

Lake Trophic Survey Reports 2014 – 2016

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Bailey Pond, located in New Boston, NH was surveyed once previously under the Lake Trophic Survey Program in 1989. The former and current trophic assessment determined the pond to be eutrophic. The natural pond is partially stratified with a large area of anoxia. Although the pond was rated eutrophic in both surveys, it has a few improvements. Chlorophyll-*a* and total phosphorus concentration decreased by more than half of the 1989 survey, and Secchi depth increased by approximately a meter. However, specific conductance was approximately three times higher and chloride levels were approximately four times higher than the 1989 survey, suggesting road salt is affecting the pond. A good dirt launch is accessible on the north-east side of the pond from Bailey Pond Road off of Joe English Road. Wetland areas were present at the southern and northern ends of the pond. There is very little development around the pond.

2016 NHDES Trophic Rating:

Eutrophic

1989 NHDES Trophic Rating:

Eutrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



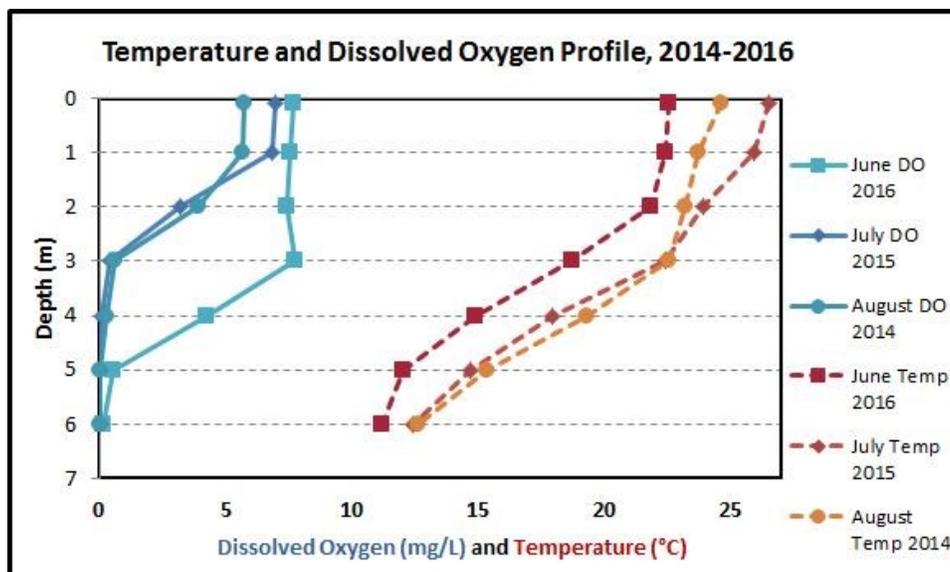
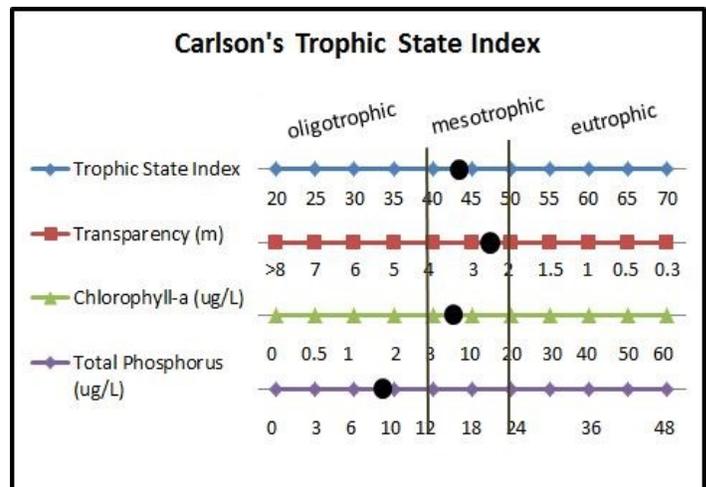
Physical Characteristics			
Elevation:	220 m (721.8 ft)	Lake area:	0.075 km ²
Mean depth:	4.2 m	Volume:	312300 m ³
Maximum depth:	6.5 m	Average Metalimnion Volume:	112550 m ³
Relative depth:	2.1 %	Average Anoxic Volume:	81375 m ³
Shore Length:	1090 m	Flushing rate:	1.8 yr ⁻¹
Shore Configuration:	1.12	P retention coeff:	0.59
Watershed area:	1.0024 km ²	Areal water load:	7.5 m/yr
% Watershed Poned:	0.00%	Lake type:	natural

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

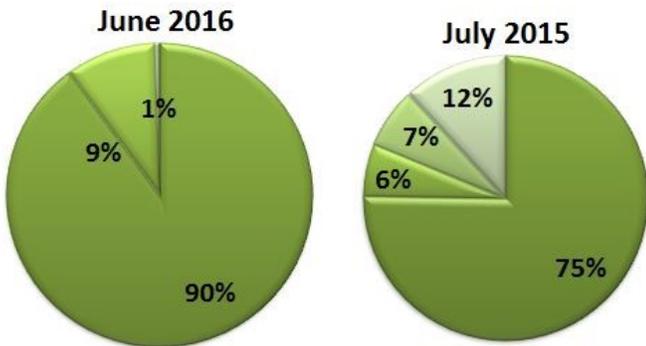
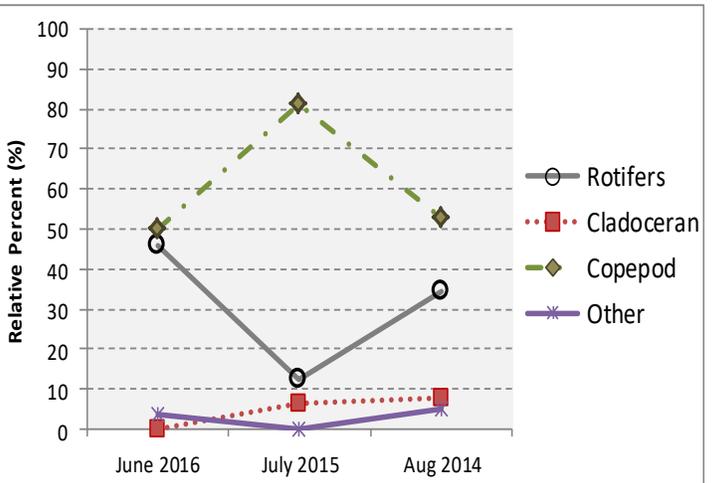
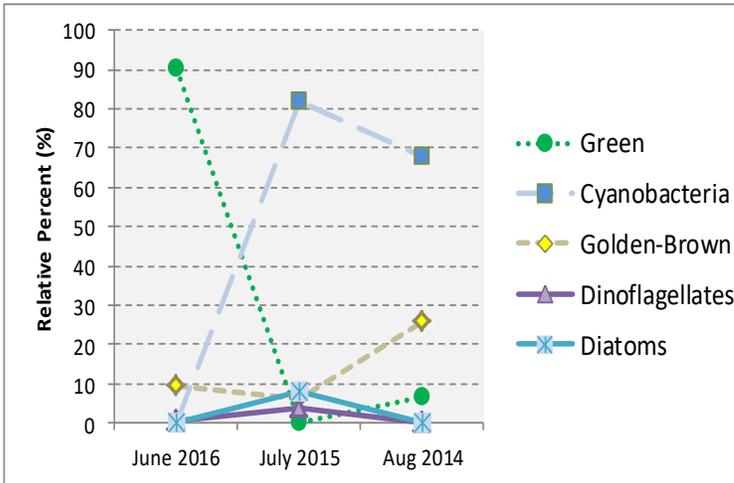
NHDES Trophic Classification: 2014 - 2016				
Bailey Pond, New Boston, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	6	2	5	2
2015	6	4	5	1
2016	5	3	5	2
Total Points:				46
Trophic classification:				Eutrophic



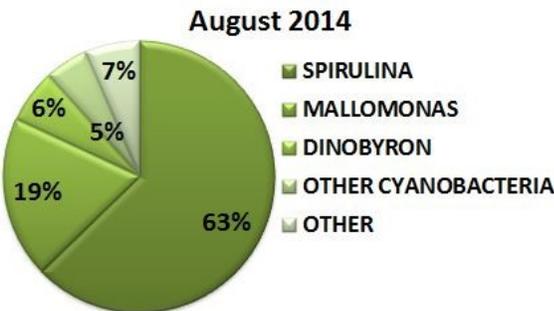
2014 - 2016

Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

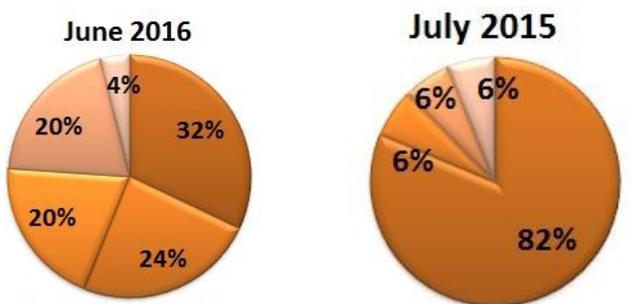
Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



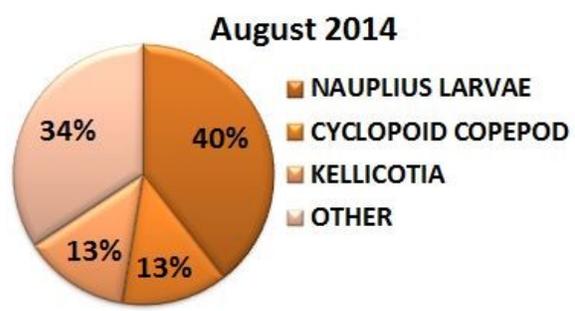
- CHROOMONAS
- DINOBYRON
- OTHER
- GLEOCAPSA
- DINOBYRON
- ASTERIONELLA
- OTHER



- SPIRULINA
- MALLOMONAS
- DINOBYRON
- OTHER CYANOBACTERIA
- OTHER



- NAUPLIUS LARVAE
- ASPLANCHNA
- BOSMINA
- POLYARTHRA
- ASPLANCHNA



- NAUPLIUS LARVAE
- CYCLOPOID COPEPOD
- KELLICOTIA
- OTHER

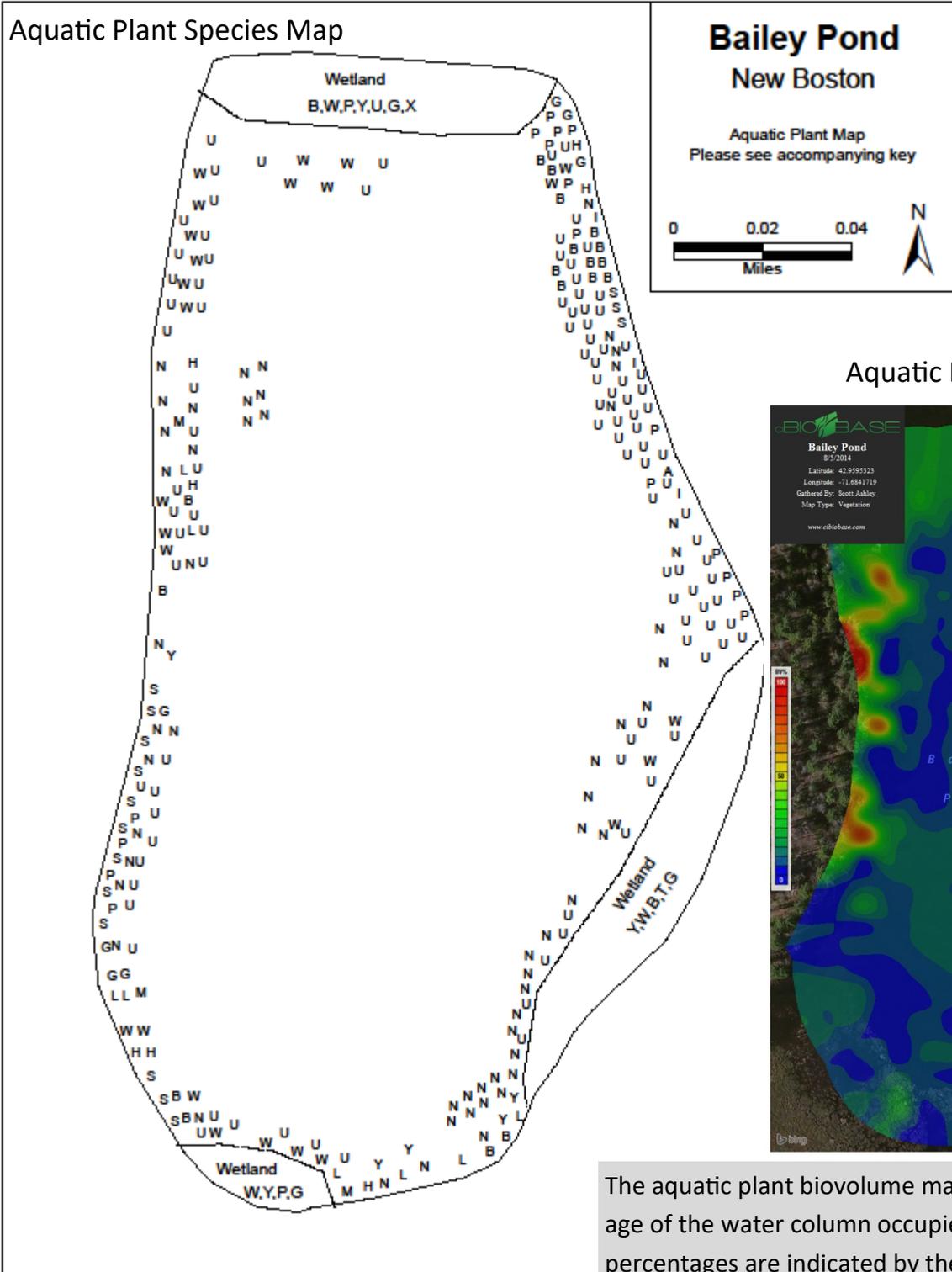
Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.17	0.29	1.00	meter	x
pH	6.09	0.34	6.07	Units	6.60
Acid Neutralizing Capacity (ANC)	3.90	0.40	3.90	mg/L	4.50
Apparent Color	28.00	7.00	28.00	CPU	29.00
Secchi Depth	2.57	0.60	2.50	meter	3.30
Secchi Depth - Scope	2.73	0.25	2.73	meter	unk
Specific Conductance	96.41	21.16	93.42	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.41	0.27	0.26	mg/L	0.30
Nitrate + Nitrite Nitrogen	< 0.05	0.00	< 0.05	mg/L	<0.05
Total Phosphorus	9.86	2.43	10.90	µg/L	11.00
Chloride	20.67	3.06	20.00	mg/L	5.00
Sulfate	1.50		1.50	mg/L	4.00
Calcium	2.75		2.75	mg/L	2.58
Magnesium	0.75		0.75	mg/L	0.56
Potassium	0.38		0.38	mg/L	0.48
Sodium	11.00		11.00	mg/L	3.80
Total Organic Carbon	4.80		4.80	mg/L	4.30
<i>Metalimnetic Depth</i>	4.17	0.29	4.00	meter	x
Chlorophyll-a	7.48	2.59	8.09	µg/L	4.39
<i>Hypolimnetic Depth</i>	5.17	1.04	5.50	meter	x
Total Phosphorus	28.23	20.22	20.40	µg/L	14.00

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

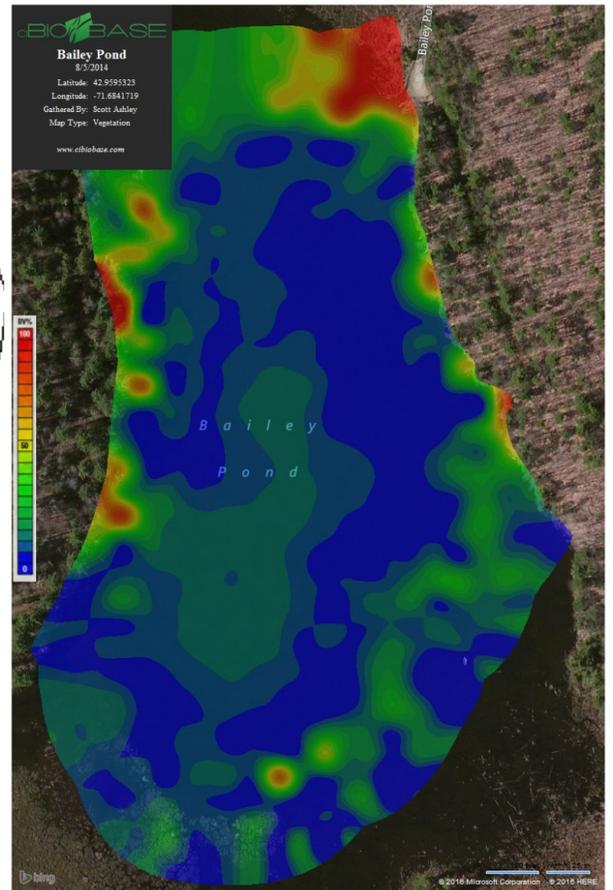
Designated Use	Parameter	Category
Aquatic Life	Chl-a	No data
	DO	No data
	DO Saturation	No data
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

Aquatic Plant Maps

Aquatic Plant Species Map



Aquatic Plant Biovolume Map



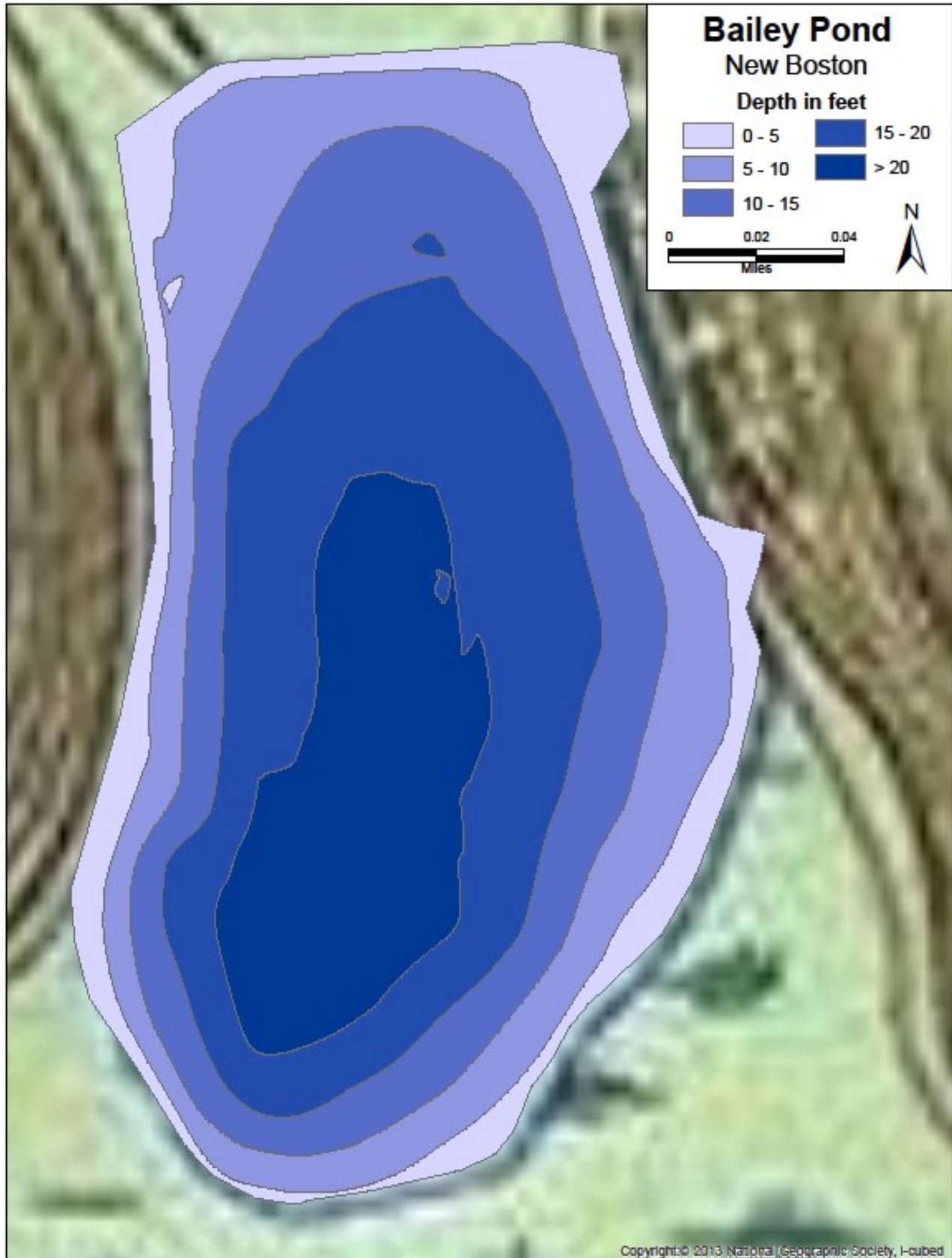
The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red, and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shore-line plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Species Key

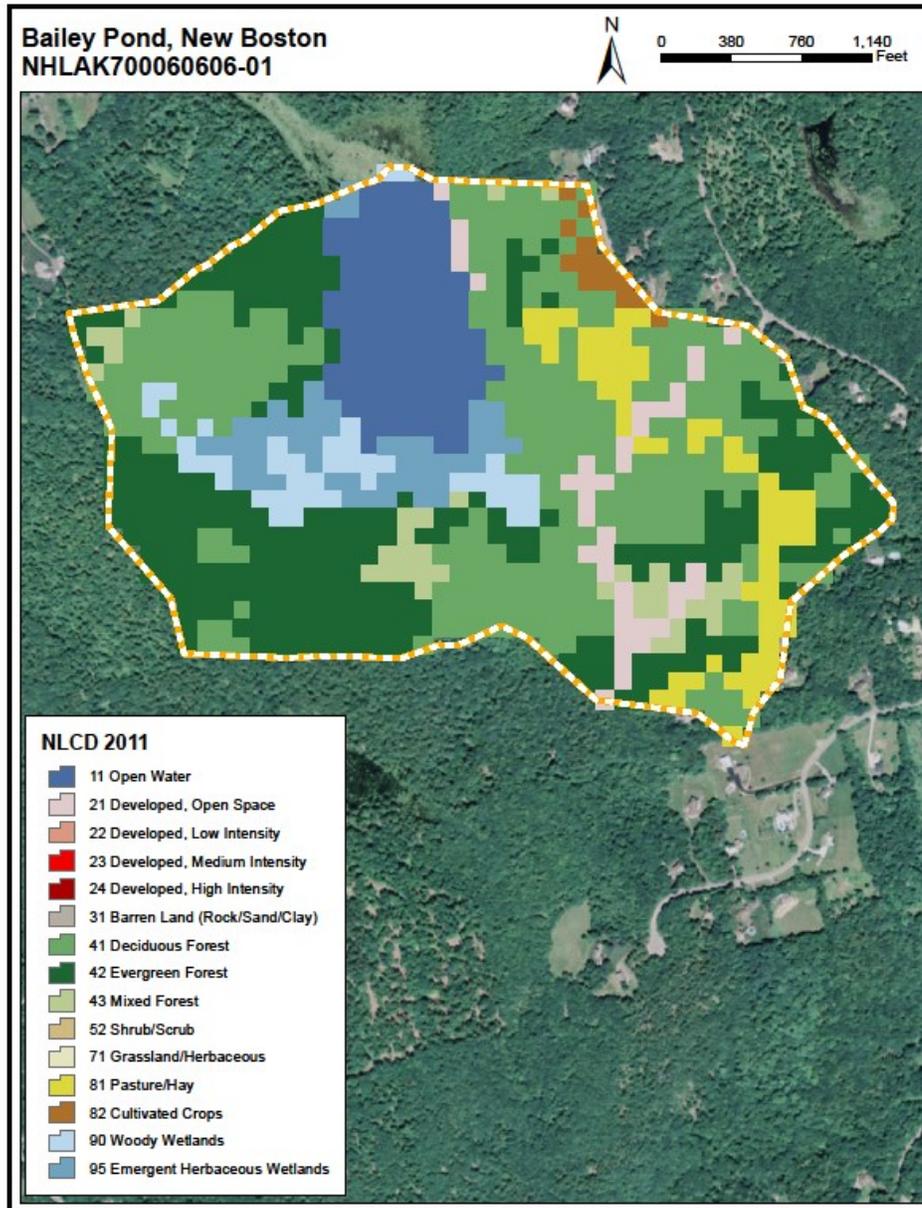
LAKE: BAILEY POND		TOWN: NEW BOSTON		DATE: 8/5/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
A	Sagittaria	Arrowhead	Sparse	
B	Brasenia schreberi	Watershield	Common/Abund	
G	Gramineae	Grass family	Scattered	
H	Nymphoides cordatum	Floating heart	Scattered	
h	Hypericum	St. John's-wort	Sparse	
I	Iris	Iris	Sparse	
L	Decodon verticillatus	Swamp loosestrife	Scattered	
M	Myrica gale	Sweetgale	Scattered	
N	Nymphaea	White water lily	Common/Abund	
P	Pontederia cordata	Pickerelweed	Common	
S	Sparganium	Bur-reed	Scattered	
T	Typha	Cattail	Sparse	
U	Utricularia	Bladderwort	Abundant	
W	Potamogeton	Pondweed	Scat/Common	
Y	Nuphar	Yellow water lily	Common	
OVERALL ABUNDANCE: Abundant				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	11.26	Barren Land	0.00	Grassland/ Herbaceous	0.00
Developed, Open Space	4.30	Deciduous Forest	33.44	Pasture Hay	7.17
Developed, Low Intensity	0.00	Evergreen Forest	28.48	Cultivated Crops	1.43
Developed, Medium Intensity	0.00	Mixed Forest	3.86	Woody Wetlands	4.53
Developed, High Intensity	0.00	Shrub/ Shrub	0.00	Emergent Wetlands	5.52

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Cedar Pond in Milan, NH is a natural, stratified lake that was previously surveyed in 1981 and 1992. All three lake trophic surveys have classified Cedar Pond as mesotrophic. A paved public boat launch is available on the north side of the waterbody, off of Route 110A. Osprey, bald eagles and loons were observed. The shoreline of Cedar Pond is encircled by a road and well developed for a northern pond, and some water quality parameters reflected this influence. Average Secchi depth from the 2014-2016 survey period was ~40% shallower than the 1992 survey and ~10% shallower than the 1981 survey. Specific conductance increased. Chloride levels are ~6x greater and sodium levels are ~2.5x greater than in 1992, which may be due to road salt or septic systems. Sulfate levels decreased by > 2x the 1992 level, which is consistent with other waterbodies in New Hampshire and indicative of reductions in acid rain. Chlorophyll-*a* and epilimnetic total phosphorus were similar to previous surveys; however, hypolimnetic total phosphorus has almost tripled since 1992. Increasing total phosphorus in the hypolimnion suggests human influences of stormwater run-off or septic systems. Cedar Pond is likely being negatively influenced by development and human activity within the watershed.

2016 NHDES Trophic Rating:

Mesotrophic

1992 NHDES Trophic Rating:

Mesotrophic

What is a lake trophic survey?

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Physical Characteristics

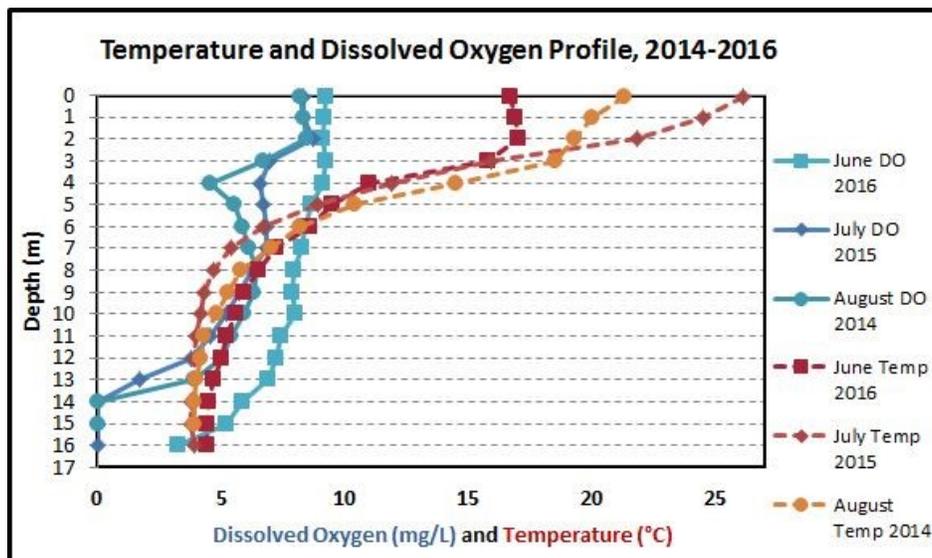
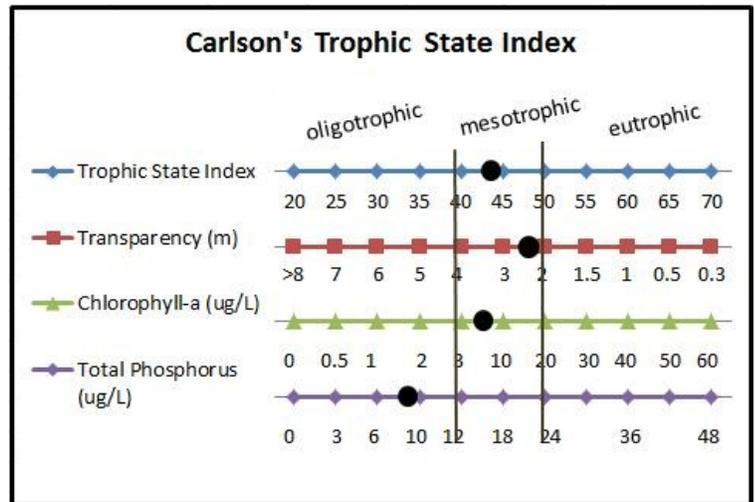
Elevation:	340 m (1115.5 ft)	Lake area:	0.323 km ²
Mean depth:	8.7 m	Volume:	2823000 m ³
Maximum depth:	16.8 m	Average Hypolimnion Volume:	977160 m ³
Relative depth:	2.62 %	Average Anoxic Volume:	59160 m ³
Shore Length:	2390 m	Flushing rate:	2.19 yr ⁻¹
Shore Configuration:	1.19	P retention coeff:	0.48
Watershed area:	10.56 km ²	Areal water load:	19.11 m/yr
% Watershed Poned:	0.00%	Lake type:	natural w/ dam

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of the NHDES classification methodology, please visit:

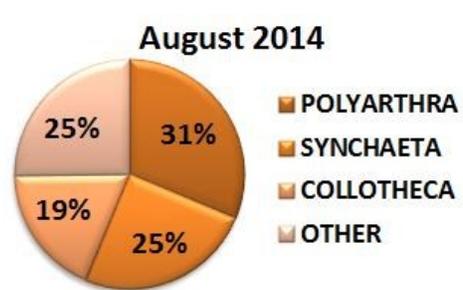
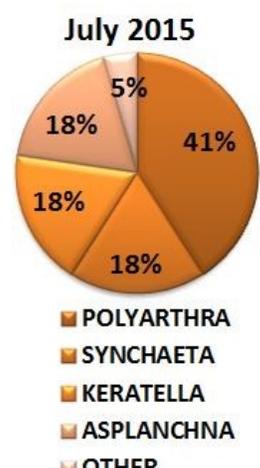
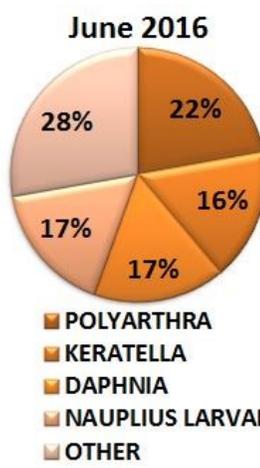
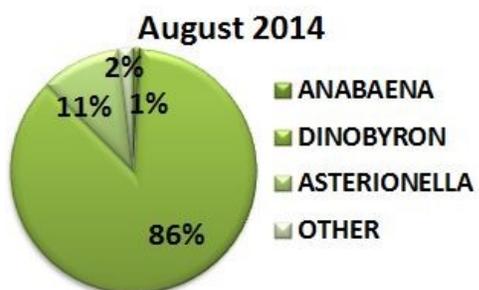
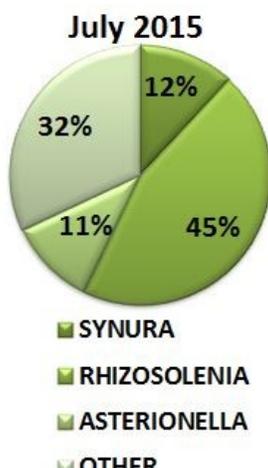
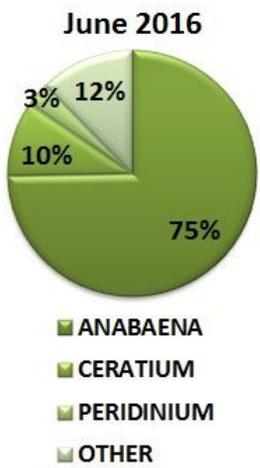
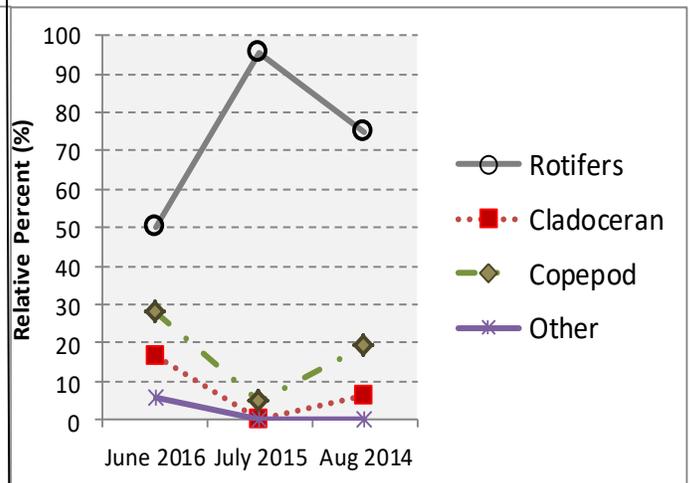
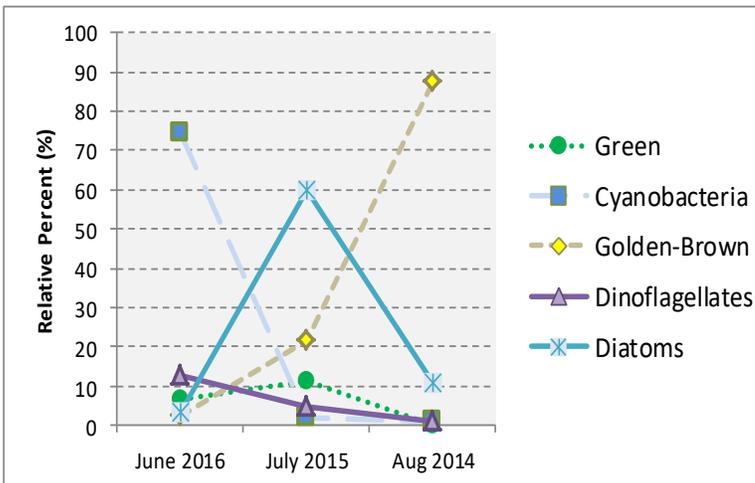
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Cedar Pond, Milan, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	6	2	5	2
2015	6	4	5	1
2016	5	3	5	2
Total Points:				28
Trophic classification:				Mesotrophic



Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.33	0.29	1.50	meter	x
pH	6.74	0.32	6.86	Units	6.60
Acid Neutralizing Capacity (ANC)	10.93	1.27	10.70	mg/L	4.50
Apparent Color	64.33	8.14	68.00	CPU	29.00
Secchi Depth	2.23	0.32	2.10	meter	3.30
Secchi Depth - Scope	3.53	0.75	3.50	meter	unk
Specific Conductance	76.30	5.76	77.60	μS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.31	0.03	0.29	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	<0.05	mg/L	<0.05
Total Phosphorus	9.99	1.92	10.20	μg/L	11.00
Chloride	37.00	44.17	12.00	mg/L	5.00
Sulfate	2.70		2.70	mg/L	4.00
Calcium	4.34		4.34	mg/L	2.58
Magnesium	0.84		0.84	mg/L	0.56
Potassium	0.66		0.66	mg/L	0.48
Sodium	11.50		11.50	mg/L	3.80
Total Organic Carbon	8.50		8.50	mg/L	4.30
<i>Metalimnetic Depth</i>	4.67	0.76	4.50	meter	x
Chlorophyll- <i>a</i>	6.30	2.54	6.01	μg/L	4.39
<i>Hypolimnetic Depth</i>	12.75	1.77	12.75	meter	x
Total Phosphorus	24.85	4.74	24.85	μg/L	14.00

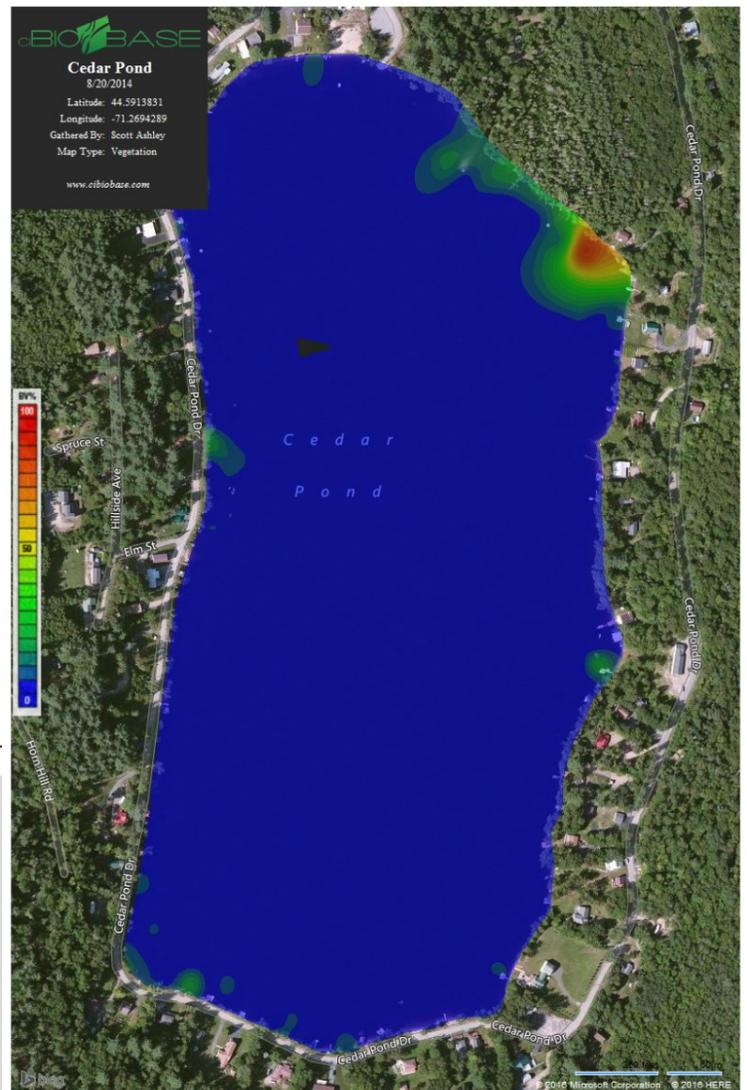
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Designated Use	Parameter	Category
Aquatic Life	Chl-a	No data
	DO	No data
	DO Saturation	No data
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data



Aquatic Plant Maps

Biovolume Map



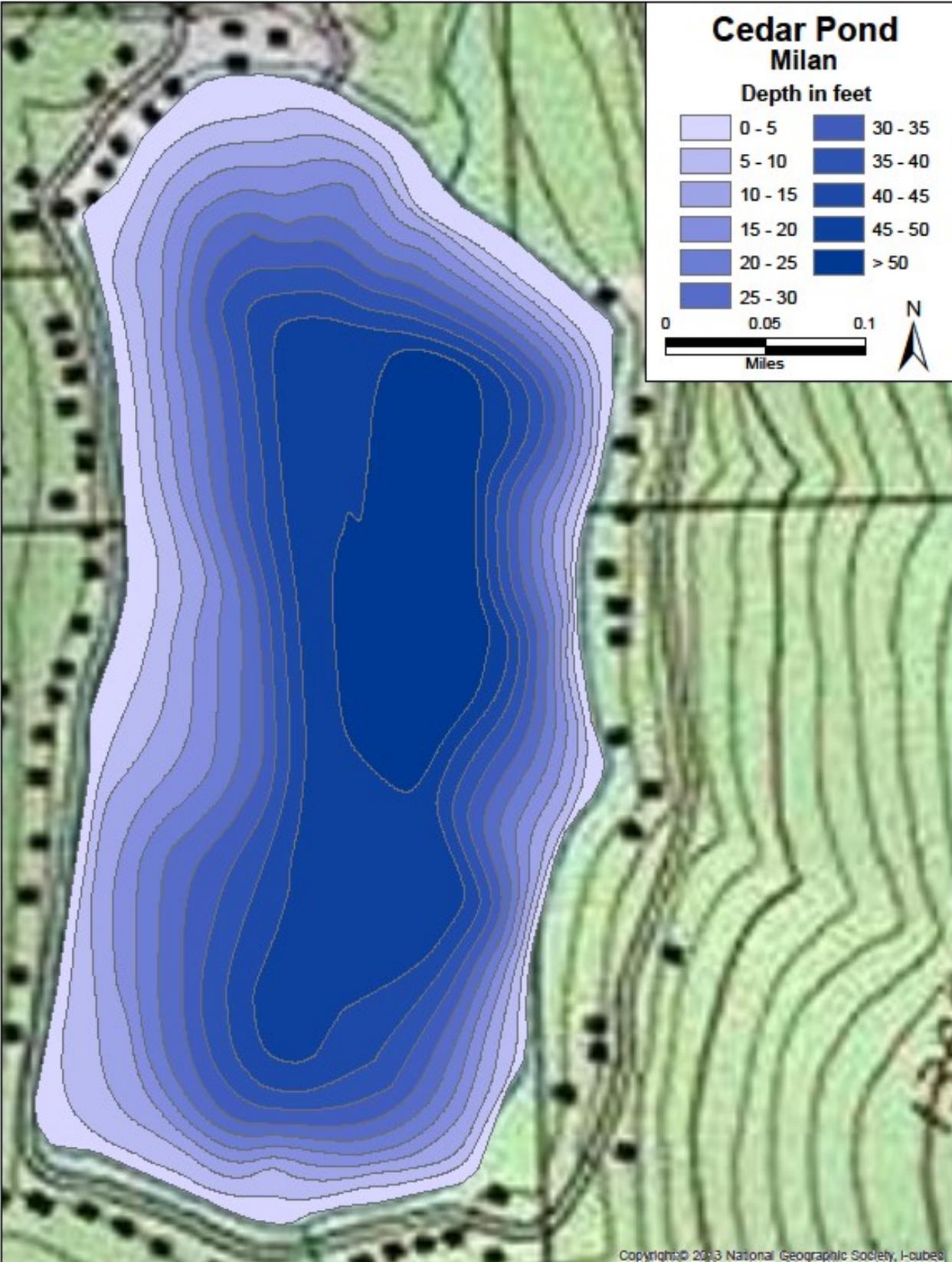
The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Species Key

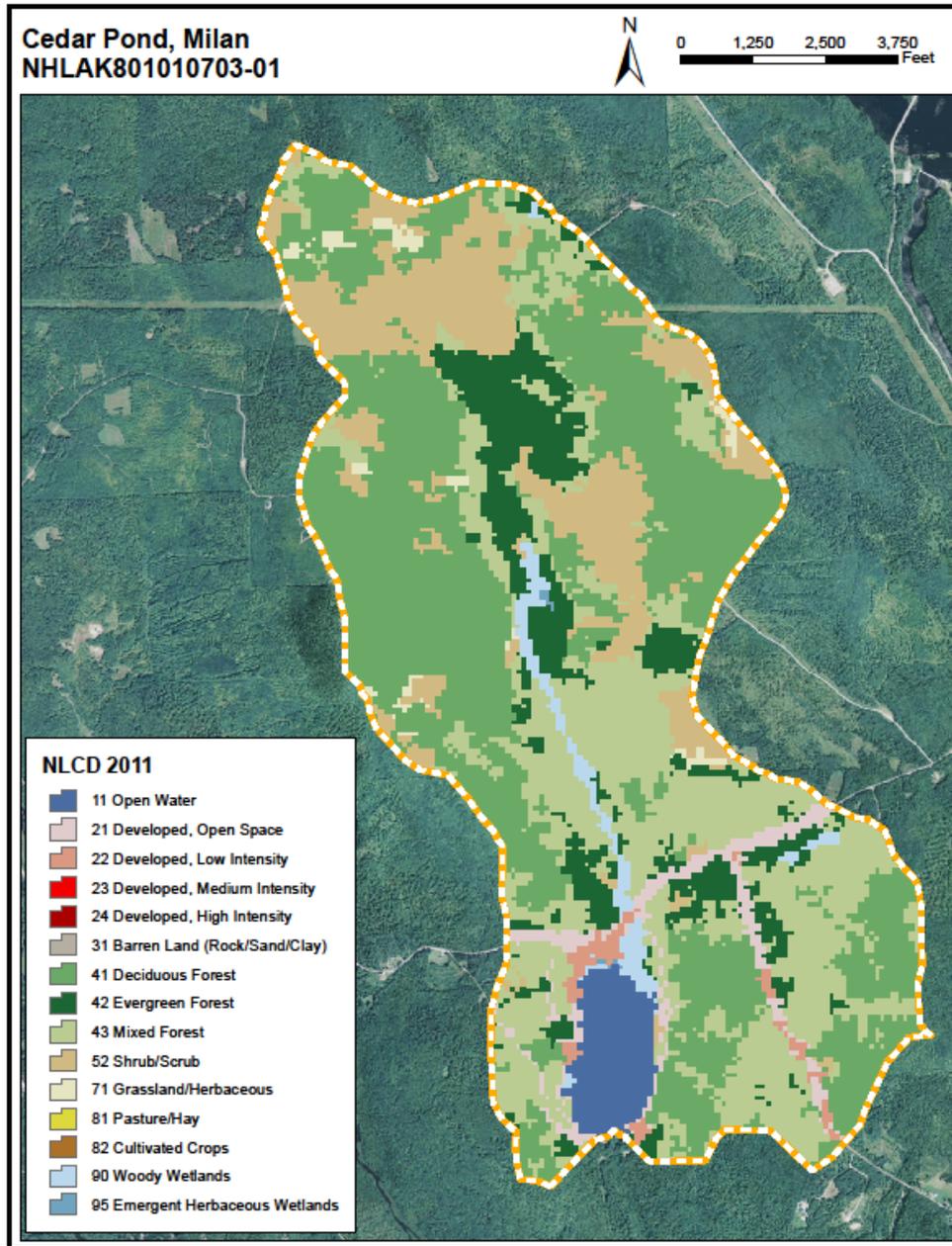
LAKE: CEDAR POND		TOWN: MILAN		DATE: 8/20/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
E	Eriocaulon septangulare	Pipewort	Sparse	
N	Nymphaea	White water lily	Scattered	
S	Sparganium	Bur-reed	Scattered	
T	Typha	Cattail	Sparse	
U	Utricularia	Bladderwort	Sparse	
W	Potamogeton	Pondweed	Sparse	
X		Sterile thread-like leaf	Sparse	
OVERALL ABUNDANCE: Scattered				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	3.04	Barren Land	0.00	Grassland/ Herbaceous	1.19
Developed, Open Space	2.89	Deciduous Forest	37.73	Pasture Hay	0.00
Developed, Low Intensity	1.06	Evergreen Forest	10.77	Cultivated Crops	0.00
Developed, Medium Intensity	0.00	Mixed Forest	27.46	Woody Wetlands	1.96
Developed, High Intensity	0.00	Shrub/ Shrub	13.81	Emergent Wetlands	0.10

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports.](#)

Daniels Lake, Weare, NH is a man-made, partially stratified waterbody that was surveyed twice previously, in 1980 and 1997. It was originally classified as eutrophic in 1980, but improved to mesotrophic in 1997. The 2014-2016 lake trophic assessment found that Daniels Lake was again eutrophic. Daniels Lake appears to be a meso-eutrophic lake that fluctuates between the two trophic categories. An herbicide treatment in 1980 may be responsible for the change in trophic status. Average chlorophyll-*a* concentration was approximately half and average total phosphorus was ~30% lower than the 1997 values, with Secchi depth improving (deepening) by ~10%. However, plant abundance increased from “common” to “abundant”, suggesting nutrients are being diverted to rooted plants rather than phytoplankton. Acid neutralizing capacity increased by ~20% and sulfate concentration decreased by 40%, indicating laws such as the Clean Air Act aimed reducing acid rain have had a positive influence. While these water quality parameters have improved since the 1997 survey, Daniels Lake also shows signs of negative human impacts. Specific conductance increased by ~30% and chloride levels were ~35% higher than 1997 levels, which suggests road salt is accumulating in the waterbody. A rough dirt boat launch is available off of Rt. 114.

2016 NHDES Trophic Rating:

Eutrophic

1997 NHDES Trophic Rating:

Mesotrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake’s overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



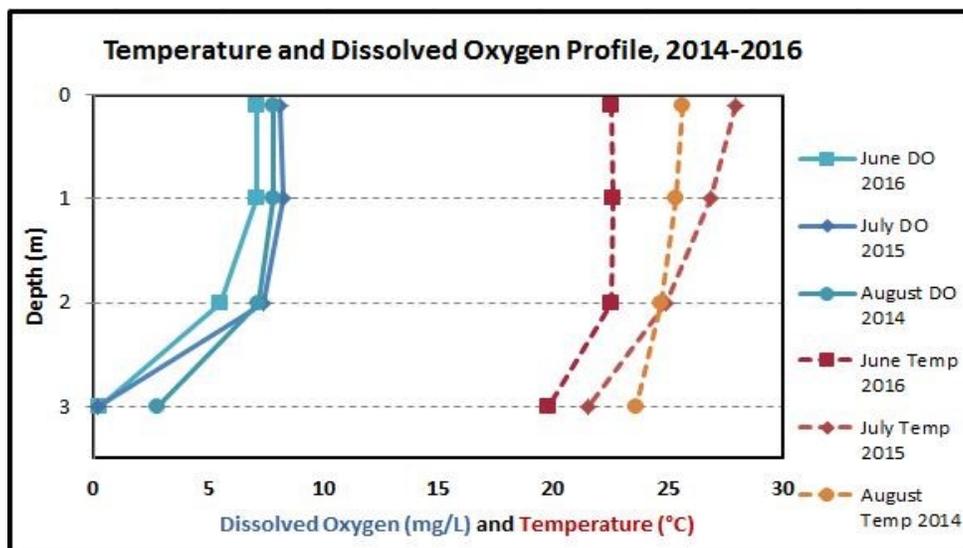
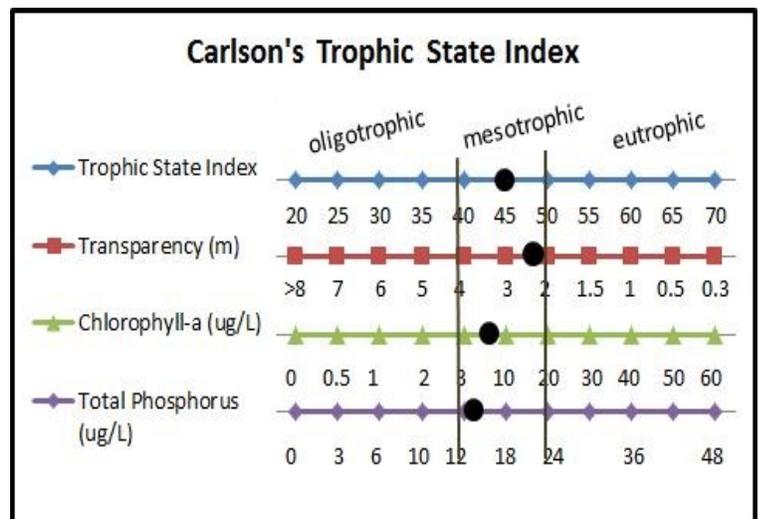
Physical Characteristics			
Elevation:	113 m (370.7 ft)	Lake area:	147750 m ²
Mean depth:	0.9 m	Volume:	127700 m ³
Maximum depth:	3.5 m	Average Metalimnion Volume:	345 m ³
Relative depth:	0.8 %	Average Anoxic Volume:	N/A
Shore Length:	3220 m	Flushing rate:	55.85 yr ⁻¹
Shore Configuration:	2.36	P retention coeff:	0.36
Watershed area:	13. 37 km ²	Areal water load:	48.29 m/yr
% Watershed Ponged:	< 0.1%	Lake type:	artificial

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of the NHDES classification methodology, please visit:

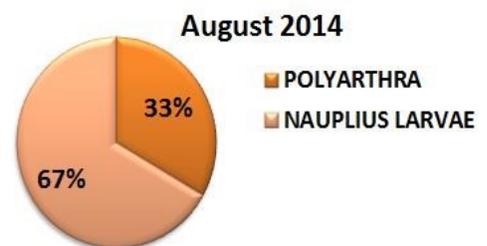
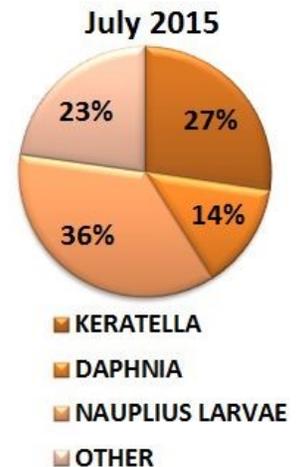
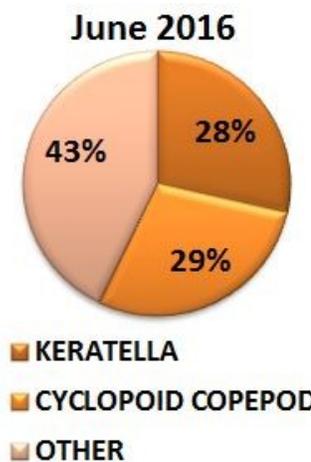
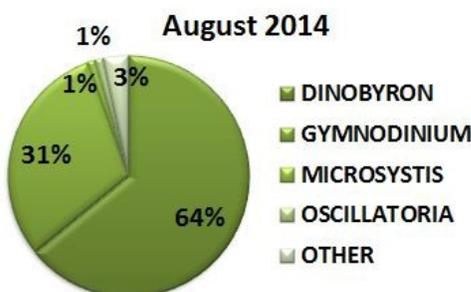
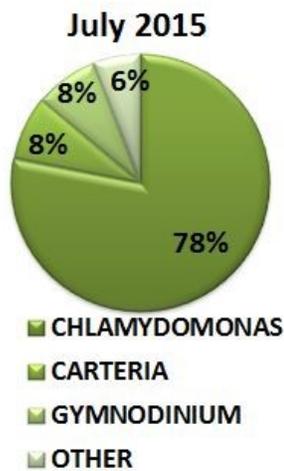
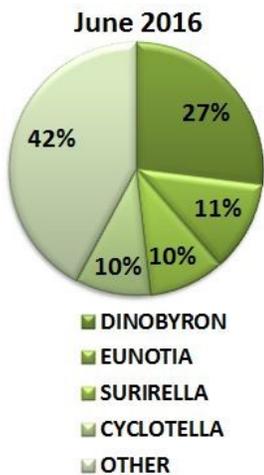
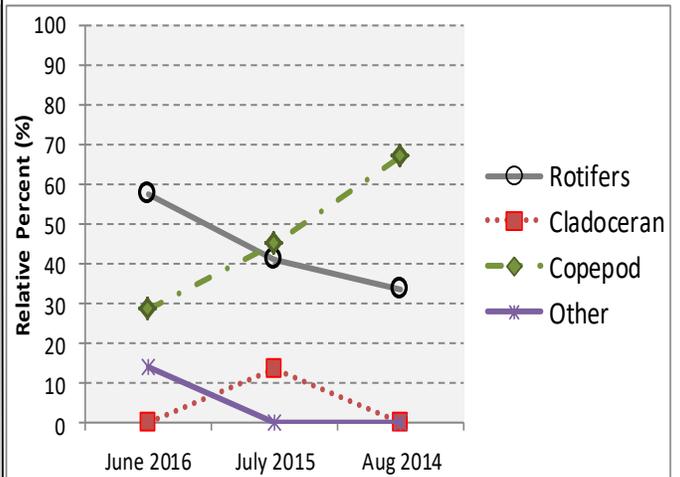
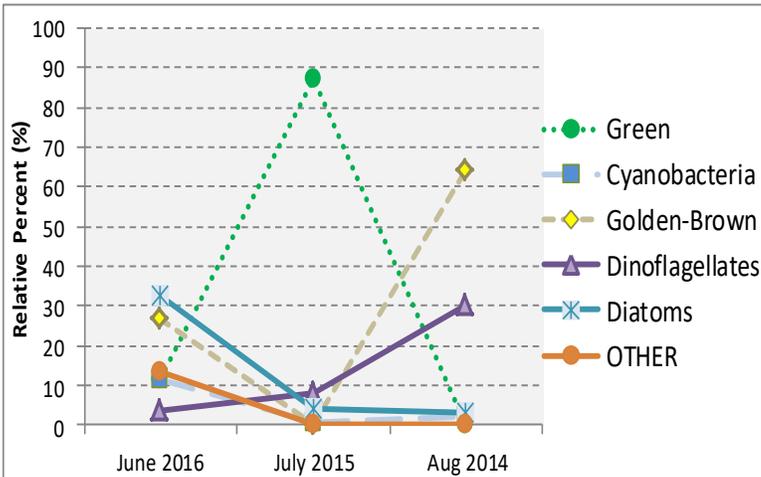
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Daniels Lake, Weare, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	1	3	5	1
2015	4	3	5	2
2016	4	3	5	1
Total Points:				37
Trophic classification:				Eutrophic



Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

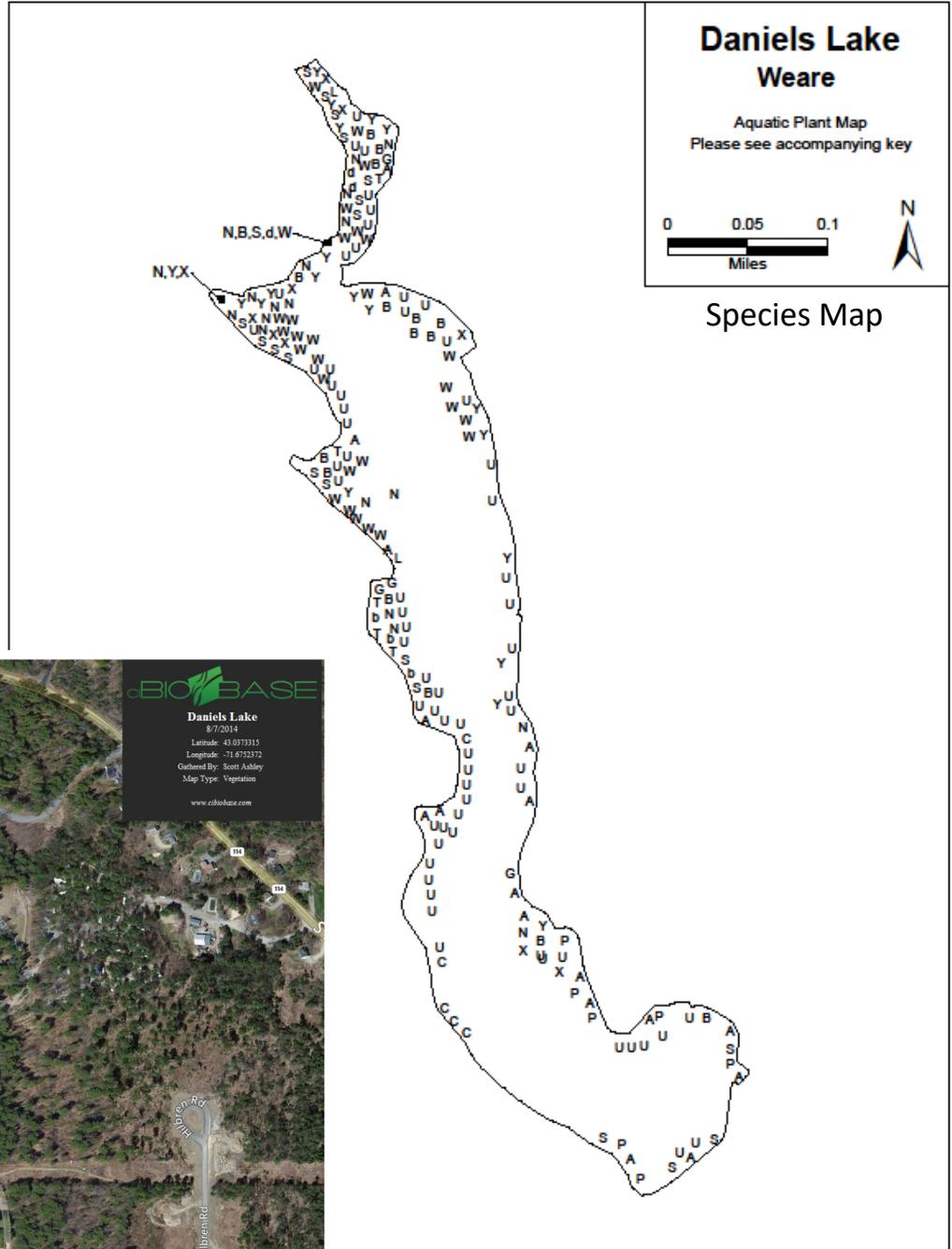


Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.17	0.29	1.00	meter	x
pH	6.60	0.16	6.67	Units	6.60
Acid Neutralizing Capacity (ANC)	10.77	1.51	10.10	mg/L	4.50
Apparent Color	50.67	8.14	47.00	CPU	29.00
Secchi Depth	2.27	0.12	2.20	meter	3.30
Secchi Depth - Scope	2.68	0.19	2.60	meter	unk
Specific Conductance	99.11	9.02	98.30	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.43	0.28	0.27	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	<0.05	mg/L	<0.05
Total Phosphorus	13.65	3.55	15.60	µg/L	11.00
Chloride	18.00	3.00	18.00	mg/L	5.00
Sulfate	2.40		2.40	mg/L	4.00
Calcium	4.68		4.68	mg/L	2.58
Magnesium	0.86		0.86	mg/L	0.56
Potassium	0.73		0.73	mg/L	0.48
Sodium	12.90		12.90	mg/L	3.80
Total Organic Carbon	5.20		5.20	mg/L	4.30
<i>Metalimnetic Depth</i>	2.50	0.50	2.50	meter	x
Chlorophyll-a	6.18	3.01	4.75	µg/L	4.39
Total Phosphorus	21.60		21.60	µg/L	unk

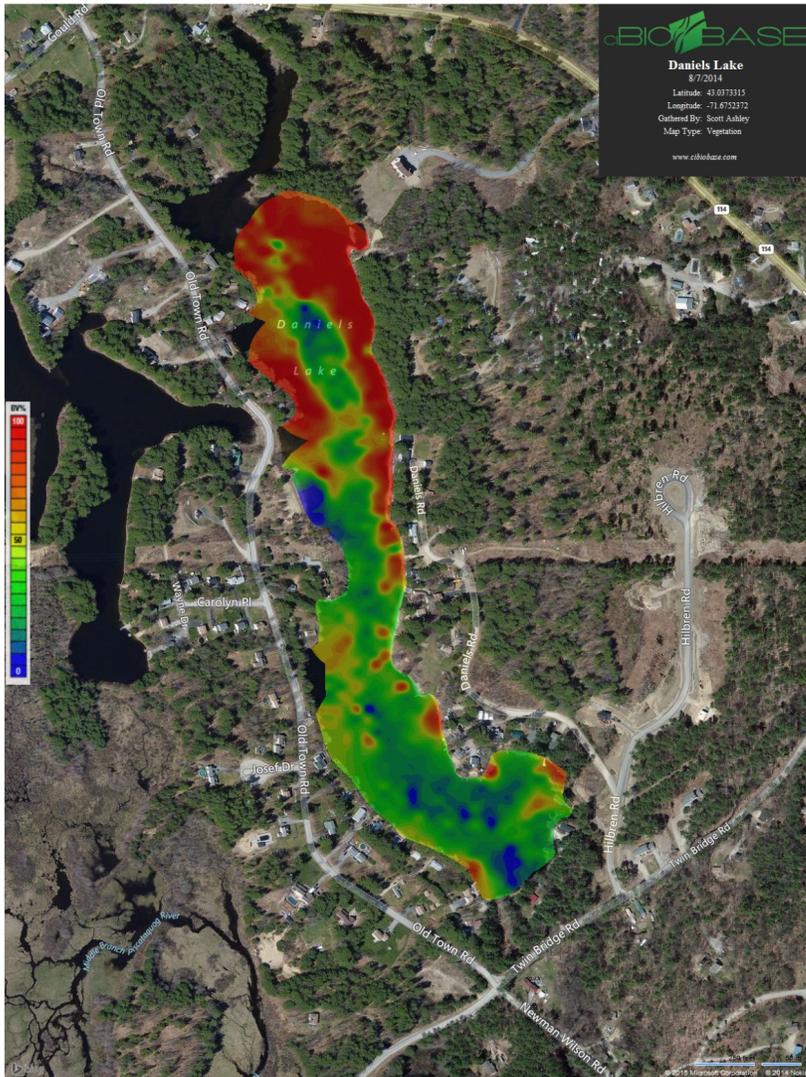
The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of NH waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chl-a	Poor
	DO Saturation	Likely good
	DO	Likely good
	Total Phosphorus	Poor
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	Chl-a	Likely bad
	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

Aquatic Plant Maps



Biovolume Map



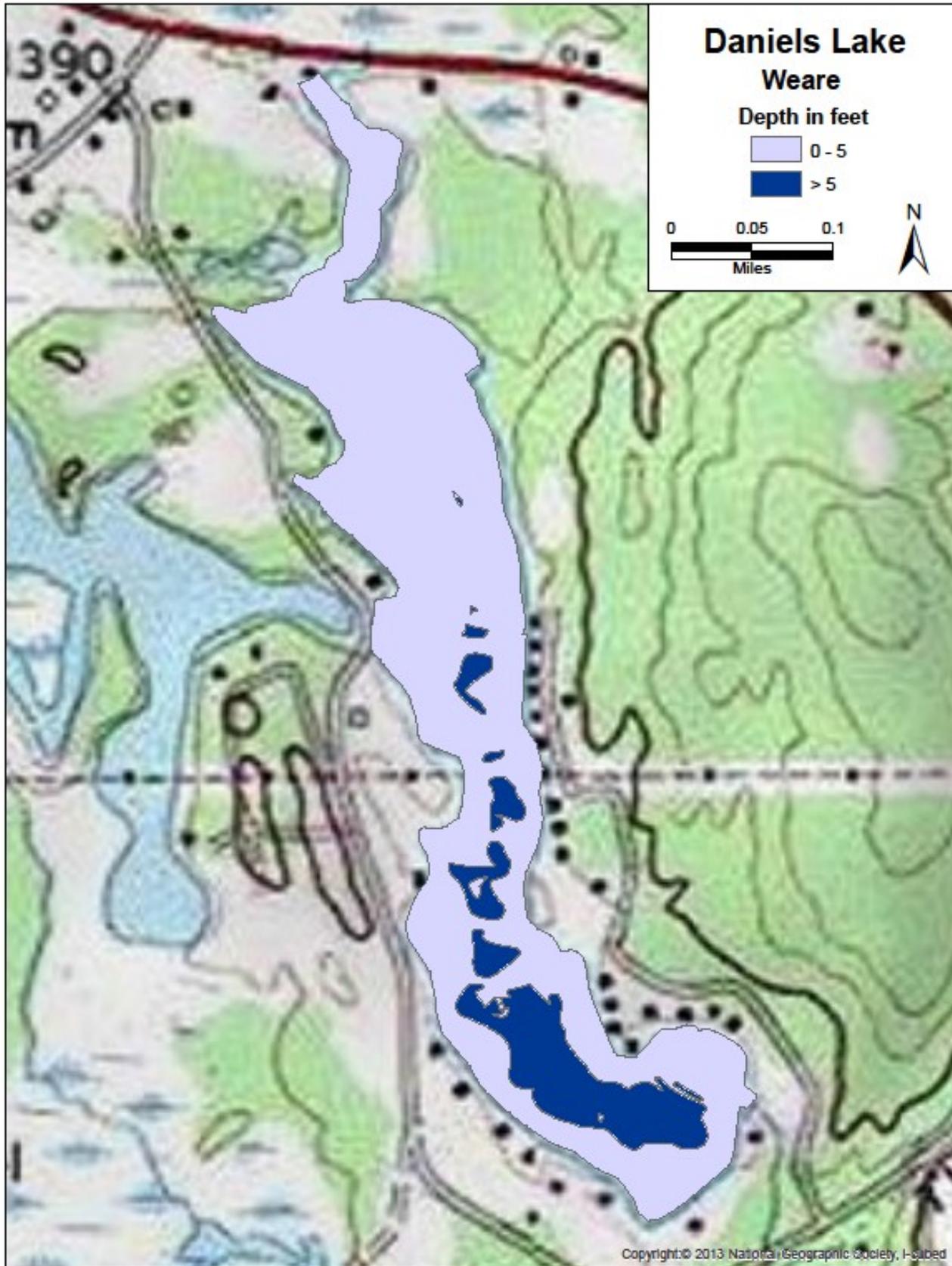
The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Species Key

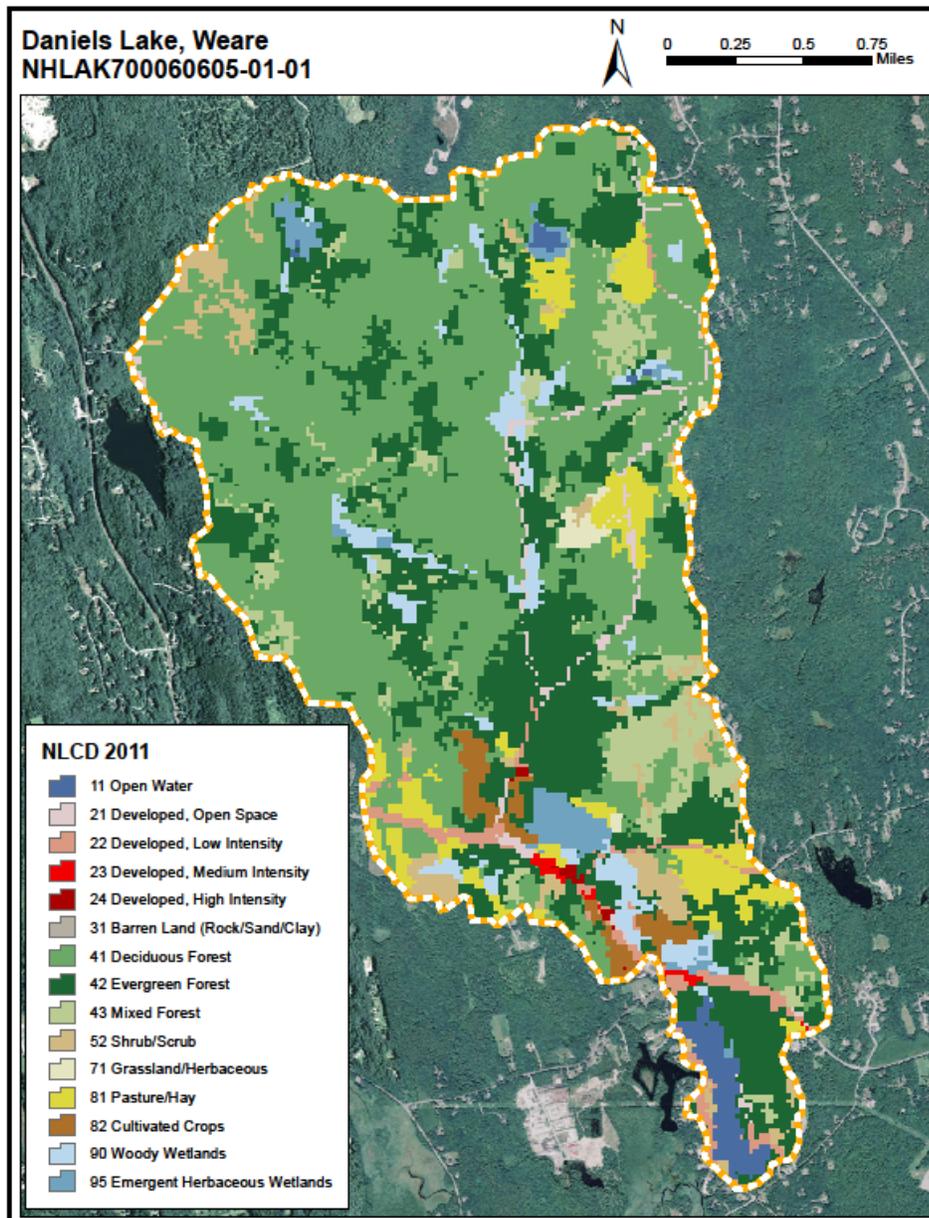
LAKE: DANIELS LAKE		TOWN: WEARE		DATE: 8/7/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
A	Sagittaria	Arrowhead	Scattered	
b	Scirpus	Bulrush	Scattered	
B	Brasenia schreberi	Watershield	Common	
C	Cyperus	Sedge	Scattered	
d	Dulichium arundinaceum	Three-way sedge	Sparse	
G	Gramineae	Grass family	Scattered	
L	Chamaedaphne calyculata	Leatherleaf	Sparse	
P	Pontederia cordata	Pickerelweed	Scat/Common	
r	Juncus	Rush	Sparse	
S	Sparganium	Bur-reed	Common	
T	Typha	Cattail	Sparse	
U	Utricularia	Bladderwort	Common/Abund	
W	Potamogeton	Pondweed	Common	
X		Sterile thread-like leaf	Common	
Y	Nuphar	Yellow water lily	Scat/Common	
OVERALL ABUNDANCE: Abundant				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/ Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	1.52	Barren Land	0.00	Grassland/ Herbaceous	0.52
Developed, Open Space	1.93	Deciduous Forest	45.14	Pasture Hay	5.12
Developed, Low Intensity	2.06	Evergreen Forest	25.38	Cultivated Crops	1.51
Developed, Medium Intensity	0.23	Mixed Forest	6.81	Woody Wetlands	3.91
Developed, High Intensity	0.18	Shrub/ Shrub	3.85	Emergent Wetlands	1.82

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports.](#)

Dodge Pond, Lempster, NH is a natural, partially stratified pond that was surveyed previously in 1990. The former and current trophic assessment determined Dodge Pond to be a eutrophic pond. A gravel boat launch provides pond access. Wetlands are present along the southwestern shoreline. Chlorophyll-*a* and epilimnetic total phosphorus concentrations have decreased since the 1990 survey; however, specific conductance and chloride levels have increased, which may be due to the nearby road and application of road salt. Although pH is similar to the 1990 level, acid neutralizing capacity (ANC) had nearly doubled with large gains in calcium and magnesium, while sulfate levels have significantly decreased. These results are likely due to reductions in acid rain as a result of the Clean Air Act and are similar to the recovery of other waterbodies around New Hampshire. For additional information about acid rain recovery in New Hampshire, [click here](#).

2016 NHDES Trophic Rating:
Eutrophic
1990 NHDES Trophic Rating:
Eutrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts, and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



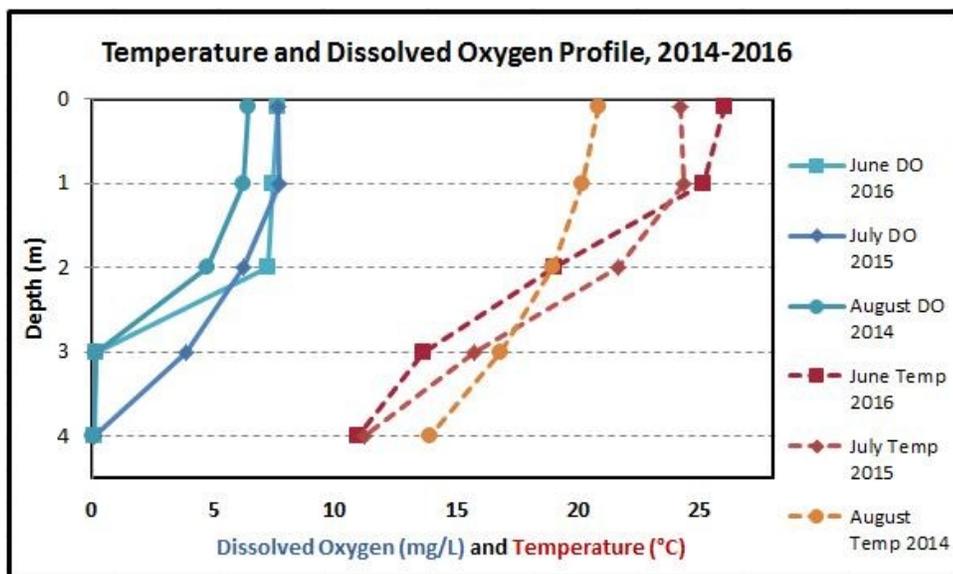
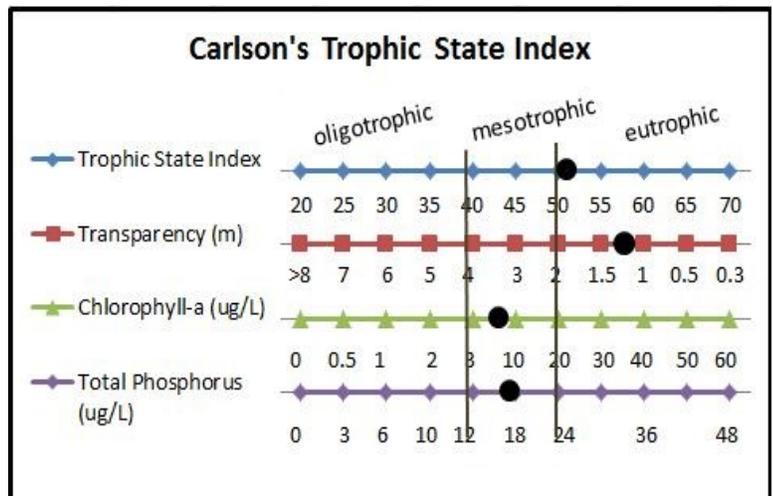
Physical Characteristics			
Elevation:	368 m (1207 ft)	Lake area:	79,800 m ²
Mean depth:	2.5 m	Volume:	199,000 m ³
Maximum depth:	4.5 m	Average Metalimnion Volume:	70,600 m ³
Relative depth:	1.4 %	Average Anoxic Volume:	19,300 m ³
Shore Length:	1380 m	Flushing rate:	7.44 yr ⁻¹
Shore Configuration:	1.38	P retention coeff:	0.48
Watershed area:	2.54 km ²	Areal water load:	18.55 m/yr
% Watershed Poned:	0.00%	Lake type:	natural

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of the NHDES classification methodology, please visit:

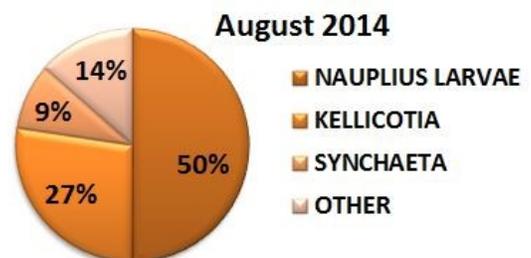
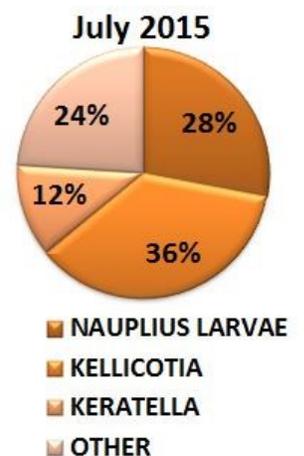
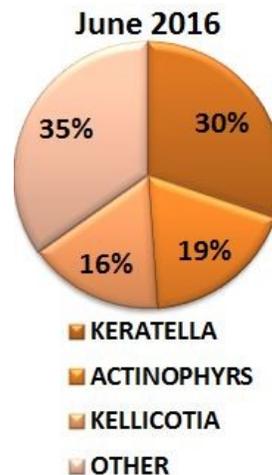
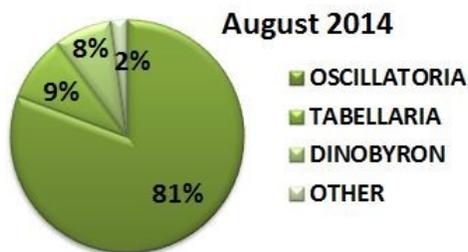
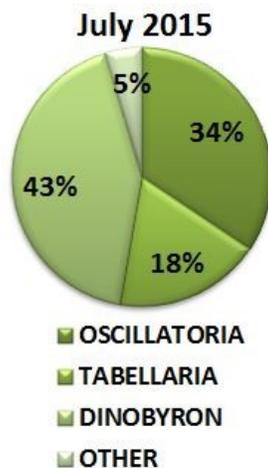
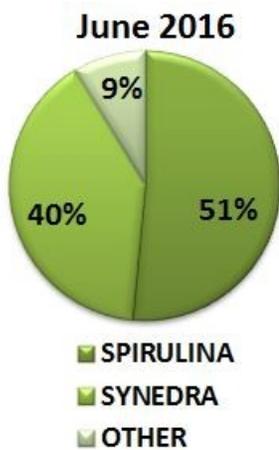
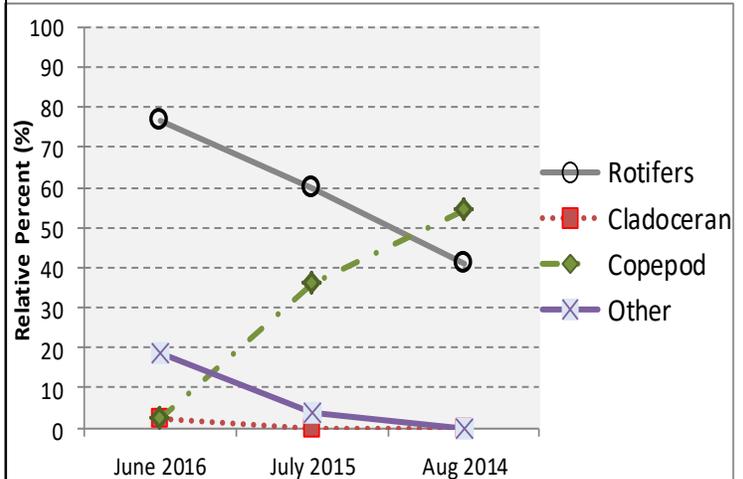
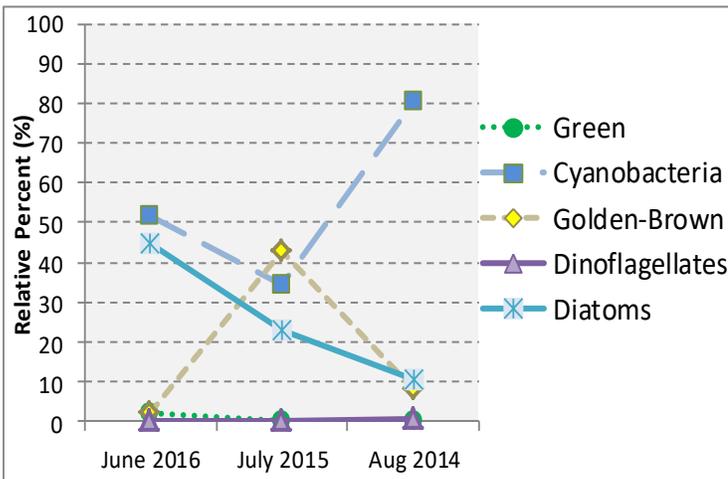
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Dodge Pond, Lempster, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	6	5	4	1
2015	5	4	4	2
2016	6	5	4	1
Total Points:				47
Trophic classification:				Eutrophic



Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



Chemical and Biological Characteristics	Mean	Standard De- viation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.00	0.00	1.00	meter	x
pH	6.35	0.19	6.31	Units	6.60
Acid Neutralizing Capacity (ANC)	5.07	1.53	4.50	mg/L	4.50
Apparent Color	106.67	15.28	110.00	CPU	29.00
Secchi Depth	1.20	0.35	1.00	meter	3.30
Secchi Depth - Scope	2.30	0.57	2.30	meter	unk
Specific Conductance	122.23	28.62	137.90	μS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.59	0.24	0.50	mg/L	0.30
Nitrate + Nitrite Nitrogen	< 0.05	0.00	< 0.05	mg/L	<0.05
Total Phosphorus	17.90	2.55	17.30	μg/L	11.00
Chloride	24.67	5.69	23.00	mg/L	5.00
Sulfate	1.30		1.30	mg/L	4.00
Calcium	12.00		12.00	mg/L	2.58
Magnesium	12.20		12.20	mg/L	0.56
Potassium	0.59		0.59	mg/L	0.48
Sodium	12.30		12.30	mg/L	3.80
Total Organic Carbon	9.60		9.60	mg/L	4.30
<i>Metalimnetic Depth</i>	3.17	0.29	3.00	meter	x
Chlorophyll-a	7.77	2.04	7.59	μg/L	4.39
Total Phosphorus	29.90		29.90	μg/L	unk

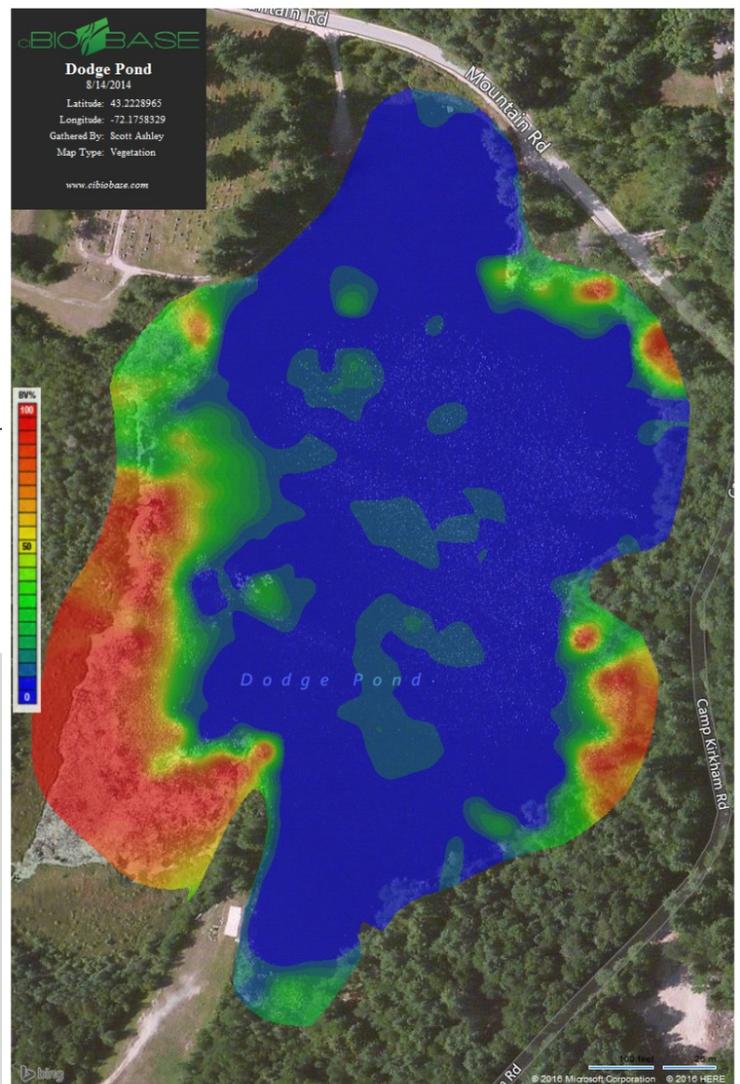
The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of NH waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chloride	Likely good
	Chl-a	No data
	DO Saturation	Likely good
	DO	Likely good
	Total Phosphorus	Likely good
	Turbidity	Likely good
	pH	Poor
Drinking Water	E. coli	Likely bad
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	Good
Secondary Contact Recreation	E. coli	Good
Wildlife	Wildlife	No data



Aquatic Plant Maps

Biovolume Map



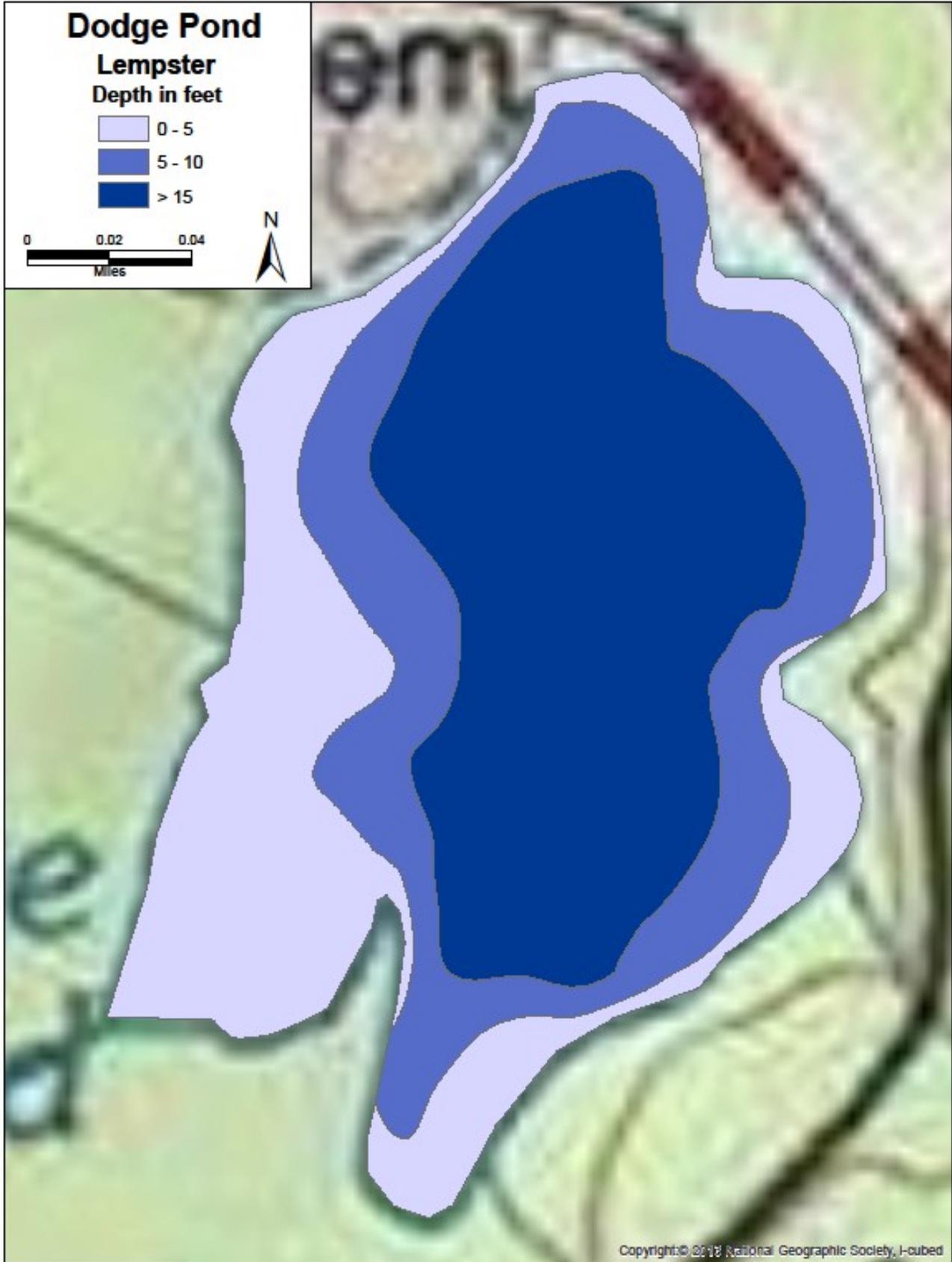
The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Species Key

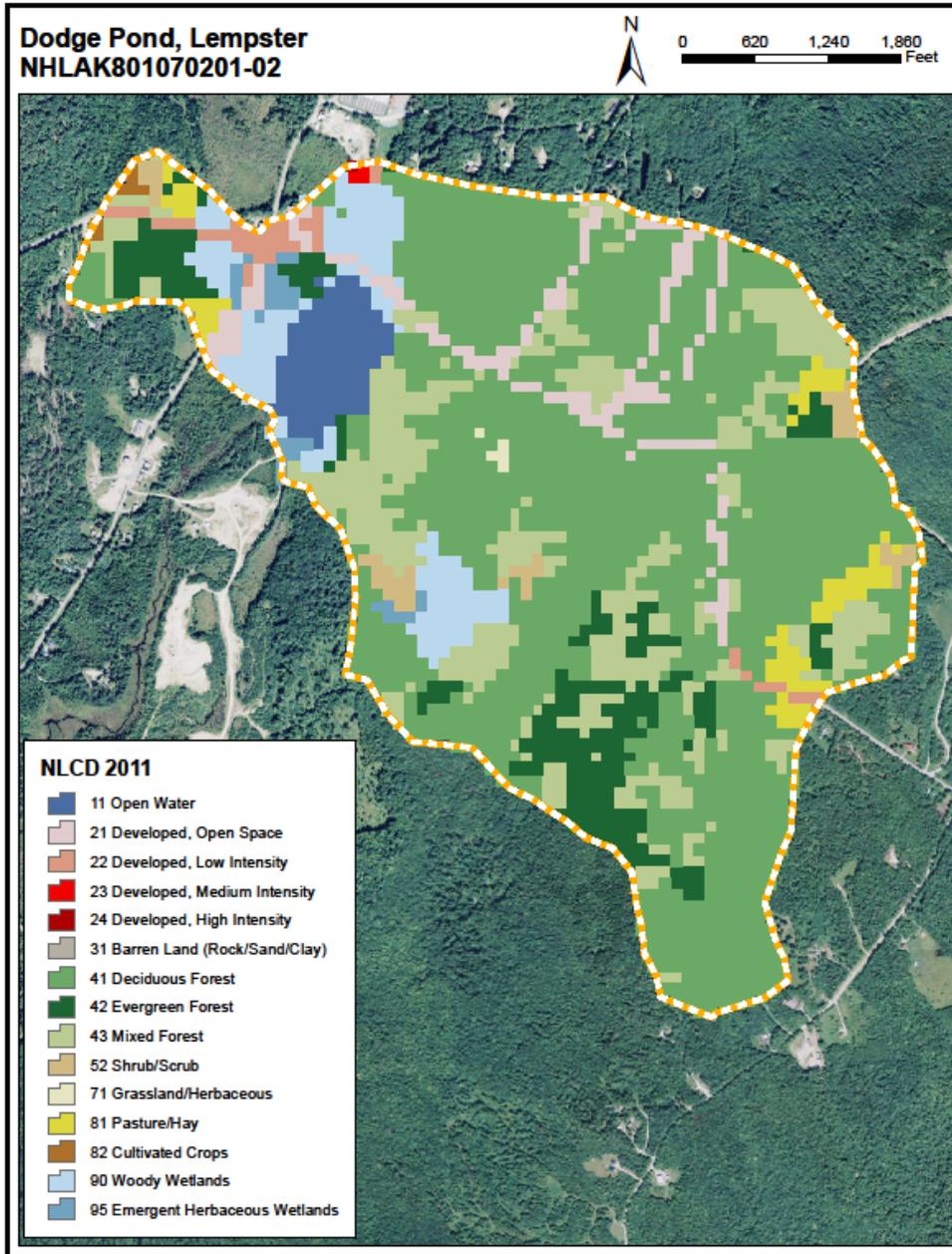
LAKE: DODGE POND		TOWN: LEMPSTER		DATE: 8/14/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
B	Brasenia schreberi	Watershield	Common/Abund	
G	Gramineae	Grass family	Scattered	
H	Nymphoides cordatum	Floating heart	Scattered	
J	Juncus	Rush	Scattered	
N	Nymphaea	White water lily	Common	
P	Pontederia cordata	Pickereelweed	Common	
S	Sparganium	Bur-reed	Common	
T	Typha	Cattail	Sparse	
U	Utricularia	Bladderwort	Scattered	
W	Potamogeton	Pondweed	Scattered	
Y	Nuphar	Yellow water lily	Scat/Common	
OVERALL ABUNDANCE: Common/Abundant				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/ Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	3.45	Barren Land	0.00	Grassland/ Herbaceous	0.18
Developed, Open Space	5.24	Deciduous Forest	52.51	Pasture Hay	2.87
Developed, Low Intensity	1.58	Evergreen Forest	8.30	Cultivated Crops	0.29
Developed, Medium Intensity	0.07	Mixed Forest	16.67	Woody Wetlands	6.14
Developed, High Intensity	0.00	Shrub/ Shrub	1.58	Emergent Wetlands	1.11

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports.](#)

Durand Pond, Randolph, NH has been surveyed once previously in 1997. This unstratified, artificial pond was classified as oligotrophic in the historic trophic survey. The trophic status was determined to be mesotrophic in the current survey due to an increase in aquatic vascular plant abundance and a decrease in Secchi depth. Created in 1964, the impoundment is surrounded by town-owned conservation lands maintained as a park and wildlife refuge. Aquatic vegetation has increased slightly since 1997. Chlorophyll-a concentration was similar to the previous survey, and total phosphorus declined. Specific conductance has increased by approximately 40% and chloride levels have approximately doubled since 1997, indicating road salt is entering the pond. Secchi depth decreased compared to the previous survey, which may be related to the increase in apparent color.

2016 NHDES Trophic Rating:
Mesotrophic
1997 NHDES Trophic Rating:
Oligotrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



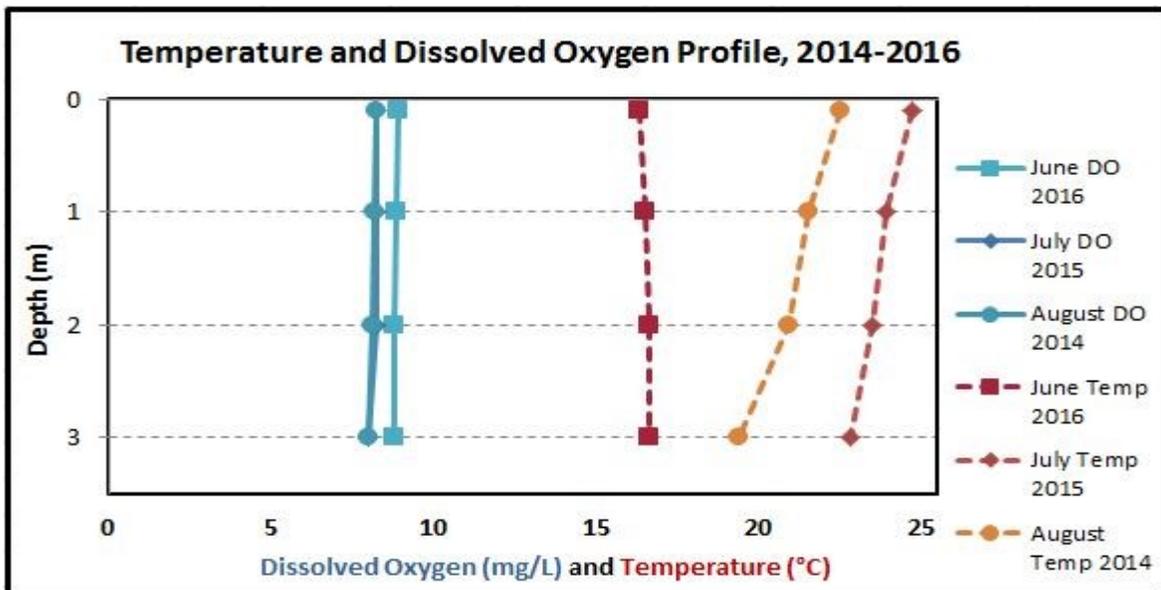
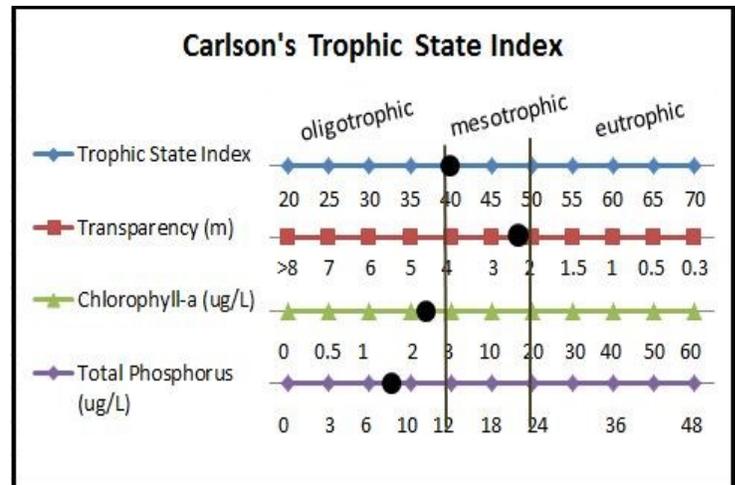
Physical Characteristics			
Elevation:	388 m (1270 ft)	Lake area:	0.033 km ²
Mean depth:	1.3 m	Volume:	42,400 m ³
Maximum depth:	3.1 m	Average Hypolimnion Volume:	N/A
Relative depth:	1.5 %	Average Anoxic Volume:	N/A
Shore Length:	910 m	Flushing rate:	4.2 yr ⁻¹
Shore Configuration:	1.42	P retention coeff:	0.64
Watershed area:	0.2633 km ²	Areal water load:	5.4 m/yr
% Watershed Poned:	0.00%	Lake type:	artificial

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

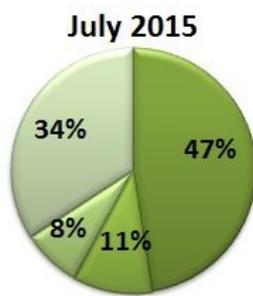
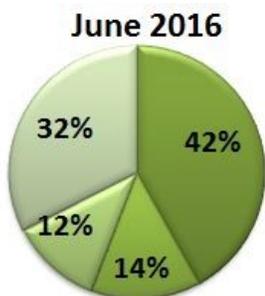
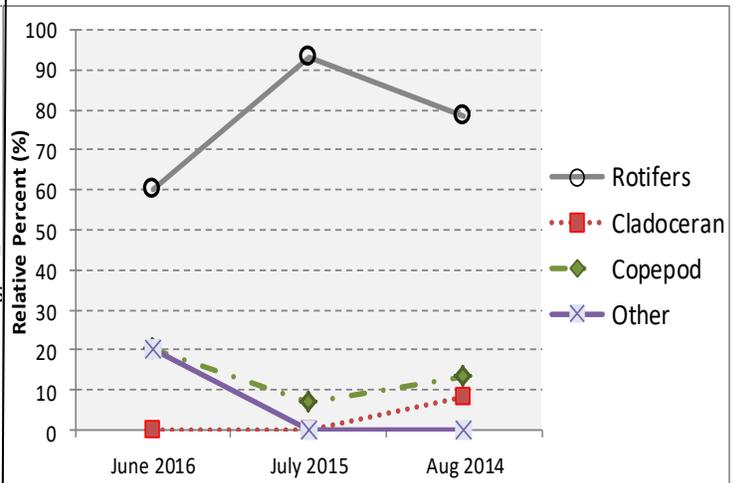
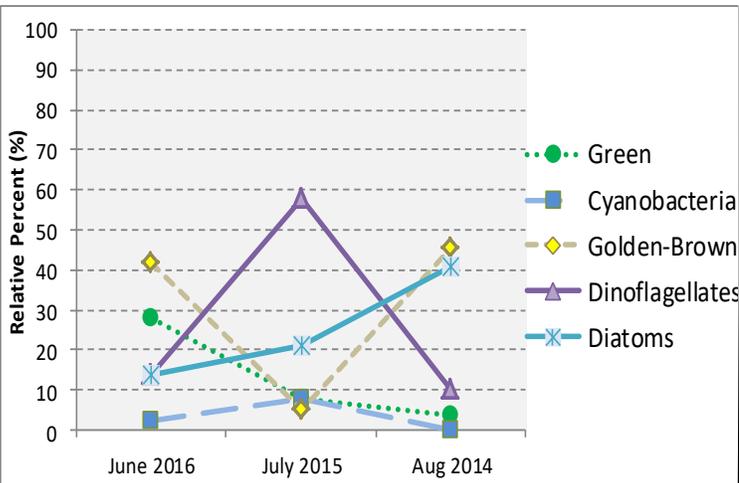
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Durand Pond, Randolph, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	*	3	1	0
2015	*	3	1	0
2016	*	4	1	0
Total Points:				13
Trophic classification:				Mesotrophic



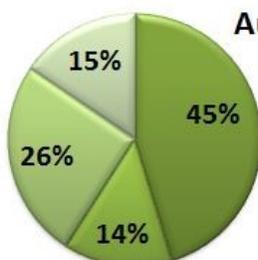
Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

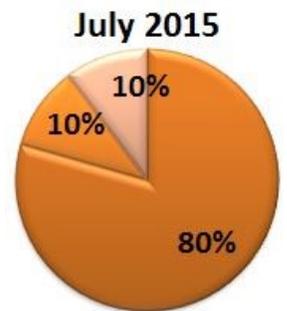


- DINOBYRON
- SPIROGYRA
- MOUGOTIA
- OTHER

- GYMNODINIUM
- PERIDINIUM
- RHIZOLENIA
- OTHER

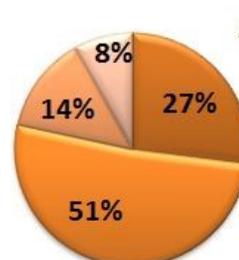


- DINOBYRON
- RHIZOLENIA
- ASTERIONELLA
- OTHER



- SYNCHAETA
- KERATELLA
- NAUPLIUS LARVAE
- ACTINOPHYRS

- KERATELLA
- POLYARTHRA
- OTHER



- KERATELLA
- POLYARTHRA
- NAUPLIUS LARVAE
- BOSMINA

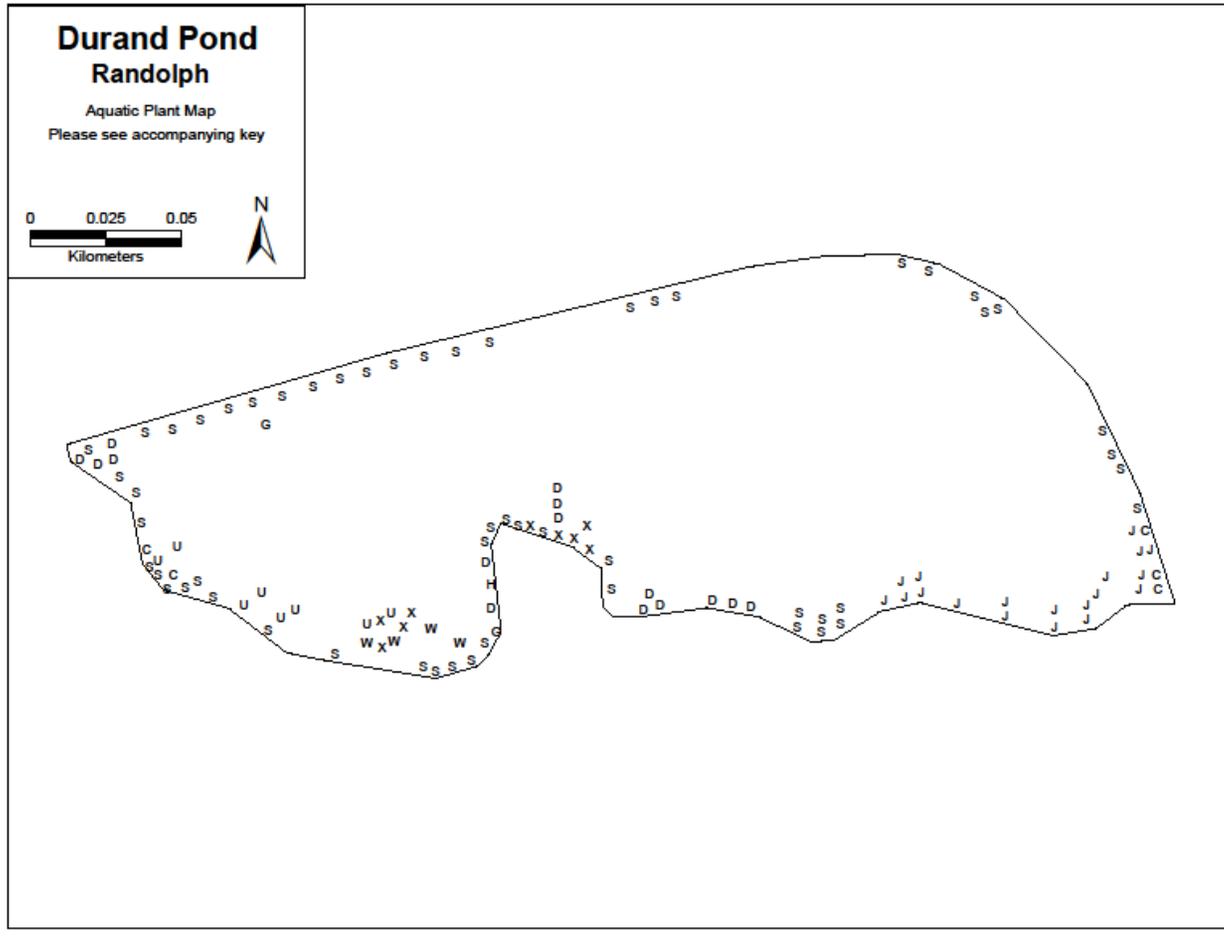
Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.33	0.29	1.50	meter	x
pH	6.37	0.05	6.36	Units	6.60
Acid Neutralizing Capacity (ANC)	3.40	0.87	3.80	mg/L	4.50
Apparent Color	17.67	2.52	18.00	PCU	29.00
Secchi Depth	2.37	0.49	2.50	meter	3.30
Secchi Depth - Scope*	2.82	0.08	2.80	meter	unk
Specific Conductance	43.43	18.48	36.40	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.13	0.00	0.13	mg/L	0.30
Nitrate + Nitrite Nitrogen	< 0.05	0.00	< 0.05	mg/L	<0.05
Total Phosphorus	8.21	1.67	7.94	µg/L	11.00
Chloride	7.97	3.55	6.60	mg/L	5.00
Sulfate	2.10		2.10	mg/L	4.00
Calcium	1.08		1.08	mg/L	2.58
Magnesium	0.40		0.40	mg/L	0.56
Potassium	1.89		1.89	mg/L	0.48
Sodium	3.69		3.69	mg/L	3.80
Total Organic Carbon	2.50		2.50	mg/L	4.30
<i>Metolimnetic Depth</i>	2.33	0.58	2.00	meter	x
Chlorophyll- <i>a</i>	2.17	0.92	2.12	µg/L	4.39

*Visible on bottom

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chl-a	No data
	DO Saturation	No data
	DO	No data
	Total Phosphorus	No data
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	Chl-a	No data
	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

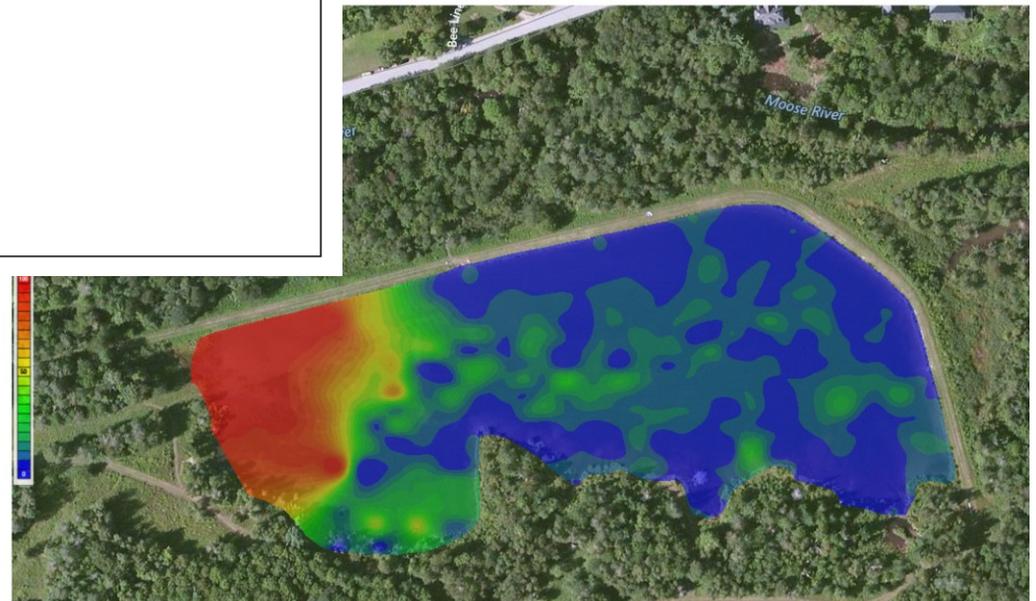
Aquatic Plant Species Map



Aquatic Plant Maps

The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red, and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Biovolume Map

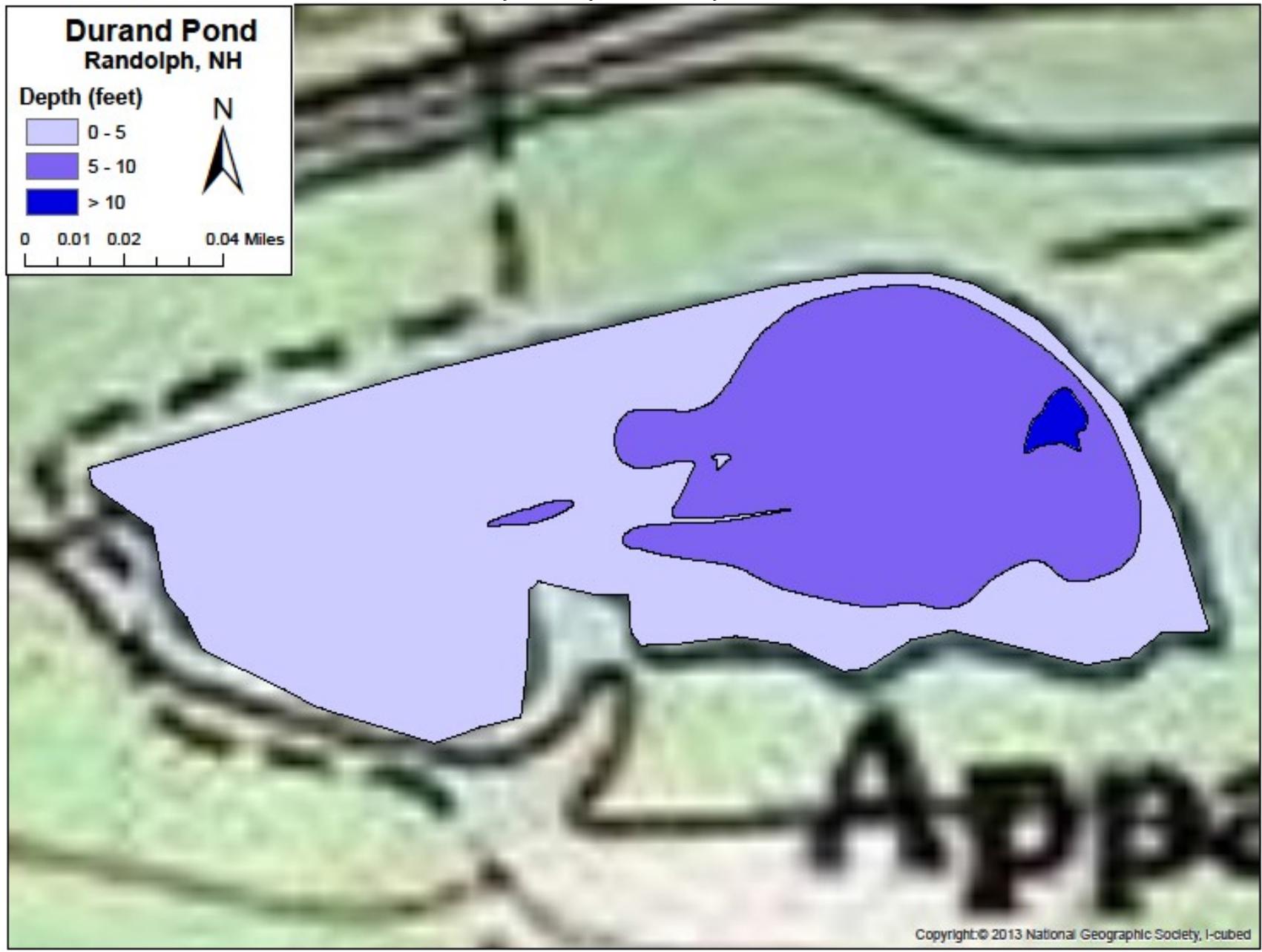


Aquatic Plant Species Key

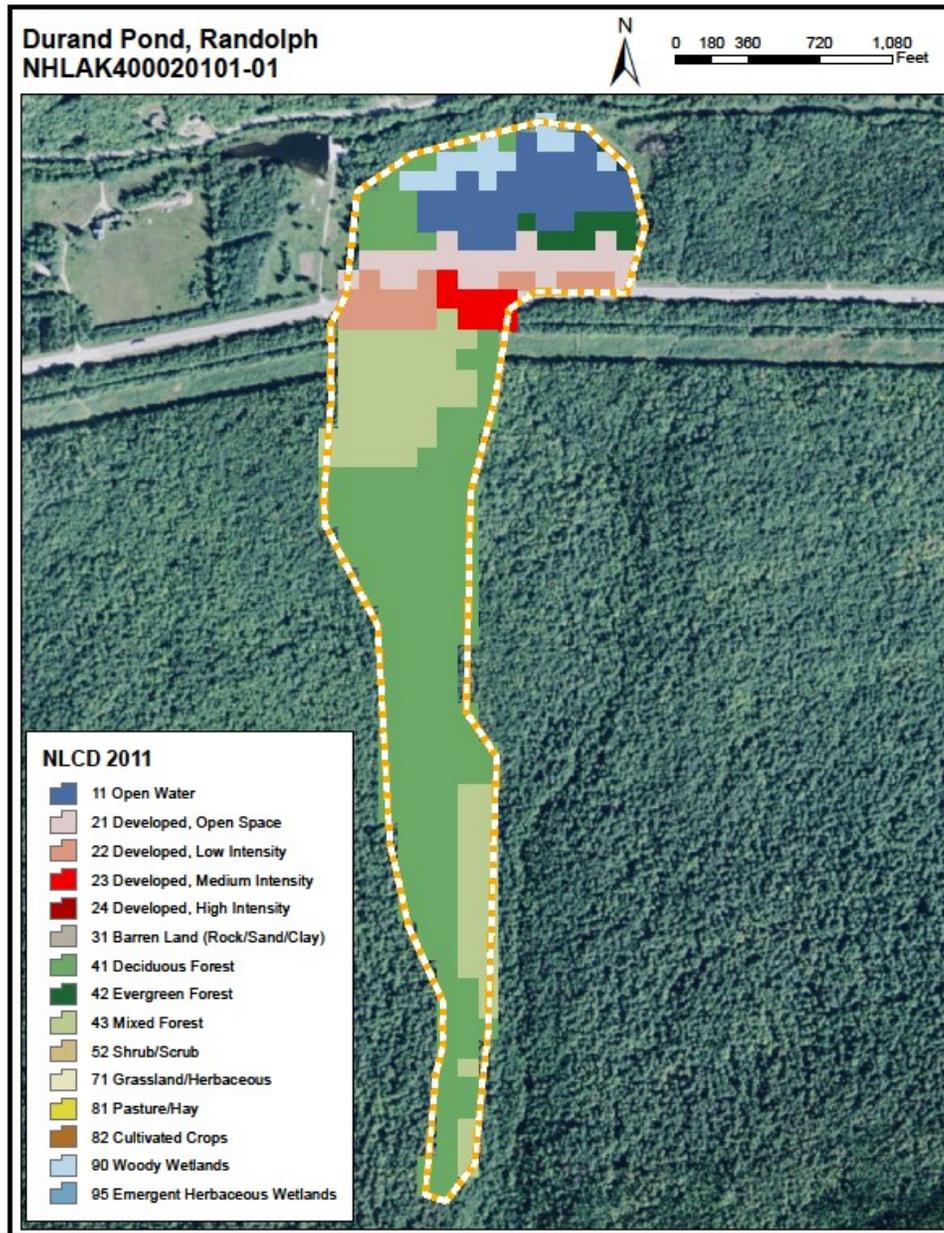
LAKE: DURAND POND		TOWN: RANDOLPH		DATE: 8/11/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
C	Cyperus	Sedge	Sparse	
D	Dulichium arundinaceum	Three-way sedge	Sparse	
G	Gramineae	Grass family	Sparse	
H	Hypericum	St. John's-wort	Sparse	
J	Juncus	Rush	Scattered	
S	Sparganium	Bur-reed	Scattered	
U	Utricularia	Bladderwort	Sparse	
W	Potamogeton	Pondweed	Sparse	
X		Sterile bottom rosette	Sparse	
OVERALL ABUNDANCE: Scattered				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/ Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	10.14	Barren Land	0.00	Grassland/ Herbaceous	0.00
Developed, Open Space	6.96	Deciduous Forest	49.28	Pasture Hay	0.00
Developed, Low Intensity	4.93	Evergreen Forest	2.32	Cultivated Crops	0.00
Developed, Medium Intensity	2.32	Mixed Forest	20.29	Woody Wetlands	3.77
Developed, High Intensity	0.00	Shrub/ Shrub	0.00	Emergent Wetlands	0.00

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Lovell Lake, Wakefield, NH was previously surveyed in 1979, 1986 and 1999 under the Lake Trophic Survey Program. Historic and current surveys have rated the lake as oligotrophic. Aquatic vegetation density has increased since the previous surveys, with the greatest increase in bassweed (*Potamogeton amplifolius*). Invasive species purple loosestrife (*Lythrum salicaria*) is present around the shoreline. The lake reflects improvements in water quality parameters attributed to the reduction of acid rain due to the Clean Air Act, as pH, acid neutralizing capacity and select cations have increased while sulfate concentration has decreased. For more information about acid rain effects on New Hampshire lakes and ponds, [click here](#). The lake also reflects anthropogenic influences such as road salt because specific conductance, chloride and sodium concentration have steadily increased with each survey. Total phosphorus and chlorophyll-*a* concentrations appear to be fairly constant. During the 2014 survey, two adult loons, a baby loon, freshwater mussels, Canada geese, a bald eagle and a great blue heron were observed.

2016 NHDES Trophic Rating:

Oligotrophic

1999 NHDES Trophic Rating:

Oligotrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



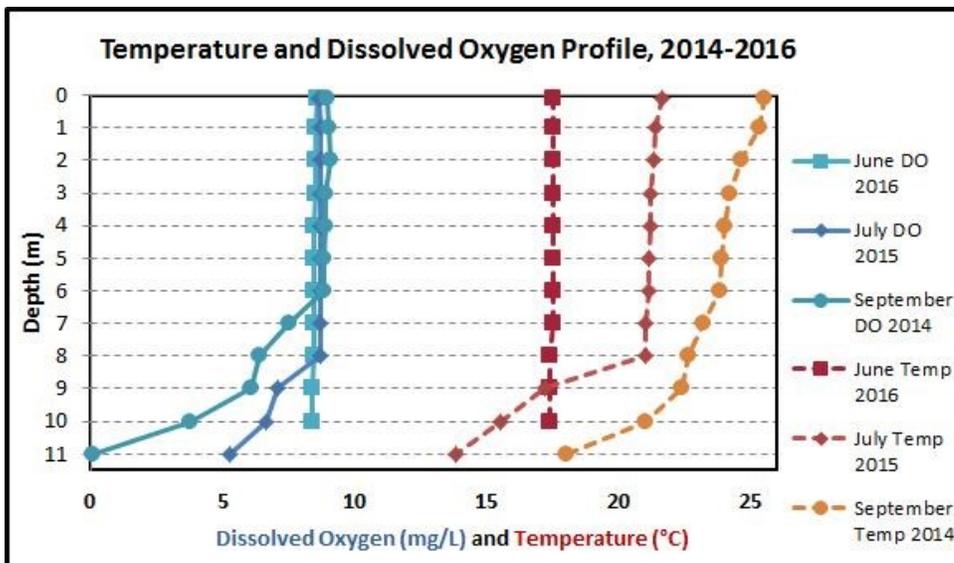
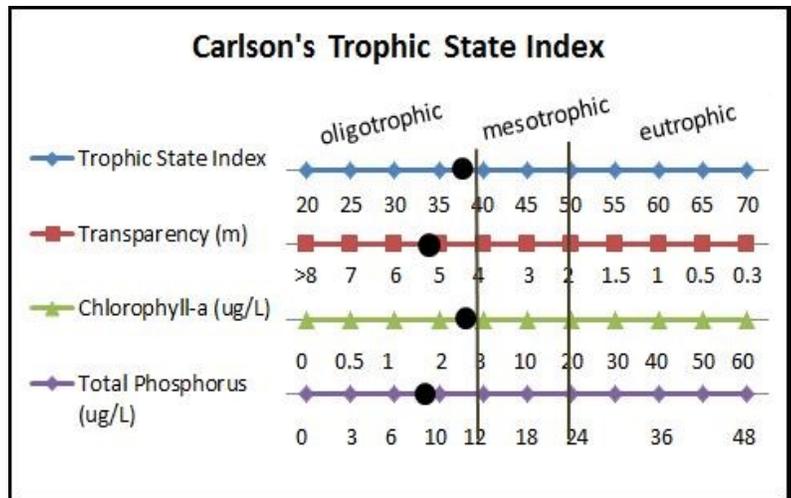
Physical Characteristics			
Elevation:	173 m (568 ft)	Lake area:	2.241 km ²
Mean depth:	5.8 m	Volume:	13,046,900 m ³
Maximum depth:	11.5 m	Average Hypolimnion Volume:	718,000 m ³
Relative depth:	0.68%	Average Anoxic Volume:	90,400 m ³
Shore Length:	13700 m	Flushing rate:	0.61 yr ⁻¹
Shore Configuration:	2.58	P retention coeff:	0.72
Watershed area:	12.7429 km ²	Areal water load:	3.57 m/yr
% Watershed Poned:	0.00%	Lake type:	natural w/ dam

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

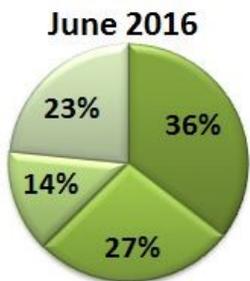
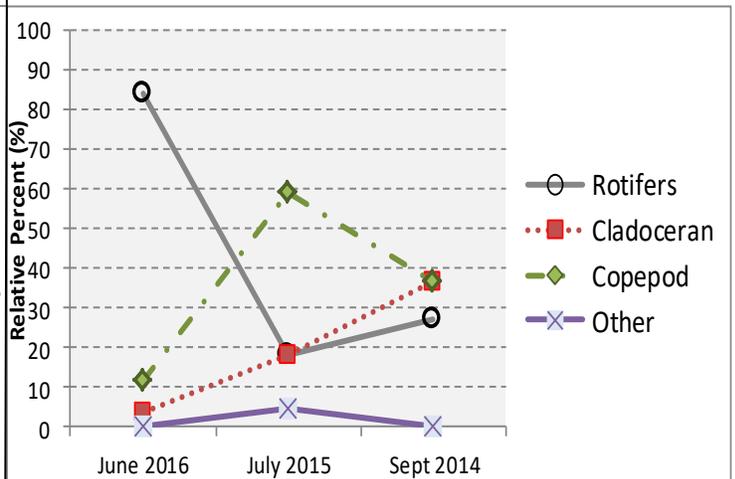
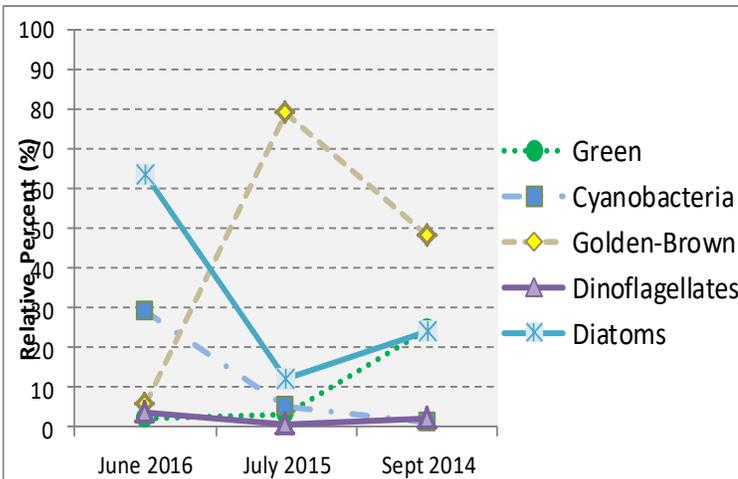
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Lovell Lake, Wakefield, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	4	1	2	0
2015	0	1	2	0
2016	*	1	2	1
Total Points:				14
Trophic classification:				Oligotrophic

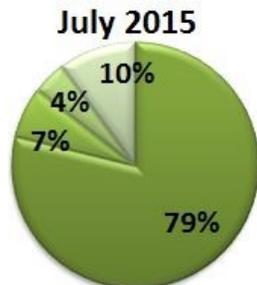


Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

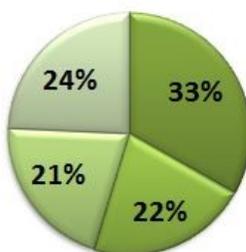
Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



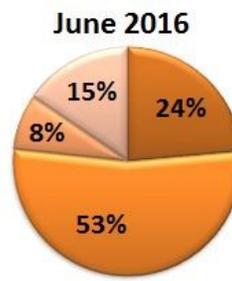
- ASTERIONELLA
- ANABAENA
- TABELLARIA
- OTHER



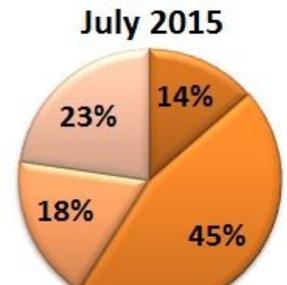
- DINOBYRON
- RHIZOSOLENIA
- ANABAENA
- OTHER



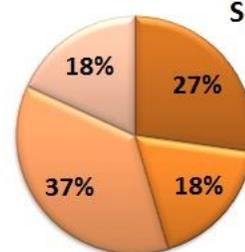
- CHRYSOSPHAERELLA
- MOUGOTIA
- TABELLARIA
- OTHER



- KERATELLA
- SYNCHAETA
- CYCLOPID COPEPOD
- OTHER



- CALANOID COPEPOD
- NAUPLIUS LARVAE
- DAPHNIA
- OTHER



- DAPHNIA
- KERATELLA
- COPEPOD ADULT
- OTHER

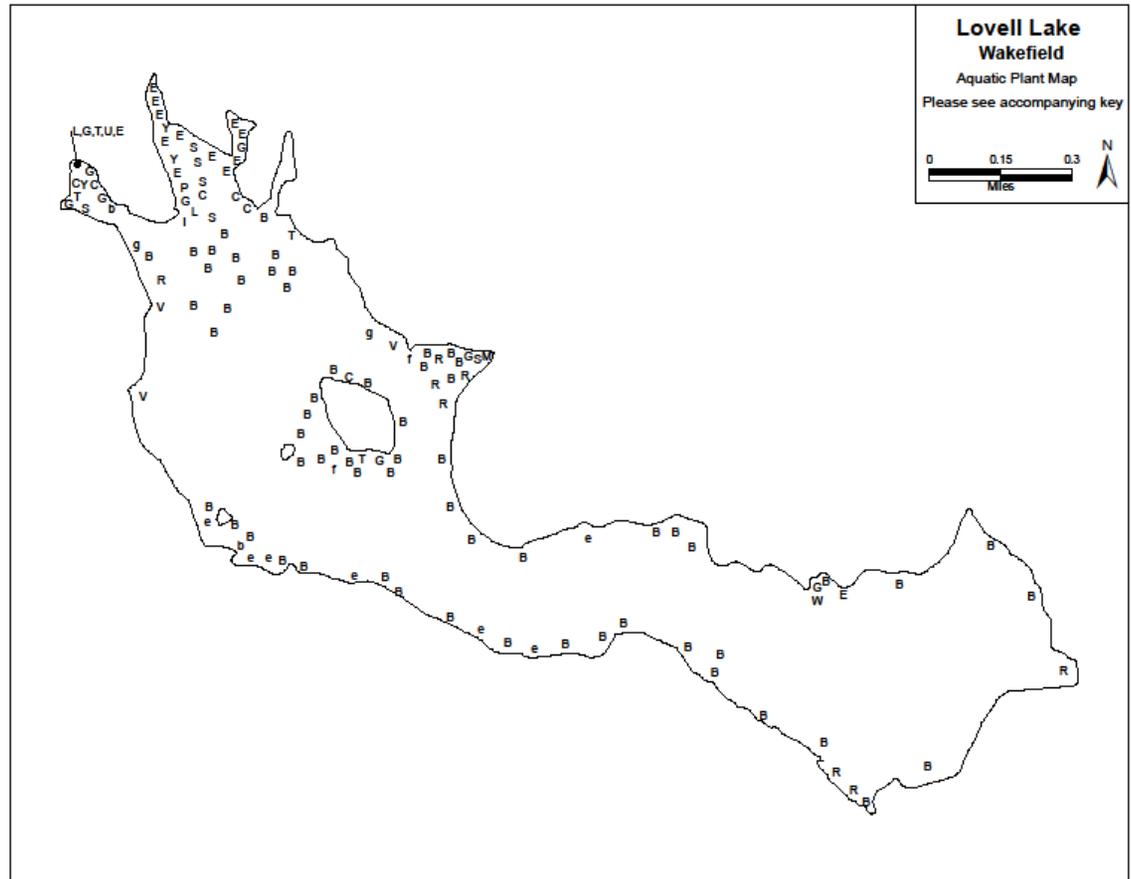
Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	4.67	0.58	5.00	meter	x
pH	7.13	0.17	7.17	Units	6.60
Acid Neutralizing Capacity (ANC)	15.00	1.49	15.60	mg/L	4.50
Apparent Color	17.50	3.54	17.50	CPU	29.00
Secchi Depth	5.22	0.25	5.10	meter	3.30
Secchi Depth - Scope	6.09	0.36	6.30	meter	unk
Specific Conductance	118.67	12.91	123.70	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.17	0.08	0.13	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	0.03	mg/L	<0.05
Total Phosphorus	9.01	1.54	9.43	µg/L	11.00
Chloride	20.67	0.58	21.00	mg/L	5.00
Sulfate	2.30		2.30	mg/L	4.00
Calcium	6.00		6.00	mg/L	2.58
Magnesium	0.88		0.88	mg/L	0.56
Potassium	0.66		0.66	mg/L	0.48
Sodium	12.90		12.90	mg/L	3.80
Total Organic Carbon	2.50		2.50	mg/L	4.30
<i>Metalimnetic Depth</i>	6.67	1.53	7.00	meter	x
Chlorophyll-a	2.86	1.53	2.51	µg/L	4.39
<i>Hypolimnetic Depth</i>	10.50		10.50	meter	x
Total Phosphorus	8.93		8.93	µg/L	14

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

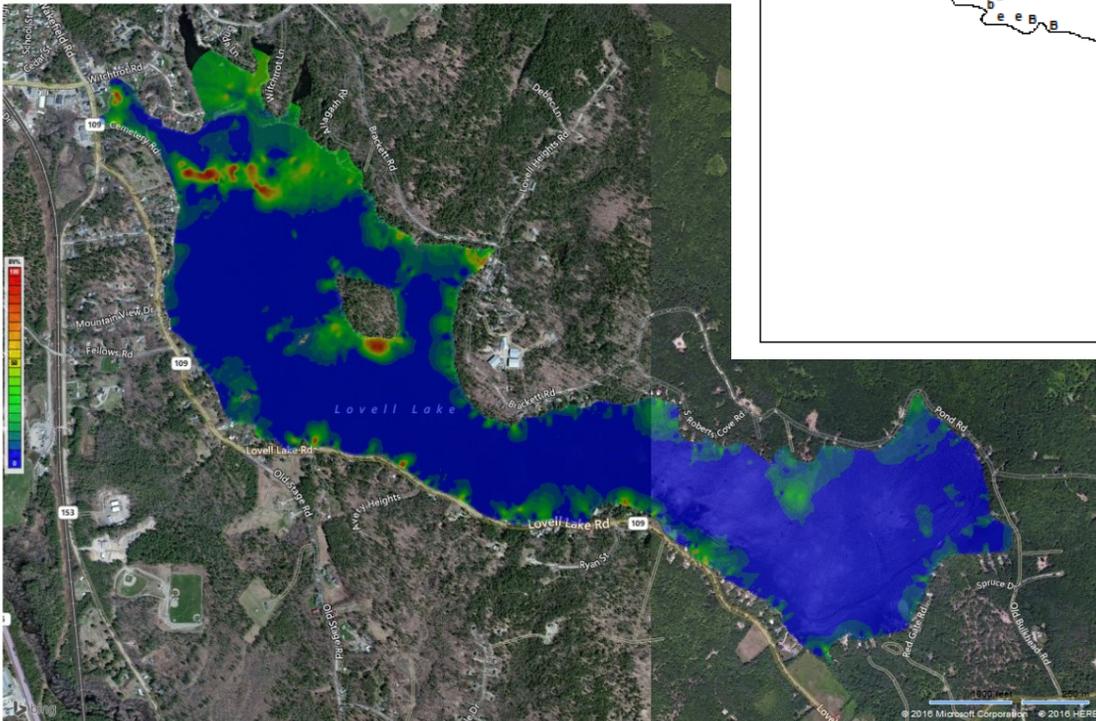
Designated Use	Parameter	Category
Aquatic Life	Chloride	Likely good
	Chl-a	Marginal
	DO Saturation	Likely good
	DO	Likely good
	Total Phosphorus	Likely good
	pH	Likely bad
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	Chl-a	Good
	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

Aquatic Plant Maps

Aquatic Plant Species Map



Aquatic Plant Biovolume Map



The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red, and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

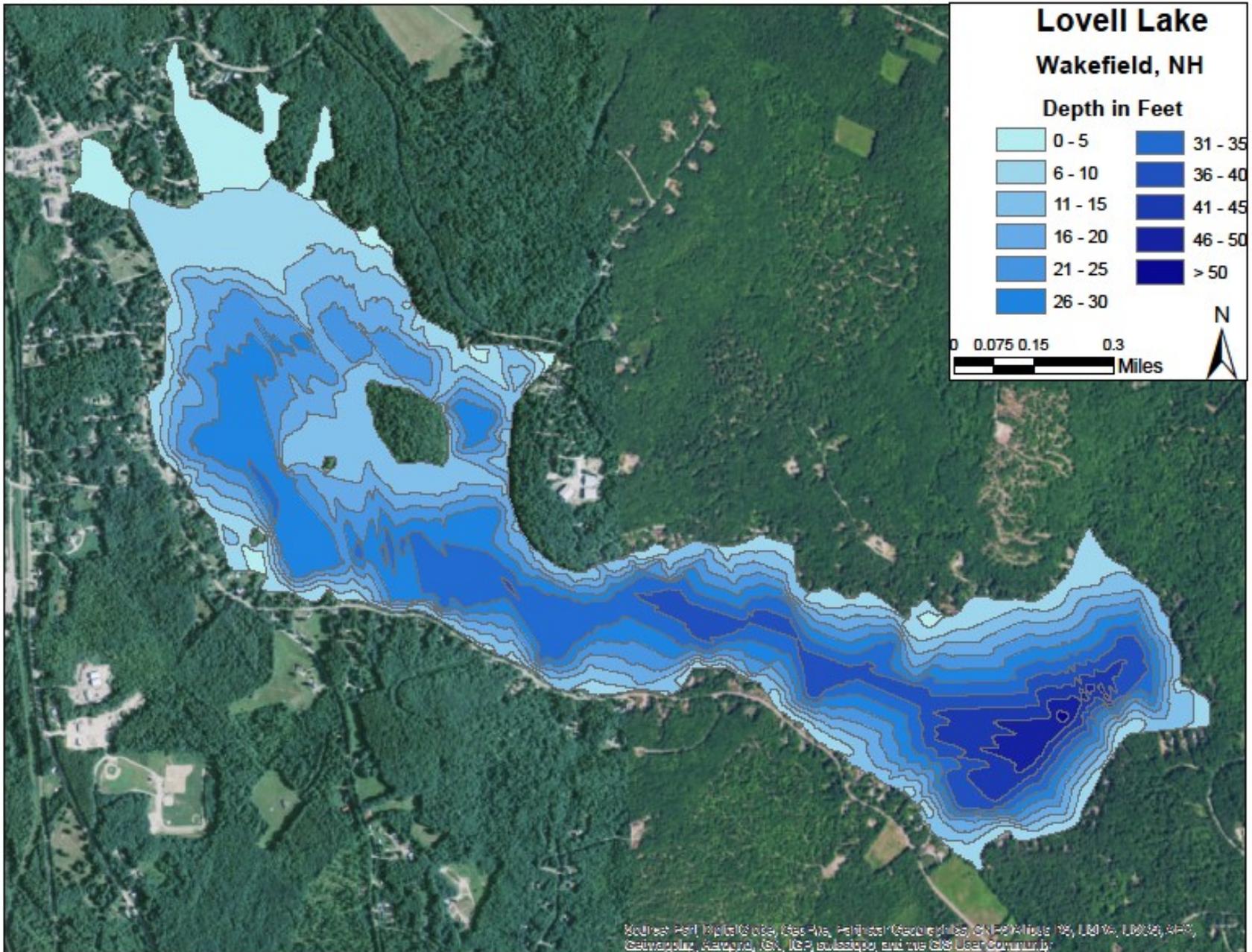
Aquatic Plant Species Key

LAKE: LOVELL LAKE		TOWN: WAKEFIELD		DATE: 9/4/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
b	Scirpus	Bulrush	Sparse	
B	Potamogeton amplifolius	Bass weed	Scat/Common	
C	Cyperus	Sedge	Scattered	
E	Eleocharis	Spike rush - sterile, grassy	Scattered	
e	Eriocaulon septangulare	Pipewort	Scattered	
f		Filamentous algae	Sparse	
g	Potamogeton spp.	Grassy pondweed	Scattered	
G	Sparganium	Bur-reed	Sparse	
L	Lythrum salicaria*	Purple loosestrife*	Sparse	
M	Myrica gale	Sweetgale	Sparse	
P	Pontederia cordata	Pickerelweed	Sparse	
R	Potamogeton robbinsii	Robbins pondweed	Scattered	
S	Sparganium	Bur-reed	Sparse	
T	Typha	Cattail	Sparse	
V	Vallisneria americana	Tape grass	Sparse	
Y	Nuphar	Yellow water lily	Sparse	
OVERALL ABUNDANCE: Scattered/Common				

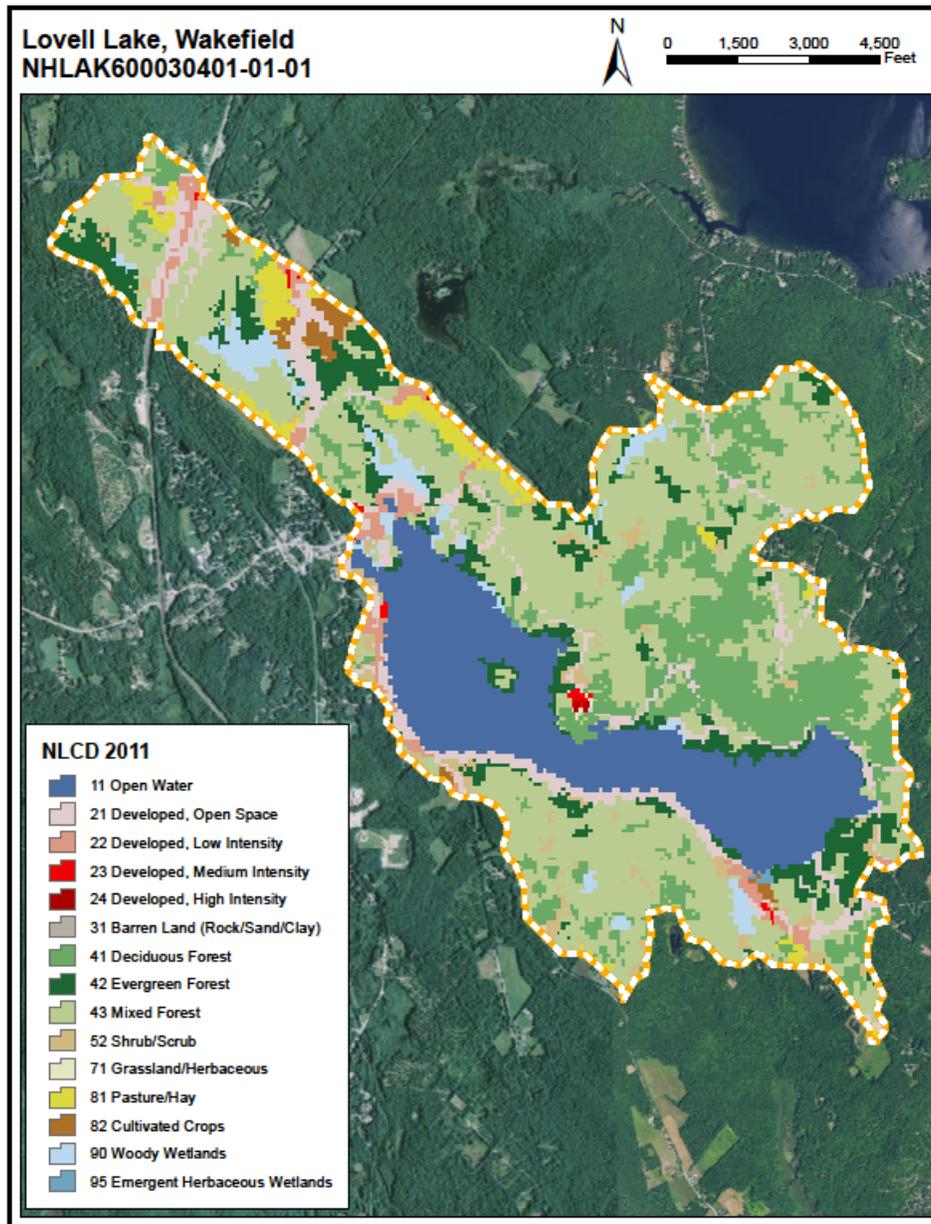
*Non-native species

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	17.42	Barren Land	0.00	Grassland/ Herbaceous	0.05
Developed, Open Space	7.52	Deciduous Forest	15.50	Pasture/ Hay	2.87
Developed, Low Intensity	2.40	Evergreen Forest	9.58	Cultivated Crops	0.97
Developed, Medium Intensity	0.32	Mixed Forest	36.79	Woody Wetlands	3.21
Developed, High Intensity	0.05	Shrub/ Shrub	3.20	Emergent Wetlands	0.12

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Baxter Mill Dam Pond, Rochester, NH is an impoundment on the Salmon Falls River and has never been surveyed previously under the Lake Trophic Survey Program. It received a trophic classification of mesotrophic. A dissolved oxygen and temperature profile was not available for the 2014 sample season. Chemical and biological measurements from 2016 are not included in this report because Baxter Mill was not impounded during the site visit. Acid neutralizing capacity was more than double the state median; however, the mean pH value was similar. Specific conductance was above 100 $\mu\text{s}/\text{cm}$ and both chloride and sodium were more than four times higher than the state medians, strongly suggesting the waterbody is anthropogenically influenced by such pollutants as road salt or septic systems. The invasive species purple loosestrife (*Lythrum salicaria*) was present on the shoreline. Baxter Mill Dam Pond, despite impoundment, was riverine, and we recommend it not be sampled under the Lake Trophic Survey Program in the future.

2016 NHDES Trophic Rating:

Mesotrophic

Previous NHDES Trophic Rating:

None

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



Physical Characteristics			
Elevation:	59 m (193.9 ft)	Lake area:	0.019 km ²
Mean depth:	0.3 m	Volume:	5600 m ³
Maximum depth:	2 m	Average Metalimnion Volume:	N/A
Relative depth:	1.3%	Average Anoxic Volume:	N/A
Shore Length:	12030 m	Flushing rate:	27089.6 yr ⁻¹
Shore Configuration:	24.87	P retention coeff:	0.0001
Watershed area:	259.62 km ²	Areal water load:	896.23 m/yr
% Watershed Poned:	2.3%	Lake type:	artificial

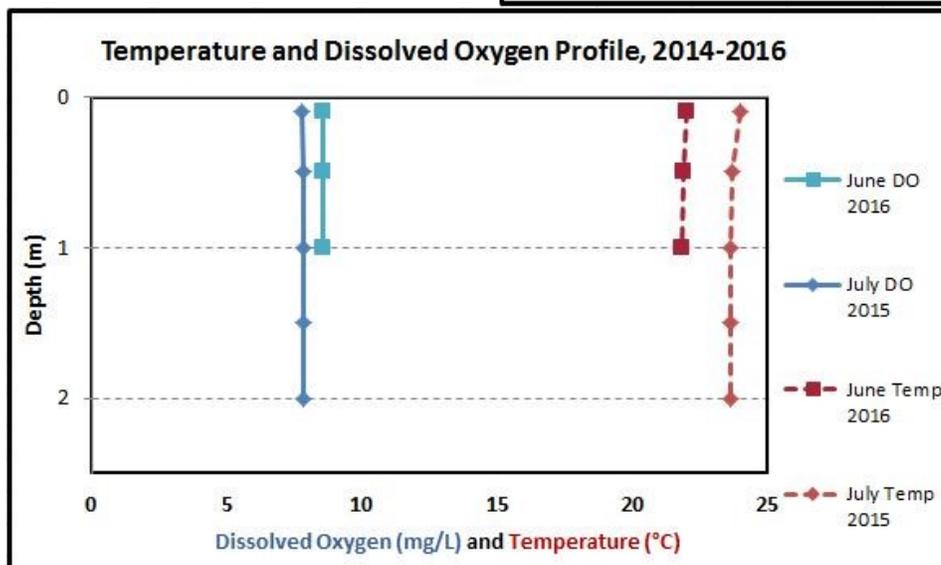
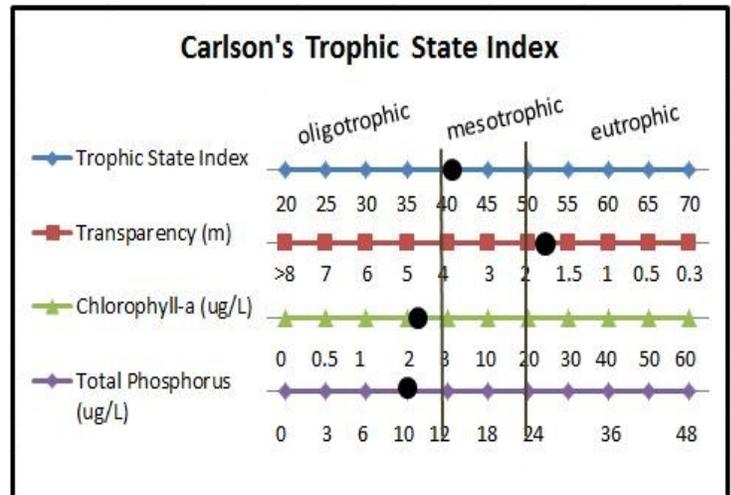
Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

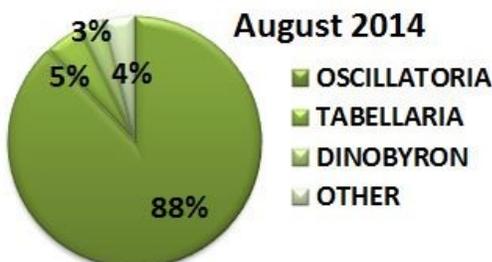
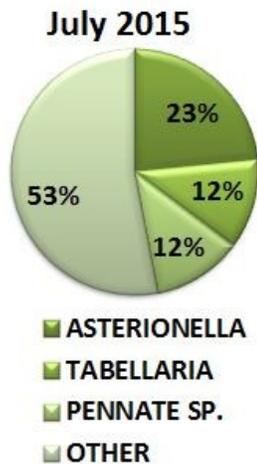
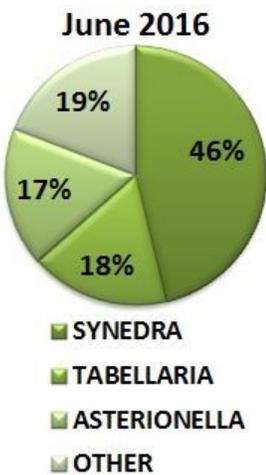
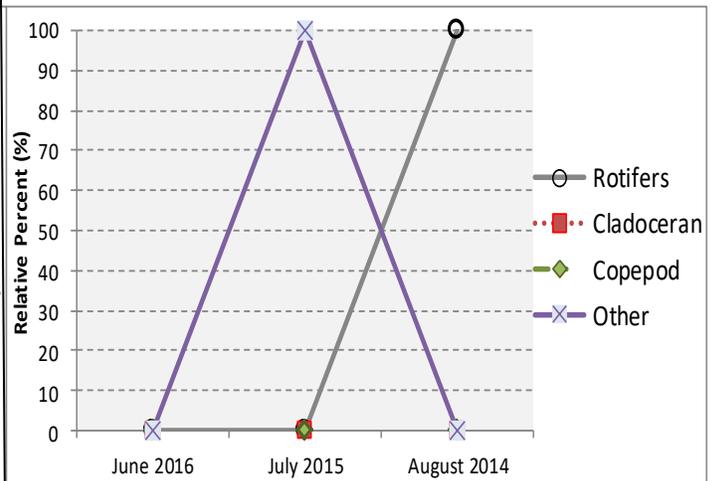
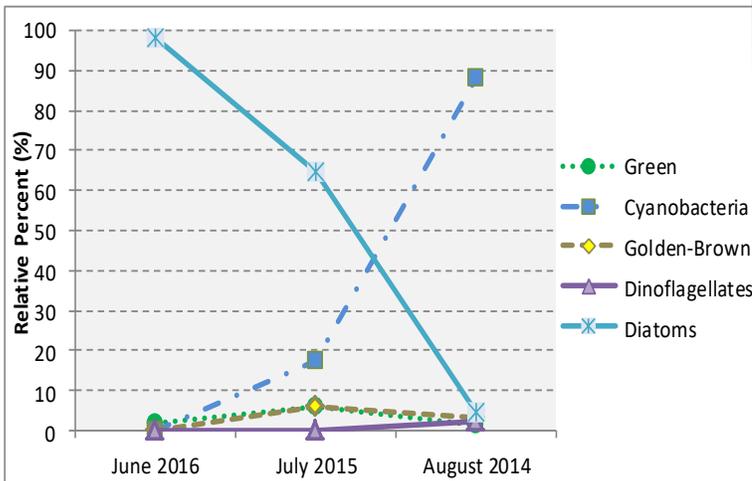
NHDES Trophic Classification: 2014 - 2016				
Salmon Falls River - Baxter Mill Dam Pond, Rochester, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	*	4	2	0
2015	*	4	2	0
2016	x	x	x	x
Total Points:				12
Trophic classification:				Mesotrophic

* Waterbody was not impounded at time of visit. Data not used for trophic calculation.



Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



No zooplankton observed in June 2016



August 2014

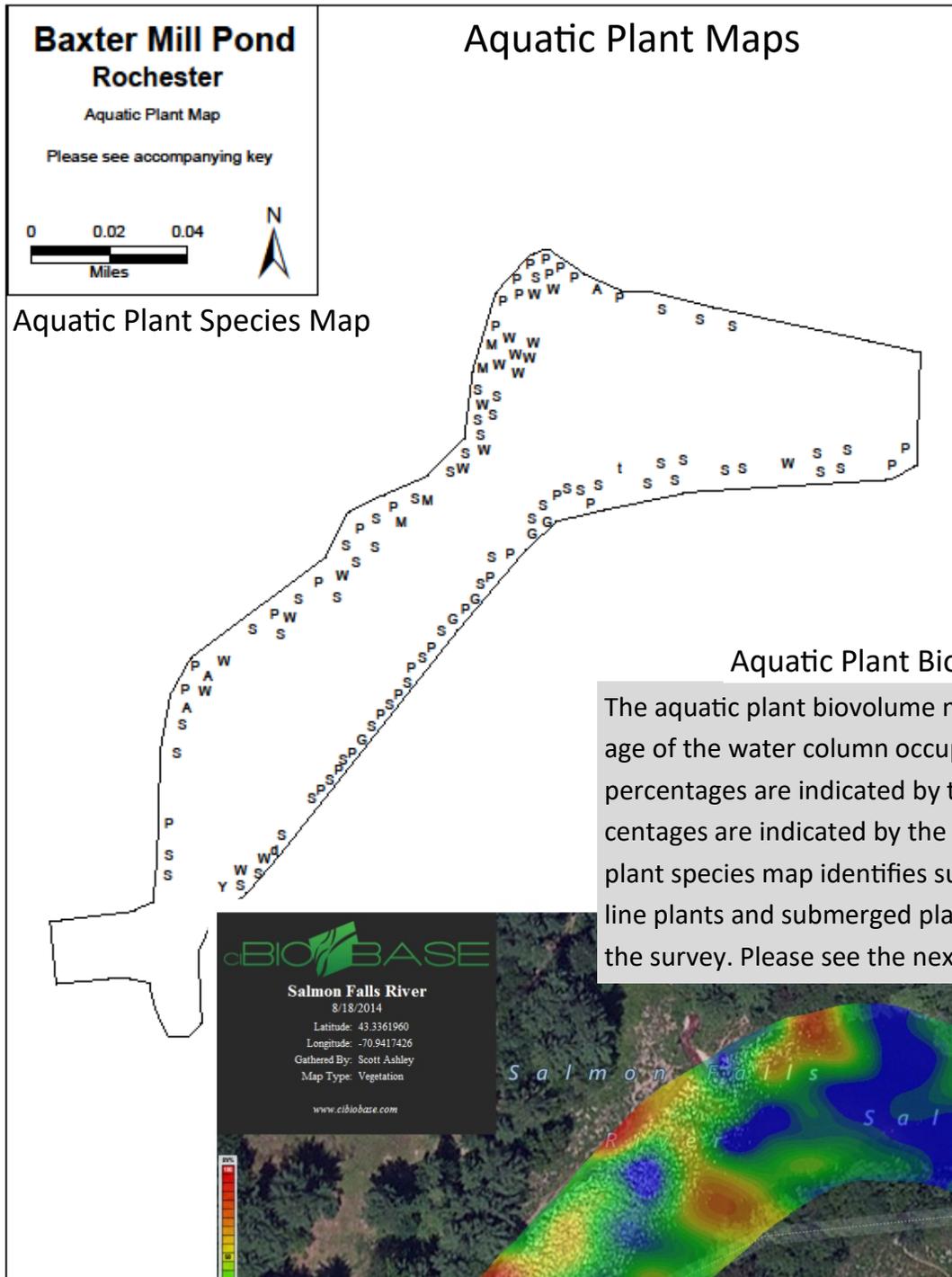


Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.00	0.00	1.00	meter	x
pH	6.43	0.24	6.43	Units	6.60
Acid Neutralizing Capacity (ANC)	10.80	0.42	10.80	mg/L	4.50
Apparent Color	41.00	5.66	41.00	CPU	29.00
Secchi Depth	1.85*	0.21	1.85*	meter	3.30
Secchi Depth - Scope	1.85*	0.21	1.85*	meter	unk
Specific Conductance	104.15	19.45	104.15	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.50	0.19	0.50	mg/L	0.30
Nitrate + Nitrite Nitrogen	0.04	0.02	0.04	mg/L	<0.05
Total Phosphorus	10.67	2.31	10.67	µg/L	11.00
Chloride	19.50	0.71	19.50	mg/L	5.00
Sulfate	1.90		1.90	mg/L	4.00
Calcium	2.55		2.55	mg/L	2.58
Magnesium	0.52		0.52	mg/L	0.56
Potassium	0.63		0.63	mg/L	0.48
Sodium	12.80		12.80	mg/L	3.80
Total Organic Carbon	5.40		5.40	mg/L	4.30
Chlorophyll-a	2.13	0.08	2.13	µg/L	4.39

* Visible on bottom

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chloride	Likely good
	Chl-a	No data
	DO Saturation	Likely good
	DO	Likely good
	Non native aquatic	Severe
	Turbidity	Likely good
	pH	Poor
Drinking Water	E. coli	Likely bad
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	Poor
Secondary Contact Recreation	E. coli	Poor
Wildlife	Wildlife	No data

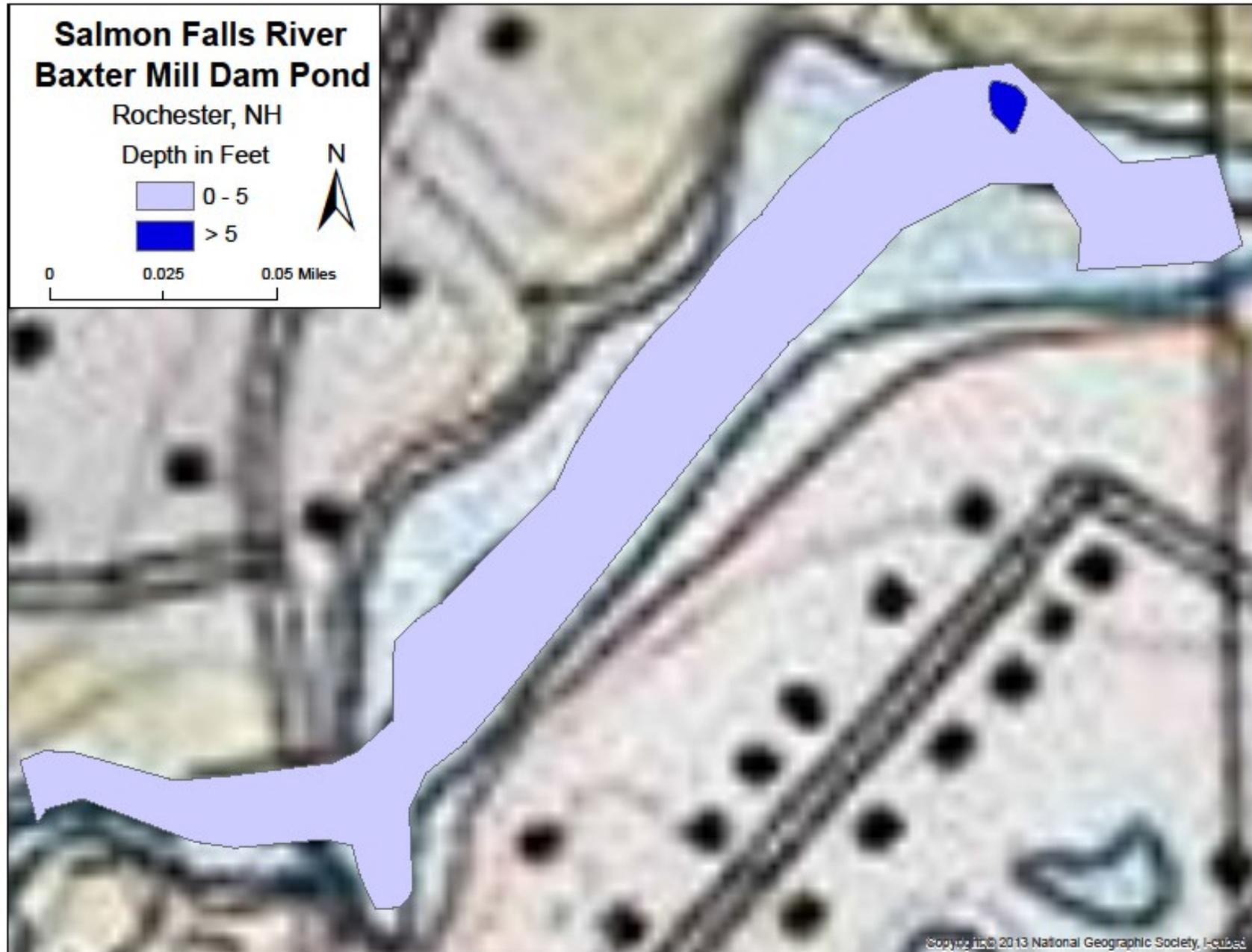


Aquatic Plant Species Key

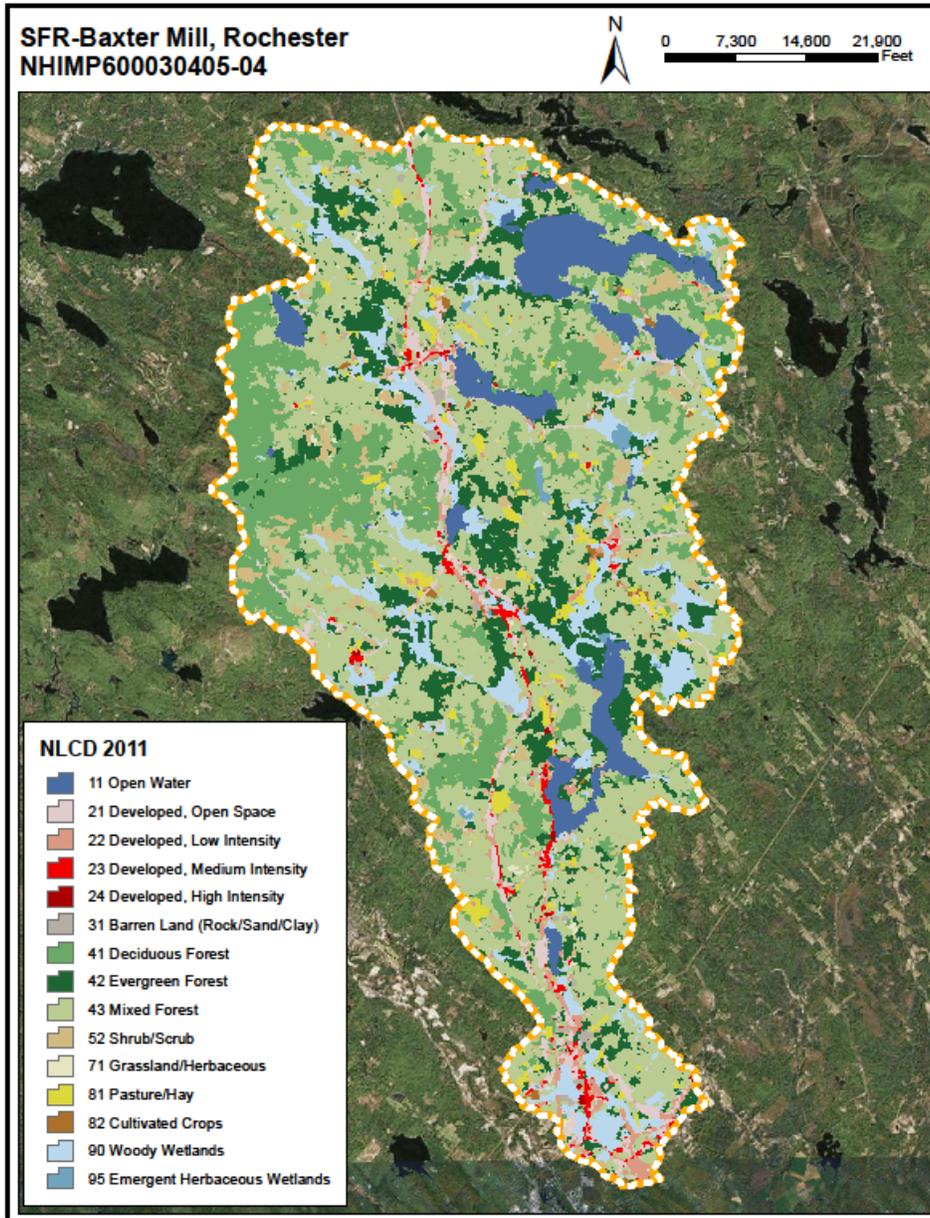
LAKE: SALMON FALLS RIVER - BAXTER MILL DAM POND		TOWN: ROCHESTER		DATE: 8/18/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
A	Sagittaria	Arrowhead	Sparse	
d	Dulichium arundinaceum	Three-way sedge	Sparse	
G	Gramineae	Grass family	Scattered	
M	Myriophyllum humile	Native milfoil	Sparse	
P	Pontederia cordata	Pickereelweed	Scat/ Common	
S	Sparganium	Bur-reed	Scat/ Common	
t	Typha	Cattail	Sparse	
W	Potamogeton	Pondweed	Scattered	
Y	Nuphar	Yellow water lily	Sparse	
OVERALL ABUNDANCE: Scattered/ Common				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	5.70	Barren Land	0.46	Grassland/ Herbaceous	0.57
Developed, Open Space	5.07	Deciduous Forest	17.50	Pasture Hay	2.90
Developed, Low Intensity	2.34	Evergreen Forest	14.09	Cultivated Crops	0.39
Developed, Medium Intensity	0.96	Mixed Forest	34.63	Woody Wetlands	7.55
Developed, High Intensity	0.13	Shrub/ Shrub	7.04	Emergent Wetlands	0.66

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Waumbek Dam Pond, Milton, NH is an unstratified impoundment on the Salmon Falls River and has never been previously surveyed under the Lake Trophic Survey Program. There is no boat launch, but is adjacent to a public park. The 2014-2016 trophic survey classified this waterbody as mesotrophic. Acid neutralizing capacity was almost three times higher than the state median; however, pH was similar. Chloride and sodium levels were almost four and three times higher than the state medians, respectively, and specific conductance was high. This suggests Waumbek Dam Pond is subject to anthropogenic pressures such as road salt or septic system inputs.

2016 NHDES Trophic Rating:

Mesotrophic

Previous NHDES Trophic Rating:

None

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



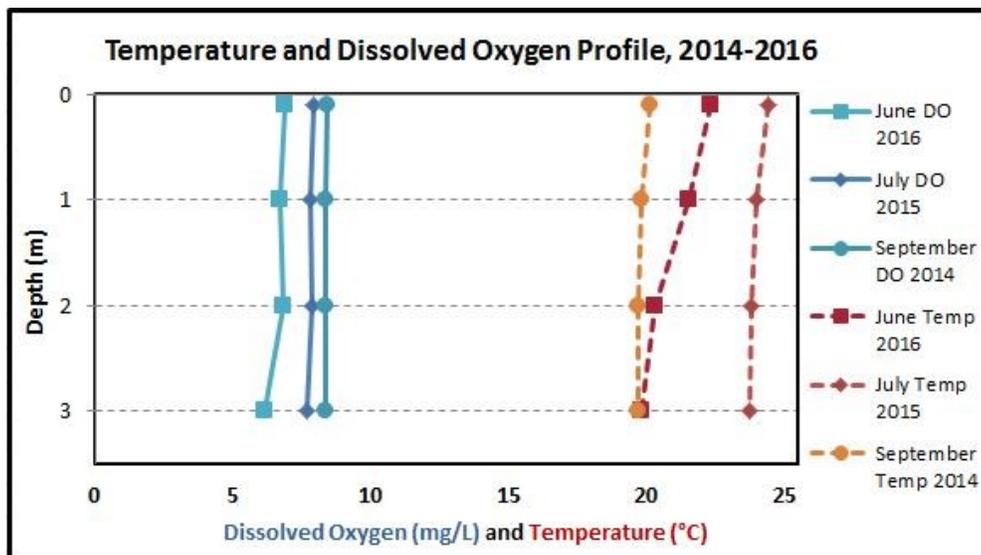
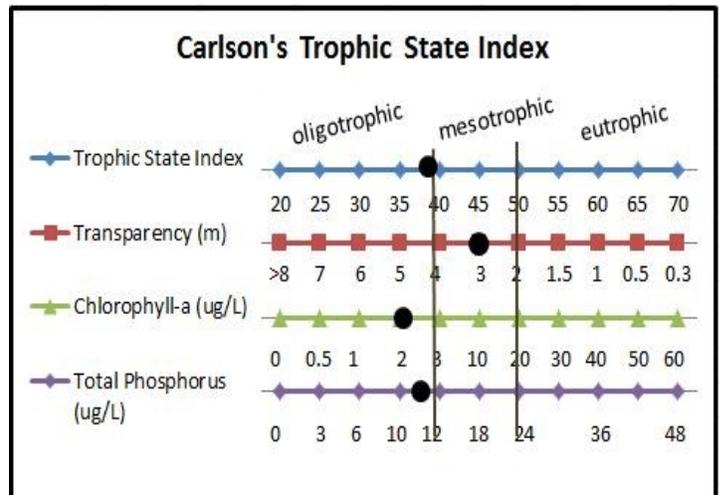
Physical Characteristics			
Elevation:	137.7 m (451.8 ft)	Lake area:	0.012 km ²
Mean depth:	1.75 m	Volume:	21700 m ³
Maximum depth:	3.6 m	Average Metalimnion Volume:	N/A
Relative depth:	2.9%	Average Anoxic Volume:	N/A
Shore Length:	620 m	Flushing rate:	2140 yr ⁻¹
Shore Configuration:	1.57	P retention coeff:	<0.00001
Watershed area:	73.8 km ²	Areal water load:	3746.6 m/yr
% Watershed Poned:	13.5%	Lake type:	artificial

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

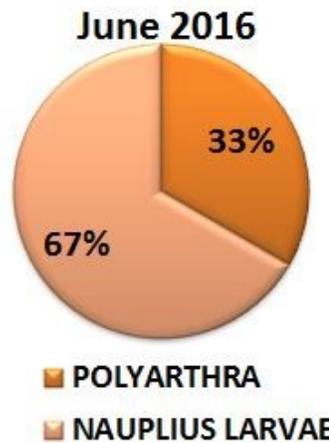
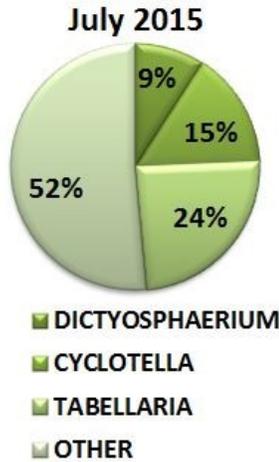
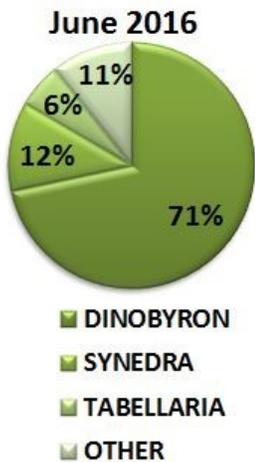
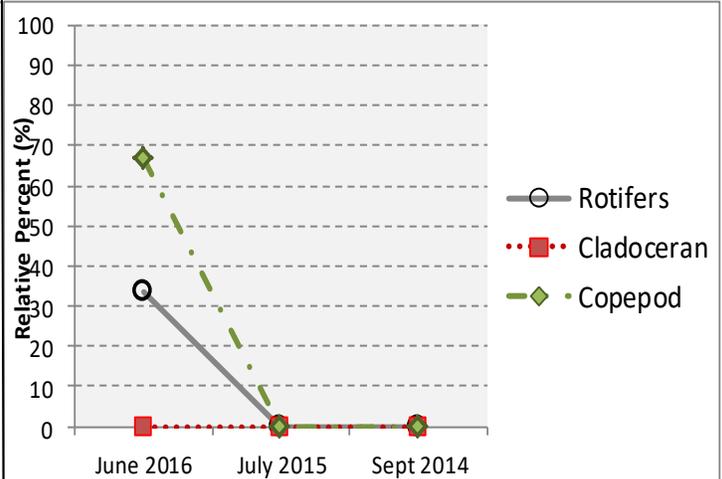
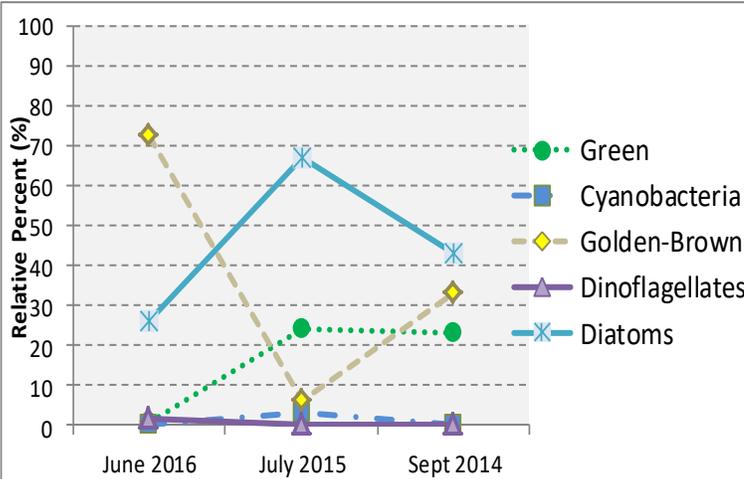
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Salmon Falls River - Waumbek Dam Pond, Milton, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	*	2	3	0
2015	*	3	3	0
2016	*	3	3	0
Total Points:				17
Trophic classification:				Mesotrophic



Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



No zooplankton observed in July 2015

No zooplankton observed in September 2014

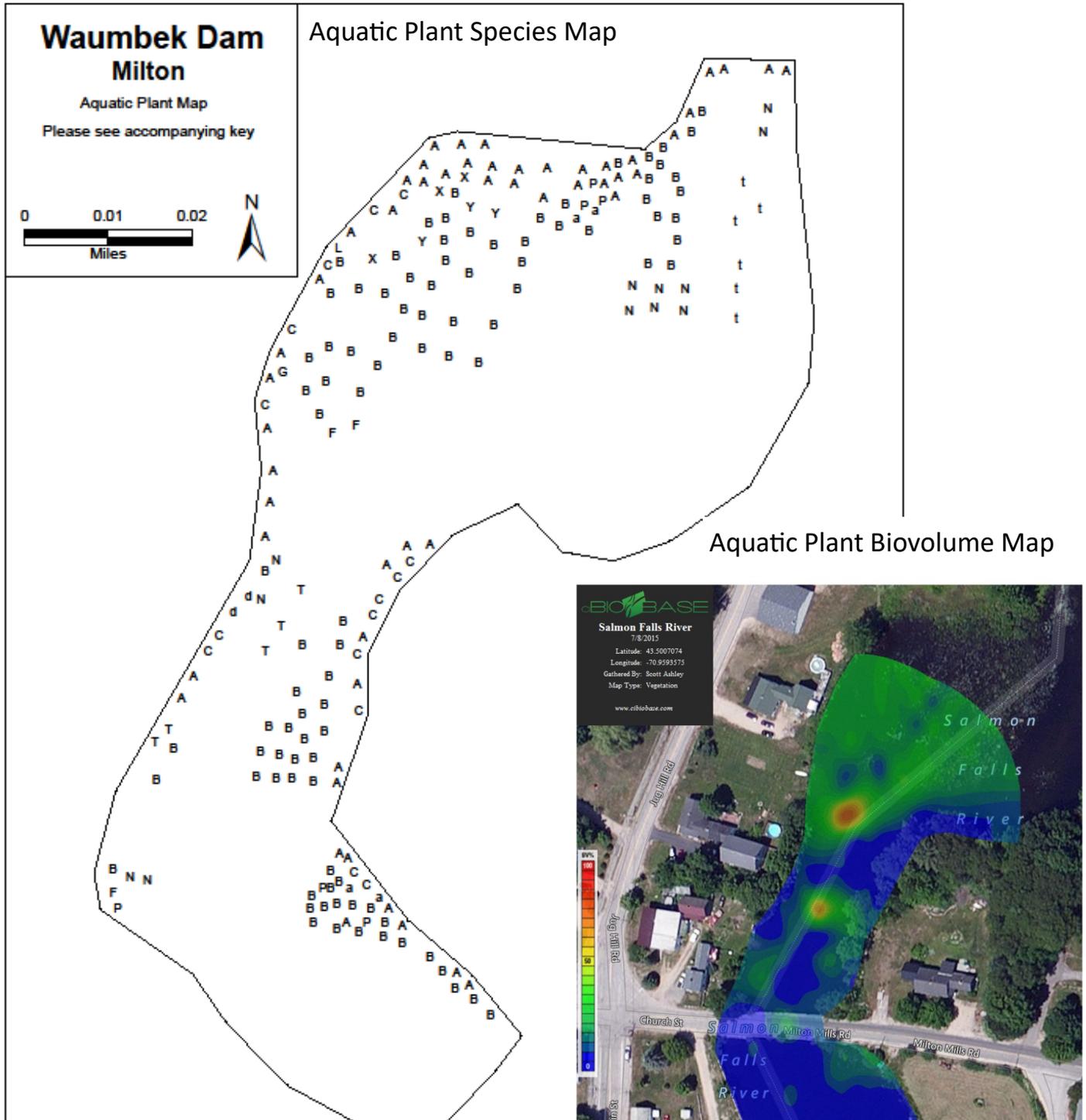
Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.67	0.29	1.50	meter	x
pH	6.79	0.04	6.77	Units	6.60
Acid Neutralizing Capacity (ANC)	13.73	3.53	13.20	mg/L	4.50
Apparent Color	36.00	10.82	33.00	PCU	29.00
Secchi Depth	3*	0.40	3*	meter	3.30
Secchi Depth - Scope	3.17*	0.21	3.1*	meter	unk
Specific Conductance	92.10	9.62	93.40	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.37	0.13	0.37	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	<0.05	mg/L	<0.05
Total Phosphorus	11.38	5.81	9.01	µg/L	11.00
Chloride	15.67	3.06	15.00	mg/L	5.00
Sulfate	2.10		2.10	mg/L	4.00
Calcium	4.97		4.97	mg/L	2.58
Magnesium	0.90		0.90	mg/L	0.56
Potassium	0.62		0.62	mg/L	0.48
Sodium	8.71		8.71	mg/L	3.80
Total Organic Carbon	3.80		3.80	mg/L	4.30
Chlorophyll- <i>a</i>	2.03	1.54	1.26	µg/L	4.39

*Visible at bottom

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chl-a	No data
	DO Saturation	No data
	DO	No data
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

Aquatic Plant Maps



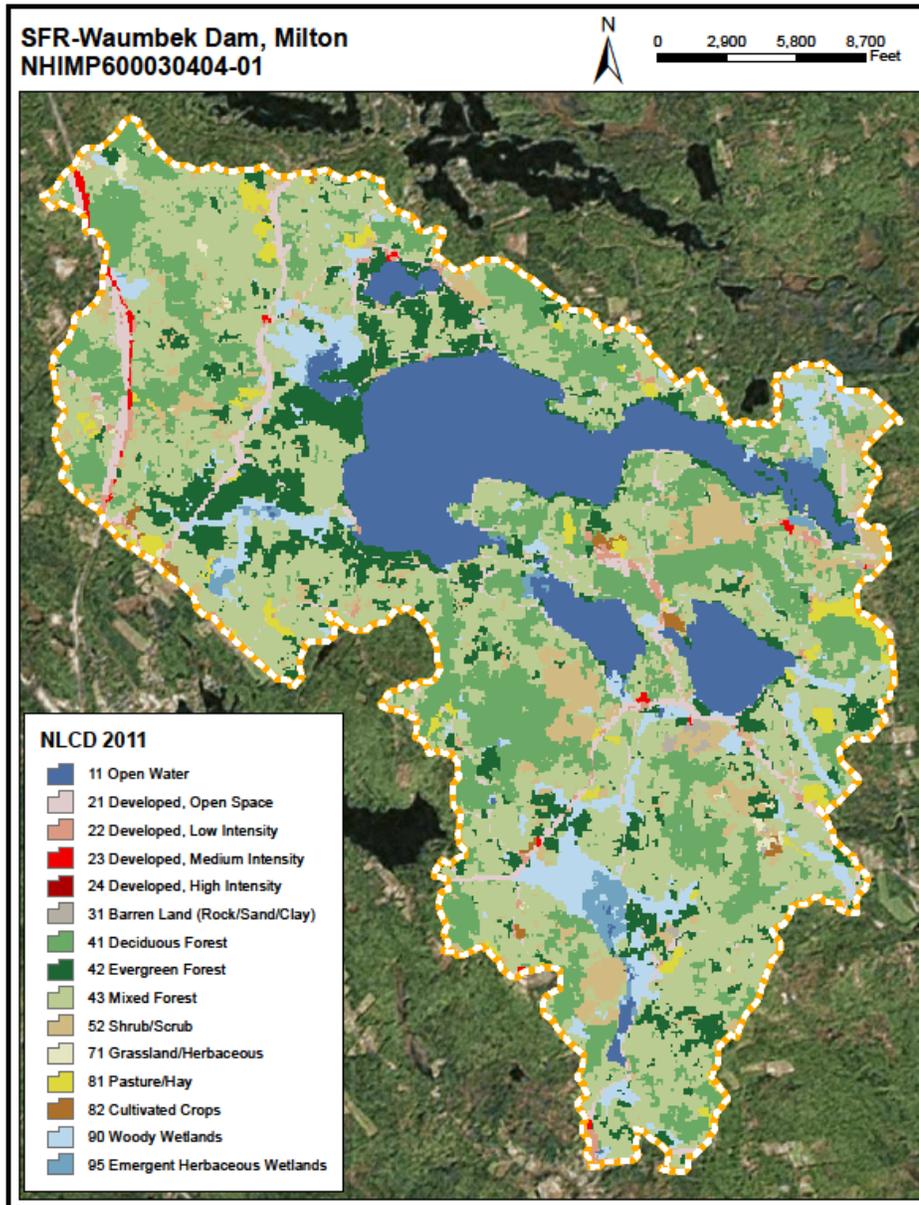
The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red, and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Species Key

LAKE: SALMON FALLS RIVER - WAUMBEEK DAM POND			
		TOWN: MILTON	DATE: 9/10/2014
KEY	PLANT NAME		ABUNDANCE
	SCIENTIFIC	COMMON	
a	Sagittaria	Arrowhead	Sparse
A	Peltandra virginica	Arrow arum	Scat/Common
B	Brasenia schreberi	Watershield	Common
C	Cyperus	Sedge	Scattered
F	Nymphoides cordatum	Floating heart	Sparse
G	Gramineae	Grass family	Sparse
L	Decodon verticillatus	Swamp loosestrife	Sparse
N	Nymphaea	White water lily	Sparse
P	Pontederia cordata	Pickerelweed	Scattered
t	Vallisneria americana	Tape grass	Sparse
T	Typha	Cattail	Sparse
U	Utricularia	Bladderwort	Sparse
X		Sterile thread-like leaf	Sparse
OVERALL ABUNDANCE: Common			

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	13.50	Barren Land	0.24	Grassland/ Herbaceous	0.39
Developed, Open Space	4.57	Deciduous Forest	19.55	Pasture Hay	2.07
Developed, Low Intensity	0.93	Evergreen Forest	10.77	Cultivated Crops	0.40
Developed, Medium Intensity	0.33	Mixed Forest	33.61	Woody Wetlands	5.83
Developed, High Intensity	0.00	Shrub/ Shrub	6.80	Emergent Wetlands	1.02

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Surry Mountain Reservoir in Surry, NH is a Corps of Engineers dam and reservoir. It was classified as oligotrophic in 1980. The 2014-2016 trophic survey determined the reservoir to be mesotrophic. The change was due to small increases in aquatic vascular plant abundance and chlorophyll-*a* concentration. Additionally, the maximum depth of the reservoir was shallower than in 1980, resulting in shallower Secchi depth readings. Surry Mountain Reservoir is unstratified with few aquatic plants. Both pH and acid neutralizing capacity have decreased (in other words, the reservoir has become more acidic) since the 1980 survey. This is in contrast to many NH waterbodies that have improved either pH and/or acid neutralizing capacity with the implementation of air quality regulations. Chlorophyll-*a* concentration increased by 25% since 1980 and Total Kjeldahl Nitrogen increased by almost 50%, but total phosphorus concentration remained the same. Specific conductance increased by ~10%. A bald eagle was observed during the 2014 sample event.

2016 NHDES Trophic Rating:
Mesotrophic
 1980 NHDES Trophic Rating:
Oligotrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



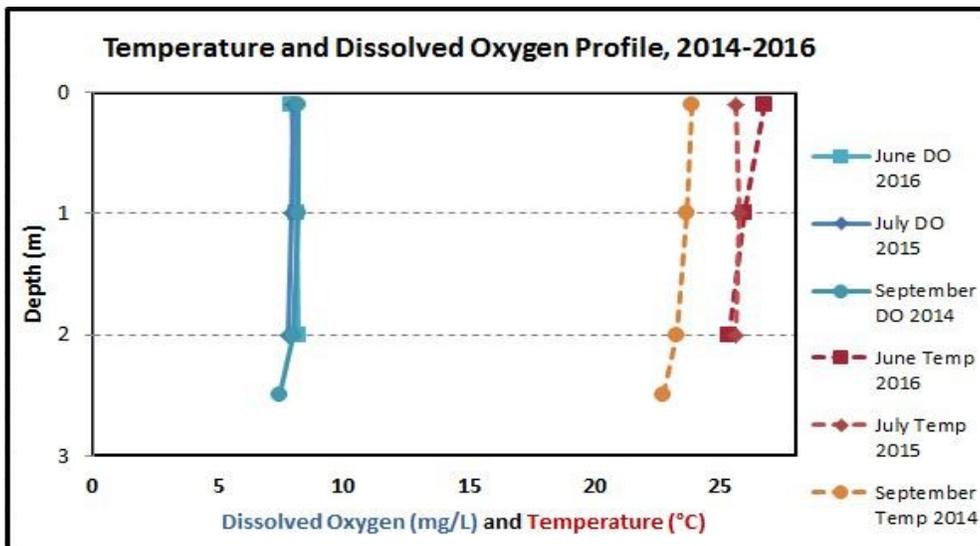
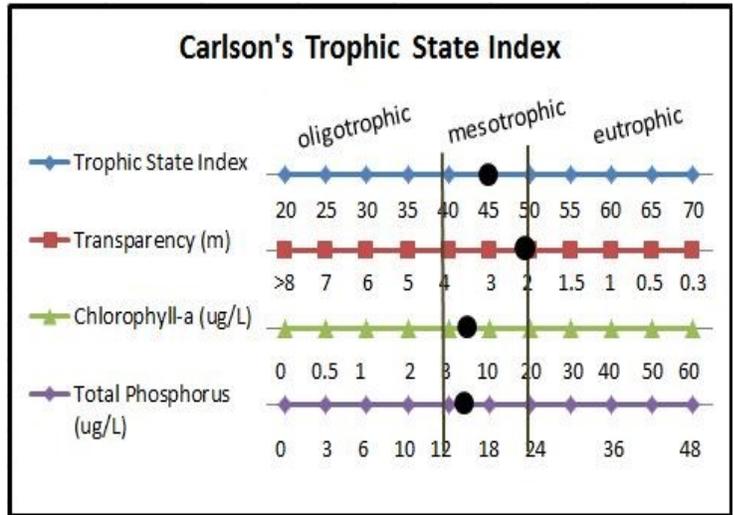
Physical Characteristics			
Elevation:	155 m (508.5 ft)	Lake area:	1.43 km ²
Mean depth:	0.8 m	Total Volume:	1,095,500 m ³
Maximum depth:	2.75 m	Average Hypolimnion Volume:	N/A
Relative depth:	0.2	Average Anoxic Volume:	N/A
Shore Length:	6,275 m	Flushing rate:	120.4 / yr ⁻¹
Shore Configuration:	1.48	P retention coeff:	0.24
Watershed area:	264.53 km ²	Areal water load:	92.39 m/ yr
% Watershed Ponged:	1.5%	Lake type:	Artificial

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

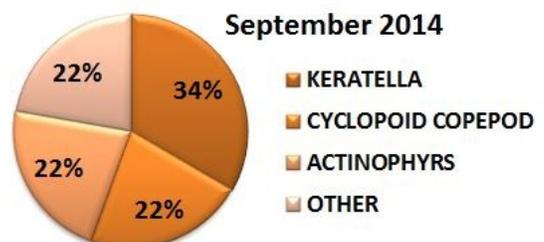
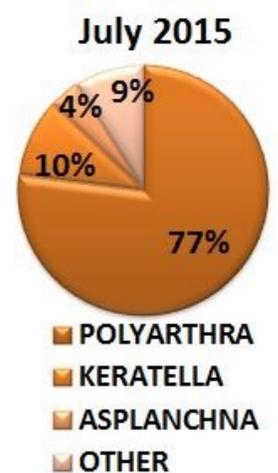
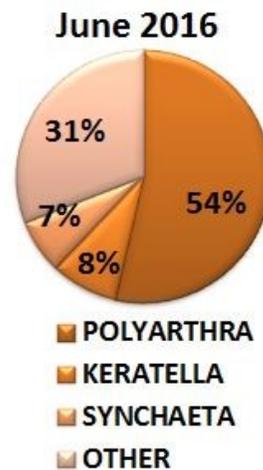
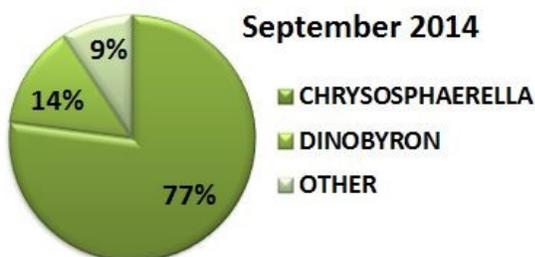
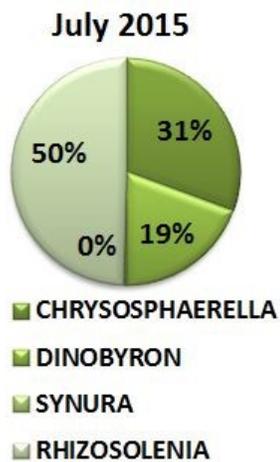
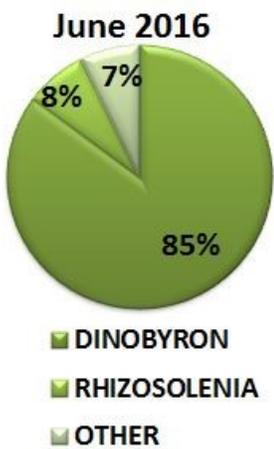
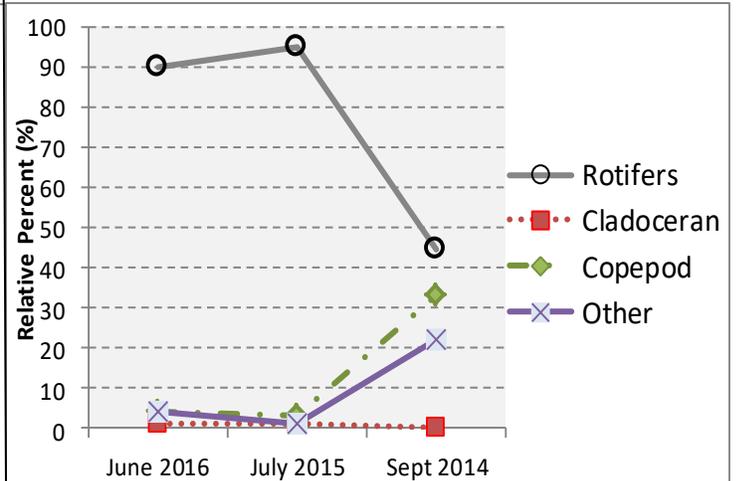
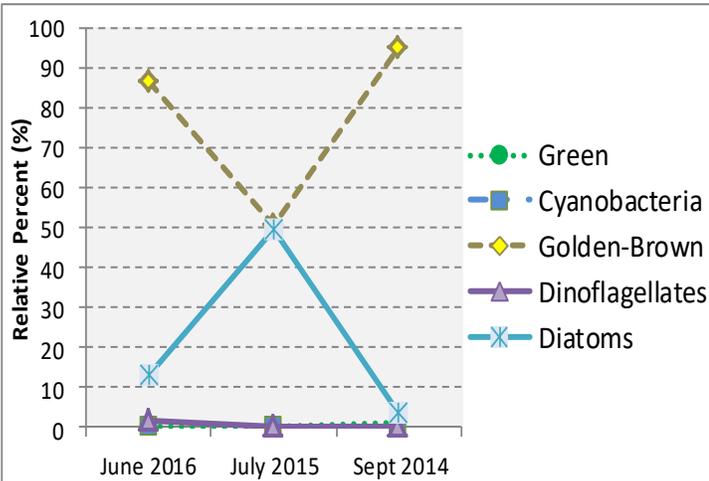
NHDES Trophic Classification: 2014 - 2016				
Surry Mountain Reservoir, Surry, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	*	3	1	0
2015	*	2	1	1
2016	*	3	1	1
Total Points:				13
Trophic classification:				Mesotrophic



2014 - 2016

Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.17	0.29	1.00	meter	x
pH	6.50	0.30	6.42	Units	6.60
Acid Neutralizing Capacity (ANC)	4.80	1.04	4.30	mg/L	4.50
Apparent Color	46.67	2.89	45.00	PCU	29.00
Secchi Depth	2.05*	0.38	2.1*	meter	3.30
Secchi Depth - Scope	2.17*	0.55	2.1*	meter	unk
Specific Conductance	54.54	8.36	54.91	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.43	0.25	0.30	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	<0.05	mg/L	<0.05
Total Phosphorus	14.00	2.89	15.20	µg/L	11.00
Chloride	7.27	1.58	6.90	mg/L	5.00
Sulfate	3.00		3.00	mg/L	4.00
Calcium	2.13		2.13	mg/L	2.58
Magnesium	0.66		0.66	mg/L	0.56
Potassium	0.61		0.61	mg/L	0.48
Sodium	5.40		5.40	mg/L	3.80
Total Organic Carbon	3.70		3.70	mg/L	4.30
<i>Metalimnetic Depth</i>	2.00	0.50	2.00	meter	x
Chlorophyll- <i>a</i>	4.28	1.38	4.20	µg/L	4.39

*Visible on bottom

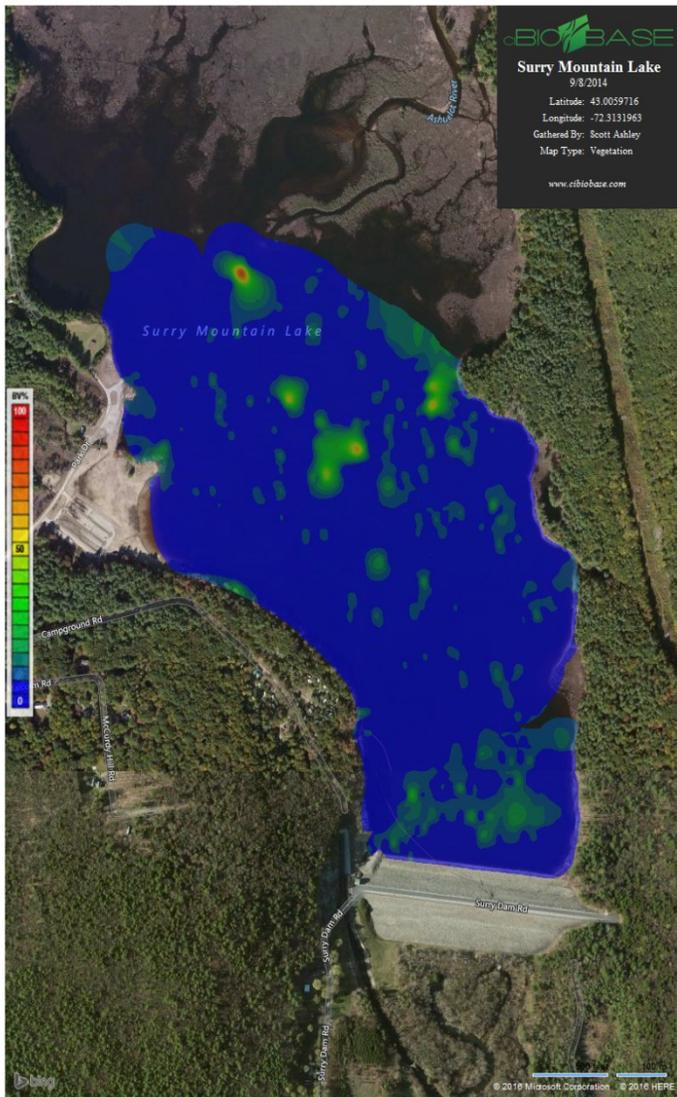
The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chloride	Likely good
	Chl-a	No data
	DO Saturation	No data
	DO	No data
	pH	Likely bad
Drinking Water	E. coli	Likely bad
Fish Consumption	Mercury	Poor
Primary Contact Recreation	Cyanobacteria	Likely bad
	E. coli	Likely good
Secondary Contact Recreation	E. coli	Likely good
Wildlife	Wildlife	No data

Aquatic Plant Maps

Aquatic Plant Species Map

Aquatic Plant Biovolume Map



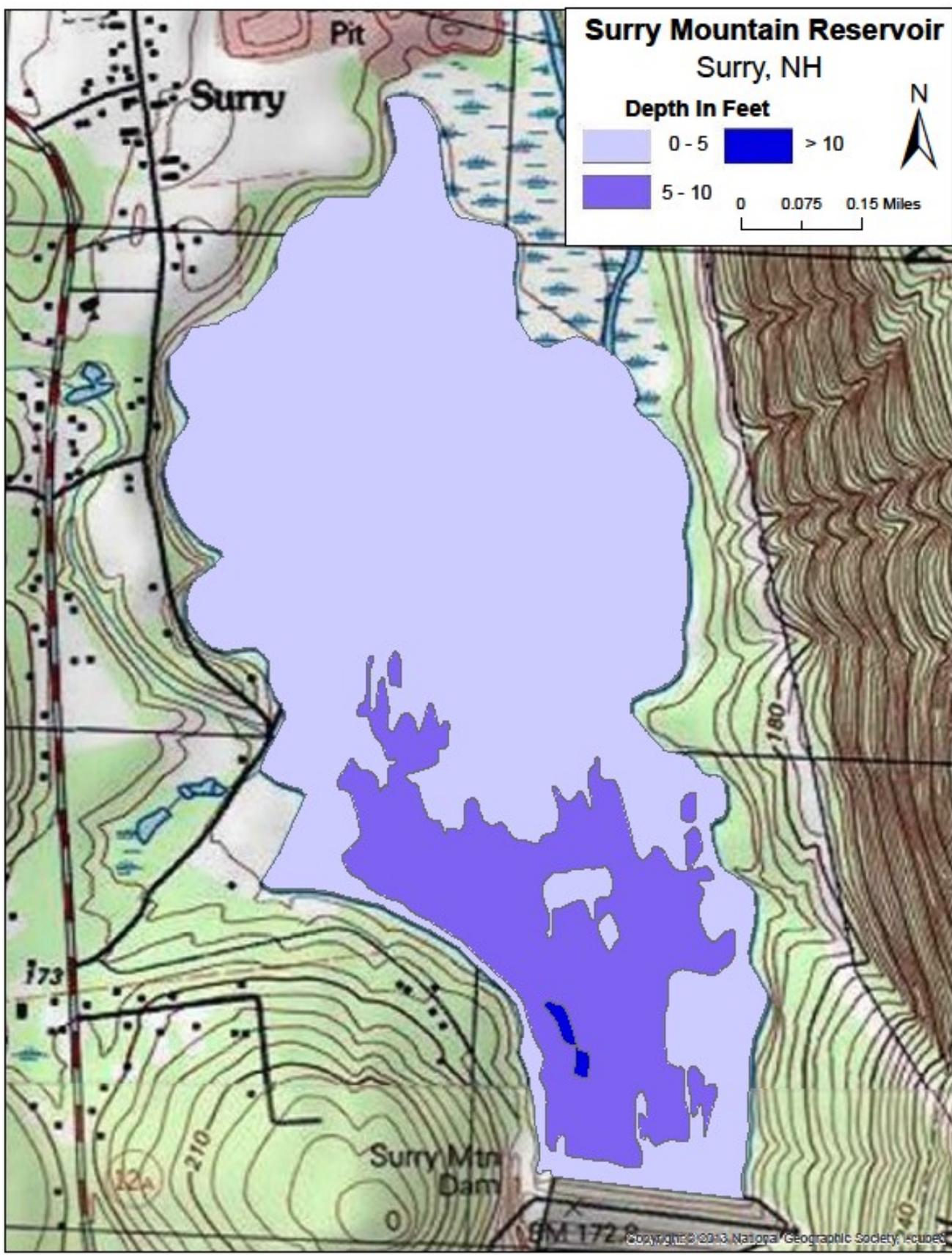
The aquatic plant biovolume map indicates the percentage of the water column occupied by aquatic plants. High percentages are indicated by the color red, and low percentages are indicated by the color blue. The aquatic plant species map identifies surface aquatic plants, shoreline plants and submerged plants that were visible during the survey. Please see the next page for the species key.

Aquatic Plant Species Key

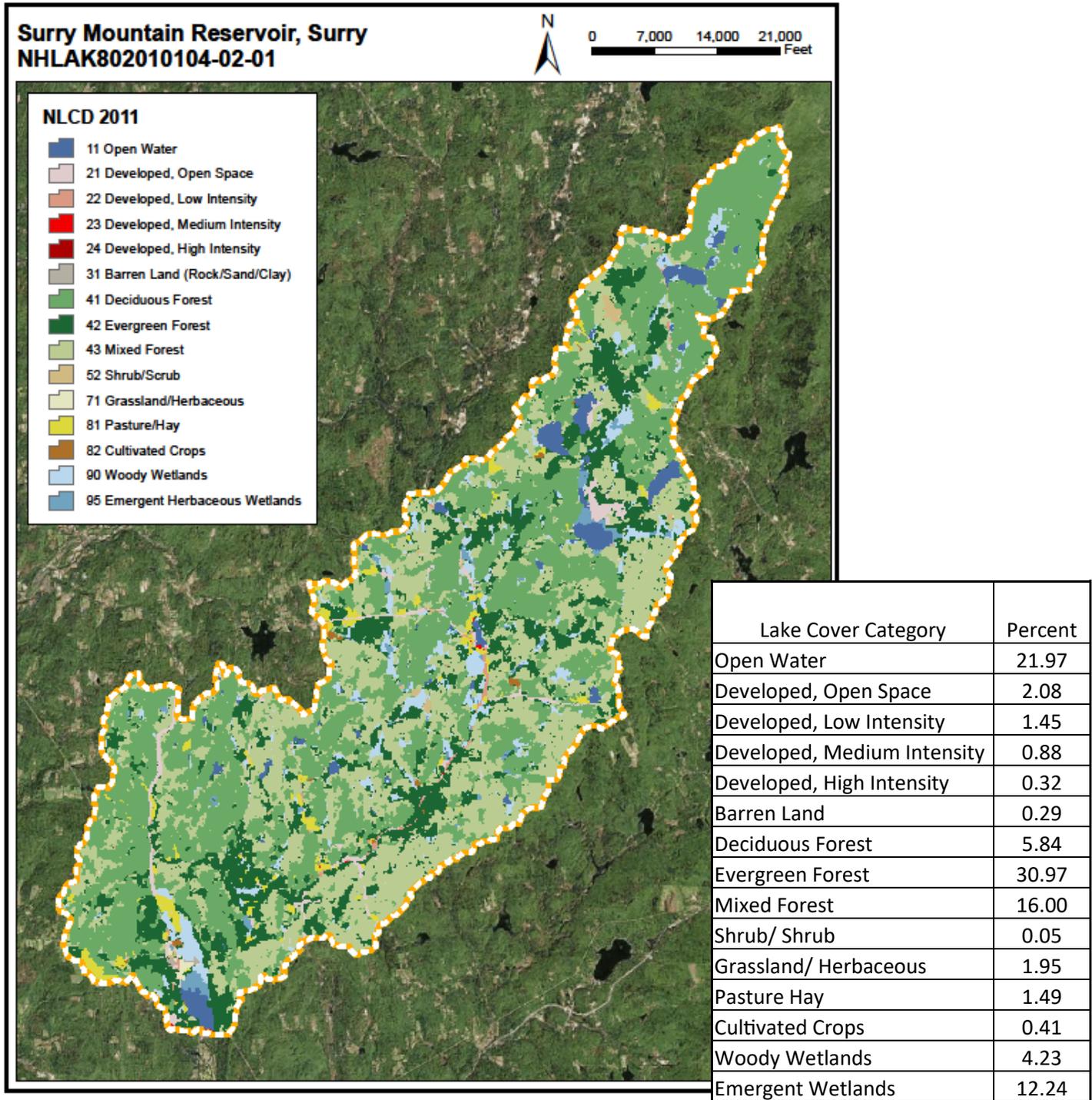
LAKE: SURRY MOUNTAIN RESERVOIR		TOWN: SURRY		DATE: 9/8/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
j	Juncus	Rush	Sparse	
J	Chamaedaphne calyculata	Leatherleaf	Sparse	
L	Decodon verticillatus	Swamp loosestrife	Sparse	
W	Potamogeton	Pondweed	Scattered	
X		Sterile thread-like leaf	Sparse	
OVERALL ABUNDANCE: Scattered				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Upper Wilson Pond, in Swanzey, NH is a small, unstratified pond that was surveyed once previously under the Lake Trophic Survey Program in 1991. Both the historic and current survey determined Upper Wilson Pond to be mesotrophic. There is no public access to the pond. Aquatic vegetation density has increased since the 1991 survey, and chlorophyll-*a* concentration has also increased. Since the 1991 survey, specific conductance has increased by approximately 40% and chloride has increased by approximately 50%, indicating road salt is entering the pond. Freshwater sponges were observed during the 2014 sampling event.

2016 NHDES Trophic Rating:
Mesotrophic
1991 NHDES Trophic Rating:
Mesotrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



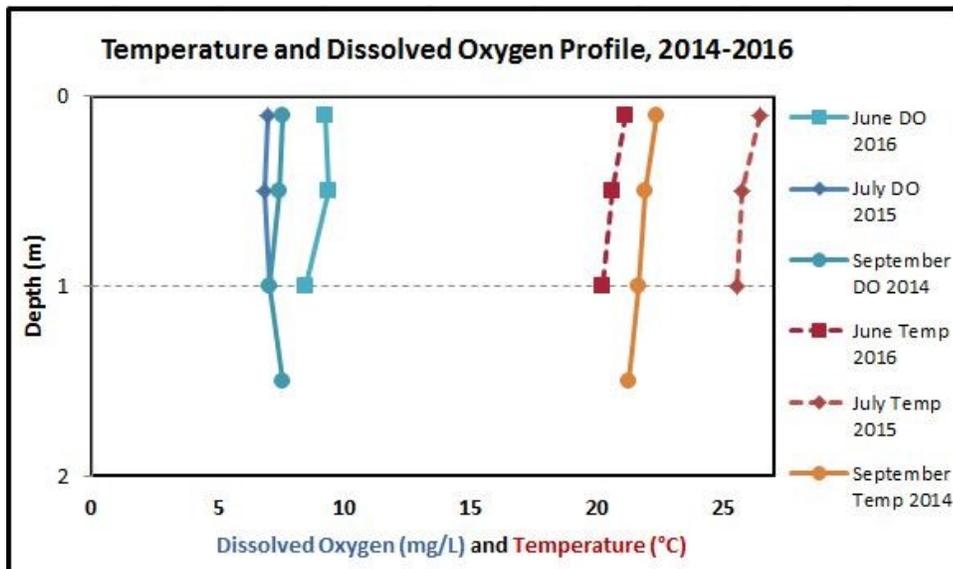
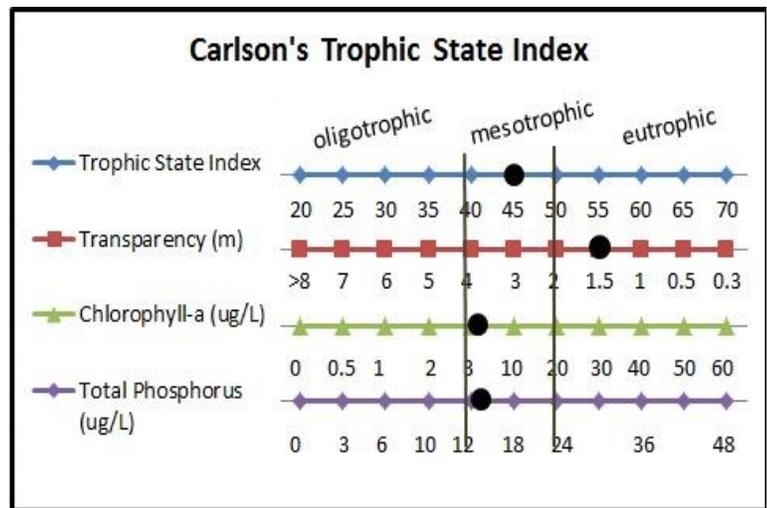
Physical Characteristics			
Elevation:	152 m (498.7 ft)	Lake area:	0.03 km ²
Mean depth:	0.6 m	Total Volume:	18,900 m ³
Maximum depth:	1.5 m	Average Hypolimnion Volume:	N/A
Relative depth:	0.8%	Average Anoxic Volume:	N/A
Shore Length:	1,160 m	Flushing rate:	9.14 / yr ⁻¹
Shore Configuration:	1.89	P retention coeff:	0.63
Watershed area:	0.31 km ²	Areal water load:	5.76 m/ yr
% Watershed Poned:	0.0%	Lake type:	Natural w/ dam

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of NHDES classification methodology, please visit:

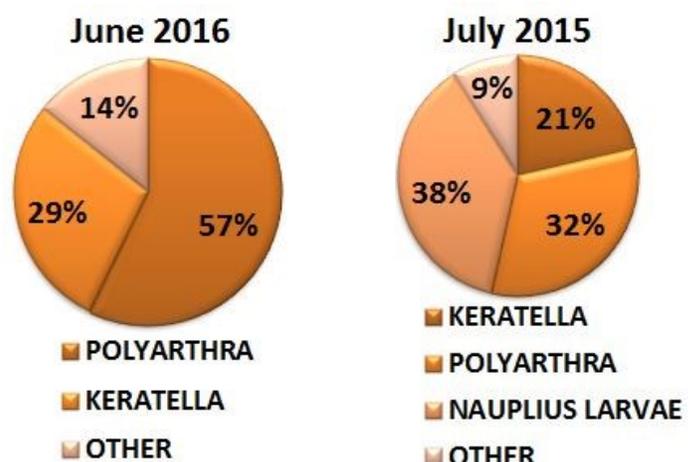
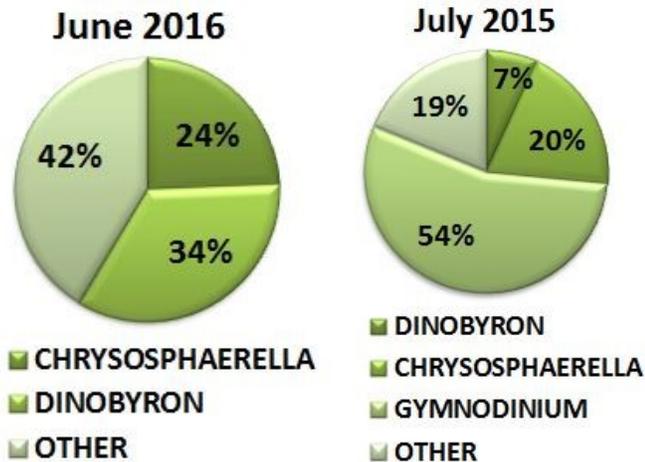
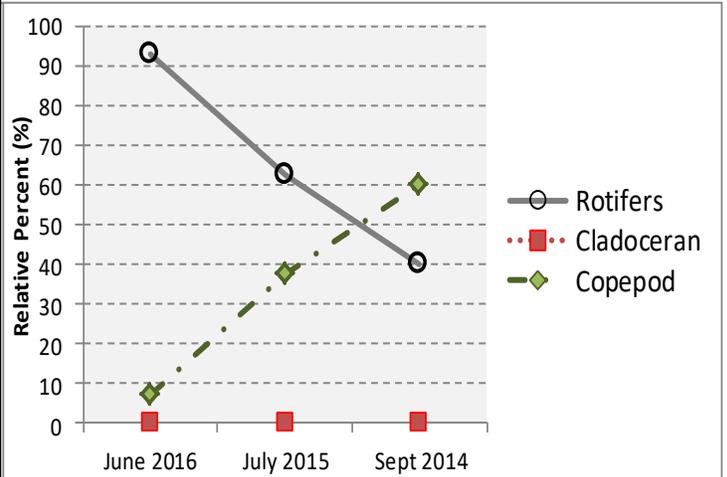
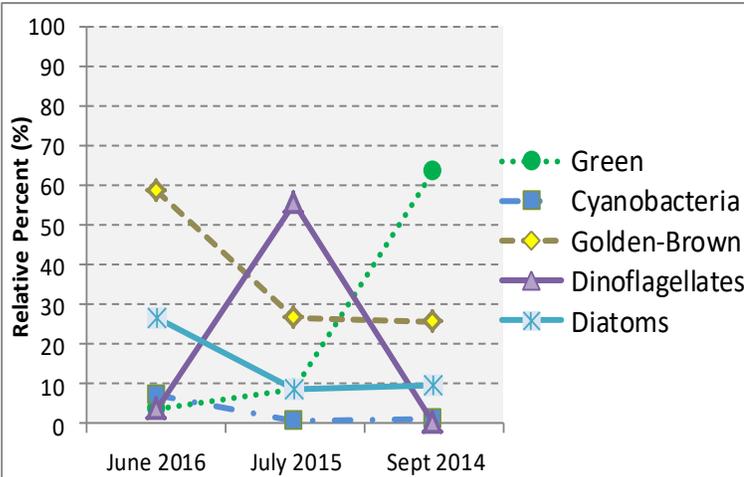
<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

NHDES Trophic Classification: 2014 - 2016				
Upper Wilson Pond, Swanzey, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	*	4	3	0
2015	*	3	3	1
2016	*	3	3	0
Total Points:				20
Trophic classification:				Mesotrophic



Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.

Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria, and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



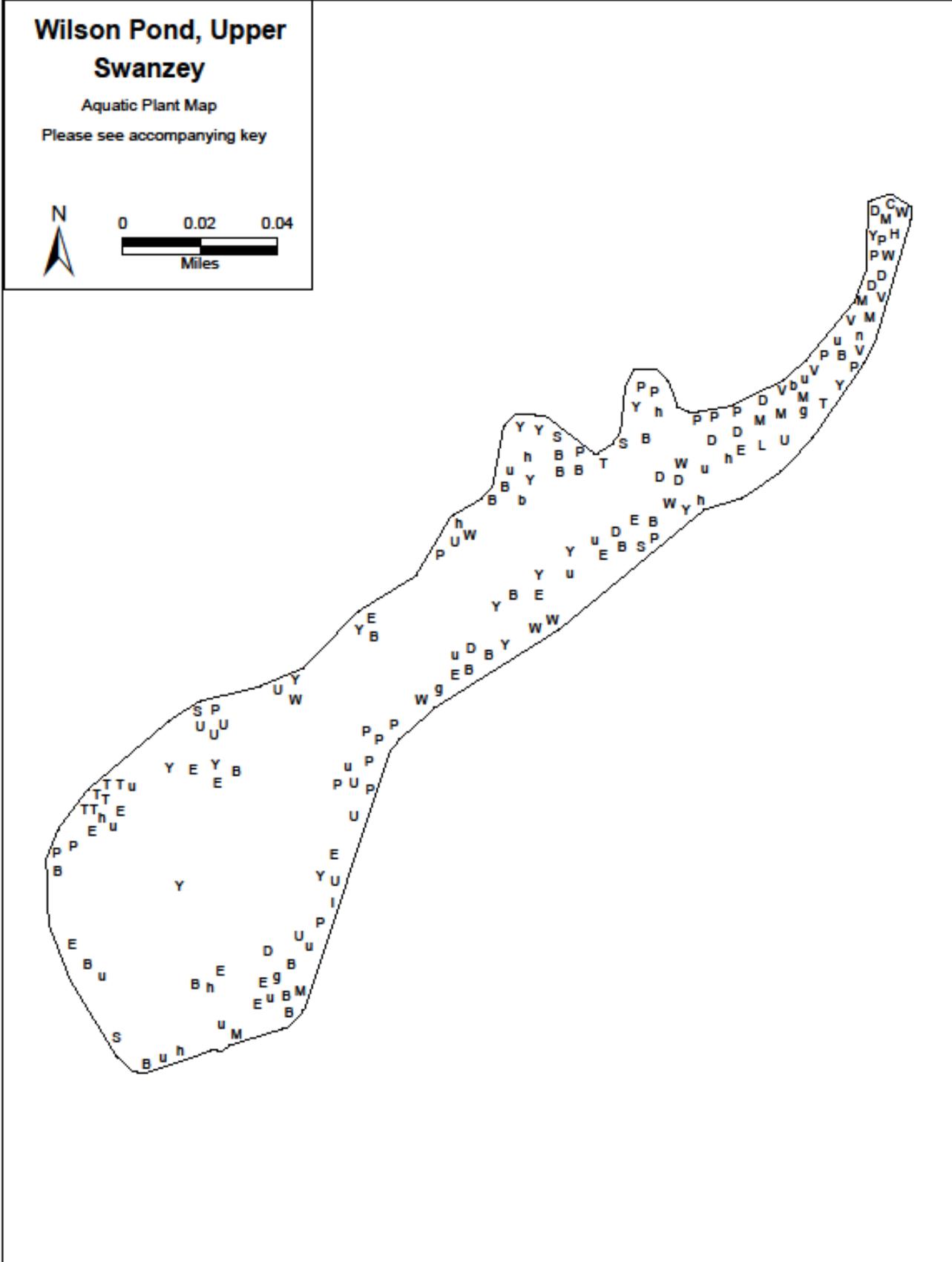
Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.00	0.00	1.00	meter	x
pH	6.45	0.18	6.44	Units	6.60
Acid Neutralizing Capacity (ANC)	5.30	0.46	5.40	mg/L	4.50
Apparent Color	36.67	2.08	36.00	CPU	29.00
Secchi Depth	1.5*	0.00	1.5*	meter	3.30
Secchi Depth - Scope	1.5*	0.00	1.5*	meter	unk
Specific Conductance	90.00	26.27	97.50	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.27	0.12	0.31	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	<0.05	mg/L	<0.05
Total Phosphorus	13.13	1.97	12.10	µg/L	11.00
Chloride	16.87	7.20	17.00	mg/L	5.00
Sulfate	3.90		3.90	mg/L	4.00
Calcium	2.19		2.19	mg/L	2.58
Magnesium	0.88		0.88	mg/L	0.56
Potassium	0.89		0.89	mg/L	0.48
Sodium	8.49		8.49	mg/L	3.80
Total Organic Carbon	4.20		4.20	mg/L	4.30
Chlorophyll- <i>a</i>	3.38	1.16	3.78	µg/L	4.39

*Visible on bottom

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of New Hampshire waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

Designated Use	Parameter	Category
Aquatic Life	Chl-a	No data
	DO Saturation	No data
	DO	No data
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

Aquatic Plant Species Map



Aquatic Plant Species Key

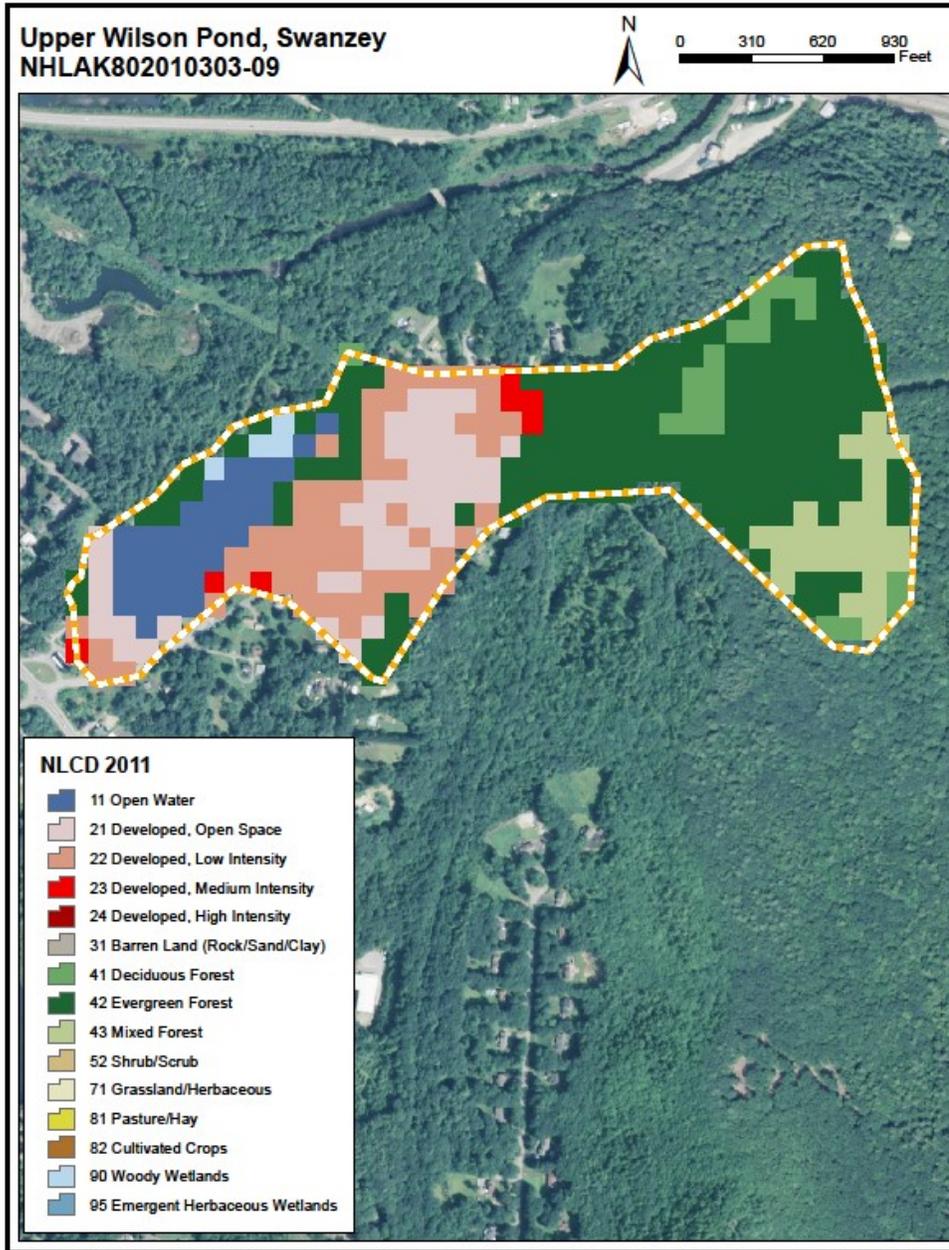
LAKE: UPPER WILSON POND				TOWN: SWANZEY		DATE: 9/9/2014
KEY	PLANT NAME		ABUNDANCE			
	SCIENTIFIC	COMMON				
b	Scirpus	Bulrush	Scattered			
B	Brasenia schreberi	Watershield	Scattered			
C	Carex	Sedge	Scattered			
D	Lemna minor	Duckweed	Scattered			
E	Eleocharis	Spike rush	Common			
g	Sparganium	Bur-reed (floating leaf)	Common			
H	Hypericum	St. John's-wort	Sparse			
h	Nymphoides cordatum	Floating heart	Scattered			
I	Iris versicolor	Blue flag	Sparse			
L	Ludwigia	False loosestrife	Sparse			
M	Myriophyllum humile	Water milfoil	Scattered			
n	Najas	Bushy pondweed	Scattered			
P	Pontederia cordata	Pickerelweed	Common			
S	Sparganium	Bur-reed (erect leaf)	Common			
T	Typha	Cattail	Scattered			
U	Utricularia radiata	Bladderwort	Common			
V	Utricularia vulgaris	Common bladderwort	Common			
W	Potamogeton epihydrus	Leafy pondweed	Scattered			
Y	Nuphar	Yellow water lily	Scattered			
OVERALL ABUNDANCE: Common						

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/ Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; submerged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	9.41	Barren Land	0.00	Grassland/ Herbaceous	0.00
Developed, Open Space	12.94	Deciduous Forest	7.06	Pasture Hay	0.00
Developed, Low Intensity	16.47	Evergreen Forest	42.65	Cultivated Crops	0.00
Developed, Medium Intensity	2.06	Mixed Forest	8.24	Woody Wetlands	1.18
Developed, High Intensity	0.00	Shrub/ Shrub	0.00	Emergent Wetlands	0.00

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345 - 354.

[Click here for an interactive map of all historic and current lake trophic survey reports](#)

Wilson Pond, Swanzey, NH is an unstratified waterbody that has been surveyed twice previously, in 1977 and 1993. It was rated mesotrophic in the previous surveys. The 2014—2016 trophic survey also determined Wilson Pond to be mesotrophic. Acid neutralizing capacity has improved by ~30% since 1993; however pH is similar to previous surveys. Although chlorophyll-*a* concentration has decreased by ~25%, Secchi depth did not increase. Total phosphorus and nitrite + nitrate nitrogen were similar to 1993 levels, but Total Kjeldahl Nitrogen (TKN) increased by ~30%. Specific conductance and chloride levels in Wilson Pond showed signs of human influence. Both specific conductance and chloride values were ~40% higher than their 1993 concentrations, suggesting road salt or septic system inputs are affecting the pond. Chinese mystery snail and a great blue heron were noted in the 2014 sample event.

2016 NHDES Trophic Rating:

Mesotrophic

1993 NHDES Trophic Rating:

Mesotrophic

What is a lake trophic survey?

A lake trophic survey evaluates physical, biological and chemical parameters in lakes or ponds greater than 10 acres, to assess a lake's overall productivity, a.k.a. trophic status. Oligotrophic, mesotrophic and eutrophic are the most common trophic classifications. Oligotrophic lakes are nutrient-poor, with few plants and very clear water. Eutrophic lakes are highly productive, with lots of plants and/or algae and less clear water. Mesotrophic lakes are in-between. Trophic surveys provides a record and catalog of water quality parameters, serve as a basis for understanding environmental impacts and help inform water quality management polices. For additional explanations of lake terminology, please visit <http://des.nh.gov/organization/divisions/water/wmb/vlap/glossary.htm>



Physical Characteristics

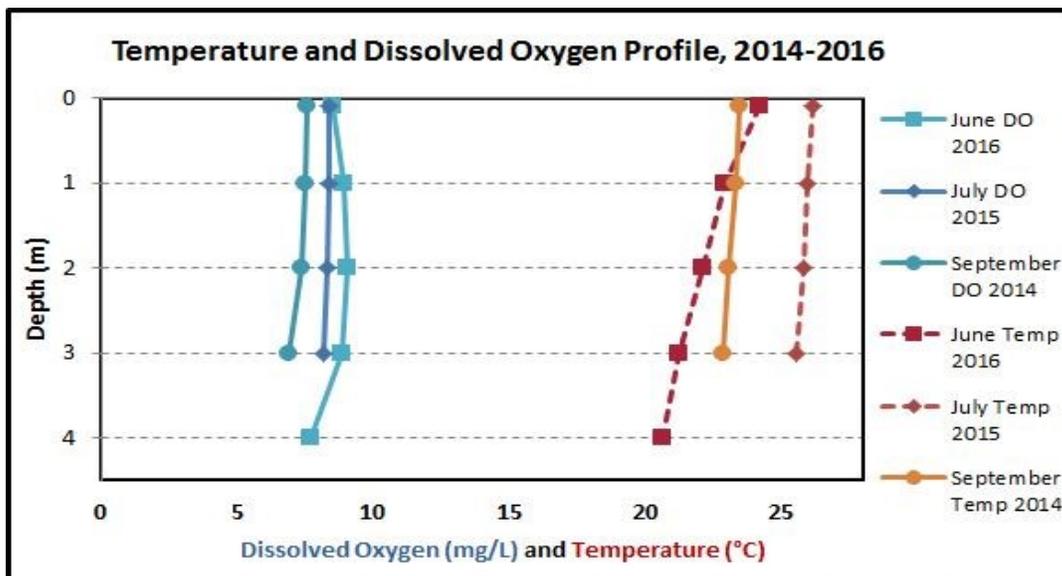
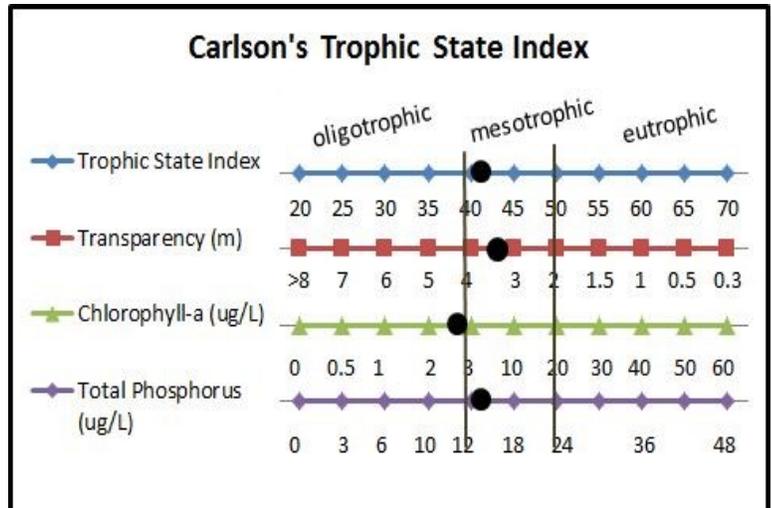
Elevation:	145 m (475.7 ft)	Lake area:	0.293 km ²
Mean depth:	1.4 m	Total Volume:	415,900 m ³
Maximum depth:	4.8 m	Average Hypolimnion Volume:	N/A
Relative depth:	0.80%	Average Anoxic Volume:	N/A
Shore Length:	3,240 m	Flushing rate:	5.06 / yr ⁻¹
Shore Configuration:	1.69	P retention coeff:	0.6
Watershed area:	3.767 km ²	Areal water load:	7.18 m/ yr
% Watershed Poned:	<0.1%	Lake type:	Natural w/ dam

Trophic Classification

The NHDES Trophic Classification System was initiated in the early 1970s and revised in 1989 and 2013. This index assigns numeric values to summer bottom dissolved oxygen (D.O.), Secchi disk transparency (S.D.), aquatic vascular plant abundance (Plant) and epilimnetic chlorophyll-*a* concentration (Chl-*a*). Lakes are now surveyed once a year for three consecutive years during the summer, whereas historically lakes were only surveyed once. For consistency with the historical trophic surveys, lakes are assigned numeric values with each annual survey, and after three years, these values are summed to a grand total, which determines the lake's trophic status. This index allows for direct comparisons to be made to historic data, which better track changes in trophic status. The NHDES Trophic Classification System is one of many ways to determine a lake's trophic status. The Carlson's Trophic State Index (TSI) is a more broadly used trophic assessment tool; however, the results are less comparable to historic NHDES data. For a more in-depth explanation of the NHDES classification methodology, please visit:

<https://www.des.nh.gov/organization/divisions/water/wmb/lakes/documents/lake-trophic-2013-info.pdf>

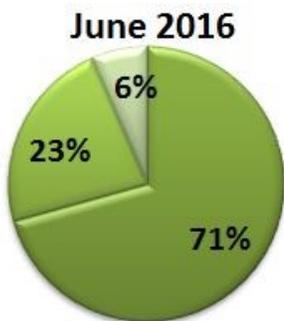
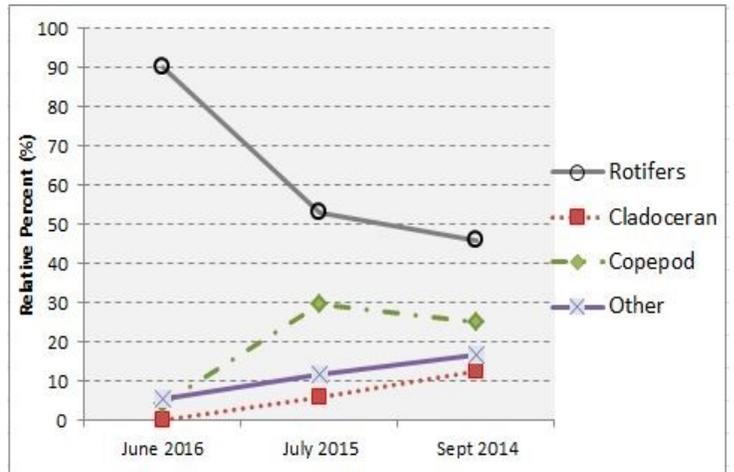
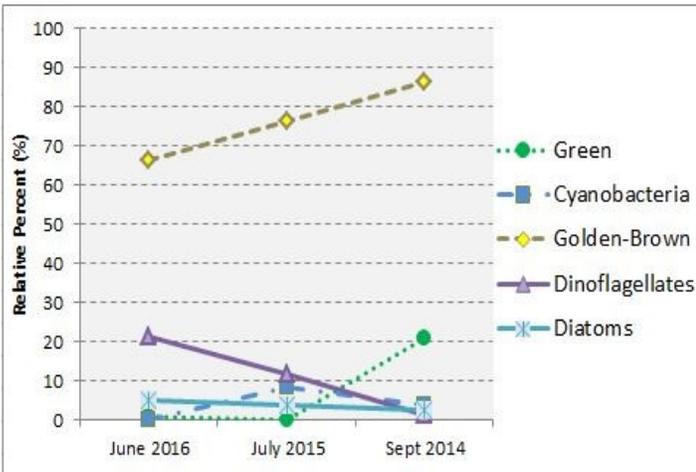
NHDES Trophic Classification: 2014 - 2016				
Wilson Pond, Swanzey, NH				
Year	D.O.	S.D.	Plant	Chl-a
2014	*	3	2	1
2015	*	2	2	0
2016	*	2	2	0
Total Points:				14
Trophic classification:				Mesotrophic



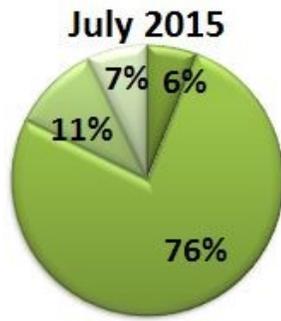
2014 - 2016

Phytoplankton are photosynthetic plants that contain chlorophyll-*a* but do not have true roots, stems or leaves. They grow on rocks, vascular plants, the lake bottom or free-floating in the water column and are a food source for zooplankton and mussels. As nutrients in the water increase, phytoplankton abundance also increases. Phytoplankton populations undergo natural succession throughout the summer, due to changes in light, nutrient availability, preda-

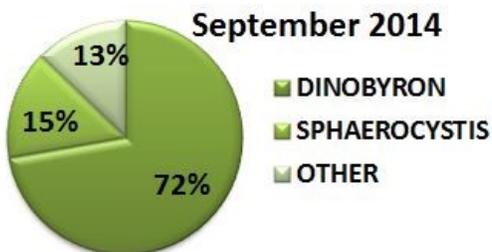
Zooplankton are microscopic animals that naturally inhabit New Hampshire lakes. They feed on phytoplankton, bacteria and other zooplankton while being an important food source for fish and mussels. Zooplankton also undergo natural succession throughout the summer, due to changes in light, nutrient availability, predation and temperature.



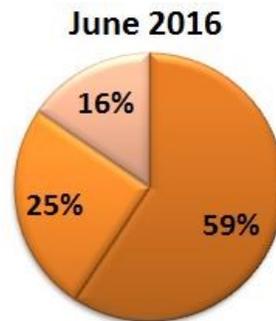
- DINOBYRON
- CERATIUM
- OTHER



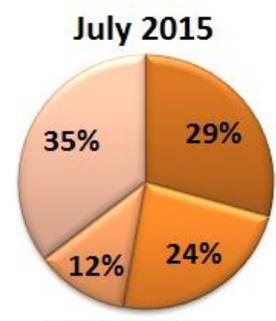
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- DINOBYRON
- CERATIUM
- OTHER



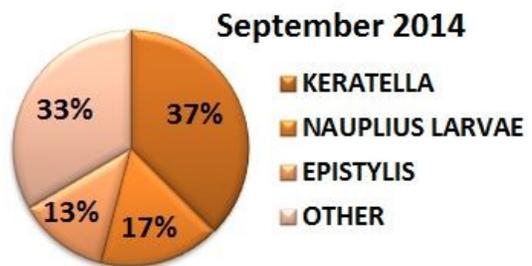
- DINOBYRON
- SPHAEROCYSTITIS
- OTHER



- POLYARTHRA
- KERATELLA
- OTHER



- KERATELLA
- POLYARTHRA
- NAUPLIUS LARVAE
- OTHER



- KERATELLA
- NAUPLIUS LARVAE
- EPISTYLIS
- OTHER

Chemical and Biological Characteristics	Mean	Standard Deviation	Median	Units	NH Median Values
<i>Epilimnetic Depth</i>	1.83	0.29	2.00	meter	x
pH	6.84	0.25	6.98	Units	6.60
Acid Neutralizing Capacity (ANC)	8.70	1.42	8.20	mg/L	4.50
Apparent Color	27.00	6.08	24.00	CPU	29.00
Secchi Depth	3.30	1.05	3.40	meter	3.30
Secchi Depth - Scope	3.49	1.29	3.49	meter	unk
Specific Conductance	148.20	35.53	161.20	µS/cm	42.3
Total Kjeldahl Nitrogen (TKN)	0.26	0.12	0.31	mg/L	0.30
Nitrate + Nitrite Nitrogen	<0.05	0.00	<0.05	mg/L	<0.05
Total Phosphorus	13.33	0.42	13.20	µg/L	11.00
Chloride	32.33	7.37	35.00	mg/L	5.00
Sulfate	4.40		4.40	mg/L	4.00
Calcium	3.60		3.60	mg/L	2.58
Magnesium	1.10		1.10	mg/L	0.56
Potassium	1.11		1.11	mg/L	0.48
Sodium	16.60		16.60	mg/L	3.80
Total Organic Carbon	4.30		4.30	mg/L	4.30
<i>Metalimnetic Depth</i>	3.33	0.58	3.00	meter	x
Chlorophyll- <i>a</i>	2.96	2.34	1.82	µg/L	4.39

The Waterbody Report Card table (below) is generated from the 2014 305(b) report on the status of NH waters and is based on data collected from 2001-2013. Additional information can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

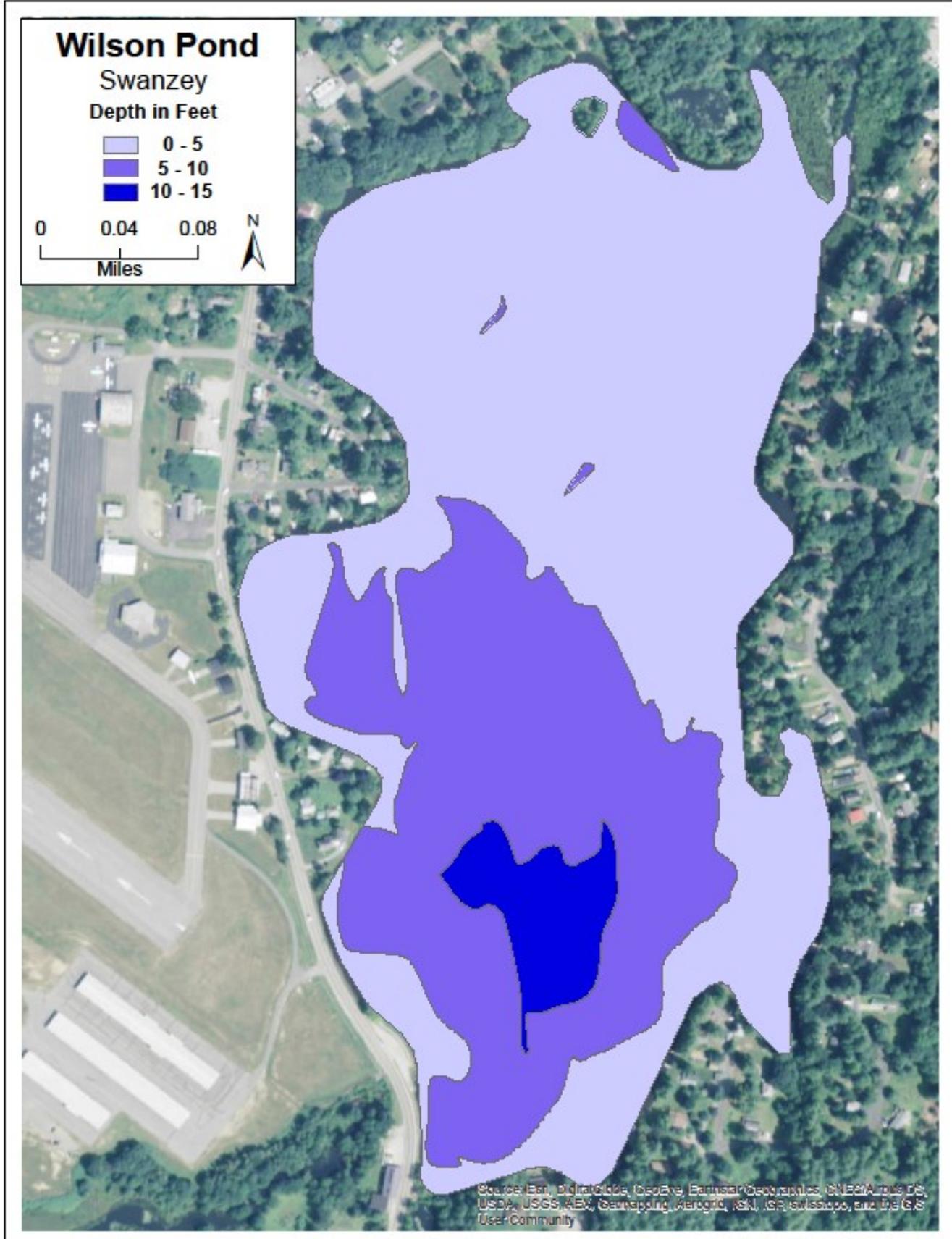
Designated Use	Parameter	Category
Aquatic Life	Chl-a	No data
	DO Saturation	No data
	DO	No data
	pH	No data
Drinking Water	After treatment	Good
Fish Consumption	Mercury	Poor
Primary Contact Recreation	E. coli	No data
Secondary Contact Recreation	E. coli	No data
Wildlife	Wildlife	No data

Aquatic Plant Species Key

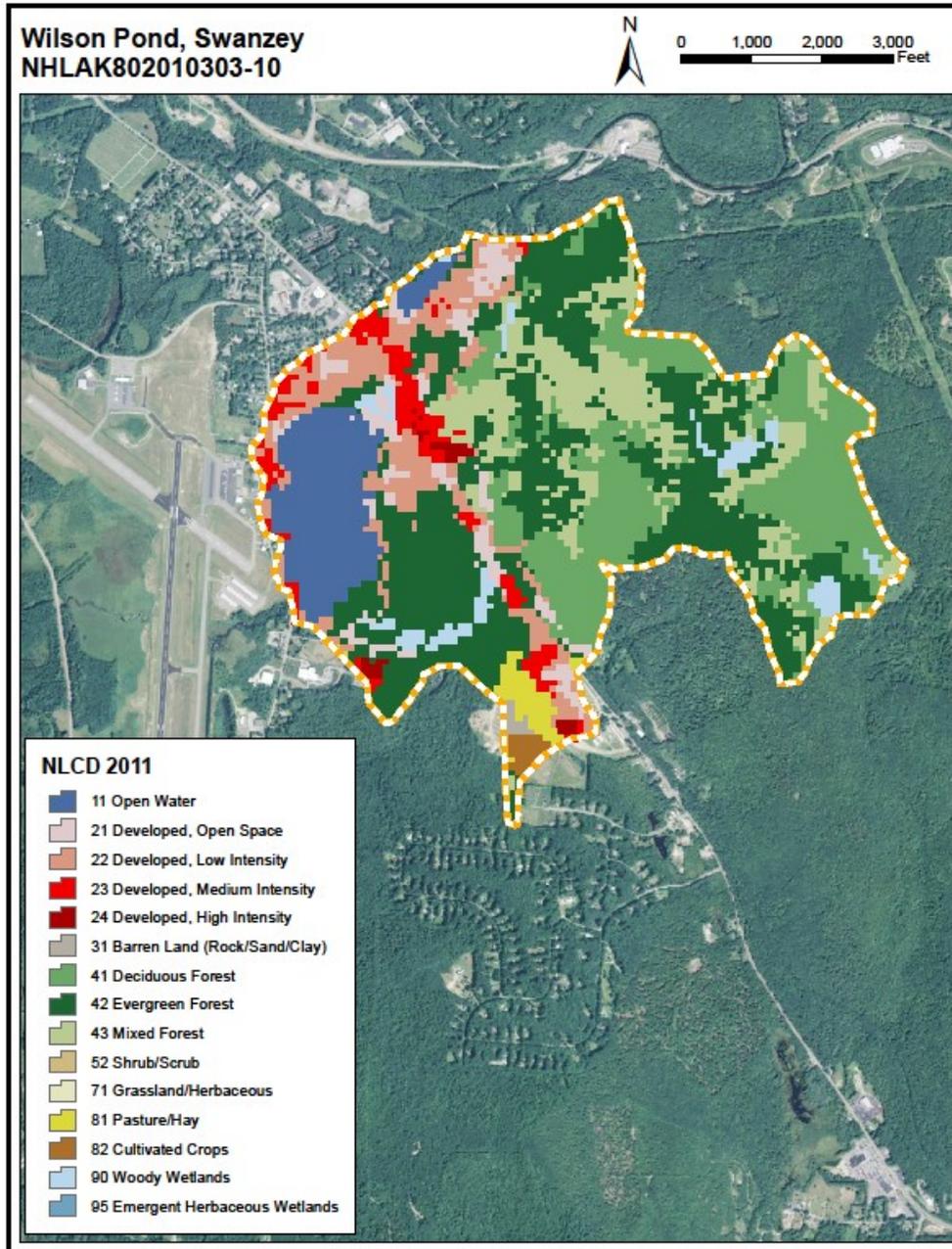
LAKE: WILSON POND		TOWN: SWANZEY		DATE: 9/9/2014
KEY	PLANT NAME		ABUNDANCE	
	SCIENTIFIC	COMMON		
A	Potamogeton amplifolius	Bass weed	Scattered	
B	Brasenia schreberi	Watershield	Scattered	
C	Ceratophyllum demersum	Coontail	Scattered	
E	Eleocharis	Grassy spike rush	Common	
f		Filamentous algae	Scattered	
g	Polygonum	Smartweed	Sparse	
G	Sagittaria graminea	Grassy arrowhead	Scattered	
h	Nymphoides cordatum	Floating heart	Scattered	
l	Iris versicolor	Blue flag	Sparse	
j	Najas	Bushy pondweed	Scattered	
M	Myriophyllum humile	Water milfoil	Scattered	
N	Nymphaea	White water lily	Scattered	
P	Pontederia cordata	Pickerelweed	Scattered	
S	Sparganium	Bur-reed (erect leaf)	Scattered	
T	Typha	Cattail	Scattered	
U	Utricularia radiata	Bladderwort	Scat/Common	
u	Utricularia purpurea	Purple bladderwort	Common	
V	Utricularia vulgaris	Common bladderwort	Common	
W	Potamogeton natans	Floating-leaf pondweed	Scattered	
X	Potamogeton epihydrus	Leafy pondweed	Scat/Common	
Y	Nuphar	Yellow water lily	Scattered	
OVERALL ABUNDANCE: Scattered/Common				

Abundance	Points	Description
Sparse	0	Few emergent plants observed; generally < 10% overall cover.
Scattered	1	Several small patches or one to two large patches or much of the shoreline with a sparsely growing plant; Generally 11-20% coverage.
Scattered/Common	2	Plants covering approximately 21-35% of lake.
Common	3	Plants around most of the shoreline but not a problem to navigation or several large patches of plants. 36-55% cover.
Common/Abundant	4	Intermediate between Common and Abundant. 56-74% cover.
Abundant	5	Plants around the entire shoreline and with large patches in several areas; sub-merged plants visible, ranging 75-89% cover.
Very Abundant	6	At least ½ of the surface with emergent, floating leaf or submerged plants; navigation and swimming is impaired in areas, 80-100% cover.

Lake Bathymetry and Depth Contours



Watershed Land Use Map



Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover	Lake Cover Category	Percent (%) Cover
Open Water	8.84	Barren Land	0.26	Grassland/ Herbaceous	0.05
Developed, Open Space	4.66	Deciduous Forest	20.96	Pasture Hay	1.42
Developed, Low Intensity	8.93	Evergreen Forest	32.12	Cultivated Crops	0.63
Developed, Medium Intensity	4.08	Mixed Forest	14.13	Woody Wetlands	3.18
Developed, High Intensity	0.74	Shrub/ Shrub	0.00	Emergent Wetlands	0.00

Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States - Representing a decade of land cover

[Click here for an interactive map of all historic and current lake trophic survey reports.](#)