

Appendix A – Lake Monona Plant Statistics 2017

Table 1: 2017 Aquatic Plant Community Statistics, Lake Monona, Dane County, WI

Total number of sites visited	813
Total number of sites with vegetation	273
Total number of sites shallower than maximum depth of plants	384
Frequency of occurrence at sites shallower than maximum depth of plants	71.09
Simpson Diversity Index	0.79
Maximum depth of plants (ft)**	15
Number of sites sampled using rake on Rope (R)	166
Number of sites sampled using rake on Pole (P)	343
Average number of all species per site (shallower than max depth)	1.43
Average number of all species per site (veg. sites only)	2.02
Average number of native species per site (shallower than max depth)	0.99
Average number of native species per site (veg. sites only)	1.57
Species Richness	13*
Species Richness (including visuals)	13*
*Filamentous algae is no longer included in species richness by WI DNR	

Table 2: 2017 Aquatic Plant Taxa-Specific Statistics, Lake Monona, Dane County, WI

Species	Frequency of occurrence within vegetated areas (%)	Frequency of occurrence at sites shallower than maximum depth of plants	Relative Frequency (%)	Number of sites where species found	Average Rake Fullness
Eurasian water milfoil	60.44	42.97	29.89	165	1.06
Curly-leaf pondweed	1.10	0.78	0.54	3	1.00
Coontail	60.81	43.23	30.07	166	1.27
Muskgrasses	2.20	1.56	1.09	6	1.00
Elodea, Common waterweed	5.13	3.65	2.54	14	1.00
Water star-grass	6.23	4.43	3.08	17	1.00
Small duckweed	2.20	1.56	1.09	6	1.17
Slender naiad	0.73	0.52	0.36	2	1.00
American lotus	1.47	1.04	0.72	4	2.00
Clasping-leaf pondweed	11.36	8.07	5.62	31	1.00
Flat-stem pondweed	7.33	5.21	3.62	20	1.00
Sago pondweed	15.75	11.20	7.79	43	1.00
Wild celery	27.47	19.53	13.59	75	1.04
Filamentous algae	49.82	35.42	*	136	1.01
*Relative frequency of Filamentous algae is no longer calculated by WI DNR					

Table 3: Historical Floristic Quality Index, Lake Monona, Dane County, WI

Genus	Species	Common Name	Coefficient of Conservatism		
			2008	2011	2017
<i>Ceratophyllum</i>	<i>demersum</i>	Coontail	3	3	3
<i>Chara</i>	<i>sp.</i>	Muskgrass	---	7	7
<i>Elodea</i>	<i>canadensis</i>	Common waterweed	3	3	3
<i>Heteranthera</i>	<i>dubia</i>	Water star-grass	6	6	6
<i>Lemna</i>	<i>minor</i>	Small duckweed	4	4	4
<i>Najas</i>	<i>flexilis</i>	Slender naiad	---	---	6
<i>Nelumbo</i>	<i>lutea</i>	American lotus	7	7	7
<i>Potamogeton</i>	<i>foliosus</i>	Leafy pondweed	6	---	---
<i>Potamogeton</i>	<i>richardsonii</i>	Clasping-leaf pondweed	5	5	5
<i>Potamogeton</i>	<i>zosteriformis</i>	Flat-stem pondweed	---	6	6
<i>Ranunculus</i>	<i>aquatillis</i>	White water crowfoot	8	8	---
<i>Spirodela</i>	<i>polyrhiza</i>	Large duckweed	5	---	---
<i>Stuckenia</i>	<i>pectinata</i>	Sago pondweed	3	---	3
<i>Vallisneria</i>	<i>americana</i>	Wild celery	6	6	6
<i>Zannichellia</i>	<i>palustris</i>	Horned pondweed	---	7	---
Total Species			11	11	11
Mean C			5.09	5.64	5.09
Floristic Quality Index (FQI)			16.88	18.69	16.88

Please note: There is no Coefficient of Conservatism for exotic species such as Eurasian water-milfoil or for species not identified to the species level (*Sagittaria sp.*).

Coefficient of Conservatism C

- 0-3 taxa found in wide variety of plant communities and very tolerant of disturbance.
- 4-6 taxa typically associated with specific plant communities and tolerate moderate disturbance.
- 7-8 taxa found in narrow range of plant communities and tolerate minor disturbance.
- 9-10 taxa restricted to a narrow range of synecological conditions, with low tolerance of disturbance.

Table 4: Historical Aquatic Plant Community Statistics, Lake Monona, Dane County, Wisconsin

	2008	2011	2017
F.o.o. at sites shallower than maximum depth of plants	80.53	74.01	71.09
Most Dominant Species *	Eurasian Water-milfoil	Coontail	Coontail
	Filamentous Algae	Eurasian Water-milfoil	Eurasian Water-milfoil
	Coontail	Wild Celery	Filamentous Algae
	Sago Pondweed	Filamentous Algae	Wild Celery
	Small Duckweed	Small Duckweed	Sago Pondweed
Maximum Depth of Plants	14	11	15
Species Richness	14	14	14
Community FQI	16.88	18.69	16.88
Average Coefficient of Conservatism	5.09	5.64	5.09

* - Based on number of sample points collected at. Visual observations are included.

Table 5: Historical Aquatic Plant Occurrences, Lake Monona, Dane County, WI

Genus	Species	Common Name	% Relative F.o.o.		
			2008	2011	2017
<i>Algae</i>	<i>sp.</i>	Filamentous algae	35.8	8.0	**
<i>Ceratophyllum</i>	<i>demersum</i>	Coontail	19.8	34.9	30.1
<i>Chara</i>	<i>sp.</i>	Muskgrass	---	0.2	1.1
<i>Elodea</i>	<i>canadensis</i>	Common waterweed	0.2	1.1	2.5
<i>Heteranthera</i>	<i>dubia</i>	Water star-grass	0.3	0.8	3.1
<i>Lemna</i>	<i>minor</i>	Small duckweed	0*	0.2	1.1
<i>Myriophyllum</i>	<i>spicatum</i>	Eurasian watermilfoil	35.3	30.4	29.9
<i>Najas</i>	<i>flexillis</i>	Slender Naiad	---	---	0.4
<i>Nelumbo</i>	<i>lutea</i>	American lotus	0.2	0.2	0.7
<i>Potamogeton</i>	<i>crispus</i>	Curly-leaf pondweed	0.6	0.8	0.5
<i>Potamogeton</i>	<i>foliosus</i>	Leafy pondweed	1.1	---	---
<i>Potamogeton</i>	<i>richardsonii</i>	Clasping-leaf pondweed	1.9	5.3	5.6
<i>Potamogeton</i>	<i>zosteriformis</i>	Flat-stem pondweed	---	1.5	3.6
<i>Ranunculus</i>	<i>aquatillis</i>	White water crowfoot	0.2	0.2	---
<i>Spirodela</i>	<i>polyrhiza</i>	Large duckweed	0*	---	---
<i>Stuckenia</i>	<i>pectinata</i>	Sago pondweed	2.7	---	7.8
<i>Vallisneria</i>	<i>americana</i>	Wild celery	1.8	9.1	13.6
<i>Zannichellia</i>	<i>palustris</i>	Horned pondweed	---	7.2	---

0* - Species was sampled visually only, statistical data was not produced.

** - F.O.O. no longer calculated by WI DNR

Appendix B – Monona Bay Plant Statistics

Table 6: 2017 Aquatic Plant Community Statistics, Monona Bay, Dane County, WI

	Main Bay	North Bay
Total number of sites visited	246	45
Total number of sites with vegetation	234	36
Total number of sites shallower than maximum depth of plants	246	45
Frequency of occurrence at sites shallower than maximum depth of plants	95.12	80
Simpson Diversity Index	0.52	0.63
Maximum depth of plants (ft)**	15	12
Average number of all species per site (shallower than max depth)	1.66	1.56
Average number of all species per site (veg. sites only)	1.75	1.94
Average number of native species per site (shallower than max depth)	0.78	1.04
Average number of native species per site (veg. sites only)	1.03	1.38
Species Richness	7*	4*
Species Richness (including visuals)	7*	4*
*Filamentous algae is no longer included in species richness by WI DNR		

Table 7: Historical Aquatic Plant Community Statistics, Monona Bay, Dane County, Wisconsin.

	N. Bay - 2011	N. Bay - 2017	Main Bay – 2008	Main Bay - 2011	Main Bay – 2017
F.o.o. at sites shallower than maximum depth of plants	48.65	80.00	35.69	12.72	95.12
Most Dominant Species	Coontail	Coontail	Coontail	Coontail	Eurasian Watermilfoil
	Common Waterweed	Eurasian Water-milfoil	Eurasian Water-milfoil	Eurasian Watermilfoil	Coontail
	Eurasian Water-milfoil	Filamentous Algae	Filamentous Algae	Sago Pondweed	Filamentous algae
	Curly-leaf Pondweed	Flatstem Pondweed	Sago Pondweed	Horned Pondweed	Sago Pondweed
	Horned Pondweed	Common waterweed	Leafy Pondweed	Small Pondweed	Curly-leaf Pondweed
Maximum Depth of Plants	8	12	12	7	15
Species Richness	5	8	5	5	8
Community FQI	7.51	4	6.93	10.00	10.29
Average Coefficient of Conservatism	4.33	6.93	4.00	5.00	4.6

Table 8: 2017 Aquatic Plant Taxa-Specific Statistics, Monona Bay, Dane County, WI

Location	Species	Frequency of occurrence within vegetated areas (%)	Frequency of occurrence at sites shallower than maximum depth of plants	Relative Frequency (%)	Number of sites where species found	Average Rake Fullness
Main Bay	Eurasian water milfoil	91.45	86.99	52.32	214.00	1.51
	Curly-leaf pondweed	1.28	1.22	0.73	3.00	1.00
	Coontail	79.06	75.20	45.23	185.00	1.23
	White water lily	0.43	0.41	0.24	1.00	1.00
	Clasping-leaf pondweed	0.43	0.41	0.24	1.00	1.00
	Flat-stem pondweed	0.43	0.41	0.24	1.00	1.00
	Sago pondweed	1.71	1.63	0.98	4.00	1.00
	Filamentous algae	69.23	65.85		162.00	1.01
North Bay	Eurasian water milfoil	63.89	51.11	32.86	23.00	1.04
	Coontail	94.44	75.56	48.57	34.00	1.47
	Common waterweed	8.33	6.67	4.29	3.00	1.00
	Flat-stem pondweed	27.78	22.22	14.29	10.00	1.10
	Filamentous algae	33.33	26.67	*	12.00	1.00
*Relative frequency of Filamentous algae is no longer calculated by WI DNR						

Table 9: Historical Floristic Quality Index, Monona Bay, Dane County, WI

Genus	Species	Common Name	N. Bay – 2011	N. Bay – 2017	Main Bay – 2008	Main Bay – 2011	Main Bay – 2017
<i>Ceratophyllum</i>	<i>demersum</i>	Coontail	3	3	3	3	3
<i>Elodea</i>	<i>canadensis</i>	Common waterweed	3	3	---	---	---
<i>Nymphaea</i>	<i>ordata</i>	White water lily	---	---	---	---	6
<i>Potamogeton</i>	<i>foliosus</i>	Leafy pondweed	---	---	6	---	---
<i>Potamogeton</i>	<i>pusillus</i>	Small pondweed	---	---	---	7	---
<i>Potamogeton</i>	<i>richardsonii</i>	Clasping-leaf pondweed	---	---	---	---	5
<i>Potamogeton</i>	<i>zosteriformis</i>	Flatstem pondweed	---	6	---	---	6
<i>Stuckenia</i>	<i>pectinata</i>	Sago pondweed	---	---	3	3	3
<i>Zannichellia</i>	<i>palustris</i>	Horned pondweed	7	---	---	7	---
Total Species			3	5	3	4	8
Mean C			4.33	4.00	4.00	5.00	4.6
Floristic Quality Index (FQI)			7.51	6.93	6.93	10.00	10.29

Please note: There is no Coefficient of Conservatism for exotic species such as Eurasian Water-milfoil or for species not identified to the species level (*Sagittaria* sp.).

Coefficient of Conservatism C

0-3 taxa found in wide variety of plant communities and very tolerant of disturbance.

4-6 taxa typically associated with specific plant communities and tolerate moderate disturbance.

7-8 taxa found in narrow range of plant communities and tolerate minor disturbance.

9-10 taxa restricted to a narrow range of synecological conditions, with low tolerance of disturbance.

Table 10: Historical Aquatic Plant Occurrences, Monona Bay, WI

Genus	Species	Common Name	% Relative Frequency of Occurrence				
			N. Bay – 2011	N. Bay – 2017	Main Bay – 2008	Main Bay – 2011	Main Bay – 2017
<i>Algae</i>	<i>sp.</i>	Filamentous Algae	---	**	9.4	---	**
<i>Ceratophyllum</i>	<i>demersum</i>	Coontail	55.6	48.6	60.4	32.6	75.2
<i>Elodea</i>	<i>canadensis</i>	Common waterweed	18.5	4.3	---	---	---
<i>Nymphaea</i>	<i>ordata</i>	White water lily	---	---	---	---	0.2
<i>Myriophyllum</i>	<i>spicatum</i>	Eurasian watermilfoil	14.8	32.9	27.3	27.9	52.3
<i>Potamogeton</i>	<i>crispus</i>	Curly-leaf pondweed	7.4	---	--	---	1.22
<i>Potamogeton</i>	<i>foliosus</i>	Leafy pondweed	---	---	1.4	---	---
<i>Potamogeton</i>	<i>pusillus</i>	Small pondweed	---	---	---	7.0	---
<i>Potamogeton</i>	<i>richardsonii</i>	Clasping-leaf pondweed	---	---	---	---	0.41
<i>Potamogeton</i>	<i>zosteriformis</i>	Flatstem pondweed	---	14.3	---	---	.2
<i>Stuckenia</i>	<i>pectinata</i>	Sago pondweed	---	---	1.4	23.3	1.0
<i>Zannichellia</i>	<i>palustris</i>	Horned pondweed	3.7	---	---	9.3	---

** - F.O.O. no longer calculated by WI DNR

Appendix C – Aquatic Invasive Species

Wisconsin Invasive Species Laws

Inspect your boat, trailer and equipment.

Remove any attached aquatic plants or animals (before launching, after loading & before transporting on a public highway)

Never Move live fish away from a waterbody.* Fish out of water are not considered live. Transport on ice is legal and recommended.

Buy minnows from a Wisconsin bait dealer and use leftover minnows only under certain conditions. *

*You may take leftover minnows purchased from a Wisconsin bait dealer away from any state water and use them again on that same water. You may use leftover minnows on other waters only if no lake or river water, or other fish were added to their container. See fishingwisconsin.org for more information.

Minnows

You may take live minnows purchased from a Wisconsin bait dealer (which includes Wisconsin registered fish farms) away from a waterbody if any of the following three conditions are met:

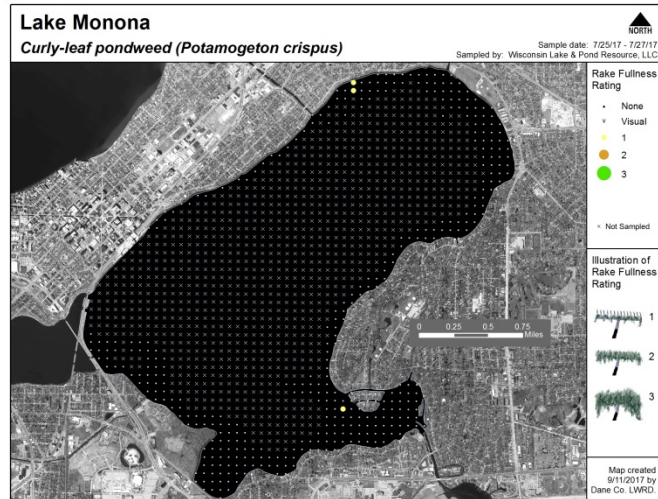
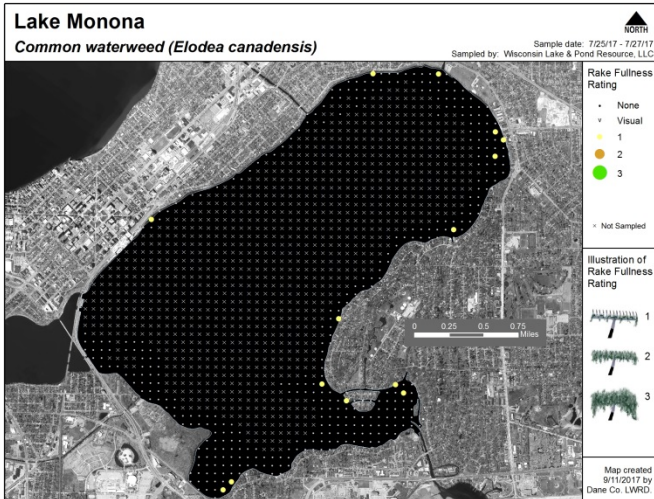
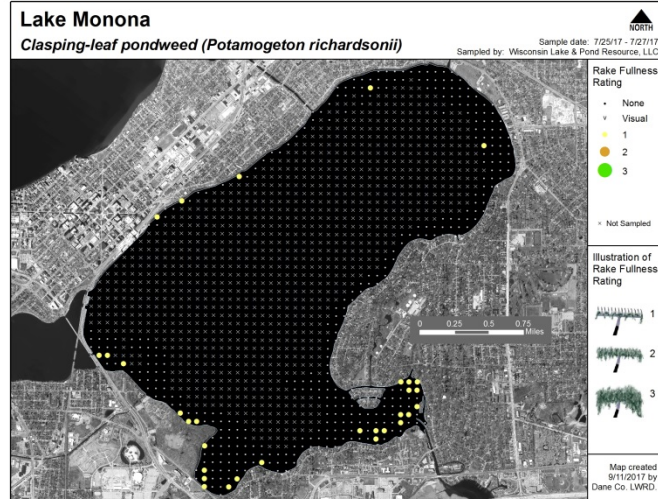
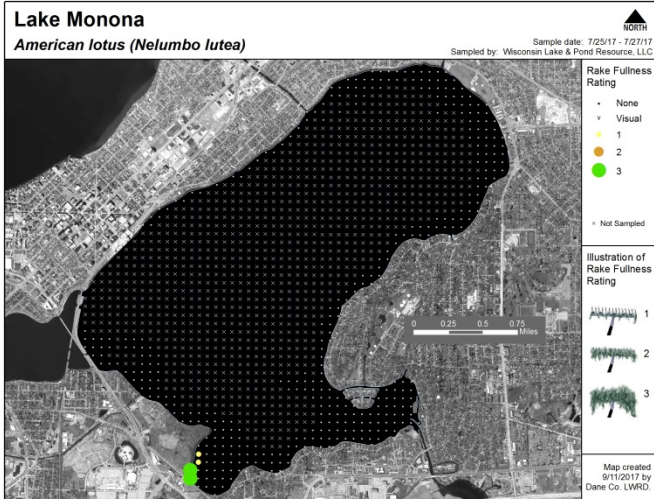
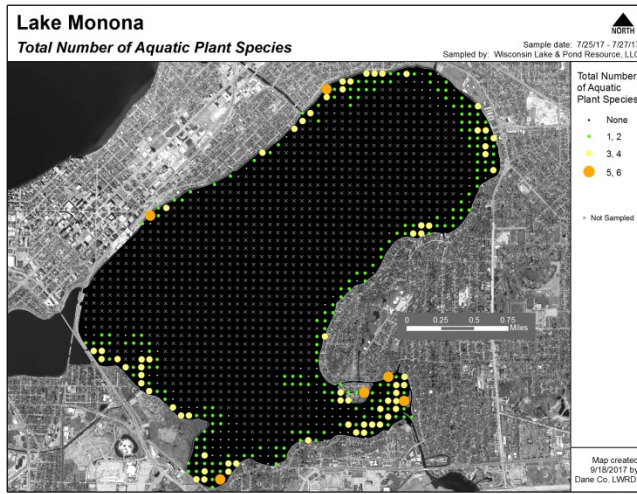
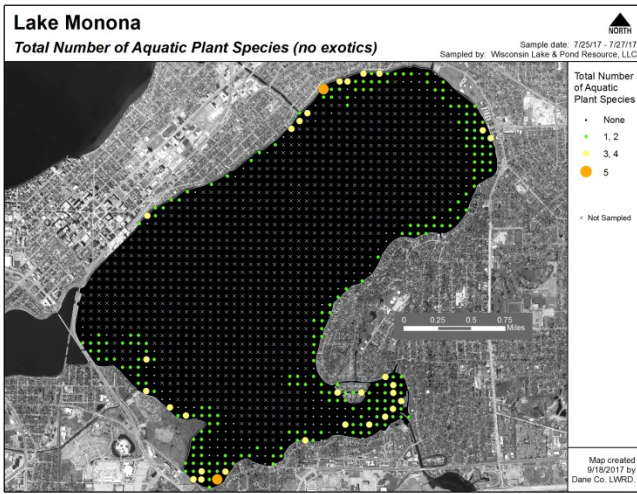
- Anglers can take purchased minnows away from a lake and use them again on that same waterbody.
- Anglers can also take purchased minnows away from a waterbody and use them elsewhere if no lake or river water or other fish were added to the bait container.
- Anglers can also take purchased minnows away from a waterbody for use elsewhere if they intend to preserve them as dead bait using approved methods.

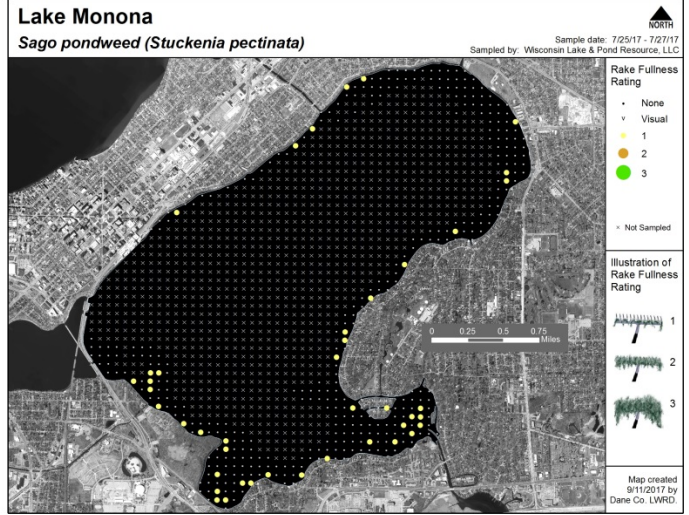
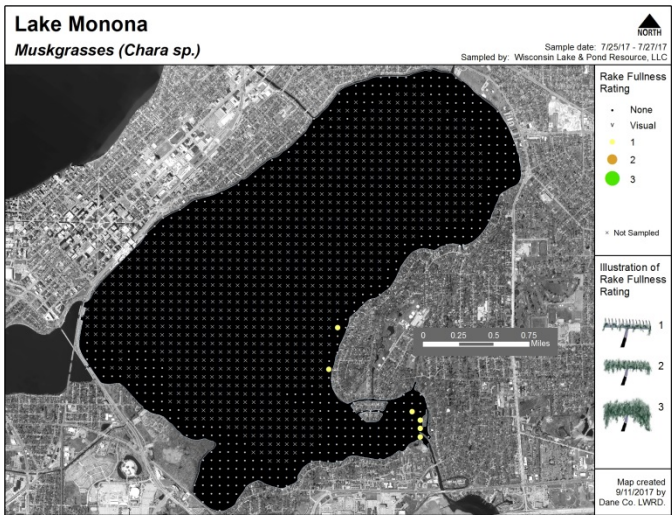
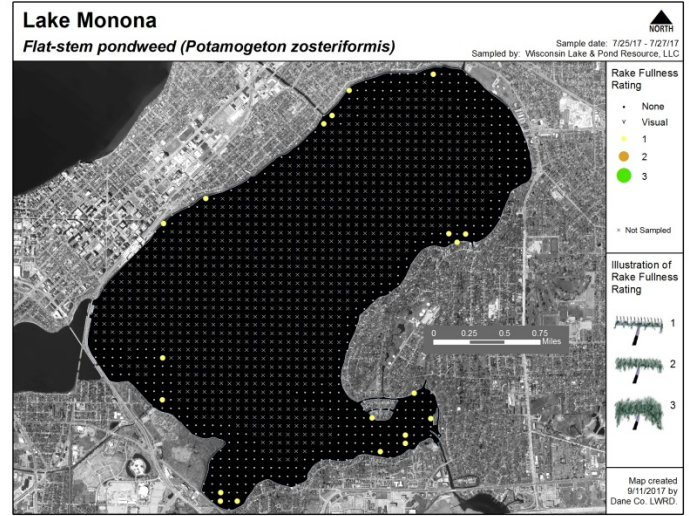
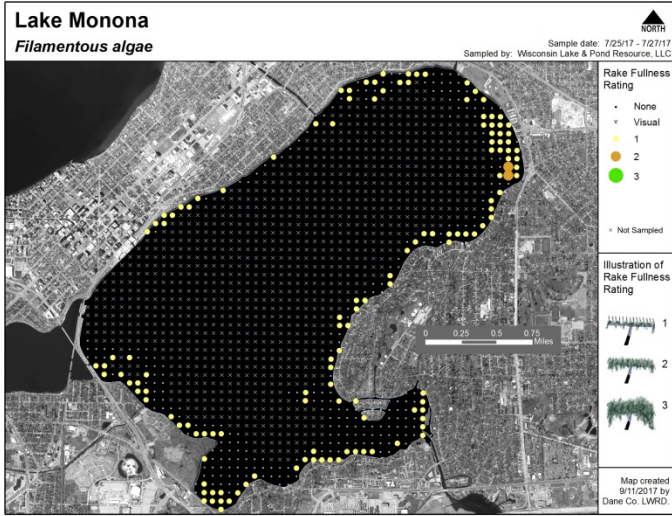
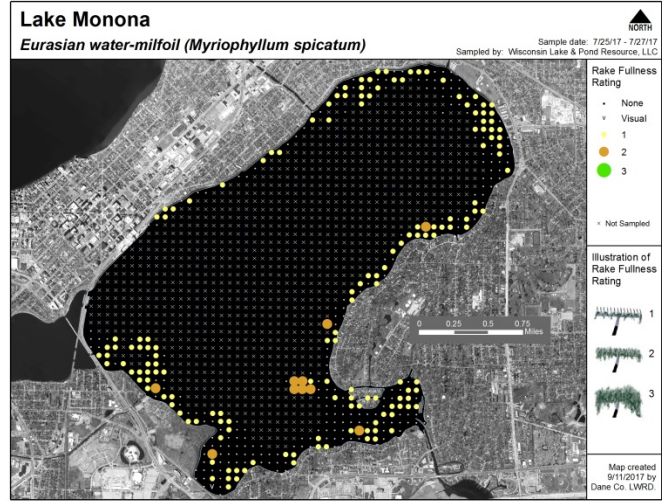
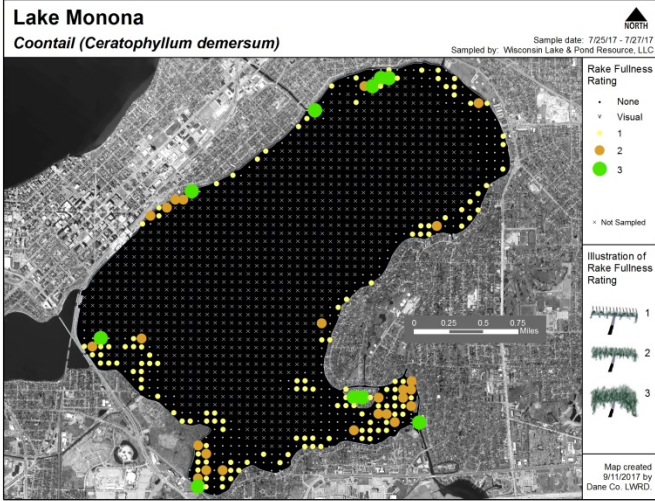
In each of these cases minnows may be transported in the amount of water needed to keep the minnows alive, up to 2 gallons. No other fish may be held in the minnow container.

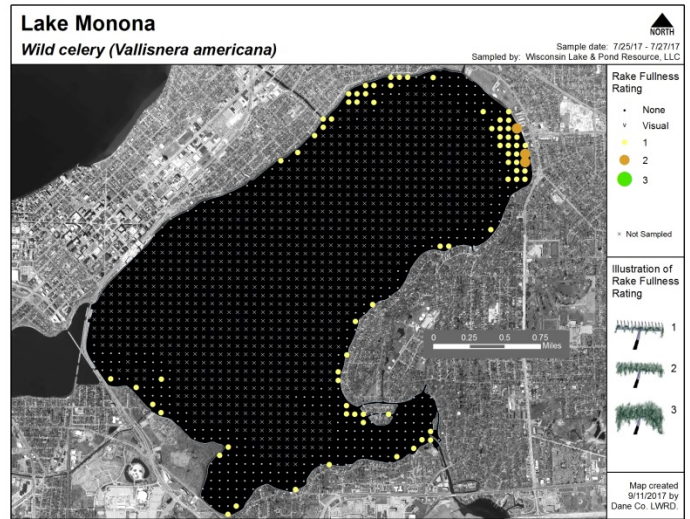
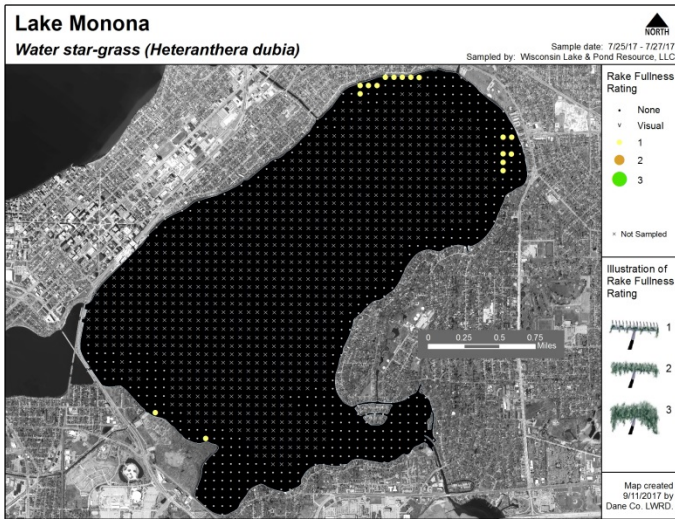
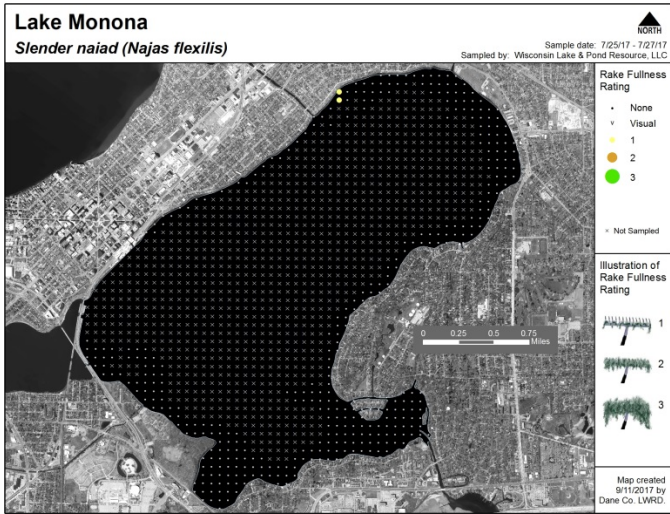
Additional Dane County Prevention Steps

- Dane County staff will remove all vegetation, mud, and other debris that is accessible from the machines before moving them away from any waterbody. (Machines include boats, harvestors, barges, and elevators)
- Dane County staff will remove the machines from a waterbody for a minimum of five dry days before moving them to another waterbody.
- When it is not possible to wait for 5 days Dane County staff will use a 2% Virkon solution mixed no more than seven days prior to application and allowing 10 minutes of contact time before rinsing with hot water to disinfect the machines before moving to another waterbody.
- Dane County staff will try to plan to move only downstream when working in the Yahara river chain as an added layer of protection
- Per Wisconsin DNR protocol found here: <http://dnr.wi.gov/topic/Invasives/disinfection.html>

Appendix D – Mapped Plant Distributions for Lake Monona







Appendix E – Mapped Plant Distributions for Monona Bay

