

November 3, 2010

Property Owners Association of Lake Hayward
c/o Mr. Tim Pelton
269 Main Street
Cromwell, CT 06416

Re: Year-End Report for the 2010 Aquatic Management Program at Lake Hayward

Dear Tim:

Please accept this as our Year-End Report for the 2010 Aquatic Management Program at Lake Hayward. Good control of the fanwort (*Cabomba caroliniana*) continues to be observed since the last whole lake Sonar (fluridone) herbicide treatment in 2008, however we did see several very limited areas of localized re-growth during our late summer survey. After the Sonar herbicide treatment in 2003, control was achieved for a solid three years before any significant amount of re-growth appeared. While there are no guarantees, it would appear that similar progression of re-growth is occurring this time around as well.

The 2010 Program consisted of a cursory vegetation inspection in June, followed by a more detailed survey in September. During each visit to the lake, we collected a Secchi Disk transparency reading and water samples for algae identification/enumeration.

Vegetation Data

A cursory survey for the sole purpose of identifying areas of fanwort re-growth was conducted on June 7th. The only fanwort observed was located in the northern end of the lake, within the extensive waterlily beds. In this area, several moderate sized patches of fanwort were growing along the narrow boating channel leading to the state boat ramp. No fanwort was observed to the south of the waterlily cover. This is a similar occurrence to what was seen for several years after the 2003 herbicide treatment and is a result of the higher amount of flushing that occurred from the inlet watercourse.

The detailed survey was conducted on September 2nd. This survey was conducted along the established series of transects and data points used in past surveys of the lake. Figure 1 shows the layout of the data points and Table 1 (attached) provides the actual collected data from each point. For comparison, data from the 2007 -2009 surveys is also included on the table. Figure 2 shows a map of the approximate vegetation distribution as indicated from the survey data.

The overall percent cover of plant growth in Lake Hayward was very similar to past levels at 32%, and the diversity of species is essentially back to pre-treatment levels with the return of naiad (*Najas flexilis*) and the continued increase of other native species. Bladderwort (*Utricularia sp.*) and stonewort (*Nitella sp.*) were the most abundant species in the lake again this year. Naiad, Robbins pondweed (*Potamogeton robbinsii*), largeleaf pondweed (*Potamogeton amplifolius*), tapegrass (*Vallisneria americana*), submersed arrowhead (*Sagittaria sp.*), slender spikerush (*Eldocharis sp.*) and thinleaf pond weed (*Potamogeton pusillius*) were also observed in numerous places around the lake.

Aquatic Control Technology, Inc.

Besides the north end of the lake, two additional locations of fanwort re-growth were identified during the September survey. One location was the lagoon adjacent to Second Beach, and the other location was located at the mouth of the expansive wetland area located near the northeast corner of the lake (at transect point C1). The fanwort growth at these locations was fairly sparse and localized in several small patches of <10 plants. The lagoon at Second Beach was one of the first places that the fanwort returned after the 2003 treatment. We did receive verbal reports that the outlet cove was infested with fanwort re-growth, however, upon careful inspection, we were unable to find any growth of fanwort and expect that people may have mistakenly referring to some fairly tall and bright green growth of bladderwort.

Water Quality and Phytoplankton Data

During the survey, a Secchi disk transparency reading and phytoplankton (algae) sample were taken in two locations (Site #1 – South End & Site #2 – North End) on the lake. The following tables present this data.

Table 2 – 2010 Water Clarity and Phytoplankton Measurements

Water Clarity Measurements

Date	South End (Station #1) Feet	North End (Station #2) Feet
6/7	10' 6"	10' 8"
9/2	12' 0"	11' 8"

Phytoplankton Data

Date	South End	North End
6/12	< 5,000 cells per ml – Mostly dominated by greens with some diatoms and chrysophytes	< 5,000 cells per ml – Mostly dominated by greens with some diatoms and chrysophytes
9/14	~6,300 cells/ml – dominated by green and golden algae species	~8,800 cells/ml – mostly green algae species

Clarity readings were desirable and typical for the lake. The algae population was low and consisted mostly of non-bluegreen species. The frequency and severity of algae blooms can be highly variable from year to year and water clarity can fluctuate rapidly over as short a time as a week.

Management Recommendations

A similar monitoring program is recommended for 2010. This will include a late spring survey specifically to look for any re-growth of fanwort that may require management. Additionally, as required in the DEP Permit, we will conduct a plant survey using GPS (to be conducted August-September) and three rounds of water clarity measurement and algae sampling (one to be collected by the Association). The cost for the two vegetation surveys and two rounds of testing is \$2,800. Additionally, we recommend the Association perform more frequent water clarity measurements (~ every week or two) from April through October.

We recommend budgeting \$20,000-\$25,000 each year for ongoing nuisance vegetation management even though re-treatment with Sonar may not be required for another two years or more. Whether partial lake applications of Sonar to control fanwort re-growth are feasible at Lake Hayward will need to be evaluated annually and is dependent on the extent and location of

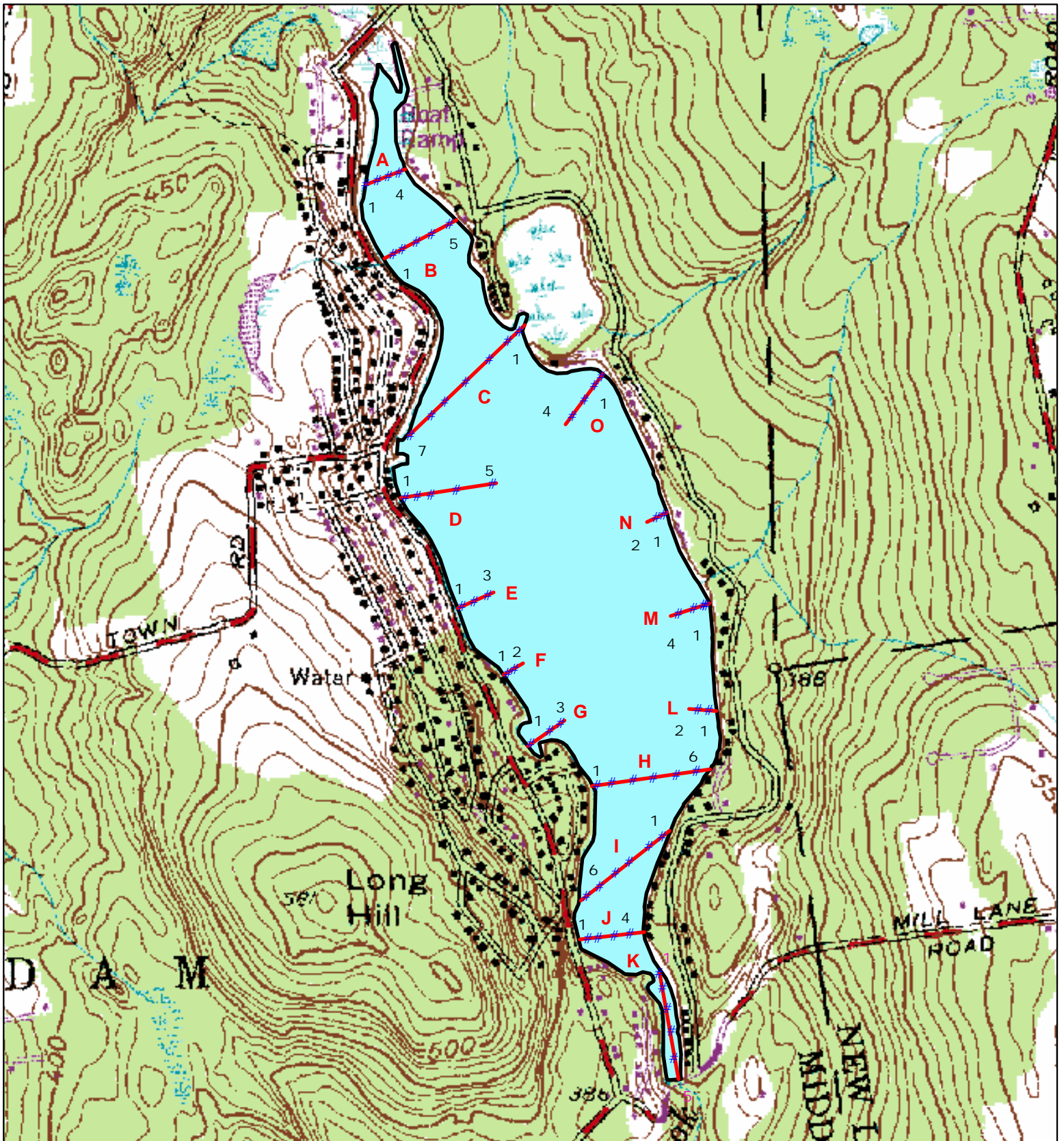
that re-growth, bottom type and other factors. The annual plant survey will provide us with the necessary information in order to make specific management recommendations.

We trust this report provides information to guide your future management decisions at Lake Hayward. If you have any questions, please feel free to give us a call. It has been a pleasure working with you this year and we look forward to continuing work with you and the Association in the future. With your permission, we'll forward a copy of this report to Judy Singer (Pesticide Management Division) and Peter Aarrestad (Inland Fisheries Division) both at CT DEP - 79 Elm Street, Hartford, CT 06106.

Sincerely,
AQUATIC CONTROL TECHNOLOGY, INC.

A handwritten signature in black ink that reads "Dominic Meringolo". The signature is written in a cursive, flowing style.

Dominic Meringolo
Senior Environmental Engineer



Lake Hayward

East Haddam, CT

Survey Points

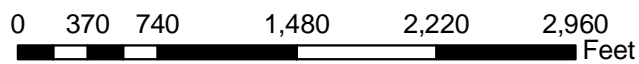
Legend:



Survey Point



Transect



AQUATIC CONTROL TECHNOLOGY, INC.

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 SUTTON, MASSACHUSETTS 01590
 PHONE: (508) 865-1000
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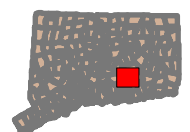
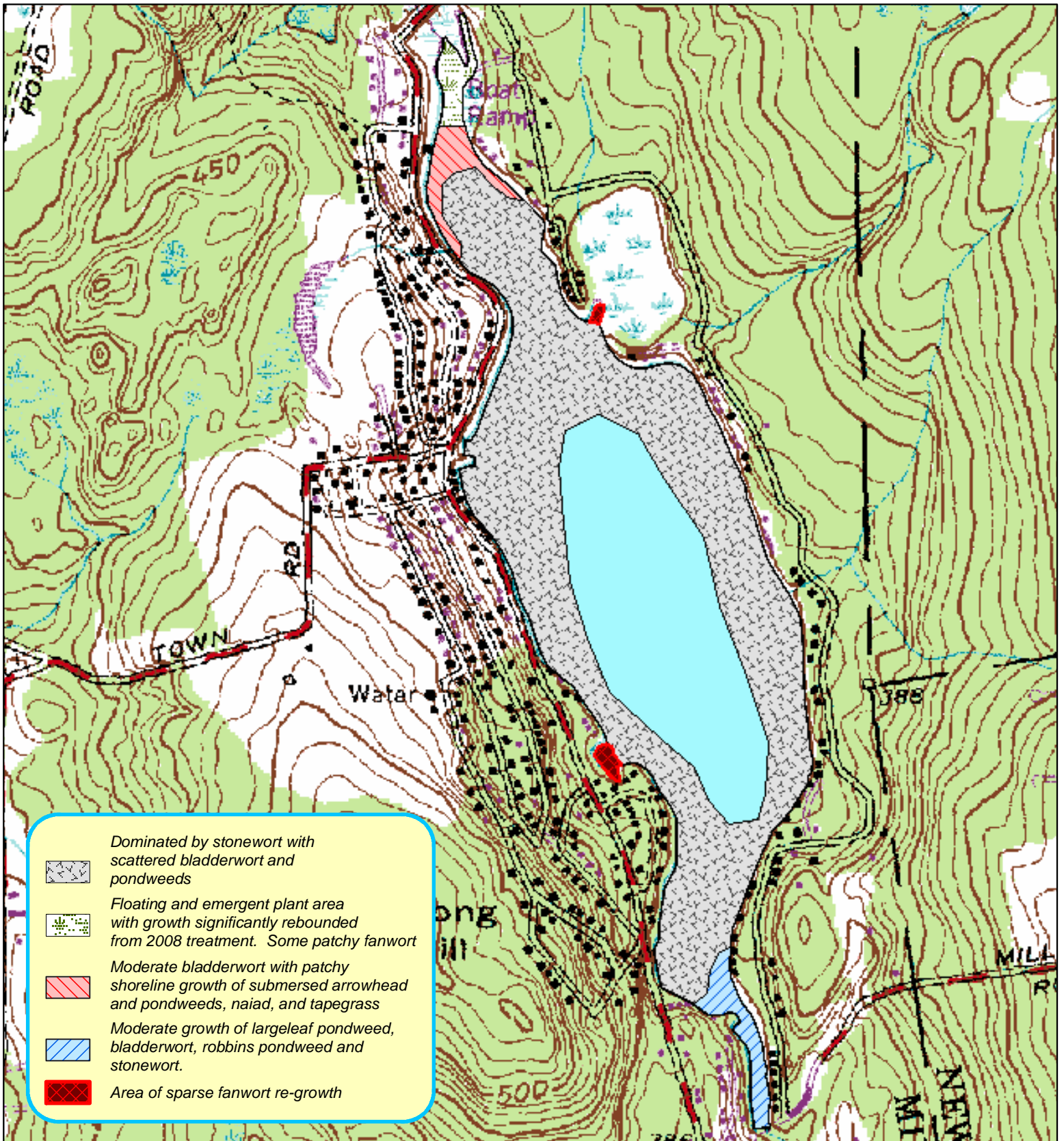


FIGURE:	SURVEY DATE:	MAP DATE:
1	6/7/10 & 9/2/10	11/2010



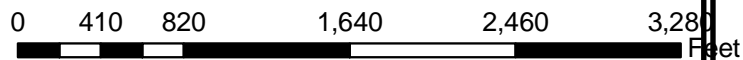
Lake Hayward

East Haddam, CT

2010 Aquatic Plant Distribution

FIGURE:	SURVEY DATE:	MAP DATE:
3	9/2/2010	11/2010

Legend:



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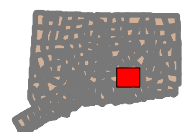


Table 1 – Lake Hayward Vegetation Data

Biomass Index Description

Index	Description
1	Plants growing at or near the bottom
2	Plants growing mid-way through the water column
3	Plants growing within 2-3 feet of the surface
4	Plants growing at or near the surface

Plant Symbol Description

Symbol	Common Name	Scientific Name
B	Watershield	<i>Brasenia schreberi</i>
Cc	Fanwort	<i>Cabomba caroliniana</i>
E	Waterweed	<i>Elodea</i> sp.
Eo	Slender spikerush	<i>Eleocharis</i> sp.
Fa	Filamentous algae	
Ni	Stonewort	<i>Nitella</i> sp.
Nj	Slender naiad	<i>Najas flexilis</i>
Nu	Yellow waterlily	<i>Nuphar</i> sp.
Ny	White waterlily	<i>Nymphaea odorata</i>
Pa	Largeleaf pondweed	<i>Potamogeton amplifolius</i>
Pr	Robbins pondweed	<i>Potamogeton robbinsii</i>
Pp, P1	Thinleaf pondweed	<i>Potamogeton pusilus</i>
S	Submersed arrowhead	<i>Sagittaria</i> sp.
U	Bladderwort	<i>Utricularia</i> sp.
V	Tapegrass	<i>Vallisneria americana</i>

Table 1 - Lake Hayward Vegetation Data (2007-2010)

Transect	Point	2007			Spring 2008			Fall 2008			Fall 2009			Fall 2010		
		% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species
A	1	100%	4	S, U, Cc	50%	3	S,U	60%	2	U, Pr, P1	80%	3	S, U, V	80%	3	U, S, V, Fa, Pe, Pp
	2	100%	3	U, Cc, S	80%	2	Pr, U, Cc, S	60%	2	Pr, U	100%	3	U	80%	2	U, Pr, Ni
	3	100%	3	Cc,U, p1, S	80%	2	Pr, Cc, U	70%	2	Pr, U	60%	2	U, Pa, Pr	90%	2	Ps, U, Pr, Ni
	4	100%	4	S	80%	3	S, U	10%	1	Pr, Fa	60%	3	S, V, U, Fa	80%	3	S, Fa, Ni, U
B	1	20%	3	U, S	5%	1	S, Ni	70%	1	Ni	5%	1	V, U	30%	3	S, V, U, Pr, Pp
	2	10%	1	Ni, Cc, U	15%	2	Cc, Ni, U	50%	1	Ni	40%	1	Ni	80%	1	Ni
	3	10%	1	Ni, Cc, U	10%	2	Cc, Ni	80%	1	Ni	30%	1	Ni, Pr	60%	2	Ni, U, Nj
	4	20%	1	Ni, U, Cc	15%	2	Cc, Ni, Pr	80%	1	Ni	5%	1	Ni	60%	2	Ni, U, Nj
	5	20%	1	Ni, U	30%	1	Ni	60%	1	Ni, Fa	80%	1	Ni, U	20%	1	Ni, U, Fa
C	1	40%	2	U, Cc, Ni, Nj	40%	2	Fa, Cc, U, S	80%	2	U, P1	60%	2	U	60%	2	U, Cc, Nu, Nj, Pp
	2	60%	2	P1, Cc, U	40%	1	P1, Ni	60%	1	Ni, P1	80%	2	U, P1	60%	2	Pp, U, Ni
	3	25%	1	Ni, U, Nj	30%	2	U, Cc	30%	1	Ni	10%	1	Ni	10%	1	Ni
	4	5%	1	Ni	40%	2	Cc, Ni	5%	1	Ni	10%	1	Ni	5%	1	Ni
	5	5%	1	Ni	30%	2	Ni, Cc	0%	-	0%	-	0%	-	-	-	
	6	10%	1	Ni, U, Nj	40%	2	Ni, Cc	5%	1	Ni	5%	1	Ni	0%	-	-
	7	50%	2	Nj, Ni	50%	1	Ni	5%	1	Ni	80%	1	Ni	5%	1	Ni
D	1	50%	1	Ni	10%	1	Ni, Pr	0%	-	30%	1	Ni, Pr	40%	2	Ni, Nj, Pr, Fa	
	2	30%	1	Nj, Pr, U	20%	1	Ni	0%	-	5%	1	Ni	80%	1	Eo	
	3	5%	1	Ni	10%	1	Ni	40%	1	Ni, Fa	60%	1	Ni	80%	1	Ni
	4	50%	2	Nj, Ni, P1	40%	1	Ni	60%	1	Ni	10%	1	Ni	80%	1	Ni
	5	5%	1	Ni	10%	1	Ni	5%	1	Ni	5%	1	Ni	0%	-	
E	1	5%	1	Ni, S, U	20%	1	Ni, P1	80%	1	Ni	5%	1	Ni	5%	1	Ni
	2	5%	1	Ni	30%	1	Ni, P1	5%	1	Ni	5%	1	Ni	5%	1	Eo
	3	20%	1	Ni, Nj	50%	1	Ni	0%	-	20%	1	Ni	80%	1	Ni, Nj	

Transect	Point	2007			Spring 2008			Fall 2008			Fall 2009			Fall 2009		
		% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species
F	1	5%	1	Ni	10%	1	P1, U, Ni	5%	1	Ni, Pr	40%	1	Ni	20%	1	Ni, Eo
	2	5%	1	Ni	5%	1	Ni	40%	1	Ni	0%			0%		
G	1	80%	2	U, P1	30%	2	U, Ni, P1, Pr	30%	1	Ni, Pr	70%	2	U, Ni	100%	3	U, Pr, Cc, Pp, Fa
	2	40%	2	U, Pt	5%	1	Ni, Pr	80%	1	Ni, Fa	70%	1.5	Ni, Pr, U	20%	1	Ni, Ni, U
	3	5%	1	U, Ni	60%	1	Ni, P1	60%	1	Ni	20%	1	Ni	10%	1	Ni
H	1	-	-	-	50%	1	P1	20%	1	Ni	50%	1	Ni	0%	-	-
	2	-	-	-	40%	1	Ni, P1, U	60%	1	Ni	20%	1	Ni	0%	-	-
	3	-	-	-	5%	1	Ni	0%	-	-	0%	-	-	0%	-	-
	4	-	-	-	5%	1	Ni	0%	-	-	0%	-	-	0%	-	-
	5	10%	1	Ni, P1	50%	1	Ni	60%	1	Ni	60%	1.5	Ni, Pr	10%	1	Eo, Fa, Ni
	6	-	-	-	60%	1	Ni	5%	1	Ni	10%	1	Ni	5%	1	Eo, Fa
I	1	-	-	-	0%	0	-	5%	1	Ni	5%	1	Ni	5%	1	Ni, Fa
	2	5%	1	Ni, Ni, U	50%	1	Ni, P1	40%	1	Ni	5%	1	Ni	80%	1	Ni, Fa
	3	10%	2	Ni, Cc, Nj	10%	1	Ni	90%	1	Ni	30%	1	Ni	80%	1	Ni, V, Fa
	4	10%	2	Ni, Pr, Nj, Cc	30%	1	Ni, U	100%	2	Ni	10%	1	Ni, U	20%	1	Ni
	5	10%	1	Nj	40%	1	Ni	40%	1	Ni	20%	1	Ni	20%	1	Ni, U
	6	50%	2	S, P1	30%	1	Ni, P1, S	60%	1	Ni	40%	1	Ni	5%	1	Ni
J	1	80%	2	Nj	20%	2	S, Ni	5%	1	Ni	80%	1	Ni	0%	-	-
	2	10%	1	Ni	30%	1	P1, Ni	40%	1	Ni	60%	1	Ni	40%	2	Ni, Fa, U, Pp
	3	5%	1	Ni	60%	1	Ni, P1	20%	1	Ni	0%			5%	1	Eo, Fa
	4	40%	3	S, Nj	10%	1	S, Ni	0%	-	-	5%	1	Ni, V, S	20%	2	S, V, Fa, Eo, U
K	1	10%	3	Pr, Cc, U, P1	20%	2	S, Ni, U	0%	-	-	30%	2	Pr, Ni, U	30%	2	V, Pr, S
	2	80%	3	cc, Pr, U, P1	60%	2	Cc, P1, U, Ni, Pr	10%	2	U, Pr	80%	1.5	U, P1, Pr	60%	3	U, Pr, Pp, Nj
	3	80%	4	Cc, U	60%	2	Cc, U, P1, Ni, Pr	20%	2	Pr, U, Ni	80%	2	Pr, U	60%	2	Pr, U, Nj, Pp
	4	60%	3	Cc	30%	2	Cc, Pr, Ni	5%	1	Ni	10%	2	Pa, Ni, U	20%	2	Ni, U, Pr
	5	40%	3	Cc	40%	3	Cc	0%	-	-	5%	1.5	P1, Ni	10%	2	U, Pr

Transect	Point	2007			Spring 2008			Fall 2008			Fall 2009			Fall 2009		
		% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species	% Cover	Biomass	Species
L	1	20%	1	Ni, Nj	5%	1	Ni	20%	1	Ni	5%	1	Ni	40%	2	Ni, Nj, Eo
	2	10%	1	Nj, P1	60%	1	Ni, P1	5%	1	Ni	5%	1	Ni, Fa	10%	1	Fa, Eo
M	1	60%	1	Ni	5%	1	Ni, Fa	40%	1	Ni	80%	1.5	Pr, Ni	10%	2	Fa, Eo, Pr, Nj
	2	40%	2	Ni	5%	1	Ni, Fa	20%	1	Ni	80%	1.5	Ni, Pr	10%	2	Fa, Eo, Pr, Nj
	3	40%	1	Nj, Ni	10%	1	Pr, Ni	20%	1	Ni, U	10%	1	Ni	80%	1	Ni, Fa
	4	40%	1	Ni Pr	30%	1	P1, Fa, S	20%	1	Ni	80%	1	Fa	10%	1	Ni, Fa
N	1	80%	1	P1, Ni	0%	1	-	40%	1	Ni, Pr	30%	1	Ni	10%	1	Ni, Eo, Fa
	2	40%	1	Ni, Nj	0%	1	-	20%	1	Ni	40%	1	Ni	0%	-	-
O	1	40%	2	U, Ni, Nj	5%	1	Ni	30%	1	Ni, U	10%	1	Ni, Pr, Fa	5%	2	Pp, Ni
	2	40%	2	Ni, P1	5%	1	Ni	40%	1	Ni	30%	1	Ni	60%	2	Nj
	3	60%	1	Ni	15%	2	Cc, Ni	20%	1	Ni	20%	1	Ni	5%	1	Ni
	4	40%	1	Ni	50%	1	Ni	5%	1	Ni	10%	1	Ni	5%	1	Ni
		36%			29%			32%			33%			32%		