2016 Zooplankton Monitoring Project
Schroon Lake, New York
January 2017

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A Primer on the Zooplankton

Zooplankton are microscopic crustaceans which inhabit lakes, ponds and rivers. Research has shown that a sound way to indirectly evaluate fish community structure is to examine the composition and quality of the food web, particularly the zooplankton community.

Fish production ultimately depends on production at lower trophic levels, and interrelationships between planktivorous ("plankton-eating") fish growth and zooplankton abundance have been well documented. It has even been suggested by some researchers that zooplankton size and abundance can be used as a predictive index in separating lakes on the basis of fish community structure (Mills et. al. 1987).

Most zooplankton range in size from 0.5 to 1.0 mm (millimeters). There are two main types of crustacean zooplankton, cladocerans and copepods. Zooplankton like *Bosmina spp.* and those of the *Daphnia* ("water flea") genera, for example, are cladocerans, whereas *Cyclops spp.*, *Diaptomus spp*. and *Mesocyclops spp*. are all representatives of the copepod grouping.

The relative abundances of zooplankton, in terms of density, vary greatly from lake to lake. The density can be as low as <1 individual per liter of water in oligotrophic lakes and as high as 500 individuals per liter in eutrophic lake systems. Cladocerans tend to be more abundant in summer, probably due to the greater availability of food, while copepods, which are generally perennial, exhibit active over-wintering populations.

Typically, the zooplankton community of most lakes is composed of five to eight dominant species and several rarer forms. The number of species found to be present is normally influenced by factors such as the availability of light, oxygen, food and nutrients. Temperature and water movements within the lake are also important factors in determining which species will be able to survive and which will eventually become dominant.

During years in which a lake is dominated by an overabundance of adult planktivorous fish or a "bumper crop" of young-of-the-year (YOY) fish during the summer, it is possible to note observable population shifts within the zooplankton community as a result of increased predation by these fish. Considerable evidence, both direct and indirect, has indicated that size-selective predation by planktivorous fish can influence the composition and the size of zooplankton communities (Brooks and Dodson 1965; Galbraith 1967; Sprules 1972; Threlkeld 1979). In general, fish select the more visible, larger zooplankton species such as *Daphnia*, thus allowing for an increase in the relative abundance of smaller zooplankton species. Zooplankton

>1 mm in total length usually suffer the greatest losses due to predation by planktivores (Wetzel 1983).

A well-established piscivorous ("fish-eating") fish population, such as walleye or lake trout, containing a plentiful number of individuals of sufficient size to effectively control planktivores is thus highly desirable, particularly in a deep oligotrophic or mesotrophic body of water. Planktivorous fish species left unchecked by natural predation have the capability of exhibiting explosive growth cycles. A commonly noticed result of such an overabundance of planktivores is "stunting" of growth within the population.

In addition to their impact on fish, the amount and type of algae (phytoplankton) in a lake are heavily dependent upon the predatory effectiveness of zooplankton, since zooplankton feed upon algae. This effectiveness is dependent on the zooplankton species present in the lake at any given time and their average size. The larger the zooplankter the more phytoplankton it can ingest and assimilate. The size and species of zooplankton in turn are often reflective of the type of fish present in any given lake system and the extent to which the fish community utilizes the zooplankton for food.

Thus, another possible effect of an overabundance of planktivorous fish is a general decline of lake water clarity. As heavy and continual foraging on zooplankton occurs, the zooplankton community eventually loses its ability to effectively control phytoplankton. As a result, phytoplankton populations increase. This increase in phytoplankton may substantially alter lake water clarity, and as a consequence, localized or even lake-wide algal blooms may occur.

Background Information

A limited study of Schroon Lake's zooplankton community was performed during a three-year time span from 1995 to 1997. The primary objective of this study was to obtain qualitative and semi-quantitative data relative to the zooplankton community of the lake. The impetus for the study was a growing concern on the part of many fishermen for the "balance" and structure of the fish community.

In order to evaluate the zooplankton community, samples were collected over a three-year period. Samples were taken in 1995 (June 14, August 22 and October 10), 1996 (June 15, July 24 and August 27) and 1997 (June 27, July 23 and August 26). Samples collected in 1995 and 1997 were obtained during the day, whereas the 1996 samples were collected in the early morning between 12:00 and 2:00 am.

The purpose of the early morning collections was to selectively sample the pelagic invertebrate community of Schroon Lake. Since an analysis of samples collected in 1995 indicated a relatively low mean zooplankton size, the decision was made to try to determine whether this phenomenon might be due to either predation by invertebrates (e.g., *Chaoborus*) or predation by a strong year-class of YOY fish. The phantom midge, *Chaoborus spp.,* is a phototaxic-negative invertebrate that migrates up into the water column from the benthos (lake bottom) at night in order to prey upon zooplankton, and it is one of the more likely species that might feed on zooplankton enough to affect the community's mean size. Due to its nocturnal behavior, this species is often not found in zooplankton samples routinely obtained during the daylight hours, and thus specialized sampling strategies (e.g., vertical towing at night) are required to collect them.

All samples were collected by vertically "hand-towing" an 80 micron mesh Wisconsin-style plankton net through the water column at a constant rate of about one meter per second. Three separate tows (aliquots) were made at each of the north and south lake basin sampling stations during each visit to the lake and these samples were combined into one sample container (Note: The south basin was not sampled on June 27 and July 23 of 1997). All collected samples were immediately preserved in a sugar-formalin solution (Haney and Hall 1973) and then transported to the Cornell University Biological Field Station on Bridgeport, NY for microscopic analysis utilizing the CAPAS (Computer-assisted Plankton Analysis System).

Thirteen species of zooplankton were observed in the collections over the three years of research. Species present were *Bosmina longirostris, Ceriodaphnia quadrangula, Chydorus sphaericus, Cyclops bicuspidatus, Daphnia galeata mendotae, Daphnia pulicaria, Daphnia retrocurva, Diaphonasoma spp., Diaptomus minutus, Epischura lacustris, Holopedium gibberum, Mesocyclops edax* and *Tropocyclops prasinus*. Interestingly, no specimens of *Chaoborus* were ever observed in the collections (LaMere, S.A. 1995; LaMere, S.A. 1996; and LaMere, S.A.

1997). There were tremendous similarities in terms of mean body size, species composition and relative abundance in sample collections obtained from the north and south basins. Interestingly, the mean size and the range in the mean body size of zooplankton increased progressively from 1995 to 1997.

The 1995 research yielded results that were somewhat concerning in that collections of zooplankton made at the north basin between June and August indicated that the mean body size of zooplankton ranged between 0.45 and 0.50 mm (LaMere, S.A. 1995). Mills et al. (1987) discovered that in lakes where crustacean zooplankton size is low (< 0.8 mm) in both the spring and mid-summer, that it is reasonable to assume that a high abundance of planktivorous fish is responsible for the predominance of small zooplankton.

In 1996, the observed range of mean body size in north basin zooplankton was between 0.64 and 0.71 mm (LaMere, S.A. 1996), and by 1997 the range had further increased to between 0.63 and 1.09 mm (LaMere, S.A. 1997). The substantial increase in this size range over the course of the three years is significant, and it suggests that whatever heavy predation that might have occurred on the zooplankton community in 1995 had relaxed somewhat by 1996 - 97.

To gain a better and more current perspective on Schroon Lake zooplankton community structure, samples were once again collected from both basins on August 21, 2014. Samples were collected in the same manner, but this time a new laboratory, ZPS Taxonomic Services in Washington, was used for the analysis.

Twenty-four species of zooplankton were found in the 2014 sample collection and the taxonomic breakdown and relative abundance was four species of cladocerans (16.6%), seven species of copepods (29.2%), and thirteen species of rotifers and protozoans (54.2%).

Zooplankton densities were found to be low in August 2014 (only about $200/m^3$ in the north basin) and these densities were representative of an oligotrophic lake system. The average size of *Daphnia* was adequate for planktivorous fish (1.0-1.2 mm, with a maximum size of 2.2 mm), but their numbers were relatively low. This suggested that the phytoplankton (algal) population was in all likelihood providing a poor quality and/or low quantity food source for zooplankton. Both the zooplankton biovolume and biomass measurements supported this general assessment (LaMere, S.A. 2014).

2016 Research

I. Introduction:

A limited study of the zooplankton community of Schroon Lake was once again performed by the lake management firm of Adirondack Ecologists, LLC (***AE***) during the summer of 2016. The study was funded by the Schroon Lake Association (***SLA***).

Since the only historical data on this population prior to 2016 was that information collected by ***AE*** in the 1990's and more recently in 2014, the primary objective of the 2016 study was to improve upon the existing zooplankton community database.

II. Methods:

Zooplankton samples were collected on August 25, 2016 by ***AE*** by vertically hand-towing an 80-micron mesh Wisconsin-style plankton net through the water column of both lake basins at a constant rate of 1 meter per second. Three separate tows or "aliquots" were taken at each of the lake basin testing sites, and these aliquots were combined into a single sample container for both the north and south basin.

The reasons for collecting three aliquots were to minimize error due to sampling bias and to ensure that a sufficient quantity of zooplankton was collected to assure the statistical integrity of the data. All collected samples were immediately preserved in a 25% isopropyl solution for future microscopic analysis and shipped to the ZP's Taxonomic Services laboratory in Lakewood, WA.

Prior to analysis, all zooplankton samples were strained through a 65-micron mesh sieve in the laboratory to selectively remove phytoplankton specimens. The species composition, number of individuals of each species observed, density (# per m^3), and the average size (in mm) of edible crustaceans was recorded.

III. Results & Discussion:

A couple of year's worth of research spread out over two decades does not provide a lot of data to analyze the aquafauna of a particular lake system. However, it does at least give some general insight into the overall make-up of the species assemblages living in this body of water and the percent composition of the various species present. The economic realities of securing funding for long-term research projects usually dictate the need for more conservatively-designed, cost-conscious studies than most lake scientists are ordinarily comfortable performing.

Furthermore, lakes are dynamic, and as such, they "react" to environmental stimuli. Factors like weather and temperature can impart profound changes on the water quality, water clarity, and ecological character of lacustrine environments. Often, the more extreme the weather change or temperature fluctuation is, the more profound the effect on the water body. These changing conditions pose a real challenge to lake managers trying to search for trends in environmental data over relatively short periods of time.

The following narrative consists of a "summarized interpretation" of the August 2016 zooplankton data collected on Schroon Lake. All raw data obtained from the laboratory involved in the analysis of this collection is contained within the Appendix section of this report.

According to ZPS Taxonomic Services, twenty-four distinct species were identified in the 2016 Schroon Lake zooplankton sample collections, even though relatively few individuals were present overall. Total (wet) biovolume was less than 0.5 mL in both basins.

The taxonomic breakdown and relative abundance was five species of cladocerans (20.8%), six species of copepods (25%), and thirteen species of rotifers and protozoans (54.2%). As in 2014, three species (*Daphnia dubia*, *Daphnia longiremis* and *Epischura sp.*) represent the only arthropods that are edible to fish, and only 21.2% and 5.7% of the zooplankton observed in the north and south basin sample, respectively, were found to be in this grouping.

Since *Epishura sp.* was such a small percentage of the total number of edible zooplankton present in the sample, the length-frequency results for *Daphnia sp.* – which represent 96.9% (in the north basin) and 94.7% (in the south basin) of the total number of edible zooplankton present – should offer a relatively accurate measurement of the average size of zooplankton available for consumption by planktivorous fish. The mean body size of the *Daphnia* collected was 1.05 mm and 1.10 mm in the north and south basins, respectively. Since trout gill raker gaps are 1.0-1.25 mm, these zooplankton are just big enough to provide potential food.

IV. Conclusions:

Edible crustacean densities are low (only about 53.5/m^3 in the north basin and 37.9/m3 in the south basin) suggesting Schroon Lake is an oligotrophic lake system. The average size of *Daphnia* is adequate for planktivorous fish (1.05-1.10 mm, with a maximum size of 1.6 mm), but their numbers are relatively low. This suggests that the phytoplankton (algal) population is providing a poor quality and/or low quantity food source for zooplankton. Both the biovolume and biomass measurements support this general assessment.

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APPENDIX

Table 1

Schroon Lake 2016		Zooplankton Densities (in no. per m^3)			
Basin Sampled		North		South	
Date/Stratum Sampled		25-Aug	Entire Wa	25-Aug	Entire Water Column
Depth Sampled (in meters)		45.72		39.624	
Volume (m^3)		0.57917		0.50194	
CLADOCERA	SpeciesCode	Density	Std.Error	Density	Std.Error
Diaphanosoma birgei	6101202	10.4	4.2	4.0	2.8
Daphnia dubia *	6102110	38.0	8.1	25.9	7.2
Daphnia longiremis*	6102113	13.8	4.9	10.0	4.5
Bosmina longirostris	6103101	100.1	13.1	111.6	14.9
Holopedium gibberum	6104101	0.0		2.0	2.0
Total cladocerans		162.3	16.7	151.4	17.4
COPEPODA					
Diaptomus minutus	6183161	10.4	4.2	2.0	2.0
diaptomid copepodites	6183100	22.4	6.2	2.0	2.0
Epischurid copepodites*	6182031	1.7	1.7	2.0	2.0
Orthocyclops modestus	6128701	3.5	2.4	0.0	
Diacyclops thomasi	6128101	10.4	4.2	10.0	4.5
Mesocyclops leuckarti (?)	6128601	0.0		2.0	2.0
Microcylcops varicans	6128103	1.7	1.7	12.0	4.9
cyclopoid copepodites	6128100	25.9	6.7	99.6	14.1
harpacticoid copepod	6190000	0.0		0.0	
copepod nauplii	6170090	13.8	4.9	378.5	27.5
Total copepods		89.8	12.5	508.0	31.8
MISC. ZOOPLANKTON					
bivalve larvae	5155090	0.0		2.0	2.0
water mite	6800000	0.0		2.0	2.0
ROTIFERA					
Rotifer split					
Asplanchna herricki	4512012	39.7	8.3	51.8	10.2
Keratella irregularis	4501018	70.8	11.1	103.6	14.4
Keratella earlinae	4501015	469.6	28.5	340.7	26.1
Kellicottia bostonensis	4501052	10.4	4.2	12.0	4.9
Trichocerca elongata	4507013	0.0		6.0	3.5
Trichocerca multicrinis	4507017	1.7	1.7	0.0	
Ascomorpha escaudis	4508021	5.2	3.0	2.0	2.0
Polyarthra vulgaris	4513011	41.4	8.5	205.2	20.2
Synchaeta sp.	4513020	0.0		2.0	2.0
Ploesoma truncatum	4513031	19.0	5.7	4.0	2.8
Conochilus unicornis	4518011	0.0		203.2	20.1
Difflugia sp. 1	1000101	0.0		4.0	2.8
Difflugia sp.3	1000103	0.0		13.9	5.3
Total rotifers and protozoans		657.8	33.7	948.3	43.5
Total Density		909.9	39.6	1611.7	56.7
Density of Edible Zooplankters (*)		53.5	9.6	37.9	8.7
Percent Edible Crustaceans		21.2		5.7	
Total Number of Individuals Counted		527		809	
Total (Wet) Biovolume (in mL)		<0.5		<0.5	
Dry Weight of Sample		ND		ND	

Schroon Lake	2016 Length-Frequencies		Units for all measurements are in divisions (1 division = 0.025 mm)			
Basin:	North					
Taxon:	Daphnia dubia	Leptodiaptomus mini	All Cyclopoids	Bosmina longirostris		Diaphanosoma birgie
Measurement No.						
1 or 26	30	21	11	9	10	30
2 or 27	30	26	34	8	12	38
3 or 28	50	29	33	16	11	18
4 or 29	29	34	29	10	11	35
5 or 30	49	32	33	10	11	23
6 or 31	47	32	29	10	11	
7 or 32	41	36	47	15	15	
8 or 33	52	35	46	14	15	
9 or 34	31	35	24	14	19	
10 or 35	40		53	10	15	
11 or 36	25		31	10	11	
12 or 37	56		38	15	15	
13 or 38	58		44	20	16	
14 or 39	62		27	15		
15 or 40	50		37	10		
16 or 41	54		32	11		
17 or 42	30		51	23		
18 or 43	19		50	11		
19 or 44			27	17		
20 or 45				19		
21 or 46				11		
22 or 47				14		
23 or 48				13		
24 or 49				12		
25 or 50				9		
Mean	41.83	31.11	35.58		13.11	28.80
Standard Deviation (in divisions)	12.93	4.96	10.88		3.45	8.29
Average Length (in mm)	1.05	0.78	0.89		0.33	0.72
(with SD, in mm)	0.32	0.12	0.27		0.09	0.21
Maximum Length Obsd. (in mm)	1.55	0.90	1.28		0.58	0.95

Total Number of Measurements for this Sample: 89

Schroon Lake	2016 Length-Frequencies		Units for all measurements are in divisions (1 division = 0.025 mm)					
Basin:	South							
Taxon:	Daphnia spp.(mostly D. dubi		Leptodiaptomus minutus		Cyclopoids		Bosmina longirostris	
Measurement No.				Other Zooplankters				
1 or 26	35		34		37	47	16	16
2 or 27	40		44	Holopedium	37	30	9	15
3 or 28	44			38	8	16	8.5	15
4 or 29	37				12	20	12.5	13
5 or 30	43			ostracod	12	29	9	19
6 or 31	52			9	19	19	19	16
7 or 32	53				21	26	14	16
8 or 33	28				28	41	17	13
9 or 34	57				20		15	10.5
10 or 35	64				10		11.5	20
11 or 36	41				24		10	15
12 or 37	33				34		12.5	17.5
13 or 38	52				25		9	17
14 or 39	38				22		14.5	10.5
15 or 40					43		14	17
16 or 41					16		12	11.5
17 or 42					25		11	10.5
18 or 43					31		12	
19 or 44					16.5		10	
20 or 45					12		12	
21 or 46					33		13	
22 or 47					21		11	
23 or 48					32		16	
24 or 49					18		18	
25 or 50					25		17	
Mean		44.07		39.00		24.53		13.71
Standard Deviation (in divisions)		10.18		7.07		9.83		3.10
Average Length (in mm) (with SD in mm)	1.10	0.25	0.98	0.18	0.61	0.25	0.34	0.08
Maximum Length Obsd. (in mm)	1.60		1.10		1.18		0.50	

Total Number of Measurements for this sample: 94

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December 2016

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I. Introduction:

A limited study of the phytoplankton community of Schroon Lake was performed by the lake management firm of Adirondack Ecologists, LLC (***AE***) during the summer of 2016. The study was funded by the Schroon Lake Association (**SLA**).

This was the fifth time that grab samples were collected and microscopically-analyzed on Schroon Lake. Samples were also previously obtained in 2008, 2009, 2013, and 2015. The principal investigator for all five of the studies was Steven A. LaMere, a Certified Lake Manager, Board Certified Environmental Scientist, and the president of ***AE***.

Since limited historical data on this population existed prior to the initial (2008) research, the primary objective of the studies was to assist in the creation of a long-term scientific database that could be used as a historical "benchmark" to compare the results of future phytoplankton monitoring efforts with. It was hoped that this database, once established, would serve as an educational and informational resource for lakeshore property owners. Understanding the character and function of the phytoplankton community is a key component to understanding the dynamics of any lake system and its food web.

Phytoplankton or algae are microscopic plants that live in the open waters of lakes and ponds and they serve as an important food source for many aquatic organisms. Many of these small plants do not root to the lake bottom or attach themselves to other objects, but rather float freely throughout the water column of the lake. Like rooted, vascular plants, algae produce dissolved oxygen and are nutrient-limited in their growth. Cyanobacteria (blue-green algae) are also organisms that float freely throughout the water column and possess photosynthetic capabilities. Unlike green and yellow-brown algae, however, blue-green algae are not "true" algae, but instead are a type of bacteria.

The abundance and species composition of algae can have significant implications with regard to both the water clarity and quality of any given body of water. Since there is normally a strong statistical correlation between secchi disk transparency (SDT) and algal biomass, with both parameters usually following predictable seasonal patterns, a change in the composition of the phytoplankton community may result in decreased water clarity and increased nutrient loading. These changes, if observed, would likely occur during the summer. The reason for this requires a short explanation.

Algae metabolize more efficiently under higher water temperatures, and since they utilize nutrients directly from the water column for photosynthesis, the higher the nutrient concentrations, the more "productive" algae become. In the spring and fall, when water temperatures are cooler and total phosphorus (TP) levels are lower, algal biomass decreases and SDT increases. As summer progresses and water temperature increases, TP levels normally increase and algal biomass responds accordingly by increasing. As algal biomass increases in the water, the SDT decreases, and this decrease is often very noticeable through visual observation.

II. Methods

Phytoplankton were collected on August 25 via surface water grab sampling at both the north and south lake basin testing sites, and these samples were immediately preserved in Lugol's Solution (approximately 1mL per 100 mL of sample) and shipped to Aquatic Analysts in Friday Harbor, Washington for laboratory analysis.

III. Results & Discussion:

One annual sampling for five years over a nine-year time span is a relatively small dataset in order to study the algae of a particular lake system. The economic realities of securing funding for long-term research projects, however, usually dictate the need for more conservatively-designed, cost-conscious studies than most scientists are ordinarily comfortable performing.

Furthermore, lakes are dynamic, and as such, they "react" to environmental stimuli. Factors like weather and temperature can impart profound changes on the water quality, water clarity, and ecological character of lacustrine environments. Often, the more extreme the weather change or temperature fluctuation is, the more profound the effect on the water body. These changing conditions pose a real challenge to lake scientists trying to search for trends in environmental data over relatively short periods of time.

The following narrative consists of a "summarized interpretation" of the August 2016 phytoplankton data collected on Schroon Lake. All raw data obtained from the laboratory involved in the analysis of these collections is contained within the *Appendix* section of this report. As monitoring of this community continues, a more comprehensive understanding of the lake itself will exist.

Schroon Lake Phytoplankton

Overall, a total of thirty species of phytoplankton were documented in the 2016 Schroon Lake samples. By comparison, a total of 28, 25, 26 and 31 species were observed in the 2008, 2009, 2013, and 2015 collections, respectively.

The most common algal species in the south basin were *Rhodomonas minuta* (22.0%), *Aphanothece sp.* (13.8%), *Cyclotella stelligera* (11.9%), and *Cryptomonas erosa* (10.1%). In the north basin, *Aphanothece sp.* (16.7%), *Rhodomonas minuta* (15.8%), *Chroococcus minimus* (10.0%), *Chroococcus minimus* (15.7%) and *Cryptomonas erosa*

(9.2%) dominated the collections. *Rhodomonas minuta*, a species which has also been dominant in past collections, is a very widespread alga (probably the most common alga in the U.S.) and it is found under a wide range of ecological conditions.

Historically, the two basins have been quite similar in terms of species composition and abundance. Most of the species in the most recent Schroon Lake phytoplankton are typical of mesotrophic lakes, with a few exceptions. *Sphaerocystis schroeteri*, for example, tends to be more common in oligotrophic waters.

Eutrophic algae have also appeared in Schroon Lake phytoplankton collections in years past (e.g., *Anabaena flos-aquae*, *Anabaena planctonica*, *Chroococcus minimus*, *Fragilaria crotonensis* and *Microcystis aeruginosa*). In the 2016 collections, *Anabaena* was present again, but only in relatively small densities. *Microcystis* is a eutrophic algal species that does have the potential for producing toxic blooms. However, the abundance of these blue-greens has always been much less than the World Health Organization (WHO) "take action" level of 100,000 cells/mL for toxic algae.

The densities of algae indicate indicate low end mesotrophic conditions. The Trophic State Indices were 44.4 and 36.9 for the north and south basin, respectively.

IV. Conclusions:

The species composition of the Schroon Lake phytoplankton community was, for the most part, normal for a late oligotrophic or an early mesotrophic lake. Algal densities were more indicative of a lake at the low end of mesotrophic conditions. Some blue-green algal species were observed in past and current collections, but their abundances have never been high enough to create a concern for health.

AE recommends that phytoplankton sampling be performed once each year to maintain the existing database. Special attention will be paid to the presence of any potentially problematic algal species in future Schroon Lake phytoplankton collections

APPENDIX

Phytoplankton Sample Analysis

Sample: Schroon Lake
Sample Site: North
Sample Depth:
Sample Date: 25-Aug-16

Total Density (#/mL): 680
Total Biovolume (um^3/mL): 466,550
Trophic State Index: 44.4

	Species	Density #/mL	Density Percent	Biovolume um^3/mL	Biovolume Percent	Group
-	-	-	-	-	-	-
1	Aphanothece sp.	113	16.7	21,757	4.7	bluegreen
2	Rhodomonas minuta	108	15.8	2,153	0.5	cryptophyte
3	Chroococcus minimus	68	10.0	2,856	0.6	bluegreen
4	Cryptomonas erosa	62	9.2	32,409	6.9	cryptophyte
5	Tabellaria fenestrata	51	7.5	281,478	60.3	diatom
6	Dinobryon sertularia	45	6.7	13,598	2.9	chrysophyte
7	Mallomonas sp.	40	5.8	15,071	3.2	chrysophyte
8	Sphaerocystis schroeteri	28	4.2	11,898	2.6	green
9	Cyclotella stelligera	23	3.3	1,246	0.3	diatom
10	Glenodinium sp.	23	3.3	15,864	3.4	dinoflagellate
11	Achnanthes minutissima	23	3.3	1,133	0.2	diatom
12	Ankistrodesmus falcatus	17	2.5	552	0.1	green
13	Cosmarium sp.	11	1.7	2,380	0.5	green
14	Gomphonema angustatum	11	1.7	3,060	0.7	diatom
15	Synedra ulna	11	1.7	45,100	9.7	diatom
16	Staurastrum gracile	6	0.8	3,060	0.7	green
17	Cymbella microcephala	6	0.8	300	0.1	diatom
18	Fragilaria crotonensis	6	0.8	4,759	1.0	diatom
19	Chlamydomonas sp.	6	0.8	1,841	0.4	green
20	Kephyrion littorale	6	0.8	538	0.1	chrysophyte
21	Nitzschia frustulum	6	0.8	680	0.1	diatom
22	Navicula capitata	6	0.8	2,720	0.6	diatom
23	Cymbella minuta	6	0.8	2,096	0.4	diatom

Phytoplankton Sample Analysis

Sample: Schroon Lake
Sample Site: South
Sample Depth:
Sample Date: 25-Aug-16

Total Density (#/mL): 337
Total Biovolume (um^3/mL): 165,618
Trophic State Index: 36.9

	Species	Density #/mL	Density Percent	Biovolume um^3/mL	Biovolume Percent	Group
-	-	-	-	-	-	-
1	Rhodomonas minuta	74	22.0	1,483	0.9	cryptophyte
2	Aphanothece sp.	46	13.8	7,784	4.7	bluegreen
3	Cyclotella stelligera	40	11.9	2,209	1.3	diatom
4	Cryptomonas erosa	34	10.1	17,669	10.7	cryptophyte
5	Chroococcus minimus	22	6.4	484	0.3	bluegreen
6	Dinobryon sertularia	19	5.5	2,891	1.7	chrysophyte
7	Chlamydomonas sp.	15	4.6	5,020	3.0	green
8	Tabellaria fenestrata	15	4.6	66,723	40.3	diatom
9	Sphaerocystis schroeteri	12	3.7	4,325	2.6	green
10	Glenodinium sp.	12	3.7	8,649	5.2	dinoflagellate
11	Achnanthes minutissima	6	1.8	309	0.2	diatom
12	Cosmarium sp.	6	1.8	1,297	0.8	green
13	Anomoeoneis vitrea	6	1.8	741	0.4	diatom
14	Ankistrodesmus falcatus	3	0.9	154	0.1	green
15	Anabaena flos-aquae	3	0.9	2,070	1.2	bluegreen
16	Chrysosphaerella sp.	3	0.9	3,707	2.2	chrysophyte
17	Staurastrum gracile	3	0.9	1,668	1.0	green
18	Oocystis pusilla	3	0.9	667	0.4	green
19	Asterionella formosa	3	0.9	680	0.4	diatom
20	Fragilaria crotonensis	3	0.9	20,758	12.5	diatom
21	Melosira italica	3	0.9	14,549	8.8	diatom
22	Fragilaria vaucheria	3	0.9	1,779	1.1	diatom

Anabaena flos-aquae cells/mL = 31