, 2024.

	Season Strata					
	May	**June**	**July**	**August**	**September**	**Season Totals**
Start date	5/11/2024	6/1/2024	7/1/2024	8/1/2024	9/1/2024	5/11/2024
End date	5/31/2024	6/30/2024	7/31/2024	8/31/2024	9/30/2024	9/30/2024
Length of fishing day (hrs)	16	16	16	16	16	NA
Number of days in strata	21	30	31	31	30	143
Weekdays sampled	10	16	18	16	16	76
Weekend/Holidays Sampled	11	14	13	15	14	67
Number of counts	34	40	45	42	46	207
Number of interviews	193	256	274	216	216	1,155
Number of completed trip interviews	39	70	57	80	82	328
Percent of completed trip interviews	20	27	21	37	38	28
Mean number of fishing boats per count (SE)	15.94 (0.74)	9.88 (0.32)	9.42 (0.35)	6.69 (0.24)	6.27 (0.21)	9.3 (0.21)
Mean number of anglers per boat party (SE)	1.76 (0.47)	1.83 (0.46)	1.80 (0.47)	2.02 (0.52)	1.71 (0.44)	1.83 (0.10)
Mean completed trip length (SE)	4.74 (0.70)	4.04 (0.72)	3.81 (0.66)	4.06 (0.92)	3.92 (0.96)	4.07 (0.31)

Table 4. Recreational water surface use on Farm Island Lake, Aitkin County, MN, May 11 – September 30, 2024.

	Season Strata					
	May	**June**	**July**	**Aug.**	**Sept.**	**Season**
	Recreational Water Activity (boat hours)					
Personal Watercraft	96	112	576	376	80	1,240
Power Boating	640	840	4,448	2,880	1,192	10,000
Non-Power Boating	72	136	320	168	48	744
Total non-fishing recreational activity	808	1,088	5,344	3,424	1,320	11,984
Fishing Boats	4,336	3,160	3,472	2,248	2,296	15,512
Total recreational activity	5,144	4,248	8,816	5,672	3,616	27,496
Fishing as a percent of total recreational use	84	74	39	40	63	56
	Recreational Water Activity (boar hours per acre)					
Personal Watercraft	0.05	0.05	0.28	0.18	0.04	0.60
Power Boating	0.31	0.41	2.17	1.40	0.58	4.87
Non-Power Boating	0.04	0.07	0.16	0.08	0.02	0.36
Total non-fishing recreational activity	0.39	0.53	2.60	1.67	0.64	5.83
Fishing Boats	2.11	1.54	1.69	1.09	1.12	7.55
Total recreational use per acre	2.50	2.07	4.29	2.76	1.76	13.39

Table 5. Fishing pressure estimates for boat anglers by strata, Farm Island Lake, Aitkin County, Minnesota, May 11th – September 30, 2024. Standard error in parentheses.

	Season Strata					
	May	**June**	**July**	**August**	**September**	**Season Total**
			Angler-Hours			
Boat anglers	8,601	7,500	8,011	5,843	4,895	34,849
(SE)	(1,948)	(1,089)	(887)	(521)	(489)	(2,505)
			Angler-hours Per Acre (Total acres: 2054.0)			
Boat anglers	4.19	3.65	3.90	2.84	2.38	16.97
(SE)	(0.95)	(0.53)	(0.43)	(0.25)	(0.24)	(1.22)

Table 6. Estimated catch in numbers and numbers per acre, Farm Island Lake, Aitkin County, Minnesota, May 11 – September 30, 2024. Standard error in parentheses.

Species	Harvested	Harvest/Acre	Released	Released/Acre	Catch	Catch/Acre
Black Crappie	554 (228)	0.27 (0.11)	349 (138)	0.17 (0.07)	903 (307)	0.44 (0.15)
Bluegill	3,175 (532)	1.54 (0.26)	6,661 (861)	3.24 (0.42)	9,836 (1,242)	4.79 (0.61)
Bowfin	0 (0)	0.00 (0.00)	22 (14)	0.011 (0.007)	22 (14)	0.011 (0.007)
Bullhead spp.	0 (0)	0.00 (0.00)	6 (4)	<0.01 (<0.01)	6 (4)	<0.01 (<0.01)
Channel Catfish	0 (0)	0.00 (0.00)	8 (8)	<0.01 (<0.01)	8 (8)	<0.01 (<0.01)
Hybrid Sunfish	0 (0)	0.00 (0.00)	10 (10)	<0.01 (<0.01)	10 (10)	<0.01 (<0.01)
Largemouth Bass	216 (86)	0.11 (0.04)	5,513 (676)	2.68 (0.33)	5,729 (681)	2.79 (0.33)
Northern Pike	287 (104)	0.14 (0.05)	6,736 (823)	3.28 (0.40)	7,023 (879)	3.42 (0.43)
Pumpkinseed	90 (29)	0.04 (0.01)	268 (126)	0.13 (0.06)	358 (130)	0.17 (0.06)
Rock Bass	97 (32)	0.05 (0.02)	2,425 (364)	1.18 (0.18)	2,522 (369)	1.23 (0.18)
Smallmouth Bass	161 (43)	0.08 (0.02)	4,162 (516)	2.03 (0.25)	4,323 (522)	2.11 (0.25)
Walleye	1,697 (229)	0.83 (0.11)	5,577 (663)	2.72 (0.32)	7,274 (824)	3.54 (0.40)
Yellow Perch	0 (0)	0.00 (0.00)	178 (60)	0.09 (0.03)	178 (60)	0.09 (0.03)
All Species	6,277 (1,283)	3.06 (0.63)	31,915 (4,263)	15.54 (2.08)	38,192 (5,050)	18.59 (2.46)

Table 7. Estimated catch in pounds and pounds per acre, Farm Island Lake, Aitkin County, Minnesota, May 11 to September 30, 2024. Standard error in parentheses.

Species	Harvested	Harvest/Acre	Released	Released/Acre	Catch	Catch/Acre
Black Crappie	443	0.22	187	0.09	634	0.31
	(244)	(0.12)	(110)	(0.05)	(278)	(0.14)
Bluegill	1,366	0.66	1,224	0.60	2,589	1.26
	(280)	(0.14)	(226)	(0.11)	(461)	(0.22)
Bowfin	0	0.00	126	0.06	126	0.06
	(*)	(*)	(82)	(0.04)	(82)	(0.04)
Bullhead spp.	0	0.00	0	0.00	0	0.00
	(*)	(*)	(*)	(*)	(*)	(*)
Channel Catfish	0	0.00	101	0.05	101	0.05
	(*)	(*)	(*)	(*)	(*)	(*)
Hybrid Sunfish	-	-	-	-	-	-
	-	-	-	-	-	-
Largemouth Bass	386	0.19	9,714	4.73	10,089	4.91
	(187)	(0.09)	(1,804)	(0.88)	(1,810)	(0.88)
Northern Pike	402	0.20	7,441	3.62	7,842	3.82
	(171)	(0.08)	(1,143)	(0.56)	(1,232)	(0.60)
Pumpkinseed	35	0.02	101	0.05	137	0.07
	(8)	(0.00)	(81)	(0.04)	(81)	(0.04)
Rock Bass	66	0.03	1,851	0.90	1,920	0.93
	(20)	(0.01)	(363)	(0.18)	(368)	(0.18)
Smallmouth Bass	240	0.12	7,462	3.63	7,699	3.75
	(88)	(0.04)	(1,341)	(0.65)	(1,348)	(0.66)
Walleye	2,601	1.27	9,710	4.73	12,311	5.99
	(443)	(0.22)	(1,455)	(0.71)	(1,743)	(0.85)
Yellow Perch	0	0.00	7	0.00	7	0.00
	(*)	(*)	(4)	(0.00)	(4)	(0.00)
All Species	5,539	2.70	37,924	18.46	43,456	21.16
	(1,440)	(0.70)	(6,610)	(3.22)	(7,408)	(3.61)

Standard errors not calculated for some species due to low sample size in MN-DNR Creel Survey Module (CSM).

Table 8. Catch per angler-hour, all anglers, Farm Island Lake Aitkin County, May 11 – September 30, 2024. Standard error in parentheses.

Species	Harvested	Released	Total Catch
Black Crappie	0.016 (0.007)	0.010 (0.004)	0.026 (0.009)
Bluegill	0.091 (0.017)	0.191 (0.028)	0.282 (0.041)
Bowfin	0.000 (*)	0.001 (*)	0.001 (*)
Bullhead spp.	0.000 (*)	0.000 (*)	0.000 (*)
Channel Catfish	0.000 (*)	0.000 (*)	0.000 (*)
Hybrid Sunfish	0.000 (*)	0.000 (*)	0.000 (*)
Largemouth Bass	0.006 (0.003)	0.158 (0.22)	0.164 (0.023)
Northern Pike	0.008 (0.003)	0.193 (0.027)	0.202 (0.029)
Pumpkinseed	0.003 (0.001)	0.008 (0.004)	0.010 (0.004)
Rock Bass	0.003 (0.001)	0.070 (0.012)	0.072 (0.012)
Smallmouth Bass	0.005 (0.001)	0.119 (0.017)	0.124 (0.017)
Walleye	0.049 (0.007)	0.160 (0.022)	0.209 (0.028)
Yellow Perch	0.000 (*)	0.005 (0.002)	0.005 (0.002)
All Species	0.180 (0.028)	.0916 (0.023)	1.096 (0.023)

Standard errors not calculated for some species due to low sample size in MN-DNR Creel Survey Module

Table 9. Percent of parties targeting a specific species, Farm Island Lake, Aitkin County, Minnesota, May11 – September 30, 2024.

	May	June	July	August	September	Season
Walleye	80.3	78.2	69.1	52.3	65.6	69.2
Smallmouth Bass	9.3	11.1	15.2	21.3	11.2	13.7
Largemouth Bass	11.4	14.3	20.8	25.0	17.4	17.9
Black Crappie	29.5	7.1	7.4	6.0	8.5	11.0
Bluegill	16.1	19.0	22.3	21.3	12.9	18.5
Northern Pike	14.5	7.5	6.7	4.2	4.9	7.4
No Particular Species	2.0	4.0	7.0	13.0	13.0	7.8
Pumpkinseed	0.0	0.0	0.0	1.4	0.9	0.4
Rock Bass	0.0	0.0	0.4	0.0	0.0	0.1

Note that there were a total of 1,155 parties interviewed and each party could mention up to two target species resulting in a sum of species percentages greater than 100 percent per strata

Table 10. Length frequency distribution of fish harvested, and fish released, as reported to clerks, Farm Island Lake, Aitkin County, Minnesota, May 11 – September 30, 2024.

	Black Crappie		Bluegill		Bowfin		Bullhead Spp.		Channel Catfish		Hybrid Sunfish	
Length (inches)	**H**	**R**	**H**	**R**	**H**	**R**	**H**	**R**	**H**	**R**	**H**	**R**
< 5.0				380								
5.0 - 5.4			6	200								1
5.5 - 5.9			4	21								
6.0 - 6.4			28	256								
6.5 - 6.9			17	17								
7.0 - 7.4		12	69	190								
7.5 - 7.9			80	36								
8.0 - 8.4		14	162	100								
8.5 - 8.9			99	4								
9.0 - 9.4	6	5	77	28								
9.5 - 9.9	10		13	9								
10.0 - 10.4	15	7	5	17				1				
10.5 - 10.9	2			1								
11.0 - 11.4	15	1										
11.5 - 11.9	1											
12.0 - 12.9	7	1										
13.0 - 13.9	16	2										
14.0 - 14.9	1	5										
15.0 - 15.9		1										
16.0 - 16.9												
17.0 - 17.9												
18.0 - 18.9												
19.0 - 19.9												
20.0 - 20.9												
21.0 - 21.9												
22.0 - 22.9						1						
23.0 - 23.9												
24.0 - 24.9												
25.0 - 25.9												
26.0 - 26.9						1						
27.0 - 27.9												
28.0 - 28.9						1						
29.0 - 29.9												
30.0 - 30.9										1		
> 31.0												
N	73	48	560	1,259	0	3	0	1	0	1	0	1
Mean Length	11.1	9.3	8.0	5.6	0.0	25.3	0.0	10.0	0.0	30.0	0.0	5.0
Min. Length	9.0	7.0	5.0	2.0	0.0	22.0	0.0	10.0	0.0	30.0	0.0	5.0
Max. Length	14.0	15.0	10.0	10.5	0.0	28.0	0.0	10.0	0.0	30.0	0.0	5.0

Table 10 Continued.

	Largemouth Bass		Northern Pike		Pumpkinseed		Rock Bass	
Length (in.)	**H**	**R**	**H**	**R**	**H**	**R**	**H**	**R**
< 5.0		11				6		1
5.0 - 5.4		1				4		10
5.5 - 5.9								
6.0 - 6.4		8			1	3		10
6.5 - 6.9					3			
7.0 - 7.4		5			2	5	1	17
7.5 - 7.9					2	1		
8.0 - 8.4		24			8	11	3	83
8.5 - 8.9								7
9.0 - 9.4	1	9				7	2	57
9.5 - 9.9								5
10.0 - 10.4		36		13			6	109
10.5 - 10.9							2	
11.0 - 11.4	3	15		2			2	38
11.5 - 11.9								1
12.0 - 12.9		128		102				45
13.0 - 13.9	8	73		56				8
14.0 - 14.9	8	145		108				7
15.0 - 15.9	2	155		84				
16.0 - 16.9	11	130	1	125				
17.0 - 17.9	3	101	8	70				
18.0 - 18.9		72	4	147				
19.0 - 19.9		13	13	48				
20.0 - 20.9		9	9	147				
21.0 - 21.9			2	27				
22.0 - 22.9		1	1	27				
23.0 - 23.9				14				
24.0 - 24.9		1	1	25				
25.0 - 25.9				8				
26.0 - 26.9				3				
27.0 - 27.9				4				
28.0 - 28.9				1				
29.0 - 29.9								
30.0 - 30.9				1				
> 31.0								
N	36	937	39	1,012	16	37	16	398
Mean Length	14.5	14.2	19.0	16.9	7.5	6.9	9.5	9.5
Minimum Length	9.0	3.0	16.5	10.0	6.1	3.0	7.0	4.0
Maximum Length	17.5	24.0	24.0	30.0	8.3	9.0	11.0	14.0

Table 10 Continued.

	Smallmouth Bass		Walleye		Yellow Perch	
Length (in.)	**H**	**R**	**H**	**R**	**H**	**R**
< 5.0		6				31
5.0 - 5.4		2				
5.5 - 5.9						
6.0 - 6.4		2				1
6.5 - 6.9						
7.0 - 7.4		4				
7.5 - 7.9						
8.0 - 8.4	1	19		6		1
8.5 - 8.9						
9.0 - 9.4		12				
9.5 - 9.9	1					
10.0 - 10.4	2	43		2		1
10.5 - 10.9				2		
11.0 - 11.4		21		5		
11.5 - 11.9	1		1	1		
12.0 - 12.9	4	99	2	22		
13.0 - 13.9	7	55	31	55		
14.0 - 14.9	2	100	98	42		
15.0 - 15.9	3	117	62	23		
16.0 - 16.9	3	102		85		
17.0 - 17.9	2	66		283		
18.0 - 18.9		52	2	288		
19.0 - 19.9	1	12	47	41		
20.0 - 20.9		18	25	10		
21.0 - 21.9		5	6	3		
22.0 - 22.9		1	1	3		
23.0 - 23.9			2	1		
24.0 - 24.9			1	1		
25.0 - 25.9						
26.0 - 26.9				2		
27.0 - 27.9				1		
28.0 - 28.9				1		
29.0 - 29.9				2		
30.0 - 30.9				1		
> 31.0						
N	27	736	278	880	0	34
Mean Length	13.6	14.2	16.1	16.9	0.0	3.5
Minimum Length	8.0	3.0	11.5	8.0	0.0	2.0
Maximum Length	19.2	22.0	24.5	30.5	0.0	10.0

Table 11. Expanded length frequency distribution of Walleye harvested and released, by strata, as reported to clerk, Farm Island Lake, Aitkin, Minnesota, May 11 – September 30, 2024.

	May		June		July		August		September		Season			
Length (Inches)	**Har**	**Rel**	**Har**	**Rel**	**Har**	**Rel**	**Har**	**Rel**	**Har**	**Rel**	**Har**	**Rel**	**Total**	
< 5.0														
5.0 - 5.4														
5.5 - 5.9														
6.0 - 6.4														
6.5 - 6.9														
7.0 - 7.4														
7.5 - 7.9														
8.0 - 8.4				5		7		17				30	30	
8.5 - 8.9														
9.0 - 9.4														
9.5 - 9.9														
10.0 - 10.4						7				5		12	12	
10.5 - 10.9						7				5		12	12	
11.0 - 11.4						7		13		5		24	24	
11.5 - 11.9							4			5	4	5	9	
12.0 - 12.9		28		38	14	49		17		5	14	137	151	
13.0 - 13.9	36	19	94	164	27	77	22	30	5	23	184	313	496	
14.0 - 14.9	164	56	193	66	130	70	56	26	59	37	602	254	856	
15.0 - 15.9	27	28	132	33	68	49	39	17	73	14	340	141	481	
16.0 - 16.9		149		159		84		90		33		514	514	16" Lower end protected slot.
17.0 - 17.9		726		580		328		73		163		1,870	1,870	
18.0 - 18.9		596	11	673		356		56		172	11	1,853	1,864	19" Upper end protected slot.
19.0 - 19.9	100	93	105	93	48	28	17	17	27	28	297	259	556	
20.0 - 20.9	100		61	5	7	35	4	9	5	9	177	58	235	
21.0 - 21.9	18		17	5				9	5		39	14	53	
22.0 - 22.9		9	6	11							6	20	26	
23.0 - 23.9	18							4			18	4	23	
24.0 - 24.9		9	6								6	9	15	
25.0 - 25.9														
26.0 - 26.9				5		7						12	12	
27.0 - 27.9				5								5	5	
28.0 - 28.9		9										9	9	
29.0 - 29.9		9				7						16	16	
30.0 - 30.9				5								5	5	
> 31.0														
Total	465	1,732	622	1,849	295	1,118	142	376	174	502	1,697	5,577	7,274	
Min. Length	13.0	12.0	13.0	8.0	12.3	8.0	11.5	8.0	13.5	10.0	11.5	8.0	8.0	
Max. Length	23.0	29.5	24.5	30.5	20.0	29.0	20.0	23.0	21.5	20.0	24.5	30.5	30.5	
Mean Length	17.6	17.5	16.3	17.0	15.3	16.7	15.1	16.0	16.0	16.7	16.1	16.8	16.7	

****Protected slot implemented in 1996.***

Table 12. Catch per angler-hour, directed pressure, Farm Island Lake, Aitkin County, Minnesota, May 11 – September 30, 2024. Standard error in parentheses.

Target Species	Harvested	Released	Total Catch
Black Crappie	0.148 (0.080)	0.176 (0.148)	0.269 (0.187)
Bluegill	0.482 (0.090)	0.814 (0.110)	1.296 (0.176)
Bowfin	NA (*)	NA (*)	NA (*)
Bullhead spp.	NA (*)	NA (*)	NA (*)
Channel Catfish	NA (*)	NA (*)	NA (*)
Hybrid Sunfish	NA (*)	NA (*)	NA (*)
Largemouth Bass	0.029 (0.014)	0.518 (0.062)	0.534 (0.061)
Northern Pike	0.110 (0.060)	0.360 (0.062)	0.389 (0.055)
Pumpkinseed	0.169 (*)	NA (*)	0.169 (*)
Rock Bass	NA (*)	NA (*)	NA (*)
Smallmouth Bass	0.012 (0.005)	0.295 (0.038)	0.299 (0.038)
Walleye	0.065 (0.006)	0.199 (0.016)	0.264 (0.011)
Yellow Perch	NA (*)	NA (*)	NA (*)

Standard errors not calculated for some species due to low sample size in MN-DNR Creel Survey Module

Table 13. Percentage of targeted parties harvesting, releasing, and catching "x" number of Walleye, Farm Island Lake, Aitkin County, Minnesota, May 11 – September 30, 2024.

Walleye kept per party	Percent of Parties
0	80.7
1	11.2
2	5.3
3	1.8
4	0.5
5	0.3
6	0.1
>6	0.3

Walleye released per party	Percent of Parties
0	59.5
1	17.4
2	9.4
3	5.3
4	3.1
5	1.6
6	1.0
>6	2.6

Walleye caught per party	Percent of Parties
0	52.0
1	20.3
2	9.0
3	6.1
4	3.9
5	3.1
6	1.6
>6	3.9

Table 14. Number and percent (in parentheses) of parties targeting a particular species equipped with and without forward-facing sonar (FFS) by strata.

Targeted Species	May	June	July	August	September	Season total
Black Crappie						
Number (%) of targeted parties with FFS	4 (7.0)	3 (16.7)	5 (25.0)	2 (15.4)	6 (31.6)	20 (15.9)
Number (%) of targeted parties without FFS	53 (93)	15 (83.3)	15 (75.0)	11 (84.6)	13 (68.4)	106 (84.1)
Number (%) of all targeted parties	57 (29.5)	18 (7.0)	20 (7.3)	13 (6.0)	19 (8.8)	126 (10.9)
Bluegill						
Number (%) of targeted parties with FFS	6 (19.4)	9 (18.8)	8 (13.3)	6 (13.0)	3 (10.3)	32 (14.9)
Number (%) of targeted parties without FFS	25 (80.6)	39 (81.3)	52 (86.7)	40 (87.0)	27 (89.7)	183 (85.1)
Number (%) of all targeted parties	31 (16.1)	48 (18.8)	60 (21.9)	46 (21.3)	29 (13.4)	215 (18.5)
Largemouth Bass						
Number (%) of targeted parties with FFS	7 (31.8)	2 (5.6)	9 (16.1)	12 (22.2)	11 (28.2)	41 (19.8)
Number (%) of targeted parties without FFS	15 (68.2)	34 (94.4)	47 (83.9)	42 (77.8)	28 (71.8)	166 (80.2)
Number (%) of all targeted parties	22 (11.4)	36 (14.1)	56 (20.4)	54 (25.0)	39 (18.1)	207 (17.9)
Northern Pike						
Number (%) of targeted parties with FFS	3 (10.7)	1 (5.3)	1 (5.6)	1 (11.1)	0 (0.0)	6 (7.1)
Number (%) of targeted parties without FFS	25 (89.3)	18 (94.7)	17 (94.4)	8 (88.9)	11 (100.0)	79 (92.9)
Number (%) of all targeted parties	28 (14.5)	19 (7.4)	18 (6.6)	9 (4.2)	11 (5.1)	85 (7.4)
No particular species						
Number (%) of targeted parties with FFS	0 (0.0)	1 (9.1)	1 (5.3)	4 (14.8)	1 (3.3)	7 (7.8)
Number (%) of targeted parties without FFS	3 (100.0)	10 (90.9)	18 (94.7)	23 (85.2)	29 (96.7)	83 (92.2)
Number (%) of all targeted parties	3 (1.6)	11 (4.3)	19 (6.9)	27 (12.5)	30 (13.9)	90 (7.8)
Pumpkinseed						
Number (%) of targeted parties with FFS	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Number (%) of targeted parties without FFS	0 (0.0)	0 (0.0)	0 (0.0)	3 (100)	2 (100.0)	5 (100.0)
Number (%) of all targeted parties	0 (0.0)	0 (0.0)	0 (0.0)	3 (1.4)	2 (0.9)	5 (0.4)

Table 14 continued.

Targeted Species	May	June	July	August	September	Season total
Rock Bass						
Number (%) of targeted parties with FFS	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Number (%) of targeted parties without FFS	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (100.0)
Number (%) of all targeted parties	0 (0.0)	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)	1 (0.1)
Smallmouth Bass						
Number (%) of targeted parties with FFS	8 (44.4)	4 (14.3)	10 (24.4)	14 (30.4)	6 (24.0)	42 (26.6)
Number (%) of targeted parties without FFS	10 (55.6)	24 (85.7)	31 (75.6)	32 (69.6)	19 (76.0)	116 (73.4)
Number (%) of all targeted parties	18 (9.3)	28 (10.9)	41 (15.0)	46 (21.3)	25 (11.6)	158 (13.7)
Walleye						
Number (%) of targeted parties with FFS	36 (23.2)	46 (22.8)	36 (19.4)	34 (30.1)	38 (25.9)	190 (23.7)
Number (%) of targeted parties without FFS	119 (76.8)	152 (77.2)	151 (80.6)	79 (69.9)	110 (74.1)	611 (76.3)
Number (%) of all targeted parties	155 (80.3)	197 (77.0)	186 (67.9)	113 (52.3)	147 (68.1)	801 (69.1)
Total						
Number (%) of targeted parties with FFS	40 (20.7)	51 (20.2)	45 (16.7)	50 (23.1)	49 (21.8)	235 (20.3)
Number (%) of targeted parties without FFS	153 (79.3)	202 (79.8)	225 (83.3)	166 (76.9)	176 (78.2)	922 (79.7)
Number of targeted parties	193	253	270	216	225	1157

Note that there was a total of 1155 parties interviewed, and each party could mention up to two target species resulting in a sum of species percentages greater than 100 percent per strata.

Table 15. Comparison of total harvest and release rates per angler-hour for targeted parties equipped with and without Forward-Facing Sonar, as reported to clerk, Farm Island Lake, Aitkin County, Minnesota, 2024.

Target Species	May		June		July		August		September		Season		
	Har	Rel	Har	Rel	Har	Rel	Har	Rel	Har	Rel	Har	Rel	Total Catch Rate
All Species Combined													
Catch per angler-hour *With Forward-Facing Sonar*	0.108	1.199	0.131	0.942	0.069	1.344	0.152	0.875	0.098	0.901	0.134	1.325	1.458
Catch per angler-hour *Without Forwar-facing Sonat*	0.147	0.693	0.150	0.705	0.113	0.538	0.134	0.505	0.124	0.653	0.193	0.822	1.014
Black Crappie													
Catch per angler-hour *With Forward-Facing Sonar*	0.000	0.350	0.030	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.010	0.060	0.070
Catch per angler-hour *Without Forwar-facing Sonat*	0.220	0.080	0.000	0.000	0.000	0.000	0.050	0.130	0.000	0.020	0.120	0.050	0.180
Bluegill													
Catch per angler-hour *With Forward-Facing Sonar*	0.000	0.730	0.220	0.110	0.370	1.420	1.000	3.890	0.690	4.160	0.380	1.440	1.820
Catch per angler-hour *Without Forwar-facing Sonat*	0.130	0.140	0.250	0.420	0.880	0.910	0.500	0.920	0.600	0.780	0.490	0.680	1.170
Largemouth Bass													
Catch per angler-hour *With Forward-Facing Sonar*	0.000	0.680	0.000	0.410	0.000	0.790	0.000	0.760	0.000	0.740	0.000	0.720	0.720
Catch per angler-hour *Without Forwar-facing Sonat*	0.000	0.280	0.020	0.350	0.060	0.390	0.010	0.540	0.000	0.590	0.020	0.430	0.460
Northern Pike													
Catch per angler-hour *With Forward-Facing Sonar*	0.000	1.230	0.000	0.000	0.000	0.440	0.000	0.440	0.000	0.000	0.000	0.480	0.480
Catch per angler-hour *Without Forwar-facing Sonat*	0.100	0.360	0.000	0.440	0.000	0.140	0.000	0.400	0.020	0.400	0.030	0.320	0.350
Smallmouth Bass													
Catch per angler-hour *With Forward-Facing Sonar*	0.000	0.210	0.000	2.630	0.000	0.920	0.000	0.430	0.000	0.180	0.000	0.580	0.580
Catch per angler-hour *Without Forwar-facing Sonat*	0.000	0.610	0.010	0.220	0.010	0.240	0.010	0.320	0.000	0.090	0.010	0.270	0.280
Walleye													
Catch per angler-hour *With Forward-Facing Sonar*	0.090	0.370	0.120	0.570	0.030	0.390	0.100	0.240	0.070	0.210	0.080	0.360	0.440
Catch per angler-hour *Without Forwar-facing Sonat*	0.060	0.200	0.110	0.280	0.060	0.150	0.040	0.090	0.060	0.130	0.070	0.180	0.250

Table 16. Number of fish caught among targeted anglers and percentage of catch using Forward-Facing Sonar (FFS) for Walleye, Smallmouth Bass, Largemouth Bass, Black Crappie, Bluegill, Northern Pike, as reported to clerk, Farm Island Lake, Aitkin County, Minnesota, 2024.

Number and percent (%) of fish caught with and without FFS	May		June		July		August		September		Season		
	Har	Rel	Har	Rel	Har	Rel	Har	Rel	Har	Rel	Har	Rel	Total
All Species with FFS	18	263	48	299	24	299	45	429	30	344	165	1634	1799
All Species without FFS	150	637	151	851	252	715	190	841	127	662	870	3706	4576
All Fish Combined	168	900	199	1150	276	1014	235	1270	157	1006	1035	5340	6375
% catch - All Species with FFS	10.7	29.2	24.1	26.0	8.7	29.5	19.1	33.8	19.1	34.2	15.9	30.6	28.2
Walleye with FFS	15	62	25	122	5	62	17	42	13	40	75	328	403
Walleye without FFS	38	126	75	197	35	86	15	33	23	53	186	495	681
Walleye Combined	53	188	100	319	40	148	32	75	36	93	261	823	1084
% catch - Walleye with FFS	28.3	33.0	25.0	38.2	12.5	41.9	53.1	56.0	36.1	43.0	28.7	39.9	37.2
Smallmouth Bass with FFS	0	10	0	51	0	30	0	47	0	8	0	146	146
Smallmouth Bass without FFS	0	39	2	39	1	36	3	67	0	9	6	190	196
Smallmouth Bass Combined	0	49	2	90	1	66	3	114	0	17	6	336	342
% catch - Smallmouth Bass with FFS	0.0	20.4	0.0	56.7	0.0	45.5	0.0	41.2	0.0	47.1	0.0	43.5	42.7
Largemouth Bass with FFS	0	36	0	7	0	34	0	59	0	42	0	178	178
Largemouth Bass without FFS	0	41	5	79	17	106	3	161	0	84	25	471	496
Largemouth Bass Combined	0	77	5	86	17	140	3	220	0	126	25	649	674
% catch - Largemouth Bass with FFS	0.0	46.8	0.0	8.1	0.0	24.3	0.0	26.8	0.0	33.3	0.0	27.4	26.4
Black Crappie with FFS	0	8	1	0	0	0	0	0	1	0	2	8	10
Black Crappie without FFS	61	21	0	0	0	0	3	7	0	1	64	29	93
Black Crappie Combined	61	29	1	0	0	0	3	7	1	1	66	37	103
% catch - Black Crappie with FFS	0.0	27.6	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	3.0	21.6	9.7
Bluegill with FFS	0	20	18	9	14	54	27	105	16	96	75	284	359
Bluegill without FFS	18	19	43	74	164	170	138	252	69	90	432	605	1037
Bluegill Combined	18	39	61	83	178	224	165	357	85	186	507	889	1396
% catch -Bluegill with FFS	0.0	51.3	29.5	10.8	7.9	24.1	16.4	29.4	18.8	51.6	14.8	31.9	25.7
Northern Pike with FFS	0	11	0	0	0	3	0	5	0	0	0	19	19
Northern Pike without FFS	12	45	0	51	0	18	0	15	1	18	13	147	160
Northern Pike Combined	12	56	0	51	0	21	0	20	1	18	13	166	179
% catch -Northern Pike with FFS	0.0	19.6	0.0	0.0	0.0	14.3	0.0	25.0	0.0	0.0	0.0	11.4	10.6

Table 17. Welch's two sample t-test between targeting angler catch rates (fish per angler-hour) with and without Forward-Facing sonar. Note that Northern Pike, Pumpkinseed, and Rock Bass were excluded from species specific analyses due to low sample size.

Statistic	All Species combined			Walleye			Smallmouth Bass			Largemouth Bass			Black Crappie			Bluegill		
	catch	harvest	release	catch	harvest	release	catch	harvest	release	catch	harvest	release	catch	harvest	release	catch	harvest	release
With FFS																		
Mean fish per angler hour	1.680	0.172	1.508	0.570	0.113	0.457	0.903	0.000	0.903	0.988	0.000	0.988	0.093	0.007	0.087	1.929	0.425	1.504
SD	2.417	0.449	2.240	0.817	0.271	0.745	1.721	0.000	1.721	1.829	0.000	1.829	0.386	0.020	0.387	4.370	0.873	3.868
SE	0.158	0.029	0.146	0.059	0.020	0.054	0.266	0.000	0.266	0.286	0.000	0.286	0.086	0.005	0.087	0.773	0.154	0.688
95% CI	0.311	0.058	0.288	0.117	0.039	0.107	0.536	0.000	0.536	0.577	0.000	0.577	0.181	0.009	0.181	1.577	0.315	1.394
Without FFS																		
Mean fish per angler hour	1.252	0.245	1.007	0.360	0.091	0.269	0.362	0.017	0.344	0.577	0.034	0.543	0.193	0.134	0.059	1.662	0.620	1.038
SD	1.886	0.760	1.487	0.745	0.270	0.616	0.560	0.105	0.561	1.034	0.185	1.009	0.553	0.432	0.254	2.944	1.427	1.979
SE	0.062	0.025	0.049	0.030	0.011	0.025	0.052	0.010	0.052	0.080	0.014	0.078	0.053	0.042	0.025	0.218	0.105	0.146
95% CI	0.122	0.049	0.096	0.059	0.210	0.049	0.102	0.019	0.103	0.158	0.028	0.155	0.106	0.083	0.049	0.429	0.208	0.289
p-value	0.0126	0.0527	0.0013	0.0017	0.3305	0.0017	0.0517	0.0803	0.0450	0.1723	0.0195	0.1396	0.3336	0.0031	0.7615	0.7344	0.3091	0.5095
t-value	2.511	-1.941	3.246	3.159	0.975	3.161	2.000	-1.765	2.063	1.386	-2.359	1.503	-0.980	-3.028	0.307	0.342	-1.025	0.667
df	309	615	287	293	314	274	44	115	44	46	165	46	35	108	22	36	64	34

Table 18. Hometown distance of Farm Island Lake Anglers.

Distance (miles)	N	Percent
0-49	570	26.8
50-99	718	33.8
100-149	470	22.1
150-199	151	7.1
200-249	15	0.7
250-299	8	0.4
300-349	35	1.6
350-399	26	1.2
400-449	12	0.6
450-499	5	0.2
500-599	13	0.6
600-699	8	0.4
700-799	10	0.5
800-899	7	0.3
900-999	14	0.7
1000-1500	43	2.0
>1500	22	1.0
Total	2127	100.0

*The 22 instances where hometown distance was greater than 1500 miles occurred from two anglers that reside in Alaska and Great Britan.

Table 19. Number and percentage of parties supporting the 16" – 19" protected Walleye slot on Farm Island Lake, Aitkin County, Minnesota, May 11 - September 30, 2024.

Support for 16" - 19" protected Walleye slot?		
Response	**Count**	**Percent**
Yes	920	80
No	236	20
Total	**1156**	**100**

Table 20. Number and percentage of anglers fishing on Farm Island Lake that listed the lakes below as other lakes they fish most often.

Lake Name (County)	Number	Percent %
Mille Lacs Lake (Mille Lacs)	323	21
Lake of the Woods (Lake of the Woods)	52	3
Leech Lake (Cass)	50	3
Bay Lake (Crow Wing)	35	2
Rush Lake (Chisago)	35	2
Upper Red Lake (Beltrami)	34	2
Little Pine (Aitkin)	33	2
Lake Minnetonka (Hennepin)	28	2
Lake Winnibigoshish (Cass)	25	2
Clearwater Lake (CrowWing)	24	2
St.Croix River (Washington)	24	2
Big Pine Lake (Aitkin)	23	2
Chisago Lake (Chisago)	21	1
Gull Lake (Cass)	21	1
Lake Vermillion (Cass)	21	1
Cedar Lake (Aitkin)	20	1
Ripple Lake (Aitkin)	19	1
Round Lake (Aitkin)	19	1
Rabbit Lake (Crow Wing)	17	1
Knife Lake (Kanabec)	16	1
Serpent Lake (Crow Wing)	16	1
Borden Lake (Crow Wing)	14	1
Sunset Lake (Aitkin)	13	1
Grindstone Lake (Pine)	12	1
Nokay Lake (Crow Wing)	12	1
Big Marine Lake (Washington)	11	1
Kabetogama Lake (St.Louis)	11	1
Pelican Lake (Crow Wing)	11	1
Tetonka Lake (Le Sueur)	11	1
Whitefish Lake (Crow Wing)	11	1
Cedar Lake (Rice)	10	1
St.Croix Lake (Chisago)	10	1
Lake Waconia (Carver)	10	1
Clear Lake (Aitkin)	9	1
Elm Island Lake (Aitkin)	9	1
Green Lake (Isanti)	9	1
Lone Lake (Aitkin)	9	1
South Long Lake (Crow Wing)	9	1
Big Sandy Lake (Aitkin)	8	1
Hanging Kettle Lake (Aitkin)	8	1
Koronis Lake (Stearns)	8	1
Mississippi River (Aitkin)	8	1
Nord Lake (Aitkin)	8	1
Spirit Lake (Aitkin)	8	1

* 224 lakes were mentioned 7 or less times making up the remaining 28%

* Based on 1505 responses out of a possible 2310 responses

Appendix

Table A1. Estimated number of fish harvested, released and total number caught, all anglers, May 11 – September 30, 2024, Farm Island Lake, Aitkin County, Minnesota. Standard error in parentheses.

Table A1a. Estimated number of fish harvested, released and total number caught, all anglers, May 11 – May 31, 2024, Farm Island Lake, Aitkin County, Minnesota. Standard error in parentheses.

Species	Harvest	Harvested/Acre	Released	Released/Acre	Total Catch	Catch/Acre
Black Crappie	474 (225)	0.231 (0.110)	240 (127)	0.117 (0.062)	714 (297)	0.347 (0.145)
Bluegill	158 (123)	0.077 (0.060)	352 (170)	0.171 (0.083)	510 (248)	0.248 (0.121)
Bowfin	0 (*)	0.000 (*)	10 (10)	0.005 (0.005)	10 (10)	0.005 (0.005)
Hybrid Sunfish	0 (*)	0.000 (*)	10 (10)	0.005 (0.005)	10 (10)	0.005 (0.005)
Largemouth Bass	0 (*)	0.000 (*)	912 (388)	0.444 (0.189)	912 (388)	0.444 (0.189)
Northern Pike	228 (101)	0.111 (0.049)	2,832 (718)	1.379 (0.349)	3,061 (781)	1.490 (0.380)
Pumpkinseed	10 (10)	0.005 (0.005)	126 (116)	0.061 (0.056)	136 (118)	0.066 (0.057)
Rock Bass	38 (22)	0.019 (0.011)	689 (247)	0.335 (0.120)	726 (251)	0.354 (0.122)
Smallmouth Bass	0 (*)	0.000 (*)	623 (223)	0.303 (0.109)	623 (223)	0.303 (0.109)
Walleye	465 (166)	0.226 (0.081)	1,732 (479)	0.843 (0.233)	2,196 (612)	1.069 (0.298)
Yellow Perch	0 (*)	0.000 (*)	19 (20)	0.009 (0.010)	19 (20)	0.009 (0.010)

Table A1b. Estimated number of fish harvested, released and total number caught, all anglers, June 1 – June 30, 2024, Farm Island Lake, Aitkin County, Minnesota. Standard error in parentheses.

Species	Harvest	Harvested/Acre	Released	Released/Acre	Total Catch	Catch/Acre
Black Crappie	32	0.016	0	0.000	32	0.016
	(22)	(0.011)	(*)	(*)	(22)	(0.011)
Bluegill	325	0.158	673	0.328	998	0.486
	(109)	(0.053)	(168)	(0.082)	(233)	(0.113)
Bowfin	0	0.000	5	0.002	5	0.002
	(*)	(*)	(5)	(0.002)	(5)	(0.002)
Largemouth Bass	38	0.018	747	0.364	785	0.382
	(18)	(0.009)	(196)	(0.096)	(203)	(0.099)
Northern Pike	18	0.009	1,412	0.687	1,429	0.696
	(19)	(0.009)	(303)	(0.148)	(305)	(0.148)
Pumpkinseed	15	0.007	28	0.014	43	0.021
	(15)	(0.007)	(16)	(0.008)	(21)	(0.010)
Rock Bass	32	0.016	808	0.393	840	0.409
	(20)	(0.010)	(209)	(0.102)	(212)	(0.103)
Smallmouth Bass	59	0.029	909	0.443	969	0.472
	(26)	(0.012)	(271)	(0.132)	(280)	(0.136)
Walleye	622	0.303	1,849	0.900	2,471	1.203
	(133)	(0.065)	(314)	(0.153)	(418)	(0.204)
Yellow Perch	0	0.000	27	0.013	27	0.013
	(*)	(*)	(13)	(0.006)	(13)	(0.006)

Table A1c. Estimated number of fish harvested, released and total number caught, all anglers, July 1 – July 31, 2024, Farm Island Lake, Aitkin County, Minnesota. Standard error in parentheses.

Species	Harvest	Harvested/Acre	Released	Released/Acre	Total Catch	Catch/Acre
Black Crappie	18	0.009	8	0.004	26	0.013
	(18)	(0.009)	(7)	(0.004)	(19)	(0.009)
Bluegill	1,316	0.641	1,849	0.900	3,165	1.541
	(389)	(0.189)	(456)	(0.222)	(792)	(0.386)
Bowfin	0	0.000	8	0.004	8	0.004
	(*)	(*)	(8)	(0.004)	(8)	(0.004)
Channel Catfish	0	0.000	8	0.004	8	0.004
	(*)	(*)	(8)	(0.004)	(8)	(0.004)
Largemouth Bass	135	0.066	1,465	0.713	1,600	0.779
	(82)	(0.040)	(325)	(0.158)	(332)	(0.161)
Northern Pike	20	0.010	920	0.448	940	0.457
	(11)	(0.005)	(149)	(0.073)	(148)	(0.072)
Pumpkinseed	35	0.017	91	0.044	126	0.061
	(18)	(0.009)	(47)	(0.023)	(49)	(0.024)
Rock Bass	20	0.010	394	0.192	414	0.201
	(11)	(0.005)	(93)	(0.045)	(93)	(0.045)
Smallmouth Bass	57	0.028	1,213	0.590	1,269	0.618
	(32)	(0.015)	(321)	(0.156)	(322)	(0.157)
Walleye	295	0.143	1,118	0.544	1,413	0.688
	(64)	(0.031)	(302)	(0.147)	(320)	(0.156)
Yellow Perch	0	0.000	14	0.007	14	0.007
	(*)	(*)	(10)	(0.005)	(10)	(0.005)

Table A1d. Estimated number of fish harvested, released and total number caught, all anglers, August 1 – August 31, 2024, Farm Island Lake, Aitkin County, Minnesota. Standard error in parentheses.

Species	Harvest	Harvested/Acre	Released	Released/Acre	Total Catch	Catch/Acre
Black Crappie	25	0.012	53	0.026	77	0.038
	(21)	(0.010)	(43)	(0.021)	(64)	(0.0314)
Bluegill	879	0.428	2,233	1.087	3,112	1.515
	(291)	(0.142)	(576)	(0.280)	(759)	(0.370)
Largemouth Bass	24	0.012	1,408	0.685	1,432	0.697
	(16)	(0.008)	(358)	(0.174)	(354)	(0.172)
Northern Pike	11	0.006	876	0.426	887	0.432
	(8)	(0.004)	(180)	(0.088)	(180)	(0.088)
Pumpkinseed	15	0.007	23	0.011	38	0.019
	(10)	(0.005)	(11)	(0.005)	(12)	(0.006)
Rock Bass	8	0.004	365	0.178	373	0.181
	(5)	(0.003)	(129)	(0.063)	(130)	(0.063)
Smallmouth Bass	35	0.017	777	0.378	812	0.395
	(13)	(0.006)	(148)	(0.072)	(149)	(0.073)
Walleye	142	0.069	376	0.183	518	0.252
	(36)	(0.018)	(95)	(0.046)	(105)	(0.051)
Yellow Perch	0	0.000	23	0.011	23	0.011
	(*)	(*)	(23)	(0.011)	(23)	(0.011)

Table A1e. Estimated number of fish harvested, released and total number caught, all anglers, September 1 – September 30, 2024, Farm Island Lake, Aitkin County, Minnesota. Standard error in parentheses.

Species	Harvest	Harvested/Acre	Released	Released/Acre	Total Catch	Catch/Acre
Black Crappie	6	0.003	49	0.024	54	0.026
	(6)	(0.003)	(30)	(0.014)	(28)	(0.014)
Bluegill	497	0.242	1,555	0.757	2,051	0.999
	(145)	(0.071)	(380)	(0.185)	(472)	(0.230)
Bullhead Spp.	0	0.000	6	0.003	6	0.003
	(*)	(*)	(4)	(0.002)	(4)	(0.002)
Largemouth Bass	20	0.010	982	0.478	1,002	0.488
	(8)	(0.004)	(186)	(0.090)	(190)	(0.093)
Northern Pike	10	0.005	697	0.339	707	0.344
	(7)	(0.004)	(121)	(0.059)	(123)	(0.060)
Pumpkinseed	15	0.007	0	0.000	15	0.007
	(8)	(0.004)	(*)	(*)	(8)	(0.004)
Rock Bass	0	0.000	169	0.082	169	0.082
	(*)	(*)	(53)	(0.026)	(53)	(0.026)
Smallmouth Bass	10	0.005	641	0.312	651	0.317
	(6)	(0.003)	(135)	(0.066)	(135)	(0.066)
Walleye	174	0.085	502	0.245	676	0.329
	(42)	(0.021)	(104)	(0.051)	(125)	(0.061)
Yellow Perch	0	0.000	95	0.046	95	0.046
	(*)	(*)	(49)	(0.024)	(49)	(0.024)

Table A2. Mean length in inches and average weight in pounds, of fish harvested ad released, all anglers, Farm Island Lake, Aitkin County, Minnesota, May 11 - September 30,2024. Standard error in parentheses.

Species	Mean Length Harvested	Mean Length Released	Mean Weight Harvested	Mean Weight Released
Black Crappie	11.0 (7.1)	9.1 (5.5)	0.8 (0.55)	0.54 (0.38)
Bluegill	8.0 (2.1)	5.7 (1.2)	0.43 (0.11)	0.18 (0.04)
Bullhead Spp.	NA	NA	NA	NA
Bowfin	NA	25.35 (23.03)	NA	5.67 (5.18)
Channel Catfish	NA	NA	NA	NA
Hybrid Sunfish	NA	NA	NA	NA
Largemouth Bass	14.6 (9.2)	14.2 (3.0)	1.78 (1.12)	1.76 (0.39)
Northern Pike	18.8 (10.6)	16.8 (3.3)	1.4 (0.78)	1.1 (0.22)
Pumpkinseed	7.5 (2.9)	7.09 (5.7)	0.39 (0.15)	0.38 (0.35)
Rock Bass	9.3 (4.1)	9.5 (2.3)	0.68 (0.3)	0.76 (0.19)
Smallmouth Bass	13.5 (5.5)	14.2 (3.0)	1.49 (0.68)	1.79 (0.39)
Walleye	16.1 (3.4)	17.0 (3.1)	1.53 (0.33)	1.74 (0.33)
Yellow Perch	NA	3.6 (1.5)	NA	0.04 (0.03)

Table A3. Angler demographics 2024, Farm Island Lake, Aitkin County, Minnesota, May 11 – September 30, 2024.

May 11 - September 30, 2024

Age Groups								
0-15	16-24	25-34	35-44	45-54	55-64	65+	Not Recorded	N
156 (7%)	156 (7%)	188 (9%)	249 (12%)	278 (13%)	563 (26%)	522 (25%)	17 (1%)	2,129 Anglers

Gender		
Male	Female	N
1765 (83%)	364 (17%)	2,129 Anglers

Table A4. Comparison of expanded length frequency distributions of Walleye harvested, released, and season totals, Farm Island Lake, Aitkin, Minnesota, 1994, 1995, 2003, 2004, 2024.

	1994			1995			2003			2004			2024			
Length	Har	Rel	Season	Har	Rel	Season	Har	Rel	Season	Har	Rel	Season	Har	Rel	Season	
< 5.0																
5.0 - 5.4					8	8										
5.5 - 5.9																
6.0 - 6.4								7	7		16	16				
6.5 - 6.9																
7.0 - 7.4					8	8		7	7							
7.5 - 7.9																
8.0 - 8.4		74	74	8	64	72		37	37		16	16		38	38	
8.5 - 8.9								7	7							
9.0 - 9.4					160	160		59	59		32	32				
9.5 - 9.9	15		15				7		7							
10.0 - 10.4	46		46	8	383	391		103	103		222	222		13	13	
10.5 - 10.9		50	50	16	8	24	7		7					13	13	
11.0 - 11.4	77	50	127	48	535	583	15	44	59		32	32		32	32	
11.5 - 11.9				226	8	234	29	7	37	33		33	6	6	12	
12.0 - 12.9	124	297	421	565	966	1531	117	148	265	49	48	97	12	139	152	
13.0 - 13.9				621	200	821	285	59	344	115	79	194	189	349	538	
14.0 - 14.9	372	397	769	460	40	500	498	52	549	197	32	228	598	266	864	
15.0 - 15.9	294		294	290	8	298	556	44	600	213	16	229	378	146	524	
16.0 - 16.9	604	25	629	234	32	266	88	288	376	33	396	429		539	539	*16" Lower end protected slot.
17.0 - 17.9	542		542	371		371	51	723	775	16	618	635		1794	1794	
18.0 - 18.9	682		682	371	16	387	22	362	384	16	824	841	12	1825	1837	*19" Upper end protected slot.
19.0 - 19.9	511		511	307	8	315	249	118	367	279	79	358	287	260	547	
20.0 - 20.9	217	25	242	97		97	146		146	180	16	196	153	63	216	
21.0 - 21.9	108		108	32		32	66		66	66	16	81	37	19	56	
22.0 - 22.9	108	25	133	40		40	22	22	44	49		49	6	19	25	
23.0 - 23.9	31		31	32	24	56	29		29	33		33	12	6	19	
24.0 - 24.9				8		8		22	22	33		33	6	6	12	
25.0 - 25.9	15		15	16		16	7	7	15							
26.0 - 26.9					8	8	15	15	29		16	16		13	13	
27.0 - 27.9	31		31											6	6	
28.0 - 28.9														6	6	
29.0 - 29.9														13	13	
30.0 - 30.9														6	6	
> 31.0																
< 16.0 inches	930	868	1797	2243	2387	4630	1515	576	2090	606	491	1098	1184	1001	2186	
16.0 - 18.9 inches	1829	25	1853	976	48	1024	161	1373	1534	66	1839	1904	12	4157	4170	
≥ 19.0 inches	1023	50	1072	533	40	572	534	185	719	639	127	766	501	418	919	
Total	3781	942	4723	3752	2475	6227	2210	2133	4343	1311	2457	3768	1697	5577	7274	

***Protected slot implemented in 1996.**

Minnesota DNR
Farm Island Lake Creel Survey
F-29R(P)36-2
Study 3, Job 1187
April 2025

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISHERIES AND WILDLIFE

Completion Report

Creel Survey of Farm Island Lake

Aitkin County, MN

May 11 – September 30, 2024

By

Danny McCann

Aitkin Area Fisheries

Approved by Rick Bruesewitz Digitally signed by Rick Bruesewitz Date: 2025.06.20 09:25:08 -05'00' Date: _____

Area Fisheries Supervisor

Approved by David Weitzel Digitally signed by David Weitzel Date: 2025.06.23 08:26:44 -05'00' Date: _____

Regional Fisheries Supervisor