

Spring 2022

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. Ongoing data collection assists biologists with evaluating trends in the fishery. This monitoring allows biologists to make changes, if needed, to the fishery to maintain the quality of fishing the membership has come to expect. Goose Lake Association understands this and contacted JadEco, LLC to continue collecting data on the fishery for Goose Lake and Beaver Lake at the Goose Lake Association property. This survey is the second survey in three years.

To assess the fishery, we utilize 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.

Goose Lake:

The spring survey on 6/10/2022 consisted of a day and night survey for Goose Lake. Before dark, we performed a 30-minute survey in daylight. After dark, we conducted another 55 minutes of DC electrofishing throughout much of the lake.

A total of 14 species were represented during this survey. Of the species collected, 11 were game species. Carp, gizzard shad, and yellow bullhead were species collected that are considered undesirable for our management goals. Flathead catfish (1), yellow perch (6), grass carp (1), silversides (1), and red ear sunfish (1) were all new to our collection this spring. A total of 525 fish were collected (423 night, 102 day). The collection consisted of largemouth bass, bluegill, white crappie, white bass, rock bass, warmouth, walleye, yellow perch, red ear sunfish, silverside, yellow bullhead, carp (common and grass), and gizzard shad.

Summary of Fisheries Data Collected - Spring 2022:

The following is a summary and interpretation of the data from the Spring 2022 fish survey. Over all, the health and condition of the fish collected during the survey was good. We collected a total of 175 largemouth bass that comprised 33.2% of the overall collection. Bluegill comprised 56.2% of the collection with 295 fish collected. Warmouth (24) were 4.57%, yellow perch (6) were 1.14%, Walleye (2) represented less than 1% of the collection.

The remaining game fish represented 1.33% of the collection. Gamefish species represented 97% of the total collection and undesirables represented 3%. Gizzard shad and carp represented 2.66% of the total.

Average relative weight (Wr) for the game species of concern were all within objective ranges with the exception of walleye (86) and red ear sunfish (88), which were under weight for their length. The gizzard shad were also under weight at 85.

Both largemouth bass and bluegill proportional stock densities were in our objective goals, which is an improvement from the previous survey. Bass had a better representation of fish over 15" and bluegill was balanced with better representation of under 6" fish, providing more forage for our bass. Bass relative weights were slightly better, and future surveys will provide more information on whether the bass community and population structure is shifting as expected.

Largemouth Bass:

The collection rate for largemouth bass was within our objective collection rate at 1.37 fish per minute (daytime) and 2.44 fish per minute (night). The average relative weight (Wr) of bass collected increased from the previous survey of 91 to 93. Our objective range is between 90 and 110. Bass Wr ranged from 69 to 113. The average length bass collected was 10.2" with a range from 3.3" to 18.3".

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 Goose Lake was at 44 during the day and at 39 at night. The RSD14 is an evaluator of how many bass are over 14" in proportion to the total number over stock size at 8". Twelve (12) largemouth bass were collected over 14" in length. The RSD14 for largemouth bass was at 9 and falls slightly under our objective range (10 to 20). In the previous survey, we only had one bass over the 15" range, but in this survey, we had more than 8% of the collection over 15".

Largemouth bass relative weights improved, larger size classes were better

represented, and the PSD was within objective ranges. Over all, the bass fishery at Goose Lake appears to be doing well, and improving.

Bluegill:

Bluegill comprised 56.2% of the total fish collected during the survey. A total of 295 bluegill were collected between the day and night surveys. During the day survey, 48 bluegill were collected at a rate of 1.6 fish per minute. The night survey collected a total of 247 fish at 4.49 fish per minute. The objective range for bluegill CPUE is between 2 and 4.5 fish per minute.

The bluegill PSD was at 26 during the day, and 51 at night. Both day and night fell within our objective range of 20 to 60. This would indicate that of the fish greater than 3" in length (stock size), 26% (daytime) and 51% (night) were larger than 6" in length (quality size). We collected 48 bluegills over 8" in length which represented over 19% of the bluegill collection. This indicates an excellent bluegill fishery for the angler. Bluegill relative weights averaged at 107, which is excellent, with a range from 82 to 134. The average bluegill length was 5.6" with a range from 1.8" to 9.1". Bluegill over 8" had an average weight over ½ pound (.504 pound) and ranged from .41 to .68 pounds.

The bluegill fishery still appears to be doing well with great relative weights, good CPUE, and the population distribution being balanced with good PSD numbers. There was also good representation of the smaller (midsized) bluegill that should be providing excellent forage for our growing bass fishery.

Black and White Crappie:

Two crappie were collected in this survey and they were both white crappie. Both crappie collected were decent sized at 11.9" and 12.5" in length and had decent relative weights at 94 and 98. The CPUE for crappie was at only 0.04 fish per minute and both crappie were collected during the night survey. Compared to other lakes in the northern to central Illinois area, these are good relative weights.

Walleye:

Walleye comprised less than 1% of the overall collection at Goose Lake with a 2 walleye collected. One walleye was observed during daytime electrofishing and the other, at night. Average relative weight for walleye were below our objective again at 86 (down from 89). Walleye were collected from 15.3" to 15.9" with an average length of 15.6".

Other desirable species:

The remaining fish were represented by yellow perch. There were six collected ranging from 4.6" to 7.5". One 6.1" rock bass was collected and 24 warmouths between 4.1" and 8.3" were observed. The one red ear sunfish collected was 10"

long. We also collected one flathead catfish that was a young recruit at 5.7" in length.

Undesirable species:

Undesirable species, such as gizzard shad, common carp, and yellow bullhead were collected representing 2.9% of the total collection. Gizzard shad, once again, averaged a large size at 14" and ranged from 9.8" to 18.3". On average, these sizes are too large for our average predators to be able to utilize for forage. This biomass of shad needs to be converted into another fish species.

Eight (8) Common carp were collected ranging in size from 14.4" to 36.4" with an average of 27.3". The CPUE for carp was at 0.2 (daytime) and 0.04 at night. These are both within our management goals of under 0.25 fish per minute.

Recommendations:

Size and creel limits:

Currently, Goose Lake Association is managing their lakes with individual limits for each lake, according to the Goose Lake Association website. It is important to manage each lake on its own because each body of water is unique.

The previous survey recommended removing the largemouth bass slot limit with 2 under 12" and 1 over 18" allowed. The current regulations on the Goose Lake website list them as a slot still. At this time, we recommend removing the under 12" limit and allow one bass over 18" as a trophy, if desired. This regulation change should be monitored closely using electrofishing surveys to determine if any other changes are necessary. The previous survey also recommended protecting the muskie with a catch and release program. The website currently lists muskie at a 1 per day over 40"

- 1) At this time, we suggest you remove the slot limit temporarily to allow a larger age structure of bass. I don't believe your bass are stunting in size due to high numbers of bass (CPUE numbers are within our objective ranges), but rather forage availability. This survey provided some insight into more abundant bluegill numbers that are within the forage range for these bass. This should only be reinstated after further electrofishing surveys.
- 2) Due to the numbers and sizes of gizzard shad, this biomass needs to be converted into a desirable sport species, such as muskie. Muskie are in the lake as a tool to control and convert shad biomass and should be catch and release. The 40" size limit allows muskie to be harvested when they are getting to the size range needed to control the big gizzard shad biomass. If

the membership desires the need to keep a muskie, change the limit to 1 over 48", otherwise we recommended catch and release.

- 3) The bag limit for panfish (crappie and bluegill combined) appears to be working. However, placing a size limit on bluegill allowing the harvest of only 5 over 8" of the 25 allowed would help to maintain the excellent bluegill size structure currently in place. There is currently no size limits on crappie, and placing a size limit of 9" would allow for better angling as the size structure improves. This needs to be monitored in the event large numbers of crappie are stunting at the 7" size class. At this time, this does not appear to be an issue. If this is an issue later, the length and creel limit will need to be adjusted.

Continue to monitor the fish community and population structure through electrofishing data collection to make changes to the creel and size limits as needed. It is important to monitor the bass numbers and community changes with these harvest regulations.

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. Stocking should be done based on individual lake size. It is my understanding that the total fish are normally separated into each lake stocking based on numbers purchased instead of the size of the water body. Each water body needs to be managed separately, by lake size. Follow the maximum stocking recommendations below.

- 1) Continue with the current walleye stocking recommendations. Walleye stocking can still be done yearly to ensure no large gaps in size structure for the anglers that desire walleye. Stock no more than 10 walleye (6"-8") per lake surface acre. If budgets are an issue, walleye could be stocked every other year. Keeping in mind that large gaps (more than two years) in stocking could show later in the angler creel survey as these size gaps begin to show.
- 2) If smallmouth bass are desired by your anglers, periodic smallmouth bass stockings can be done in an attempt to create a self-sustaining, spawning smallmouth bass fishery. No smallmouth bass were observed during this survey. Stocking up to 5 per acre (5"-8") for a few years might be enough to get the fishery started. However, it is difficult to get smallmouth to thrive in an environment with largemouth bass. Largemouth bass populations have a tendency to out compete the smallmouth, especially in more turbid waters (less clear).

- 3) With the presence of large gizzard shad, stocking of keystone predators that can convert the biomass of shad into a desired sport species is important. Stocking of 0.25 to 0.3 fish per surface acre annually would begin to establish this fishery. ***NOTE: Muskie stocking can be controversial to anglers (especially pan fishermen and bass anglers) because they believe the muskie will eat all of their gamefish. However, the scientific studies done in Illinois provide insight into the benefits of stocking muskie and their dietary habits. This stocking rate is a low rate and stocking numbers should not exceed 1 fish per surface acre. These fish should be protected with more conservative creel limits to ensure they remain in the lake to convert the shad biomass. Early removal at 40" would not be recommended.

Habitat Enhancement:

As we've stated in the past, one of the most important things that can improve the bass fishery is improving habitat for young of the year survival and ambush for larger bass hunting grounds. The less energy a largemouth bass has to use to catch forage, and the bigger the forage base (or 'food packet') the more the bass can put into growth and less energy into hunting. Strategic placement of quality structure throughout the lake will improve the fishery. With this being a multi-use lake for more than fishing (ie swimming, boating, skiing), care should be taken to ensure any structures placed are placed safely for these multi uses. I cannot stress enough the importance of fish structure and habitat within your lake.

To my knowledge, the Association is working to improve the aquatic plant management program and currently maintains a developing (possibly still aggressive) aquatic plant and algae management program. This program is likely needed due to non-native invasive species control as well as algae control. However, there is a need for native aquatic plants in the lake.

The management of a quality native plant community provides food and cover as well as water quality benefits to the lake and members. Native aquatic plants can help balance the use of nutrients, such as phosphorus and nitrogen, which would otherwise be available only to the planktonic algae.

It is important that Goose Lake Association work to reduce non-native plants while managing natives, not eradicating them, to allow for other recreational opportunities on the lake. These plant communities are nurseries for young of the year bass, bluegill, and crappie.

Table 1: Catch Per Unit Effort (CPUE) by species on Goose Lake, Spring 2019

| <i>Species:</i> | <i>Number:</i> | | | <i>Fish / Minute</i> | | | <i>Obj. (fish/min)</i> |
|-------------------|----------------|------------------|------------|----------------------|--------------|------------|------------------------|
| | <i>22s Day</i> | <i>22s Night</i> | <i>19s</i> | <i>22s D</i> | <i>22s N</i> | <i>19s</i> | |
| Bluegill: | 48 | 247 | 188 | 1.60 | 4.49 | 3.76 | 2.0-4.5 |
| Carp: | 6 | 2 | 7 | 0.20 | 0.04 | 0.14 | > 0.25 |
| Flathead Catfish: | --- | 1 | --- | --- | 0.02 | --- | ----- |
| Largemouth Bass: | 41 | 134 | 75 | 1.37 | 2.44 | 1.5 | 1.0-2.5 |
| Walleye: | 1 | 1 | 9 | 0.03 | 0.02 | 0.18 | ----- |
| Grass Carp: | --- | 1 | --- | --- | 0.02 | --- | ----- |
| Yellow Perch: | --- | 6 | --- | --- | 0.11 | --- | ----- |
| Black Crappie: | --- | --- | 3 | --- | --- | 0.06 | ----- |
| White Crappie: | --- | 2 | 7 | --- | 0.04 | 0.14 | ----- |
| White Bass: | --- | --- | 1 | --- | --- | 0.02 | ----- |
| Hyb BLG X RES | --- | --- | 2 | --- | --- | 0.04 | ----- |
| Rock Bass: | 1 | --- | 1 | 0.03 | --- | 0.02 | ----- |
| Warmouth: | 1 | 23 | 8 | 0.03 | 0.42 | 0.16 | ----- |
| Gizzard Shad: | 4 | 2 | 31 | 0.13 | 0.04 | 0.62 | ----- |
| Yellow Bullhead: | --- | 1 | --- | --- | 0.04 | --- | ----- |
| Siverside: | --- | 2 | --- | --- | 0.04 | --- | ----- |
| Redear Sunfish: | --- | 1 | --- | --- | 0.02 | --- | ----- |
| Total CPUE | 102 | 423 | 332 | 3.39 | 7.74 | 6.64 | 6.00 plus |

Table 2: Proportional Stock Density (PSD) – Goose Lake, Spring 2019

| <i>Species:</i> | <i>22s</i> | <i>19s</i> | <i>Objective</i> |
|------------------|------------|------------|------------------|
| Largemouth Bass: | 44 | 36 | 40-70 |
| Bluegill: | 26 | 76 | 20-60 |

Table 3: Relative Weight (Wr) – Goose Lake, Spring 2019

| <i>Species:</i> | <i>Wr (Ave)</i> | | <i>Range:</i> | | <i>Objective</i> |
|-------------------|-----------------|------------|---------------|------------|------------------|
| | <i>22s</i> | <i>19s</i> | <i>22s</i> | <i>19s</i> | |
| Bluegill: | 107 | 110 | 82-134 | 91-137 | 90-110 |
| Carp: | 104 | --- | 72-125 | --- | 90-110 |
| Flathead Catfish: | --- | --- | --- | --- | 90-110 |
| Largemouth Bass: | 93 | 91 | 69-113 | 75-104 | 90-110 |
| Walleye: | 86 | 89 | 82-90 | 80-95 | 90-110 |
| Grass Carp: | --- | --- | --- | --- | 90-110 |
| Yellow Perch: | 111 | --- | 95-142 | --- | 90-110 |
| Black Crappie: | --- | 93 | 94-98 | 88-100 | 90-110 |
| White Crappie: | 96 | 99 | 94-98 | 88-111 | 90-110 |
| Rock Bass: | 94 | --- | 94 | v | 90-110 |
| Warmouth: | 107 | --- | 88-126 | --- | 90-110 |
| Gizzard Shad: | 85 | --- | 78-99 | --- | 90-110 |
| Yellow Bullhead: | 110 | --- | 110 | --- | 90-110 |
| Siverside: | --- | --- | --- | --- | 90-110 |
| Redear Sunfish: | 88 | --- | 88 | --- | 90-110 |



Table 4: Length Ranges by Species – Goose Lake, Spring 2019

| Species: | Length: | | Average: | |
|-------------------|--------------------|-------------|-----------------|------------|
| | 22s | 19s | 22s | 19s |
| Bluegill: | 1.8"-9.1" | 2.2-9.8" | 5.6" | 6.7" |
| Carp: | 14.4"-36.4" | 12-33.5" | 27.3" | 25.1" |
| Flathead Catfish: | 5.7" | --- | 5.7" | --- |
| Largemouth Bass: | 3.3"-18.3" | 3.3"-20.7" | 10.2" | 10" |
| Walleye: | 15.2"-15.9" | 13.7"-17.3" | 15.6" | 15.2" |
| Grass Carp: | 46.7" | --- | 46.7" | --- |
| Yellow Perch: | 4.6"-7.5" | --- | 5.5" | --- |
| White Crappie: | 11.9"-12.5" | 8.9"-12.4" | 12.2" | 10.5" |
| Rock Bass: | 6.1" | 9.2" | 6.1" | 9.2" |
| Warmouth: | 4.1"-8.3" | 2.8"-8.9" | 6.8" | 5.9" |
| Gizzard Shad: | 9.8"-18.3" | 15.9"-18.5" | 14" | 17.2" |
| Yellow Bullhead: | 9.9" | --- | 9.9" | --- |
| Siverside: | 3.4"-3.8" | --- | 3.6" | --- |
| Redear Sunfish: | 10" | --- | 10" | --- |







