7	0.105	24.04	8.01	9.15	-	-	-	-	-
7	0.115	25.72	8.26	8.61	10	15	1.5	8	0.80
8	0.094	22.60	7.87	7.35	10	16	1.6	24	2.40
8	0.128	24.64	8.03	12.03	10	20	2.0	20	2.00
8	0.103	23.76	8.03	9.00	-	-	-	-	-
8	0.115	25.41	8.24	8.30	10	36	3.6	14	1.40
9	0.094	22.61	7.82	7.45	10	17	1.7	46	4.60
9	0.132	25.13	8.12	4.16	8	32	4.0	2	0.25
9	0.105	24.07	8.01	8.97	8	24	3.0	8	1.00
9	0.115	25.49	8.33	8.17	10	33	3.3	13	1.30
10	0.093	22.73	7.75	7.41	10	14	1.4	24	2.40
10	0.129	25.49	8.30	7.58	10	28	2.8	1	0.10
10	0.105	24.09	7.96	9.26	10	31	3.1	24	2.40
10	0.114	26.94	8.94	10.06	10	23	2.3	20	2.00
11	0.083	22.66	7.80	7.46	10	13	1.3	22	2.20
11	0.130	25.69	8.29	7.35	10	29	2.9	2	0.20
11	0.097	24.46	7.99	9.12	10	24	2.4	30	3.00
11	0.115	26.38	8.39	8.71	10	24	2.4	20	2.00
12	0.093	22.67	7.78	7.20	10	15	1.5	4	0.40
12	-	-	-	-	-	-	-	-	-
12	0.106	24.32	7.93	8.79	7	29	4.1	29	4.14
12	0.114	26.54	7.97	7.65	10	28	2.8	12	1.20
13	0.096	22.44	8.02	8.14	10	39	3.9	30	3.00
13	0.108	19.23	7.73	9.80	10	24	2.4	12	1.20
13	0.127	25.12	8.16	7.56	9	28	3.1	20	2.22
13	0.106	24.55	7.98	9.60	10	37	3.7	15	1.50
13	0.116	26.56	8.34	8.45	10	24	2.4	18	1.80
14	0.092	22.44	8.01	8.15	10	22	2.2	11	1.10
14	-	-	-	-	-	-	-	-	-
14	0.108	24.46	7.97	9.10	10	33	3.3	22	2.20
14	0.115	26.44	8.24	8.50	10	21	2.1	4	0.40
15	0.095	22.44	7.85	7.93	10	28	2.8	12	1.20
15	0.137	25.76	8.15	7.49	10	21	2.1	6	0.60
15	0.106	23.99	7.92	8.93	10	31	3.1	5	0.50
15	0.117	27.37	8.31	8.15	10	28	2.8	7	0.70
16	0.092	21.44	7.11	8.53	10	28	2.8	6	0.60
16	0.136	25.64	8.17	7.46	10	19	1.9	3	0.30
16	0.104	24.00	7.92	8.75	10	27	2.7	2	0.20
16	0.115	26.65	8.38	8.61	10	20	2.0	3	0.30
17	0.091	21.67	7.35	7.91	10	32	3.2	36	3.60
17	-	-	-	-	-	-	-	-	-
17	0.094	24.50	7.94	8.84	10	17	1.7	22	2.20

17	0.117	26.32	8.45	9.25	10	20	2.0	7	0.70
18	0.089	21.18	7.43	6.97	10	25	2.5	12	1.20
18	0.108	20.08	7.59	8.75	10	13	1.3	2	0.20
18	0.129	25.82	8.19	7.36	10	32	3.2	7	0.70
18	0.101	24.85	7.86	8.15	-	-	-	-	-
18	0.118	27.27	8.39	8.87	10	26	2.6	14	1.40
19	0.091	21.53	7.39	7.31	10	31	3.1	18	1.80
19	0.127	25.24	7.92	6.53	10	25	2.5	0	0.00
19	0.101	24.49	7.88	8.43	10	27	2.7	26	2.60
19	0.119	27.49	8.48	9.03	10	36	3.6	0	0.00
20	0.090	21.70	7.44	7.78	10	22	2.2	19	1.90
20	-	-	-	-	-	-	-	-	-
20	0.102	24.79	7.88	8.59	-	-	-	-	-
20	0.119	27.43	8.39	8.67	10	26	2.6	12	1.20
21	0.094	21.52	7.70	7.57	10	16	1.6	16	1.60
21	0.139	26.65	8.18	7.35	9	27	3.0	2	0.22
21	0.107	24.34	7.88	8.66	10	21	2.1	16	1.60
21	0.123	28.80	8.53	8.67	10	34	3.4	7	0.70
22	0.092	21.72	7.79	7.52	10	20	2.0	27	2.70
22	-	-	-	-	-	-	-	-	-
22	0.108	24.70	7.97	8.94	10	21	2.1	20	2.00
22	0.122	28.54	6.70	8.75	10	16	1.6	10	1.00
23	0.091	21.79	7.76	7.71	9	17	1.9	15	1.67
23	-	-	-	-	-	-	-	-	-
23	0.107	24.61	7.67	8.01	10	32	3.2	9	0.90
23	0.122	28.38	8.40	8.80	10	32	3.2	19	1.90
24	0.091	21.93	7.71	8.06	10	17	1.7	13	1.30
24	0.135	27.55	8.30	7.47	-	-	-	-	-
24	0.108	24.09	8.00	8.76	10	25	2.5	23	2.30
24	0.123	29.09	7.50	9.53	10	19	1.9	13	1.30
25	0.091	21.44	7.60	8.07	10	30	3.0	20	2.00
25	-	-	-	-	-	-	-	-	-
25	0.108	24.38	8.04	8.75	10	27	2.7	26	2.60
25	0.120	28.20	8.68	8.94	9	11	1.2	11	1.22
26	0.092	21.80	7.66	7.53	10	22	2.2	15	1.50
26	0.098	26.93	8.27	7.03	10	17	1.7	3	0.30
26	0.108	24.35	8.06	8.65	10	25	2.5	22	2.20
26	0.119	27.73	8.62	8.88	4	3	0.8	0	0.00
27	0.091	21.15	7.70	7.93	10	43	4.3	75	7.50
27	-	-	-	-	-	-	-	-	-
27	0.107	24.04	8.22	9.27	10	18	1.8	15	1.50
27	0.119	28.07	8.64	8.43	-	-	-	-	-
28	0.090	21.46	7.59	7.55	10	13	1.3	15	1.50

28	0.133	26.78	8.29	7.51	10	21	2.1	5	0.50
28	0.106	23.94	7.98	8.80	10	24	2.4	33	3.30
28	0.123	28.52	8.60	8.09	-	-	-	-	-
29	0.097	22.27	7.72	8.16	8	19	2.4	36	4.50
29	0.149	25.39	7.89	6.49	10	24	2.4	0	0.00
29	0.116	24.27	7.71	8.00	10	19	1.9	16	1.60
29	0.121	27.93	8.58	8.19	10	19	1.9	12	1.20
30	0.095	22.43	7.80	8.40	10	24	2.4	21	2.10
30	-	-	-	-	-	-	-	-	-
30	0.104	23.35	7.87	8.94	10	23	2.3	9	0.90
30	0.122	28.39	8.71	8.27	10	29	2.9	15	1.50
31	0.108	19.88	7.60	9.60	10	24	2.4	40	4.00
31	0.126	26.30	8.33	7.76	10	25	2.5	7	0.70
31	0.102	23.95	7.98	9.45	10	27	2.7	10	1.00
31	0.117	26.87	8.40	9.21	10	19	1.9	8	0.80
32	0.108	20.42	7.70	8.23	10	21	2.1	28	2.80
32	-	-	-	-	-	-	-	-	-
32	0.101	24.50	7.99	8.61	10	18	1.8	20	2.00
32	0.120	27.33	8.41	9.31	-	-	-	-	-
33	0.110	20.48	7.64	7.97	10	41	4.1	28	2.80
33	0.133	27.13	8.47	8.08	10	19	1.9	1	0.10
33	0.102	24.86	8.06	8.58	10	20	2.0	23	2.30
33	0.119	28.58	8.47	8.94	10	22	2.2	12	1.20
34	0.112	20.90	7.90	6.01	10	11	1.1	9	0.90
34	-	-	-	-	-	-	-	-	-
34	0.107	24.64	7.91	8.74	10	28	2.8	15	1.50
34	0.120	27.86	8.74	8.57	10	14	1.4	3	0.30
				2008 TOTAL	**296**	**686**	**2.3**	**662**	**2.24**
				2009 TOTAL	**60**	**134**	**2.2**	**119**	**1.98**
				2010 TOTAL	**156**	**385**	**2.5**	**81**	**0.52**
				2011 TOTAL	**282**	**761**	**2.7**	**552**	**1.96**
				2012 TOTAL	**303**	**754**	**2.5**	**365**	**1.20**

2008 (Gray), 2009 (White), 2010 (Yellow), 2011 (Green), and 2012 (Blue)

1.1.5 White Rapids Reservoir

White Rapids Reservoir was surveyed July 11, 2012. Eighty stems were collected from 8 of the 10 locations within the reservoir (Figure 1-5). The plants at each site were covered by a thick blanket of algae and mostlydominated by native plant species rather than EWM at every site except 6 and 7. Only a few (less than 5) unhealthy, blackened strands of EWM were found at those two sites. However, adult weevils were observed at every site even at 6 and 7. This year's weevil population is the lowest to be found

Figure 1-5. WE Energies White Rapids Hydro Project. 2012 Weevil Distribution.

Survey Transect

1,000 500 0 1,000 Feet

300 150 0 300 Meters

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over the four years of monitoring at 0.61 weevils/stem (Table 1-5). This is a dramatic decrease from the previous two years.

There was an increase of surface water temperature at each site but this is not comparable to the increase in other reservoirs. All other parameters measured were average when compared to previous years.

Table 1-5 Stem Analysis and Water Quality Data at Each Transect in White Rapids Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.231	24.85	8.26	6.97	10	21	2.1	9	0.90
1	0.246	25.29	7.98	11.50	10	14	1.4	11	1.10
1	0.196	24.41	8.56	8.70	10	15	1.5	45	4.50
1	0.242	26.54	8.45	8.32	10	21	2.1	18	1.80
2	0.237	24.82	8.16	7.80	10	10	1.0	7	0.70
2	0.255	25.23	7.78	9.10	10	14	1.4	27	2.70
2	0.198	24.34	7.89	7.26	9	25	2.8	17	1.89
2	0.236	27.05	8.82	9.05	10	21	2.1	15	1.5
3	0.254	25.66	8.05	5.38	8	8	1.0	3	0.38
3	0.252	25.46	7.59	6.30	10	16	1.6	1	0.10
3	0.202	24.43	7.82	7.50	10	9	0.9	10	1.00
3	0.250	26.90	8.37	8.36	10	18	1.8	0	0.00
4	0.235	24.66	8.10	8.39	10	26	2.6	13	1.30
4	0.252	24.87	7.75	10.17	10	11	1.1	16	1.60
4	0.197	26.22	8.95	14.33	8	18	2.3	45	5.63
4	0.245	26.23	8.16	7.06	10	20	2.0	1	0.10
5	0.237	24.47	8.08	6.48	7	11	1.6	7	1.00
5	0.258	25.59	8.00	11.55	10	10	1.0	11	1.10
5	0.206	24.42	8.62	8.29	6	7	1.2	8	1.33
5	0.250	26.56	8.18	6.44	10	25	2.5	2	0.20
6	0.236	24.48	8.10	7.92	10	18	1.8	28	2.80
6	0.261	24.53	7.77	10.30	10	28	2.8	91	9.10
6	0.205	24.66	7.65	7.67	10	19	1.9	45	4.50
6	0.242	26.19	8.44	8.39	-	-	-	-	-
7	0.238	25.31	8.10	7.46	10	16	1.6	52	5.20
7	0.260	25.51	7.84	10.83	10	20	2.0	64	6.40
7	0.201	24.94	8.09	9.45	10	13	1.3	74	7.40
7	0.238	27.13	9.08	11.48	-	-	-	-	-
8	0.237	25.37	8.23	9.49	10	16	1.6	3	0.30
8	0.252	25.33	7.94	10.32	10	17	1.7	31	3.10

8	0.201	25.03	7.93	8.94	8	14	1.8	11	1.38
8	0.246	26.53	8.23	7.35	10	16	1.6	2	0.20
9	0.230	25.70	8.34	9.30	10	14	1.4	4	0.40
9	0.252	25.78	7.96	10.64	10	27	2.7	33	3.30
9	0.199	24.61	7.73	7.75	10	10	1.0	9	0.90
9	0.246	26.63	8.54	8.70	10	23	2.3	2	0.20
10	0.238	25.07	8.12	8.03	10	23	2.3	16	1.60
10	0.248	25.74	8.00	11.12	10	20	2.0	30	3.00
10	0.200	24.78	7.82	8.33	10	9	0.9	17	1.70
10	0.239	27.77	9.06	9.30	10	19	1.9	9	0.90
				2008 TOTAL	**95**	**163**	**1.7**	**142**	**1.49**
				2010 TOTAL	**100**	**177**	**1.8**	**315**	**3.15**
				2011 TOTAL	**91**	**139**	**1.5**	**281**	**3.09**
				2012 TOTAL	**80**	**163**	**2.0**	**49**	**0.61**

2008 (Gray), 2009 (White), 2010 (Yellow), 2011 (Green), and 2012 (Blue)

1.1.6 Chalk Hill Reservoir

On July 11, 2012 the EnviroScience field team collected 130 stems from 13 locations that were originally established in 2008 (Figure 1-6). A total of 221 weevil life stages were found this season,this is the lowest amount found over the four years but is not the lowest overall weevil population (Table 1-6). In addition to White Rapids Reservoir, algae heavily coated the plants.

The DO readings ranged from 7.11 to 16.50 which are considerably high but historically comparable to 2010. The temperature was the highest ever recorded increasing from 1 to over 3 degrees at each site 2011 to 2012.

Table 1-6 Stem Analysis and Water Quality Data at Each Transect in Chalk Hill Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.236	25.90	8.39	8.89	10	16	1.6	8	0.80
1	0.261	26.67	8.23	13.62	10	40	4.0	14	1.40
1	0.208	25.23	8.01	8.62	10	23	2.3	12	1.20
1	0.126	26.78	9.11	7.76	10	20	2.0	8	0.80
2	0.233	25.64	8.40	8.56	10	13	1.3	3	0.30
2	0.264	26.05	8.15	11.53	9	19	2.1	47	5.22
2	0.209	25.46	7.77	8.12	7	29	4.1	19	2.71

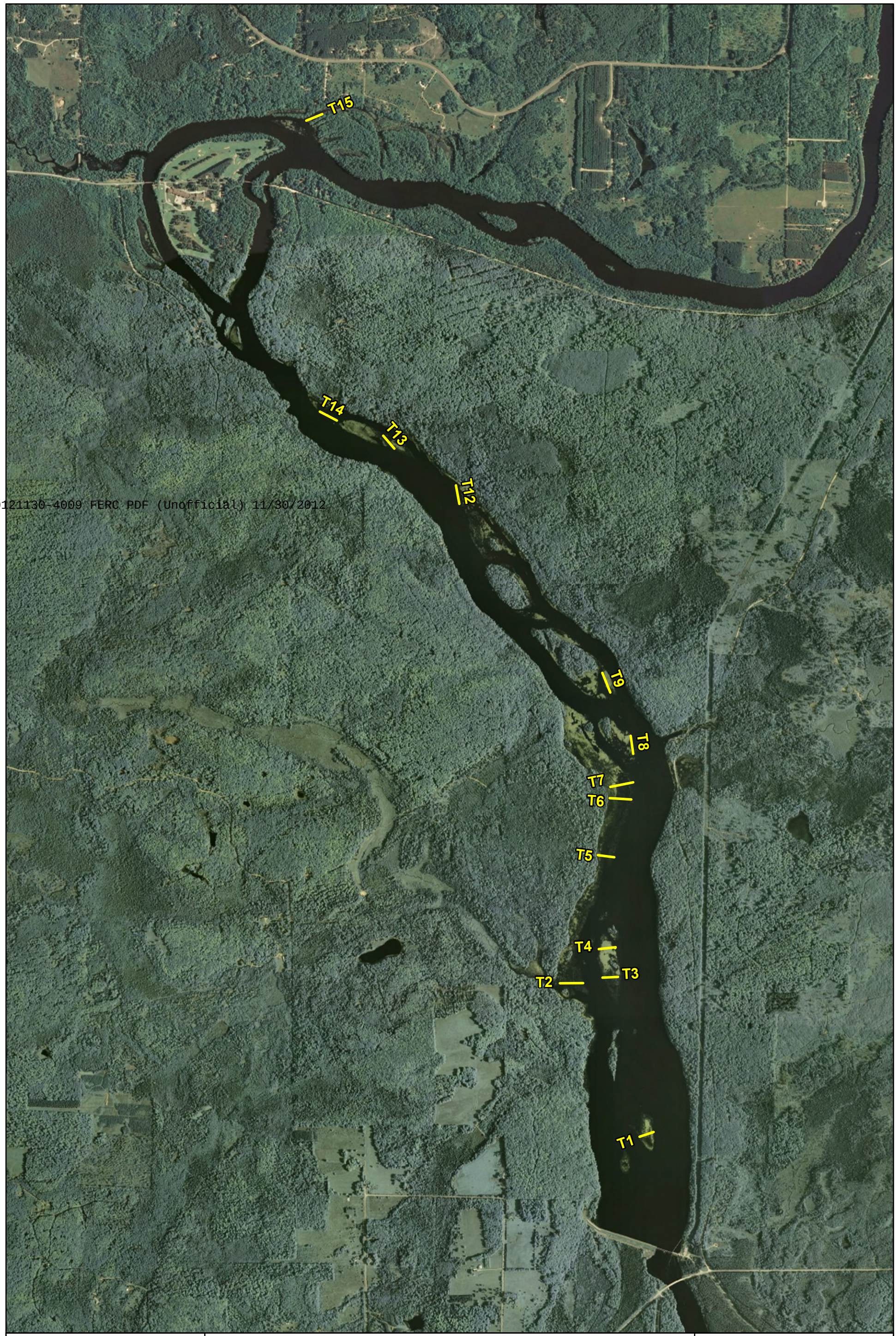

Figure 1-6. WE Energies Chalk Hill Hydro Project. 2012 Weevil Distribution.

Survey Transect

2,000 1,000 0 2,000 Feet

600 300 0 600 Meters

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2	0.244	28.11	8.48	9.57	10	24	2.4	9	0.90
3	0.233	26.14	8.27	8.17	8	14	1.8	1	0.13
3	0.264	26.62	8.17	11.59	10	23	2.3	30	3.00
3	0.200	24.43	7.75	8.49	10	40	4.0	10	1.00
3	0.240	27.32	8.23	8.40	10	19	1.9	14	1.40
4	0.237	26.44	8.25	8.23	10	31	3.1	11	1.10
4	0.265	26.42	8.14	11.52	8	7	0.9	26	3.25
4	0.201	24.44	7.77	8.20	2	8	4.0	0	0.00
4	0.243	27.75	8.62	9.91	10	19	1.9	15	1.50
5	0.231	25.76	8.12	7.95	10	16	1.6	10	1.00
5	0.264	26.47	8.60	15.30	10	16	1.6	14	1.40
5	0.202	24.86	7.80	9.25	10	23	2.3	18	1.80
5	0.232	28.12	9.13	11.65	10	24	2.4	10	1.00
6	0.228	25.18	8.31	8.29	10	27	2.7	22	2.20
6	0.245	28.12	9.18	9.06	9	15	1.7	39	4.33
6	0.206	25.50	7.89	8.49	10	28	2.8	44	4.40
6	0.233	28.44	9.19	12.15	10	24	2.4	21	2.10
7	0.226	26.17	8.43	7.57	10	19	1.9	7	0.70
7	0.263	27.29	8.82	8.54	8	15	1.9	30	3.75
7	0.211	26.73	8.00	9.04	10	42	4.2	23	2.30
7	0.231	27.95	9.01	11.32	10	22	2.2	21	2.10
8	0.230	25.88	8.35	8.44	10	15	1.5	23	2.30
8	0.271	25.67	8.47	7.30	10	18	1.9	24	2.40
8	0.203	24.98	7.86	8.40	10	29	2.9	6	0.60
8	0.229	27.26	8.43	8.14	10	22	2.2	7	0.70
9	0.235	26.50	8.36	9.50	10	15	1.5	10	1.00
9	0.273	25.49	8.16	6.97	7	16	2.3	36	5.14
9	0.200	24.26	7.72	7.74	10	22	2.2	1	0.10
9	0.235	27.85	8.71	9.60	10	20	2.0	22	2.20
10	0.231	24.40	8.11	7.03	10	29	2.9	4	0.40
10	0.278	24.27	7.80	10.88	8	31	3.9	8	1.00
10	0.207	25.89	7.91	8.38	-	-	-	-	-
10	0.238	26.62	8.09	7.11	-	-	-	-	-
11	0.236	25.66	8.26	7.32	10	24	2.4	55	5.50
11	0.279	24.36	7.81	10.47	10	18	1.8	19	1.90
11	0.201	24.21	7.77	7.85	10	20	2.0	1	0.10
11	0.241	26.93	8.16	7.41	-	-	-	-	-
12	0.233	25.56	8.18	7.50	10	31	3.1	25	2.50
12	0.281	24.51	7.84	11.31	7	17	2.4	31	4.43
12	0.202	24.14	7.77	7.85	10	22	2.2	38	3.80
12	0.235	27.08	7.88	8.30	10	21	2.1	21	2.10
13	0.235	25.32	8.26	8.50	10	16	1.6	15	1.50
13	0.271	26.77	8.95	15.36	10	13	1.3	26	2.60

13	0.201	23.61	7.68	7.86	10	18	1.8	7	0.70
13	0.221	30.12	8.90	16.50	10	24	2.4	19	1.90
14	0.244	26.28	8.37	7.80	10	43	4.3	25	2.50
14	0.280	24.26	7.77	10.94	9	30	3.3	38	4.22
14	0.202	23.66	7.73	7.87	10	27	2.7	76	7.60
14	0.223	28.69	8.69	11.47	10	19	1.9	25	2.50
15	0.255	27.00	8.66	9.88	10	29	2.9	12	1.20
15	0.279	24.99	8.00	12.30	8	12	1.5	4	0.50
15	0.207	25.11	7.75	8.75	10	16	1.6	9	0.90
15	0.239	27.10	8.49	10.91	10	24	2.4	19	1.9
16	0.245	25.06	8.40	8.28	10	24	2.4	4	0.40
16	0.276	24.69	8.03	12.82	10	21	2.1	12	1.20
16	0.205	23.83	7.76	8.34	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-
				2008 TOTAL	**158**	**362**	**2.3**	**235**	**1.49**
				2010 TOTAL	**143**	**311**	**2.2**	**398**	**2.78**
				2011 TOTAL	**129**	**347**	**2.7**	**264**	**2.05**
				2012 TOTAL	**130**	**282**	**2.2**	**211**	**1.62**

2008 (Gray), 2009 (White), 2010 (Yellow), 2011 (Green), and 2012 (Blue)

1.1.7 Brule Reservoir

In 2010, the EWM increased but was not found anywhere within the reservoir by July of 2011. However, it was observed to be rebounding by the time of the weevil follow-up survey in August. This season, milfoil was found at every site collecting exactly 100 stems on July 9 (Figure 1-7). Given the lack of EWM from the previous year, EnviroScience biologists weren't expecting to find much weevil activity. However, adults and larval damage were observed in multiple sites. Additionally, the results from lab analysis revealed 56 life stages for an overall weevil population of 0.56 weevils/stem (Table 1-7).

The conductivity readings decreased at every site, some being the lowest readings ever recorded. This decrease could be a possible result of the construction occurring upstream in the Paint River. When comparing the temperature data from 2011 to 2012, it increased at every site. It appears that the dissolved oxygen (DO) has had the biggest fluctuations over the five years while the pH has been pretty consistent.

Figure 1-7. WE Energies Brule Hydro Project. 2012 Weevil Distribution.

Table 1-7 Stem Analysis and Water Quality Data at Each Transect in Brule Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.169	24.42	8.48	9.03	10	13	1.3	0	0.00
1	0.162	24.68	7.78	6.98	9	20	2.2	6	0.67
1	0.167	24.72	8.40	8.60	-	-	-	-	-
1	0.114	28.15	8.71	9.90	10	26	2.6	5	0.50
2	0.159	24.85	8.41	9.27	10	17	1.7	4	0.40
2	0.117	23.21	7.39	6.44	9	20	2.2	11	1.22
2	0.165	24.46	8.05	8.38	-	-	-	-	-
2	0.116	28.47	8.30	9.15	10	23	2.3	8	0.80
3	0.157	24.20	8.34	8.19	10	15	1.5	13	1.30
3	0.164	28.13	8.45	7.56	9	29	3.2	2	0.22
3	0.151	24.10	8.02	8.13	-	-	-	-	-
3	0.099	26.77	7.89	9.05	10	26	2.6	7	0.70
4	0.163	24.71	8.27	8.85	10	21	2.1	14	1.40
4	0.160	27.55	8.39	7.54	10	21	2.1	4	0.40
4	0.153	24.18	7.95	8.26	-	-	-	-	-
4	0.103	30.10	8.95	10.54	10	17	1.7	11	1.10
5	0.163	23.94	8.35	9.32	10	13	1.3	7	0.70
5	0.159	25.75	7.98	6.68	10	23	2.3	12	1.20
5	0.150	24.01	7.83	8.16	-	-	-	-	-
5	0.099	26.36	7.97	8.10	10	36	3.6	7	0.70
6	0.177	23.58	8.30	8.75	10	14	1.4	4	0.40
6	0.168	26.63	8.07	12.01	9	16	1.8	0	0.00
6	0.148	24.19	7.61	7.02	-	-	-	-	-
6	0.113	26.42	7.42	7.72	10	18	1.8	5	0.50
7	0.171	23.18	8.08	7.69	10	14	1.4	2	0.20
7	0.183	22.28	7.31	12.59	9	25	2.8	14	1.56
7	0.174	24.26	7.95	8.39	-	-	-	-	-
7	0.105	26.11	7.37	8.35	10	56	5.6	5	0.50
8	0.173	23.21	8.15	7.83	10	23	2.3	7	0.70
8	0.165	25.73	7.82	11.52	8	28	3.5	16	2.00
8	0.169	24.41	7.92	8.26	-	-	-	-	-
8	0.097	25.99	7.52	8.06	10	44	4.4	3	0.30
9	0.175	27.42	8.82	11.65	10	26	2.6	13	1.30
9	0.147	24.26	7.49	6.55	-	-	-	-	-
9	0.146	27.19	7.99	8.30	10	32	3.2	0	0.00
10	0.165	26.00	7.94	13.56	8	21	2.6	18	2.25
10	0.168	24.67	7.93	8.11	-	-	-	-	-
10	0.122	25.96	7.51	8.20	10	22	2.2	5	0.50

2008 TOTAL	**80**	**130**	**1.6**	**51**	**0.64**
2010 TOTAL	**91**	**229**	**2.5**	**96**	**1.05**
2011 TOTAL	**0**	**0**	**0.0**	**0**	**0.00**
2012 TOTAL	**100**	**300**	**3.0**	**56**	**0.56**

2008 (Gray), 2009 (White), 2010 (Yellow), 2011 (Green), and 2012 (Blue)

1.1.8 Lower Paint Reservoir

Upon arrival at the reservoir, the water level was observed to be higher than normal, possibly due to newconstruction on the dam. This created poor visibility conditions (less than 2') plus there was heavy sediment coating on the plants. Historically, this reservoir has contained some of the highest weevil populations found during the study. At the time of the July 10, 2012 survey the milfoil was measured as sparse. The only moderately dense area found throughout the reservoir was at T8. No EWM was found at five locations; 1, 4, 7, 10 and 13. Thirty six weevil life stages were found on the 68 stems collected from the eight remaining sites (Figure 1-8, Table 1-8). This is the lowest population found over the four years of monitoring.

Multiple native macrophyte species were observed: Clasping-leaf pondweed (*Potamogeton richardsonii*), Coontail (*Ceratophyllum demersum*), Common waterweed (*Elodea canadensis*), Flat-stem pondweed (*Potamogeton zosteriformis*), Bladderwort (*Utricularia subulata*), Northern watermilfoil (*Myriophyllum sibiricum*), Yellow water lily (*Nuphar sp.*), Floating-leaf Bur-reed (*Sparganium fluctuans*), Watershield (*Brasenia schreberi*), Naiad (*Najas flexis*), Ribbon-leaf pondweed (*Potamogeton epiphydrus*) and Floating-leaf pondweed (*Potamogeton natans*).

Conductivity and DO readings decreased at every site. Temperature also decreased but only from 2011 to 2012.

Table 1-8 Stem Analysis and Water Quality Data at Each Transect in Lower Paint Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.162	21.97	7.97	7.28	10	11	1.1	10	1.00
1	0.161	25.17	7.71	6.37	9	29	3.2	17	1.89
1	0.151	24.63	7.99	8.90	-	-	-	-	-
1	0.093	22.86	7.76	5.44	-	-	-	-	-
2	0.162	21.46	8.02	7.98	10	14	1.4	12	1.20
2	0.160	25.26	7.77	6.72	10	29	2.9	16	1.60
2	0.149	24.56	7.98	8.49	-	-	-	-	-

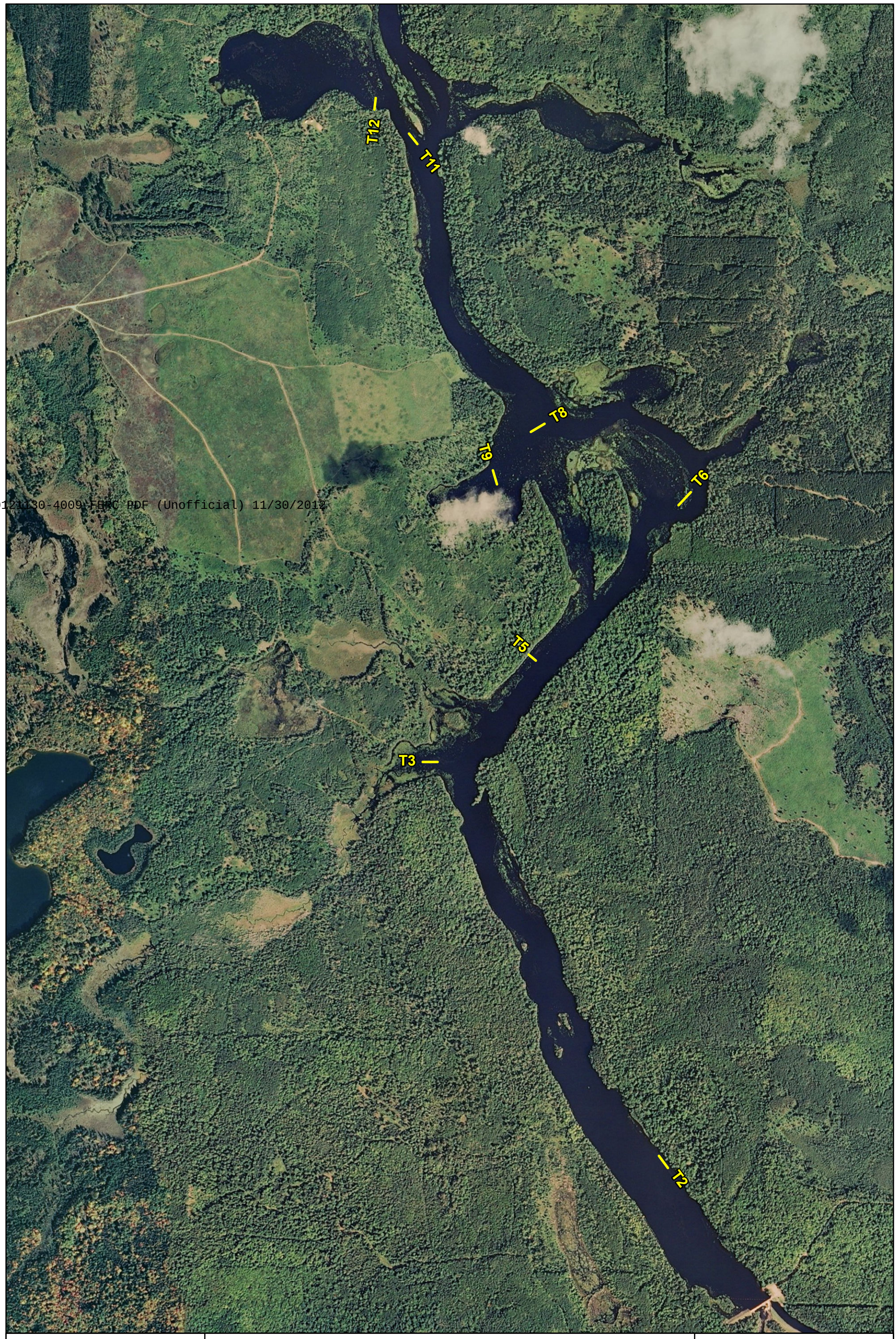

Figure 1-8. WE Energies Lower Paint Hydro Project. 2012 Weevil Distribution.

Survey Transect

1,000 500 0 1,000 Feet

300 150 0 300 Meters

N

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2	0.092	22.71	7.24	5.65	9	27	3.0	7	0.78
3	0.160	20.77	8.15	7.77	10	14	1.4	6	0.60
3	0.148	25.97	7.74	6.49	9	25	2.8	27	3.00
3	0.153	24.62	7.95	8.54	10	32	3.2	25	2.50
3	0.096	23.10	6.96	3.43	6	14	2.3	3	0.50
4	0.161	20.96	8.09	7.70	10	14	1.4	3	0.30
4	0.156	24.66	7.69	5.95	8	16	2.0	14	1.75
4	0.155	24.99	8.01	8.98	10	31	3.1	24	2.40
4	0.096	23.47	7.32	5.64	-	-	-	-	-
5	0.162	20.83	8.12	7.90	10	11	1.1	12	1.20
5	0.160	25.42	7.82	11.41	10	35	3.5	29	2.90
5	0.155	24.98	8.01	8.79	-	-	-	-	-
5	0.096	23.40	7.34	5.63	8	23	2.9	4	0.50
6	0.165	21.27	8.25	8.58	10	12	1.2	12	1.20
6	0.162	24.64	7.89	12.83	10	31	3.1	30	3.00
6	0.156	24.79	8.01	8.88	-	-	-	-	-
6	0.096	22.97	7.33	6.32	10	25	2.5	7	0.70
7	0.158	20.01	8.29	8.06	10	18	1.8	25	2.50
7	0.160	24.52	7.67	12.20	10	20	2.0	21	2.10
7	0.155	25.21	7.98	8.60	10	17	1.7	13	1.30
7	0.095	23.01	7.33	6.15	-	-	-	-	-
8	0.167	21.46	8.31	8.56	10	26	2.6	37	3.70
8	0.155	23.10	7.46	10.66	10	22	2.2	54	5.40
8	0.155	24.72	7.90	9.60	10	10	1.0	1	0.10
8	0.098	24.04	7.26	6.43	10	29	2.9	1	0.10
9	0.163	20.58	8.15	7.59	10	27	2.7	10	1.00
9	0.153	24.65	8.15	12.35	10	23	2.3	7	0.70
9	0.147	24.99	8.00	9.06	8	9	1.1	14	1.75
9	0.096	24.05	7.26	4.84	10	29	2.9	5	0.50
10	0.163	19.24	8.13	7.35	10	27	2.7	13	1.30
10	0.160	23.22	7.54	10.93	10	24	2.4	13	1.30
10	0.156	23.75	7.75	8.34	10	17	1.7	2	0.20
10	0.100	23.85	7.30	6.78	-	-	-	-	-
11	0.161	20.59	8.12	6.67	10	26	2.6	16	1.60
11	0.164	23.87	7.61	11.93	10	13	1.3	25	2.50
11	0.155	24.10	7.93	8.43	10	15	1.5	6	0.60
11	0.102	23.90	7.36	6.75	5	15	3.0	2	0.40
12	0.167	21.46	8.31	8.56	10	22	2.2	14	1.40
12	0.148	22.30	8.29	11.30	10	19	1.9	2	0.20
12	0.145	24.70	8.05	8.15	9	18	2.0	1	0.11
12	0.094	22.99	7.25	5.90	10	20	2.0	7	0.70
13	0.160	25.21	7.91	6.48	10	10	1.0	15	1.50

13	0.153	24.69	7.85	8.37	-	-	-	-	-
13	0.098	24.47	7.16	6.12	-	-	-	-	-
				2008 TOTAL	**120**	**222**	**1.9**	**170**	**1.42**
				2010 TOTAL	**126**	**296**	**2.3**	**270**	**2.14**
				2011 TOTAL	**77**	**149**	**1.9**	**86**	**1.12**
				2012 TOTAL	**68**	**182**	**2.7**	**36**	**0.53**

2008 (Gray), 2009 (White), 2010 (Yellow), 2011 (Green), and 2012 (Blue)

1.1.9 Twin Falls Reservoir

The EnviroScience field team found the majority of the sites to be sporadic and sparse throughout Twin Falls on July 9, 2012. Seven sites (2, 5, 7, 13, 14, 19 and 22) were considered moderately dense (Figure 1-9). Lab analysis revealed increases as well as decreases in all the sites for an overall total of 148 weevil life stages on 250 stems (Table 1-9). The highest weevil population measured was the very first year in 2008.

Multiple native species were observed at each site. Some of those included: Clasping-leaf pondweed, Coontail, Common waterweed, Coontail, Flat-stem pondweed, Bladderwort, Northern watermilfoil, Yellow water lily, Floating-leaf Bur-reed, Watershield, Naiad, Sago pondweed (*Potamogeton pectinatus*), Whorled watermilfoil (*Myriophyllum verticillatum*), White-stem pondweed (*Potamogeton praelongus*), Buttercup (*Ranunculus longirostris*), Large-leaf pondweed (*Potamogeton amplifolius*), Variable pondweed (*Potamogeton gramineus*) and Robbins pondweed (*Potamogeton robinsii*).

The conductivity readings dropped considerably within the river flowage while the readings increased in Badwater Lake. Other parameters were average compared to other years.

Table 1-9 Stem Analysis and Water Quality Data at Each Transect in Twin Falls Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.156	22.68	8.00	7.50	10	26	2.6	17	1.70
1	0.158	23.08	8.04	6.24	10	24	2.4	15	1.50
1	0.157	23.63	7.72	8.04	9	23	2.6	4	0.44
1	0.118	23.35	7.52	6.49	10	27	2.7	14	1.40
2	0.153	22.68	7.82	7.68	10	30	3.0	17	1.70
2	0.160	22.85	7.76	6.45	10	31	3.1	0	0.00
2	0.155	25.05	7.84	8.01	10	29	2.9	16	1.60

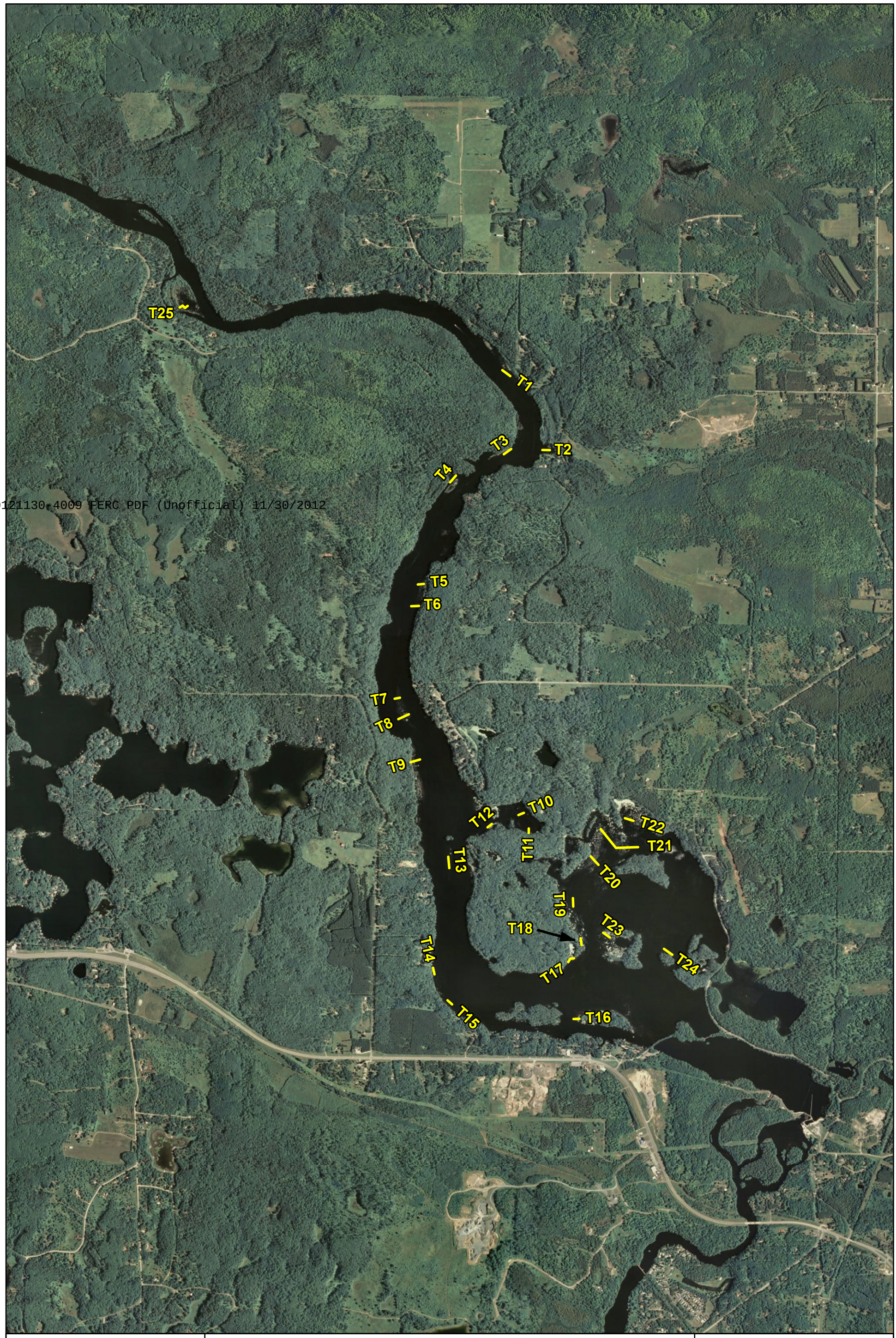

Figure 1-9. WE Energies Twin Falls Hydro Project. 2012 Weevil Distribution.

Survey Transect

2,000 1,000 0 2,000 Feet

600 300 0 600 Meters

N

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2	0.125	24.00	7.66	6.36	10	25	2.5	23	2.30
3	0.154	23.30	7.83	8.02	10	22	2.2	22	2.20
3	0.162	23.83	7.85	7.26	10	19	1.9	6	0.60
3	0.147	22.23	7.72	7.75	10	22	2.2	14	1.40
3	0.121	24.37	7.64	7.84	10	28	2.8	17	1.70
4	0.151	22.66	8.03	7.46	10	24	2.4	21	2.10
4	0.160	23.41	7.83	6.87	10	16	1.6	3	0.30
4	0.144	23.64	7.90	8.90	-	-	-	-	-
4	0.119	24.05	7.56	6.85	10	28	2.8	2	0.20
5	0.146	23.80	7.96	8.39	10	23	2.3	17	1.70
5	0.164	23.91	7.75	6.31	10	17	1.7	4	0.40
5	0.145	22.72	7.77	8.07	10	23	2.3	14	1.40
5	0.121	24.75	7.46	6.59	10	25	2.5	2	0.20
6	0.144	23.45	7.89	7.68	10	29	2.9	15	1.50
6	0.172	24.23	8.81	10.50	10	17	1.7	15	1.50
6	0.144	22.90	7.72	8.21	9	30	3.3	16	1.78
6	0.123	25.64	7.62	6.60	10	31	3.1	3	0.30
7	0.148	23.65	7.95	8.92	10	32	3.2	5	0.50
7	0.161	23.35	7.86	6.13	10	33	3.3	1	0.10
7	0.145	23.45	7.78	8.55	10	32	3.2	17	1.70
7	0.122	24.68	7.56	6.64	10	70	7.0	3	0.30
8	0.144	23.36	7.99	8.32	10	21	2.1	20	2.00
8	0.163	23.60	8.19	6.91	10	18	1.8	6	0.60
8	0.146	23.73	7.79	8.30	10	20	2.0	17	1.70
8	0.122	25.34	7.67	6.56	10	47	4.7	2	0.20
9	0.152	23.62	7.95	8.18	10	23	2.3	7	0.70
9	0.160	22.75	7.89	6.17	10	25	2.5	4	0.40
9	0.146	23.08	7.74	8.86	9	32	3.6	15	1.67
9	0.120	26.65	7.64	6.76	10	26	2.6	5	0.50
10	0.151	22.31	7.81	7.78	10	19	1.9	9	0.90
10	0.188	27.50	8.66	7.62	10	21	2.1	0	0.00
10	0.153	27.36	8.23	8.73	10	18	1.8	1	0.10
10	0.171	26.82	8.28	8.77	10	14	1.4	2	0.20
11	0.152	22.45	7.78	7.93	10	8	0.8	3	0.30
11	0.187	27.10	8.61	8.04	9	21	2.3	0	0.00
11	0.155	27.48	8.18	9.13	10	23	2.3	1	0.10
11	0.175	25.67	8.45	9.02	10	18	1.8	1	0.10
12	0.148	22.35	7.75	7.41	10	23	2.3	9	0.90
12	0.192	27.14	8.39	12.03	10	36	3.6	5	0.50
12	-	-	-	-	10	16	1.6	2	0.20
12	0.141	26.65	7.94	7.38	10	280	2.8	6	0.60
13	0.149	22.20	7.86	7.71	10	29	2.9	13	1.30

13	0.170	24.47	7.83	12.81	10	25	3.5	4	0.40
13	0.151	24.08	7.77	8.49	10	31	3.1	5	0.50
13	0.127	27.29	7.80	6.59	10	54	5.4	1	0.10
14	0.151	22.78	7.82	7.60	10	19	1.9	10	1.00
14	0.181	26.21	8.00	13.41	9	28	3.1	5	0.56
14	0.162	26.41	8.04	9.75	10	22	2.2	9	0.90
14	0.128	27.22	7.69	7.34	10	38	3.8	1	0.10
15	0.151	22.52	7.85	7.77	10	16	1.6	7	0.70
15	0.176	25.05	7.94	12.39	10	36	3.6	1	0.10
15	0.163	26.81	8.22	9.68	10	13	1.3	2	0.20
15	0.126	26.56	7.71	7.56	10	67	6.7	15	1.50
16	0.152	22.68	8.01	8.12	10	24	2.4	20	2.00
16	0.192	26.48	8.01	13.35	9	23	2.6	4	0.44
16	0.156	26.56	8.30	9.91	10	24	2.4	7	0.70
16	0.133	26.85	7.74	8.17	10	29	2.9	23	2.30
17	0.150	22.59	8.08	7.84	9	16	1.8	1	0.11
17	0.181	25.00	8.12	12.92	10	21	2.1	5	0.50
17	0.152	25.86	8.09	9.08	10	16	1.6	7	0.70
17	0.174	27.31	8.45	8.20	10	19	1.9	3	0.30
18	0.147	23.26	8.09	7.57	10	13	1.3	5	0.50
18	0.184	27.32	8.94	13.78	10	22	2.2	3	0.30
18	0.151	28.27	8.81	9.32	10	18	1.8	7	0.70
18	0.184	27.58	8.53	8.12	10	21	2.1	10	1.00
19	0.151	23.09	8.19	8.48	8	15	1.9	6	0.75
19	0.181	27.04	8.99	15.53	10	26	2.6	0	0.00
19	0.149	27.31	8.78	10.09	10	18	1.8	5	0.50
19	0.182	27.34	8.36	8.66	10	58	5.8	4	0.40
20	0.154	24.06	8.21	8.12	10	20	1.4	7	0.70
20	0.181	27.60	9.24	15.71	10	20	2.0	0	0.00
20	0.150	27.57	9.00	10.32	9	20	2.2	8	0.89
20	0.185	27.95	8.56	8.33	10	53	5.3	1	0.10
21	0.151	23.86	8.35	8.89	9	14	1.6	0	0.00
21	0.180	27.27	9.23	15.98	10	18	1.8	1	0.10
21	0.149	26.95	8.72	10.22	10	33	3.3	3	0.30
21	0.181	27.89	9.21	10.45	10	34	3.4	3	0.30
22	0.153	23.77	8.48	9.07	7	15	2.1	4	0.57
22	0.185	27.51	9.06	11.50	10	21	2.1	0	0.00
22	0.146	25.32	8.47	9.88	10	25	2.5	3	0.30
22	0.191	27.67	8.50	8.27	10	15	1.5	1	0.10
23	0.152	23.55	8.36	8.91	9	19	2.1	5	0.56
23	0.184	26.39	8.89	15.39	10	24	2.4	5	0.50
23	0.150	27.94	8.76	10.36	10	14	1.4	0	0.00

23	0.178	26.66	8.74	10.42	10	16	1.6	3	0.30
24	0.155	24.42	8.17	8.14	10	22	2.1	6	0.60
24	0.186	26.46	8.60	13.43	10	22	2.2	1	0.10
24	0.147	26.08	8.19	9.42	10	20	2.0	0	0.00
24	0.178	26.56	6.77	8.75	10	17	1.7	3	0.30
25	0.153	25.53	7.92	8.53	10	30	3.0	5	0.50
25	0.135	24.08	7.79	4.77	10	15	1.5	0	0.00
2008 TOTAL					**232**	**502**	**2.2**	**246**	**1.06**
2010 TOTAL					**237**	**564**	**2.4**	**88**	**0.37**
2011 TOTAL					**236**	**552**	**2.3**	**178**	**0.75**
2012 TOTAL					**250**	**803**	**3.2**	**148**	**0.59**

2008 (Gray), 2009 (White), 2010 (Yellow), 2011 (Green), and 2012 (Blue)

1.1.10 Pine Reservoir

Over the past several years, the genetic makeup of the plants in Pine Reservoir were idenitified as Northern watermilfoil and hybrid milfoil (Northern watermilfol x Eurasian watermilfoil). On July 11, 2012, stems were collected from three areas for a total of 30 stems. Before the stems were sent to the Annis Water Resources Institute, they were analyzed for weevil presence identifying 2 eggs and 1 adult on which was later identified as Northern watermilfoil.

1.2 WEEVIL DISTRIBUTION DISCUSSION

This particular survey has been performed during the same week annually for five years. During this timeframe, EnviroScience biologists have observed fluctuations in the density of EWM (and hybrid milfoil), the weevil population in each reservoir as well as all water quality parameters. Seasonal variation from year to year seems to be the largest factor impacting weevil effectiveness. This year was an exceptionally good season for milfoil growth given the abnormal temperatures across the Midwest in the spring. This holds true given the temperature readings were the highest recorded in five of the nine reservoirs this year. Additionally, milfoil was observed to be at the surface and flowering by mid-May in multiple states as far north as the Upper Peninsula of MI. This natural occurrence isn't typically seen until later is the summer months. Moreover,these plants can flower multiple times throughout a growing season, which could potentially result in new milfoil growth. However, flowering has been observed in the Menominee River watershed in previous years as early as May which could be a trait of hybrid milfoil.

Early season flowering may affect the overall weevil population growth. Tthe milfoil weevil utilizes the apical meristem (very top of the plant) for egg laying, once the larvae hatch and burrow down the stem, that particular stem can no longer flower. If the milfoil is starting to flower when the overwintered adults leave shore from hibernation, the only viable option for survival is to mate on the lateral meristems which will not be as effective. This early growing season or flowering could alter the overall weevil population. In fact, flowering milfoil was observed in every reservoir while the weevil populations decreased in every reservoir this season. It notable that the EWM increased, possibly doubled, in density from what was observed during the survey to only weeks later.

2.0 MILFOIL SOLUTION® PROGRAM

Reservoir/ Lake	Year	Sites Established	Total Number of weevils
Badwater	2007	S1BT	4,900
Brule	2007, 2009	S1B	18,192
Cowboy	2009	S1C	8,000
Lower Paint	2009, 2010, 2011	S1LP, S2LP, S3LP, S4LP	29,400

During the summer of 2007, a Milfoil Solution® (formerly MiddFoil®) program began and 25 units (1,000 weevils = 1 unit) of milfoil weevils were stocked on Eurasian watermilfoil (EWM) in three reservoirs in the Menominee River system: Brule, Twin Falls (Badwater), and Lower Paint. The discovery of an indigenous weevil population that year led to the start of a weevil distribution study in 2008. It was decided to further implement the Milfoil Solution® program in 2009 in Brule, Lower Paint, and Cowboy Lake stocking eight units in each reservoir. No further implementations occurred in Badwater Lake (Twin Falls Reservoir) due to the lack of EWM found in 2008. In 2010, surveys were conducted in Badwater, Brule, Cowboy and Lower Paint. In addition to surveys in Lower Paint, 12,000 weevils were stocked for a second consecutive year. An additional 10,000 weevils were stocked in Lower Paint in 2011 for a third consecutive year while qualitative and quantitative data were collected two different times in Badwater and Cowboy Lakes, Brule and Lower Paint reservoirs.

In 2012, a follow up survey at each of the fore mentioned areas was performed during the weevil distribution study. No weevils were stocked.

2.1 MILFOIL SOLUTION® RESULTS

Both quantitative and qualitative data collection were completed at the time of the follow-up survey in each site. Quantitative data collection included collecting EWM stems along three transect lines to microscopically analyze the presence of weevil life stages and determine the number of weevils per stem in a survey area. EWM plant density was determined by collecting all stems within a 0.09 m^2 PVC quadrat and converting this to the number of EWM stems per square meter. The data will serve as an indicator of fluctuations in EWM density across multiple survey years.

Qualitative measurements include visual analysis of the milfoil plants, the presence of a weevil population and weevil-induced damage, and native plant species abundance in the survey areas.

2.1.1 Brule Reservoir – S1B

Follow-up survey

The EWM density was considered sparse to moderately dense compromising 30% of the plant community at the time of the July 9th survey (Figure 2-1). The other species identified were Clasping-leaf pondweed, Coontail, Sago pondweed, Water marigold (*Bidens beckii*), Ribbon-leaf pondweed and yellow pond lilies. No weevil life stages or damage to the EWM was observed in the field. However, 18 life stages were found on the 30 stems collected for lab analysis (Table 2-1A). In 2011, the EWM was virtually gone in July but was on the comeback by August. The EWM was still considered sparse in July, 2012 (Table 2-1B). Given the warm temperatures, it can be expected that the density increased by late summer.

Table 2-1A Summary Data from Site Transect Analysis of EWM During 2007, 2009, 2010, 2011 and 2012 Initial and Follow-up Surveys of Brule Reservoir

Site #	Parameter Measured	Initial Survey 6/27/07	Follow-up Survey 8/8/07	Initial Survey 6/23/09	Follow-up Survey 8/18/09	Initial Survey 6/15/10	Follow-up Survey 8/5/10	Initial Survey 6/14/11	Follow-up Survey 8/4/11	Follow-up Survey 7/9/12
S1B	Total weevils	18.00	15.00	0.00	12.00	24.00	23.00		0.0	18.0
	Total stems	30.00	30.00	30.00	30.00	30.00	29.00	*NP	30.00	30.00
	Total weevils/stem	**0.60**	**0.50**	**0.00**	**0.40**	**0.80**	**0.79**		**0.00**	**0.60**
	Average meristems/stem	2.13	2.73	3.07	3.13	2.87	1.38		2.10	2.46

*NP= EWM Not Present

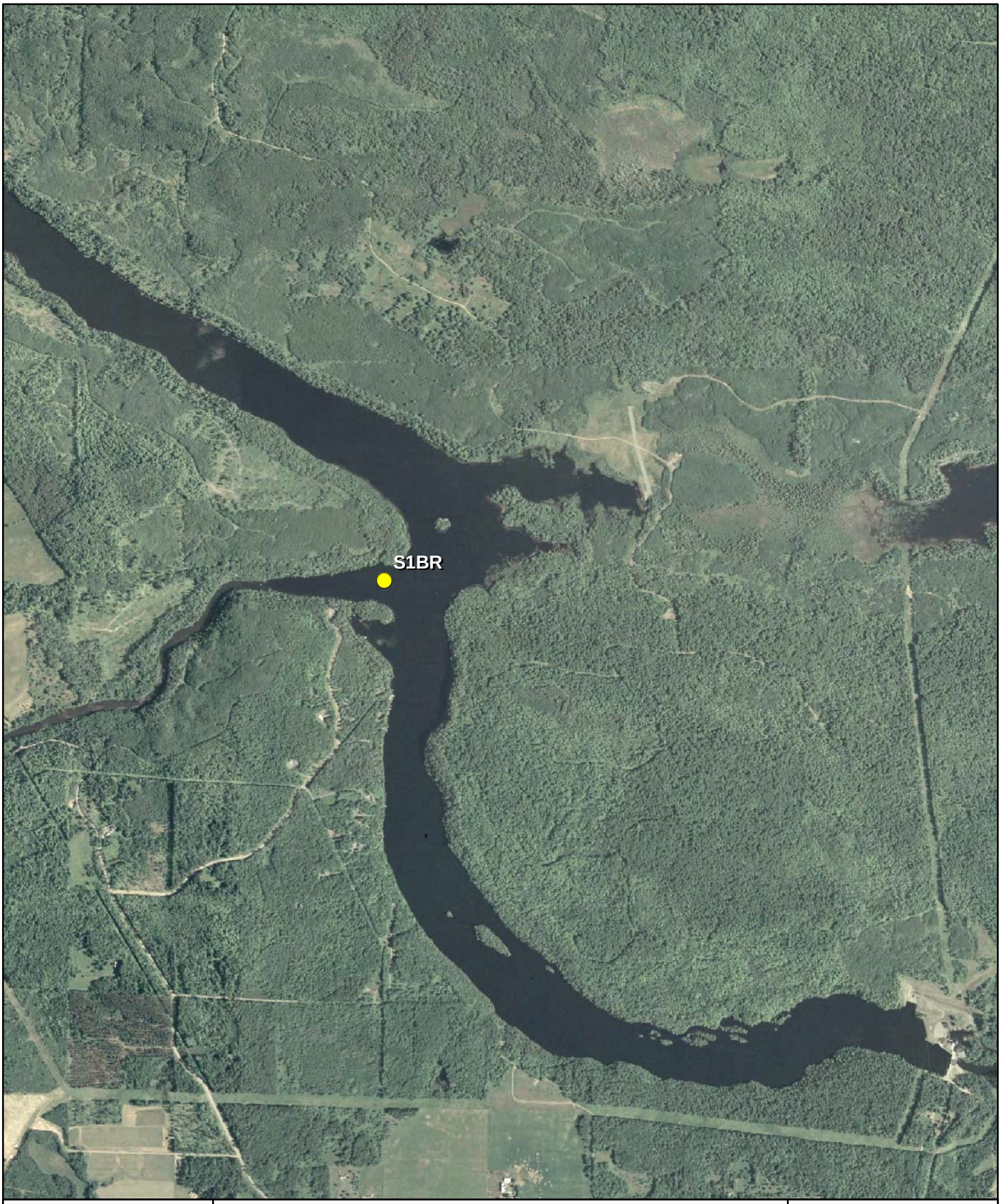

Figure 2-1. MiddFoil Stocking Location, Brule Hydro Project.

2007/2009 Stocking Location

300 150 0 300 Meters

1,000 500 0 1,000 Feet

N

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Table 2-1B Average Seasonal Densities of Eurasian Watermilfoil Collected During 2007, 2009, 2010, 2011 Initial and Follow-up Surveys and 2012 July Survey of Brule Reservoir (stems/m^2)

Site #	2007	2009	2010	2011	2012
S1B	133.34	72.22	42.40	*NP	14.81

*NP= EWM Not Present

2.1.2 Kingsford Reservoir (Cowboy Lake) – S1C

Follow-up Survey

After last season's results of finding over 100 weevil life stages at S1C in the NW corner of Cowboy Lake, EnviroScience biologists were hopeful that the weevil population would largely reduce the EWM infestation(Figure 2-2). However, at the time of the July 8th survey the EWM was considered moderately dense with more than 50% at the surface and flowering. Dense patches were observed throughout the whole northwestern shore with new growth observed below the canopy at 3' tall. Native plant species present included: Common waterweed, Coontail, Large-leaf pondweed, Eel grass (*Vallisneria americana*), Naiad and Yellow pond lilies.

No weevil life stages were seen while in the field but more than 30% larvae induced damage to the non-flowering EWM was observed. Only 3 life stages were revealed from laboratory analysis (Table 2-2A). The EWM density was observed to be increasing in July of 2012 (Table 2-2B).

Table 2-2A Summary Data from Site Transect Analysis of EWM During 2009, 2010, 2011 and 2012 Initial and Follow-up Surveys of Cowboy Lake

Site #	Parameter Measured	Initial Survey 6/23/09	Follow-up Survey 8/19/09	Initial Survey 6/15/10	Follow-up Survey 8/5/10	Initial Survey 6/14/11	Follow-up Survey 8/4/11	Initial Survey 7/8/12
S1C	Total weevils	0.00	2.00	23.00	4.00	115.00	3.00	3.00
	Total stems	30.00	30.00	28.00	30.00	29.00	27.00	30.00
	Total weevils/stem	**0.00**	**0.07**	**0.82**	**0.13**	**3.97**	**0.11**	**0.10**
	Average meristems/stem	1.13	1.90	2.04	1.97	2.07	2.11	3.17

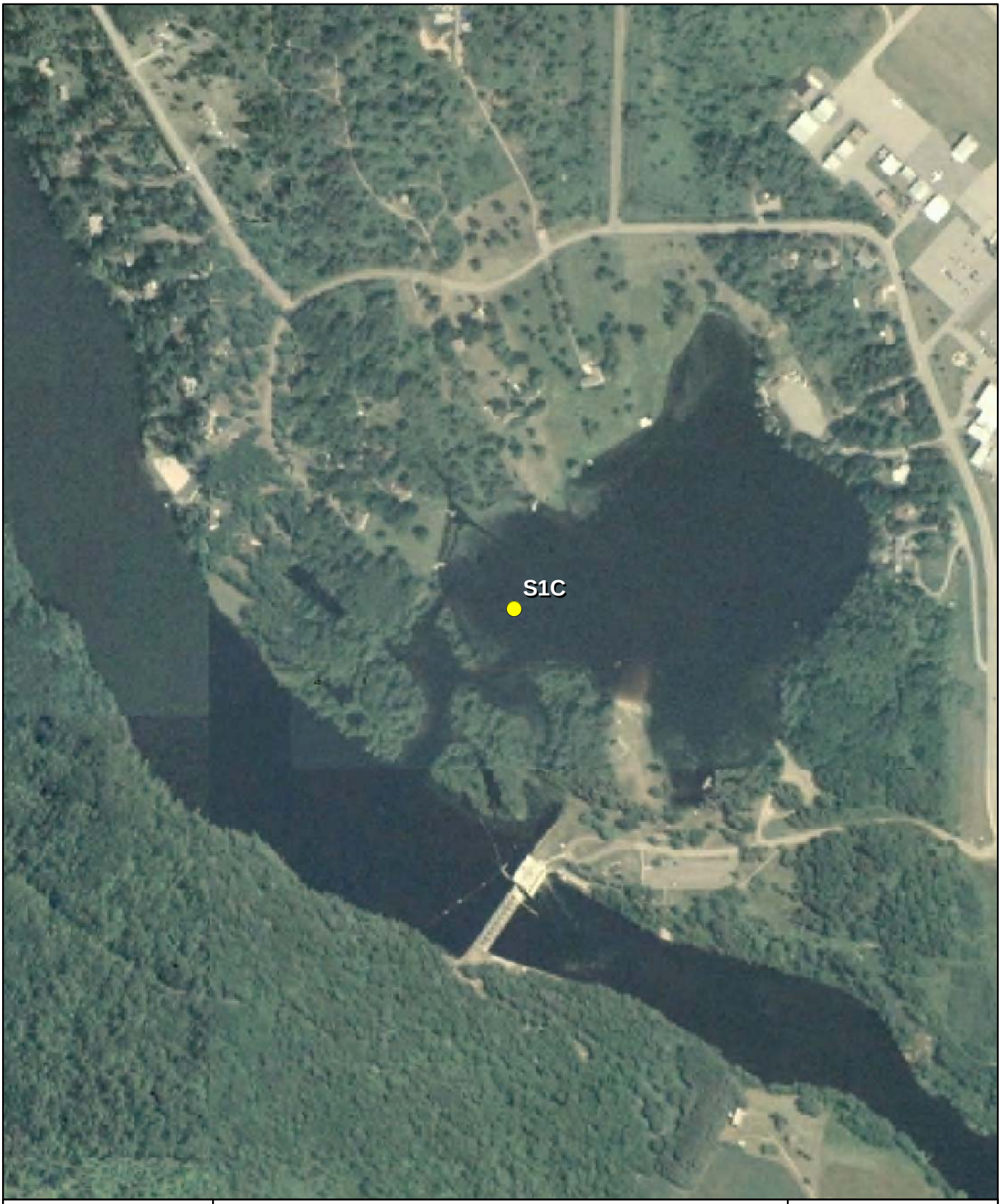

Figure 2-2. MiddFoil Stocking Locations, Cowboy Lake (Kingsford Hydro Project).

2009 Stocking Location

100 50 0 100 Meters

300 150 0 300 Feet

N

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Table 2-2B Average Seasonal Densities of Eurasian Watermilfoil Collected During 2009, 2010, and 2011 Initial and Follow-up Surveys and 2012 Survey of Cowboy Lake (stems/m^2)

Site #	2009	2010	2011	2012
S1C	69.45	15.89	9.70	29.63

2.1.3 Lower Paint Reservoir – S1LP, S2LP, S3LP, S4LP

Follow up survey

As previously mentioned, the water levels were higher than normal upon arrival to the reservoir. The survey was conducted at three sites (S1LP, S2LP, and S3LP) on July 10, 2012, no EWM was found in S4LP. EWM density in S1LP was considered sparse finding a narrow band 20' from shore while S2LP was very sparse with the majority of the plants found further out toward the river channel. At S3LP the EWM was moderately dense comprising 50% of the plant community (Figure 2-3). While in the field, adult weevils were found in S1LP and S3LP but no larvae induced damage was observed at any of the sites. However, lab analysis revealed multiple life stages in each site (Table 2-3A).

Native plant species throughout the three survey sites included: Bladderwort, Clasping-leaf pondweed, Common waterweed, Coontail, Northern watermilfoil, Whorled watermilfoil, Flat-stem pondweed and Yellow water lily. Coontail and bladderwort were noted as the densest species observed at each site.

The EWM densities were low at each site during the July survey but current conditions might have influenced those results making it an abnormal year.

Figure 2-3. Milfoil Solutions Stocking Locations, Lower Paint Hydro Project.

Table 2-3A Summary Data from Site Transect Analysis of EWM During 2007, 2009, 2010, 2011 and 2012 Initial and Follow-up Surveys of Lower Paint Reservoir

Site #	Parameter Measured	Initial Survey 6/27/07	Follow-up Survey 8/8/07	Initial Survey 6/22/09	Follow-up Survey 9/18/09	Initial Survey 6/15/10	Follow-up Survey 8/5/10	Initial Survey 6/14/11	Follow-up Survey 8/4/11	Follow-up Survey 7/10/12
S1LP	Total weevils	77.00	25.00	45.00	8.00	--	--	*NP	3.00	43.00
	Total stems	30.00	30.00	30.00	30.00	--	--		10.00	30.00
	Total weevils/stem	**2.57**	**0.67**	**1.50**	**0.27**	--	--		**0.3**	**1.43**
	Average meristems/stem	1.37	2.47	2.80	2.10	--	--		1.8	2.23
S2LP	Total weevils	n/a	n/a	11.00	20.00	95.00	20.00	28.00	20.00	28.00
	Total Stems	n/a	n/a	47.00	30.00	27.00	28.00	28.00	28.00	30.00
	Total weevils/stem	n/a	n/a	**0.23**	**0.67**	**3.52**	**0.71**	**1.00**	**0.71**	**0.93**
	Average Meristems/stem	n/a	n/a	2.83	2.00	4.04	2.32	2.78	2.32	2.60
S3LP	Total weevils	n/a	n/a	n/a	n/a	84.00	14.00	50.0	14.00	29.00
	Total stems	n/a	n/a	n/a	n/a	30.00	30.00	30.00	30.00	40.00
	Total weevils/stem	n/a	n/a	n/a	n/a	**2.80**	**0.47**	**1.66**	**0.47**	**0.73**
	Average meristems/stem	n/a	n/a	n/a	n/a	4.04	1.77	2.73	1.77	2.90
S4LP	Total weevils	n/a	n/a	n/a	n/a	151.00	11.00	*NP	*NP	*NP
	Total stems	n/a	n/a	n/a	n/a	60.00	28.00			
	Total weevils/stem	n/a	n/a	n/a	n/a	**2.52**	**0.39**			
	Average meristems/stem	n/a	n/a	n/a	n/a	2.67	2.64			

n/a= site not esablished

*NP= EWM Not Present

Table 2-3B Average Seasonal Densities of Eurasian Watermilfoil Collected During 2007, 2009, 2010, 2011 Initial and Follow-up Surveys and 2012 July Survey of Lower Paint Reservoir (stems/m^2)

Site #	2007	2009	2010	2011	2012
S1LP	63.89	31.95	--	*NP	9.26
S2LP	n/a	33.34	65.70	12.89	5.55
S3LP	n/a	n/a	47.23	9.23	9.26
S4LP	n/a	n/a	58.34	*NP	n/a

n/a = site not established
*NP= EWM Not Present

2.1.4 Twin Falls Reservoir (Badwater Lake) – S1BT

Follow-up survey

The survey was conducted at S1BT in Badwater Lake in Twin Falls Reservoir (Figure 2-4) on July 9, 2012. EWM density was considered moderately dense comprising 40% of the plant community. The remaining plant community was a diverse mix of: Large-leaf pondweed, Clasping-leaf pondweed, Flat-stem pondweed, Robbins pondweed, White-stem pondweed, Common waterweed, Sago pondweed, Water marigold and Yellow pond lilies.

No life stages or weevil-induced damage to the plants was observed in the field. Three life stages were found on the stems analyzed in the lab and minimal damage was seen (Table 2-4A).

Although the density reading for 2012 looks comparable to the density averages of previous years; it is only one survey not an average. If two readings were taken around the same times of the previous years' surveys, it's possible the reading would be higher than what was found in 2010.

Figure 2-4. MiddFoil Stocking Locations, Twin Falls Hydro Project.

2007 Stocking Site

0 150 300 600 Feet

0 50 100 200 Meters

N

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Table 2-4A Summary Data from Site Transect Analysis of EWM During 2007, 2010, and 2011 Initial and Follow-up Surveys of Badwater Lake

Site #	Parameter Measured	Initial Survey 6/23/07	Follow-up Survey 8/18/07	Initial Survey 6/15/10	Follow-up Survey 8/5/10	Initial Survey 6/14/11	Follow-up Survey 8/4/11	Follow-up Survey 7/9/12
S1BT	Total weevils	0.00	0.00	1.00	3.00	10.00	0.00	3.00
	Total stems	29.00	30.00	29.00	30.00	29.00	30.00	30.00
	Total weevils/stem	**0.00**	**0.0**	**0.03**	**0.10**	**0.35**	**0.00**	**0.10**
	Average meristems/stem	1.93	1.77	1.97	1.23	3.14	1.77	3.20

Table 2-4B Average Seasonal Densities of Eurasian Watermilfoil Collected During 2007, 2010, 2011 Initial and Follow-up Surveys and 2012 July Survey of Badwater Lake (stems/m^2)

Site #	2007	2010	2011	2012
S1BT	116.11	36.11	28.89	27.77

2.2 MILFOIL SOLUTION® DISCUSSION

Initially in 2007, three areas (Cowboy and Badwater Lakes and Brule Reservoir) were chosen to use Milfoil Solution® based on the amount of infestation, stocking one site in each area. It was then we discovered the natural weevil population in each of these sites resulting in the start of the population study within the watershed in 2008. An additional reservoir (Lower Paint) was added for weevil stocking in 2009. Of these four areas, some sites were only stocked once while others twice. From all the data collected over the last several years, it is very hard to evaluate the level of impact there has been by augmenting the natural weevil population in these four reservoirs. From our surveys, EnviroScience continues to find weevils in all of the stocking areas (as seen in 2012) and continue to see density fluctuations from year to year. Additionally, the native plant community continues to increase and compete with the EWM.

Document Content(s)