

Figure 1: Map of the 2023 4th instar chironomid larvae relative abundance at the 32 sites on Lake Winnebago. Catch Rates are relative to point size, with larger points indicating higher catch rates, an X indicates no chironomid caught.

**Lake Winnebago Summary**

- The average amount of chironomid larvae per dredge sample for Lake Winnebago was 0.89, with the highest at site 8 with an average of 9 chironomids per dredge sample (Figure 1).
- The 2023 assessment observed the lowest relative abundance on Lake Winnebago in nearly 20 years of sampling chironomids (Figure 3).
- Although the chironomid densities were low this year, the spatial distribution of larvae during the 2023 assessment still followed historical trend of the northern and central sites of Lake Winnebago yielding highest average catch rates of chironomid larvae (Figure 1).
- Lake Winnebago saw the highest chironomid density from sites 8, 7, 2 and 10 respectively. All of these sites are in the northern region (Figure 1).

**Upriver Lakes Survey Summary**

- The 2023 assessment yielded the second-lowest relative abundance of chironomid larvae (2.18/dredge drop) since Upriver sampling started in 2017. 2017 had the lowest relative abundance with an average of 0.58 chironomids/dredge drop (Figure 4).
- In 2023, the highest chironomid densities were in Lake Winnecone, followed by Lake Butte des Morts, and then Lake Poygan (Figure 5).
- This year is the first year Lake Winnecone had the highest relative abundance of 4th instar chironomid larvae (Figure 5).
- The northern shore of Lake Winnecone, south/southeastern end of Lake Butte des Morts, and the western side of Lake Poygan had the highest relative abundance of 4th instar chironomids.

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**Lake Information**

Winnebago: 131,939 acres  
Butte des Morts: 8,581 acres  
Poygan: 14,024 acres  
Winnecone: 4,553 acres

**Introduction**

Chironomids, commonly referred to as “bloodworms” in their larva stage, are critical to the diet of lake sturgeon. In 2013, a standard assessment of chironomid larvae was initiated in Lake Winnebago, followed by an assessment of the Upriver Lakes (Butte des Morts, Winnecone and Poygan) in 2017. Chironomid assessments dating back to 1961 have provided one of the longest, although not continuous, records of lentic chironomid larvae abundance.

For more information on chironomids please see the [chironomid fact sheet](#)

**Objectives**

1. Assess relative abundance.
2. Assess spatial distribution of chironomid larvae within Lake Winnebago and the Upriver Lakes.

**Metric Descriptions**

**Relative abundance** describes population size and is estimated by the **number of 4th instar chironomid larvae per dredge drop**. The mean catch per dredge drop was used to calculate relative abundance for each lake.

**Survey Method**

- Substrate samples are collected in early August using an Eckman Dredge.
- The Eckman Dredge is dropped twice per site.
- Lake Winnebago has 32 sampling sites.
- Upriver Lakes has 34 sampling sites:
  - 12 on Lake Butte Des Morts
  - 8 on Lake Winnecone
  - 14 on Lake Poygan
- Substrate samples are filtered through a 541 -µm sieve bucket and the remaining material is analyzed in the field for 4th instar chironomid larvae.
- Samples with high amounts of detritus were preserved in 96% Ethanol for analysis in the lab.
- 4th instar chironomid larvae are tallied for each dredge sample to track for relative abundance.

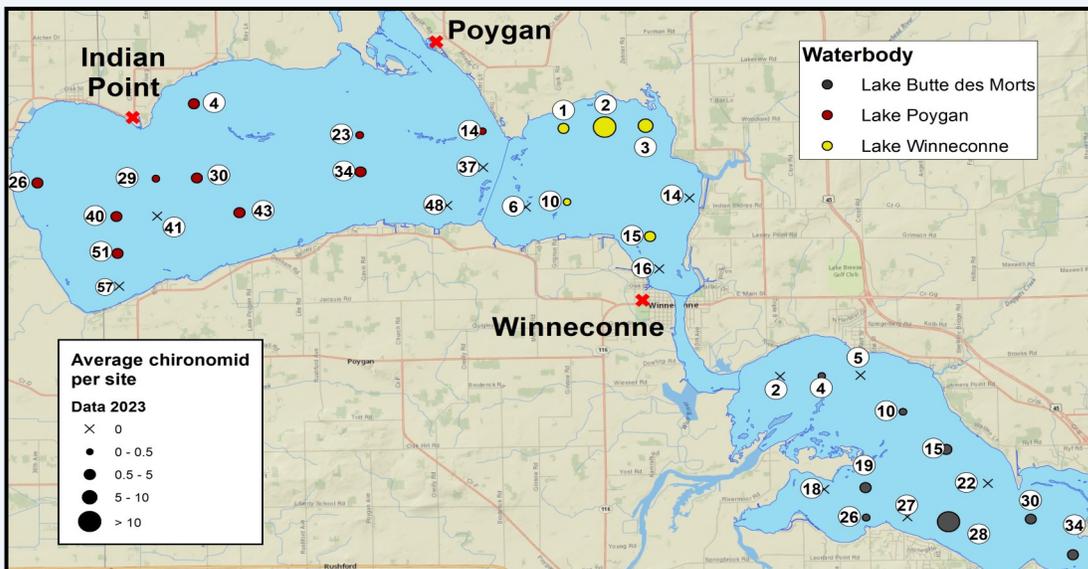


Figure 2: Map of the 2023 4th instar chironomid larvae relative abundance at the 34 sites on the Upriver Lakes on the Winnebago system. Catch rates are relative to point size, with larger points indicating higher catch rates, an X indicates no chironomid caught.



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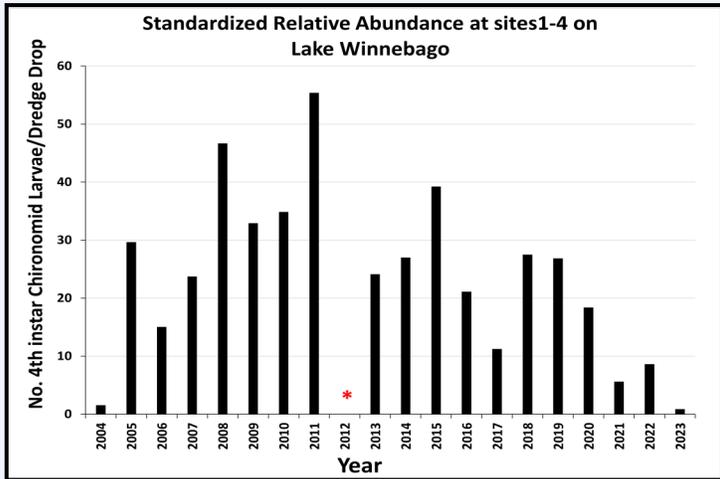


Figure 3: Graph of the standardized relative abundance of 4th instar chironomids from sites 1-4 on Lake Winnebago in 2004-2023. \*Sampling did not occur in 2012.

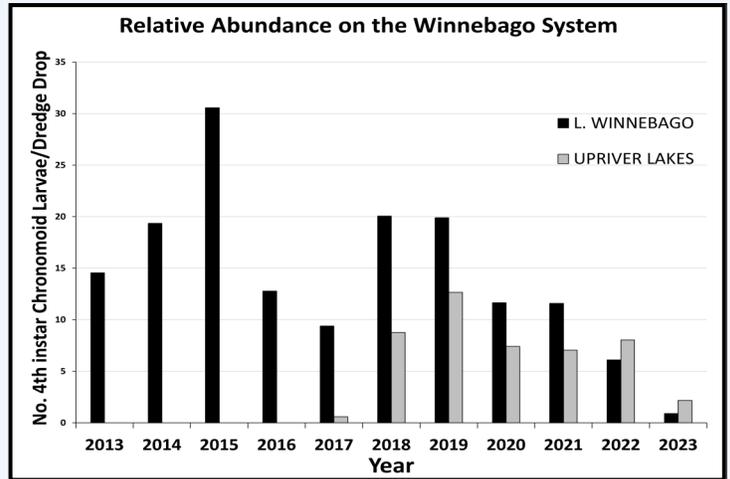


Figure 4: Graph of the relative abundance of 4th instar chironomid larvae from the standardized locations on Lake Winnebago vs. Upriver Lakes from 2013-2023, Upriver Lakes were not sampled until 2017.

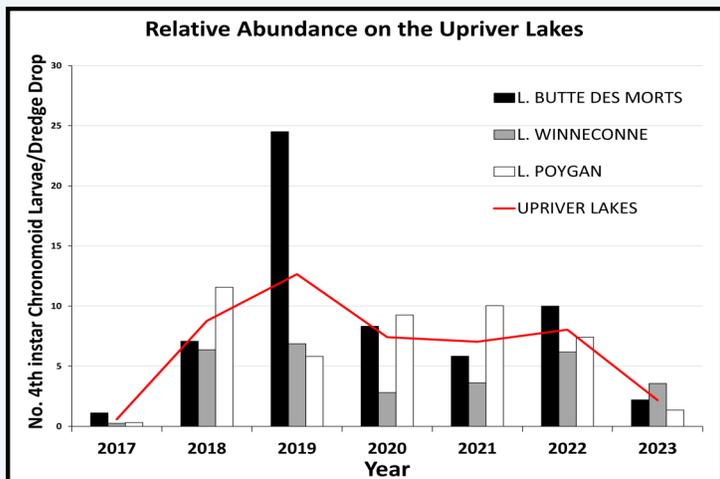


Figure 5: Graph of the relative abundance of 4th instar chironomid larvae from the 34 standardized locations on the Winnebago system Upriver Lakes from 2017-2023.

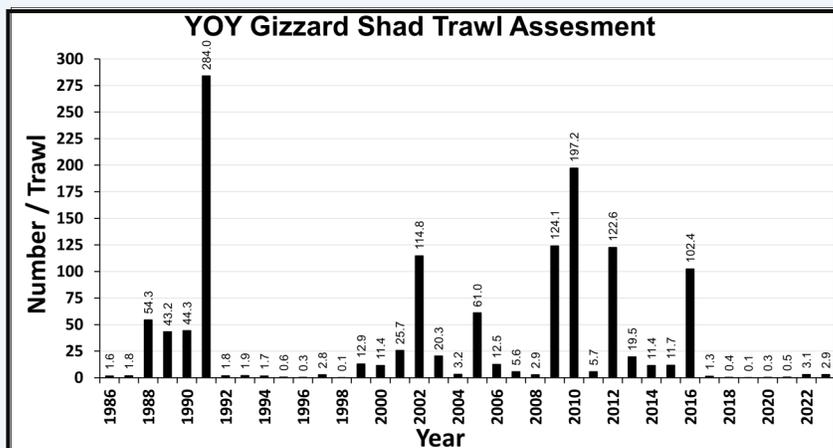


Figure 6: Graph of the average number of young of year (YOY) gizzard shad per trawl on Lake Winnebago from August-October from 1986-2023.

**Species Assessment Summary**

- This is the second time since paired sampling data were available that the relative abundance in the Upriver Lakes is higher than Lake Winnebago (Figures 4). The average catch rate for all of the Upriver Lakes was 2.17 larvae per dredge drop compared to Lake Winnebago's 0.89 larvae per dredge drop.
- 4th instar chironomid larvae relative abundances were down in 2022 and 2023, however many samples were observed with younger instar chironomid larvae. These are not counted as part of the survey.
- Chironomids can have a boom and bust population cycle where we observe upward and downward trends that are shown in our long term data set on Lake Winnebago (Figure 3).
- We will continue monitoring the chironomid populations within the Winnebago System to determine if low chironomid densities will persist or if we will see improvement in the coming years.

**Gizzard Shad And Chironomids**

- When chironomid abundance is low, lake sturgeon have the ability to feed on zebra mussels, crayfish and a variety of fish. One of the better alternative food sources for lake sturgeon is gizzard shad.
- Young of year (YOY) gizzard shad make up the majority size class consumed by lake sturgeon, usually on the bottom of the lake (dead or dying), as lake sturgeon are highly dependent on benthic food resources.
- 2023 YOY gizzard shad population on Lake Winnebago is 2.9 fish/trawl, compared to the overall average from 1986-2023 at with 35.4 fish/trawl (Figure 6). The 2023 population is similar to 2022 (3.1 fish/trawl).
- Although this was another low abundance year for gizzard shad, like chironomids, they have shown boom and bust year classes on Lake Winnebago.
- We will continue to monitor the gizzard shad population with the trawling survey on Lake Winnebago to assess population trends.