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ORIGINAL

December 15, 2005

Magalie Roman Salas
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

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OFFICE OF THE
SECRETARY
2005 DEC 21 A 10 28
FEDERAL ENERGY
REGULATORY COMMISSION

Subject: FERC Hydroelectric Project No. 11162
Submittal of Purple Loosestrife Monitoring Results-License Article 410

Dear Magalie Roman Salas:

In accordance with the July 16, 2003 Federal Energy Regulatory Commission Order Modifying and Approving Nuisance Plant Control Plan (License Article 410) we are pleased to provide you with an original and eight copies of the 2005 survey results. Copies of this report were submitted to the appropriate resources agencies for review and comment (see attached documentation). However, no comments or questions were received in response to the survey results. We anticipate discussing the survey results and future monitoring and/or control measures during our annual meeting in 2006 regarding Article 408 (Aquatic Resources Enhancement Plan).

Please contact me if you have questions or require additional information regarding this submittal.

Regards,
Natural Resources Consulting, Inc.

William R. Poole

William R. Poole
Principal Scientist

Enclosure

Cc. Mildred Godoy-Daniels - Alliant Energy
Patricia Grant - FERC

ORIGINAL

**PURPLE LOOSESTRIFE and
EURASIAN MILFOIL SURVEY REPORT
PRAIRIE DU SAC HYDROELECTRIC PROJECT
FERC Project No. 11162
PRAIRIE DU SAC, WISCONSIN**

September 13, 2005



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REGULATORY COMMISSION

NRC Project # 05-114

**NATURAL RESOURCES CONSULTING, INCORPORATED
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PURPLE LOOSESTRIFE and EURASIAN MILFOIL SURVEY REPORT

**PRAIRIE DU SAC HYDROELECTRIC PROJECT
FERC Project No. 11162**

PRAIRIE DU SAC, WISCONSIN

September 13, 2005


Prepared For:

**Mr. Mike Prindle
Wisconsin Power & Light Company
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NRC Project # 05-114



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Prairie du Sac Hydroelectric Project
WP&L
September 13, 2005

Purple Loosestrife/Milfoil Survey
Columbia & Sauk Counties, Wisconsin
NRC Project # 05-114

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Columbia & Sauk Counties, Wisconsin
NRC Project # 05-114

INTRODUCTION AND OBJECTIVES

In accordance with Article 410 of the Federal Energy Regulatory Commission (FERC) Order Issuing Original License (June 27, 2002) for the Prairie du Sac Hydroelectric Project, FERC Project No. 11162-002, Wisconsin Power and Light Company (WP&L) was required to develop and implement a purple loosestrife (*Lythrum salicaria*) and Eurasian water milfoil (*Myriophyllum spicatum*) monitoring plan. The purpose of the monitoring plan is to assist the Wisconsin Department of Natural Resources (WDNR) and the U.S. Fish and Wildlife Service (FWS) in controlling the spread of these nuisance plant species.

On August 4 and August 9, 2005, Natural Resources Consulting, Inc. (NRC) performed a purple loosestrife and Eurasian water milfoil survey within the project boundary of the Prairie du Sac Hydroelectric Project. The survey extended from the Prairie du Sac dam east to the I-94 bridge crossing and included all shorelines, wetlands, and islands within the ordinary high water elevation of Lake Wisconsin.

SURVEY METHODS

The survey was conducted by boat and involved slowly motoring along the impoundment shorelines, shorelines of islands, and wetlands. The survey team included a qualified botanist familiar with the ecology and identification of the target species. Locations and density of purple loosestrife occurrences were recorded using a Trimble Geographic Information System (GPS) unit capable of sub-meter accuracy. The density of each stand was estimated based on the number of plants and were categorized according to the following scale:

- > 1 to 5 plants
- > 6 to 25 plants
- > 26 to 100 plants
- > 100 to 500 plants
- > 500+ plants

Purple loosestrife locations recorded by GPS were overlaid on digitized 1995 aerial photographs. Each purple loosestrife stand was coded based on its density category (Appendix A). A comparison of purple loosestrife stand location and density from 2002 and 2005 is also provided in Appendix A. The Table located in Appendix B provides the GPS coordinates for 2005 collected data.

While surveying for purple loosestrife an effort was made to detect the presence of Eurasian milfoil within floating leaved and submersed aquatic plant beds. This survey was conducted by examining hand-pulled rake samples of submersed aquatic plants for the presence of Eurasian milfoil. When Eurasian milfoil was present the location was recorded with a GPS and the extent of infestation was estimated and categorized as low, medium, or high. The categories are based on the following general observations:

- > **Low:** not the dominant submersed species and only a few plants observed within the vicinity.
- > **Medium:** not the dominant submersed species but nearly as abundant as the dominant submersed species (subdominant).
- > **High:** wide spread throughout vicinity and the dominant submersed species.

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RESULTS

The survey was conducted on August 4 and August 9, 2004 while purple loosestrife was in full bloom. This species was observed to be relatively wide spread within the project boundary occurring sporadically in low densities along the steep shorelines of both residential and undeveloped areas and at high densities in many of the wetland areas within the bays and especially in the upper reaches of the project boundary along the sandbar islands. Eurasian milfoil was observed within several bays, canals, and near several shallow shorelines within the project boundaries.

The sporadic occurrences of purple loosestrife tend to be found along developed shorelines where recent disturbance has taken place such as tree removal or construction activities. It also appears that many private riparian landowners have intentionally promoted the plants for aesthetic purposes. Most of these areas contain only 1 to 5 plants. The plants growing in these areas are restricted only to the shorelines because of the presence of steep banks, manicured lawns, and/or dense tree cover.

Purple loosestrife was found to be prevalent within several of the bays and wetlands. The western extent of the southern most bay of Wiegans Bay contains a wetland complex that is infested with 100 – 500 plants and scattered pockets of 1 to 5 plants and 6 to 25 plants. The central and northern bays of Wiegans Bay are relatively free of purple loosestrife with only two stands of 1 to 5 plants. Sunset Bay, located north of E. Harmon Road, contains large wetland areas in the southwest and southeast corner both of which are dominated by over 500 purple loosestrife plants. These wetland areas continue south of STH 188 where they are also dominated by purple loosestrife. A small portion in the southwestern most part of Okee Bay continues to be infested with the species and contains over 500 plants. Although, a large portion of this bay contains ideal habitat for purple loosestrife, only a small portion is infested. A small bay extending adjacent to the south-southeast side of Pine Bluff contains a wetland complex that is co-dominated by over 500 purple loosestrife plants. Harmony Grove Bay contains scattered stands along the south eastern shoreline, however these wetland areas are dominated by shrub-carr vegetation and purple loosestrife is limited only to the edges. There is a considerable reduction in the extent of purple loosestrife infestation within Harmony Grove Bay compared to the 2003 survey. There is also an increase of stands with 1 to 5 plants along the shorelines of the five canals off the east side of Harmony Grove Bay. Stoners Bay contains a dense stand comprised of over 500 plants within the wetland area in the northwest portion of the bay. The surveyors were unable to enter into Whalen's Bay on the eastern part of the lake due to low clearance under the CTH V Bridge. This bay was surveyed from the western edge with binoculars. The eastern edge of the CTH V Bridge is lined with stands of 1 to 5 purple loosestrife plants. This is a considerable decrease from the 2003 and 2004 surveys. In the remaining portion of Whalen Bay no purple loosestrife plants were observed. Although, it was difficult to determine whether purple loosestrife was present or absent along the far eastern portions of Whalen Bay with binoculars.

The occurrence and abundance of purple loosestrife increases significantly approximately 2 miles upstream of Tipperary Point. This increase in purple loosestrife is due to more ideal habitat conditions for the species such as shallow water, low lying islands, wetlands, and subtle shoreline slopes. Almost all of the shorelines of the sandbar islands are infested with dense stands (500+) of purple loosestrife plants. The interior of many of these islands are also dominated by purple loosestrife however, this is dependent on the density of woody vegetation. Islands dominated by shrub-carrs and/or forested communities contain less purple loosestrife in their interiors. Several narrow channels between islands were not surveyed since water levels were too low to provide access. These areas are shown in Appendix A. However, because of the prevalence of purple loosestrife on almost all of the islands in this vicinity, it can be assumed that at least the shorelines of these areas are most likely dominated by purple loosestrife plants.

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Most of the wetland areas dominated by herbaceous wetland vegetation that are within the project boundary are dominated or co-dominated by purple loosestrife. However, there are some of these wetland types that do not contain any or only a few purple loosestrife plants. These areas include Gallus Slough, Whalen Bay (although not verified), and portions of Okee Bay.

The base of most all bays and areas with shallow shorelines within the project boundary contain submerged and floating leaved aquatic vegetation such as coon's tail, water weed, and pond lily with suitable habitat for Eurasian milfoil. Eurasian milfoil was observed at medium densities within Gallus Slough, a decrease from the 2004 survey where it occurred as a dominant species throughout most of the bay. A prolific, high density population was observed in Stoners Bay as well as near and within the residential canals off of Harmony Grove Bay. Several locations of Eurasian milfoil characterized to contain medium levels of infestation include: the western edges of two small islands located approximately 1 mile northeast of Pine Bluff; the western most portions of the north and south bays of Wiegans Bay; the northeastern shoreline of Harmony Grove; and the southern shoreline west of the CTH V Bridge. A low density of Eurasian milfoil was observed southeast of Pine Bluff.

CONCLUSIONS

The lower $\frac{3}{4}$ of the Lake Wisconsin impoundment from the Prairie du Sac dam east to approximately 2 miles upstream of Tipperary Point contains limited available habitat for extensive purple loosestrife stands with the exception of the wetland areas located at the base of several bays. These areas limit the density and extent of purple loosestrife infestation because they contain steep slopes, dense tree cover, and/or manicured lawns. We found that most wetland areas adjacent to the impoundment that were dominated by herbaceous vegetation were infested with purple loosestrife. Those wetland areas dominated by shrub-carr or forested communities limited the extent of infestation to the shorelines. Emergent wetlands not dominated with purple loosestrife should be considered high priority for monitoring and eradication to prevent these areas from becoming infested. The northeastern portion of the impoundment, approximately 2 miles north of Tipperary Point, contains the most extensive purple loosestrife infestations due to the shallow water conditions, low lying islands, and extensive wetlands. The results from the 2005 purple loosestrife survey were very similar to the 2003 and 2004 survey results. However, a distinct reduction in purple loosestrife density was observed within Harmony Grove Bay and a small bay located on the north side of the lake approximately 2 miles northeast of the Merrimac Ferry crossing from the 2003 survey. Additionally, there were fewer sporadic plants observed along the shorelines south of Wiegans Bay to the Prairie du Sac dam. Two sandbars, approximately 2 miles upstream of Tipperary Point, had portions decrease in stand size of purple loosestrife when compared to the 2003 and 2004 survey. In one instance densities decreased from 500+ plants to 100 to 500 plants and in the other it decreased significantly from 500+ plants to 6 to 25 plants.

Eurasian milfoil infestation within the project boundaries does not appear to be extensive, but was found to be more prevalent than in the 2003 survey and very similar to the 2004 survey. Eurasian milfoil occurs as the dominant submersed plant species in Stoners Bay and in and around the residential canals of Harmony Grove. Additionally, milfoil occurs as a subdominant species in portions of the western edges of two small islands located approximately 1 mile northeast of Pine Bluff, Wiegans Bay, Sunset Bay, Harmony Grove, and along the south shoreline northwest of the Okee Bridge. The base of most of the bays on the lake and many of the shallow shorelines contain habitat where Eurasian milfoil may exist or may quickly become established.

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APPENDIX A
PURPLE LOOSESTRIFE LOCATION & DENSITY MAPS



Eurasian Milfoil Abundance 2005

- ✕ High
- ✕ Medium
- ✕ Low

**Purple Loosestrife Stand Size Comparison
Lake Wisconsin Purple Loosestrife Survey**

Public 051229-0139-001



Location
Columbia County & Sauk County, WI

Project Information
NRC Project Number #: 05-114
Modified September 6, 2005

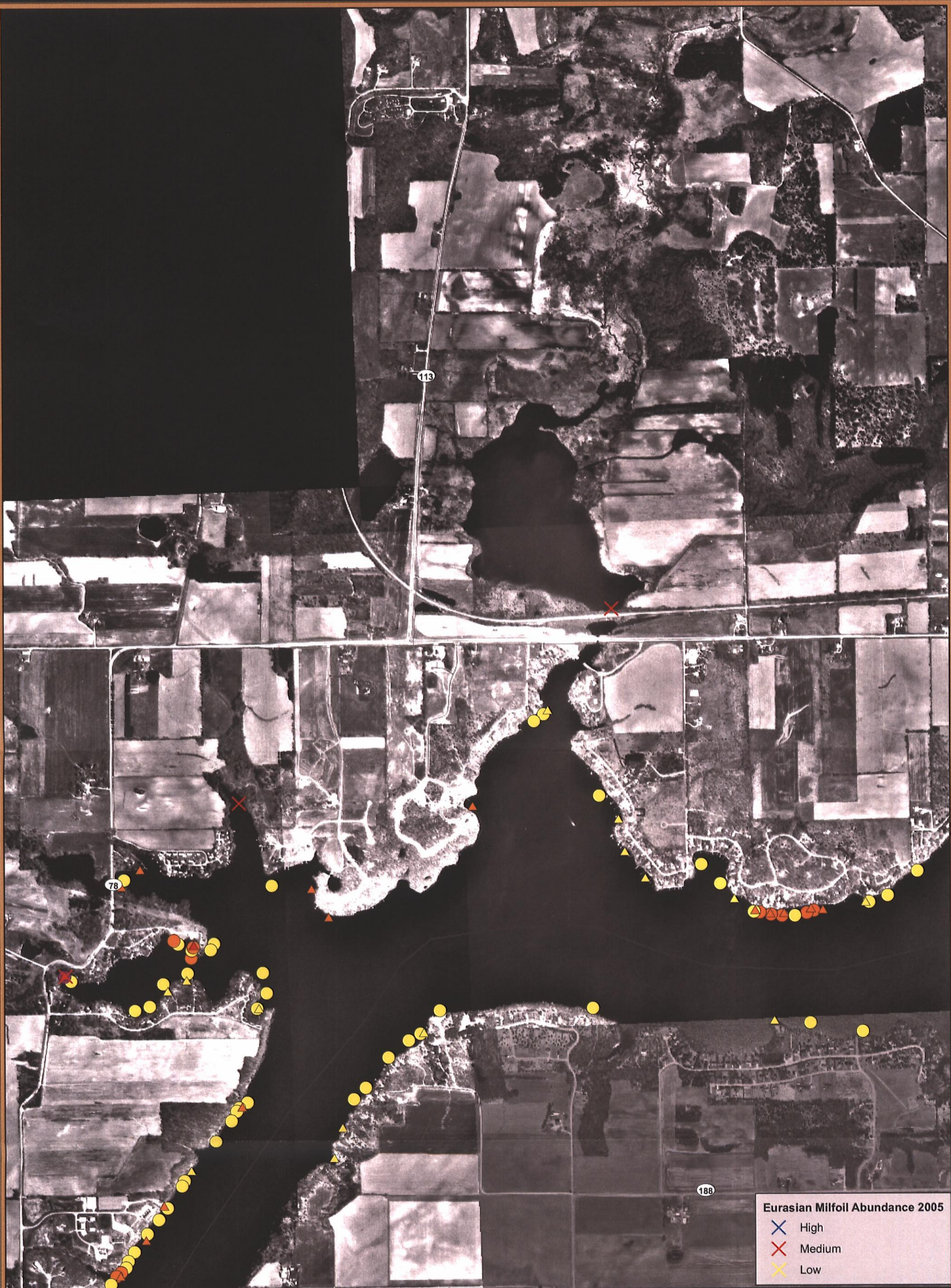
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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051229-0139-002



Eurasian Milfoil Abundance 2005
 X High
 X Medium
 X Low

Purple Loosestrife Stand Size Comparison
 Lake Wisconsin Purple Loosestrife Survey



Location Columbia County & Sauk County, WI
Project Information NRC Project Number #: 05-114 Modified September 6, 2005
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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051229-0139-003



Eurasian Milfoil Abundance 2005
 X High
 X Medium
 X Low

Purple Loosestrife Stand Size Comparison
Lake Wisconsin Purple Loosestrife Survey

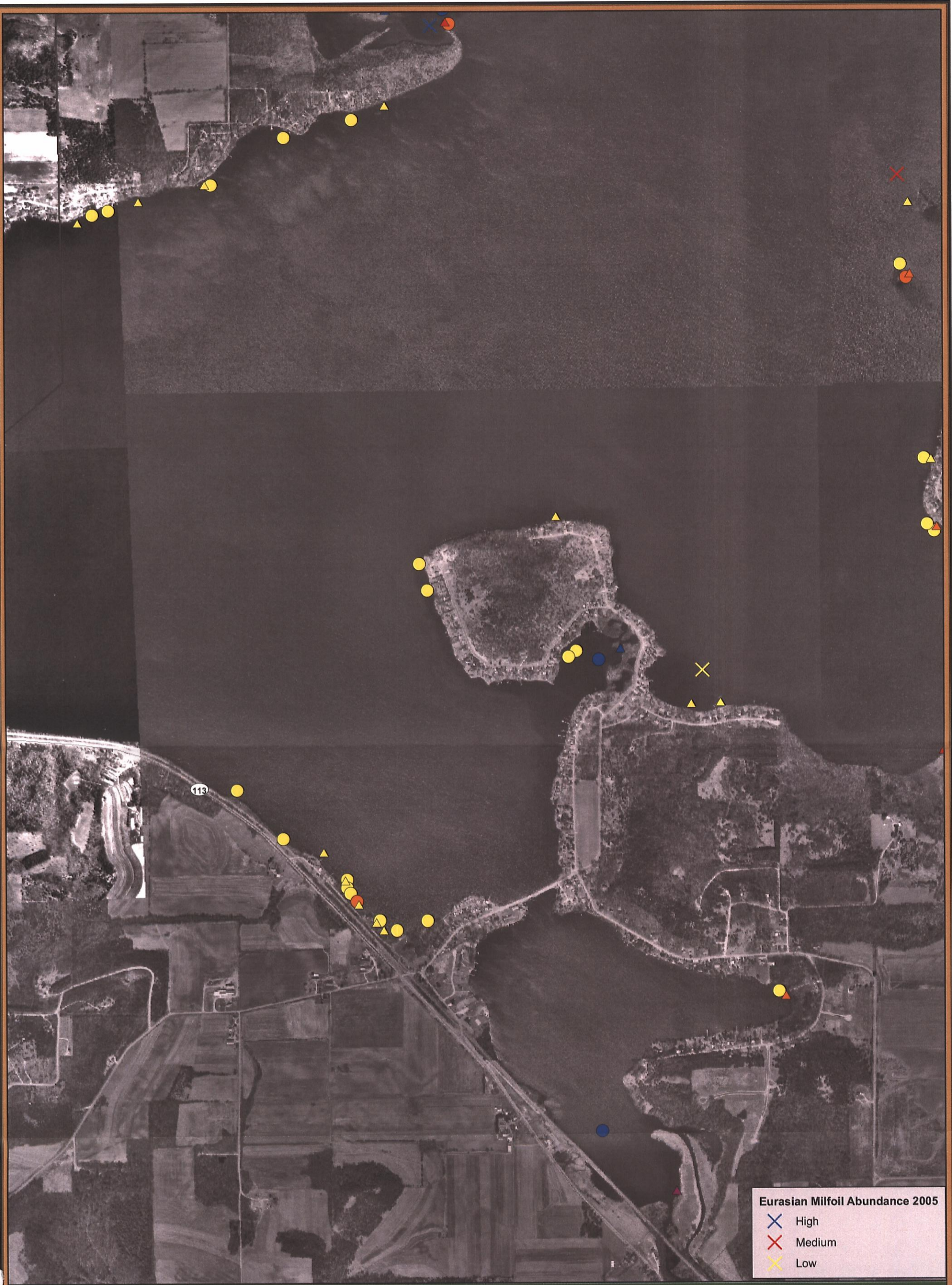


Location Columbia County & Sauk County, WI
Project Information NRC Project Number #: 05-114 Modified September 6, 2005
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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051229-0139-004



Purple Loosestrife Stand Size Comparison
Lake Wisconsin Purple Loosestrife Survey

Eurasian Milfoil Abundance 2005

- X High
- X Medium
- X Low

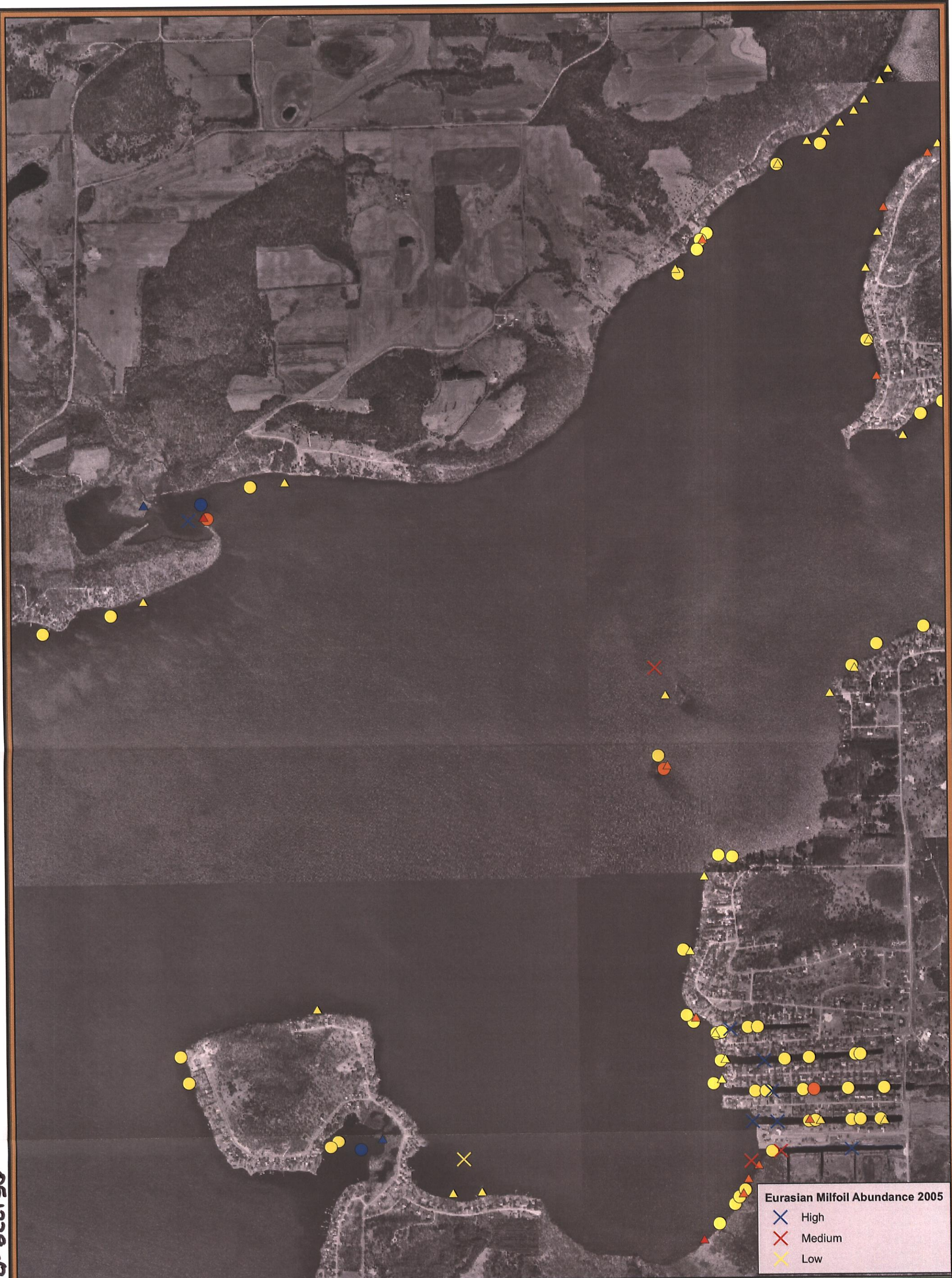


Location
Columbia County & Sauk County, WI
Project Information
NRC Project Number #: 05-114 Modified September 6, 2005
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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051229-0139-005



Eurasian Milfoil Abundance 2005

- ⊗ High
- ⊗ Medium
- ⊗ Low

Purple Loosestrife Stand Size Comparison
Lake Wisconsin Purple Loosestrife Survey

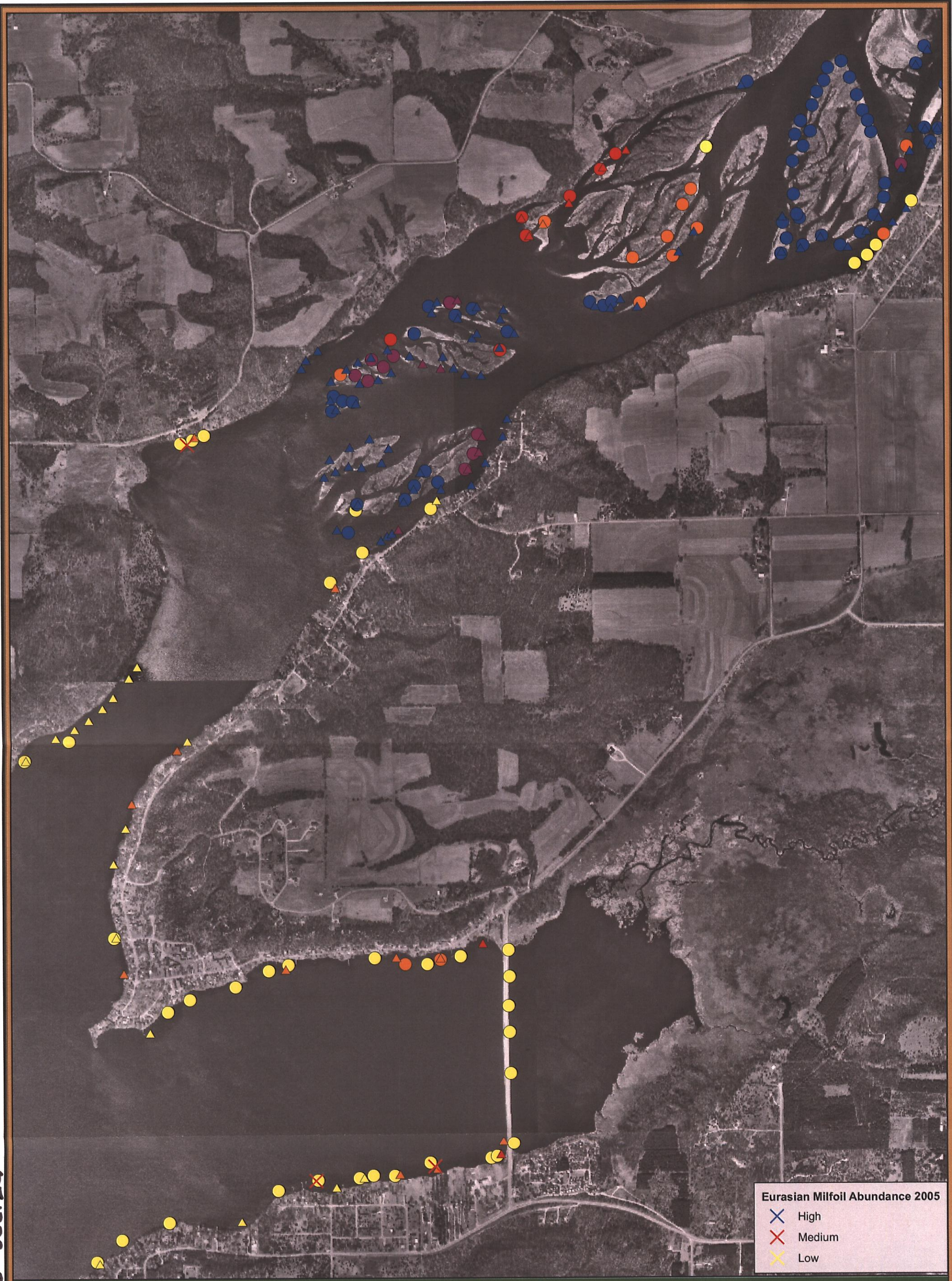


Location
Columbia County & Sauk County, WI
Project Information
NRC Project Number #: 05-114 Modified September 6, 2005
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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051229-0139-006



Purple Loosestrife Stand Size Comparison
Lake Wisconsin Purple Loosestrife Survey

Eurasian Milfoil Abundance 2005

- ⊗ High
- ⊗ Medium
- ⊗ Low



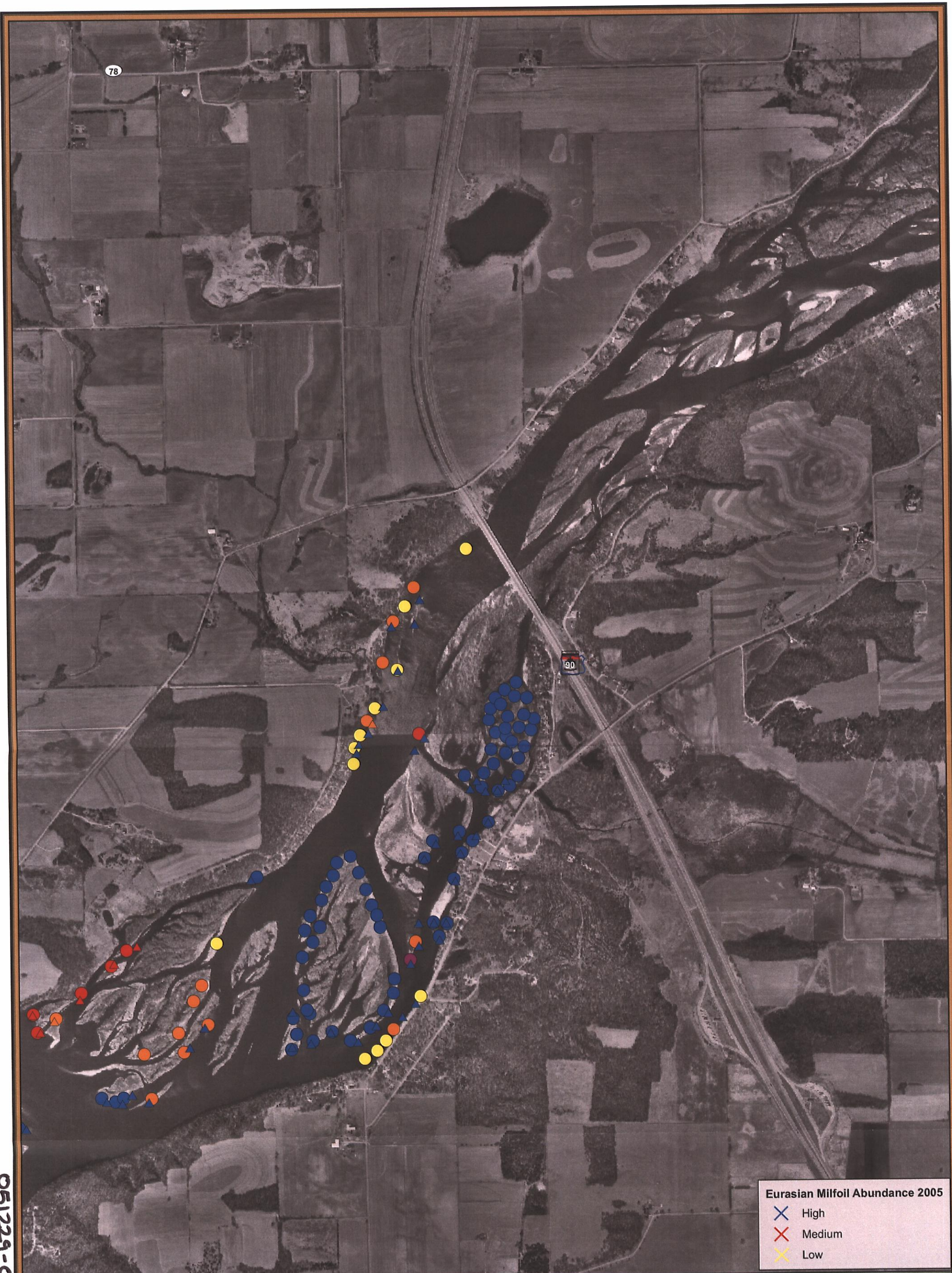
Location
Columbia County & Sauk County, WI
Project Information
NRC Project Number #: 05-114 Modified September 6, 2005
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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051229-0139-007



Purple Loosestrife Stand Size Comparison
Lake Wisconsin Purple Loosestrife Survey

Eurasian Milfoil Abundance 2005

- ✕ High
- ✕ Medium
- ✕ Low



Location
Columbia County & Sauk County, WI
Project Information
NRC Project Number #: 05-114 Modified September 6, 2005
0 650 1,300 Feet

2005 Stand Size	2002 Stand Size
● 1-5	▲ 1-5
● 6-25	▲ 6-25
● 26-100	▲ 26-100
● 100-500	▲ 100-500
● 500+	▲ 500+

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APPENDIX B
GPS COORDINATES

Point ID	Size of Loosestrife Stand	X	Y
1	500+	2101910	523880
2	500+	2093390	516837
3	500+	2093521	517243
4	500+	2080186	508617
5	500+	2064692	493200
6	500+	2067374	492820
7	500+	2082459	492311
8	500+	2082432	499173
9	500+	2102578	524681
10	500+	2102818	524627
11	500+	2103112	524841
12	500+	2102324	524854
13	500+	2103125	525108
14	500+	2101724	523640
15	500+	2102244	524027
16	500+	2102271	523720
17	500+	2102431	523893
18	500+	2102671	524160
19	500+	2101844	523893
20	500+	2102151	523333
21	500+	2101844	522705
22	500+	2102044	522692
23	500+	2101924	522505
24	500+	2101243	521691
25	500+	2101096	521437
26	500+	2100896	521184
27	500+	2100602	520997
28	500+	2100335	521130
29	500+	2099735	520877
30	500+	2100055	520997
31	500+	2100936	522959
32	500+	2100856	523186
33	500+	2100749	523440
34	500+	2099762	521331
35	500+	2100629	523680
36	500+	2100429	523586
37	500+	2100376	523399
38	500+	2100202	523039
39	500+	2099948	522612
40	500+	2099908	522225
41	500+	2099922	521744
42	500+	2099254	523386
43	500+	2096945	520183
44	500+	2097145	520129
45	500+	2097266	520183
46	500+	2095731	519756
47	500+	2095223	520089
48	500+	2094583	520129
49	500+	2094970	519996
50	500+	2094369	519729

51	500+	2093155	518608
52	500+	2093181	518821
53	500+	2093315	518755
54	500+	2093462	518741
55	500+	2094222	517313
56	500+	2094356	517513
57	500+	2094516	517727
58	500+	2094703	517567
59	500+	2101058	522648
60	500+	2101010	522815
61	500+	2100008	521394
62	500+	2099817	521096
63	500+	2099972	521454
64	500+	2100270	523233
65	500+	2100032	522815
66	500+	2100067	522445
67	500+	2100175	522660
68	500+	2102992	524701
69	500+	2102610	524892
70	500+	2102753	525023
71	500+	2102718	525238
72	500+	2102789	525489
73	500+	2102944	525429
74	500+	2102944	525190
75	500+	2103207	525274
76	500+	2103314	525525
77	500+	2103362	525692
78	500+	2103100	526229
79	500+	2102694	525680
80	500+	2102718	525847
81	500+	2102789	526002
82	500+	2102932	526121
83	500+	2102932	525178
84	500+	2103028	525345
85	500+	2102932	525548
86	500+	2103135	525560
87	500+	2103207	525751
88	500+	2102968	525727
89	500+	2102873	525907
90	500+	2103076	526026
91	500+	2103255	526002
92	500+	2101261	521896
93	100-500	2048954	495741
94	100-500	2101497	522172
95	100-500	2094890	520183
96	100-500	2094062	519409
97	100-500	2093742	519355
98	100-500	2093915	519248
99	100-500	2093502	519128
100	100-500	2093688	519048
101	100-500	2095290	518261
102	100-500	2095223	517980

103	100-500	2095103	517754
104	26-100	2101657	525482
105	26-100	2097332	522345
106	26-100	2096665	521731
107	26-100	2097105	522118
108	26-100	2095958	521424
109	26-100	2096011	521157
110	26-100	2095624	519489
111	26-100	2094022	519649
112	6-25	2094708	510605
113	6-25	2094192	510543
114	6-25	2101240	521159
115	6-25	2080273	508406
116	6-25	2089068	500016
117	6-25	2086925	504693
118	6-25	2049757	491464
119	6-25	2049685	491407
120	6-25	2049092	490440
121	6-25	2078892	495644
122	6-25	2059777	496647
123	6-25	2059673	496616
124	6-25	2059319	496581
125	6-25	2059158	496594
126	6-25	2058996	496625
127	6-25	2050777	496009
128	6-25	2050807	496162
129	6-25	2050529	496260
130	6-25	2101803	527631
131	6-25	2101296	527137
132	6-25	2101136	526536
133	6-25	2100896	525682
134	6-25	2101577	522438
135	6-25	2098520	521251
136	6-25	2098160	520850
137	6-25	2098427	521825
138	6-25	2098307	521598
139	6-25	2098080	521130
140	6-25	2097573	520823
141	6-25	2097679	520169
142	6-25	2096291	521357
143	6-25	2093288	519142
144	1-5	2095440	507697
145	1-5	2095527	507725
146	1-5	2095003	510654
147	1-5	2094517	510542
148	1-5	2093745	510631
149	1-5	2092485	510533
150	1-5	2092198	510452
151	1-5	2091711	510215
152	1-5	2091047	510029
153	1-5	2090726	509852
154	1-5	2089948	510930

155	1-5	2093122	516110
156	1-5	2093593	516547
157	1-5	2093497	517159
158	1-5	2102380	528186
159	1-5	2101473	527351
160	1-5	2100817	520727
161	1-5	2100996	520844
162	1-5	2101130	520993
163	1-5	2091287	518256
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165	1-5	2090944	518145
166	1-5	2089296	513800
167	1-5	2088657	513509
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