Three Lakes Zooplankton
2023 Report

Lake Rippowam, Lake Oscaleta, & Lake Waccabuc

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Three Lakes Zooplankton Report

Lake Rippowam, Lake Oscaleta, & Lake Waccabuc

Introduction

The Three Lakes Council maintains an outstanding water quality monitoring program to properly manage its three lakes: Lake Waccabuc, Lake Oscaleta and Lake Rippowam. This includes conducting the CSLAP Water Quality Monitoring Program with assistance from the New York State Department of Environmental Conservation (NYSDEC) and the New York State Federation of Lake Associations (NYSFOLA), as well as further water quality testing beyond these programs. This data is reviewed and used to maintain the lakes as a natural resource for the community for recreation and aesthetic value. SŌLitude Lake Management was pleased to provide services to the Three Lakes Council again in 2023. Zooplankton samples for each of the three lakes were collected by the client on August 10th, 2023.

Zooplankton Monitoring

Methodology

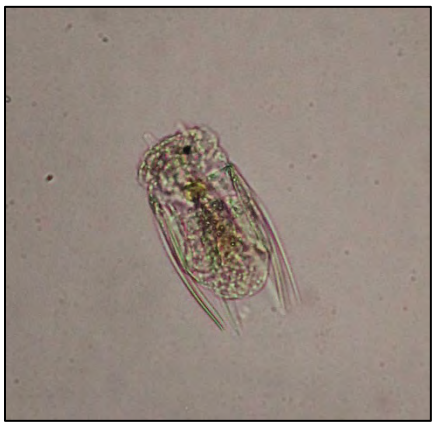
Zooplankton samples were collected, by the client, with an 80 µm Nitex plankton net. At Lake Waccabuc and Lake Oscaleta, a single vertical tow was performed to a depth of 18 feet. At Lake Rippowam, two 9-foot vertical tows were composited into a single sample due to the water depth at the sampling station. Using as little site water as possible, the sides of the net were rinsed of any trapped zooplankton, concentrating the organisms into the net bottom. This concentrate was then emptied into a clean 1,000 mL HDPE sample bottle. Immediately after collection, the sample was preserved with an equal amount of 10% sucrose formalin, to achieve a 5% solution. Sucrose was added to the preservative to help maintain carapace integrity. The samples were then placed in a cooler stocked with blue icepacks. On arrival at SŌLitude Lake Management's laboratory, the samples were stored in a dark refrigerator until being identified and enumerated.

In the laboratory, each sample was manually mixed for about one minute, before a one mL subsample was removed using a calibrated syringe. The subsample was placed on a Sedgewick-Rafter counting cell and examined under a compound microscope at 100X magnification. By using calibrated guides on the microscope stage, the entire one mL sample was examined, and any zooplankton were identified and enumerated to the lowest practical taxa using regionally appropriate taxonomic keys. This procedure was repeated two more times to generate a total of three replicate counts. The counts were then averaged, and back calculated to achieve an organism per liter density. The zooplankton examination data sheets are included in the appendix of this report. Also included in the appendix are descriptions of the zooplankton groups and individual lake distribution pie charts.

2023 Zooplankton Results

Table 1: 2023 Zooplankton Distribution						
Zooplankton Group	**Lake Rippowam**		**Lake Oscaleta**		**Lake Waccabuc**	
	Org./L	%	Org./L	%	Org./L	%
Rotifera	2,994	79.4%	9,172	94.6%	2,209	86.2%
Cladocera	155	4.1%	286	2.9%	174	6.8%
Copepoda	620	16.5%	242	2.5%	179	7.0%
Total Organisms	**3,769**	**100%**	**9,700**	**100%**	**2,563**	**100%**

Lake Rippowam



At Lake Rippowam in 2023, zooplankton abundance was considered high at 3,769 organisms/L (Table 1). A total of 50 different species of zooplankton were observed in the sample, which is the highest of all three basins. Rotifera dominated the assemblage, accounting for 79.4% of the sample at 2,994 organisms/L. The most abundant species within the Rotifera group was *Conochiloides coenobasis* with 591 organisms/L. Within the Lake Rippowam sample, 34 other Rotifera species were present including *Polyarthra vulgaris* (pictured left).

Copepoda was the second most abundant group at Lake Rippowam with 620 organisms/L (or 16.5%) observed. This group had moderate diversity as six species were recorded including *Cyclopoid nauplius, Microcyclops rubellus, Diacyclops bicuspidatus odessanus, Ectocyclops phaleratus, Ergasilus spp., and Calanoid nauplius.* The most abundant species of Copepoda was *Cyclopoid nauplius* at 237 organisms/L.

The least common zooplankton group observed was Cladocera at 155 organisms/L, or 4.1%. Nine different species of Cladocera were observed which are considered moderate in diversity. The species that were recorded include *Ilyocryptus spp., Bosmina longirostris, Monospilus dispar, Eurycercus spp., Daphnia magna, Ceriodaphnia lacustris, Ceriodaphnia laticaudata, Ceriodaphnia rigaudi,* and *Diaphanosoma birgei*. Of the nine observed species, *Bosmina longirostris* was the most abundant with 48 organisms/L recorded. Cladocera are a desirable group to have as their primary source of nutrients is algae.

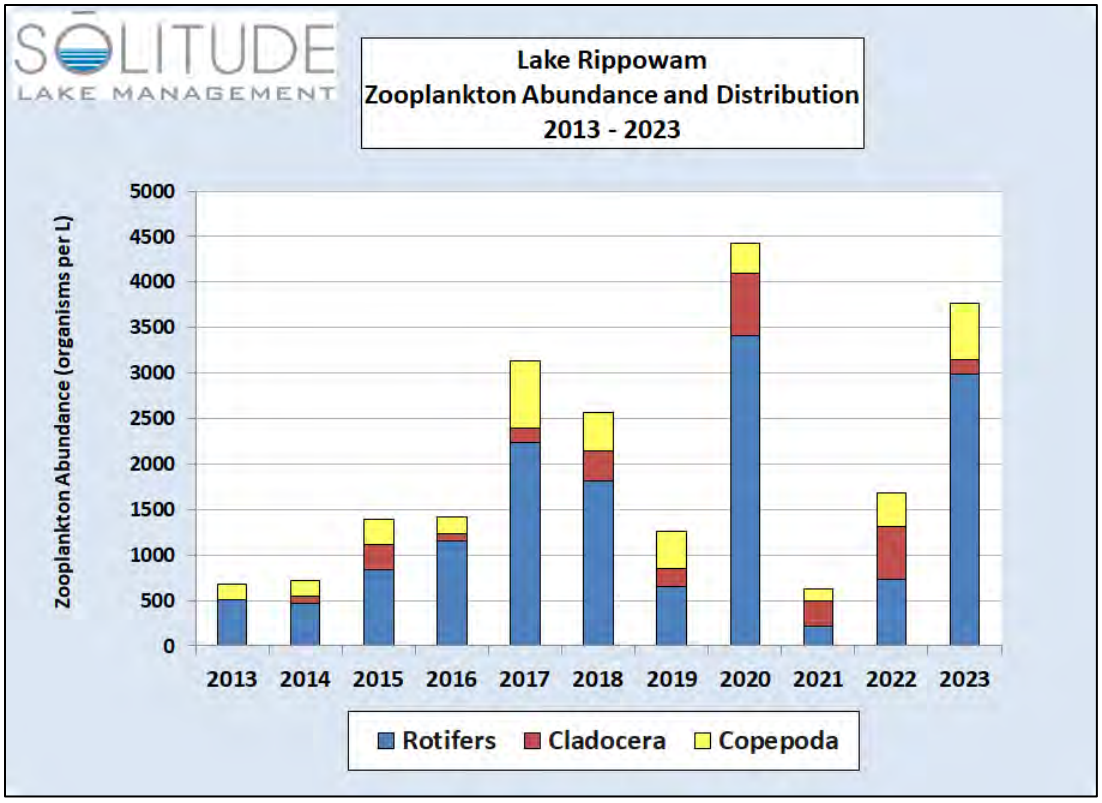


Figure 1. Lake Rippowam Zooplankton 2013-2023

The zooplankton abundance at Lake Rippowam had been consistently increasing from 2013 until 2018 (Figure 1). Zooplankton density was considered moderate in 2013, 2014 and 2021. From 2015 to 2019, zooplankton abundance was considered high despite the significant decrease in 2019. In 2020, levels increased significantly to the highest seen at Lake Rippowam. These levels decreased dramatically in 2021 as the lake experienced the lowest density of zooplankton since sampling began. Zooplankton abundance increased in 2022 and continued to rise in 2023. Samples collected in 2023 showed the second highest zooplankton abundance since sampling began in 2013.

Rotifers have been the dominant zooplankton group every year up until 2021 when Cladocera were the dominant group. Copepods have continuously been the second most abundant group with the exceptions of 2015, 2021, and 2022. The sudden population increase and then subsequent die off might have changed the order of dominance within Lake Rippowam. However, that does not seem to be the case when compared to the 2023 results. Total zooplankton abundance reached a high of 4,428 organisms/L in 2020 before greatly decreasing to 620 organisms/L in 2021. Copepods and Rotifers experienced this decrease significantly more than Cladocera. It is likely that the low development of submersed aquatic vegetation (SAV) could explain the Rotifer dominance in the data set. SAV beds act as refuge for zooplankton, helping evade predaceous fish (such as alewives).

Lake Oscaleta

For Lake Oscaleta, the total zooplankton abundance this year was considered very high at 9,700 organisms/L. This was the highest recorded zooplankton density since the start of the project in 2013. The basin also had the highest total zooplankton abundance out of the Three Lakes in 2023. Zooplankton diversity was considered high for the basin as well with 36 different species recorded. Rotifera dominated the sample with a density of 9,172 organisms/L, or 94.6% of the assemblage. Of the Rotifers observed, 27 different species were recorded with the most dominant species being *Asplanchna priodonta* (pictured right).

The second most abundant zooplankton group at Lake Oscaleta was Cladocera. This group accounted for 286 organisms/L, or 2.9% of the sample, with three different species observed. The three species observed include *Bosmina longirostris, Ceriodaphnia rigaudi,* and *Daphnia magna*. *Bosmina longirostris* was the most dominant species of Cladocera observed in the basin at 174 organisms/L.

The least abundant group of zooplankton, Copepoda, were only a few organisms short from being the second most abundant group. Copepods accounted for 242 organisms/L, or 2.5% of the sample. In 2023, six different Copepod species were recorded in Lake Oscaleta including *Cyclopoid nauplius, Microcyclops rubellus, Acanthocyclops robustus, Calanoid nauplius, Ergasilus spp.,* and *Limnocalanus macrurus.*

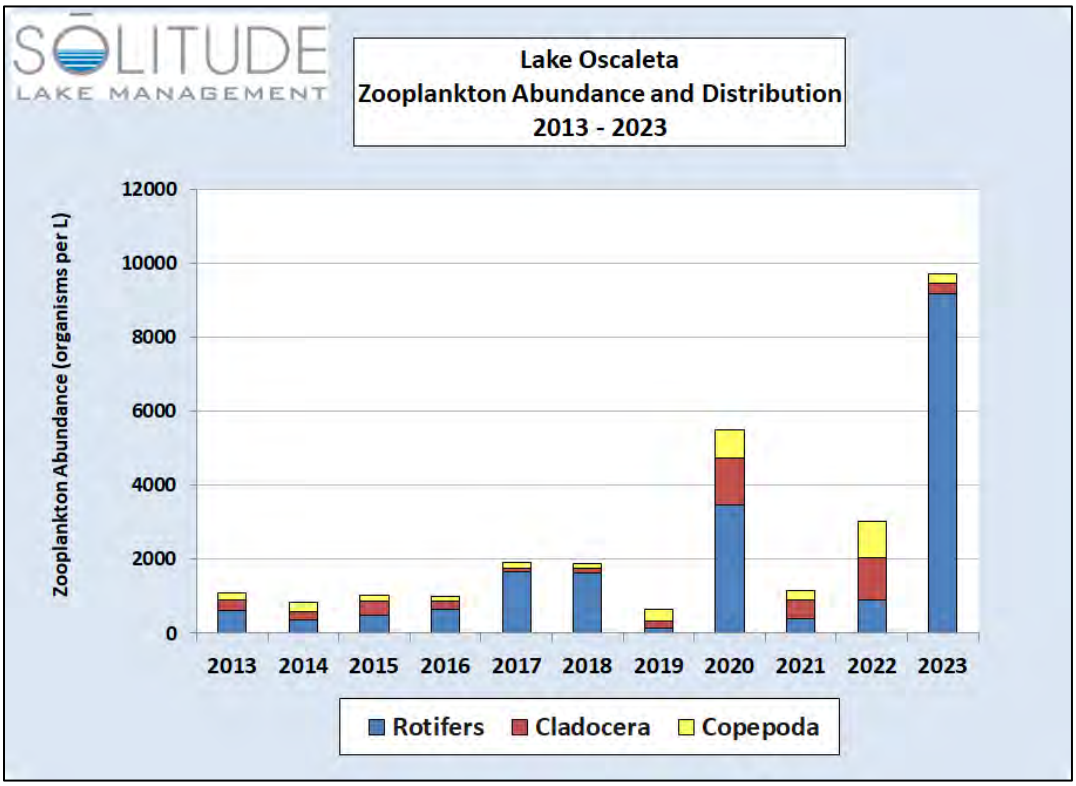


Figure 2. Lake Oscaleta Zooplankton 2013-2023

At Lake Oscaleta, high overall zooplankton has been observed more consistently starting in 2017 with a total of 1,923 organisms/L observed at the time. In 2019, we saw the lowest zooplankton abundance at Lake Oscaleta since the start of the monitoring project. This was then followed by a dramatic increase in zooplankton populations in 2020. The overall abundance in 2020 was considered very high as levels increased to 5,489 organisms/L. In 2021, levels dropped greatly and were more consistent with the historical data. It is interesting to note that Cladocera dominated in 2021 and continued to dominate in 2022. Before 2020, Rotifers had dominated every zooplankton sample at Lake Oscaleta, including 2020. Greater distribution between the three zooplankton groups is displayed from 2019 to 2022, compared to 2016 to 2018. Cladocera and Copepod densities were very low in 2017 and 2018 while Rotifer abundances were high. Dominance has shifted as Cladocera and Copepods increased in the past four years. This trend is very similar to that of Lake Rippowam, where total zooplankton decreased in 2019, increased significantly in 2020, and decreased again in 2021. However, in 2023, the results show that Rotifers are once again the dominant zooplankton group.

Lake Waccabuc

At Lake Waccabuc, total zooplankton abundance was considered high with 2,562 organisms/L observed. A total of 33 different species were observed in the 2023 sample. Rotifers were the dominant zooplankton group this year at 2,209 organisms/L, or 86.2% of the sample. The most dominant species of Rotifer was *Conochilus unicornis* (pictured left), accounting for 499 organisms/L.

Copepoda was the second most abundant group at 179 organisms/L, or 7.0% of the zooplankton sample. Four different species were documented at Lake Waccabuc including *Microcyclops rubellus, Cyclopoid nauplius, Ergasilus spp.,* and *Calanoid nauplius*. The most common species being *Microcyclops rubellus* at 87 organisms/L.

The zooplankton group Cladocera was present at 174 organisms/L, or 6.8% of the sample. This group reported low diversity with four species observed: *Bosmina longirostris, Eubosmina coregoni, Bosminopsis deitersi* and *Ceriodaphnia rigaudi.* The most dominant Cladocera species was *Bosmina longirostris* at 141 organisms/L.

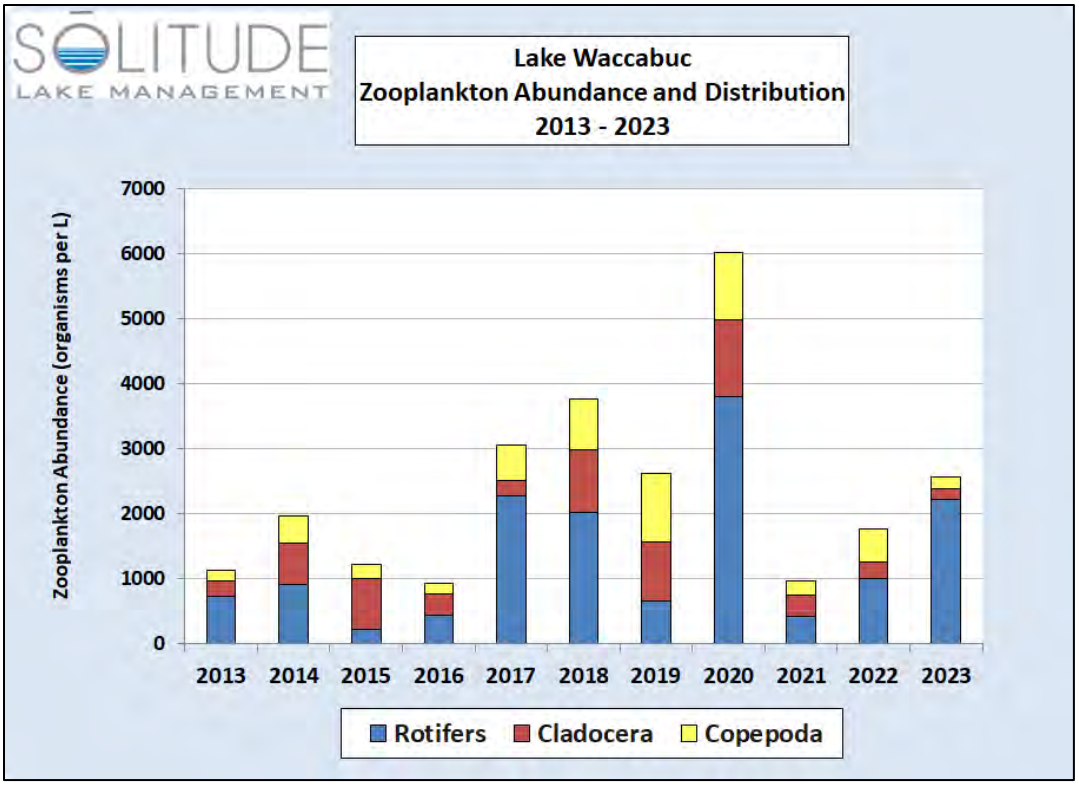


Figure 3. Lake Waccabuc Zooplankton 2013-2023

At Lake Waccabuc, zooplankton distribution has been the most diverse over the years compared to the other two lakes. Cladocera and Copepod abundance has fluctuated the most at Lake Waccabuc. These two groups outnumbered Rotifers over multiple years including 2014, 2015, 2016, 2019 and 2021. One year to note is 2015 when Cladocera dominated the assemblage. Another year to note is 2019 where Copepods were the dominate zooplankton group. However, Rotifers have been the dominant group for six out of the 11 years of the monitoring project (2013, 2017, 2018, 2020, 2022, and 2023). The Rotifer community has developed the most out of the three groups since 2020.

Overall zooplankton abundance has been considered high for most of the monitoring project, with the exception of 2016 and 2021. In 2021, zooplankton density decreased significantly and was considered moderate in abundance, which is similar to the 2016 results. All three lakes experienced a similar trend with levels spiking in 2020 and decreasing significantly in 2021. The most abundant year for zooplankton was in 2020 with 6,003 organisms/L reported at the lake. Lake Waccabuc typically contains the highest zooplankton abundance out of the three lakes but is second to Lake Oscaleta this year.

Conclusion

Summary

Zooplankton abundance increased significantly at all three lakes in 2023 as compared to 2022. At Lake Waccabuc, zooplankton abundance was high and dominated by Rotifers. At Lake Oscaleta, very high zooplankton abundance was recorded with Rotifers dominating the community. At Lake Rippowam, high zooplankton abundance was observed and dominated by Rotifers. All three lakes saw an increase in Rotifer abundance from 2022.

Recommendations

It is recommended that the Three Lakes Council continues at least their historical monitoring program. It is strongly recommended that stakeholders invest in a robust monitoring program including increased sampling frequency and water quality parameters, to better record the conditions of each basin. Zooplankton and algae are incredibly variable and can shift populations within a day, so single sampling events only inform what was happening at the exact time the sample was obtained. With increased sampling frequency, biologists will be able to analyze seasonal changes and offer more insight into system dynamics. Oftentimes, problems with zooplankton and algae are attributed to nutrients, so obtaining nutrient data would address root causes of the issue.

The Three Lakes Council has now compiled 11 years of zooplankton data for Lake Rippowam, Lake Oscaleta, and Lake Waccabuc. Monitoring the health of a lake ecosystem requires sampling a diverse array of biological communities such as fish, aquatic plants, algae, and zooplankton. This is essential to providing stewardship to a delicate ecosystem. The comprehensive water quality data collected via the CSLAP program continues to be suitable to assess the overall ecological status of the three basins.

SŌLitude Lake Management recommends the Three Lakes Council to continue monitoring zooplankton and algae in the 2024 season. Sampling throughout the growing season (May through September) would be more suitable to observe seasonal variation. However, continuing the same sampling format and techniques applied in 2013 through 2023 does provide value. Therefore, at least a single sample event should be collected in mid-July of 2024, to coincide with the SAV surveys and historical data.

SŌLitude Lake Management would like to take this opportunity to thank the Three Lakes Council for allowing us to provide lake management consulting services. We look forward to working with you again during the 2024 lake management season.

Sincerely,

Vicky Thiel

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Appendix

Zooplankton Primer

2023 Zooplankton Examination Data and Pie Charts

2013-2023 Zooplankton Abundance and Distribution Graphs

A Zooplankton Primer

Zooplankton provides an important link in a typical lake food web between algae and fish, especially during early and juvenile stages. In general, zooplankton feed on algae while fish in turn feed on zooplankton. The rate of feeding efficiency is primarily based on body size. However, zooplankton group and specific genera also plays an important role. There are three main groups of zooplankton found in freshwater systems: Rotifers, Cladocera, and Copepods.

Rotifers are a diverse group of zooplankton, very common in lakes and marine environments alike. Rotifers are generally the smallest zooplankton of the three groups,and thus typically the least efficient algae grazers. Feeding preferences are determined primarily by mouth structures and include generalist feeders (omnivores) or predators. Generalists can eat any small organic detritus encountered. Meanwhile, predators can eat other smaller Rotifers and small algae. Generalist feeders include *Filinia spp., Keratella spp., Lecane spp., Euchlanis spp.*, and *Brachionus spp*. Predator genera include *Polyarthra spp.* (larger species)*, Asplanchna spp., Synchaeta spp.*, and *Trichocerca spp*.

Cladocera are less diverse, but also very common in freshwater lakes. They are sometimes called “water fleas”. They spend most of their lifecycle reproducing via parthenogenesis (asexual reproduction with an all-female population) only switching to less efficient sexual reproduction when environmental conditions decline. Some genera (such as *Daphnia*) can be quite large (up to 5.0 mm long, visible without magnification), and thus can be classified as highly efficient phytoplankton grazers. Most Cladocera are phytoplankton grazers, although their diet includes most organic matter ingested, including bacteria and protozoa. Body size (and thus mouth size) determines feeding efficiency, but ironically the larger-bodied genera are easier to see by predaceous fish, and thus typically have reduced numbers in populations of zooplanktivorous fish. *Daphnia spp.* are the most efficient algae feeders, while *Ceriodaphnia spp., Bosmina spp.* and *Eubosmina spp.* are less efficient. There are a few predator genera as well, including *Polyphemus spp.* and *Leptodora spp*.

Copepods are almost excusive to freshwater lake systems (not streams or rivers) and estuarine and marine systems. Of the six suborders native to the United States, three are parasitic, and three are free living. One of the free-living suborders, Harpacticoida, are exclusively benthic and thus are often not collected in in traditional plankton tows (unless the bottom sediments are disturbed). The remaining two suborders, the Calanoida and the Cyclopoida are of primary concern during lake studies. All Copepods have several naupilar stages, followed by several immature stages, before reaching an adult stage. Both suborders are considered large-bodied zooplankton but have distinct feeding preferences. Calanoids are almost exclusively algae feeders and have even demonstrated selective feeding strategies. Cyclopoids have mouth parts suitable for biting and seizing prey. Their diet is primarily other crustacean zooplankton (including cannibalism on younger life stages), algae, and organic detritus ingestion (but less efficiently).

Zooplankton Count Results

Site: Lake Rippowam **Date: 8/10/23**

Group	Order	Family	Genus	Replicate			Total/3	x1000 mL	Water	# organisms
				A	B	C	(# per mL)	(= 1 L)	sampled (L)	per L
Rotifera	**Ploima**	Brachionidae	*Kellicottia longispina*	4			1.33	1333	68.8	19
			Kellicottia bostoniensis		2	1	1.00	1000	68.8	15
			Keratella tecta	1		2	1.00	1000	68.8	15
			Keratella crassa	2	5	2	3.00	3000	68.8	44
			Keratella cochlearis		4	1	1.67	1667	68.8	24
			Keratella earlinae		1	13	4.67	4667	68.8	68
			Brachionus bidentata	2			0.67	667	68.8	10
			Brachionus havanaensis	1			0.33	333	68.8	5
			Brachionus calyciflorus			3	1.00	1000	68.8	15
			Anuraeopsis fissa	64		10	24.67	24667	68.8	359
			Anuraeopsis navicula		34	34	22.67	22667	68.8	329
			Euchlanis pellucida			3	1.00	1000	68.8	15
			Notholca foliacea			6	2.00	2000	68.8	29
		Asplanchnidae	*Asplanchna priodonta*			6	2.00	2000	68.8	29
		Gastropidae	*Ascomorpha saltans*	1		3	1.33	1333	68.8	19
			Ascomorpha ecaudis			3	1.00	1000	68.8	15
			Gastropus hyptopus		7	5	4.00	4000	68.8	58
			Gastropus stylifer			1	0.33	333	68.8	5
		Lecanidae	*Monostyla closterocerca*			5	1.67	1667	68.8	24
		Synchaetidae	*Polyarthra major*	3		3	2.00	2000	68.8	29
			Polyarthra vulgaris	5		2	2.33	2333	68.8	34
			Polyarthra remata		2	3	1.67	1667	68.8	24
		Trichocercidae	*Trichocerca rattus*	16	1	3	6.67	6667	68.8	97
			Trichocerca cylindrica	2	1	6	3.00	3000	68.8	44
			Trichocerca similis	1			0.33	333	68.8	5
			Trichocerca pusilla	2	2	4	2.67	2667	68.8	39
			Trichocerca longiseta		1	12	4.33	4333	68.8	63
			Trichocerca mucosa		21	8	9.67	9667	68.8	141
	Collothecaceae	Collothecidae	*Collotheca pelagica*			2	0.67	667	68.8	10
	Flosculariaceae	Conochilidae	*Conochiloides coenobasis*	98		24	40.67	40667	68.8	591
			Conochiloides natans		52	56	36.00	36000	68.8	523
			Conochilus unicornis	42		12	18.00	18000	68.8	262
		Hexarthridae	*Hexarthra mira*	1	3	2	2.00	2000	68.8	29
		Filinidae	*Filinia longiseta*		1		0.33	333	68.8	5
		Testudinellidae	*Pompholyx sulcata*	1			0.33	333	68.8	5
									Total:	**2994**
Cladocera	**Cladocera**	Ilyocrytidae	*Ilyocryptus spp.*	1			0.33	333	68.8	5
		Bosminidae	*Bosmina longirostris*		5	5	3.33	3333	68.8	48
		Chydoridae	*Monospilus dispar*		1		0.33	333	68.8	5
			Eurycercus spp.			3	1.00	1000	68.8	15
		Daphniidae	*Daphnia magna*	1		4	1.67	1667	68.8	24
			Ceriodaphnia lacustris	6			2.00	2000	68.8	29
			Ceriodaphnia laticaudata	2			0.67	667	68.8	10
			Ceriodaphnia rigaudi			1	0.33	333	68.8	5
		Sididae	*Diaphanosoma birgei*		1	2	1.00	1000	68.8	15
									Total:	**155**
Copepoda	**Cyclopoida**		*Cyclopoid nauplius*	22	14	13	16.33	16333	68.8	237
		Cyclopidae	*Microcyclops rubellus*	18	6	13	12.33	12333	68.8	179
			Diacyclops bicuspidatus odessanus	7	2		3.00	3000	68.8	44
			Ectocyclops phaleratus		1		0.33	333	68.8	5
	Calanoida		*Calanoid nauplius*	3		6	3.00	3000	68.8	44
	Poecilostomatoida	Ergasilidae	*Ergasilus spp.*	10	3	10	7.67	7667	68.8	111
									Total:	**620**

Total Organisms per L	Rotifera	%	Cladocera	%	Copepoda	%
3769	2994	79.4%	155	4.1%	620	16.5%

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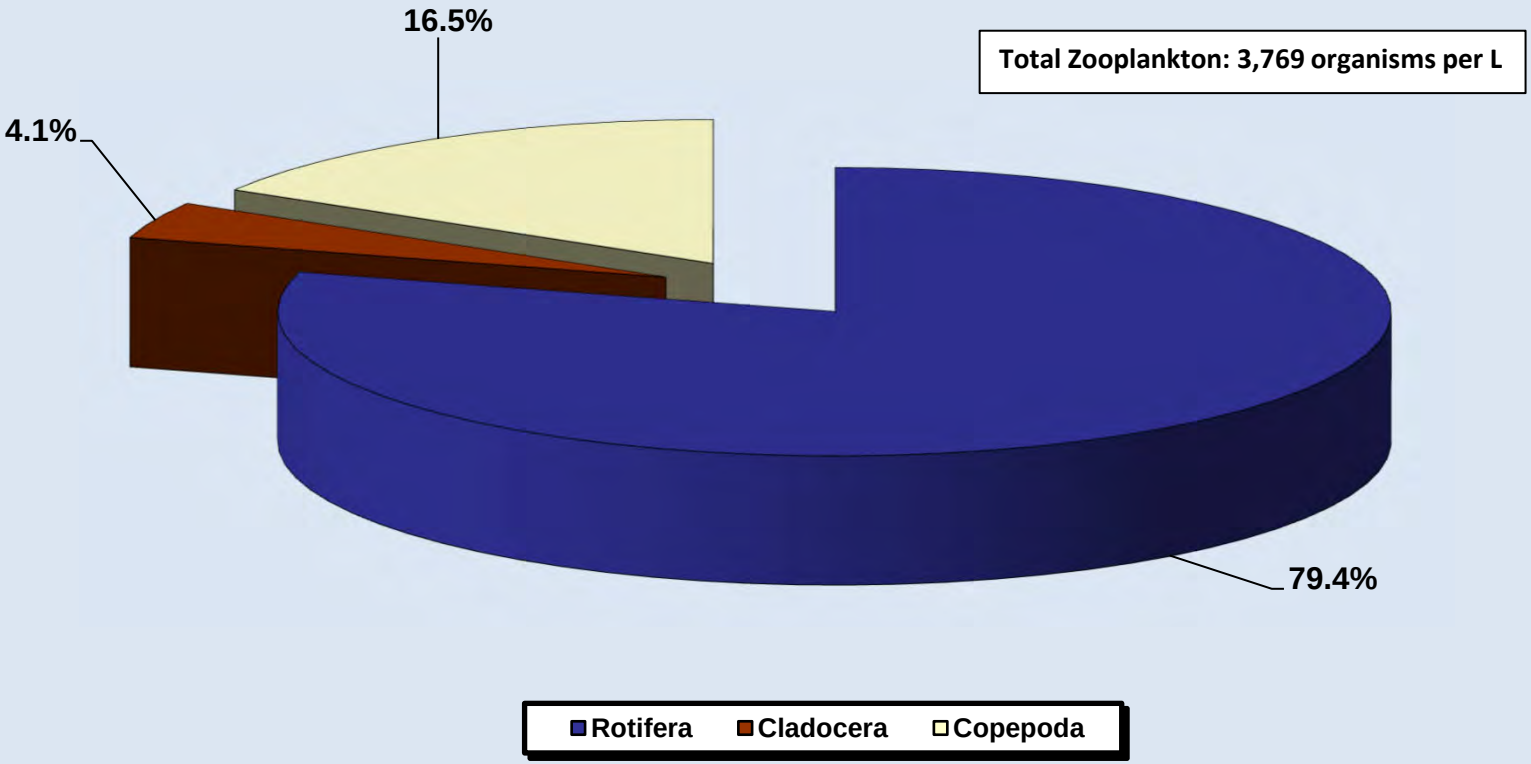
Lake Rippowam
August 10, 2023
Zooplankton Distribution



Zooplankton Count Results

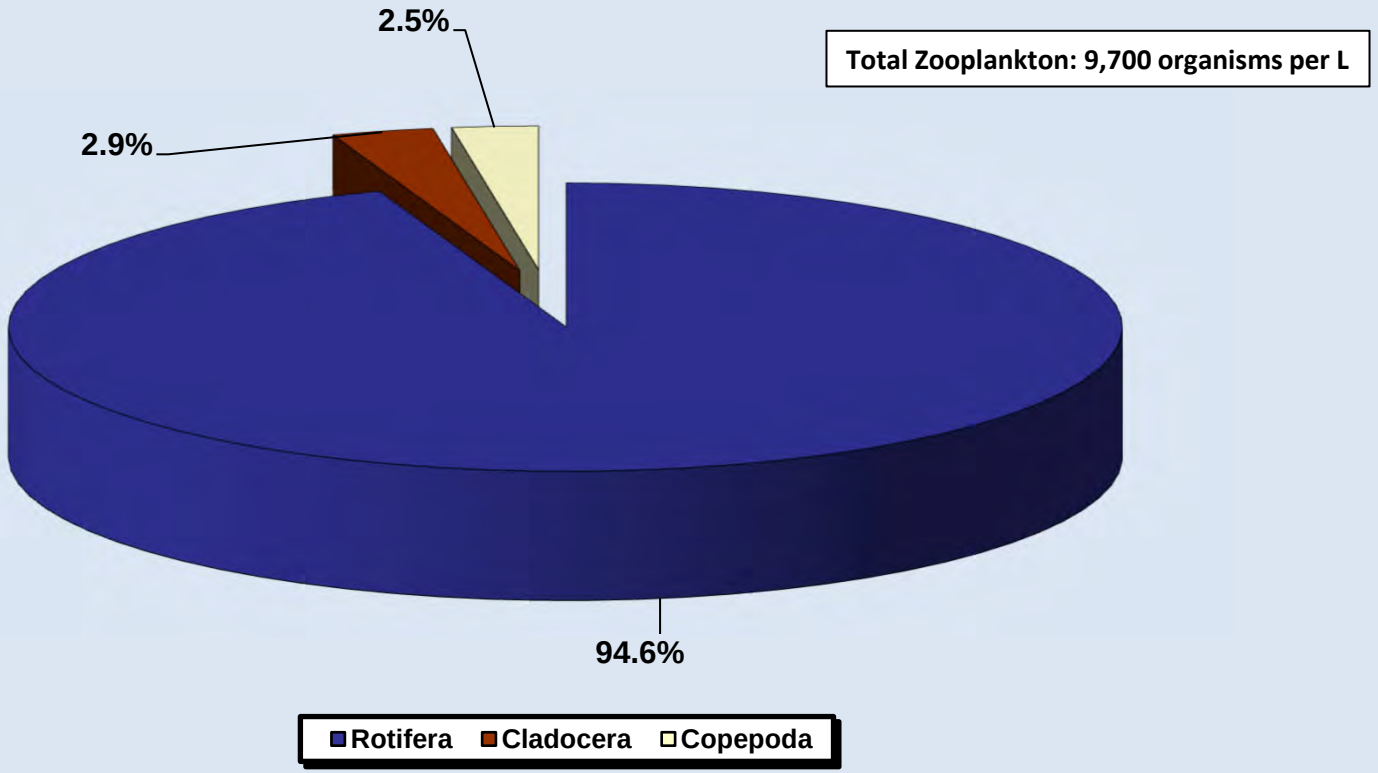
Site: Lake Oscaleta **Date: 8/10/23**

Group	Order	Family	Genus	Replicate			Total/3	x1000 mL	Water	# organisms
				A	B	C	(# per mL)	(= 1 L)	sampled (L)	per L
Rotifera	**Ploima**	Asplanchnidae	*Asplanchna priodonta*	3	1267	133	467.67	467667	68.8	6797
		Brachionidae	*Keratella earlinae*	23	18	5	15.33	15333	68.8	223
			Keratella crassa	12	65	5	27.33	27333	68.8	397
			Keratella taurocephala	7			2.33	2333	68.8	34
			Keratella tecta		1		0.33	333	68.8	5
			Keratella cochlearis			1	0.33	333	68.8	5
			Anuraeopsis navicula	25	1		8.67	8667	68.8	126
			Anuraeopsis fissa	2			0.67	667	68.8	10
			Kellicottia bostoniensis	13			4.33	4333	68.8	63
			Kellicottia longispina		19	5	8.00	8000	68.8	116
			Platyias quadricornis	1			0.33	333	68.8	5
			Brachionus calyciflorus		1		0.33	333	68.8	5
		Gastropidae	*Ascomorpha saltans*	6			2.00	2000	68.8	29
		Synchaetidae	*Polyarthra remata*	3	1	1	1.67	1667	68.8	24
			Polyarthra major	2			0.67	667	68.8	10
			Polyarthra vulgaris	2	26	1	9.67	9667	68.8	141
			Polyarthra dolichoptera	1			0.33	333	68.8	5
			Ploesoma truncatum	3			1.00	1000	68.8	15
		Trichocercidae	*Trichocerca rattus*	45	1		15.33	15333	68.8	223
			Trichocerca rousseleti	1			0.33	333	68.8	5
			Trichocerca cylindrica	1			0.33	333	68.8	5
			Trichocerca similis	1			0.33	333	68.8	5
			Trichocerca pusilla		2	2	1.33	1333	68.8	19
	Floscullariaceae	Conochilidae	*Conochilus unicornis*	70	101		57.00	57000	68.8	828
			Conochiloides natans	1	5		2.00	2000	68.8	29
			Conochiloides coenobasis	2		3	1.67	1667	68.8	24
		Hexarthridae	*Hexarthra mira*	2		3	1.67	1667	68.8	24
									Total:	**9172**
Cladocera	**Cladocera**	Bosminidae	*Bosmina longirostris*	7	26	3	12.00	12000	68.8	174
		Daphniidae	*Ceriodaphnia rigaudi*	2	6		2.67	2667	68.8	39
			Daphnia magna	3	12		5.00	5000	68.8	73
									Total:	**286**
Copepoda	**Cyclopoida**		*Cyclopoid nauplius*	4	5	1	3.33	3333	68.8	48
		Cyclopidae	*Microcyclops rubellus*	5	12	1	6.00	6000	68.8	87
			Acanthocyclops robustus		1		0.33	333	68.8	5
	Calanoida		*Calanoid nauplius*	3	8	2	4.33	4333	68.8	63
		Centropagidae	*Limnocalanus macrurus*		2		0.67	667	68.8	10
	Poecilostomatoida	Ergasilidae	*Ergasilus spp.*	1	5		2.00	2000	68.8	29
									Total:	**242**

Total Organisms per L	Rotifera	%	Cladocera	%	Copepoda	%
9700	9172	94.6%	286	2.9%	242	2.5%

SOLITUDE LAKE MANAGEMENT

Lake Oscaleta
August 10, 2023
Zooplankton Distribution



Zooplankton Count Results

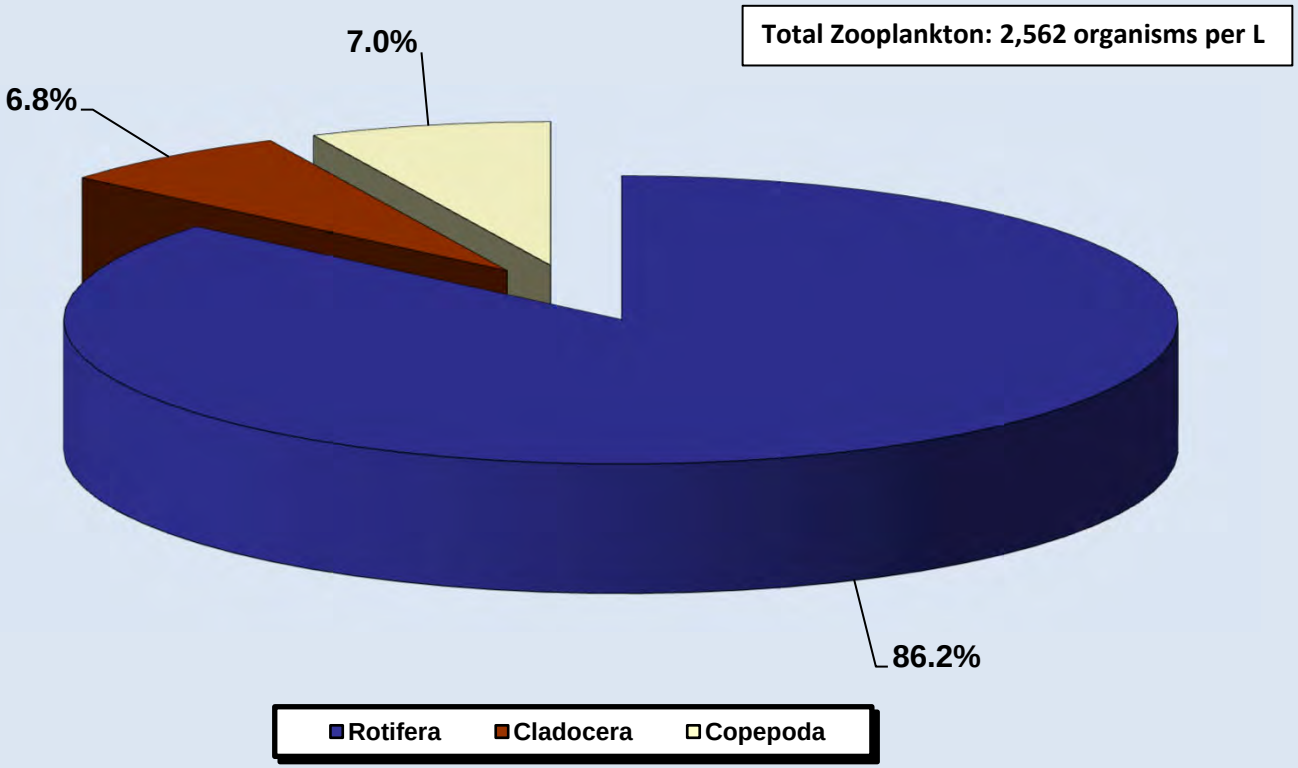
Site: Lake Waccabuc **Date: 8/10/23**

Group	Order	Family	Genus	Replicate			Total/3	x1000 mL	Water	# organisms
				A	B	C	(# per mL)	(= 1 L)	sampled (L)	per L
Rotifera	**Ploima**	Brachionidae	*Brachionus calyciflorus*	35	5		13.33	13333	68.8	194
			Brachionus bidentata		1		0.33	333	68.8	5
			Brachionus rubens		1		0.33	333	68.8	5
			Kellicottia longispina	1			0.33	333	68.8	5
			Keratella earlinae	2		35	12.33	12333	68.8	179
			Keratella crassa			5	1.67	1667	68.8	24
			Anuraeopsis fissa	1		1	0.67	667	68.8	10
			Anuraeopsis navicula	3			1.00	1000	68.8	15
			Notholca acuminata	1			0.33	333	68.8	5
			Platyias quadricornis	4			1.33	1333	68.8	19
		Asplanchnidae	*Asplanchna priodonta*	12		10	7.33	7333	68.8	107
		Gastropidae	*Ascomorpha saltans*	11	1	37	16.33	16333	68.8	237
		Synchaetidae	*Polyarthra euryptera*	1		9	3.33	3333	68.8	48
			Polyarthra remata	20			6.67	6667	68.8	97
		Trichocercidae	*Trichocerca multicrinis*	1			0.33	333	68.8	5
			Trichocerca rattus	16	6	2	8.00	8000	68.8	116
			Trichocerca mucosa	5			1.67	1667	68.8	24
			Trichocerca cylindrica	6		9	5.00	5000	68.8	73
			Trichocerca pusilla	20	2	9	10.33	10333	68.8	150
			Trichocerca longiseta	55	10		21.67	21667	68.8	315
			Trichocerca tetractis	10		3	4.33	4333	68.8	63
			Trichocerca lata			1	0.33	333	68.8	5
	Flosculariaceae	Conochilidae	*Conochilus unicornis*	48		55	34.33	34333	68.8	499
			Conochiloides natans			1	0.33	333	68.8	5
		Hexarthridae	*Hexarthra mira*	1			0.33	333	68.8	5
									Total:	**2209**
Cladocera	**Cladocera**	Bosminidae	*Bosmina longirostris*	22	1	6	9.67	9667	68.8	141
			Eubosmina coregoni	1			0.33	333	68.8	5
			Bosminopsis deitersi			4	1.33	1333	68.8	19
		Daphniidae	*Ceriodaphnia rigaudi*			2	0.67	667	68.8	10
									Total:	**174**
Copepoda	**Cyclopoida**		*Cyclopoid nauplius*	3	1	2	2.00	2000	68.8	29
		Cyclopidae	*Microcyclops rubellus*	12		6	6.00	6000	68.8	87
	Calanoida		*Calanoid nauplius*	6		2	2.67	2667	68.8	39
	Poecilostomatoida	Ergasilidae	*Ergasilus spp.*	2		3	1.67	1667	68.8	24
									Total:	**179**

Total Organisms per L	Rotifera	%	Cladocera	%	Copepoda	%
2562	2209	86.2%	174	6.8%	179	7.0%

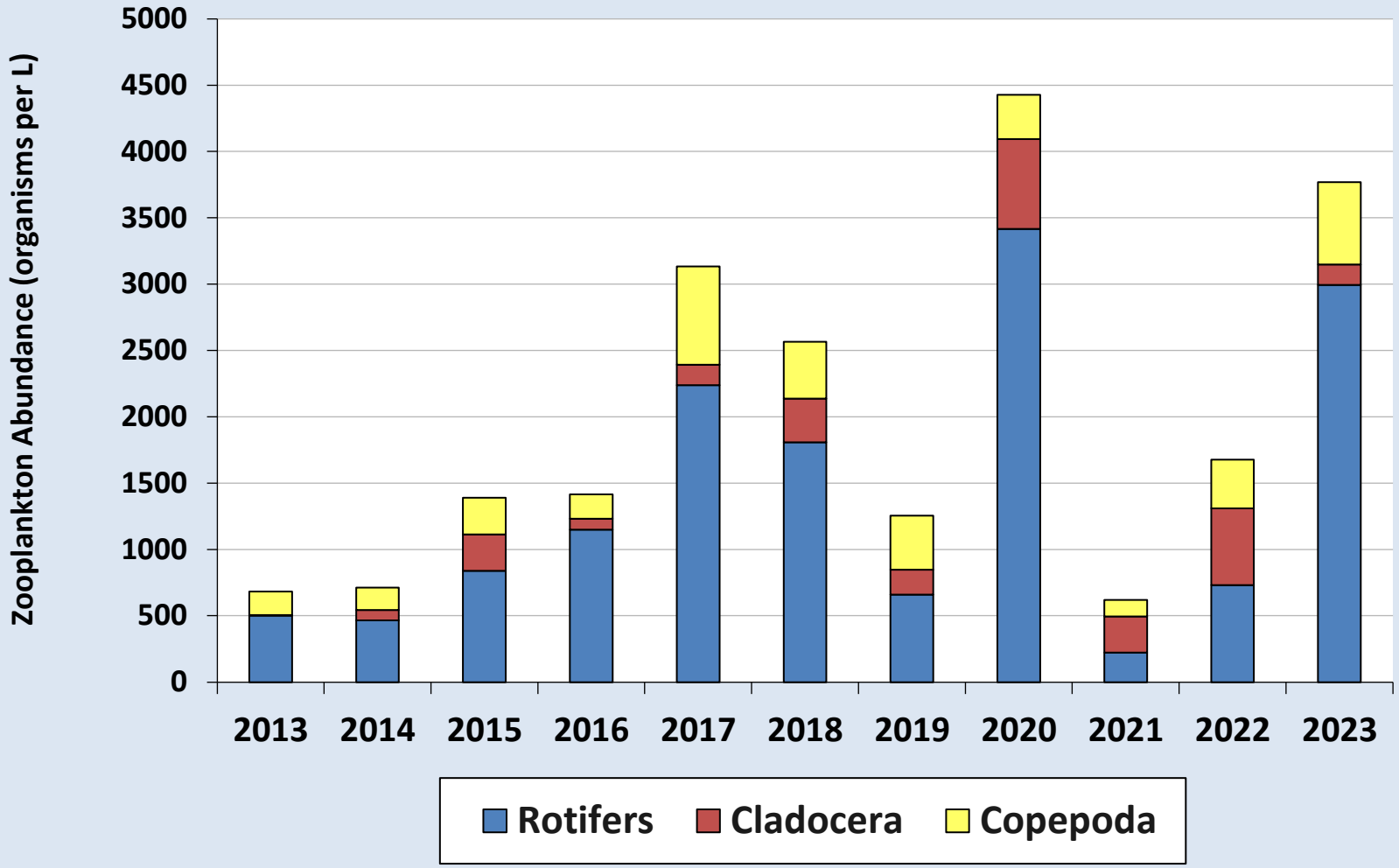
SOLITUDE LAKE MANAGEMENT

Lake Waccabuc
August 10, 2023
Zooplankton Distribution



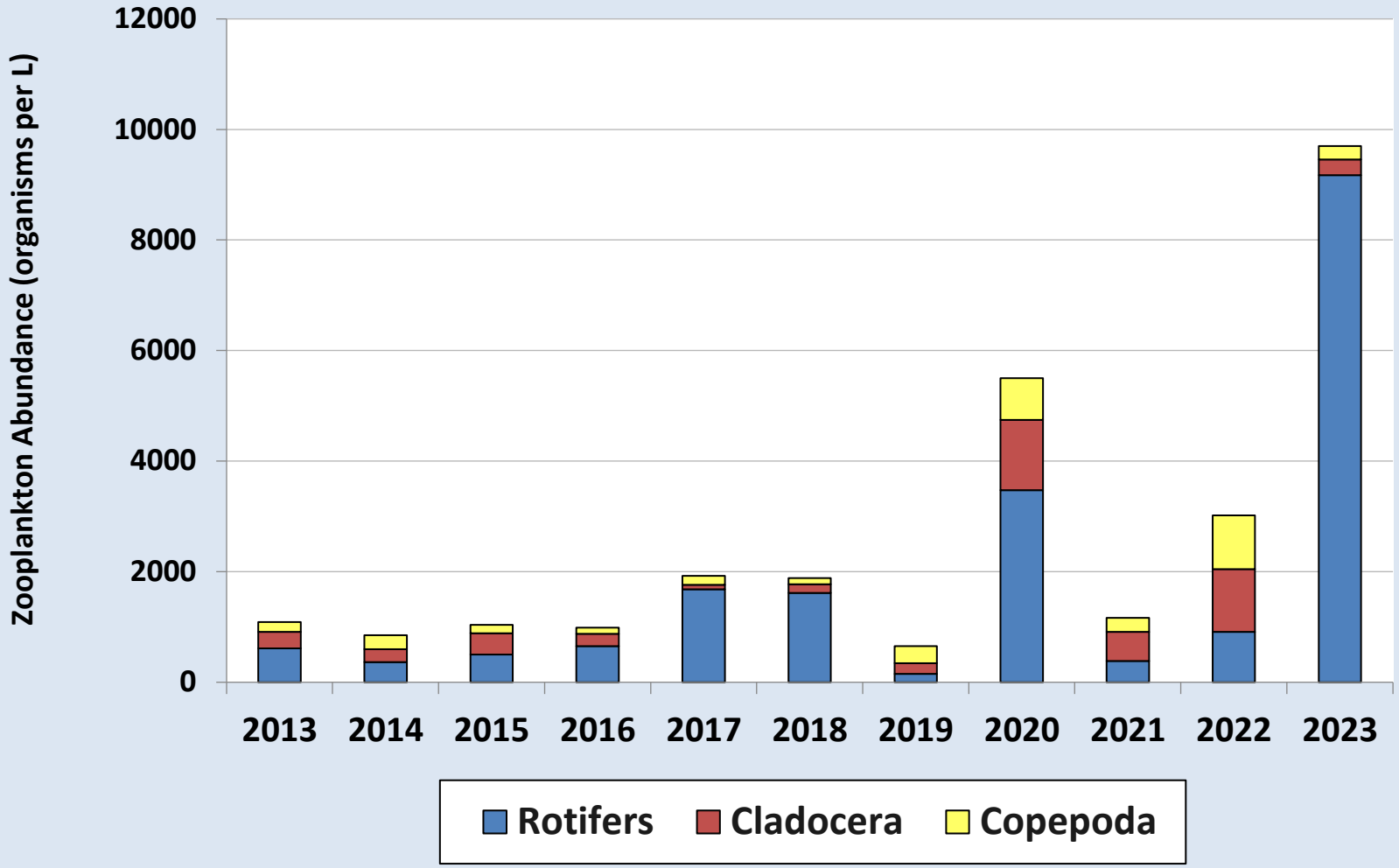
SOLITUDE LAKE MANAGEMENT

Lake Rippowam
Zooplankton Abundance and Distribution
2013 - 2023



SOLITUDE LAKE MANAGEMENT

Lake Oscaleta
Zooplankton Abundance and Distribution
2013 - 2023



SOLITUDE LAKE MANAGEMENT

Lake Waccabuc
Zooplankton Abundance and Distribution
2013 - 2023