2012 Progress Report of Milfoil Biological Control Research for the Menominee River

Prepared for:

WE Energies
333 W. Everett St.
Milwaukee, WI 53203

Prepared by:

EnviroScience, Inc.,
3781 Darrow Road, Stow, Ohio 44224
(800) 940-4025 · www.enviroscienceinc.com

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INTRODUCTION

Since 2008 EnviroScience has been contracted to further investigate the milfoil weevil (*Euhrychiopsis lecontei*) and its potential to control Eurasian watermilfoil (*Myriophyllum spicatum*) (EWM) within the Menominee River watershed. This report summarizes the 2012 findings.

1.0 WEEVIL DISTRIBUTION AND MILFOIL COLLECTION METHODS

The distribution study has been consistently performed during the second week of July for the past three years. In 2008, all nine reservoirs were surveyed as a base for the study. It was decided to survey only half the reservoirs in 2009. Based on the drastic changes observed over the two years, all nine reservoirs were surveyed for subsequent years; 2010, 2011 and 2012.

Stems of EWM were collected along the same transects taken in 2008. This was achieved by collecting pairs of plants along a transect line running perpendicular to shore and swimming through selected beds of EWM. The tops of two randomly selected plants were removed at five evenly spaced intervals, for a total of ten plants along each line. Plants for the distribution study were assessed immediately after collection for assessment of all weevil life stages.

Water quality measurements were taken at each transect, measuring pH, temperature, dissolved oxygen (DO), and conductivity using a YSI 556 MPS multi-parameter water quality monitoring device. All measurements were taken at the surface.

1.1 WEEVIL DISTRIBUTION AND RESULTS

1.1.1 Big Quinnesec Reservoir

Over the last several years, EWM was to be very spars or non-existen in most sites.t. On July 8, 2012, the EWM was observed to be increasing. Eurasian watermilfoil was still not found in transects 2 and 5 while the remaining sites were measured as very sparse to moderately dense during the survey (Figure 1-1). A total of 22 weevil life stages were found on the 44 stems collected for the stem analysis, the lowest recorded over five years. This low weevil population density (0.50 weevils/stem) is to be expected given the lack of food source available the previous year (Table 1-1).

The increase of EWM could be contributed to the increase of temperature, the highest recorded of the five years. The conductivity readings during the 2012 survey season were more comparable to that recorded in 2009.

Figure 1-1. WE Energies Big Quinnesec Hydro Project. 2012 Weevil Distribution.

Table 1-1 Stem Analysis and Water Quality Data at Each Transect in Big Quinnesec 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	22.78	8.31	7.54	10	25	2.5	14	1.40
1	0.205	22.96	8.25	9.56	10	8	0.8	10	1.00
1	0.180	24.44	7.90	6.61	10	27	2.7	3	0.30
1	0.152	23.29	7.61	7.13	-	-	-	-	-
1	0.202	27.71	8.07	7.92	10	28	2.8	3	0.30
2	0.161	23.25	8.09	8.33	9	26	2.9	23	2.56
2	0.196	22.97	8.37	9.69	-	-	-	-	-
2	0.183	25.48	7.97	7.02	9	11	1.2	7	0.78
2	0.152	23.48	7.66	7.26	-	-	-	-	-
2	0.201	27.05	8.25	7.85	-	-	-	-	-
3	0.162	23.14	8.06	7.86	10	23	2.3	30	3.00
3	0.205	23.68	8.78	11.90	10	14	1.4	4	0.40
3	0.182	25.81	8.45	8.45	10	15	1.5	13	1.30
3	0.152	23.41	7.72	7.94	-	-	-	-	-
3	0.200	26.37	8.53	8.40	4	7	1.8	4	1.00
4	0.159	22.50	8.14	7.53	10	30	3.0	49	4.90
4	0.191	23.08	8.38	9.12	10	23	2.3	10	1.00
4	0.179	24.16	7.98	5.98	10	14	1.4	3	0.30
4	0.154	24.07	7.65	7.78	-	-	-	-	-
4	0.198	27.16	8.87	9.98	10	26	2.6	4	0.40
5	0.162	22.86	8.04	7.58	10	18	1.8	11	1.10
5	0.205	23.00	8.29	9.16	10	22	2.2	15	1.50
5	0.180	25.00	8.29	6.98	-	-	-	-	-
5	0.153	23.81	7.58	7.59	-	-	-	-	-
5	0.203	26.63	8.90	7.47	-	-	-	-	-
6	0.164	23.32	8.14	8.70	10	23	2.3	17	1.70
6	0.208	23.45	8.41	9.20	10	15	1.5	7	0.70
6	0.182	25.74	8.27	7.31	10	15	1.5	15	1.50
6	0.155	24.08	7.66	7.16	-	-	-	-	-
6	0.205	27.00	8.44	7.84	10	17	1.7	2	0.20
7	0.163	23.33	8.12	9.11	10	28	2.8	27	2.70
7	0.187	23.56	8.41	10.70	10	15	1.5	15	1.50
7	0.182	25.74	8.41	7.82	10	25	2.5	24	2.40
7	0.153	23.81	7.62	7.49	10	17	1.7	19	1.90
7	0.205	27.05	8.69	8.96	10	19	1.9	9	0.90
				2008 TOTAL	**69**	**173**	**2.5**	**171**	**2.48**

2009 TOTAL	60	97	1.6	61	1.02
2010 TOTAL	59	107	1.8	65	1.10
2011 TOTAL	10	17	1.7	19	1.90
2012 TOTAL	44	97	2.2	22	0.50

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

1.1.2 Kingsford Reservoir

Eurasian watermilfoil was collected at every location within Kingsford Reservoir for a total of 150 stems (Figure 1-2). Sixty-five weevil life stages were found on those stems during lab analysis (Table 1-2). The overall weevil population is comparable to that found in 2009, 0.41 to 0.44. Although more EWM was seen compared to the 2011 survey, it was still considered sparse at more than half of the sites. The EWM was noted to be at the surface and flowering at most locations at the time of the July survey. The milfoil weevil does not utilize the flowering part of the plant which could directly impact the weevil effectiveness.

At the time of the survey, the milfoil in Cowboy Lake was sparse to moderate and still below the surface. Lab analysis revealed weevil life stages from every location sampled with the exception of T15, located in Cowboy Lake.

All the parameters measured at each site increased from 2011 to 2012 but were average compared to the five years.

Table 1-2 Stem Analysis and Water Quality Data at Each Transect in Kingsford Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.165	25.61	8.24	7.60	10	25	2.5	48	4.80
1	0.192	21.94	8.49	9.36	10	7	0.7	2	0.20
1	0.190	27.07	8.65	8.90	10	18	1.8	19	1.90
1	0.150	22.21	7.54	6.86	10	25	2.5	46	4.60
1	0.160	28.22	8.89	10.53	10	20	2.0	2	0.20
2	0.161	24.40	7.90	7.44	10	30	3.0	51	5.10
2	0.188	21.36	8.32	9.07	10	7	0.7	2	0.20
2	0.181	25.45	8.09	7.19	10	25	2.5	31	3.10
2	0.151	22.63	7.56	6.85	-	-	-	-	-
2	0.153	26.14	8.06	7.70	10	18	1.8	8	0.80
3	0.165	25.66	7.99	7.16	10	21	2.1	29	2.90

Figure 1-2. WE Energies Kingsford Hydro Project. 2012 Weevil Distribution.

Survey Transect

1,600 800 0 1,600 Feet

400 200 0 400 Meters

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3	0.177	21.36	8.21	8.92	10	6	0.6	2	0.20
3	0.188	26.00	8.30	7.68	10	27	2.7	20	2.00
3	0.148	22.71	7.60	7.24	10	20	2.0	31	3.10
3	0.158	27.24	7.93	7.34	10	33	3.3	8	0.80
4	0.165	25.54	7.92	7.40	10	26	2.6	26	2.60
4	0.191	21.49	8.24	8.97	10	6	0.6	1	0.10
4	0.186	26.13	8.32	7.78	9	19	2.1	25	2.78
4	0.150	22.86	7.63	7.50	-	-	-	-	-
4	0.152	25.75	7.78	6.68	10	20	2.0	4	0.40
5	0.164	25.37	8.09	9.43	9	15	1.7	24	2.67
5	0.192	21.44	8.27	8.87	10	25	2.5	11	1.10
5	0.192	27.87	8.91	-	10	21	2.1	5	0.50
5	0.150	22.94	7.67	7.25	-	-	-	-	-
5	0.151	25.00	7.78	6.79	10	16	1.6	3	0.30
6	0.169	25.02	7.81	12.60	10	19	1.9	29	2.90
6	0.193	21.99	8.27	9.29	10	23	2.3	24	2.40
6	0.174	25.62	8.15	7.34	10	14	1.4	24	2.40
6	0.149	22.71	7.61	7.30	-	-	-	-	-
6	0.162	26.85	7.94	7.64	10	21	2.1	6	0.60
7	0.192	30.15	8.38	9.65	10	22	2.2	26	2.60
7	0.195	22.28	8.30	9.15	10	26	2.6	3	0.30
7	0.191	29.72	9.32	11.37	10	21	2.1	12	1.20
7	0.151	23.42	7.76	8.04	10	30	3.0	11	1.10
7	0.168	26.76	7.92	8.11	10	21	2.1	4	0.40
8	0.172	27.01	8.35	9.83	10	18	1.8	6	0.60
8	0.196	21.80	8.25	9.00	10	16	1.6	4	0.40
8	0.193	29.43	9.27	9.47	9	13	1.4	3	0.33
8	0.154	23.39	7.73	7.82	-	-	-	-	-
8	0.184	27.03	8.05	8.04	10	35	3.5	4	0.40
9	0.186	28.19	8.19	8.58	10	15	1.5	36	3.60
9	0.196	21.63	8.19	8.89	10	22	2.2	2	0.20
9	0.191	27.71	8.85	8.74	9	24	2.7	17	1.89
9	0.154	23.65	7.74	7.71	-	-	-	-	-
9	0.181	28.53	7.99	8.07	10	34	3.4	7	0.70
10	0.175	28.62	8.17	8.50	9	14	1.6	17	1.89
10	0.203	22.84	8.46	9.67	10	23	2.3	2	0.20
10	0.192	28.21	8.37	7.70	10	20	2.0	28	2.80
10	0.156	24.12	7.77	7.75	9	28	3.1	17	1.89
10	0.179	28.34	8.06	8.15	10	18	1.8	4	0.40
11	0.174	29.52	8.69	8.92	10	15	1.5	16	1.60
11	0.196	22.88	8.50	9.62	10	13	1.3	4	0.40
11	0.190	28.00	8.51	7.98	9	18	2.0	13	1.44
11	0.144	24.75	8.38	8.63	-	-	-	-	-

11	0.194	28.19	8.50	7.86	10	22	2.2	7	0.70
12	0.170	28.34	8.75	9.03	10	22	2.2	0	0.00
12	0.188	22.91	8.81	9.73	10	18	1.8	3	0.30
12	0.185	27.74	8.86	8.11	10	24	2.4	7	0.70
12	0.143	24.33	8.45	8.76	9	10	1.1	9	1.00
12	0.192	28.54	9.34	10.33	10	21	2.1	6	0.60
13	0.171	28.25	8.73	9.17	10	19	1.9	11	1.10
13	0.189	23.07	8.79	8.76	10	5	0.5	0	0.00
13	0.191	28.70	8.86	8.11	10	27	2.7	6	0.60
13	0.144	24.73	8.59	8.50	10	22	2.2	7	0.70
13	0.193	28.63	9.32	9.60	10	31	3.1	2	0.20
14	0.166	27.13	8.85	9.51	9	18	2.0	3	0.33
14	0.187	22.27	8.80	10.01	10	2	0.2	0	0.00
14	0.189	28.31	8.95	7.84	10	28	2.8	1	0.10
14	0.144	24.68	8.60	8.87	10	23	2.3	1	0.10
14	0.191	28.18	9.30	9.29	10	23	2.3	1	0.10
15	0.172	28.94	8.83	9.35	10	14	1.4	3	0.30
15	0.184	22.38	8.82	10.19	10	17	1.7	2	0.20
15	0.183	27.97	9.04	8.71	10	23	2.3	0	0.00
15	0.142	24.10	8.65	8.82	9	25	2.8	4	0.44
15	0.191	28.53	9.37	10.18	10	24	2.4	0	0.00
				2008 TOTAL	**147**	**293**	**2.0**	**329**	**2.24**
				2009 TOTAL	**150**	**216**	**1.4**	**62**	**0.41**
				2010 TOTAL	**146**	**322**	**2.2**	**211**	**1.45**
				2011 TOTAL	**77**	**183**	**2.4**	**122**	**1.58**
				2012 TOTAL	**150**	**357**	**2.4**	**66**	**0.44**

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

1.1.3 Michigamme Falls Reservoir

On July 10, 2012, a total of 210 stems were collected from all 21 transects in Michigamme Falls Reservoir (Figure 1-3). The highest weevil population ever recorded in the five years was found in the southern part of the reservoir, transects 1, 2 and 19-21. Unfortunately, the weevil densities decreased in the remaining locations with the exception of T12 which stayed the same (Table 1-3).

One observation from the data is the increase of meristems (lateral meristems) which could be a result of the early growing season. It is misfortunate to say that a majority of the water quality data and notes are missing. From the limited data available, the temperature readings were the highest ever recorded.

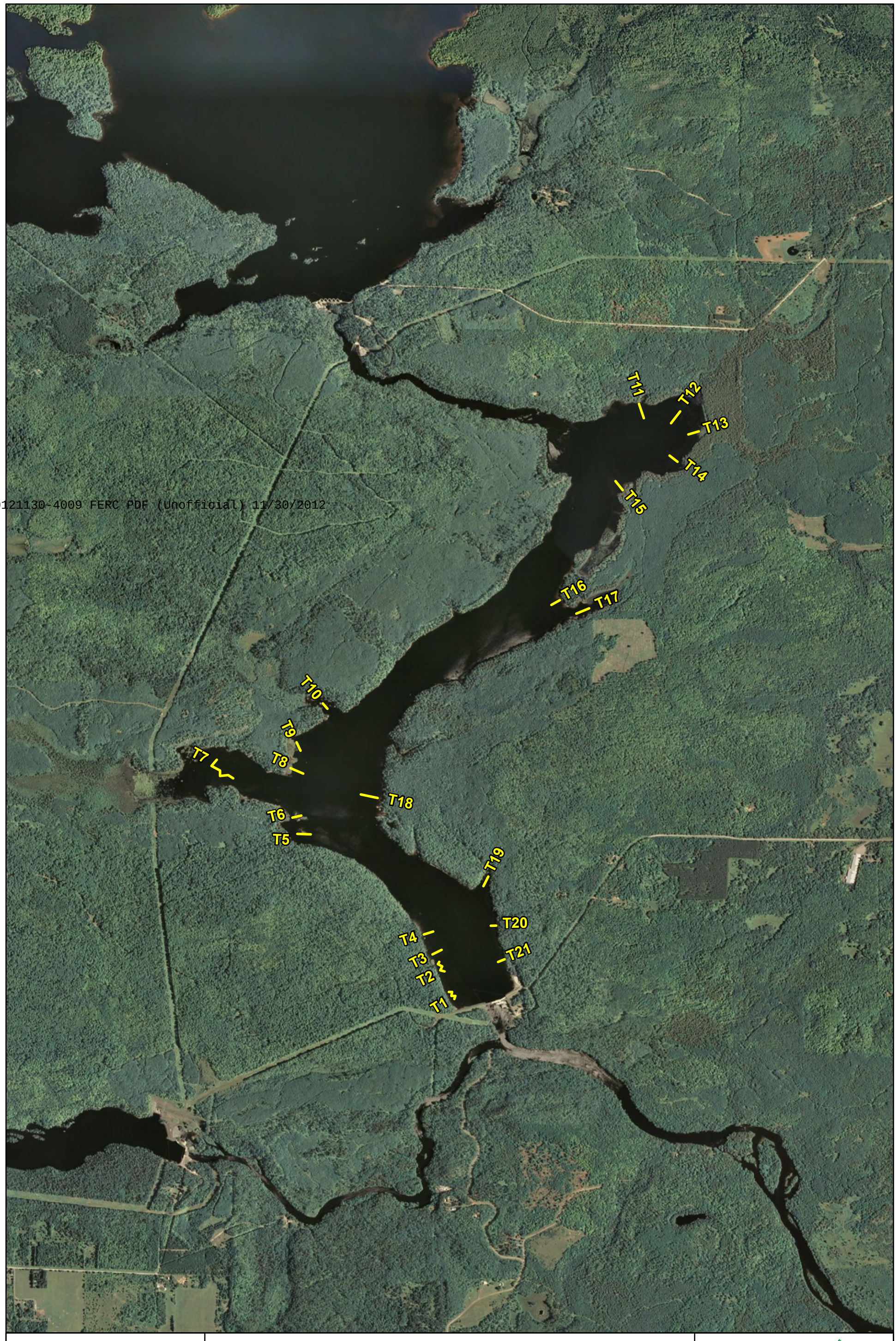

Figure 1-3. WE Energies Michigamme Falls Hydro Project. 2012 Weevil Distribution.

Survey Transect

2,000 1,000 0 2,000 Feet

600 300 0 600 Meters

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Table 1-3 Stem Analysis and Water Quality Data at Each Transect in Michigamme Falls Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils/ Stem
1	0.094	22.70	8.37	8.45	10	18	1.8	27	2.70
1	0.113	19.31	8.12	8.97	10	7	0.7	1	0.10
1	0.118	22.29	7.88	6.02	9	14	1.6	9	1.00
1	0.105	22.72	8.34	9.05	10	28	2.8	8	0.80
1					10	24	2.4	25	2.50
2	0.094	22.60	8.19	8.48	10	11	1.1	2	0.20
2	0.113	19.64	8.01	9.44	10	6	0.6	1	0.10
2	0.123	22.56	7.69	6.25	10	17	1.7	10	1.00
2	0.104	22.60	8.14	9.33	10	31	3.1	12	1.20
2					10	23	2.3	15	1.50
3	0.093	22.59	8.01	8.02	10	13	1.3	13	1.30
3	0.111	19.22	7.97	9.51	10	11	1.1	1	0.10
3	0.123	22.55	7.69	6.51	10	23	2.3	7	0.70
3	0.104	22.76	8.01	9.25	10	17	1.7	23	2.30
3					10	26	2.6	19	1.90
4	0.093	22.46	7.89	7.78	10	13	1.3	4	0.40
4	0.113	19.60	7.97	9.47	10	25	2.5	2	0.20
4	0.123	22.53	7.64	6.30	10	22	2.2	23	2.30
4	0.104	22.70	7.90	9.06	10	23	2.3	7	0.70
4					10	35	3.5	1	0.10
5	0.092	22.04	7.92	7.98	9	11	1.2	5	0.56
5	0.113	19.88	7.90	9.33	10	18	1.8	3	0.30
5	0.124	23.23	7.80	6.97	9	16	1.8	13	1.44
5	0.104	22.72	7.80	8.82	10	37	3.7	7	0.70
5					10	31	3.1	0	0.00
6	0.092	21.88	7.83	7.85	10	13	1.3	21	2.10
6	0.113	19.92	7.86	9.18	10	21	2.1	10	1.00
6	0.125	23.45	7.89	7.04	9	23	2.6	23	2.56
6	0.105	23.19	7.90	9.17	10	36	3.6	22	2.20
6					10	31	3.1	0	0.00
7	0.091	20.93	7.80	7.50	8	12	1.5	0	0.00
7	0.105	19.86	7.89	9.17	10	19	1.9	0	0.00
7	0.127	23.70	7.94	7.94	-	-	-	-	-
7	0.105	22.00	7.81	8.44	10	21	2.1	15	1.50
7					10	14	1.4	3	0.30

8	0.091	22.25	8.02	7.91	10	15	1.5	11	1.10
8	0.114	20.11	7.89	9.38	10	24	2.4	1	0.10
8	0.125	23.42	7.88	6.65	10	34	3.4	19	1.90
8	0.106	23.39	7.88	9.35	10	26	2.6	21	2.10
8					10	40	4.0	2	0.20
9	0.093	22.12	7.83	7.49	10	22	2.2	9	0.90
9	0.115	20.67	8.08	9.96	10	25	2.5	0	0.00
9	0.125	23.52	7.91	6.57	9	36	4.0	12	1.33
9	0.107	24.00	7.86	8.51	10	24	2.4	13	1.30
9					10	18	1.8	2	0.20
10	0.092	22.00	7.71	7.76	10	23	2.3	13	1.30
10	0.114	20.47	8.06	9.49	10	23	2.3	2	0.20
10	0.124	23.61	7.85	6.76	10	27	2.7	19	1.90
10	0.107	23.60	7.86	9.24	-	-	-	-	-
10					10	21	2.1	10	1.00
11	0.101	22.87	7.77	7.88	10	28	2.8	9	0.90
11	0.114	20.00	7.92	9.11	10	27	2.7	3	0.30
11	0.128	24.54	7.98	6.87	10	25	2.5	11	1.10
11	0.105	23.17	7.87	9.27	10	17	1.7	12	1.20
11					10	21	2.1	8	0.80
12	0.103	22.70	8.37	8.45	10	18	1.8	27	2.70
12	0.116	19.60	7.93	9.05	10	22	2.2	9	0.90
12	0.130	24.56	8.04	6.91	10	27	2.7	9	0.90
12	0.160	23.61	8.01	9.38	-	-	-	-	-
12					10	22	2.2	9	0.90
13	0.107	22.10	7.87	8.23	10	15	1.5	40	4.00
13	0.122	20.13	7.97	9.65	10	11	1.1	1	0.10
13	0.127	24.44	8.02	6.71	10	22	2.2	18	1.80
13	0.160	23.73	8.13	9.46	10	19	1.9	13	1.30
13					10	28	2.8	11	1.10
14	0.096	22.75	7.91	8.28	10	19	1.9	22	2.20
14	0.116	20.60	7.99	9.46	10	7	0.7	1	0.10
14	0.127	24.52	8.06	7.07	10	36	3.6	13	1.30
14	0.106	23.71	8.00	9.25	10	18	1.8	8	0.80
14					10	19	1.9	2	0.20
15	0.094	22.61	7.88	7.92	10	23	2.3	21	2.10
15	0.113	20.14	7.60	9.54	10	5	0.5	1	0.10
15	0.128	24.09	7.93	6.80	10	17	1.7	9	0.90
15	0.105	23.45	7.94	7.92	-	-	-	-	-
15					10	29	2.9	4	0.40
16	0.095	22.99	7.97	8.00	9	10	1.1	12	1.33

EnviroScience, Inc
3781 Darrow Road, Stow, OH 44224
(800) 940-4025 Fax: (330)688-3858.
www.enviroscienceinc.com

16	0.113	20.29	7.93	9.44	10	7	0.7	1	0.10
16	0.128	24.34	7.95	6.97	10	26	2.6	15	1.50
16	0.105	23.44	7.96	9.01	10	29	2.9	11	1.10
16	0.124	27.98	8.63	8.62	10	17	1.7	4	0.40
17	0.095	23.11	7.88	7.79	10	26	2.6	17	1.70
17	0.113	20.99	8.99	9.27	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-
17	0.106	23.65	7.89	8.98	10	23	2.3	13	1.30
17	0.125	28.57	8.84	9.28	10	38	3.8	1	0.10
18	0.093	22.27	7.70	7.80	10	27	2.7	37	3.70
18	0.115	20.46	7.98	9.59	10	17	1.7	9	0.90
18	0.126	23.66	7.96	7.32	10	16	1.6	1	0.10
18	0.104	22.91	7.80	8.88	10	27	2.7	44	4.40
18	0.124	28.02	8.68	9.04	10	34	3.4	3	0.30
19	0.094	23.47	7.80	8.07	10	22	2.2	15	1.50
19	0.114	19.95	7.86	9.26	10	16	1.6	4	0.40
19	0.123	23.12	7.91	6.73	10	28	2.8	5	0.50
19	0.103	22.10	7.45	7.06	10	18	1.8	6	0.60
19	0.125	28.80	9.04	10.70	10	22	2.2	31	3.10
20	0.094	22.96	7.80	8.12	10	25	2.5	25	2.50
20	0.116	20.80	7.96	9.42	10	10	1.0	1	0.10
20	0.119	23.01	7.84	6.68	10	26	2.6	11	1.10
20	0.104	22.72	7.68	8.49	8	18	2.3	2	0.25
20	0.126	28.55	8.75	9.28	10	28	2.8	41	4.10
21	0.093	22.79	7.77	7.92	5	6	1.2	11	2.20
21	0.117	21.03	8.02	9.53	10	17	1.7	3	0.30
21	-	-	-	-	-	-	-	-	-
21	0.104	22.37	7.76	8.71	2	5	2.5	0	0.00
21	0.126	28.76	8.74	9.24	10	24	2.4	13	1.30
				2008 TOTAL	**201**	**370**	**1.8**	**341**	**1.70**
				2009 TOTAL	**200**	**318**	**1.6**	**54**	**0.27**
				2010 TOTAL	**176**	**435**	**2.5**	**227**	**1.29**
				2011 TOTAL	**170**	**417**	**2.5**	**237**	**1.39**
				2012 TOTAL	**210**	**545**	**2.6**	**204**	**0.97**

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

1.1.4 Peavy Falls Reservoir

The milfoil has been increasing in Peavy Falls Reservoir since the drastic decline in 2009. There are 35 transect locations throughout the reservoir. Over 300 stems were collected from 32 of the locations on July 10th (Table 1-4). No milfoil was found in transects 23,27 and 28. This is the highest amount of stems collected over the five

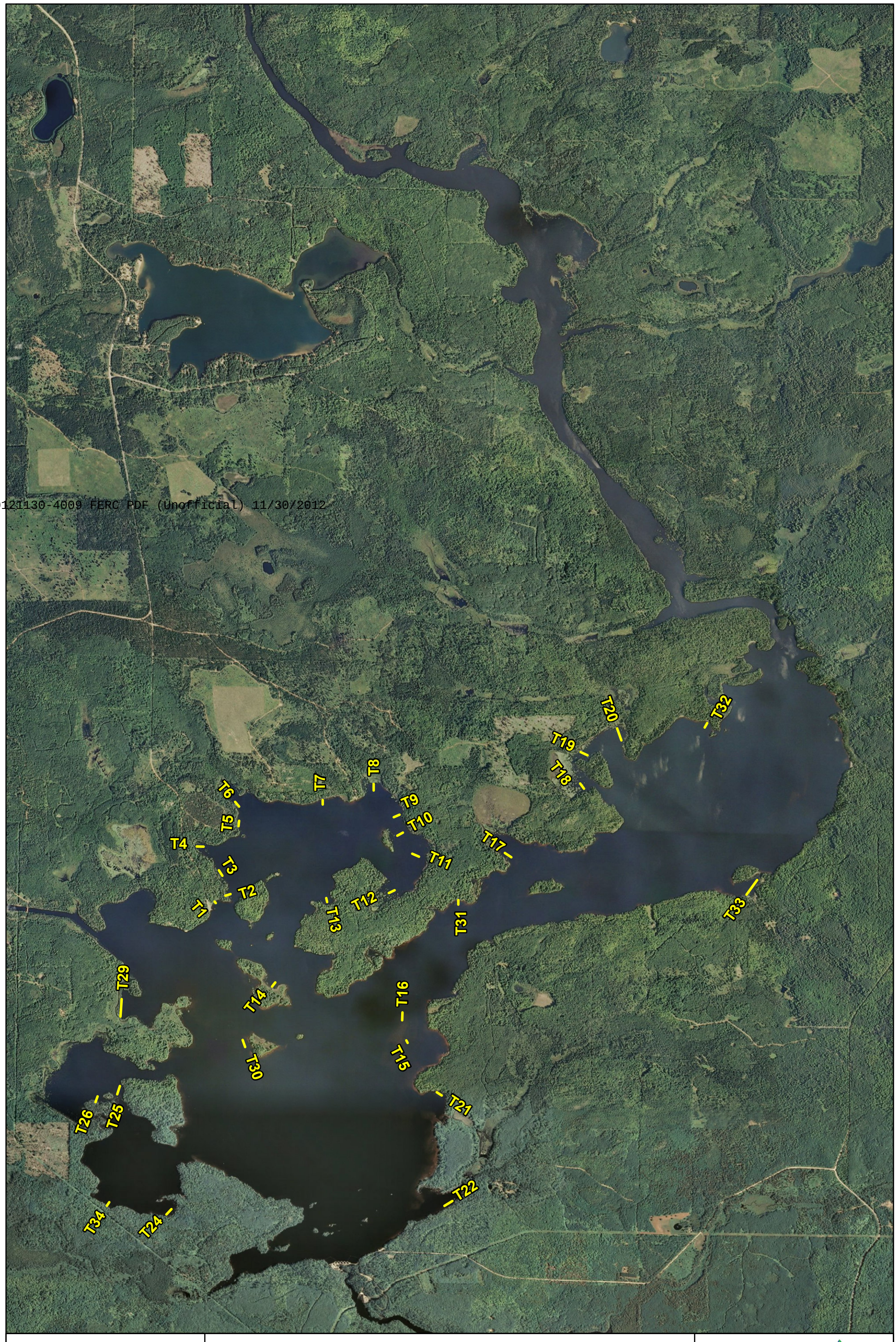

Figure 1-4. WE Energies Peavy Falls Hydro Project. 2012 Weevil Distribution.

years with an average weevil density of 1.20 weevils/stem (Table 1-4). However, it's the second lowest weevil density recorded, the highest being in 2008 while the lowest was found in 2010. Given the lack of milfoil in 2009, low weevil densities in 2010 were expected. However, the overall weevil population was considerably high in 2011. Given the trend, expectations were that there would be less milfoil in 2012, but unfortunately,seasonal variability could be a limiting factor for the weevils to 'catch up' to the aggressive growing EWM.

The temperature increased at every site throughout the reservoir and was the highest reading over the five years.

Table 1-4 Stem Analysis and Water Quality Data at Each Transect in Peavy Falls Reservoir

	Water Quality				Stem Counts			Weevil Count	
Transect	Cond	Temp	pH	DO	Stems	Meristems	Ave. Meristem/ Stem	Total Weevils	Ave. Weevils /Stem
1	0.095	22.10	8.48	7.64	10	26	2.6	25	2.50
1	-	-	-	-	-	-	-	-	-
1	0.107	24.05	8.75	9.56	10	36	3.6	44	4.40
1	0.115	25.62	8.37	8.58	10	28	2.8	10	1.00
2	0.095	21.94	8.22	7.67	10	18	1.8	14	1.40
2	-	-	-	-	-	-	-	-	-
2	0.106	24.34	8.29	9.12	7	15	2.1	6	0.86
2	0.115	24.95	8.24	8.37	10	35	3.5	8	0.80
3	0.094	21.99	7.92	7.78	10	34	3.4	15	1.50
3	0.131	24.11	8.07	11.69	-	-	-	-	-
3	0.103	24.42	8.22	9.01	-	-	-	-	-
3	0.115	25.53	8.30	8.48	10	39	3.9	8	0.80
4	0.092	22.14	7.74	7.56	10	36	3.6	31	3.10
4	-	-	-	-	-	-	-	-	-
4	0.105	24.18	8.12	8.90	10	31	3.1	26	2.60
4	0.115	25.60	8.14	8.60	10	30	3.0	37	3.70
5	0.093	22.26	7.85	8.25	9	14	1.6	10	1.11
5	0.129	24.47	8.13	12.25	10	18	1.8	2	0.20
5	0.104	23.91	8.13	9.43	10	33	3.3	8	0.80
5	0.115	25.55	8.27	8.42	10	18	1.8	23	2.30
6	0.092	22.24	7.94	7.73	10	14	1.4	17	1.70
6	-	-	-	-	-	-	-	-	-
6	0.082	24.14	8.04	9.19	10	38	3.8	28	2.80
6	0.115	25.43	8.28	8.51	10	26	2.6	17	1.70
7	0.094	22.33	7.98	7.47	10	21	2.1	33	3.30
7	-	-	-	-	-	-	-	-	-