



Floatingleaf and Emergent Plants in the Pike Lake Chain, 2010

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## **Pike Lake Chain, Price and Vilas Counties, Wisconsin Aquatic Plant Surveys in 2010**

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**Amik Lake  
Pike Lake  
Round Lake  
Turner Lake**

**Prepared for:  
Pike Lake Chain Lakes  
Association**



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# Pike Lake Chain, Price and Vilas Counties, Wisconsin, Aquatic Plant Surveys in 2010

## Introduction

Pike Lake Chain has a variety of native aquatic plants. The objective of the 2010 plant evaluations were to assess the status of native aquatic plants and to characterize the summer aquatic plant community of the Pike Lake Chain using a point-intercept plant survey. These surveys can serve as a reference point to determine if aquatic plants are increasing or decreasing in the future.

Aquatic plants are very important to lakes. They act as nurseries for small fish, refuges for larger fish, and they help to keep the water clear. Currently Pike, Round, Amik and Turner Lakes have a wide diversity of aquatic plants, but coverage varies greatly within the four lakes.



**Figure 1. Fern pondweed was the dominant plant sampled in Amik Lake in 2010.**

# Methods

**Point Intercept Survey:** An aquatic plant survey of the Pike Lake Chain (Figure 2) was conducted by Blue Water Science in 2010. The survey used a point-intercept survey method. A grid map was prepared by Wisconsin DNR and points were distributed throughout the lake (Figure 3). Points were spaced between 47 to 72 meters apart depending on the rake (Table 1). GPS coordinates used a UTM WGS84 datum. At each sample point, plants were sampled with a 2-sided rake sampler. Due to the brownish-stained water, no visual sighting were used. All plant samples were collected with the rake sampler.

**Percent Occurrence of Plants:** After the survey all sites with plants were tabulated. The number of sites where a particular species was observed was divided by the total number of sites with plants. The result was the percent occurrence of sites with plants. The result was the percent occurrence.

**Plant Density Ratings Based on Rake Samples:** During the point-intercept survey aquatic plant abundance was estimated using the rake sampler. Aquatic plant rake densities are shown below.



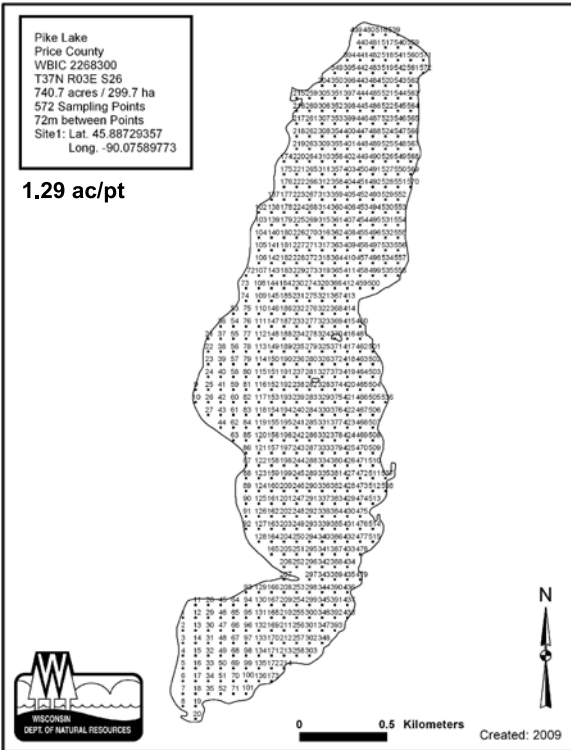
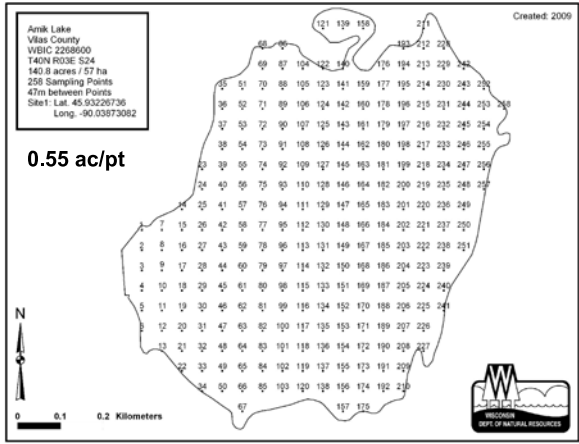
Typical plant growth patterns with associated density ratings on a scale of 1, 2, or 3.

Table 1. Summary of lake sizes and point-intercept points.

Lake Statistics	Size (acres)	Date of Survey	Total Points	Distance Between Points (m)
Amik	224	July 30, 2010	258	47
Pike	806	July 15, 2010	572	72
Round	726	July 29, 2010	894	58
Turner	149	July 16, 2010	268	49

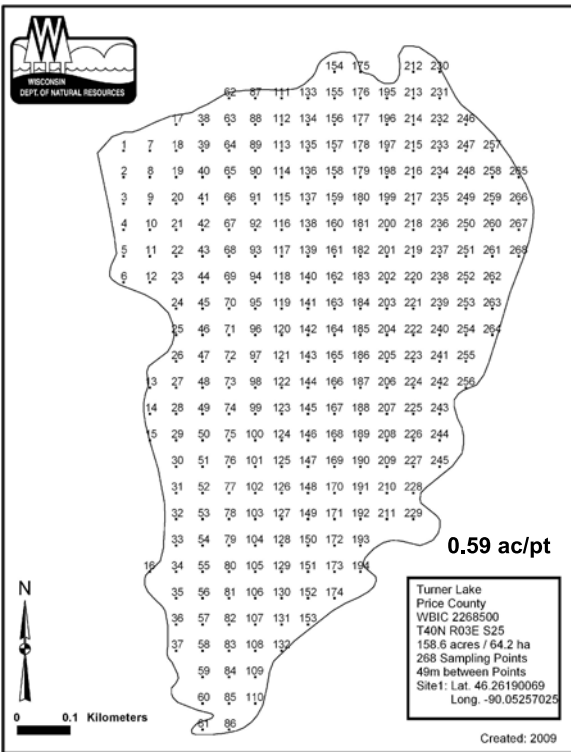
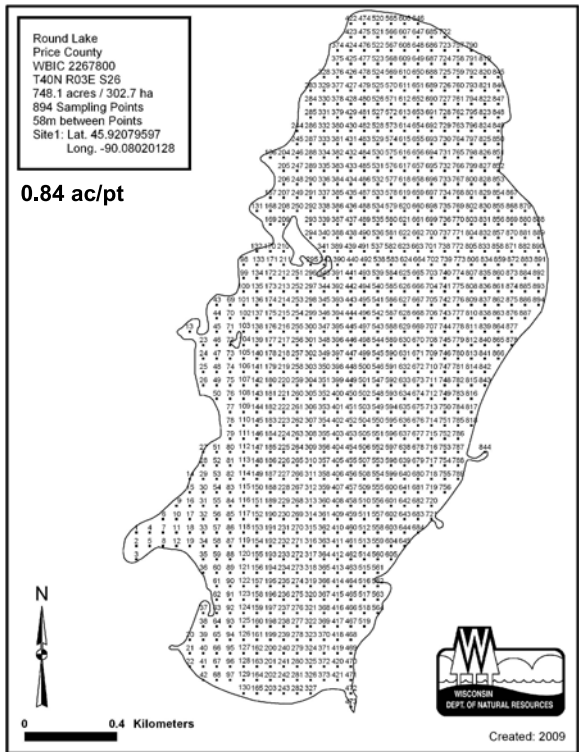


Figure 2. Pike, Round, and Amik and Turner Lakes are located in Price and Vilas Counties, Wisconsin.



Amik Lake

Pike Lake



Round Lake

Turner Lake

Figure 3. Lake maps with point-intercept points used in the aquatic plant surveys.

## Aquatic Plant Survey Results for 2010

The coverage and abundance of aquatic plants for Pike, Round, and Amik and Turner Lakes in 2010 are summarized in Table 2 and then discussed for individual lakes in the following pages. Of the submerged plants, water celery is the most common in Pike and Round Lakes. Fern pondweed is the most abundant plant in Amik Lake and elodea was most abundant in Turner Lake. Between 12 to 14 species of submerged and floatingleaf plant species are found in the four lakes. The distribution of aquatic plants in the four lakes is shown in Figure 4.

**Table 2. Summary for Pike Chain of Lakes aquatic plant percent occurrences for 2010 (top number). Number in parentheses is the number of sites the plant was found. Green shading represents dominant plant species.**

	Percent Occurrence of Aquatic Plants in the Growing Zone				
	Pike (108 sites)	Round (129 sites)	Amik (258 sites)	Turner (154 sites)	Total Occurrence (649 sites)
Pickerel plant ( <i>Pontederia cordata</i> )	1 (1)	--	2 (5)	3 (5)	(11)
Swamp loosestrife ( <i>Decodon verticillatus</i> )	--	--	--	1 (1)	(1)
Bulrush - softstem ( <i>Scirpus validus</i> )	4 (4)	1 (1)	1 (2)	1 (2)	(9)
Cattails ( <i>Typha</i> sp)	--	--	--	1 (1)	(1)
Watershield ( <i>Brasenia Schreberi</i> )	16 (17)	3 (4)	1 (3)	3 (5)	(29)
White waterlily ( <i>Nuphar</i> sp)	2 (2)	6 (8)	7 (18)	1 (4)	(32)
Spatterdock ( <i>Nuphar variegatum</i> )	5 (5)	2 (3)	2 (6)	2 (3)	(17)
Floatingleaf burreed ( <i>Sparganium</i> sp)	8 (9)	--	1 (1)	5 (8)	(18)
Coontail ( <i>Ceratophyllum demersum</i> )	8 (9)	1 (1)	33 (80)	11 (17)	(107)
Chara ( <i>Chara</i> sp)	7 (8)	39 (49)	3 (8)	1 (2)	(67)
Moss ( <i>Drepanocladus</i> sp)	3 (3)	--	1 (1)	--	(4)
Elodea ( <i>Elodea canadensis</i> )	--	2 (2)	32 (77)	40 (61)	(148)
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	5 (5)	3 (4)	7 (16)	3 (5)	(30)
Naiads ( <i>Najas</i> sp)	28 (30)	44 (56)	1 (2)	13 (20)	(108)
Nitella ( <i>Nitella</i> sp)	11 (12)	--	24 (58)	10 (15)	(85)
Cabbage ( <i>Potamogeton amplifolius</i> )	3 (3)	2 (3)	22 (52)	6 (9)	(67)
Variable pondweed ( <i>P. gramineus</i> )	6 (6)	17 (22)	--	--	(28)
Floatingleaf pondweed ( <i>P. natans</i> )	1 (1)	--	--	--	(1)
Stringy pondweed ( <i>P. pusillus</i> )	2 (2)	--	3 (8)	14 (21)	(31)
Claspingleaf pondweed ( <i>P. richardsonii</i> )	18 (19)	14 (18)	27 (64)	15 (23)	(124)
Fern pondweed ( <i>P. robbinsii</i> )	11 (12)	2 (3)	61 (148)	28 (43)	(206)
Flatstem pondweed ( <i>P. zosteriformis</i> )	1 (1)	1 (1)	20 (47)	13 (20)	(69)
Bladderwort ( <i>Utricularia</i> sp)	6 (6)	1 (1)	1 (2)	--	(9)
Water celery ( <i>Vallisneria americana</i> )	81 (87)	79 (100)	7 (17)	13 (20)	(224)
Number of submerged and floatingleaf species	14	12	14	12	
Estimated Acres of Coverage	139	108	137	91	
% Plant Coverage of lake	19%	14%	97%	57%	

## Pike Lake Chain - Native Plant Distribution

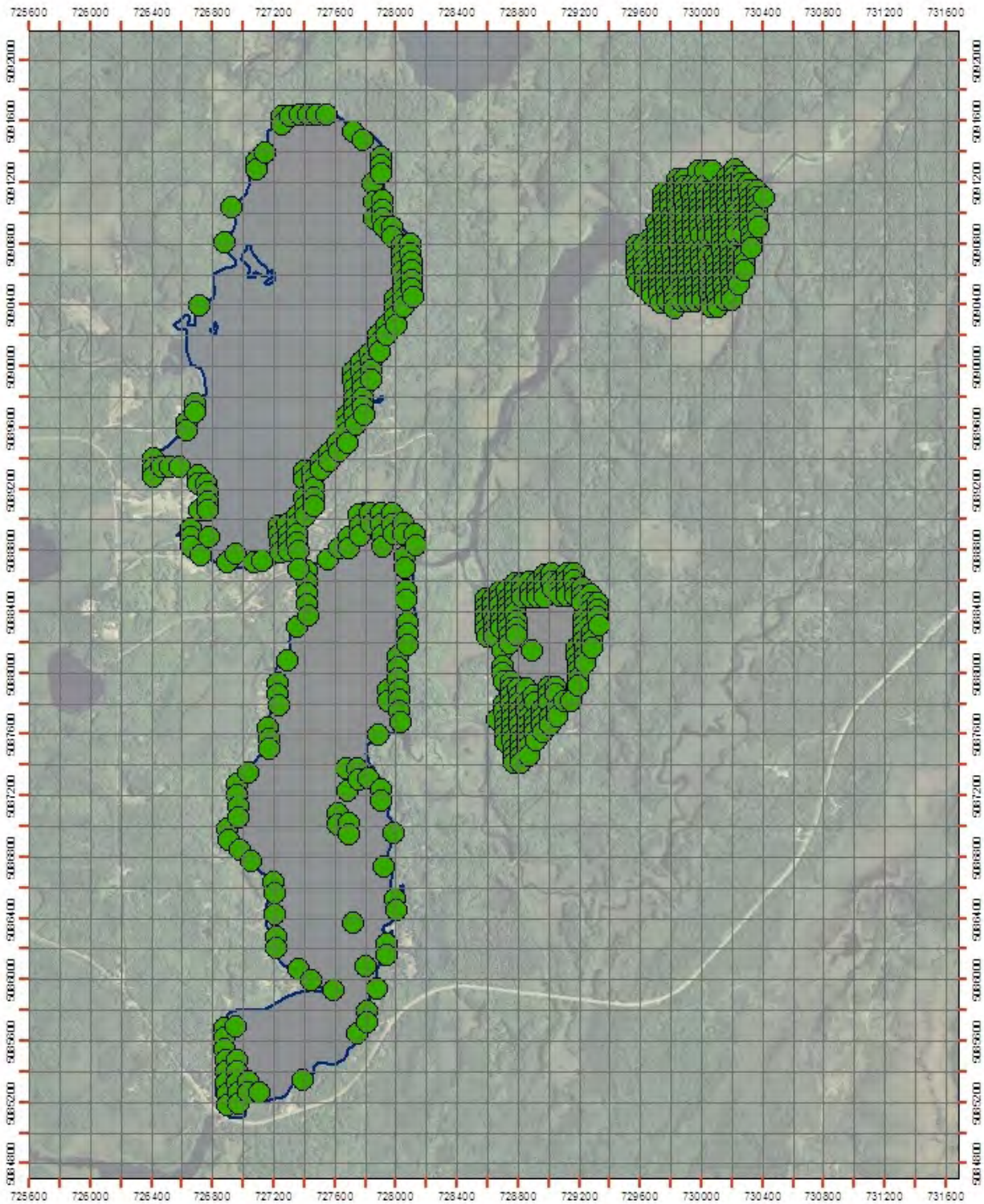
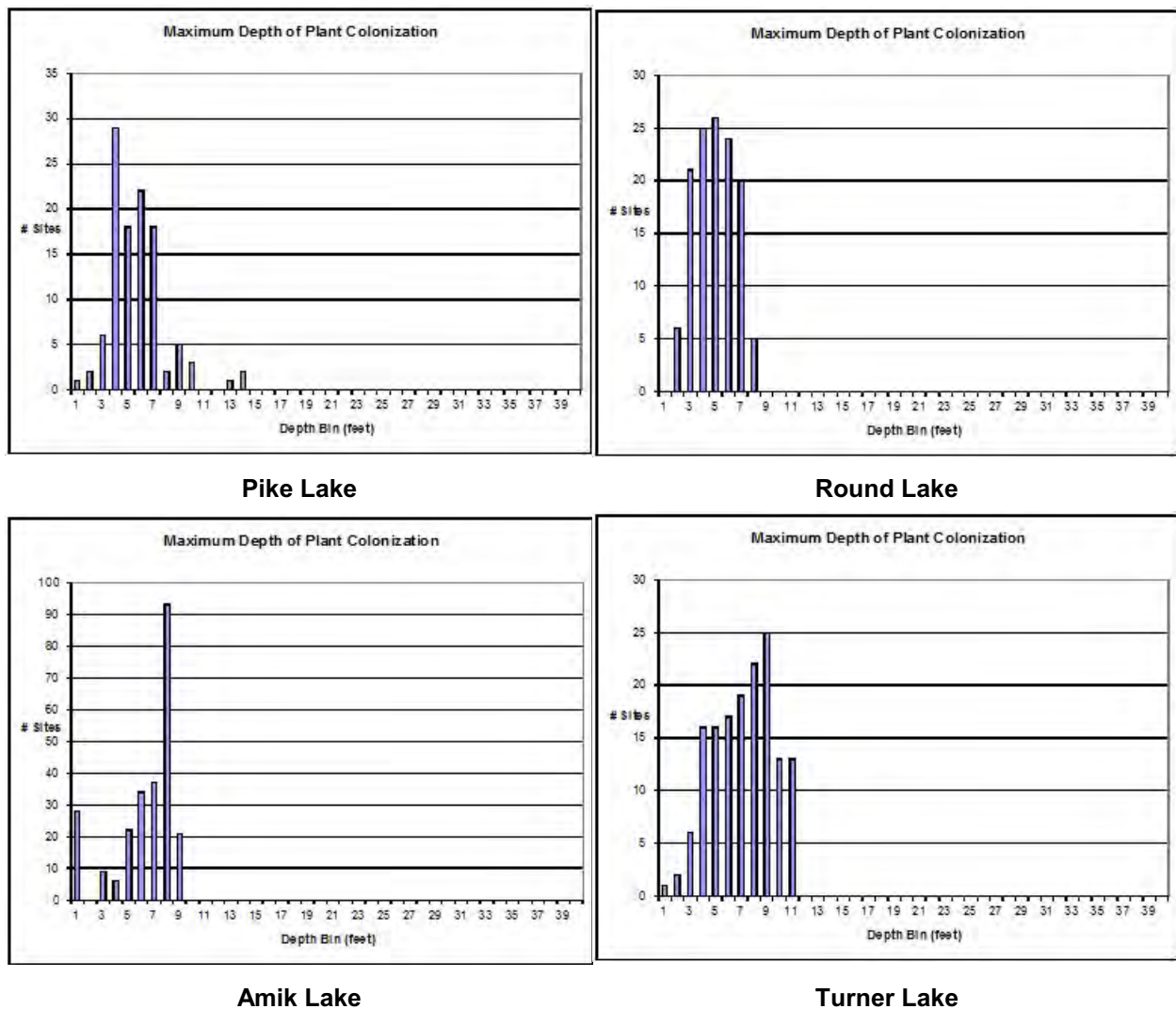


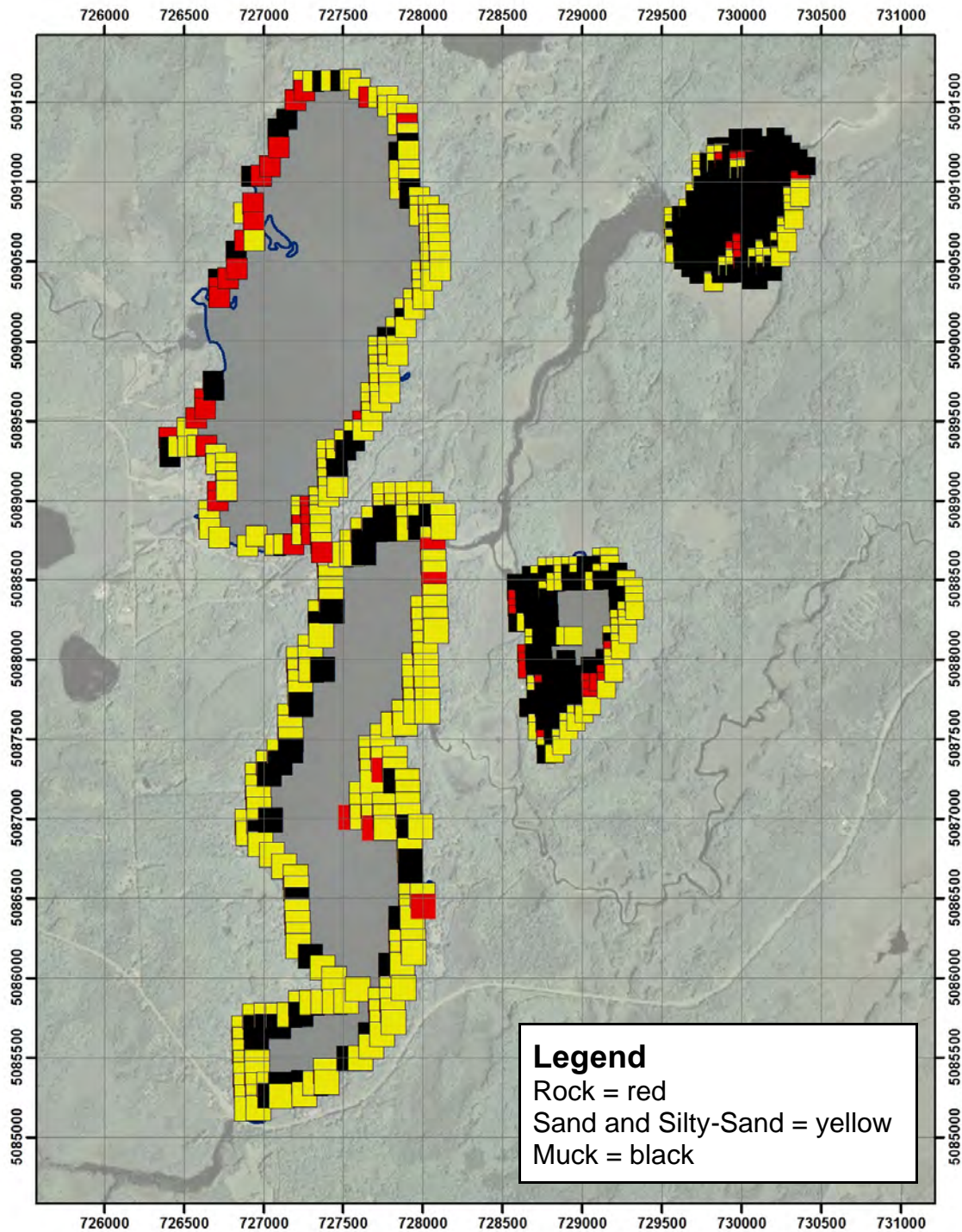
Figure 4. Native aquatic plant distribution in the four lakes in the Pike Chain in 2010. Round Lake is shown in the upper left and Pike Lake is in the lower left. Amik Lake is shown in the upper right and Turner Lake is in the lower right.

**Depth of Colonization of Aquatic Plants in the Pike Lake Chain:** The depth of water that aquatic plants grow is partly a function of sunlight penetration and sunlight penetration can be gaged by the Secchi disc depth. Although plants were found growing out to 14 feet deep in Pike Lake, they were scarce at water depths greater than 7 feet (Figure 5). Round Lake also had most of the rooted plant growth out to about 7 feet. Turner Lake had consistent plant growth out to 11 feet. Amik Lake was colonized out to 9 feet but that is about as deep as the lake is. The bog stain which colors the lake water with a brownish-red tinge may affect sunlight penetration and may limit aquatic plant growth in Pike and Round Lakes to 7 or 8 feet (Figure 4).



**Figure 5. Depth of colonization for all plants sampled in the Pike Chain.**

**Pike Lake Chain - Lake Sediment Composition:** Sediment composition of littoral zone (plant growing zone) for the Pike Chain is shown in Figure 6. Sediments in Round Lake (upper left) and Pike Lake (lower left) are dominated by sand and rock. Amik Lake (upper right) is dominated by muck and Turner Lake (lower right) is a combination of muck (west shore) and sand (east shore).



**Figure 6. Sediment composition in the plant growing zone of the Pike Lake Chain of Lakes.**



# Summary of Aquatic Plant Surveys for Individual Lakes

**Amik Lake Aquatic Plants:** Amik Lake has a diverse plant community with 14 species of floatingleaf and submerged plants (Table 3). In 2010, fern pondweed was the most common species followed by a half dozen other species. Amik Lake is shallow and plant growth was found throughout most of the lake in 2010, but generally scattered. Plant growth is robust along the nearshore areas (Figure 7).

An interesting plant species in Amik Lake is cabbage (*Potamogeton amplifolius*). In 2000 it was reported to cover almost the entire lake basin. However, in 2001, cabbage was present, but scattered. It had the appearance of a “die-back”. Upon inspection of leaves and stems, we found that aquatic insect larvae were apparently feeding on the leaves and stems of the cabbage probably causing the “die-back”. Its possible this insect could be responsible for controlling the excessive growth of cabbage (Figure 8).

Since 2001, it appears cabbage has not be a long-term problem in Amik. The good news is that the abundant vegetation will help keep water quality good. The only downside is that a couple of residences have a slight problem getting to open water.

In 2010, cabbage was common, but the dominant plant was fern pondweed (Table 3 and Figure 10).

A compilation of Amik Lake aquatic plants is given in Table 4.



**Figure 7. Nearshore growth of aquatic vegetation in Amik Lake, July 2001.**

**Table 3. Summary for Amik Lake aquatic plant percent occurrences for 2010 (top number). Number in parentheses is the number of sites the plant was found. Green shading represents dominant plant species.**

	Percent Occurrence of Aquatic Plants
	Amik (258 sites)
Pickereel plant ( <i>Pontederia cordata</i> )	2 (5)
Bulrush - softstem ( <i>Scirpus validus</i> )	1 (2)
Watershield ( <i>Brasenia Schreberi</i> )	1 (3)
White waterlily ( <i>Nuphar sp</i> )	7 (18)
Spatterdock ( <i>Nuphar variegatum</i> )	2 (6)
Floatingleaf burreed ( <i>Sparganium sp</i> )	1 (1)
Coontail ( <i>Ceratophyllum demersum</i> )	33 (80)
Chara ( <i>Chara sp</i> )	3 (8)
Moss ( <i>Drepanocladus sp</i> )	1 (1)
Elodea ( <i>Elodea canadensis</i> )	32 (77)
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	7 (16)
Naiads ( <i>Najas sp</i> )	1 (2)
Nitella ( <i>Nitella sp</i> )	24 (58)
Cabbage ( <i>Potamogeton amplifolius</i> )	22 (52)
Stringy pondweed ( <i>P. pusillus</i> )	3 (8)
Claspingleaf pondweed ( <i>P. richardsonii</i> )	27 (64)
Fern pondweed ( <i>P. robbinsii</i> )	61 (148)
Flatstem pondweed ( <i>P. zosteriformis</i> )	20 (47)
Bladderwort ( <i>Utricularia sp</i> )	1 (2)
Water celery ( <i>Vallisneria americana</i> )	7 (17)
Number of submerged and floatingleaf species	14



**Figure 8. [top-left] This chironomid species was found on the underside of cabbage leaves in Amik Lake in 2001.**

**[top-left] At the time of the plant survey on July 26, 2001, much of the cabbage community was found scattered and not at nuisance densities.**

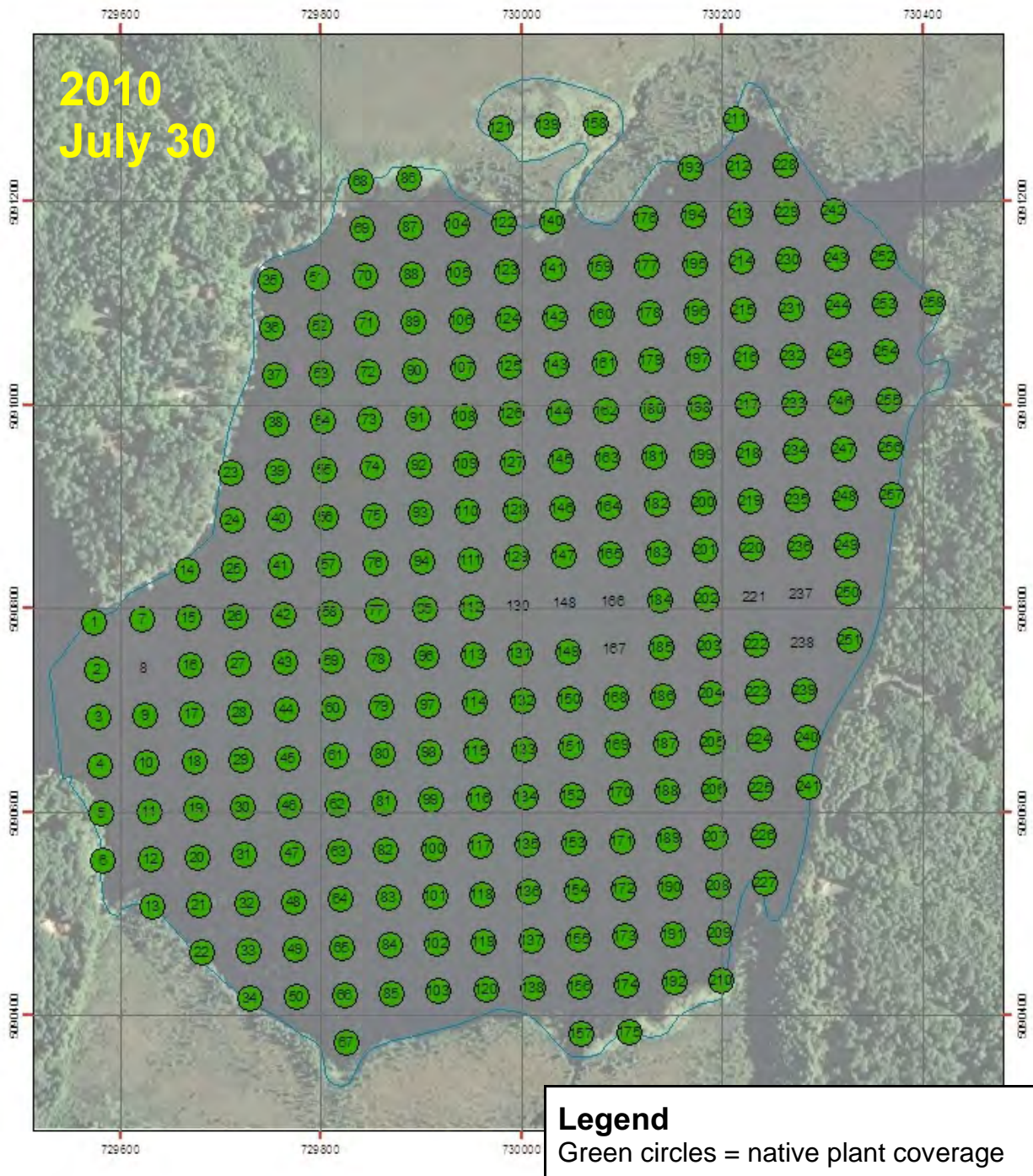
**[bottom-left] Watershield in Amik Lake on July 15, 2010.**

**[bottom-right] Fern pondweed in Amik Lake on July 15, 2010.**



**Pike Chain of Lakes volunteers helped collect plant data.**

**Amik Lake (141 acres) Native Plant Distribution:** Coverage is approximately 137 ac out of 141 acres or 97% plant coverage.



**Figure 9. Amik Lake native plant distribution, July 30, 2010.**

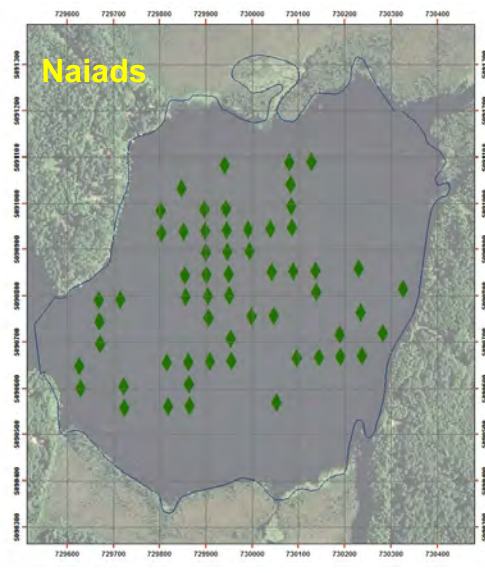
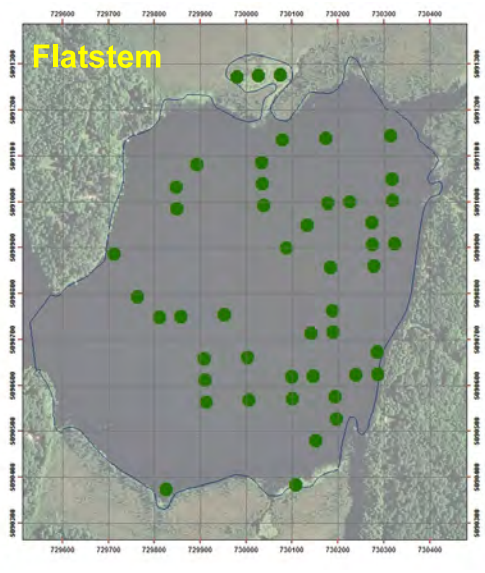
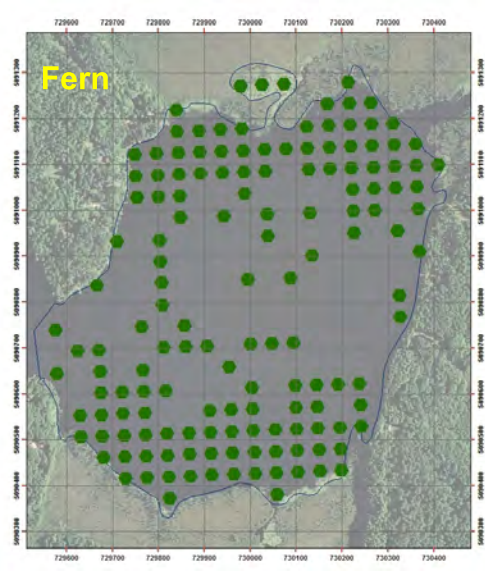
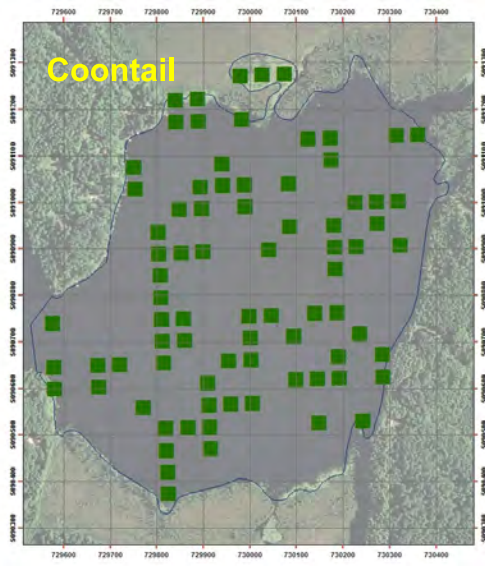
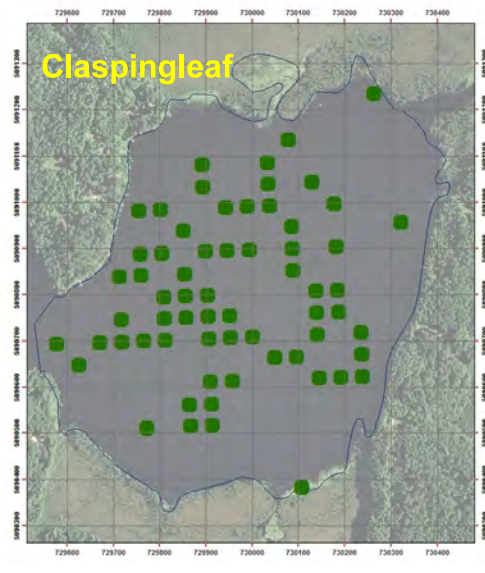
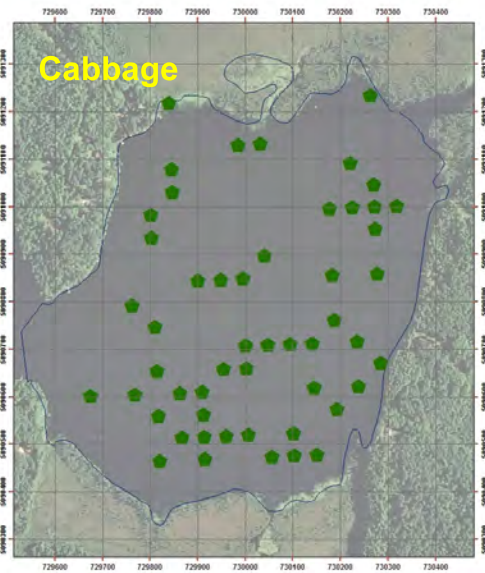


Figure 10. Individual maps of selected plants found in Amik Lake on July 30, 2010.

## Amik Lake - Lake Sediment Composition

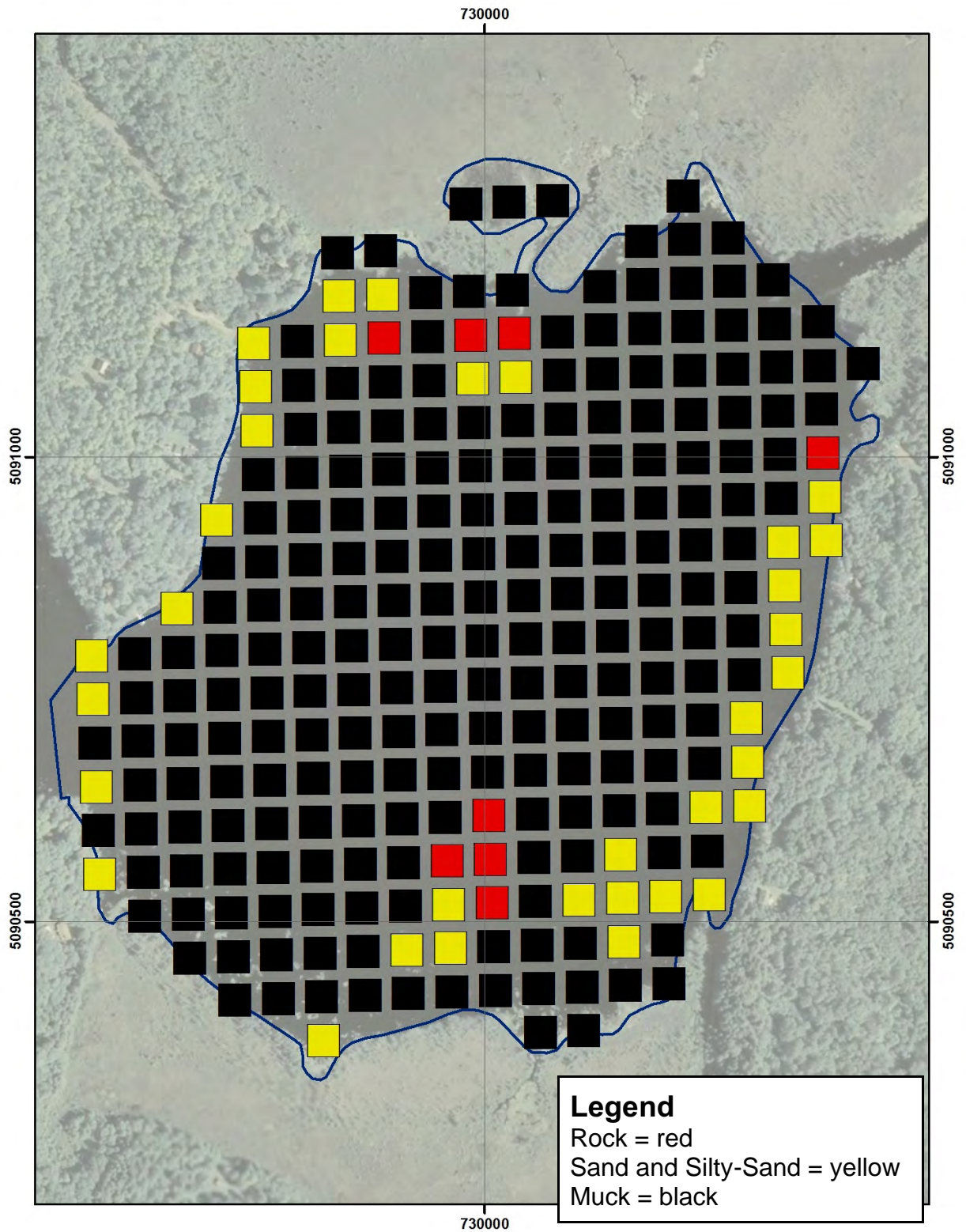


Figure 11. Amik Lake sediments are composed primarily of muck with scattered areas of sand.

Table 4. Amik Lake aquatic plant data for 2010.

Site	Depth (ft)	Bul-rush	Pickeral	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	Moss	Naiads	Nitella	North. Milfoil	Sagit-taria	Stringy Pond-weed	Water Celery
6			1	1		1												1			2
121			1			1					1		1	1							
139			1			1					1		1	1							
158			1			1					1		1	1							
175					1	1				1		1		1							1
240	2							1			1			1							
241	2										1	1		1							1
210	2.5					1						1	1								1
1	3																				1
14	3													1							1
68	3			1	1			1			1	1	2								
86	3			1	3		1				1										
104	3												2								1
122	3		1								1	2	1								
141	3							1					1								
211	3					1							1								
140	3.5			2			1					1									
255	3.5					1							1						2		
258	3.5			1									2								
5	4					1					1										1
22	4					1							3								
36	4										2		1					1			2
193	4											1	2								
227	4										1	1	1					1			
254	4												2								
256	4	1																			1
257	4	2											1								2
138	4.5												1								
176	4.5											1	2								
209	4.5												1								
228	4.5							1		1		1	1								
251	4.5												3								
23	5												1					1			
34	5												3								
35	5												3								
37	5										2	1	2								
51	5												2								
67	5										1	1	1	1							
69	5										1		2								
87	5										1	1	2								
119	5											1	3								
123	5							1					2								
135	5										1		1	1					2		
136	5							1					2								
157	5					1						1	3								
159	5									1			2	1							
192	5												3								
212	5												2								
213	5											1	3								
229	5												3								
242	5												3								
250	5											1	2					1			
252	5										2		1								
253	5												3								
13	5.5					1							2								
21	5.5			1		1						1	2								
50	5.5					1			1				2					1			
85	5.5												2								
102	5.5							1			2		1								
174	5.5												2								
177	5.5										1	1	3								
194	5.5												2								
230	5.5												3								
231	5.5												2								
4	6										1	1	1								
12	6					1							2								
20	6												3								
33	6												3								
49	6												3								
52	6											1	3								
66	6					1					1		2								
70	6												3								
84	6												2								
88	6												3								
103	6												2								
105	6												3								

**Table 4. Amik Lake aquatic plant data for 2010.**

Site	Depth (ft)	Bul-rush	Pickeral	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	Moss	Naiads	Nitella	North. Milfoil	Sagit-taria	Stringy Pond-weed	Water Celery	
118	6							1					3									
120	6											1	3									
124	6												2									
155	6							1					3									
156	6												2									
173	6							1					2									
190	6										1	1	2									
195	6										3	1	1	1								
208	6												1	1								
216	6												3									
226	6												2									
232	6							1					2									
239	6								1			1					1					1
244	6												3									
65	6.5							1			1		3									
71	6.5							2					3									
154	6.5												3									
172	6.5							1					2									
191	6.5					1		1				1	1	1								
196	6.5										1		3									
214	6.5												3									
215	6.5							1					3									
233	6.5							1			1		3									
243	6.5										1	1	1	1								
245	6.5												3	1								
246	6.5							1			3			1								
249	6.5											1						1				
2	7										1		2									
7	7											1										
10	7																	2				
11	7																	2				
19	7							1			1		3									
31	7												1					2				
32	7												3									
38	7											1								1		
48	7					1						1	2									
53	7												1									2
54	7							1			1							1				
64	7										1		2									
72	7							1				1	1	1				1				
89	7												2	1								
101	7							1			1	2		1								
106	7										1	1	1					1				
117	7										1		2									1
125	7										1		1					1				
137	7												3									
142	7												1	1								
160	7																	2				
170	7										1		2	1								
171	7												2	1								
178	7												2									
188	7							1			1		1	1								
189	7												1									
217	7							1			2	1	2	1								
218	7											1	1									
234	7							1			2	1		2				1				
3	7.5											2									1	
18	7.5										1		2									1
55	7.5							1			1	1	1					1				
56	7.5										1	1	1	1				1			1	2
57	7.5												2									
58	7.5										1	1	1	2								
59	7.5							1			1	2		1								
73	7.5								1				1	1								
90	7.5										1	2										
143	7.5										1			1					1			
152	7.5											1										
153	7.5																			1		
161	7.5										1									1		
162	7.5																			1		
179	7.5																					
197	7.5																					
207	7.5							1				1		1								
236	7.5							1						2								
247	7.5												1									
248	7.5										1			1								



Table 4. Amik Lake aquatic plant data for 2010.

Site	Depth (ft)	Bul-rush	Pickeral	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	Moss	Naiads	Nitella	North. Milfoil	Sagit-taria	Stringy Pond-weed	Water Celery	
8	8																					
9	8												2									
15	8																1					
16	8																1					
17	8									1			1				2			1		
24	8											1		1								
25	8									1												
26	8																1					
27	8									1												
28	8									1												
29	8										1											
30	8												1				1					
39	8											1									1	
40	8									1		1										
41	8								1	1												
42	8							2						1								
43	8												2									
45	8												1			1						
46	8							1					3									
47	8										2		1								1	
60	8									1	1	2	1									
61	8							1			1						1					
62	8												1									
63	8							1									1					
74	8									1		1					1					
75	8										1	2										
76	8									1							1					
77	8								1	1		1					2					
78	8									1	1	1	1	1								
79	8										1	1	1									
80	8											1					1					
83	8							1		1	1	1	1									
91	8										1						1	1				
92	8											2					1					
93	8									1	1	1					2					
95	8									2							1					
98	8													1			2	1				
99	8							1		1	1			1								
100	8							1		1	2	1	1	1								
107	8								1		1	1										
108	8									1			1								1	
109	8																				1	
110	8									2		1									1	
111	8							1													1	
126	8								1	1	1											
127	8																				1	
128	8									1											1	
131	8										1										1	
132	8							1		2	1		1									
134	8											1	1									
144	8									1			1	1								
145	8												1								1	
146	8							2			1											
150	8							1				2	1									
151	8									1		2										
163	8									1	1	1									1	
164	8									2		1		1								
168	8							1			2	1	1									
169	8									1		1									1	
180	8												1									
181	8											1		1								
182	8												1									
186	8							1		2				1								
187	8																				1	
198	8							2		1				1								
199	8										1	2										
202	8									2		1										
203	8							2		2	1			1								
204	8											1		1							1	1
205	8										1										1	
206	8									1	1		1									
219	8															1						
221	8																					
222	8																				1	
223	8							1		1	1											
224	8									1											1	

**Table 4. Amik Lake aquatic plant data for 2010.**

Site	Depth (ft)	Bul-rush	Pickeral	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	Moss	Naiads	Nitella	North. Milfoil	Sagit-taria	Stringy Pond-weed	Water Celery	
225	8							1		2			1	1								
235	8													1								
81	8.5							1									1					
82	8.5									1							1			1		
94	8.5							2									1					
96	8.5									1		1					1					
97	8.5									1		2	1									
112	8.5																2					
113	8.5									2		1		1								
114	8.5									1							1					
115	8.5							1			1	1	1				1					
116	8.5									1												1
129	8.5							1				1	1									
133	8.5							2			1	2		1								
165	8.5									1			1				1					
184	8.5									1							1					
185	8.5									2	1	1										
200	8.5									2	1	1										
201	8.5							1			2							1				
220	8.5																1					
238	8.5																					
44	9								1	1								1		1		
147	9																1					
149	9										1						1					
166	9																					
167	9																					
183	9																1					
237	9																					
130	9.5																					
148	10																					
<b>Average</b>		<b>1.5</b>	<b>1.0</b>	<b>1.2</b>	<b>1.7</b>	<b>1.0</b>	<b>1.0</b>	<b>1.1</b>	<b>1.0</b>	<b>1.2</b>	<b>1.2</b>	<b>1.1</b>	<b>1.8</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.2</b>	<b>1.1</b>	<b>2.0</b>	<b>1.0</b>	<b>1.3</b>	
<b>occurrence (258 sites)</b>		<b>2</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>18</b>	<b>2</b>	<b>52</b>	<b>8</b>	<b>64</b>	<b>80</b>	<b>77</b>	<b>148</b>	<b>47</b>	<b>1</b>	<b>2</b>	<b>58</b>	<b>16</b>	<b>1</b>	<b>8</b>	<b>17</b>	
<b>% occurrence</b>		<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>20</b>	<b>3</b>	<b>25</b>	<b>31</b>	<b>30</b>	<b>57</b>	<b>18</b>	<b>0</b>	<b>1</b>	<b>22</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>7</b>	

**Pike Lake Aquatic Plants:** Pike Lake has a nice variety of aquatic plant species with water celery and naiads being the most common species (Table 5). Floatingleaf species were present and colonized more than 17 sites (Figure 14).

A unique feature of Pike Lake is the bottom covering of wooden slabs in the north shore of the southern bay. They were discarded into the bay during the sawmill operation. No aquatic plants were found in this area (Figure 14), but they offer some habitat for fish and invertebrates.

Chara and naiads grew to the deepest depths at 14 feet. Plant data for individual sample sites is shown in Table 6.



**Figure 12. Discarded wooded slabs from the sawmill operation are still found on the north shore in a southern bay of Pike Lake.**

**Table 5. Summary for Pike Lake aquatic plant percent occurrences for 2010 (top number). Number in parentheses is the number of sites the plant was found. Green shading represents dominant plant species.**

	Percent Occurrence of Aquatic Plants
	Pike (108 sites)
Pickereel plant ( <i>Pontederia cordata</i> )	1 (1)
Bulrush - softstem ( <i>Scirpus validus</i> )	4 (4)
Watershield ( <i>Brasenia Schreberi</i> )	16 (17)
White waterlily ( <i>Nuphar sp</i> )	2 (2)
Spatterdock ( <i>Nuphar variegatum</i> )	5 (5)
Floatingleaf burreed ( <i>Sparganium sp</i> )	8 (9)
Coontail ( <i>Ceratophyllum demersum</i> )	8 (9)
Chara ( <i>Chara sp</i> )	7 (8)
Moss ( <i>Drepanocladus sp</i> )	3 (3)
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	5 (5)
Naiads ( <i>Najas sp</i> )	28 (30)
Nitella ( <i>Nitella sp</i> )	11 (12)
Cabbage ( <i>Potamogeton amplifolius</i> )	3 (3)
Variable pondweed ( <i>P. gramineus</i> )	6 (6)
Floatingleaf pondweed ( <i>P. natans</i> )	1 (1)
Stringy pondweed ( <i>P. pusillus</i> )	2 (2)
Claspingleaf pondweed ( <i>P. richardsonii</i> )	18 (19)
Fern pondweed ( <i>P. robbinsii</i> )	11 (12)
Flatstem pondweed ( <i>P. zosteriformis</i> )	1 (1)
Bladderwort ( <i>Utricularia sp</i> )	6 (6)
Water celery ( <i>Vallisneria americana</i> )	81 (87)
Number of submerged and floatingleaf species	14



**Figure 13. [top photos] Examples of floatingleaf plants in Pike Lake consisting of watershield and Sparganium on July 26, 2001. [bottom photos] Aquatic plants on July 15, 2010.**



**Lake resident volunteers helped collect plant data.**

**Pike Lake (741 acres) Native Plant Distribution:** Coverage is approximately 139 acres out of 741 acres or 19% plant coverage.

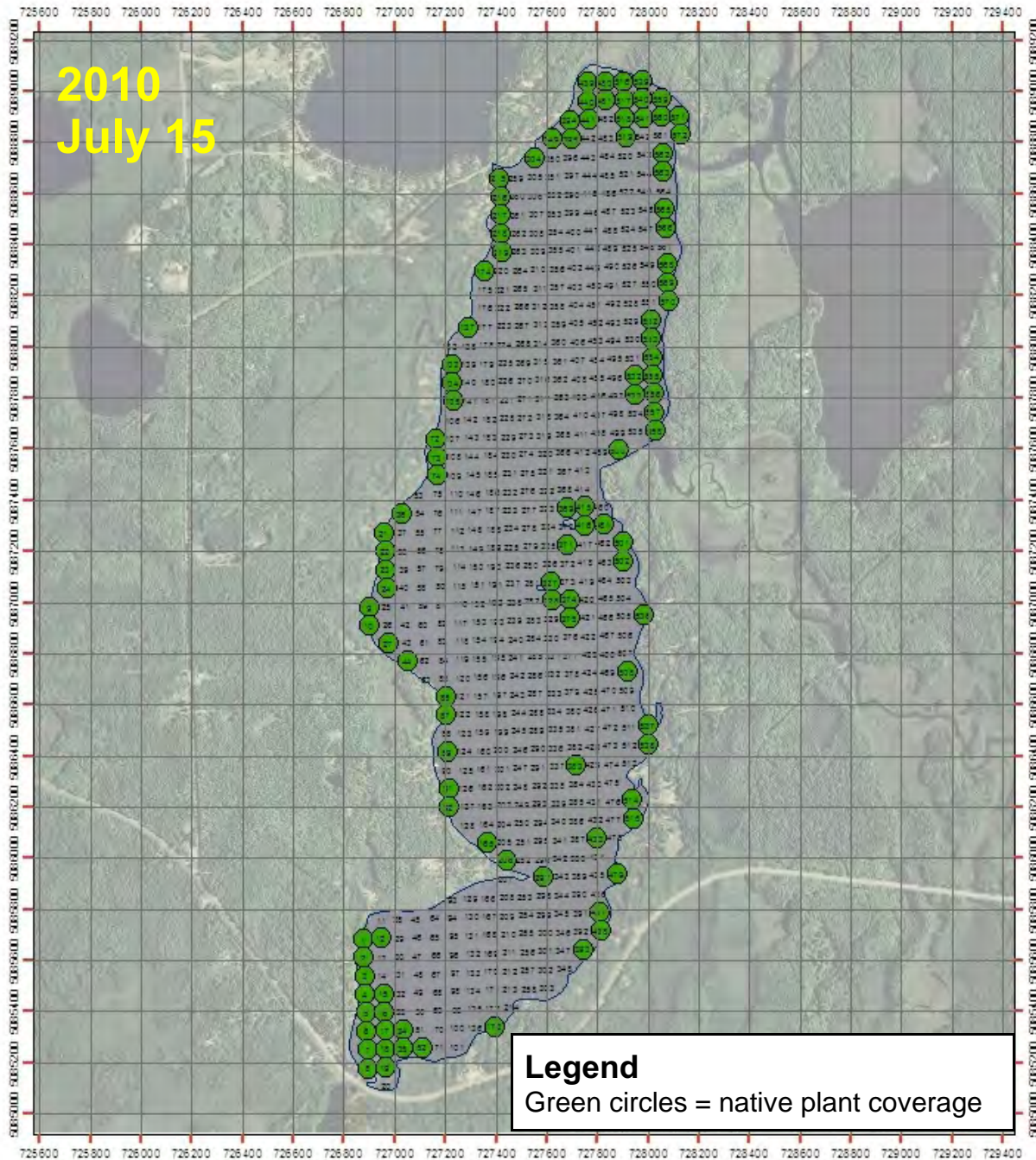
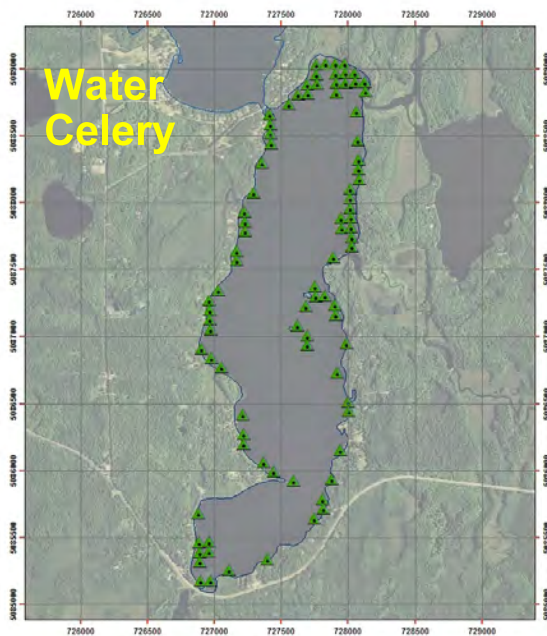
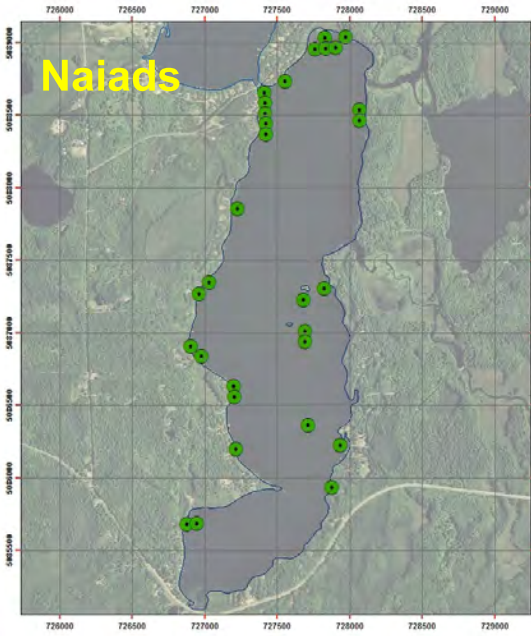


Figure 14. Pike Lake native plant distribution, July 15, 2010.



**Figure 15. Individual maps of selected plants found in Pike Lake on July 15, 2010.**

## Pike Lake - Lake Sediment Composition

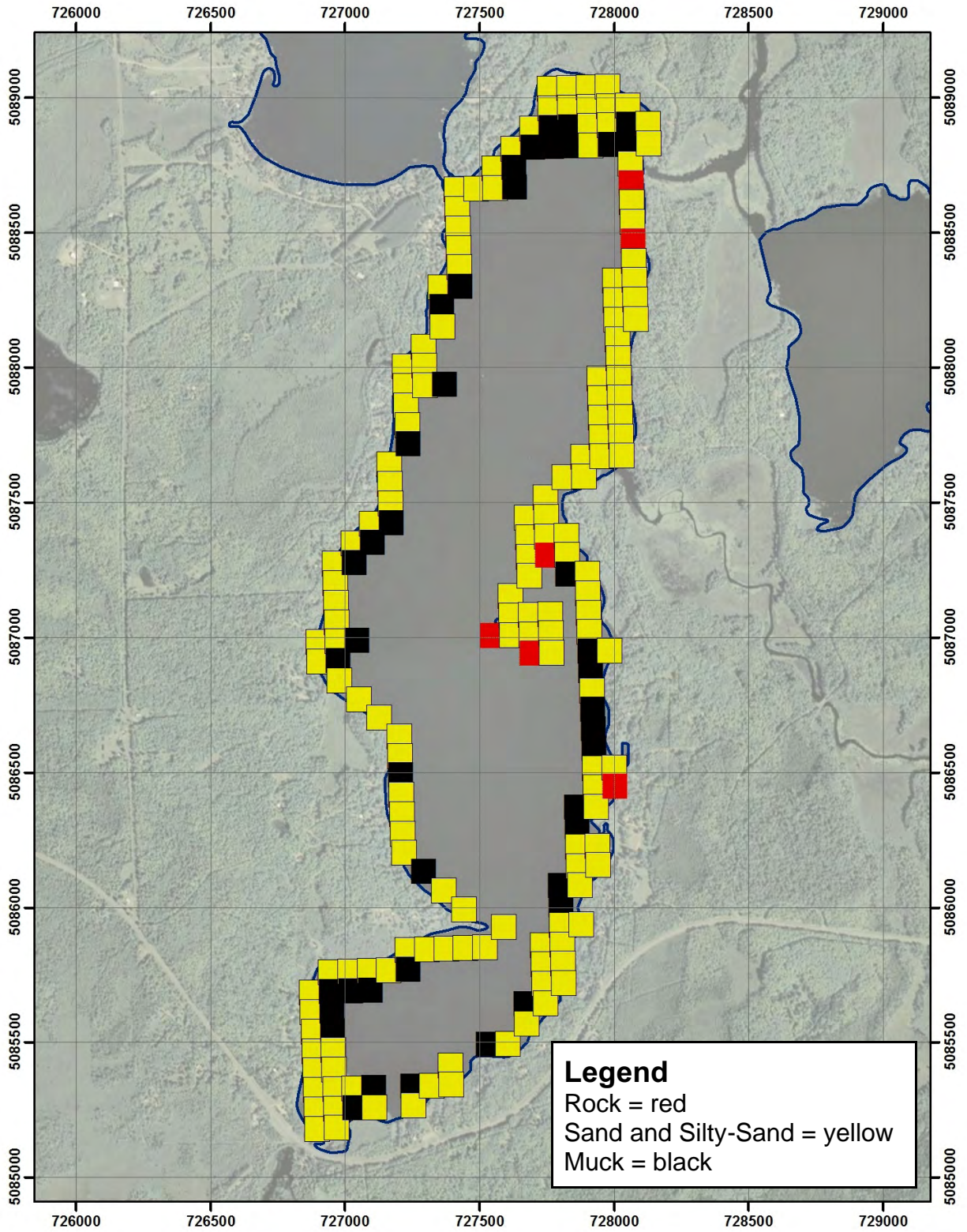


Figure 16. The nearshore area of Pike Lake is dominated by sandy sediments with some areas of muck mixed in. Rock and gravel are found at several sites as well.



Table 6. Pike Lake aquatic plant survey data for 2010.

Site	Depth (ft)	Bul-rush	Pick-eral	Spatter-dock	Water-shield	White Lily	Bladder wort	Cabb-age	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Fern Pond-weed	Flat-stem Pond-weed	Float-ingleaf Pond-weed	Moss	Naiads	Nitella	North-Milfoil	Spar-ganium	Stringy Pond-weed	Vari. Pond-weed	Water Celery	FA benthic
9	1	1	1																				
19	2			1	1	1					1	1			1							1	
87	2															1			1				
8	2.5				1	1					1	3										1	
86	2.5															1							
7	3				1						1			1				1					
10	3			1					1							2						1	
11	3																						
18	3			1	2							2			1			1					
63	3																						
93	3																						
173	3																		2			1	
513	3																						
21	3.5															1						1	
104	3.5															1					1	1	
129	3.5																						
216	3.5	2								1						1							1
479	3.5									1						1							1
1	4											1				1		1				2	
4	4				1						1											2	
5	4				1		3															1	
6	4						1				1											1	
17	4				1						1	3											
27	4			2							1					1			2			1	
35	4											3											
92	4															2						2	
102	4																						
103	4																		2			1	
217	4				3				1	1						2						1	
218	4															1						2	
304	4															1						1	
373	4																						
414	4																						
436	4																						
437	4																						1
439	4																1					2	
460	4																						
478	4																						
480	4															2						1	
507	4																						
515	4																1					2	
516	4											1										1	
538	4																1					2	
539	4															2						1	
553	4																					2	
554	4									1												1	
556	4							1														1	
557	4						1			1												2	
558	4									1					1						1	1	
570	4																					1	
23	4.5	2										1										2	
36	4.5															1						2	
208	4.5																						
327	4.5								1													2	
438	4.5																					1	
501	4.5				1					1									1			2	
514	4.5															1							
555	4.5							1														1	
2	5				1																		
3	5				3		1																
16	5				1		1				1	1										1	
34	5							1				1											
44	5																2		1			2	
45	5																						
52	5				1						1											1	
370	5																						
500	5									1							1					1	
536	5																					1	
537	5																			1		1	
569	5																1					1	
572	5																					2	
72	5.5				1																	2	

Table 6. Pike Lake aquatic plant survey data for 2010.

Site	Depth (ft)	Bul-rush	Pick-eral	Spatter-dock	Water-shield	White Lily	Bladder wort	Cabbage	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Fern Pond-weed	Flat-stem Pond-weed	Float-ingleaf Pond-weed	Moss	Naiads	Nitella	North. Milfoil	Spar-ganium	Stringy Pond-weed	Vari. Pond-weed	Water Celery	FA benthic
215	5.5															1						2	
15	6											1										2	
22	6											1										2	
24	6																					2	
28	6																					2	
73	6									1							1					2	
89	6																1					1	
91	6																	1				2	
105	6									1									1			1	
165	6																					2	
166	6																						
219	6												1			1							
328	6									1													
348	6																						
374	6								1							2						2	
375	6								2							1						1	
393	6																			1		2	
415	6									1							1					1	
440	6				1											1					1	1	
503	6																						
519	6								1									1				1	1
531	6																						1
535	6																						
559	6			1						1									1			2	
562	6																	1					
565	6															0.5							
567	6																		1			2	
571	6																						
53	6.5																						
174	6.5																					2	
206	6.5																					2	
394	6.5																1					1	
517	6.5															1					1	1	
552	6.5																				1	1	
568	6.5																					2	
12	7															1							
13	7																						
14	7																						
64	7																						
90	7																						
101	7																						
136	7																						
137	7																					1	
172	7																						
259	7																						
297	7																					2	
303	7																						
305	7	2																					
368	7																						
391	7																						
392	7																						
416	7																					1	
477	7																						
499	7																						
502	7									1												2	
518	7									1												2	1
532	7									1											1	1	
533	7																1					1	
540	7																					1	
563	7																					1	
564	7																						
566	7															1						1	
25	7.5																						
71	7.5																						
421	7.5																						
551	7.5																						
138	8																						
253	8																						
349	8																					1	
420	8																						
435	8																						
459	8																						
511	8																						
512	8																						

**Table 6. Pike Lake aquatic plant survey data for 2010.**

Site	Depth (ft)	Bul-rush	Pick-eral	Spatter-dock	Water-shield	White Lily	Bladder wort	Cabbage	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Fern Pond-weed	Flat-stem Pond-weed	Float-ingleaf Pond-weed	Moss	Naiads	Nitella	North. Milfoil	Spar-ganium	Stringy Pond-weed	Vari. Pond-weed	Water Celery	FA benthic
550	8																						
560	8																					1	
561	8																						
29	8.5																						
51	8.5																						
74	8.5																						1
139	8.5																						
481	8.5				1		1									1					1		
100	9																						
176	9																						
413	9																						
441	9																					1	2
461	9									1						1						1	
476	9																						
482	9																						
504	9																						
541	9									2													2
542	9																						
543	9				1																		
46	10																						
88	10																						
94	10																						
128	10																						
350	10																						
369	10									1													
371	10															1						2	
395	10																					2	
419	10																						
442	10																						
483	10																						
26	11																						
37	11																						
75	11																						
258	11																						
281	11																						
282	11																						
326	11																						
347	11																						
106	12																						
175	12																						
179	12																						
213	12																						
302	12																						
351	12																						
412	12																						
417	12																						
434	12																						
462	12																						
510	12																						
41	13																						
54	13																						
220	13																						
325	13																						
418	13																						
463	13																						
475	13																						
505	13																						
506	13																						
508	13																1						2
324	14																						
329	14																						
372	14																						
383	14								1							1							
433	14							1															
464	14																						
474	14																						
509	14																						
465	15																						
<b>Average</b>		<b>1.8</b>	<b>1.0</b>	<b>1.2</b>	<b>1.3</b>	<b>1.0</b>	<b>1.3</b>	<b>1.0</b>	<b>1.1</b>	<b>1.1</b>	<b>1.0</b>	<b>1.6</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.2</b>	<b>1.1</b>	<b>1.0</b>	<b>1.3</b>	<b>1.0</b>	<b>1.0</b>	<b>1.4</b>	<b>1.2</b>
<b>occurrence from 0-14 feet (108 sites)*</b>		<b>4</b>	<b>1</b>	<b>5</b>	<b>17</b>	<b>2</b>	<b>6</b>	<b>3</b>	<b>8</b>	<b>19</b>	<b>9</b>	<b>12</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>30</b>	<b>12</b>	<b>5</b>	<b>9</b>	<b>2</b>	<b>6</b>	<b>87</b>	<b>5</b>
<b>% occurrence</b>		<b>4</b>	<b>1</b>	<b>5</b>	<b>16</b>	<b>2</b>	<b>6</b>	<b>3</b>	<b>7</b>	<b>18</b>	<b>8</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>28</b>	<b>11</b>	<b>5</b>	<b>8</b>	<b>2</b>	<b>6</b>	<b>81</b>	<b>5</b>

\*There were a total of 572 sites on the grid map, but plants grew out to 14 feet and there were 108 sites from 0 to 14 feet.

**Round Lake Aquatic Plants:** Round Lake had 12 aquatic species in 2010. Plants only grew out to a depth of eight feet. Plant coverage is shown in Figure 18. Water celery (Figure 19) was the most common plant, with naiads and claspingleaf also being common.

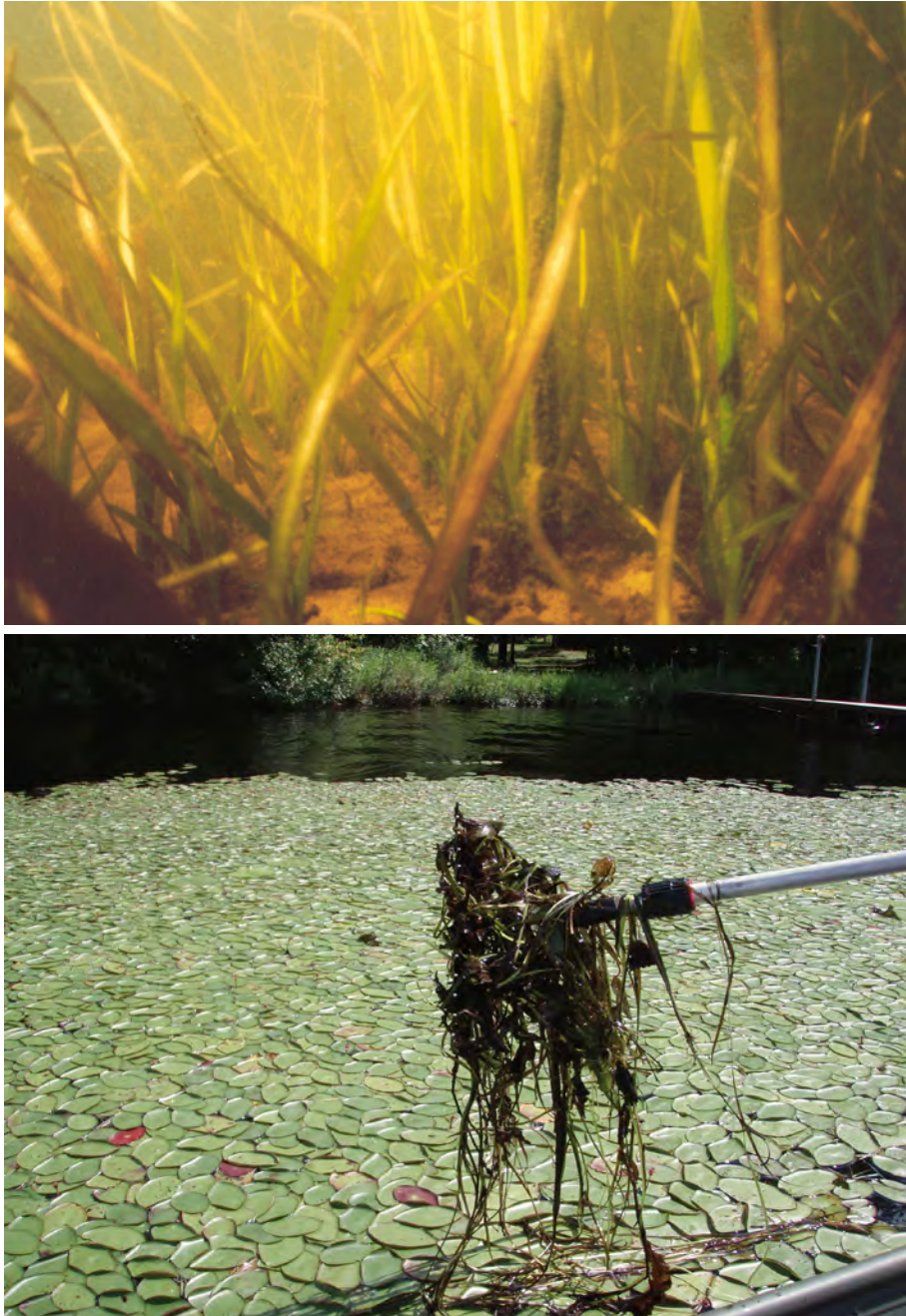


Figure 17. [top] Underwater picture of water celery in Round Lake on July 26, 2001. [bottom] Watershield (floatingleaf plant) and water stargrass (on rakehead) sampled on July 15, 2010.

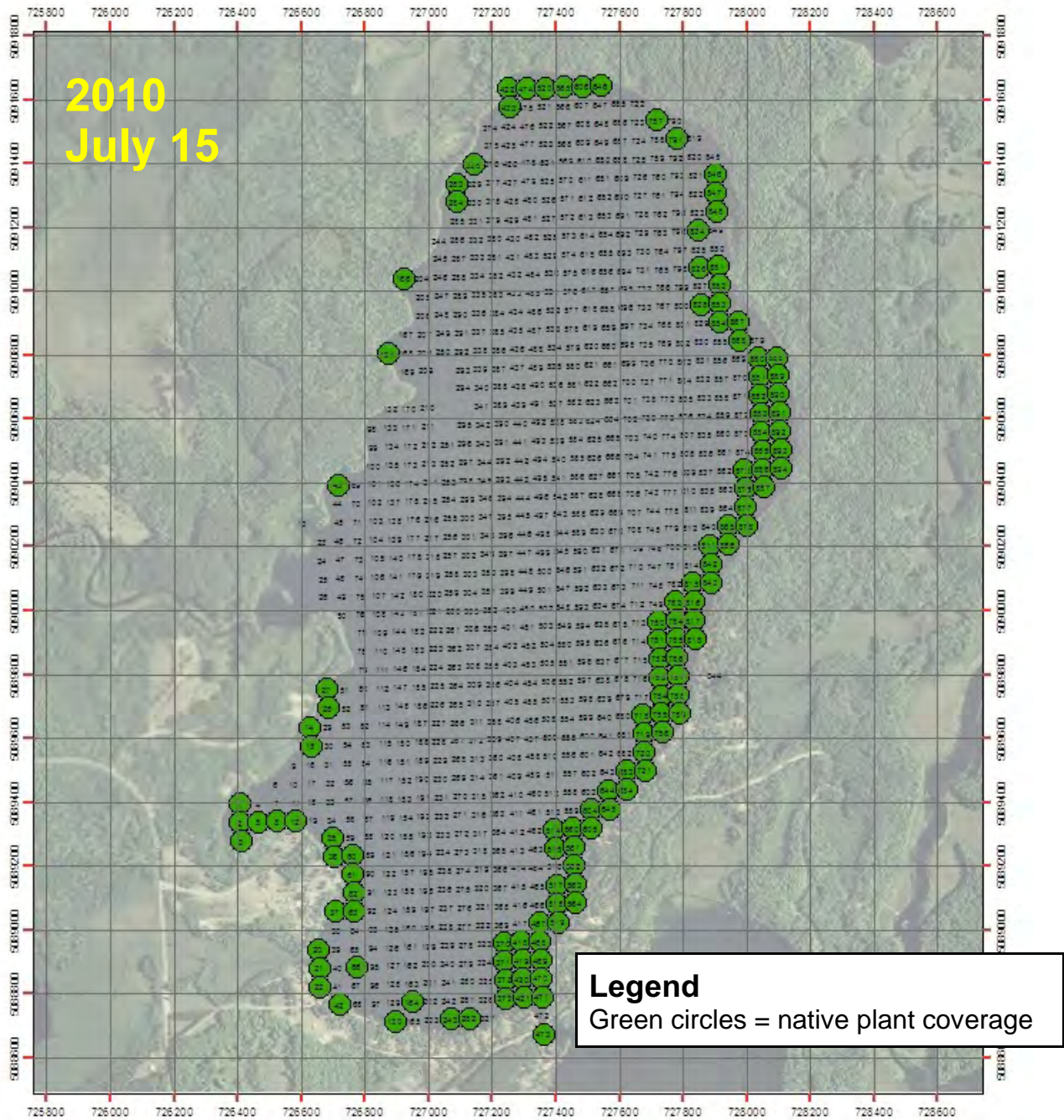
**Table 7. Summary for Round Lake aquatic plant percent occurrences for 2010 (top number). Number in parentheses is the number of sites the plant was found. Green shading represents dominant plant species.**

	Percent Occurrence of Aquatic Plants
	Round (129 sites)
Bulrush - softstem ( <i>Scirpus validus</i> )	1 (1)
Watershield ( <i>Brasenia Schreberi</i> )	3 (4)
White waterlily ( <i>Nuphar sp</i> )	6 (8)
Spatterdock ( <i>Nuphar variegatum</i> )	2 (3)
Coontail ( <i>Ceratophyllum demersum</i> )	1 (1)
Chara ( <i>Chara sp</i> )	39 (49)
Elodea ( <i>Elodea canadensis</i> )	2 (2)
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	3 (4)
Naiads ( <i>Najas sp</i> )	44 (56)
Cabbage ( <i>Potamogeton amplifolius</i> )	2 (3)
Variable pondweed ( <i>P. gramineus</i> )	17 (22)
Claspingleaf pondweed ( <i>P. richardsonii</i> )	14 (18)
Fern pondweed ( <i>P. robbinsii</i> )	2 (3)
Flatstem pondweed ( <i>P. zosteriformis</i> )	1 (1)
Bladderwort ( <i>Utricularia sp</i> )	1 (1)
Water celery ( <i>Vallisneria americana</i> )	79 (100)
Number of submerged and floatingleaf species	12



**Lake resident volunteers helped collect plant data.**

**Round Lake (748 acres) Native Plant Distribution:** Coverage is approximately 108 acres out of 748 acres or 14% plant coverage.



**Figure 18. Round Lake native plant distribution, July 15, 2010.**

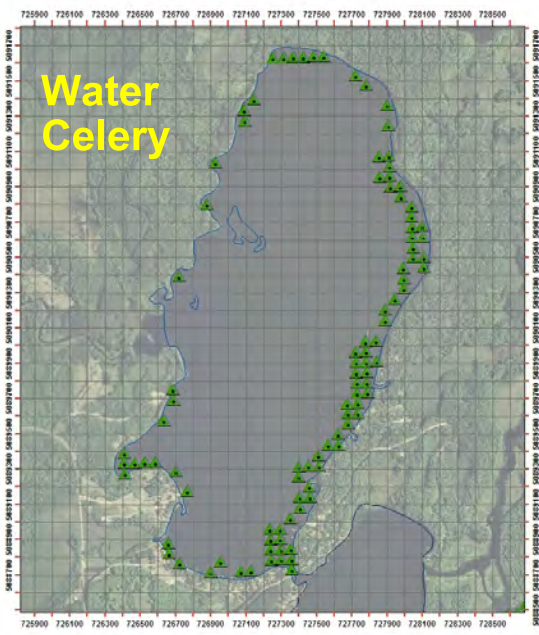
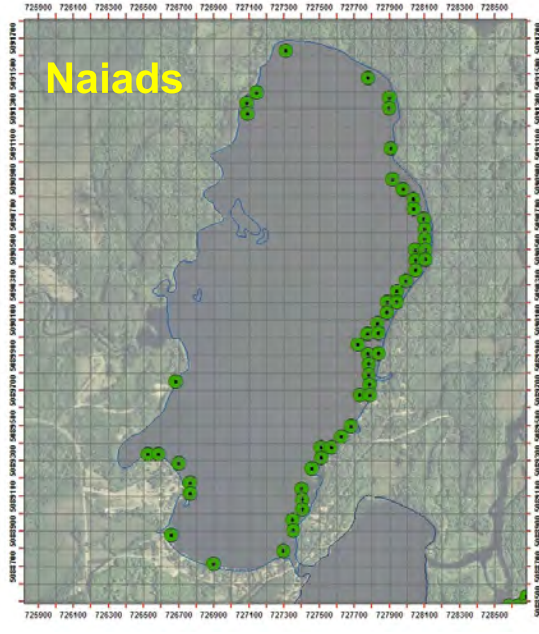
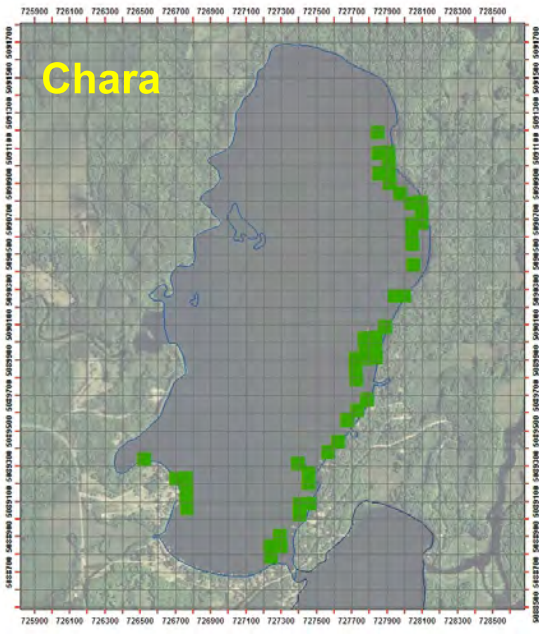


Figure 19. Individual maps of selected plants found in Round Lake on July 15, 2010.

## Round Lake - Lake Sediment Composition

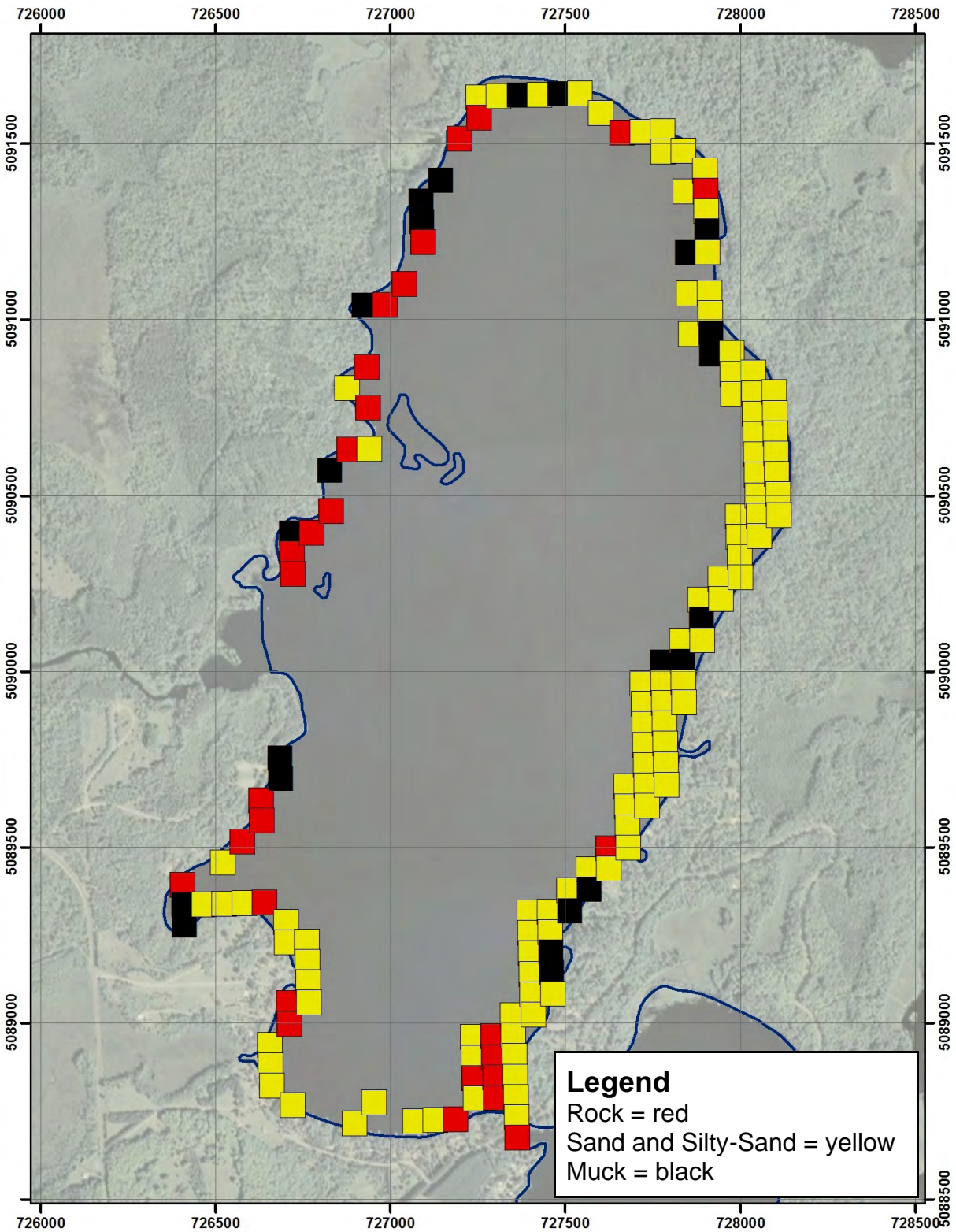


Figure 20. Round Lake nearshore sediments (out to 8 feet deep) are rocky on the west shoreline and sandy on the east shoreline. The rocky sediments on the west shoreline may limit aquatic plant growth.



**Table 8. Round Lake aquatic plant data for 2010.**

Site	Depth (ft)	Bul-rush	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Claspingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flatstem Pond-weed	Northern Milfoil	Naiad	Variable Pond-weed	Water Celery
36	2							1									
132	2																
516	2																
721	2														1		
817	2							2									
819	2																
843	2							1									
849	2																
878	2							2								1	
888	2							1									
62	2.5							1							1		
63	2.5							1								1	
561	2.5							1							1	1	
645	2.5							1							1		
684	2.5							2							1	1	1
789	2.5							1							1		
845	2.5																
866	2.5														2	1	
889	2.5							2								1	
5	3			1													1
20	3	1	1		1	1					1		1			1	
422	3															1	1
423	3															2	
468	3														2		
469	3														2	1	
562	3		1					2									1
565	3																1
605	3														2	1	1
720	3							3									1
788	3								1						2	1	1
790	3																
846	3														1	1	1
894	3														2		1
372	3.5							1	1								1
564	3.5							1	1							1	
757	3.5								1								2
818	3.5							1	1						2		1
847	3.5														2	2	
851	3.5							1							2		1
852	3.5							1									1
3	4			1													2
9	4																
21	4		1												1		1
100	4																
373	4							2	1								1
421	4														2		1
517	4														2		2
518	4							1							2		1
519	4				1			1						1	2		
563	4								1			1					1
756	4							2									1
785	4							1							2		1
787	4														2		1
815	4								1						1	1	
865	4							1							2		1
879	4																
880	4							1							2		1
887	4														2	1	
890	4							1							2	1	1
891	4														2	1	1
892	4														2	1	

**Table 8. Round Lake aquatic plant data for 2010.**

Site	Depth (ft)	Bul-rush	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Claspingleaf Pondweed	Coon-tail	Elodea	Fern Pondweed	Flatstem Pondweed	Northern Milfoil	Naiad	Variable Pondweed	Water Celery
22	4.5																1
560	4.5															1	2
752	4.5							1									1
786	4.5														2		1
816	4.5							1							1		1
886	4.5							1							2		
893	4.5											1			2		1
8	5							1							1		1
12	5														1		1
27	5								1						1		1
130	5								1						1		1
328	5														1		2
470	5			1	1		1										2
472	5																2
473	5																
474	5														2		2
718	5								1								2
719	5																1
751	5							2									1
753	5							2									1
755	5														2		1
784	5							1	1								1
791	5														2		1
824	5							1								1	
842	5														2		2
848	5								1								1
867	5																1
131	5.5				1												1
471	5.5				1												2
646	5.5								1								2
754	5.5																2
885	5.5						1								1		1
1	6				1									1			2
2	6			1						1				1			1
28	6																2
37	6				1												
38	6																
43	6						2										1
98	6																
166	6										1			1			1
204	6																
283	6														1		2
284	6								1						1		2
327	6																
371	6																1
374	6																
418	6																1
419	6							1									1
420	6							1									2
520	6								1								2
783	6							1							1		1
826	6							1									1
853	6							1									2
875	6																1
877	6														1		2
881	6														1		1
42	6.5				1				1								1
61	6.5							1							1		1
370	6.5																2
604	6.5														1		2
644	6.5																2

**Table 8. Round Lake aquatic plant data for 2010.**

Site	Depth (ft)	Bul-rush	Spatter-dock	Water-shield	White Lily	Bladder-wort	Cabbage	Chara	Claspingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flatstem Pond-weed	Northern Milfoil	Naiad	Variable Pond-weed	Water Celery
841	6.5														1		2
854	6.5							1							1		1
876	6.5											1					2
882	6.5							1									2
883	6.5							1									1
6	7																
14	7																
15	7																2
35	7														1		1
44	7																
45	7																
60	7							1									
69	7																
167	7																
169	7																
170	7																
243	7								1								1
282	7																2
285	7																
467	7																1
514	7							1									2
515	7																1
683	7																2
685	7																
828	7							1									1
245	7.5																
606	7.5																2
750	7.5														1		1
821	7.5																
868	7.5							1							1		1
884	7.5							1									2
19	8																
164	8																1
723	8																
869	8																
39	9																
50	9																
68	9																
369	9																
375	9																
417	9																
681	9																
682	9																
803	9																
827	9																
855	9																
34	10																
97	10																
286	10																
820	10																
874	10																
<b>Average</b>		<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.3</b>	<b>1.2</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.5</b>	<b>1.1</b>	<b>1.3</b>
<b>occurrence from 0 - 8 feet (129 sites)*</b>		<b>1</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>49</b>	<b>18</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>56</b>	<b>22</b>	<b>100</b>
<b>% occurrence</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>39</b>	<b>14</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>44</b>	<b>17</b>	<b>79</b>

\*There were a total of 894 sites on the grid map, but plants grew out to 8 feet and there were 127 sites from 0 to 8 feet.

**Turner Lake Aquatic Plants:** Turner Lake has a diverse aquatic plant community (Figure 21) dominated by elodea in 2010 followed by fern pondweed (Table 9). Plant distribution in 2010 is shown in Figure 22 and distribution of elodea and fern pondweed is shown in Figure 23. Aquatic plant data for individual sites is shown in Table 10.



**Figure 21. [top-left] Nearshore vegetation in Turner, on August 4, 2001. [top-right] Water celery and elodea collected during the plant survey on Turner Lake in 2001. [bottom-left] Arrowhead plants in Turner Lake on July 16, 2010. [bottom-right] Fern pondweed found in Turner Lake on July 16, 2010.**

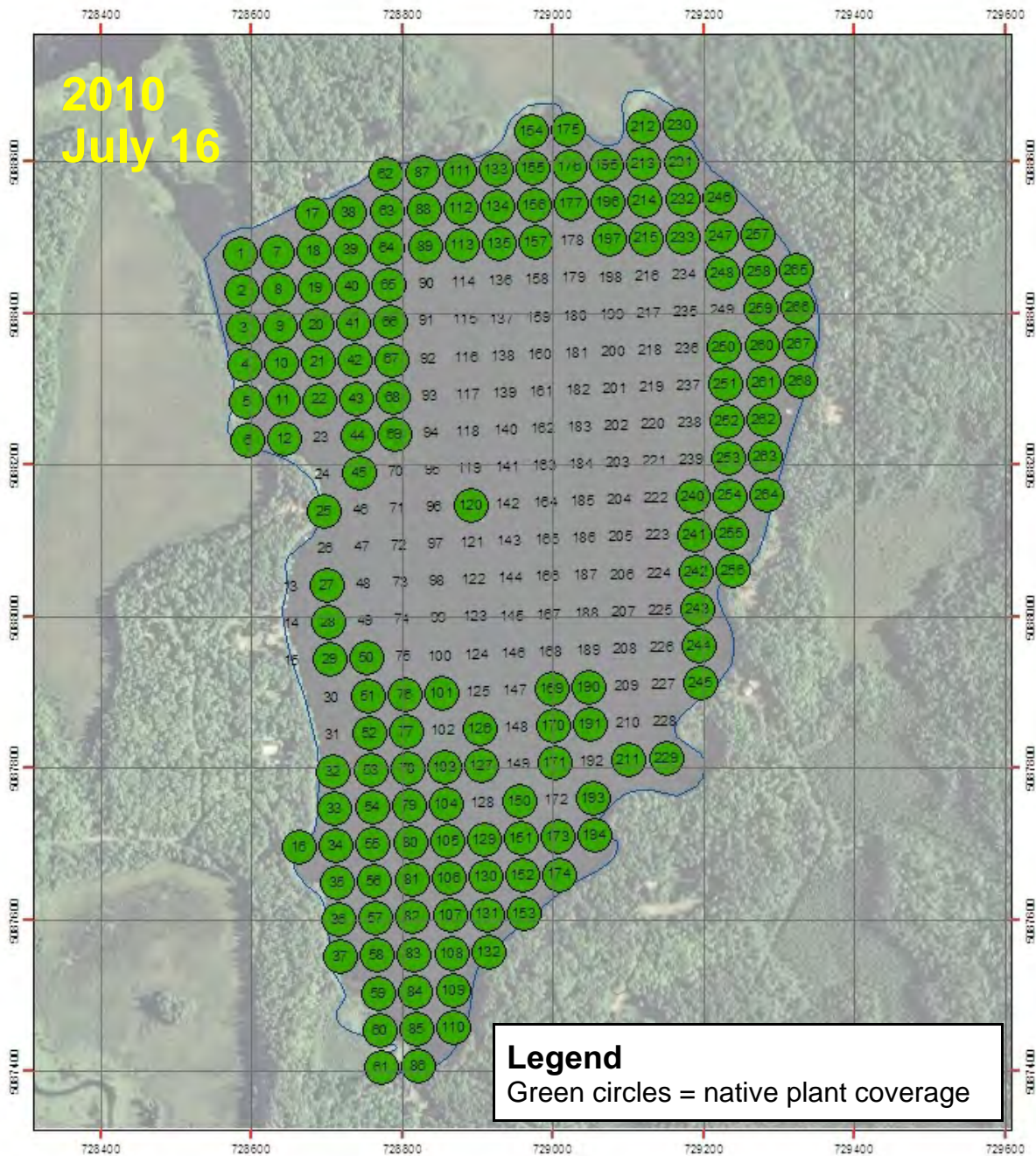


**Lake resident volunteers helped collect plant data.**

**Table 9. Summary for Turner Lake aquatic plant percent occurrences for 2010 (top number). Number in parentheses is the number of sites the plant was found. Green shading represents dominant plant species.**

	Percent Occurrence of Aquatic Plants
	Turner (154 sites)
Pickereel plant ( <i>Pontederia cordata</i> )	3 (5)
Swamp loosestrife ( <i>Decodon verticillatus</i> )	1 (1)
Bulrush - softstem ( <i>Scirpus validus</i> )	1 (2)
Cattails ( <i>Typha</i> sp)	1 (1)
Watershield ( <i>Brasenia Schreberi</i> )	3 (5)
White waterlily ( <i>Nuphar</i> sp)	2 (4)
Spatterdock ( <i>Nuphar variegatum</i> )	2 (3)
Floatingleaf burreed ( <i>Sparganium</i> sp)	5 (8)
Coontail ( <i>Ceratophyllum demersum</i> )	11 (17)
Chara ( <i>Chara</i> sp)	1 (2)
Elodea ( <i>Elodea canadensis</i> )	40 (61)
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	3 (5)
Naiads ( <i>Najas</i> sp)	13 (20)
Nitella ( <i>Nitella</i> sp)	10 (15)
Cabbage ( <i>Potamogeton amplifolius</i> )	6 (9)
Stringy pondweed ( <i>P. pusillus</i> )	14 (21)
Claspingleaf pondweed ( <i>P. richardsonii</i> )	15 (23)
Fern pondweed ( <i>P. robbinsii</i> )	28 (43)
Flatstem pondweed ( <i>P. zosteriformis</i> )	13 (20)
Water celery ( <i>Vallisneria americana</i> )	13 (20)
Number of submerged and floatingleaf species	12

**Turner Lake (159 acres) Native Plant Distribution:** Coverage is approximately 91 acres out of 159 acres or 57% plant coverage.



**Figure 22. Turner Lake native plant distribution, July 16, 2010.**

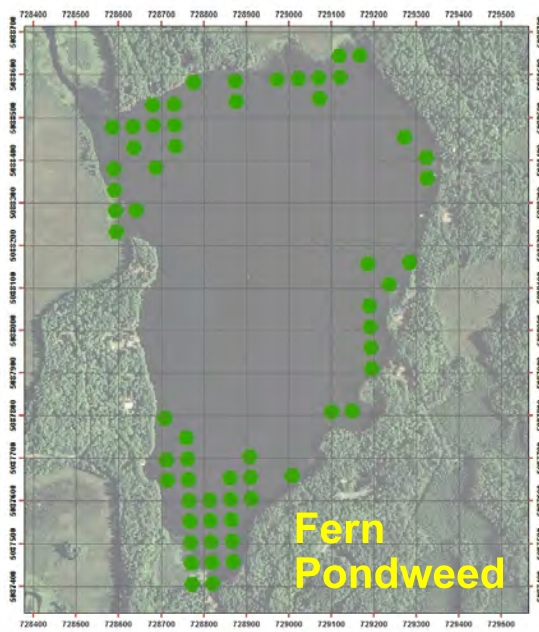
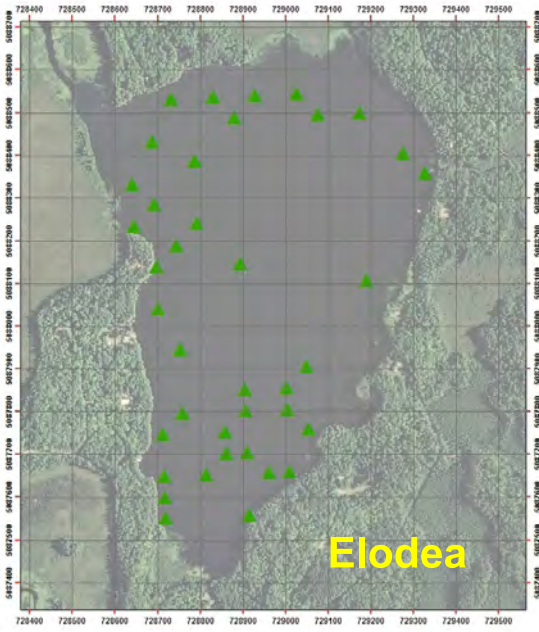


Figure 23. Individual maps of selected plants found in Turner Lake on July 16, 2010.

## Turner Lake - Lake Sediment Composition

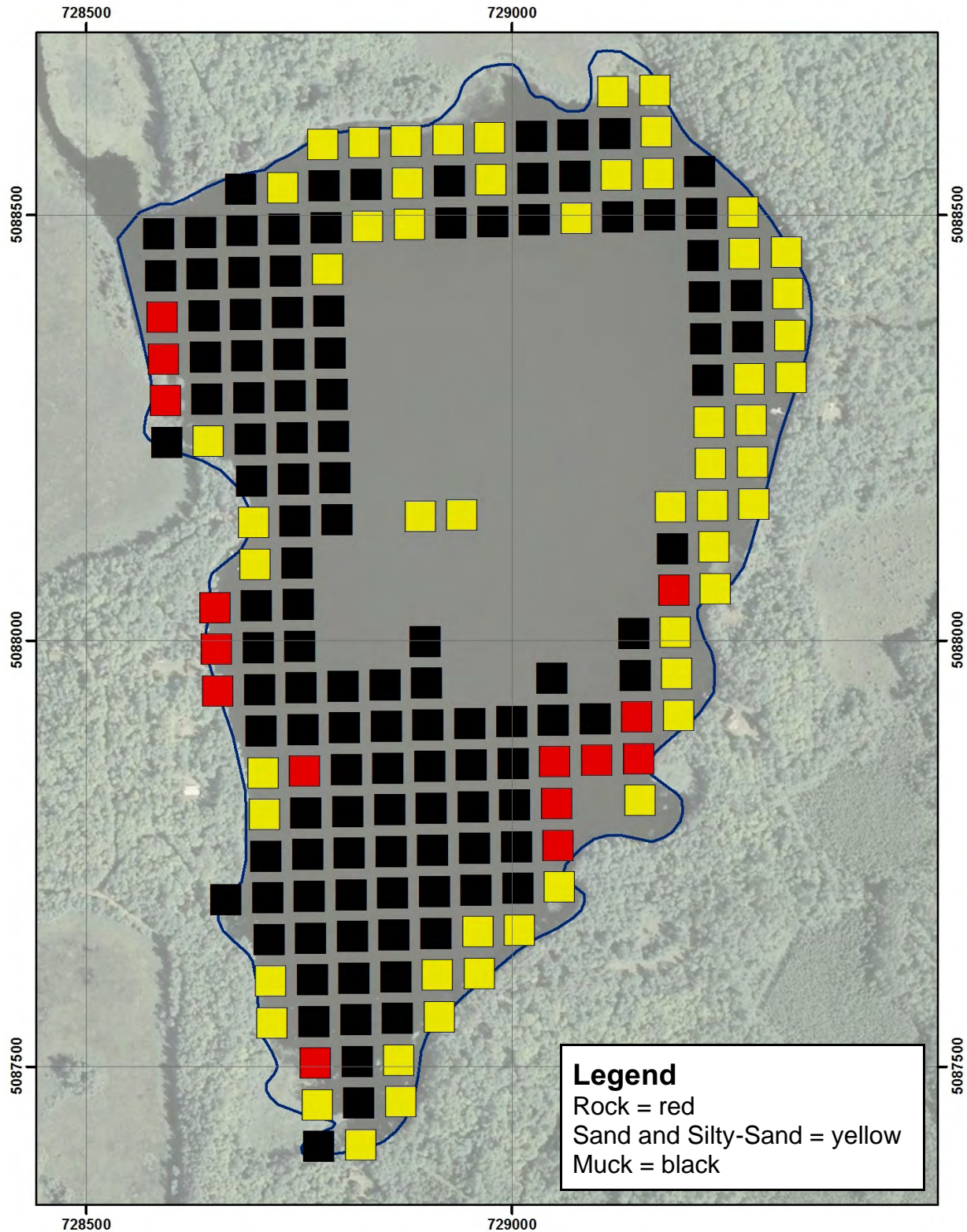


Figure 24. The bottom sediments of Turner Lake are a mix of sandy areas and mucky areas, although mucky areas are more common. Fern pondweed was generally found in the areas with soft mucky sediment.



**Table 10. Turner Lake aquatic plant survey data for 2010.**

Site	Depth (ft)	Bul-rush	Bur-reed	Pickeral	Spatter-dock	Swamp Loose-strife	Water-shield	White Lily	Cabb-age	Chara	Clasp-ingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	North. Milfoil	Naiad	Nitella	Stringy Pond-weed	Water Celery
154	0																			
175	0																			
16	1			1	1															
132	2		1								1	1	1		1					2
256	2	1	1	1				1												
85	2.5													1						
61	3			2		1		1						1		1				
86	3		1	1			1	1						2						
120	3	4											1							
153	3																			1
254	3										1									
60	3.5		1											3						
194	3.5		1				1													
262	3.5																			1
263	3.5								1											
37	4						1				1		2							
110	4													2						
133	4								1						1					1
174	4												1	1						
212	4		2		1						1			2						
229	4								1					1						1
230	4		1											2						
231	4																			1
232	4														1					1
253	4										1									
255	4													1	1					
257	4															1				1
264	4													2						
267	4		1										1	1						
87	4.5														2					1
111	4.5			3										2						
228	4.5																			
4	5						1							2						
5	5				1									2						
6	5													2						
15	5																			
59	5													2						
62	5													3						
109	5													2						
155	5													2						
195	5													2						1
242	5								1					1	1					
243	5													3						
244	5													1						
252	5								1											
265	5														1					
84	5.5													1						
258	5.5													2	1					2
266	5.5													2						
268	5.5														1					
1	6													1			1			1
12	6												1							
13	6																			
17	6													2						
33	6												1							1
36	6						1						1				1			
38	6											1	1	1		1				
58	6											1		2	1					
112	6													2						2
152	6												1			1				1
156	6														1	2				
211	6													1		1				
246	6											1			1	2				
14	6.5																			
31	6.5																			
32	6.5							1						1						
82	6.5													3						
108	6.5													2						1
131	6.5													2						1
176	6.5													3						
213	6.5													3						
240	6.5													1	1	1				

**Table 10. Turner Lake aquatic plant survey data for 2010.**

Site	Depth (ft)	Bul-rush	Bur-reed	Pickeral	Spatter-dock	Swamp Loose-strife	Water-shield	White Lily	Cabbage	Chara	Claspingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	North. Milfoil	Naiad	Nitella	Stringy Pond-weed	Water Celery
245	6.5								1					2						1
2	7								1								1			
7	7													3	1					
18	7													3						
24	7																			
25	7												1							
35	7												2	1	1					
39	7													1						
57	7													3						
83	7													3						
107	7													3	1					
214	7														1	1				
261	7											1			2	1				1
3	7.5													2						
11	7.5													2						
56	7.5													1						
196	7.5													2						
8	8													1						
9	8																1	1		
10	8												1						1	
19	8										1		1		2	1			1	
20	8													1	1					
26	8																			
34	8													1	1					2
40	8										1			1		1			1	
55	8													1						
63	8														1		1			
65	8											1			1	1			2	
89	8										1	1			1	1				
106	8											1		1	1					
113	8												1						1	
130	8													1						
151	8										1									
177	8											1	1		1					
197	8											2	1		1	1				
247	8														1				1	
41	8.5									1		1								
64	8.5								1										2	
81	8.5										1	1			3					
134	8.5										1		2			1				
215	8.5															1			1	
21	9										1								2	
22	9									1			2				1		1	
30	9																			
42	9																			
52	9										1									
53	9												1							
54	9										1	1		1						
77	9														1					
78	9											1			3			1	1	
79	9										1					1		1	1	
80	9											1			1					
88	9												1							
104	9												2		1					
105	9												1						1	
128	9																			
129	9								1			1	1	1	2					
135	9																		1	
157	9																		1	
173	9														2				1	
193	9												1						2	
251	9																		1	
259	9										1		1		1	1		1		
260	9											1			1					
23	9.5																			
27	9.5												1							
51	9.5															2				
103	9.5																		1	
172	9.5																			
178	9.5																			
227	9.5																			
233	9.5												1						1	

**Table 10. Turner Lake aquatic plant survey data for 2010.**

Site	Depth (ft)	Bul-rush	Bur-reed	Pickeral	Spatter-dock	Swamp Loose-strife	Water-shield	White Lily	Cabb-age	Chara	Claspingleaf Pond-weed	Coon-tail	Elodea	Fern Pond-weed	Flat-stem Pond-weed	North. Milfoil	Naiad	Nitella	Stringy Pond-weed	Water Celery
29	10																		1	
43	10																	1		
66	10												1						1	
67	10										1				1				2	
76	10														1					
150	10										2								1	
192	10																			
241	10												1							
248	10										1									
250	10																	1		
28	10.5																		1	
44	10.5										3				1					
68	10.5																		2	
69	10.5												1							
127	10.5												1		1					
149	10.5																			
170	10.5												1							
171	10.5												1							
191	10.5										1									
210	10.5																			
45	11												1		1				1	
46	11																			
49	11																			
50	11												1						1	
70	11																			
100	11																			
101	11																		1	
102	11																			
124	11																			
125	11																			
126	11												1						1	
142	11																			
147	11																			
169	11																			
190	11												1							
209	11																			
226	11																			
48	11.5																			
75	11.5																			
123	11.5																			
148	11.5																			
47	12																			
71	12																			
189	12																			
225	12																			
<b>Average</b>		<b>2.5</b>	<b>1.1</b>	<b>1.6</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.2</b>	<b>1.1</b>	<b>1.8</b>	<b>1.2</b>	<b>1.1</b>	<b>1.0</b>	<b>1.2</b>	<b>1.2</b>	<b>1.1</b>	<b>1.2</b>
<b>occurrence from 0 to 11 feet (154 sites)*</b>		<b>2</b>	<b>8</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>4</b>	<b>9</b>	<b>2</b>	<b>23</b>	<b>17</b>	<b>61</b>	<b>43</b>	<b>20</b>	<b>5</b>	<b>20</b>	<b>15</b>	<b>21</b>	<b>20</b>
<b>% occurrence</b>		<b>1</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>1</b>	<b>15</b>	<b>11</b>	<b>40</b>	<b>28</b>	<b>13</b>	<b>3</b>	<b>13</b>	<b>10</b>	<b>14</b>	<b>7</b>

\*There were a total of 263 sites on the grid map but plants grew out to 11 feet and there were 154 sites from 0 to 11 feet.

**Comparing Aquatic Plants from 2001 to 2010:** Pike Chain of Lakes aquatic plant surveys for the four primary lakes have been conducted in 2001 and 2010, by Blue Water Science, and results are shown in Table 11. Although plant distribution has remained somewhat stable there has been some changes in the occurrence of aquatic plant species.

**Table 11. Summary for Pike Chain of Lakes aquatic plant percent occurrences for 2001 and 2010. Number in parentheses is the occurrence. Green shading represents dominant plant species.**

	Percent Occurrence of Aquatic Plants (%)							
	Pike		Round		Amik		Turner	
	2001 (44 sites)	2010 (108 sites)	2001 (44 sites)	2010 (127 sites)	2001 (22 sites)	2010 (241 sites)	2001 (24 sites)	2010 (154 sites)
Pickereel plant ( <i>Pontederia cordata</i> )	11	1	--	--	14	2	17	3
Swamp loosestrife ( <i>Decodon verticillatus</i> )	--	--	--	--	--	--	--	1
Arrowhead ( <i>Sagittaria sp</i> )	--	--	--	--	5	--	--	--
Three square ( <i>Scirpus americanus</i> )	--	--	5	--	--	--	--	--
Bulrush - softstem ( <i>Scirpus validus</i> )	7	4	9	1	5	1	13	1
Cattails ( <i>Typha sp</i> )	--	--	--	--	5	--	--	1
Watershield ( <i>Brasenia Schreber</i> )	11	16	--	3	5	1	4	3
White waterlily ( <i>Nuphar sp</i> )	9	2	--	6	45	7	13	1
Spatterdock ( <i>Nuphar variegatum</i> )	16	5	7	2	18	2	8	2
Floatingleaf burreed ( <i>Sparganium sp</i> )	18	8	--	--	5	1	--	5
Coontail ( <i>Ceratophyllum demersum</i> )	7	8	--	1	64	33	33	11
Chara ( <i>Chara sp</i> )	2	7	16	39	--	3	--	1
Moss ( <i>Drepanocladus sp</i> )	--	3	--	--	--	1	--	--
Elodea ( <i>Elodea canadensis</i> )	2	--	--	2	--	32	38	40
Pipewort ( <i>Eriocaulon septangulare</i> )	--	--	--	--	--	--	8	--
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	9	5	2	3	41	7	33	3
Naiads ( <i>Najas sp</i> )	57	28	27	44	5	1	--	13
Nitella ( <i>Nitella sp</i> )	--	11	7	--	--	24	--	10
Cabbage ( <i>Potamogeton amplifolius</i> )	--	3	--	2	41	22	13	6
Ribbon-leaf pondweed ( <i>P. epiphydrus</i> )	--	--	--	--	36	--	13	--
Variable pondweed ( <i>P. gramineus</i> )	9	6	25	17	--	--	--	--
Illinois pondweed ( <i>P. illinoensis</i> )	--	--	--	--	18	--	--	--
Floatingleaf pondweed ( <i>P. natans</i> )	5	1	--	--	9	--	--	--
Stringy pondweed ( <i>P. pusillus</i> )	20	2	--	--	5	3	8	14
Claspingleaf pondweed ( <i>P. richardsonii</i> )	23	18	25	14	23	27	17	15
Fern pondweed ( <i>P. robbinsii</i> )	7	11	2	2	45	61	67	28
Flatstem pondweed ( <i>P. zosteriformis</i> )	11	1	2	1	38	20	17	13
Bladderwort ( <i>Utricularia sp</i> )	2	6	--	1	32	1	--	--
Water celery ( <i>Vallisneria americana</i> )	59	81	50	79	23	7	46	13
Number of submerged and floatingleaf species	17	19	10	15	17	18	14	16

# Aquatic Plant Distribution for the Pike Lake Chain of Lakes in 2001 and 2010

## Amik Lake Aquatic Plant Distribution in 2001 and 2010

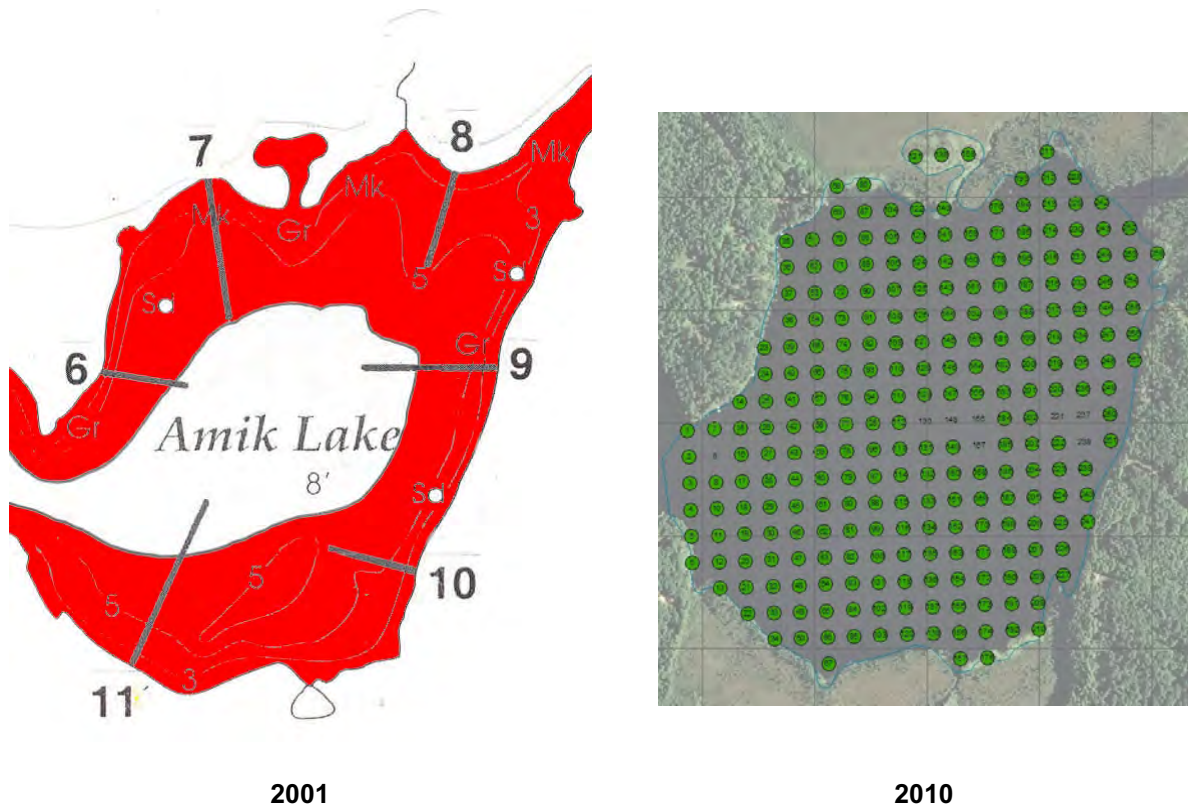
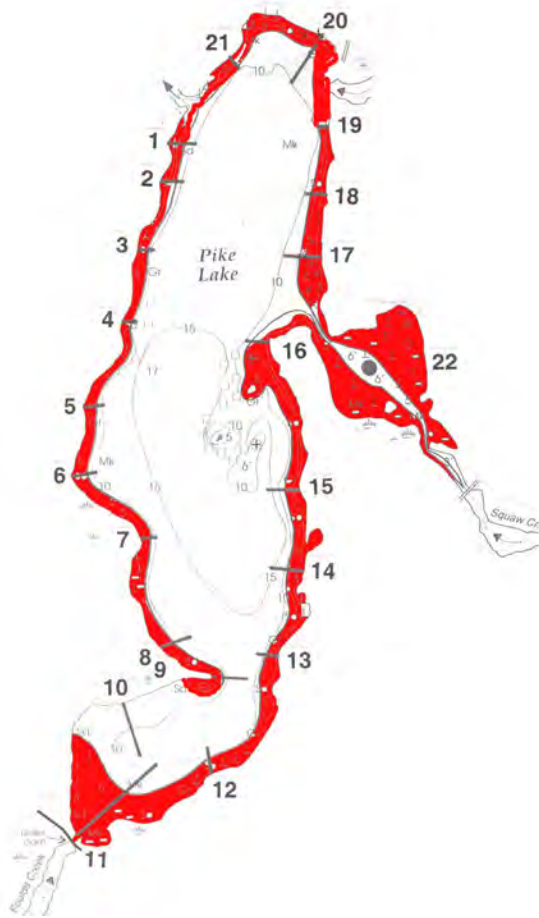
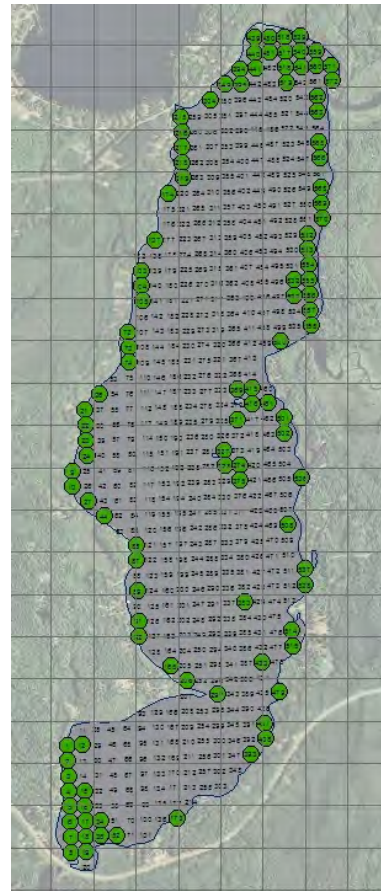


Figure 25. Aquatic plant distribution in Amik Lake in 2001 may have been slightly less than plant distribution in 2010. The dominant plant in 2001 was coontail and in 2010 it was fern pondweed.

## Pike Lake Aquatic Plant Distribution in 2001 and 2010



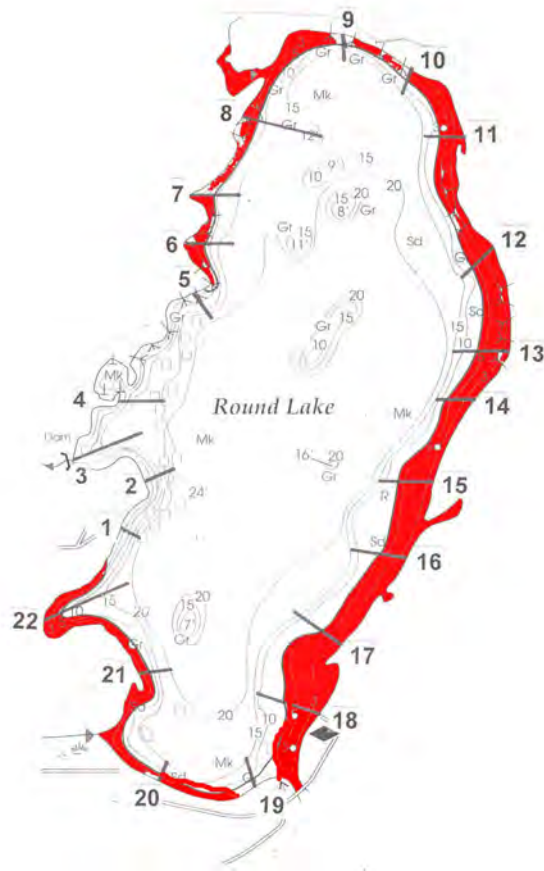
2001



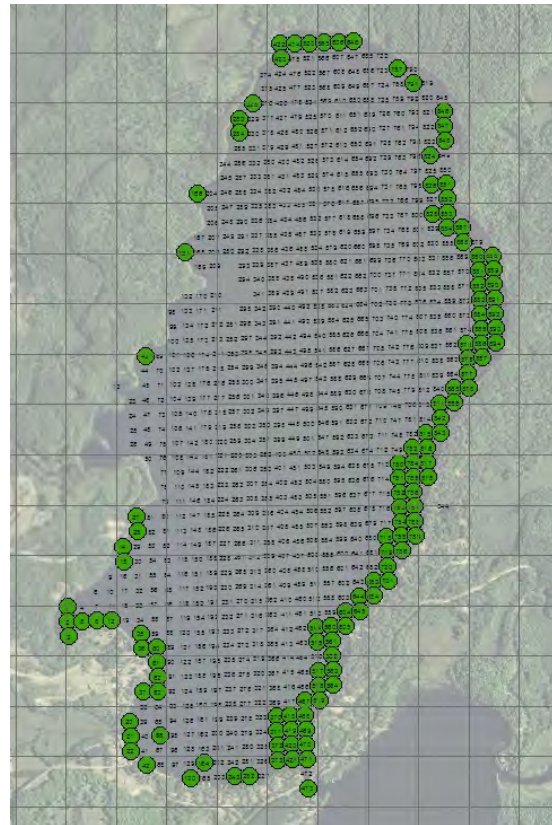
2010

Figure 26. Aquatic plant distribution in Pike Lake appears to be stable from 2001 to 2010. Aquatic plant coverage in 2001 was similar to 2010. The dominant aquatic plant in both surveys was water celery.

# Round Lake Aquatic Plant Distribution in 2001 and 2010



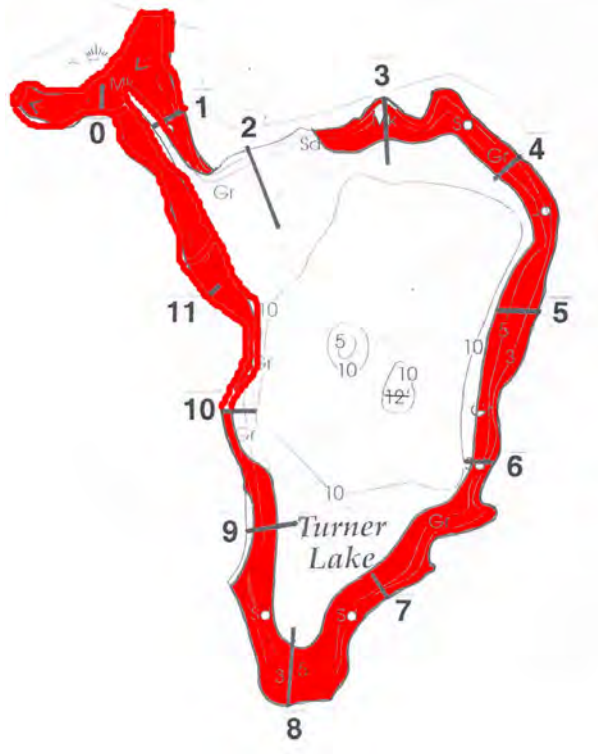
2001



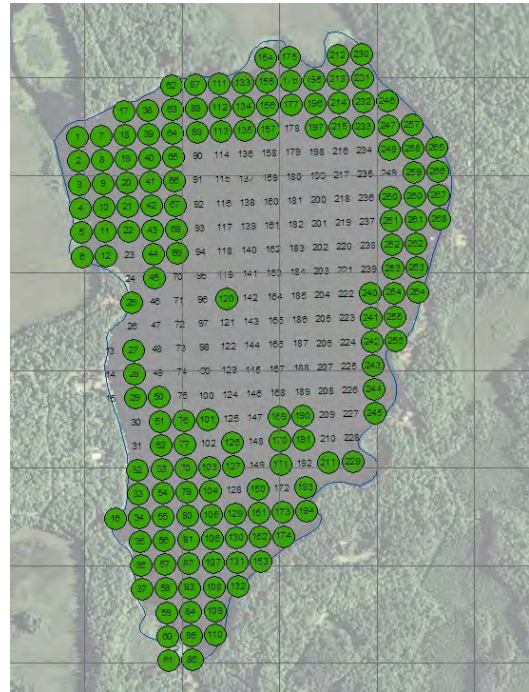
2010

Figure 27. The aquatic plant distribution in Round Lake appears to be stable from 2001 to 2010, with similar coverage patterns. The dominant plant in both surveys was water celery.

# Turner Lake Aquatic Plant Distribution in 2001 and 2010



2001



2010

Figure 28. Aquatic plant distribution in Turner Lake in 2001 was slightly less compared to distribution in 2010. In 2001, the dominant plant was fern pondweed and in 2010 the dominant plant was elodea.



# Appendix: Aquatic Plant Surveys from 2001

**Table A-1. Summary for Pike Chain of Lakes aquatic plant occurrences for 2001 (surveys conducted by Blue Water Science).**

	Percent Occurrence of Aquatic Plants			
	Pike (44 stations)	Round (44 stations)	Amik (22 stations)	Turner (24 stations)
Pickereel plant ( <i>Pontederia cordata</i> )	11	--	14	17
Arrowhead ( <i>Sagittaria</i> sp)	--	--	5	--
Three square ( <i>Scirpus americanus</i> )	--	5	--	--
Bulrush - softstem ( <i>Scirpus validus</i> )	7	9	5	13
Cattails ( <i>Typha</i> sp)	--	5	5	--
Watershield ( <i>Brasenia Schreberi</i> )	11	--	5	4
White waterlily ( <i>Nuphar</i> sp)	9	--	45	13
Spatterdock ( <i>Nuphar variegatum</i> )	16	7	18	8
Floatingleaf burreed ( <i>Sparganium</i> sp)	18	--	5	--
Coontail ( <i>Ceratophyllum demersum</i> )	7	--	64	33
Chara ( <i>Chara</i> sp)	2	16	--	--
Elodea ( <i>Elodea canadensis</i> )	2	--	--	38
Pipewort ( <i>Eriocaulon septangulare</i> )	--	--	--	8
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	9	2	41	33
Naiads ( <i>Najas</i> sp)	57	27	5	--
Nitella ( <i>Nitella</i> sp)	--	7	--	--
Cabbage ( <i>Potamogeton amplifolius</i> )	--	--	41	13
Ribbon-leaf pondweed ( <i>P. epiphydrus</i> )	--	--	36	13
Variable pondweed ( <i>P. gramineus</i> )	9	25	--	--
Illinois pondweed ( <i>P. illinoensis</i> )	--	--	18	--
Floatingleaf pondweed ( <i>P. natans</i> )	5	--	9	--
Stringy pondweed ( <i>P. pusillus</i> )	20	--	5	8
Claspingleaf pondweed ( <i>P. richardsonii</i> )	23	25	23	17
Fern pondweed ( <i>P. robbinsii</i> )	7	2	45	67
Flatstem pondweed ( <i>P. zosteriformis</i> )	11	2	36	17
Bladderwort ( <i>Utricularia</i> sp)	2	--	32	--
Water celery ( <i>Vallisneria americana</i> )	59	50	23	46
Number of submerged and floatingleaf species	17	10	17	14

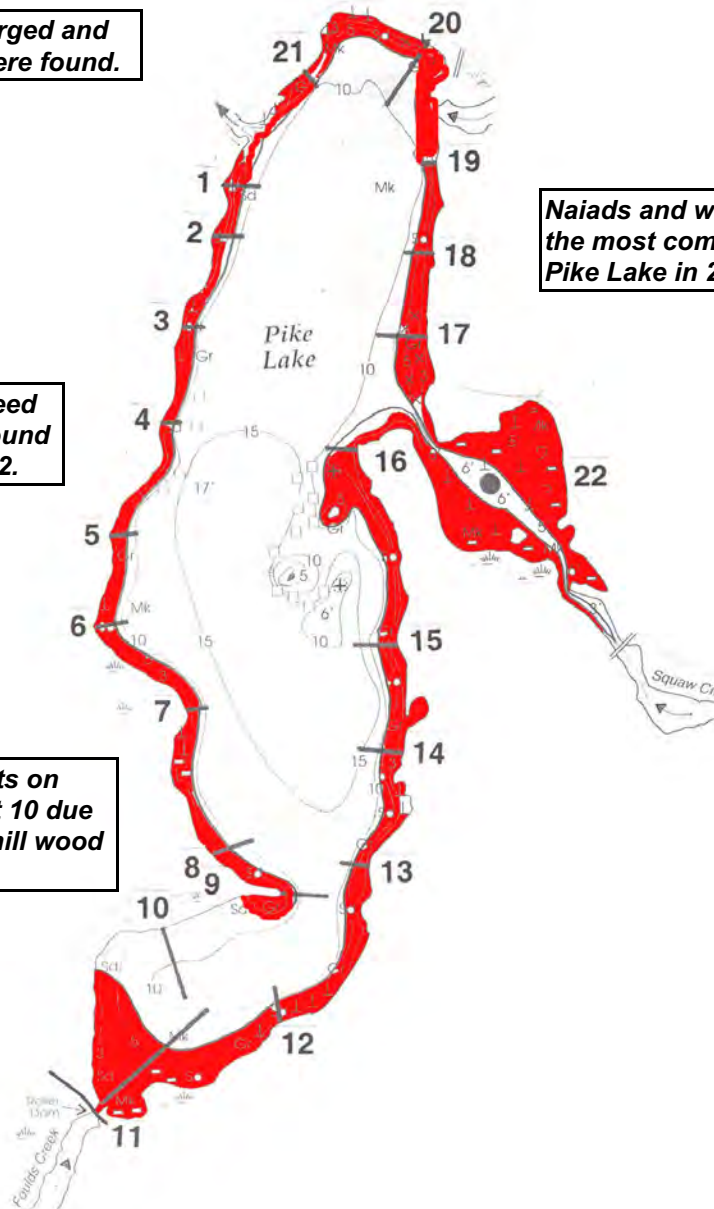
**Pike Lake (740 acres)  
(maximum rooted plant depth = 6 feet)**

**17 species of submerged and floatingleaf plants were found.**

**Naiads and water celery are the most common plants in Pike Lake in 2001.**

**Floatingleaf burreed is pretty and is found around Transect 2.**

**No plants on transect 10 due to sawmill wood slabs.**



**Figure A-1. Pike Lake aquatic plant map based on the 2001 survey conducted by Blue Water Science.**

**Round Lake (748 acres)  
(maximum rooted plant depth = 6 feet)**

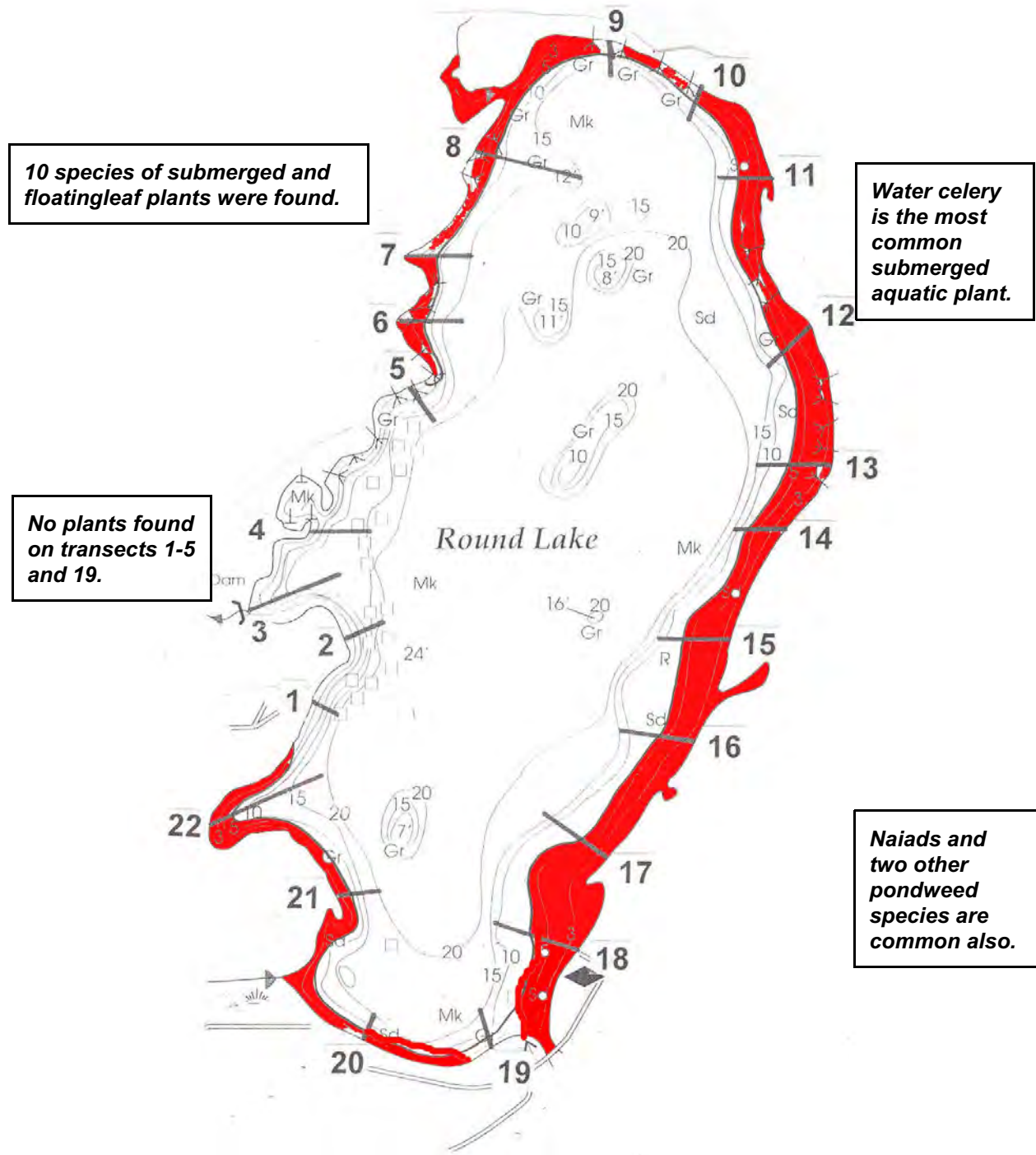
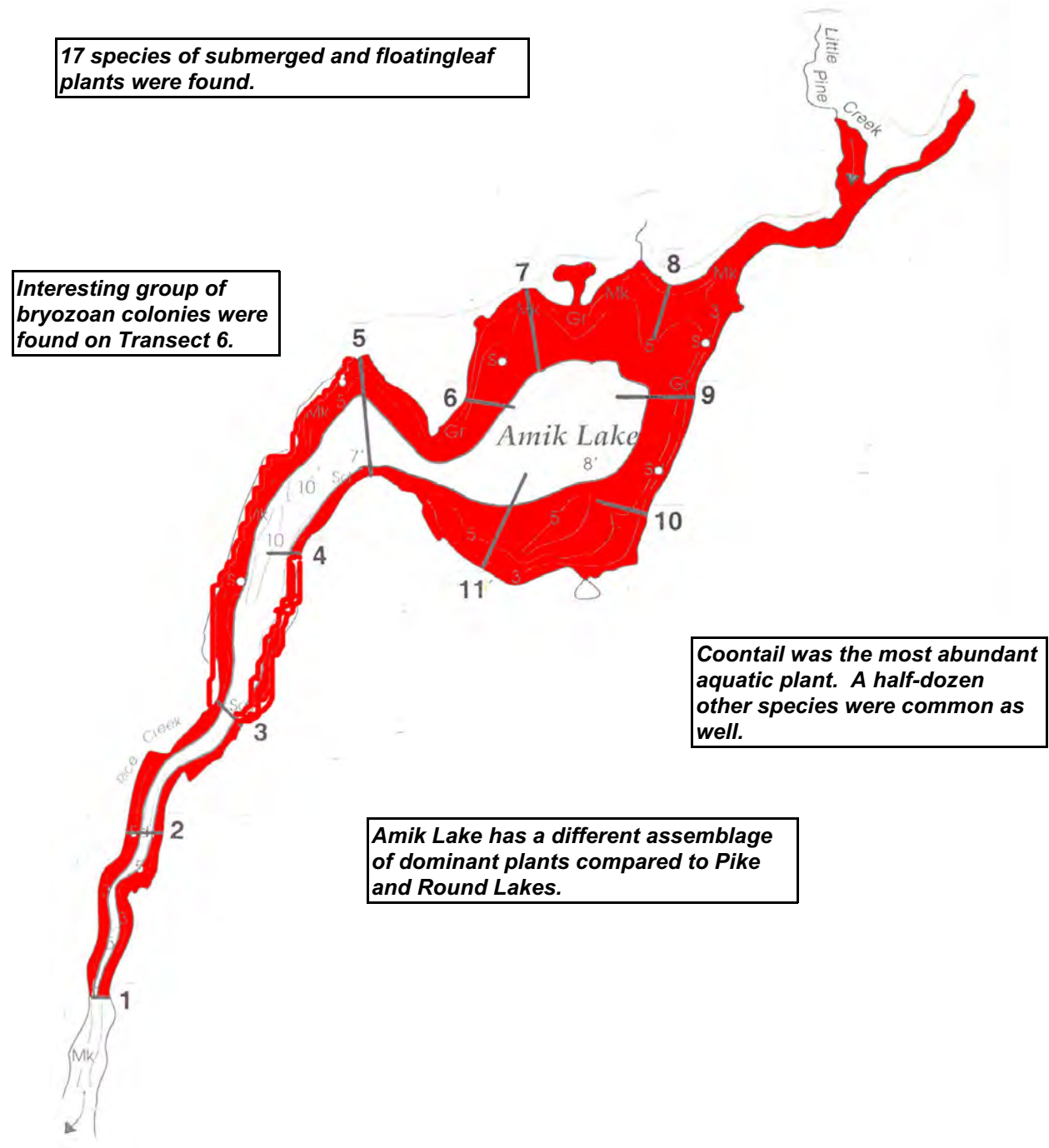


Figure A-2. Round Lake aquatic plant map based on the 2001 survey conducted by Blue Water Science.

**Amik Lake (141 acres)  
(maximum rooted plant depth = 6 feet)**



**Figure A-3. Amik Lake aquatic plant map based on the 2001 survey conducted by Blue Water Science.**

**Turner Lake (159 acres)  
(maximum rooted plant depth = 7 feet)**

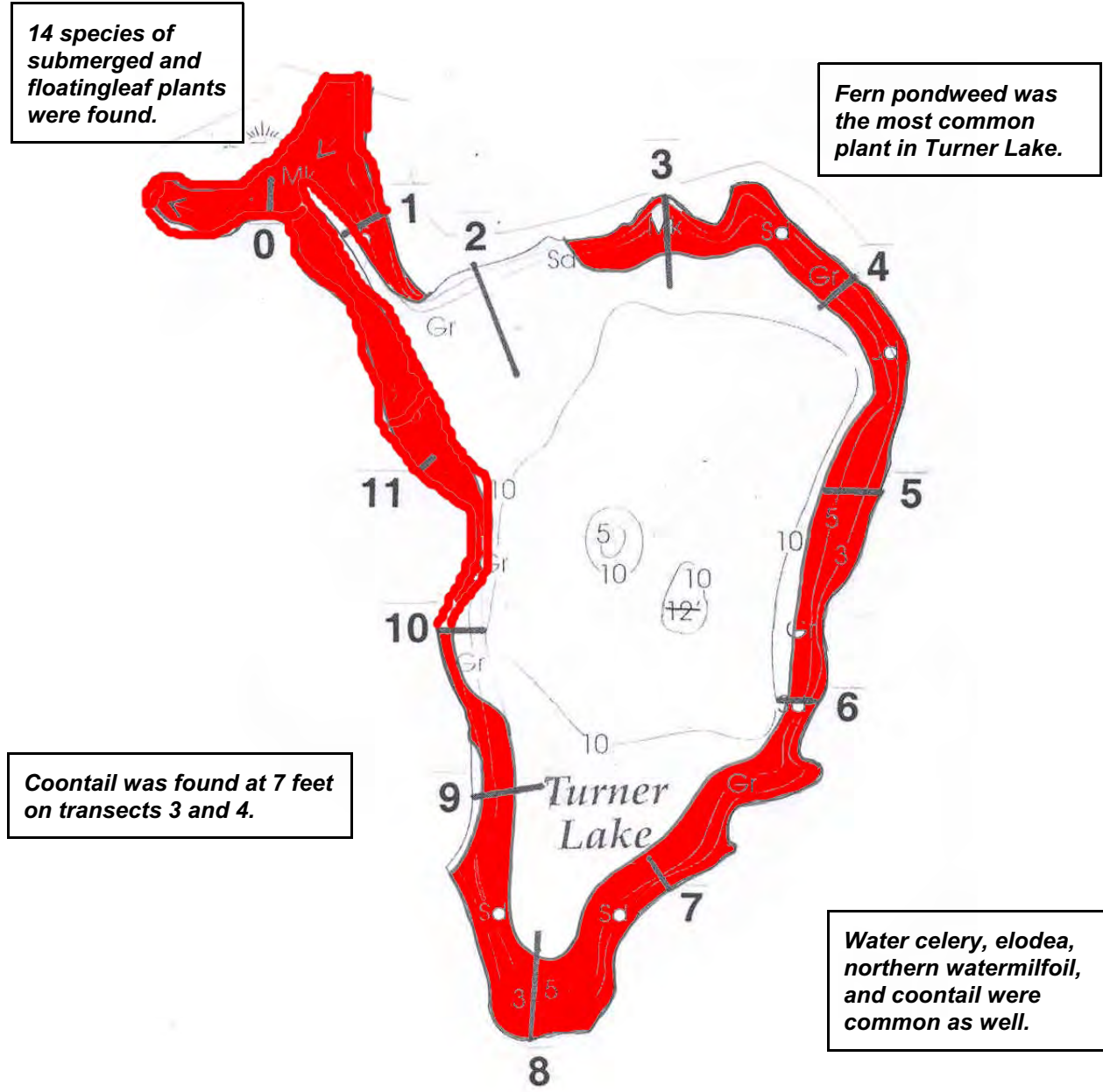


Figure A-4. Plant map of Turner Lake.

## Shoreland Plant Inventory in the Pike Lake Chain of Lakes in 2001

Emergent plants supply critical aquatic habitat and invaluable lake aesthetics, as well as supplying water quality benefits.

Lake residents organized into teams and surveyed nearly the entire shoreline of the Pike Lake Chain of Lakes in 2001. Results of their survey efforts are shown on the next four pages.

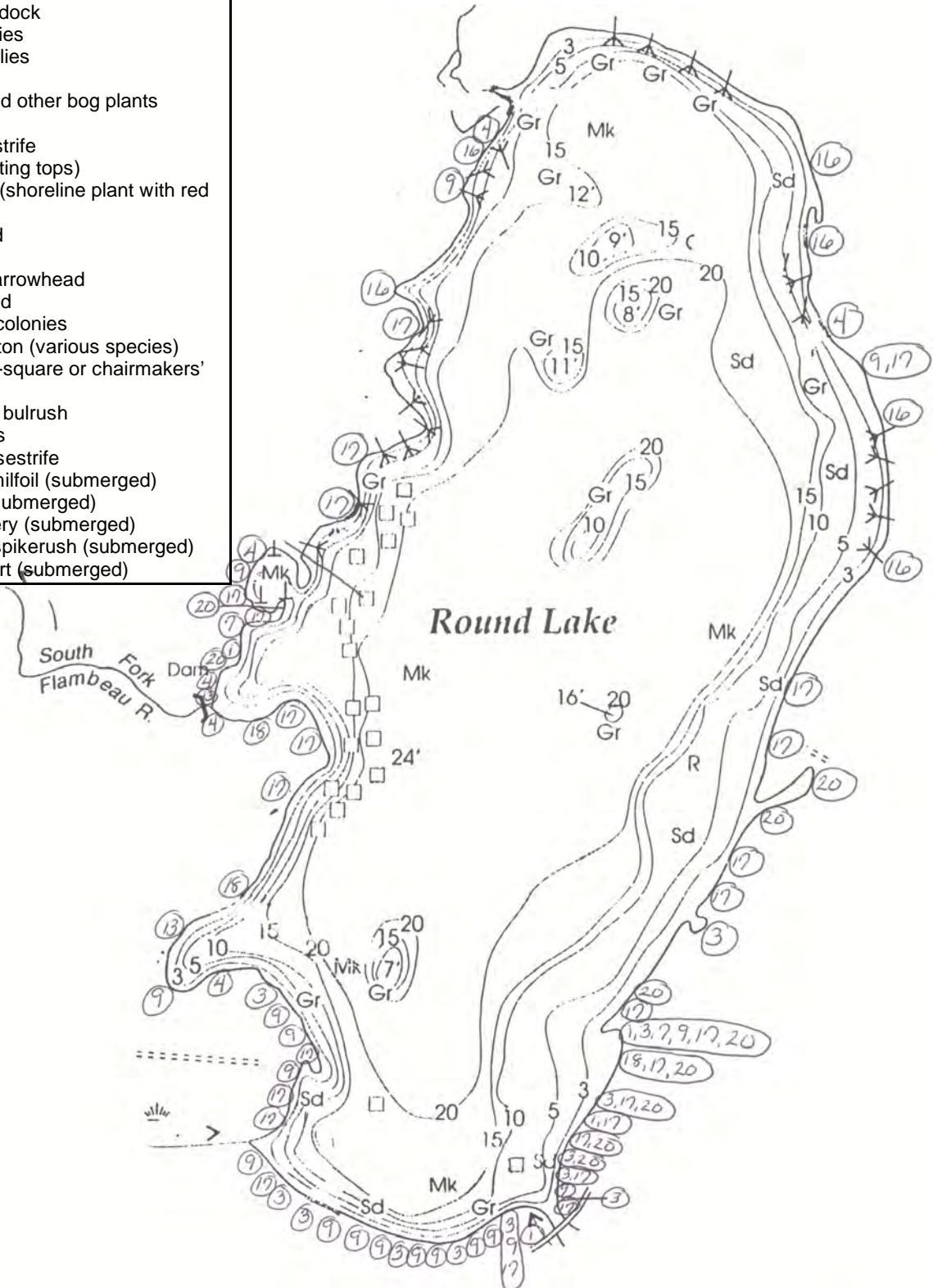


**Figure A-11. Floatingleaf plants (mostly water lilies) and emergent vegetation along the shoreline somewhere on the Pike Chain.**

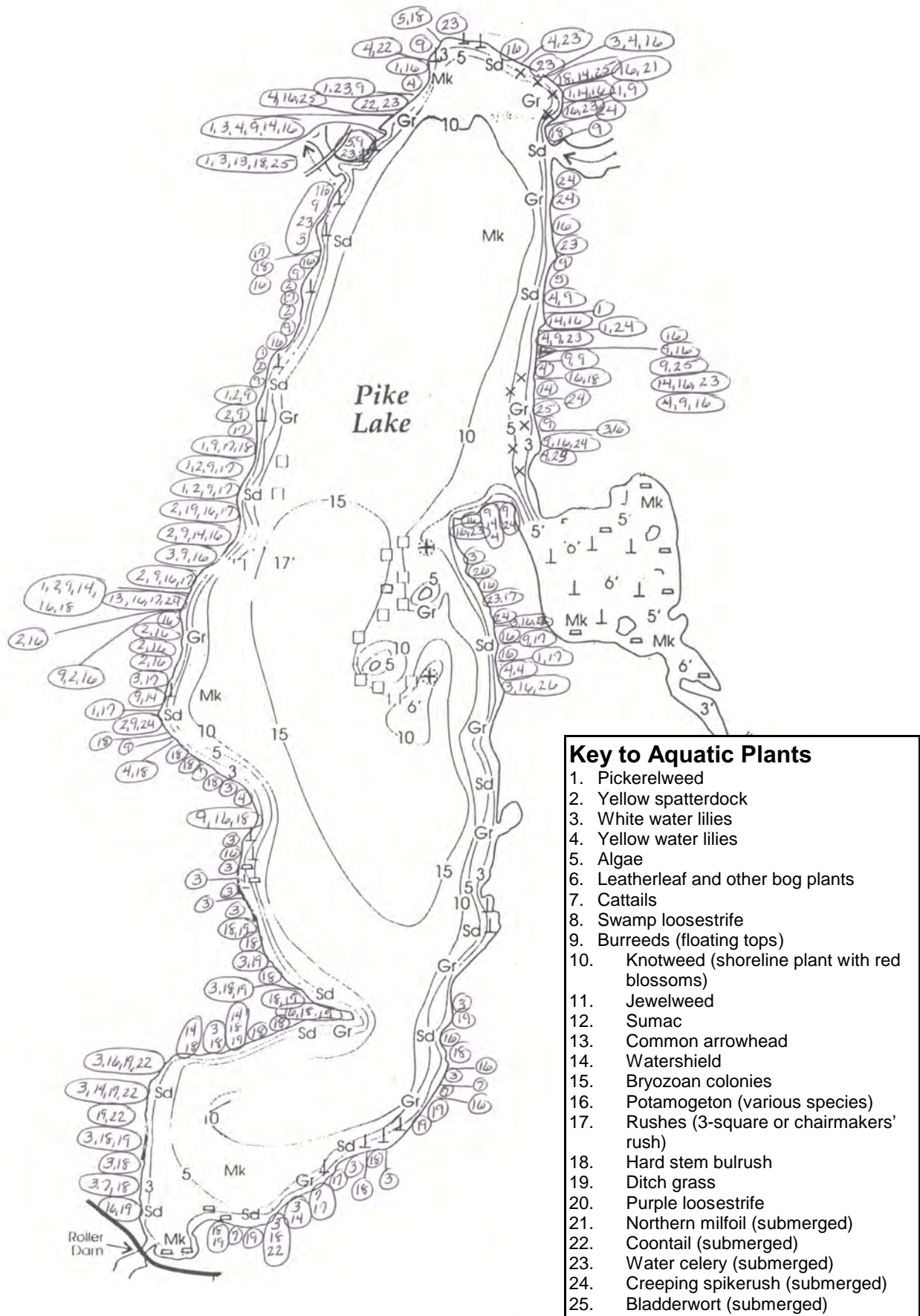
# 2001 - Shoreland Plant Inventory

## Key to Aquatic Plants

1. Pickerelweed
2. Yellow spatterdock
3. White water lilies
4. Yellow water lilies
5. Algae
6. Leatherleaf and other bog plants
7. Cattails
8. Swamp loosestrife
9. Bur-reeds (floating tops)
10. Knotweed (shoreline plant with red blossoms)
11. Jewelweed
12. Sumac
13. Common arrowhead
14. Watershield
15. Bryozoan colonies
16. Potamogeton (various species)
17. Rushes (3-square or chairmakers' rush)
18. Hard stem bulrush
19. Ditch grass
20. Purple loosestrife
21. Northern milfoil (submerged)
22. Coontail (submerged)
23. Water celery (submerged)
24. Creeping spikerush (submerged)
25. Bladderwort (submerged)

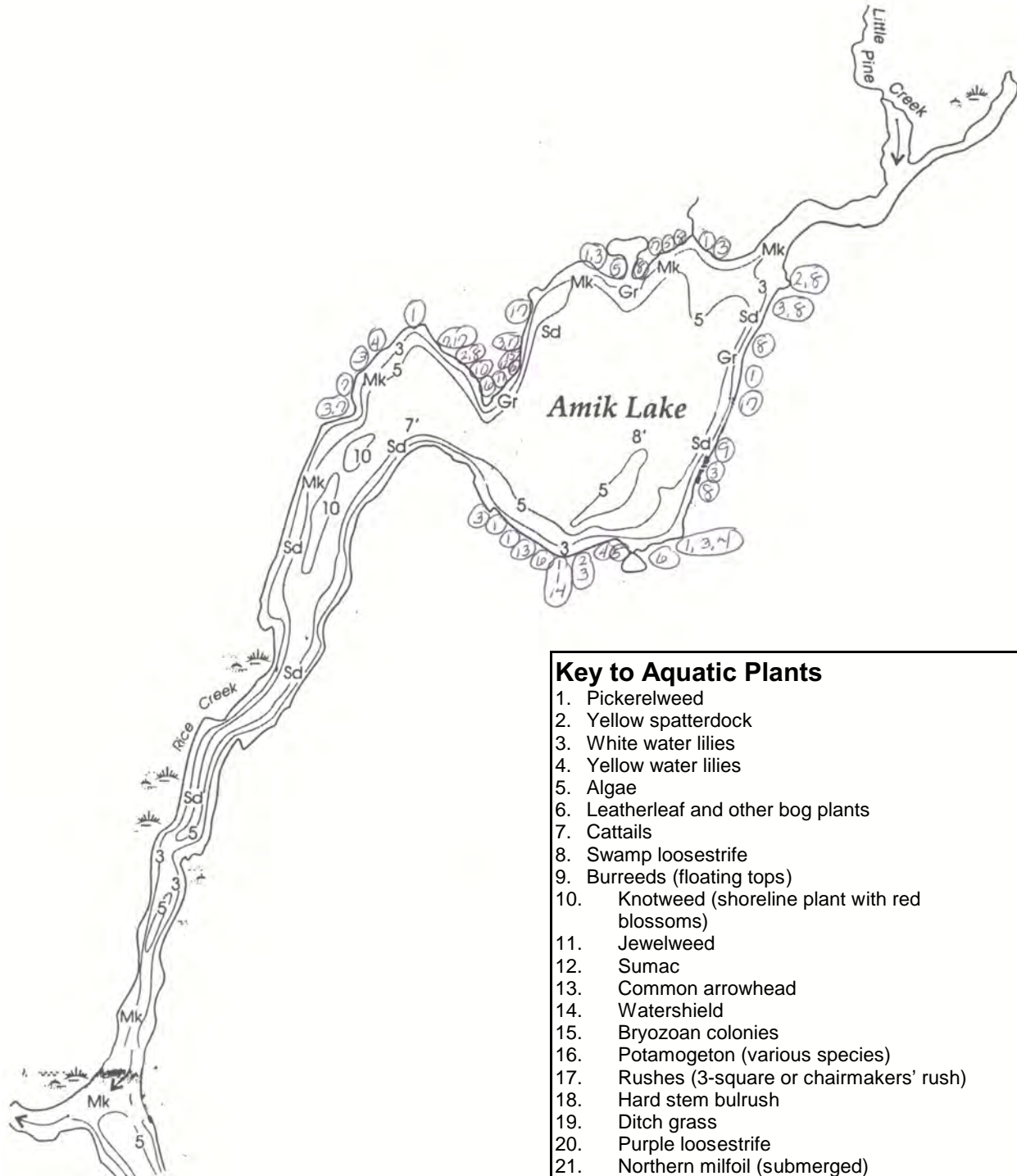


# 2001 - Shoreland Plant Inventory





# 2001 - Shoreland Plant Inventory



Key to Aquatic Plants	
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7.	Cattails
8.	Swamp loosestrife
9.	Burreeds (floating tops)
10.	Knotweed (shoreline plant with red blossoms)
11.	Jewelweed
12.	Sumac
13.	Common arrowhead
14.	Watershield
15.	Bryozoan colonies
16.	Potamogeton (various species)
17.	Rushes (3-square or chairmakers' rush)
18.	Hard stem bulrush
19.	Ditch grass
20.	Purple loosestrife
21.	Northern milfoil (submerged)
22.	Coontail (submerged)
23.	Water celery (submerged)
24.	Creeping spikerush (submerged)
25.	Bladderwort (submerged)

# 2001 - Shoreland Plant Inventory

