NRC
Natural Resources Consulting, Inc.

P.O. Box 128
Cottage Grove, WI 53527-0128
608-839-1998 • Fax 608-839-1995

www.nrc-inc.net

ORIGINAL

April 29, 2005

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

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), on behalf of Wisconsin Power & Light Company, we are pleased to provide you with an original and eight copies of the 2003 and 2004 survey results. Copies of each 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.

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. Mike Prindle - Alliant Energy
Patricia Grant - FERC

PURPLE LOOSESTRIFE and EURASIAN MILFOIL SURVEY REPORT

PRAIRIE DU SAC HYDROELECTRIC PROJECT

FERC Project No. 11162

PRAIRIE DU SAC, WISCONSIN

October 5, 2004

NRC Project # 04-035

NATURAL RESOURCES CONSULTING, INCORPORATED
P.O. BOX 128
COTTAGE GROVE, WISCONSIN 53527-0128
(608) 839-1998

PURPLE LOOSESTRIFE and EURASIAN MILFOIL SURVEY REPORT

PRAIRIE DU SAC HYDROELECTRIC PROJECT
FERC Project No. 11162

PRAIRIE DU SAC, WISCONSIN

October 5, 2004

Prepared For:

Mr. Mike Prindle
Wisconsin Power & Light Company
S9270A Dam Road
Prairie du Sac, WI 53578-9712

Prepared By:

Natural Resources Consulting, Incorporated
P.O. Box 128
119 South Main Street, Suite D
Cottage Grove, Wisconsin 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

NRC Project # 04-035

Jeff Kraemer
Environmental Scientist/Botanist

Stacy Tervo
Environmental/GIS Technician

TABLE OF CONTENTS

INTRODUCTION AND OBJECTIVES ..... **Page 1**

SURVEY METHODS ..... **Page 1**

RESULTS ..... **Page 1**

CONCLUSIONS ..... **Page 3**

Appendix A – Purple Loosestrife & Eurasian Milfoil Location & Density Maps

Appendix B – GPS Coordinates

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 (*Myriophullum 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 July 28 and July 29, 2004, Natural Resources Consulting, Inc. (NRC) performed a purple loosestrife and Eurasian water milfoil survey within the project boundaries 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 slow monitoring 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 their density category (Appendix A). The GPS coordinates are provided on the Table in Appendix B.

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 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.

RESULTS

The survey was conducted on July 28 and July 29, 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 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 had taken place such as tree removal or construction activities. It also appeared that many private riparian landowners had intentionally promoted the plants for aesthetic purposes. Most of these areas contained 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 contained a wetland complex that was infested with 26 – 100 plants. Sunset Bay, located north of E. Harmon Road, contained 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 seemed to be recently infested with the species and contained over 500 plants. Although, a large portion of this bay contains ideal habitat for purple loosestrife only a small portion was infested. A small bay extending adjacent to the south-southeast side of Pine Bluff contained a wetland complex that was co-dominated by over 500 purple loosestrife plants. Harmony Grove Bay contained scattered stands along the southern shoreline, however these wetland areas were dominated by shrub-carr vegetation and purple loosestrife was limited only to the edges. There was a considerable reduction in the extent of purple loosestrife infestation within Harmony Grove Bay compared to the 2003 survey. Stoners Bay contained 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 in 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 was lined with stands of 100 to 500 purple loosestrife plants. 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 increased significantly approximately 2 miles upstream of Tipperary Point. This increase in purple loosestrife was 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 were infested with dense stands (500+) of purple loosestrife plants. The interior of many of these islands were also dominated by purple loosestrife however, this was dependent on the density of woody vegetation. Islands dominated by shrub-carrs and/or forested communities contained 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.

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 were some of these

wetland types that did 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 boundaries contained 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 high densities within Gallus Slough where it occurred as a dominant species throughout most of the bay. A prolific, high density population was also observed near the western edges of two small islands located approximately 1 mile northeast of Pine Bluff. Several locations of Eurasian milfoil characterized to contain medium levels of infestation were mapped including: the western most portions of the north and central bays of Wiegans Bay; the south central portion near the shoreline of Sunset Bay; the northeastern shoreline of Harmony Grove; and sporadic occurrences throughout the western portions of Stoners Bay. A low density of Eurasian milfoil was observed in the western most portion of the southern most bay of Wiegans Bay.

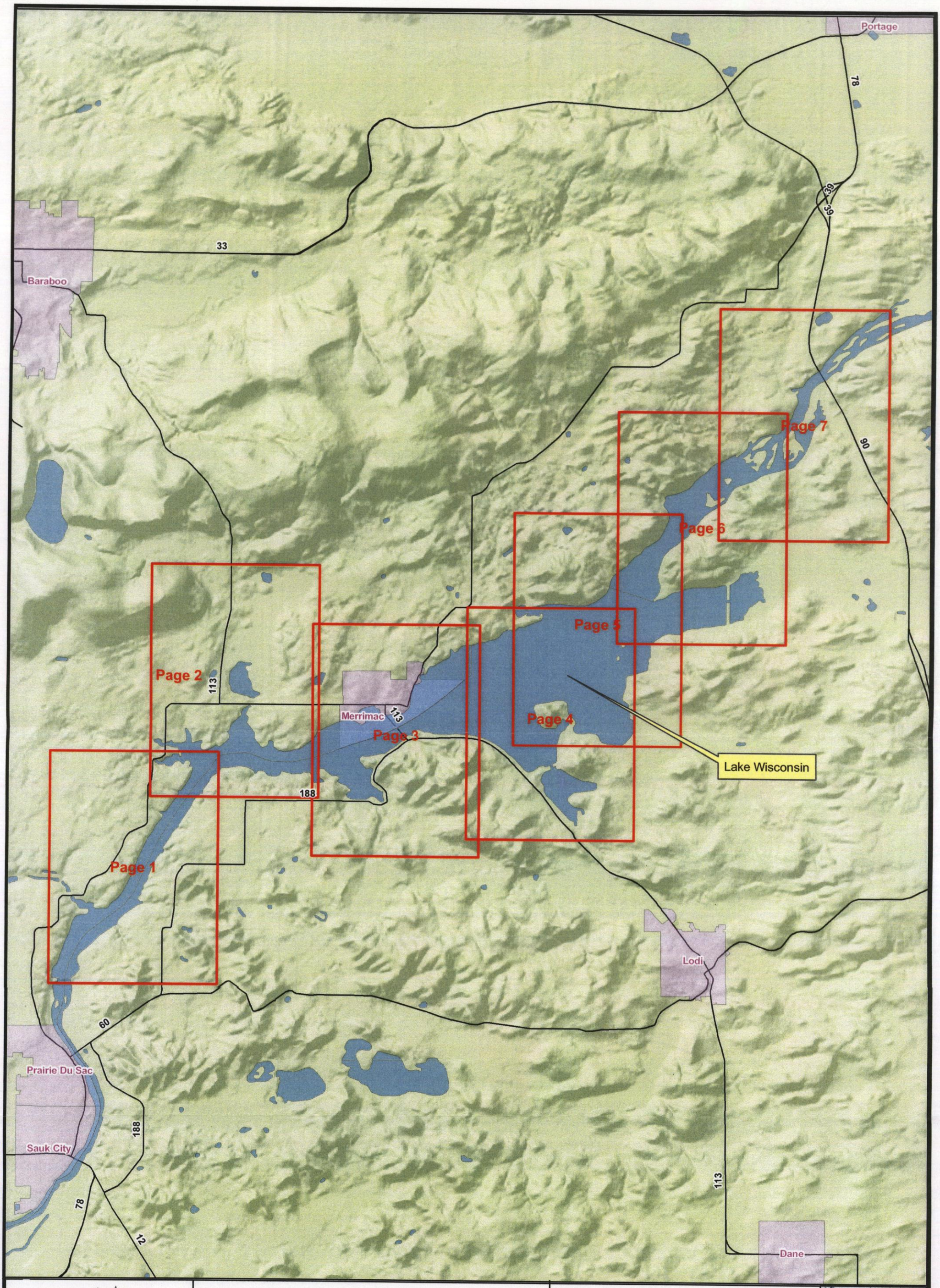
CONCLUSIONS

The lower ¾ 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 2004 purple loosestrife survey were very similar to the 2003 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. Additionally, there were fewer sporadic plants observed along the shorelines south of Wiegans Bay to the Prairie du Sac dam.

Eurasian milfoil infestation within the project boundaries did not appear to be extensive, but was found to be more prevalent than in the 2003 survey. Eurasian milfoil occurred as the dominant submersed plant species in Gallous Slough and near two islands northeast of Pine Bluff. Additionally, milfoil occurred as a subdominant species in portions of Wiegans Bay, Sunset Bay, Stoners 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. More extensive monitoring efforts targeted specifically toward this species may reveal a broader distribution than what was recorded during this survey.

APPENDIX A

PURPLE LOOSESTRIFE LOCATION & DENSITY MAPS



NRC
Natural Resources Consulting, Inc.

119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 3,500 7,000 Feet

Index Map

Lake Wisconsin Purple Loosestrife Survey

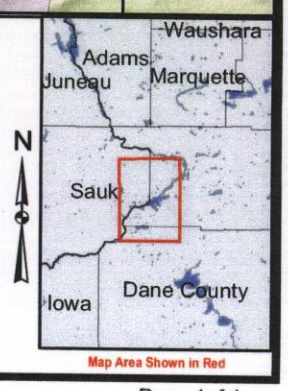
Lake Wisconsin, Columbia & Sauk Counties, WI

NRC Project Number #: 04-035

Map Last Updated
September 8, 2004

Legend

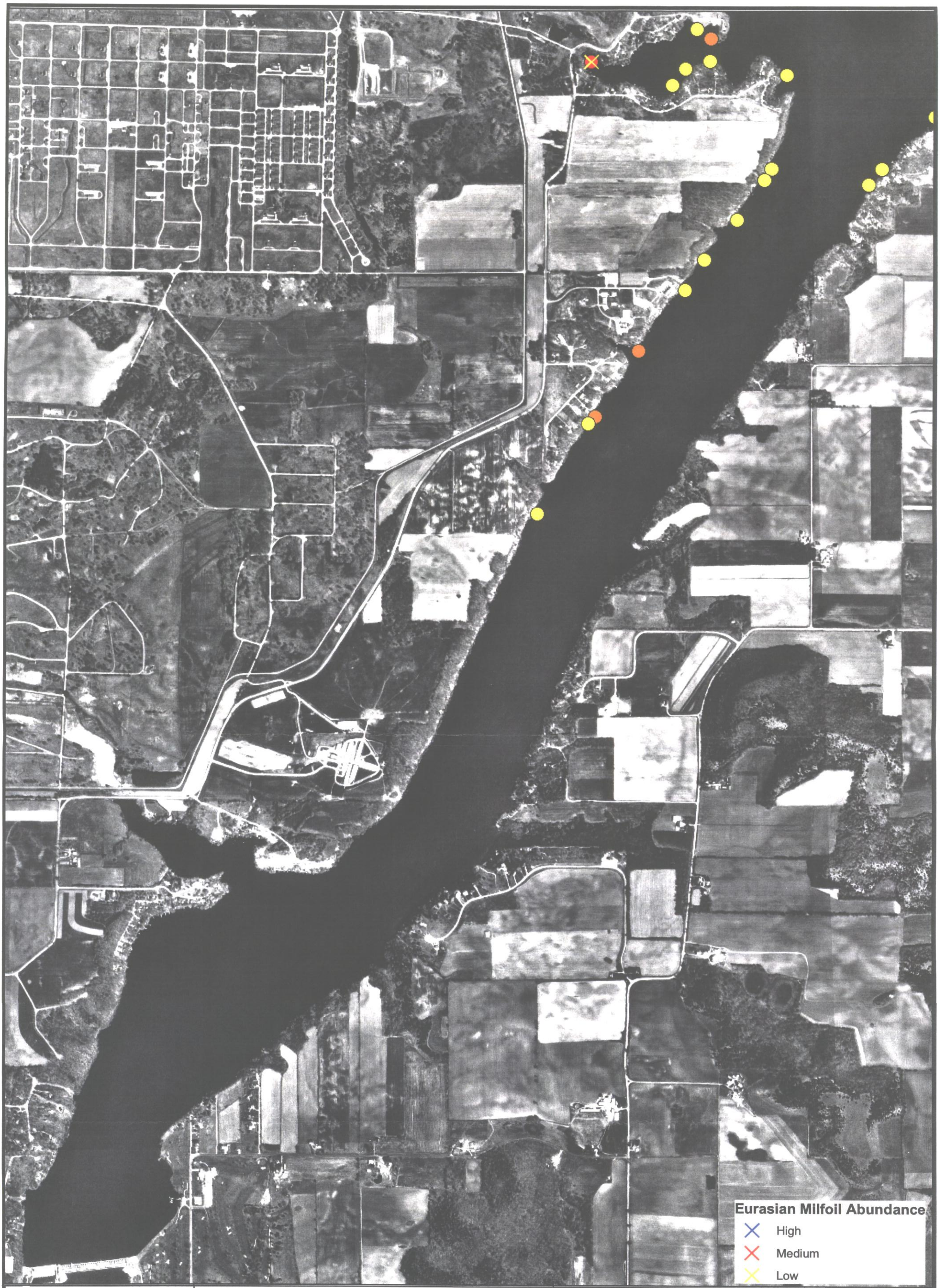
- Index Pages
- Cities&Villages
- Highways



Map Area Shown in Red

Overview.mxd Map Created by S. Tervo

050518c0016 — 001 Public



NRC
Natural Resources Consulting, Inc.
119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

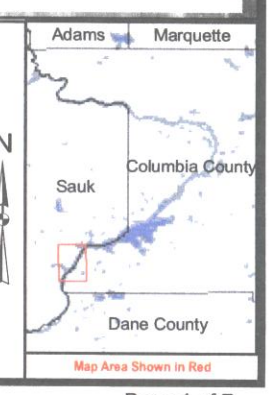
NRC Project Number #: 04-035

Map Last Updated
September 8, 2004

Purple Loosestrife Stand Size

- 1-5
- 6-25
- 26-100
- 100-500
- 500+
- Non-Surveyed Areas with High Likelihood of Purple Loosestrife Infestation

N



Aerial02.mxd Map Created by S. Tervo

050512006 — 006

NRC
Natural Resources Consulting, Inc.
119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

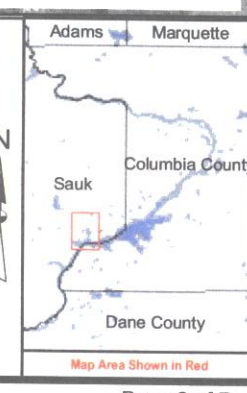
NRC Project Number #: 04-035

Map Last Updated
September 8, 2004

Purple Loosestrife Stand Size

- 1-5
- 6-25
- 26-100
- 100-500
- 500+
- Non-Surveyed Areas with High Likelihood of Purple Loosestrife Infestation

N



Aerial02.mxd Map Created by S. Tervo

050918001—003

NRC
Natural Resources Consulting, Inc.
119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

NRC Project Number #: 04-035

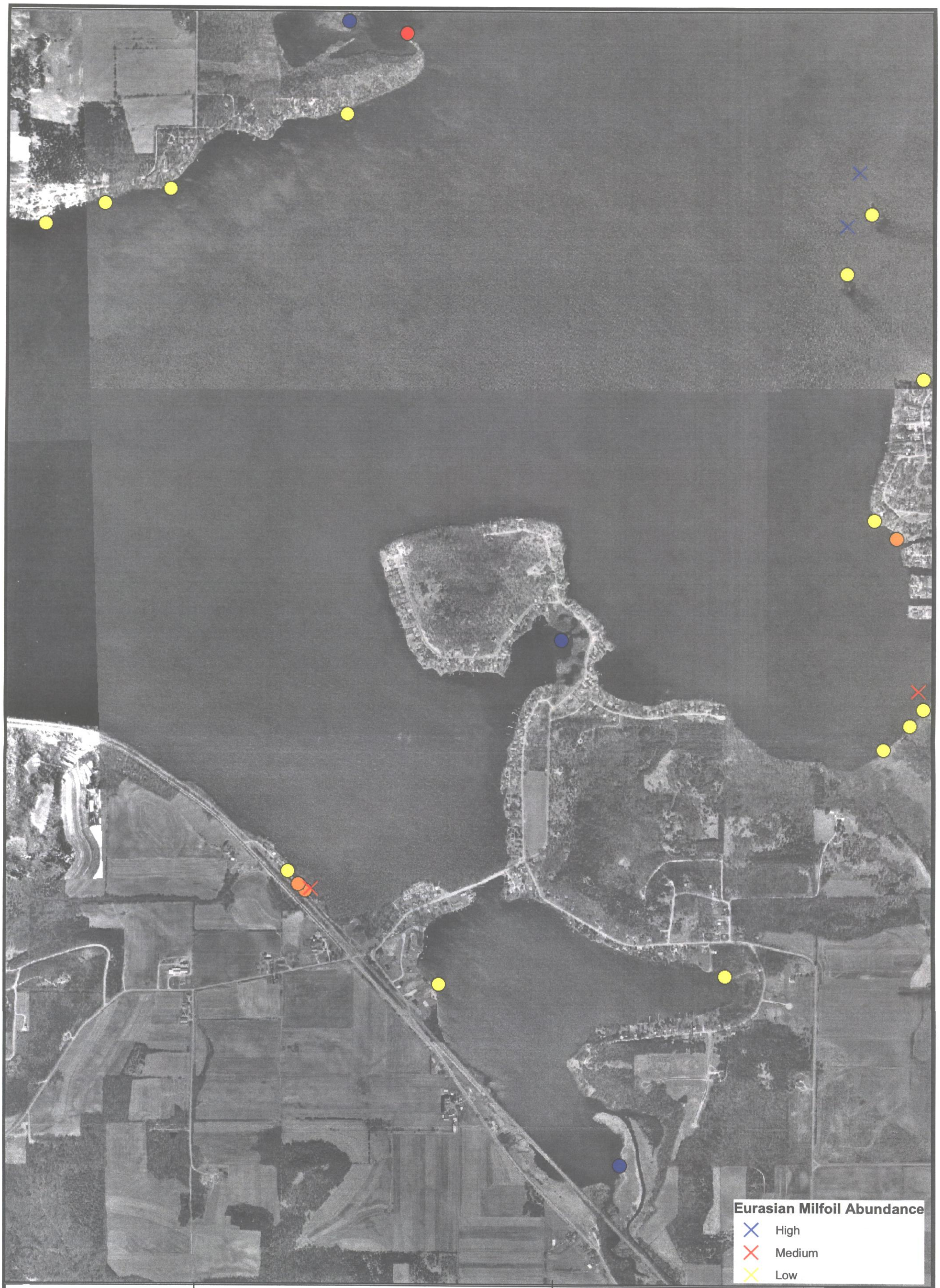
Map Last Updated
September 8, 2004

Purple Loosestrife Stand Size

- 1-5
- 6-25
- 26-100
- 100-500
- 500+
- Non-Surveyed Areas with High Likelihood of Purple Loosestrife Infestation

N

Aerial02.mxd Map Created by S. Tervo



NRC
Natural Resources Consulting, Inc.
119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

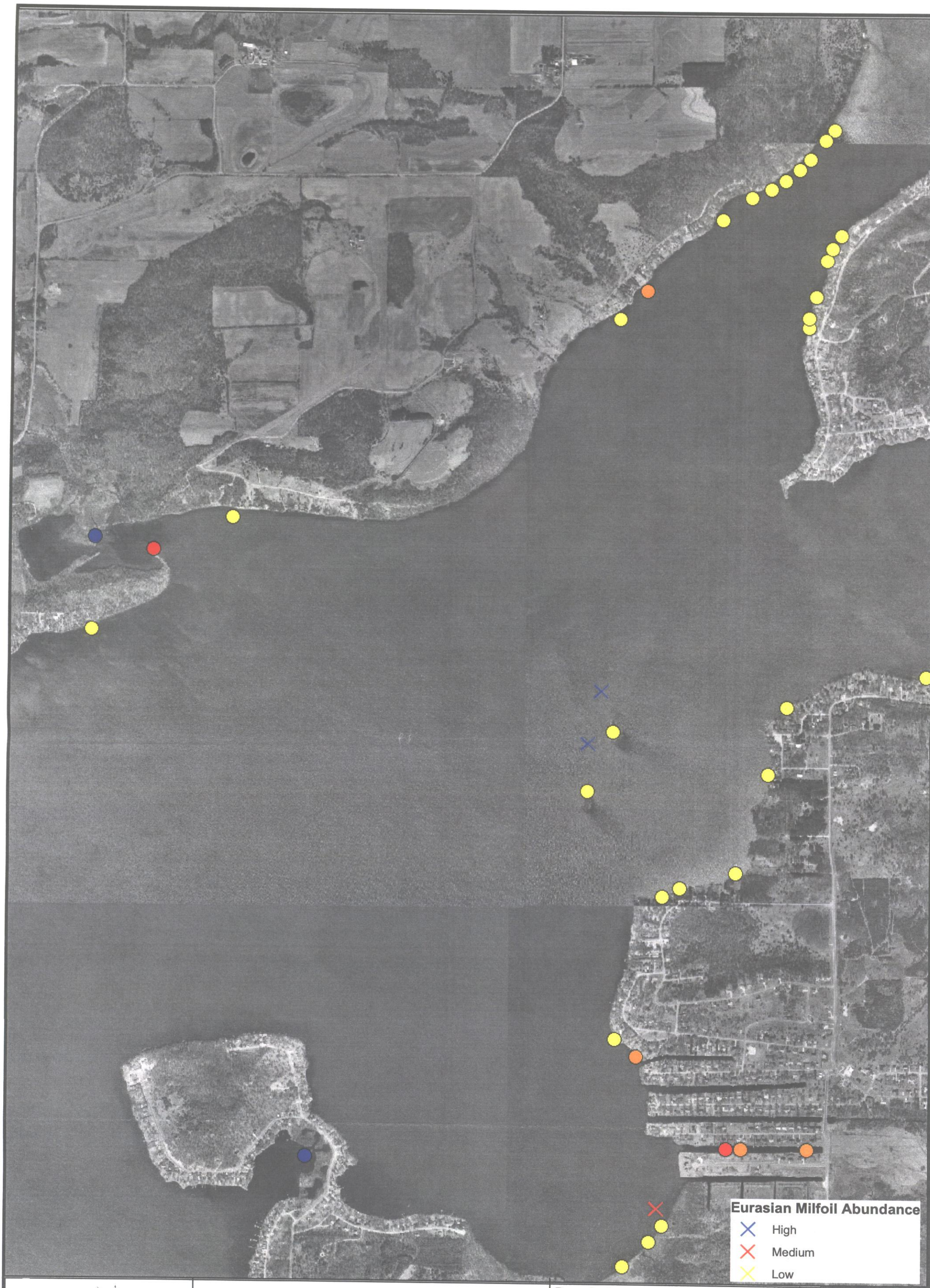
Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

NRC Project Number #: 04-035

Map Last Updated September 8, 2004

Aerial02.mxd Map Created by S. Tervo



NRC
Natural Resources Consulting, Inc.

119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

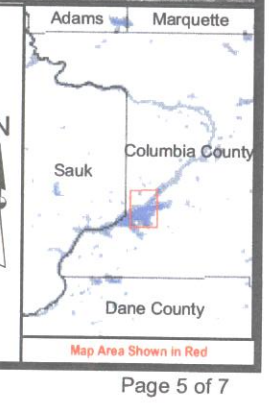
NRC Project Number #: 04-035

Map Last Updated
September 8, 2004

Purple Loosestrife Stand Size

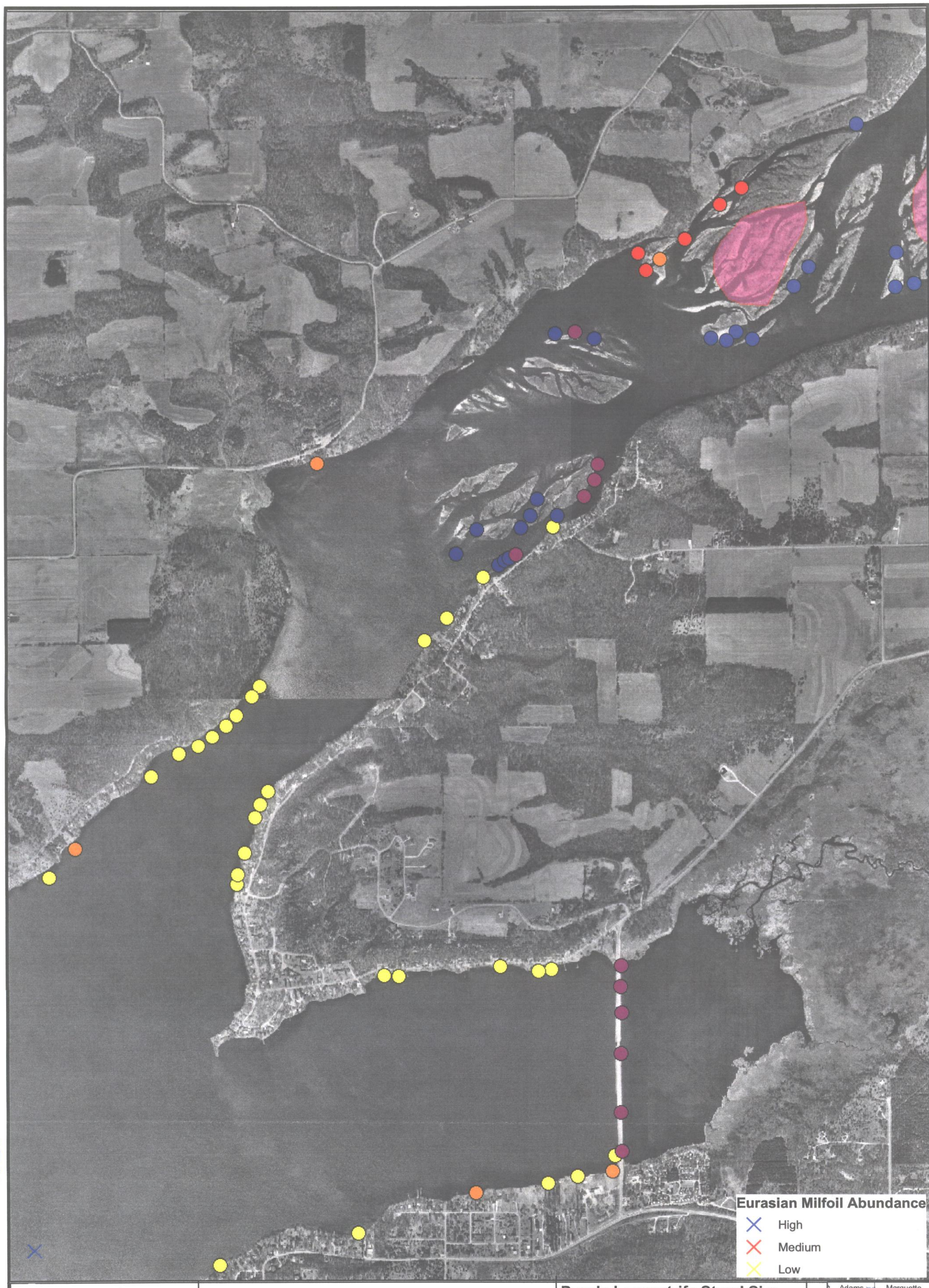
- 1-5
- 6-25
- 26-100
- 100-500
- 500+
- Non-Surveyed Areas with High Likelihood of Purple Loosestrife Infestation

N



Aerial02.mxd Map Created by S. Tervo

050516001—006



NRC
Natural Resources Consulting, Inc.

119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

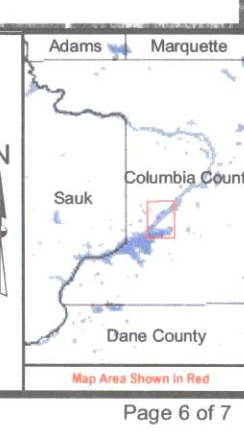
NRC Project Number #: 04-035

Map Last Updated
September 8, 2004

Purple Loosestrife Stand Size

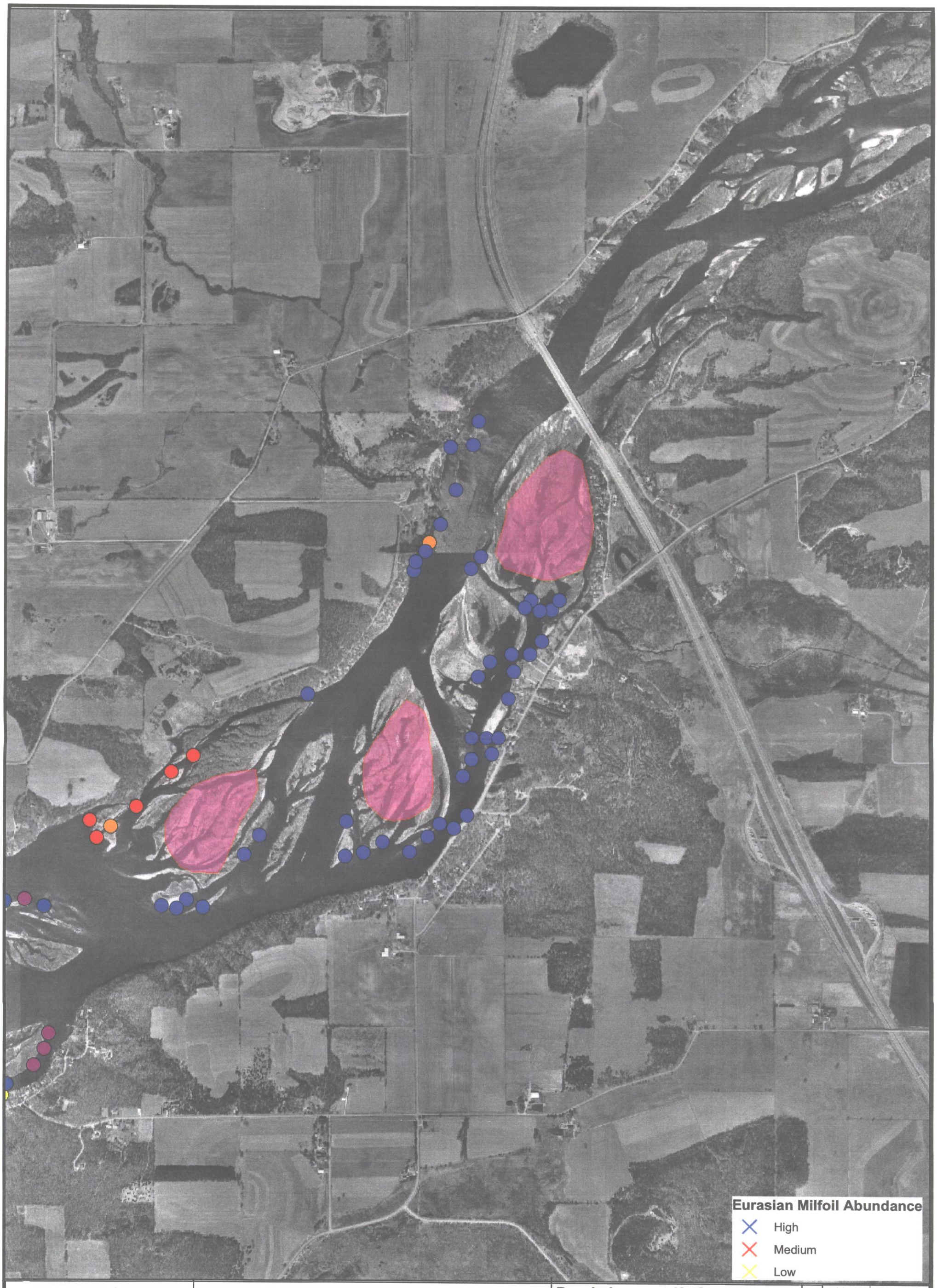
- 1-5
- 6-25
- 26-100
- 100-500
- 500+
- Non-Surveyed Areas with High Likelihood of Purple Loosestrife Infestation

N



Aerial02.mxd Map Created by S. Tervo

05051800160



NRC
Natural Resources Consulting, Inc.
119 South Main Street, Suite D
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995
www.nrc-inc.net

0 650 1,300 Feet

Project Area and Orthophotography

Lake Wisconsin Purple Loosestrife Survey

Lake Wisconsin, Columbia & Sauk Counties, WI

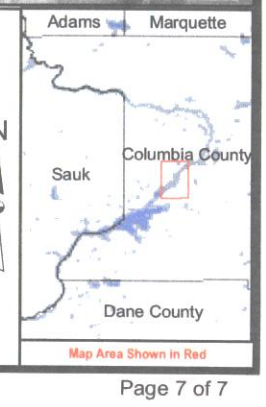
NRC Project Number #: 04-035

Map Last Updated
September 8, 2004

Purple Loosestrife Stand Size

- 1-5
- 6-25
- 26-100
- 100-500
- 500+
- Non-Surveyed Areas with High Likelihood of Purple Loosestrife Infestation

N



Aerial02.mxd Map Created by S. Tervo

050516001600 8

APPENDIX B

GPS COORDINATES

Point ID	Size of Loosestrife Stand	X	Y
1	500+	2124731	516875
2	500+	2125038	517241
3	500+	2125705	517276
4	500+	2125853	517457
5	500+	2125949	517704
6	500+	2126251	517459
7	500+	2126793	520121
8	500+	2126209	520189
9	500+	2124637	518763
10	500+	2124724	518626
11	500+	2125017	518714
12	500+	2124652	519039
13	500+	2124220	519226
14	500+	2124288	519347
15	500+	2124460	519487
16	500+	2124876	519213
17	500+	2125047	519318
18	500+	2125237	519389
19	500+	2125067	519008
20	500+	2125343	519061
21	500+	2125532	519166
22	500+	2125478	519494
23	500+	2125806	519410
24	500+	2126289	519396
25	500+	2126446	519224
26	500+	2126619	519139
27	500+	2126843	519124
28	500+	2127117	519522
29	500+	2126719	519658
30	500+	2126787	519727
31	500+	2126130	520033
32	500+	2127340	519731
33	500+	2127131	519937
34	500+	2127182	520075
35	500+	2124626	517900
36	500+	2124918	518075
37	500+	2125210	518198
38	500+	2125487	518062
39	500+	2125385	517854
40	500+	2125093	517783
41	500+	2124903	517799
42	500+	2124713	517728
43	500+	2124541	517641
44	500+	2127227	518488
45	500+	2130668	523340
46	500+	2129971	521201
47	500+	2129747	520908
48	500+	2129138	520112
49	500+	2128895	520223

50	500+	2128750	520093
51	500+	2128524	520124
52	500+	2131251	520902
53	500+	2131263	521420
54	500+	2131525	520953
55	500+	2131815	521117
56	500+	2132220	520974
57	500+	2132494	521202
58	500+	2132670	521397
59	500+	2132881	521334
60	500+	2133073	521529
61	500+	2133005	522111
62	500+	2133132	522370
63	500+	2133130	522694
64	500+	2133356	522695
65	500+	2133534	522697
66	500+	2133439	522453
67	500+	2133221	523616
68	500+	2133397	523843
69	500+	2133675	523296
70	500+	2133753	523700
71	500+	2133994	523961
72	500+	2133719	523959
73	500+	2134171	524156
74	500+	2134313	524626
75	500+	2134425	524772
76	500+	2134135	524608
77	500+	2134005	524769
78	500+	2133908	524655
79	500+	2133240	525410
80	500+	2133096	525232
81	500+	2132240	525193
82	500+	2132271	525323
83	500+	2132415	525486
84	500+	2132639	525891
85	500+	2132776	527056
86	500+	2132862	526410
87	500+	2133116	527091
88	500+	2133194	527447
89	1-5	2050403	492315
90	6-25	2049725	491402
91	6-25	2049090	490400
92	1-5	2048994	490298
93	1-5	2048244	488951
94	1-5	2053096	493922
95	1-5	2053286	494154
96	1-5	2054065	494931
97	1-5	2059179	495120
98	1-5	2062023	494400
99	1-5	2062275	495302
100	1-5	2062837	495199
101	1-5	2063218	494828

102	500+	2064510	493123
103	1-5	2065814	492721
104	1-5	2066247	492840
105	1-5	2066568	493118
106	500+	2067371	492711
107	1-5	2066748	495074
108	1-5	2066051	495429
109	6-25	2065779	495657
110	1-5	2067847	496688
111	1-5	2069404	498106
112	6-25	2069719	498234
113	1-5	2078575	495868
114	1-5	2080844	494212
115	500+	2083563	491524
116	1-5	2085095	494363
117	500+	2082629	499358
118	1-5	2073057	505198
119	1-5	2069840	501694
120	1-5	2067170	500136
121	1-5	2065013	499251
122	1-5	2064316	499319
123	1-5	2062510	498461
124	1-5	2061427	497298
125	1-5	2060839	496849
126	1-5	2060501	496785
127	6-25	2059883	496675
128	6-25	2059693	496664
129	6-25	2059337	496614
130	6-25	2058999	496616
131	1-5	2057313	497128
132	1-5	2056850	497914
133	1-5	2056107	500125
134	1-5	2055918	499550
135	6-25	2050758	496075
136	1-5	2050546	496226
137	26-100	2048975	495716
138	1-5	2050188	495370
139	1-5	2050386	495627
140	1-5	2050751	495747
141	1-5	2051876	495540
142	1-5	2051669	494134
143	1-5	2051563	493972
144	1-5	2051158	493373
145	1-5	2050691	492765
146	1-5	2087405	497768
147	1-5	2087794	498139
148	1-5	2087982	498387
149	1-5	2087238	501197
150	6-25	2087566	500937
151	1-5	2087929	503323
152	1-5	2088191	503462
153	1-5	2089018	503701

154	1-5	2089469	505189
155	1-5	2087155	505789
156	1-5	2086793	504892
157	1-5	2089735	506199
158	1-5	2091791	506694
159	6-25	2093561	507321
160	1-5	2094630	507461
161	1-5	2095071	507574
162	6-25	2095598	507660
163	1-5	2095633	507891
164	1-5	2094678	510681
165	1-5	2094483	510651
166	1-5	2093906	510704
167	1-5	2092391	510559
168	1-5	2092175	510566
169	1-5	2089967	511919
170	1-5	2089977	512055
171	1-5	2090079	512389
172	1-5	2090230	512924
173	1-5	2090304	513112
174	1-5	2090429	513310
175	1-5	2092758	515586
176	1-5	2093099	515924
177	1-5	2093630	516545
178	100-500	2095722	510729
179	100-500	2095707	510421
180	100-500	2095727	510027
181	100-500	2095714	509427
182	100-500	2095720	508537
183	100-500	2095741	507955
184	6-25	2078829	495578
185	6-25	2078759	495638
186	6-25	2078729	495677
187	500+	2124731	516875
188	500+	2125038	517241
189	500+	2125371	516714
190	500+	2125462	516779
191	500+	2125532	516816
192	100-500	2125625	516874
193	500+	2125705	517276
194	500+	2125853	517457
195	500+	2125949	517704
196	1-5	2126188	517299
197	500+	2126251	517459
198	100-500	2126648	517752
199	100-500	2126808	518005
200	100-500	2126862	518228
201	6-25	2132481	525628
202	26-100	2128985	522398
203	26-100	2128654	522146
204	26-100	2128147	521624
205	6-25	2127768	521318

206	26-100	2127563	521153
207	26-100	2127450	521406
208	500+	2126793	520121
209	100-500	2126508	520217
210	500+	2126209	520189
211	6-25	2122651	518227
212	1-5	2121805	514891
213	1-5	2121681	514728
214	1-5	2121453	514444
215	1-5	2121297	514285
216	1-5	2121093	514113
217	1-5	2120884	513977
218	1-5	2120605	513846
219	1-5	2120179	513511
220	6-25	2119067	512425
221	1-5	2118671	511998
222	1-5	2112915	508927
223	500+	2110854	508607
224	26-100	2111727	508430
225	1-5	2110837	507209
226	1-5	2108216	506064
227	1-5	2107252	505829
228	1-5	2106367	505520
229	6-25	2121624	499576
230	6-25	2120652	499569
231	26-100	2120436	499568