

**Introduction:**

Fisheries management is a dynamic process and continued monitoring and analysis is needed to maintain a level of fishing that is desired by the community. The Galena Territory Association recognizes this, and through their effort has been able to compile data over multiple years to evaluate trends in the fishery. This report will compare fall data collected from 2019 through 2023 by JadEco. By comparing these multiple year samples, we can better review trends in the fishery. This, in turn, allows us to ensure the fishery at The Galena Territory Association continues to maintain or improve over time and offset potential problems as they occur. Along with the electrofishing data collected, we have been provided with creel census data collected by the lake manager. This data has proven valuable to understand the fishery and the angler's successes.

We were able to conduct day and night DC electrofishing surveys Fall 2023. Daytime DC Electrofishing was conducted for a total of 110 minutes throughout much of the lake and another 56 minutes after dark on November 1, 2023. We collected 2,195 fish that represented 12 different species. Ten of the 12 were important sportfish, and the remainder were non-game white suckers (1) and bullhead (5). Of the total fish collected, only these 6 fish were non-game.

Water clarity readings were good the day of the survey with visibility over five feet again in 2023. We believe we collected a good representative sample of sportfish during the survey, and the night collection provided valuable additional information, especially about the population structure for the bluegill. Once again, the fall sample collected in 2023 indicates an excellent fishery for The Galena Territory Association.

We utilized several indices in fisheries management as tools to interpret the population structure and condition of the fishery. Data analysis tools such as Catch Per Unit Effort (CPUE) provide information on the abundance of species. The quantity of fish collected within a certain amount of time determines the CPUE. This is used for the collection as a whole, or per species comparisons. Proportional stock density (PSD) is also analyzed on important game species. This is a fisheries assessment tool used to determine the size distribution of the fish within a population. Relative weights ( $W_r$ ) are calculated to provide insight into the condition of the fish in a population or fish community. They also provide an understanding of the size structure of game species within the lake and provide information on length to weight relationships to better understand if your game fish are relatively fat, or relatively thin. Potential changes in the predator / prey relationships and available forage can be interpreted through these metrics.



Combined, these metrics provide information on the game fish community, species density, and potential trends in the fishery.

**Summary of Fisheries Data Collected in Fall 2023:**

The following is a summary and interpretation of the data from the fall 2023 fish survey and a comparison to previous fall collections performed by JadEco. With the exception of 2019, all subsequent years have data collected after dark. We have more than five years of data now, but we reflect on a five year window for our management goals and trends.

Over all, the health and condition of the fish collected during the 2023 fall survey was good with all but walleye, perch, and muskie within our objective range for relative weights. Both walleye and perch have consistently been lower, but this is the best relative weight we've had for both species in some time. This may be an indicator those fisheries are improving. We also noticed a decline in relative weights for the other species collected, except the walleye and perch.

During previous surveys, we have observed yellow grub worm parasites, anchor worms, and leeches. These are naturally occurring parasites and should not be a major concern for the fishery. However, we did not observe these concerns with any of the fall surveys the past few years and we will continue to monitor for parasites.

We collected 2,195 fish resulting in 12.57 fish per minute collected. Only six fish (3 bullhead and 1 white suckers) were considered non-game. Of the fish collected, a total of 685 largemouth bass comprised 31.2% of the overall collection. Bluegill comprised over 60% of the fish surveyed with 1,327 fish collected followed by black crappie (69) yellow perch (45) smallmouth bass (32) and rainbow trout (9). We also collected 3 muskie ranging from 28.1" to 30.9". Walleye and redear sunfish were both represented by 8 fish respectively. Three hybrid bluegill were observed in 2023.

Largemouth bass from young of the year at 2" and up to 20.2" were collected with a high CPUE at 3.79 fish per minute. These higher than objective CPUE's for bass have been consistent at The Galena Territory Association. Bluegill CPUE was high as well at 7.96 fish per minute with fish up to 8.2" collected. The bluegill PSD was at 34 and within our objective range for bluegill collected at night. The night surveys consistently show the larger bluegill in the fall, where spring surveys close to the spawn would normally be the time to see these fish. Along with the bass and bluegill, there was good representation of black crappie from 1.9" young of the year to 10.7" and averaging 5.6". The crappie also had good relative weights (99). We had an excellent collection of smallmouth bass from 3.2" young of the year up to 17.4". We believe the smallmouth bass fishery has established well, and anglers

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should continue to be able to target and catch these fish. We collected yellow perch from 3" to 11.4" and walleye from 11.1" up to 22". Muskie were represented during the survey with 3 fish collected from 28.1" to 30.9".

Relative weights (Wr) for the game species of concern were all within objective ranges, with the exception of the walleye and yellow perch, which both improved since the 2022 survey at 89 and just slightly below our objective of 90-110. The largemouth bass Wr was good at 98 and well within our objective range. Bluegill Wr remained within our objective range at 97, but dropped since the 2022 survey (102) and are more consistent with years past. Black crappie were good as well with average Wr at 99 with a decent collection of crappie averaging 5.6" (range 1.9" to 10.7"), and there was a total collection of 69 black crappie. Based on the smaller size representation, spawning and recruitment continues and the fishery is expected to maintain as a fishable crappie population.

### **Largemouth Bass:**

The collection rate for largemouth bass was above our objective collection rate (1-2.5 fish per minute) at 3.79 fish per minute. We observed a high collection of bass in the 7" to 10" range in 2022 (shifting from smaller sizes in 2021), and once again they have shifted to the 10" to 13" classes. The average relative weight of bass collected was at 98 and consistent with previous years. This is within our objective range and would indicate a relatively fat average bass at The Galena Territory Association, however, looking at the relative weight scatter plot, it appears a downward trend in Wr as bass increase in length. This needs to be monitored.

The PSD or 'proportional stock density' metric to analyze the size structure of the bass population was used. This is a comparison of the stock (>8") to quality (>12") size bass in the sample. The objective range for largemouth bass PSD is 40-70. The PSD for bass at The Galena Territory Association was at 39 in 2023 (up from 35 in 2022). This is slightly below our objective range. The RSD14 for largemouth bass was at 25 and is up down slightly from 2022 (26) and 2021 (31), but consistent with 2020 (26) and 2019 (25). The RSD 14 remains above our objective (10 to 20). This would indicate a good number of bass greater than 14" in the fishery. Largemouth Bass were collected up to 20.2" and the average largemouth length in the survey was 8.5".

Comparing the data reported on the angler creel cards, we've seen a severe reduction in the reporting of bass caught. In 2023, 1,623 bass were reported with 258 between 17" and 20". They also reported 45 fish caught over 20". This is substantially lower than 2022 with 3,973 bass reported with 846 of them between 17" and 20" and 292 over 20". The 2023 reporting is more consistent with 2020 and 2021 angler reported data and I don't believe this is a concern at this time.



### **Bluegill:**

We collected 1,327 bluegill with a high CPUE of 7.96 fish per minute, which is above our objective of 2-4.5 fish per minute. The bluegill represented over 60% of the overall catch in this survey. Once again, the larger bluegill were not well represented in this survey and needs to be closely monitored. Harvest reports were up for bluegill this year with 4,491 fish reported. Nearly 22% of the bluegill reported were between 8" and 10" and 62 fish between 10" and 12" were reported. Bluegill Wr was good at 97 and is within our objective range. One point to note is that the larger bluegill were not observed during our survey until the night survey. These larger bluegill came up into the shorelines allowing us to collect them. In all, the bluegill fishery appears to be doing ok based on the data we collected and the angler reports.

The PSD was at 34 (up from 10 in 2022 and higher than 18 in 2021). The PSD is within our objective range (20-60). This would indicate that of the fish greater than 3" in length (stock size), 34% were larger than 6" in length (quality size). Bluegill ranged from 1" - 8.2" and averaged 3.8" in length.

Historically, over the past 5 years, the bluegill fishery has been showing an improvement in overall size structure until 2020, and it's important to monitor the bluegill sizes in both surveys and angler reports. I don't believe the fishery has fully rebounded since the 2020 decline and continued monitoring is needed. Adjustments may need to be made to the fishery and more data collection may be necessary, such as spring surveys and age and growth data collection.

### **Black Crappie:**

We collected a total of 69 black crappie for a CPUE of 0.31 fish per minute. The fish collected ranged in size from 1.9" to 10.7" and averaged 5.6". The smaller sizes were present again and spawning is still occurring. The PSD for crappie was within our objective range as well at 33. Generally, our spring collections provide better data for our crappie, but once again this fall collection is an indicator the fishery is doing very well.

The reported angler catch for crappie was up from 2022 with 2,890 crappie reported. Over 44% of the collection were crappie between 7" and 10" and crappie over 10" represented over 11% of the reported fish caught.

Relative weights for crappie were also good at 99. This species can be cyclical in its population with good year classes and several years with gaps. Based on the data from the last several spring and fall surveys and angler creel survey data, multiple year classes were observed and the crappie continue to do well at The Galena Territory Association and should be providing an excellent crappie fishery.



### **Smallmouth bass:**

We had a decent collection of smallmouth bass in this survey with 32 fish collected at a rate of 0.11 fish per minute. This is the lowest collection rate we seen in the past 5 years. The average smallmouth collected was 11.9" with the largest at 17.4". We also observed young of the year recruitment with smallmouth down to 3.2" observed. The relative weights were within our objective range at 91, but the lowest we've seen since 2020. Based on this and previous collections, this would indicate decent smallmouth bass fishing opportunities for The Galena Territory Association anglers.

One observation causing concern is that the angler reports for smallmouth bass is substantially lower with only 159 fish reported compared to 2022 at 383. These numbers are still good compared to previous years, but this needs to be monitored.

The annual spawning and recruitment of smallmouth bass in The Galena Territory Association is excellent for the fishery. It is difficult for smallmouth to compete against largemouth bass here in Midwest impoundments, but it appears to be occurring successfully at The Galena Territory Association.

### **Walleye:**

We collected 8 walleyes in 2023 ranging from 11.1" to 22" in length (averaged 14.2"). The overall CPUE was at 0.14 fish per minute and the average Wr was low at 89, but showing improvement. This low Wr is consistent with previous data for The Galena Territory with Wr averages being under our objective range but this is the highest Wr we've observed historically. Continuing to stock walleye should improve the fishery for anglers targeting walleye. There were 75 walleye reported by anglers, and this is more than previous reports provided. Nearly half of the walleye reported were over 20" and 20 were reported over 24".

### **Yellow Perch:**

Yellow perch continue to do well at The Galena Territory Association. There were 45 fish collected at a rate of 0.11 fish per minute. The average perch collected was 5.8" and ranged from 3" to 11.4". Perch relative weights were below our objective range again in 2022 at 89, but this is still better than the past couple of years.

Anglers reported a total of 418 perch caught in 2023. This is down from the previous couple of years with 524 perch caught in 2022, and 922 reported in 2021. Proportionally, the size distribution is the same with quality fish being caught, just a lower catch is reported.

### **Rainbow Trout:**

We were able to capture 9 rainbow trout this fall ranging from 15" to 18.1". Seven of these were captured during the night survey, near the dam. While this is a put



and take fishery for The Galena Territory Association, it has shown to be a fishable population that is being stocked.

### **Recommendations:**

#### **Fish Habitat:**

As noted in our previous reports, The Galena Territory Association should continue to place quality fish habitat throughout the lake. Placement of both shallow and deep structure would benefit the fishery, and in particular the bass fishery. Most lakes similar to The Galena Territory Association allow swimming, skiing, and other water recreation and therefore do not allow the placement of shallow structures. It is my understanding that the lake is a “no swimming” lake, therefore you may have less concern for structure locations than other lake associations that allow swimming.

Multiple material types can be used to create successful structures to improve the fishery as well as the fishing opportunities for anglers. Many fishing clubs use Christmas trees and cinder blocks to place structure. While these materials are readily available and easy to handle, there are better structures that can be built by the volunteers, or purchased through suppliers. Use of hard wood treetops, wooden pallets, or even PVC can provide long-term structures. We could assist you with developing these structures, as well as placement recommendations, if needed. **If structure is being placed, please send me a copy of the locations (and depths) as well as the number, size, and materials used for those structures.**

Along with placement of structure, the aquatic plant management program is important to the fishery. Aquatic plants provide oxygen to living organisms, nurseries to young fish, and a food supply of aquatic invertebrates to bolster the food chain for these growing fish. An aquatic plant management program is needed to ensure the establishment of quality native aquatic plants. Developing a plant management program or strategy would benefit the fishery to ensure the plants are managed to improve the fishery.

It is my understanding that the Association has been treating for Curly Leaf Pondweed now for a few years. While this is good to reduce the biomass of that non-native invasive species, the Association should still be monitoring for growth of native species as part of a management plan. Native aquatic plants are needed to maintain a quality fishery; therefore, the Association should work on developing an overall aquatic plant management plan as well, not just conducting treatments. We can further discuss this at your request.

#### **Size limits:**

Current largemouth bass limits allow the harvest of 5 bass between 11" and 12.9". Continue this harvest limit. Angler reports are that they are removing some of this size class and the largemouth bass population distribution shows we still need to maintain the harvest and continue to monitor the population. This may also allow more forage for the larger bass that are trending towards lower relative weights.

The 2023 creel report shows that approximately 50% of the bluegill reported were between 6" and 8". This would indicate plenty of bluegill to be harvested for their creel with the ONLY 5 bluegill over 8" rule in effect. Continue to restrict these larger (over 8") bluegill harvests to help better balance the bluegill fishery, while still allowing anglers to harvest enough to eat. This will be difficult to enforce but **educating the anglers about the need to release the largest males back instead of keeping them for the creel could improve the trophy fishing for The Galena Territory Association.** This type of program restricts the harvest on bluegill larger than 8" to no more than 5 per day.

The crappie fishery appears to be stable at this time and no need for limit adjustments.

### **Stocking:**

Stocking is always subjective to budgetary constraints, and all recommendations may not be able to be met. Stocking recommendations should always be re-evaluated based on subsequent fish population sampling. At this time, we do not recommend any changes to the stocking program previously proposed and outlined below.

- 1) Periodic stocking of muskie is necessary to maintain the fishery at The Galena Territory. I recommend stocking muskie at a rate no more than 1 fish per acre. To maintain consistent size classes, stockings should be done every other year. Generally, you can purchase muskie at 12" and larger. Larger fish have better survival rates. These numbers may be adjusted based on subsequent data collected by angler reports as well as electrofishing data on stock survival. There were 75 12" and larger tiger muskie stocked by the Association in 2023.
- 2) It is unlikely walleye are spawning at The Galena Territory Association, and periodic stockings will be necessary to maintain a viable fishery for anglers. Annual stocking of walleye can be done at a rate not to exceed 10 walleye per acre per year. Walleye should be stocked at 6"-8". The Association stocked 1,100 6" to 8" walleye in 2023.
- 3) We didn't collect channel catfish again in 2023. There were 2,200 8" to 12" channel catfish stocked in 2023, so I expect we may start seeing them. An



annual, or every other year, stocking can be done at an 8"-10" size range, or larger. The larger the catfish, the better their stock survival. Please note that a MINIMUM of 8" stocking size is required. Fish smaller than 8" are more likely to be consumed by other sport species as prey. Stocking densities of 10 fish per acre is a good guideline.

Stocking should occur in the fall as temperatures are dropping into the 50's, but before early winter. Early spring stocking before temperatures get too warm can be done as well if conditions and budgets warrant. **Please continue to send JadEco copies of your stocking records annually.**

If budgetary constraints are a problem, stocking every other year may be an option, keeping in mind limited year-class strength and size gaps in the fish that may be observed by fisherman and their creel.

Continue encouraging angler reporting and collecting angler creel data whenever possible. The reporting for angling appeared to be improving in 2022, but was more consistent with previous years in 2023. This is valuable information and should continue. Once again, records on what anglers are removing (bass slot range) was included for 2023 and it appears that it is a relatively low harvest and we should encourage anglers to utilize the resource when possible. If there is good participation, we may need to drop from 5 per day to 3 per day.





Table 1: Catch Per Unit Effort (CPUE) by species

Species:	Number:					Fish / Minute					Obj. (fish/min)
	23f*	22f*	21f*	20f*	19f	23f*	22f*	21f*	20f*	19f	
Largemouth Bass:	685	854	637	514	487	3.79	4.22	4.03	3.03	6.96	1.0-2.5
Bluegill:	1327	2080	1542	1285	432	7.96	6.07	9.45	6.72	6.17	2.0-4.5
Black Crappie:	69	49	58	194	7	0.31	0.19	0.36	1.17	0.1	0.2-0.8
Smallmouth Bass:	32	80	38	48	24	0.11	0.44	0.24	0.29	0.34	1.0-2.5
Walleye:	8	12	2	14	---	0.14	0.05	0.01	0.05	---	-----
Yellow Perch:	45	31	32	105	48	0.11	0.15	0.1	0.08	0.69	-----
Redear Sunfish:	8	6	16	6	21	0.07	0.12	0.06	0.06	0.3	-----
Muskie:	3	1	2	2	2	0.02	0.02	0.02	0.02	0.03	-----
Bullhead:	5	3	2	---	2	0.02	0.04	0.01	---	0.03	-----
Green Sunfish:	---	---	2	1	1	---	---	0.01	0.01	0.01	-----
Hybrid Bluegill:	3	2	1	1	1	0.01	0.02	0.2	0.01	0.01	-----
Rainbow Trout:	9	---	---	---	---	0.01	---	---	---	---	-----
White Sucker:	1	5	8	1	10	0.02	0.1	0.2	0.01	0.14	-----
Channel Catfish:	---	---	---	2	---	---	---	---	0.01	---	-----
Total CPUE	2195	3123	2340	2172	1034	12.57	11.42	14.69	11.46	14.77	6.00 plus

\* Includes day and night surveys

Table 2: Proportional Stock Density (PSD)

Species:	23f	22f	21f	20f	19f	Objective
Largemouth Bass:	39	35	54	75	59	40-70
Bluegill:	34	10	18	30	31	30-60
Black Crappie:	33	33	80	74	0	30-60
Walleye:	25	67	100	100	---	30-60

Table 3: Relative Weight (Wr)

Species:	Wr (Ave)					Range:					Objective
	23f*	22f*	21f*	20f*	19f	23f	22f	21f	20f	19f	
Largemouth Bass:	98	100	98	98	97	67-173	63-180	68-159	70-128	70-120	90-110
Bluegill:	97	102	95	97	93	62-146	69-175	75-157	79-137	65-128	90-110
Black Crappie:	99	104	97	100	---	89-116	90-121	82-111	87-133	---	90-110
Smallmouth Bass:	91	93	94	90	84	72-153	70-125	70-116	72-106	66-107	90-110
Walleye:	89	83	83	84	---	74-98	66-94	82-84	70-99	---	90-110
Yellow Perch:	89	88	84	95	88	75-101	78-101	71-96	73-112	78-100	90-110
Redear Sunfish:	112	114	113	128	116	112	91-141	100-134	125-133	105-124	90-110
Rainbow Trout:	91	---	---	---	---	82-100	---	---	---	---	90-110
Muskie:	77	---	---	---	---	75-79	---	---	---	---	90-110
Channel Catfish:	---	---	---	103	---	---	---	---	103	---	-----

\* Includes day and night surveys

Table 4: Length Ranges by Species

Species:	Length:					Average:				
	23f	22f	21f	20f	19f	23f	22f	21f	20f	19f
Largemouth Bass:	2"-20.2"	2.6"-19.1"	2.2"-19.8"	2.6"-20.7"	2.4"-19.4"	8.5"	9.3"	8.4"	8.2"	7.8"
Bluegill:	1"-8.2"	0.6"-8.5"	1.1"-9"	1.2"-9"	1.3"-8.3"	3.8"	4"	3.9"	4.5"	3.5"
Black Crappie:	1.9"-10.7"	6.5"-11.5"	2.6"-10.8"	2.3"-10.9"	2.3"-3.2"	5.6"	7.7"	8.1"	7.3"	2.7"
Walleye:	11.1"-22"	12.4"-26.5"	13.6"-20.1"	10.2"-23.4"	--"	14.2"	17.7"	16.9"	17.1"	--"
Smallmouth Bass:	3.2"-17.4"	3.8"-18.4"	2.8"-15.9"	3.2"-19.5"	3.6"-17.5"	11.9"	10"	10"	13"	12.4"
Yellow Perch:	3"-11.4"	6.4"-11.2"	2.2"-9.3"	2.8"-11.3"	2.8"-10.1"	5.8"	8.4"	6.5"	4.6"	4.4"
White Sucker:	21.3"	19.7"-22.1"	13.6"-20.6"	21.7"	7.5"-23.1"	21.3"	20.9"	18.4"	21.7"	19.7"
Redear Sunfish:	2.6"-3.4"	2.8"-9.1"	1.7"-9.6"	2.6"-10.4"	1.6"-10.6"	2.8"	6.9"	6"	6"	5.4"
Green Sunfish:	--"	--"	5.6"-5.9"	5.3"	5.6"	--"	--"	5.7"	5.3"	5.6"
Hybrid Bluegill:	4.6"-5.8"	3.9"-6.6"	5.8"	--"	--"	5"	5.3"	5.8"	--"	--"
Bullhead:	9.4"-11.5"	7.9"-11.4"	6.3"-12"	--"	12"-12.1"	10.3"	9.7"	9.2"	--"	12.1"
Muskie:	28.1"-30.9"	30.9"	27.2"-32.5"	26.5"-37.6"	18.1"-25.6"	29.4	30.9"	29.8"	32"	21.8"
Rainbow Trout:	15"-18.1"	--"	--"	--"	--"	16.7"	--"	--"	--"	--"
Channel Catfish:	--"	--"	--"	7.7"-10.3"	--"	--"	--"	--"	9"	--"

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