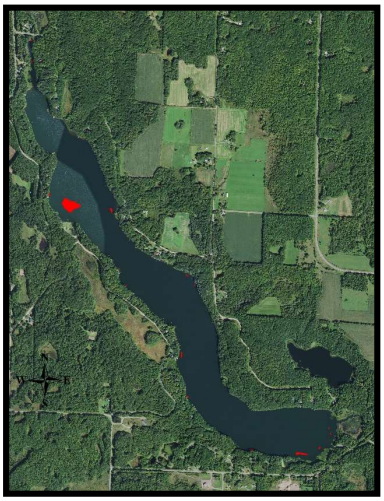
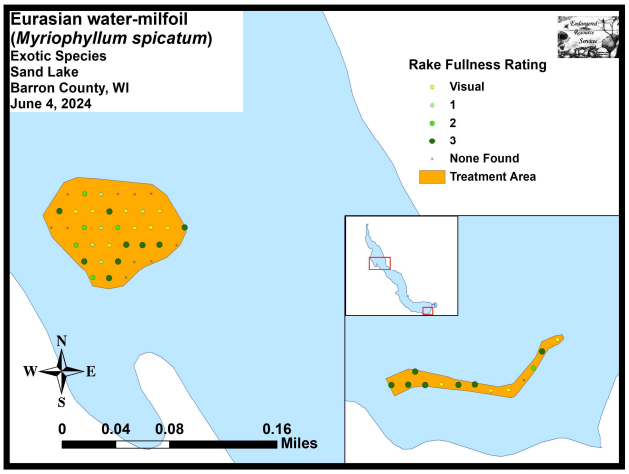
Eurasian water-milfoil (*Myriophyllum spicatum*) Pre/Posttreatment Surveys
Sand Lake (WBIC: 2661100)
Barron County, Wisconsin



Sand Lake Eurasian water-milfoil beds 9/4/23

Dense Eurasian water-milfoil in the southeast bay 6/4/24

Project Initiated by:
The Sand Lake Management District, Harmony Environmental, and the Wisconsin Department of Natural Resources



Pretreatment Eurasian water-milfoil density and distribution – 6/4/24

Surveys Conducted by and Report Prepared by:
Endangered Resource Services, LLC
Matthew S. Berg, Research Biologist
St. Croix Falls, Wisconsin
June 4, 2024 and June 11, 2025

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INTRODUCTION:

Sand Lake (WBIC 2661100) is a 322-acre drainage lake in northwestern Barron County, Wisconsin in the Town of Maple Plain (T36N R14W S17/20/21/28). It reaches a maximum depth of 57ft in the south basin and has an average depth of approximately 30ft Figure 1). Sand Lake is mesotrophic bordering on oligotrophic in nature with summer Secchi readings over the last ten years averaging 12.7ft (WDNR 2024). This good to very good water clarity produced a littoral zone that extended to at least 18ft in 2024. The bottom substrate is predominately sand and sandy muck with scattered gravel primarily along the shoreline. Some areas of thick organic muck occur in bays on the west side of the lake and at the far north and south ends (Miller et al. 1965).

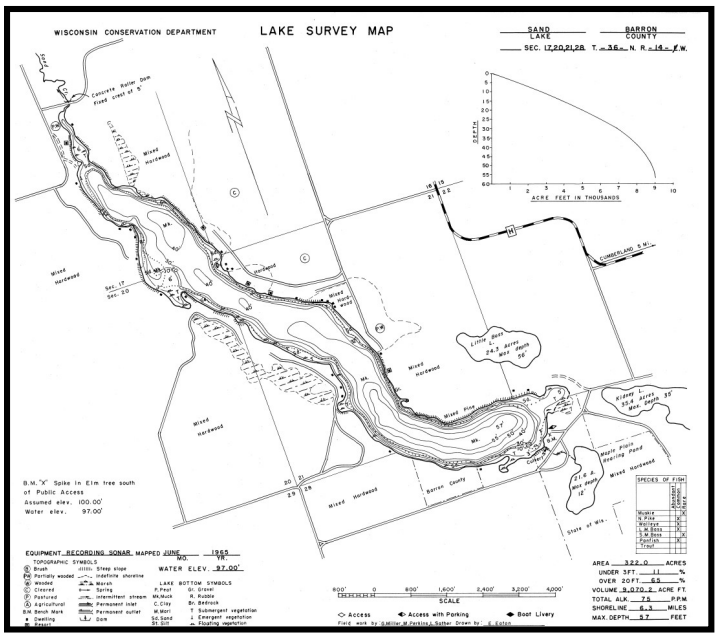


Figure 1: Sand Lake Bathymetric Map

BACKGROUND AND STUDY RATIONALE:

Eurasian water-milfoil (*Myriophyllum spicatum*) (EWM) is an invasive exotic plant species that was first discovered in Sand Lake in 2002. Since that time, the Sand Lake Management District (SLMD) has engaged in active management using herbicides and manual removal as outlined in their Wisconsin Department of Natural Resources (WDNR) approved Aquatic Plant Management Plan (APMP). Following the highly successful 2021 ProcellaCor treatment on the lake which reduced EWM to almost undetectable levels, manual removal was the only active management that occurred in 2022 and 2023. Because of this, EWM bed mapping was also the only formal survey requested in 2022 and 2023. After the 2023 bed mapping survey documented an uptick in EWM, the SLMD, under the direction of Harmony Environmental (Cheryl Clemens) (HE), decided to treat two areas totaling 4.63 acres with ProcellaCor in 2024. Prior to the planned herbicide application, we conducted a pretreatment survey on June 4, 2024 to determine initial EWM levels and finalize treatment areas. Following the June 10, 2024 treatment, we were asked to return to the lake on June 11, 2025 to determine the year-over-year impacts of the treatment. This report is the summary analysis of those surveys.

METHODS:

Pre/Post Herbicide Surveys:

The SLMD and HE provided area shapefiles, and we generated pre/post survey points based on the size and shape of the proposed treatment areas. Within the two treatment areas, we created offset points at 20m resolution to form a 50-point sampling grid that extrapolated to more than 10pts/acre. Although more than the 4-10pts/acre required by WDNR protocol for pre/post treatment surveys, this higher effort level was requested to improve the statistical validity when sampling in such a small area (Appendix I). (Appendix I).

These points were uploaded to a handheld mapping GPS (Garmin 76CSx) and located on the lake. At each point, we recorded the depth and bottom substrate and used a rake to sample an approximately 2.5ft section of the bottom. EWM was assigned a rake fullness value of 1-3 as an estimation of abundance (Figure 2), and we also recorded visual sightings of EWM within six feet of the sample point. Because visual sightings are not calculated into the pre/post statistical formulas, we only assigned a rake fullness value for non-EWM plants. A cumulative rake fullness value was also noted.

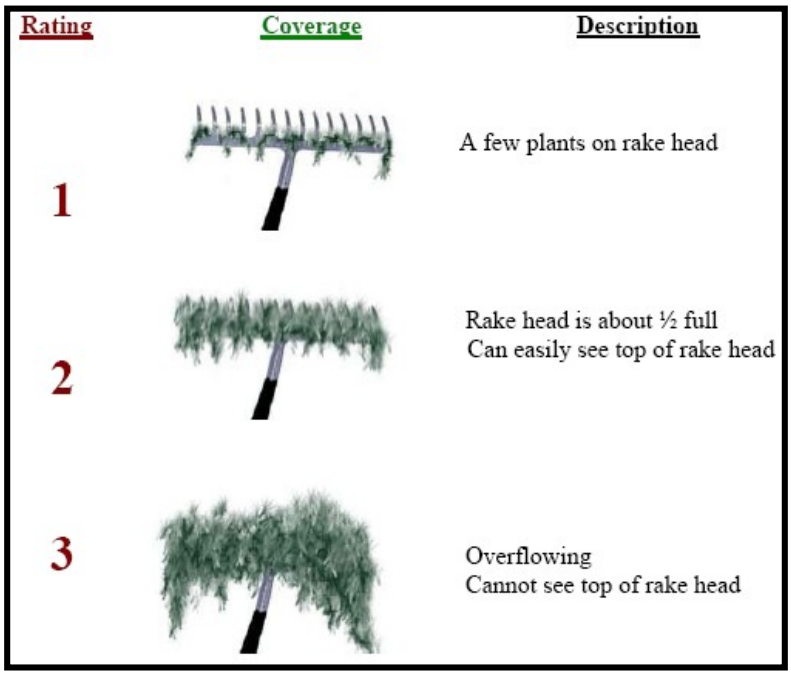


Figure 2: Rake Fullness Ratings

We entered all data collected into the standard WDNR aquatic plant management spreadsheet (Appendix II). Data was analyzed using the linked statistical summary sheet and the WDNR pre/post analysis worksheet (UWEX 2010). For pre/post differences of individual plant species as well as count data, we used the Chi-square analysis on the WDNR pre/post survey worksheet. For comparing averages (mean species/point and mean rake fullness/point), we used t-tests. Differences were determined to be significant at $p<0.05$, moderately significant at $p<0.01$ and highly significant at $p<0.001$.

RESULTS AND DISCUSSION:

Finalization of Treatment Areas:

The two management areas totaling 4.63 acres (1.44% of the lake's total surface area) were selected after analyzing the late-summer 2023 bed mapping survey which showed they had the highest levels of EWM anywhere on the lake (Figure 3) (Appendix I). After the pretreatment survey again found high levels of Eurasian water-milfoil throughout both areas, the SLMD decided to continue with treatment as initially proposed. Treatment occurred on June 10th with Northern Aquatic Services (Dale Dressel - Dresser, WI) applying ProcellaCor at a rate of 4-6 pdu/acre ft. (160.8 total pdus – at 3.17 fl. oz./pdu) (Table 1). At the time of treatment, the reported water temperature was 65°F and the air temperature was 63°F. Variable winds were clocked at 1-3mph.

Table 1: Spring Eurasian Water-milfoil Treatment Summary
Sand Lake – Barron County, WI
June 10, 2024

Bed Number	Final Treatment Area (acres)	Chemical, Rate, and Total Volume
4A	3.84	ProcellaCor – 4pdu – 122.9pdu
19A	0.79	ProcellaCor – 6pdu – 37.9pdu
Total	**4.63**	**ProcellaCor – 4-6pdu– 160.8pdu**

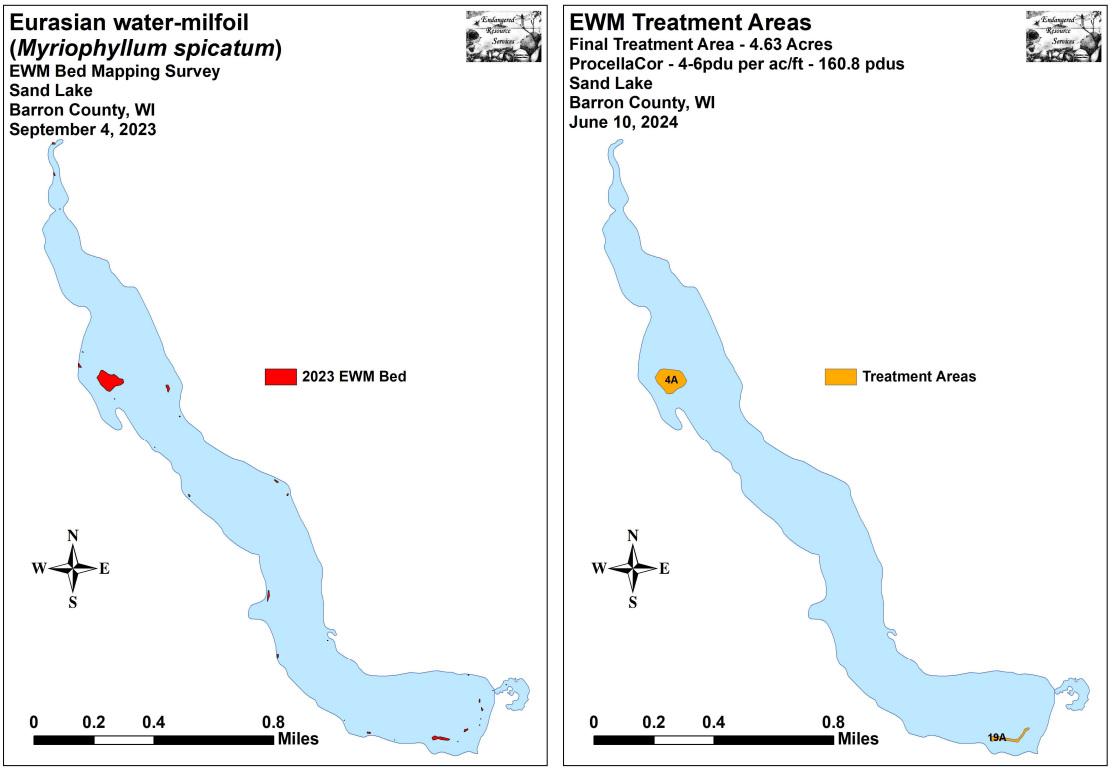


Figure 3: Late Summer 2023 EWM Bed Map and 2024 Treatment Areas

Eurasian Water-milfoil Pre/Post Herbicide Surveys:

All survey points occurred in areas between 7.5ft and 22.5ft of water (Figure 4). Within the beds, plants grew at a mean of 9.8ft and a median of 9.0ft during the pretreatment survey (Table 2). Posttreatment, both the mean (9.6ft) and the median (8.5ft) declined slightly. Most Eurasian water-milfoil beds were established over nutrient-poor sandy muck, although we also found some growing in pure sand; albeit usually at lower densities (Figure 4) (Appendix III).

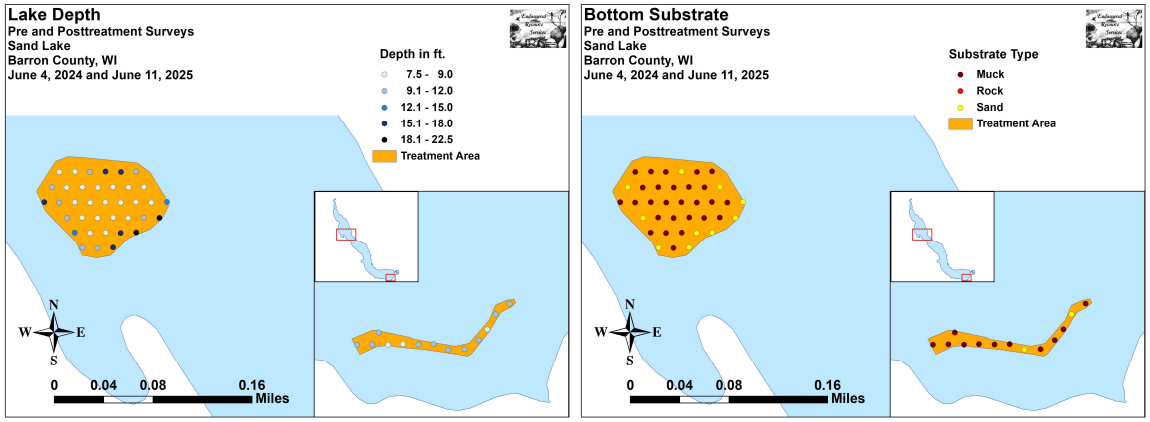


Figure 4: Treatment Area Depths and Bottom Substrate

Pretreatment, we found 47 points (94.0%) fell within the 17.0ft littoral zone. During the posttreatment survey, this zone declined to 16.5ft but still included 47 points. The overall frequency of plant occurrence was also unchanged at 46 points both pre and posttreatment (97.9% littoral coverage) (Figure 5) (Appendix IV).

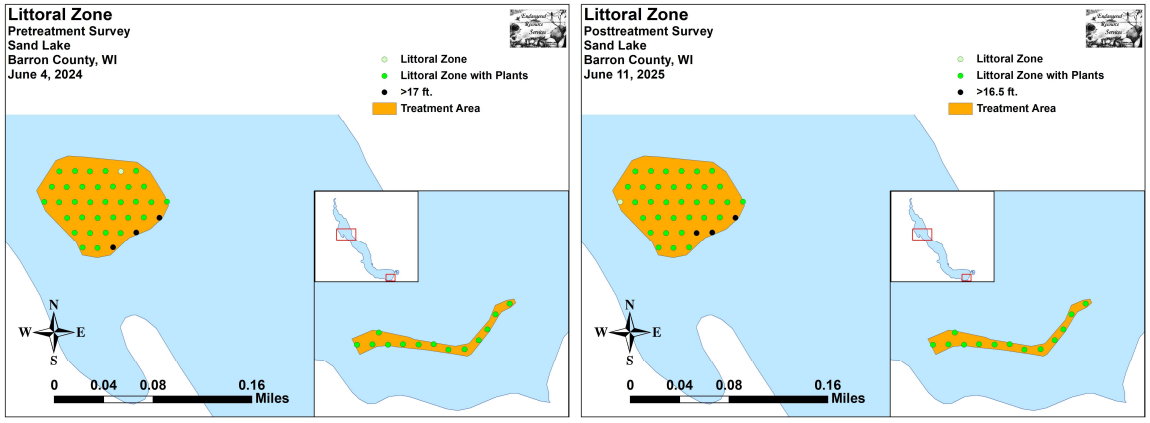


Figure 5: Pre/Posttreatment Littoral Zone

Table 2: Pre/Posttreatment Surveys Summary Statistics
Sand Lake - Barron County, Wisconsin
June 4, 2024 and June 11, 2025

Summary Statistics:	Pre	Post
Total number of points sampled	50	50
Total number of sites with vegetation	46	46
Total number of sites shallower than the maximum depth of plants	47	47
Freq. of occur. at sites shallower than max. depth of plants (in percent)	97.9	97.9
Simpson Diversity Index	0.86	0.86
Mean Coefficient of Conservatism	6.2	5.9
Floristic Quality Index	23.3	23.0
Maximum depth of plants (ft)	17.0	16.5
Mean depth of plants (ft)	9.8	9.6
Median depth of plants (ft)	9.0	8.5
Average number of all species per site (shallower than max depth)	3.17	2.55
Average number of all species per site (veg. sites only)	3.24	2.61
Average number of native species per site (shallower than max depth)	2.60	2.47
Average number of native species per site (sites with native veg. only)	2.84	2.58
Species Richness	15	16
Mean Rake Fullness (veg. sites only)	2.37	1.54

Overall diversity was unchanged with a very high Simpson's Index of 0.86 during each survey. When looking at just the native plant community health, the Floristic Quality Index fell slightly from 23.3 pretreatment to 23.0 posttreatment. Total richness ticked up from 15 species pretreatment to 16 species posttreatment. Mean native species richness at points with native vegetation declined from a moderate 2.84 species/point pretreatment to 2.48/point posttreatment, but this was not significant (p=0.17) (Figure 6) (Appendix IV).

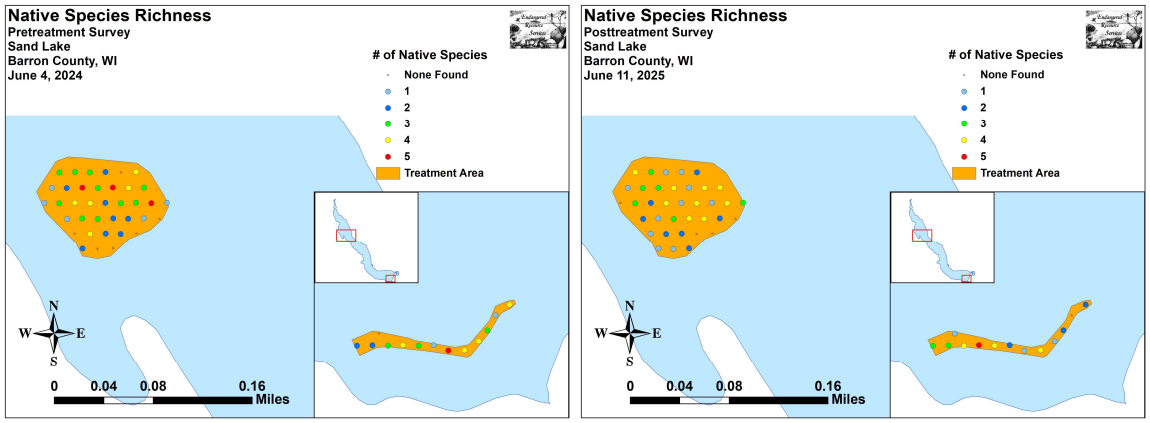


Figure 6: Pre/Posttreatment Native Species Richness

Mean total rake fullness underwent a highly significant decline **(p<0.001)** from a moderately high 2.37 pretreatment to a low-moderate 1.54 posttreatment. Visual analysis of the maps showed most of these declines occurred in areas formerly dominated by dense Eurasian water-milfoil (Figure 7) (Appendix IV).

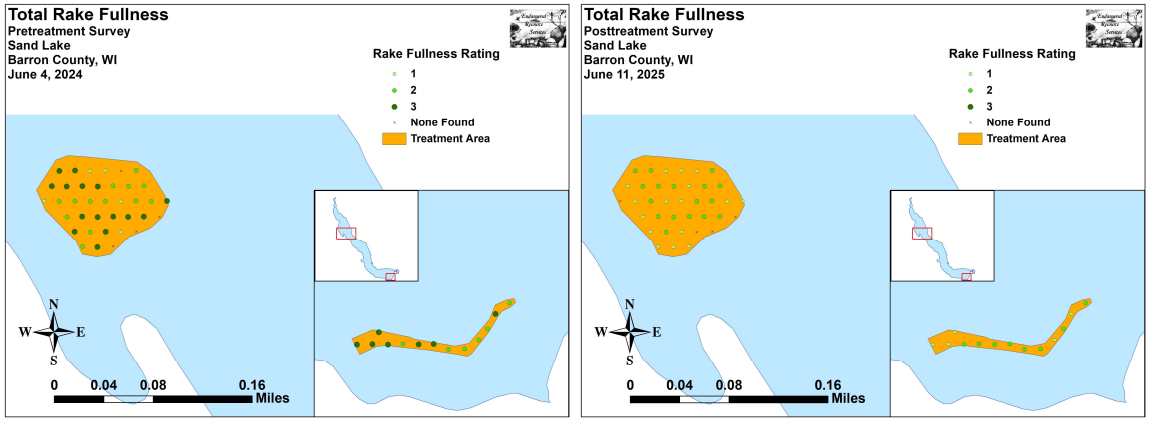


Figure 7: Pre/Posttreatment Total Rake Fullness

During the pretreatment survey, we found Eurasian water-milfoil in the rake at 27 of 47 littoral points (57.45% coverage) with 12 additional visual sightings (Table 3). We rated 16 points a rake fullness of 3, five a 2, and the remaining six a 1 for a mean rake fullness of 2.41. The 21 points with a rake fullness of 2 or 3 suggested 44.68% of the littoral treatment areas had a significant infestation (Figure 8) (Appendix V).

Posttreatment, we found EWM in the rake at four points (8.51% littoral coverage) with one additional visual sighting (Table 4). Of these, none rated a rake fullness of 3, one was a 2 (2.13% significant littoral infestation), and the other three rated a 1 for a mean rake fullness of 1.25. Most plants found occurred in the study area near the landing on the outer edge of the littoral zone. On the Silo Bay reef, a single piece of a single plant in the rake was the only evidence of EWM we saw.

Statistically, our results suggested the overall treatment produced a highly significant decline ($p<0.001$) in total distribution and rake fullness 3; a moderately significant decline in mean density ($p=0.004$) and visual sightings ($p=0.001$); and a significant decline in rake fullness 2 ($p<0.05$). Rake fullness 1 also declined, but this was not significant ($p=0.46$) (Figure 9).

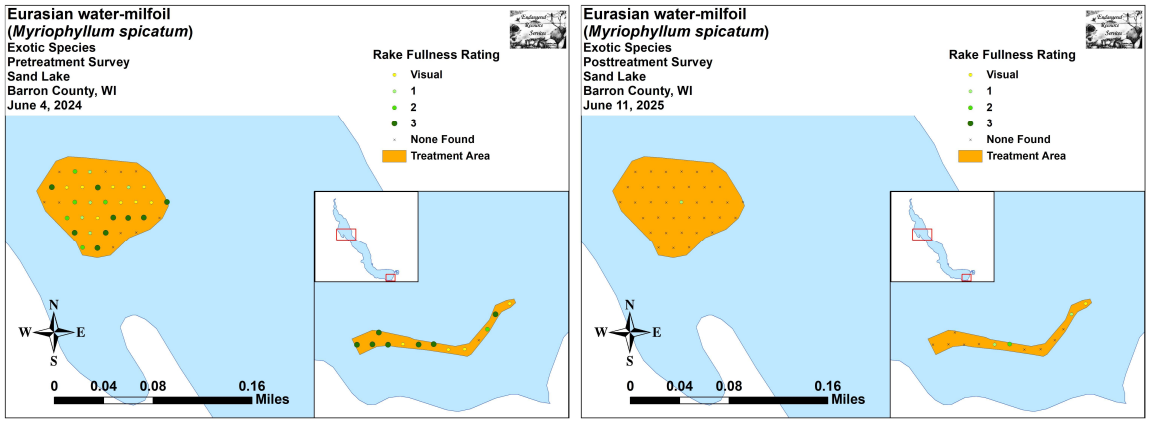
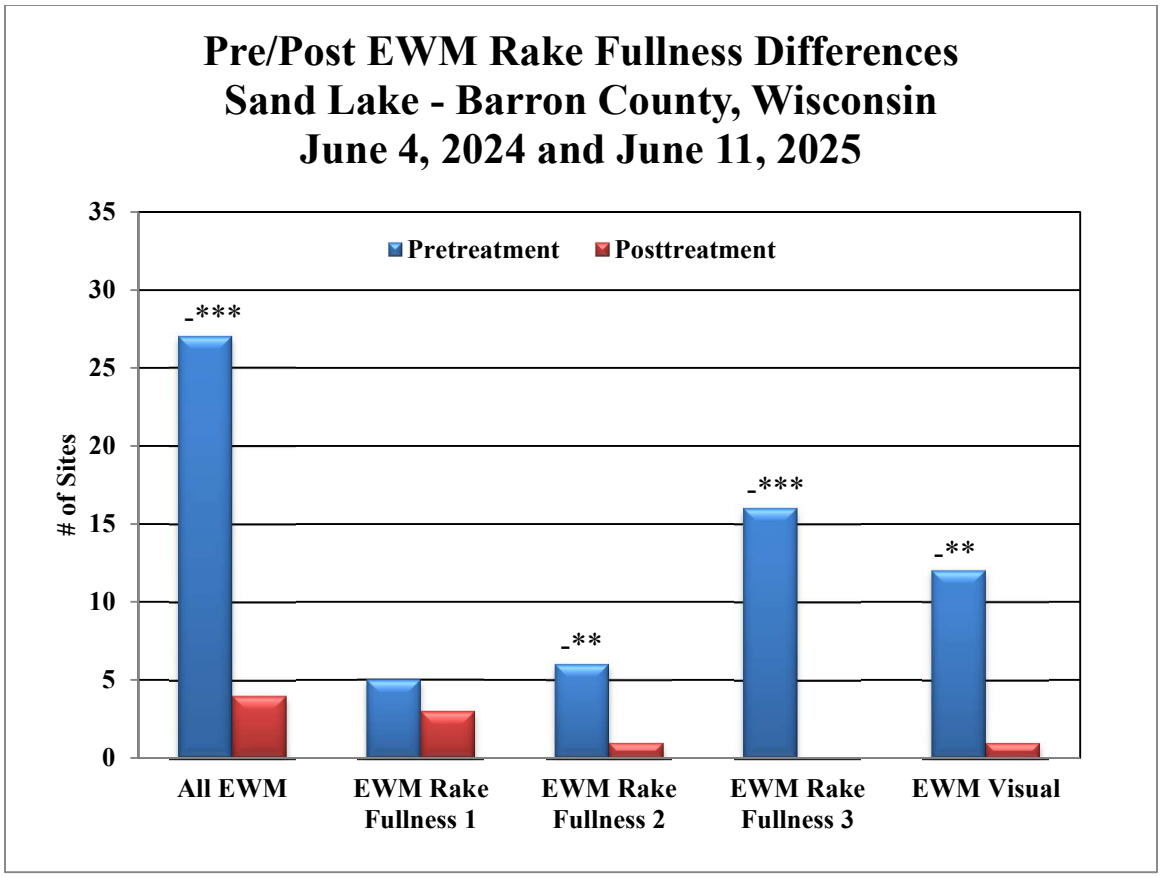


Figure 8: Pre/Posttreatment Eurasian Water-milfoil Density and Distribution



Significant differences = * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Figure 9: Changes in Eurasian Water-milfoil Rake Fullness

Coontail (*Ceratophyllum demersum*) was the most widely-distributed native species during the pretreatment survey and the second most posttreatment (Figure 10) (Tables 3 and 4). Present at 30 sites with a mean rake fullness of 1.43, it saw a nearly-significant posttreatment decline (p=0.06) in distribution (21 sites) and a significant decline **(p=0.01)** in density (1.14 mean rake fullness). These losses were especially noticeable on the reef.

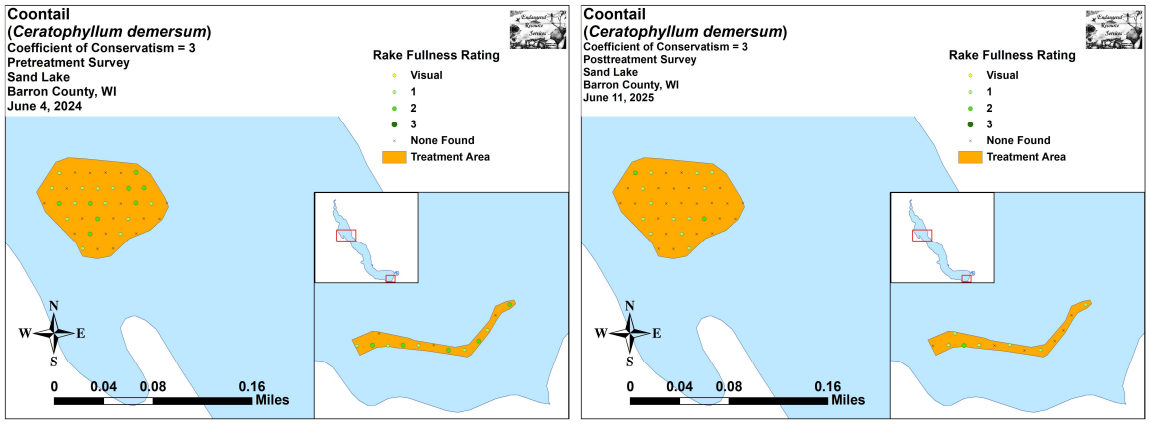


Figure 10: Pre/Posttreatment Coontail Density and Distribution

Flat-stem pondweed (*Potamogeton zosteriformis*), the second most common species pretreatment and the third most common posttreatment, experienced a non-significant decline (p=0.30) in distribution (24 sites pre/19 sites post). However, its mean density (mean rake fullness 1.08 pre/1.31 post) underwent a significant increase **(p=0.01)** (Figure 11).

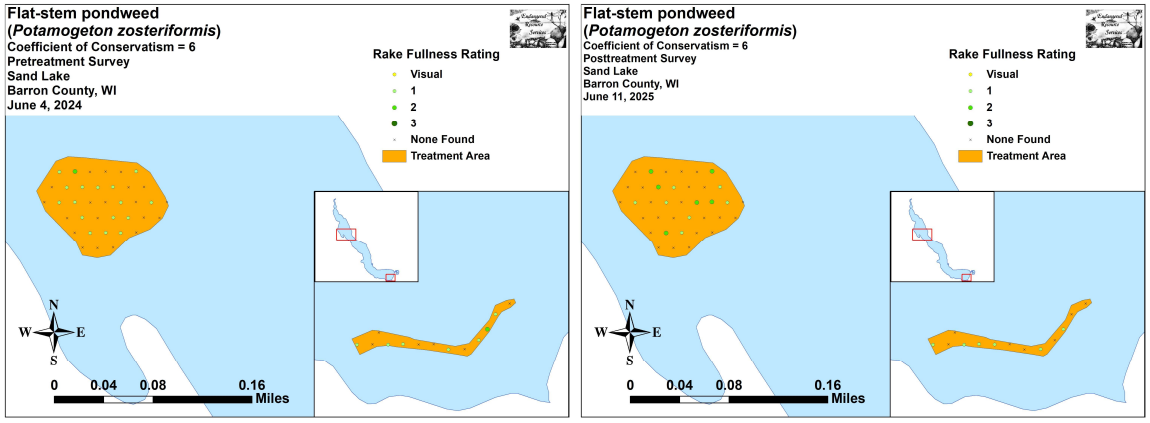


Figure 11: Pre/Posttreatment Flat-stem Pondweed Density and Distribution

Clasping-leaf pondweed (*Potamogeton richardsonii*) was the third most common native species in the pretreatment survey (19 sites/mean rake 1.11) and the most common posttreatment (29 sites/mean rake 1.41). The increase in distribution was significant **(p=0.04)**, and the increase in density was moderately significant **(p=0.006)**. These gains were especially pronounced on the reef (Figure 12).

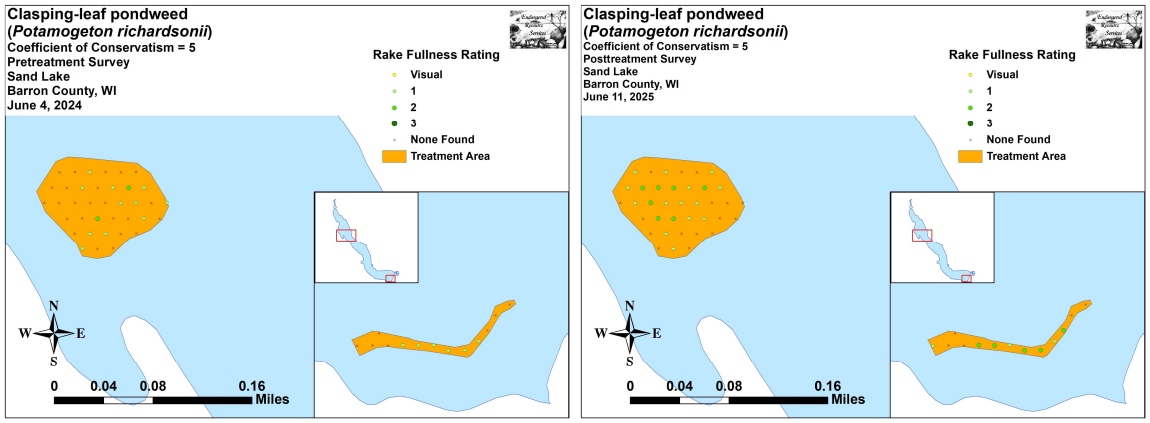


Figure 12: Pre/Posttreatment Clasping-leaf Pondweed Density and Distribution

Northern water-milfoil (*Myriophyllum sibiricum*) was tied for the fourth-ranked species in the pretreatment native community (Figure 13). A sister species to EWM, it also suffered highly significant declines **($p<0.001$)** in both distribution (12 sites pre/absent post) and density (mean rake fullness 1.75 pretreatment/absent post).

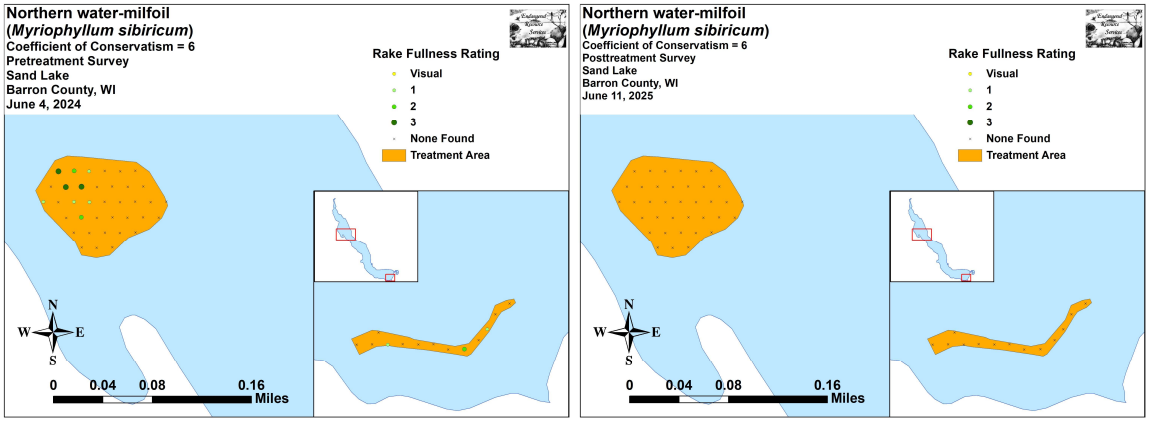


Figure 13: Pre/Posttreatment Northern Water-milfoil Density and Distribution

Small pondweed (*Potamogeton pusillus*), the other species tied as the fourth-ranked species in the pretreatment native community, was present at 12 sites with a mean rake fullness of 1.00 (Figure 14). Posttreatment, it was found at nine sites – a non-significant decline (p=0.46) in distribution – as it fell back to the fifth-ranked native species. All samples again had a rake fullness of 1.

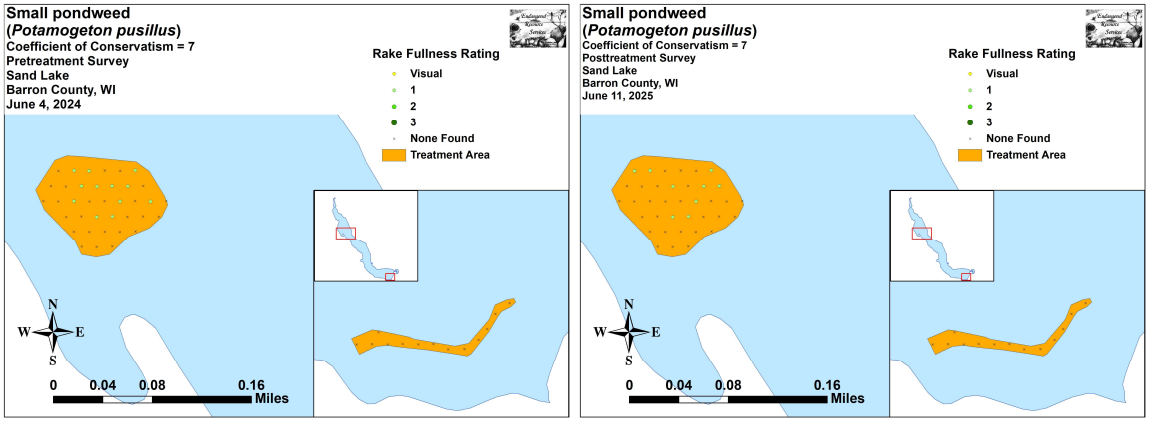


Figure 14: Pre/Posttreatment Small pondweed Density and Distribution

Common waterweed (*Elodea canadensis*) was the sixth-ranked native plant prior to treatment and tied as the fifth-ranked species posttreatment. In 2024, it was present at 11 sites with a mean rake fullness of 1.18. Posttreatment, we found it at nine points with a mean rake fullness of 1 (Figure 15). Neither of these declines were, however, significant (p=0.62/p=0.08).

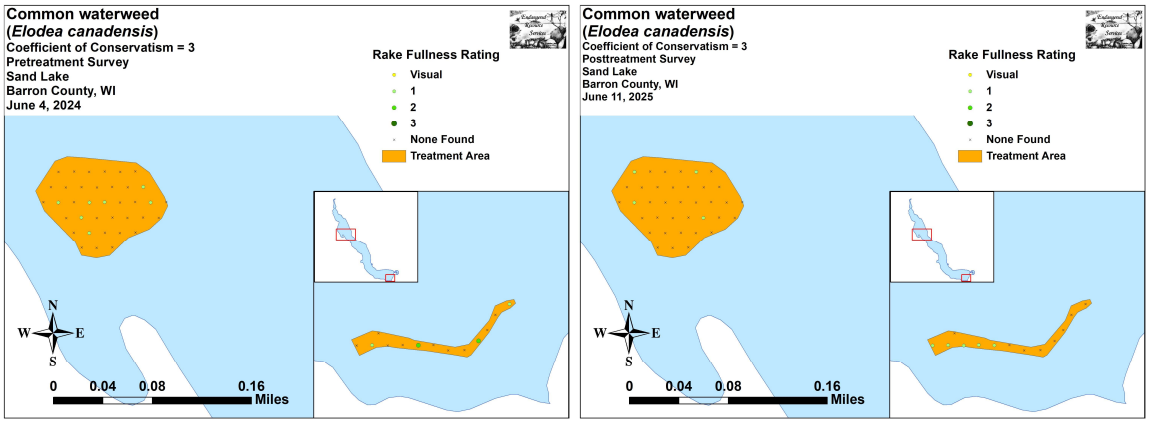


Figure 15: Pre/Posttreatment Common waterweed Density and Distribution

Fern pondweed (*Potamogeton robbinsii*) was present at single point with a rake fullness of 1 during the pretreatment survey. Posttreatment, we found it at ten points all with a rake fullness of 1. This increase in distribution was moderately significant **(p=0.004)**, and we noted it was widespread on the reef in 2025 (Figure 16).

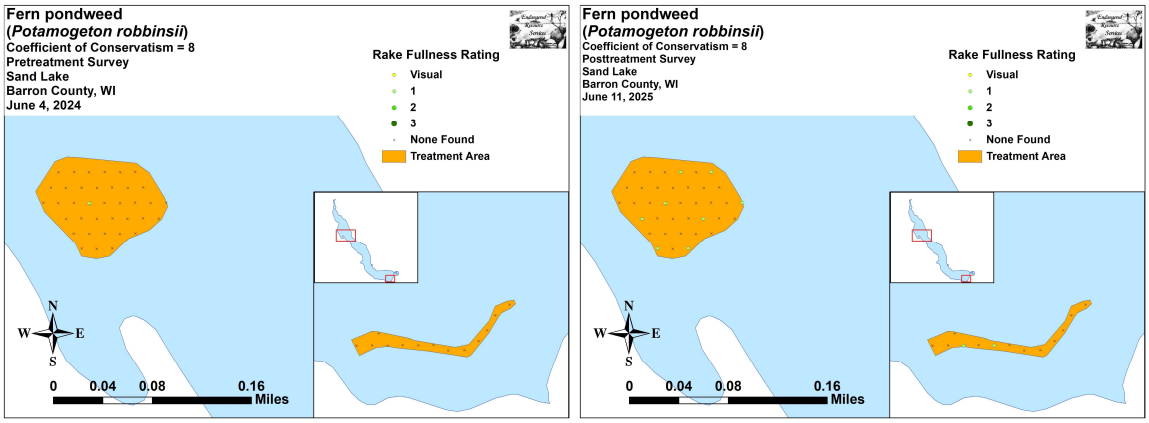


Figure 16: Pre/Posttreatment Fern Pondweed Density and Distribution

Table 3: Frequencies and Mean Rake Sample of Aquatic Macrophytes
Pretreatment Survey - Sand Lake - Barron County, Wisconsin
June 4, 2024

Species	Common Name	Total Sites	Relative Freq.	Freq. in Veg.	Freq. in Lit.	Mean Rake	Visual Sites
Ceratophyllum demersum	Coontail	30	20.13	65.22	63.83	1.43	0
Myriophyllum spicatum	**Eurasian water-milfoil**	**27**	**18.12**	**58.70**	**57.45**	**2.41**	**12**
Potamogeton zosteriformis	Flat-stem pondweed	24	16.11	52.17	51.06	1.08	0
Potamogeton richardsonii	Clasping-leaf pondweed	19	12.75	41.30	40.43	1.11	0
Myriophyllum sibiricum	Northern water-milfoil	12	8.05	26.09	25.53	1.75	0
Potamogeton pusillus	Small pondweed	12	8.05	26.09	25.53	1.00	0
Elodea canadensis	Common waterweed	11	7.38	23.91	23.40	1.18	0
Potamogeton amplifolius	Large-leaf pondweed	3	2.01	6.52	6.38	1.00	0
Potamogeton friesii	Fries' pondweed	3	2.01	6.52	6.38	1.00	0
Potamogeton gramineus	Variable pondweed	2	1.34	4.35	4.26	1.00	0
Ranunculus aquatilis	White water crowfoot	2	1.34	4.35	4.26	1.00	0
Chara sp.	Muskgrass	1	0.67	2.17	2.13	1.00	0
Lemna trisulca	Forked duckweed	1	0.67	2.17	2.13	1.00	0
Potamogeton illinoensis	Illinois pondweed	1	0.67	2.17	2.13	1.00	0
Potamogeton robbinsii	Fern pondweed	1	0.67	2.17	2.13	1.00	0

* Excluded from the relative frequency calculation **Exotic Species in Bold**

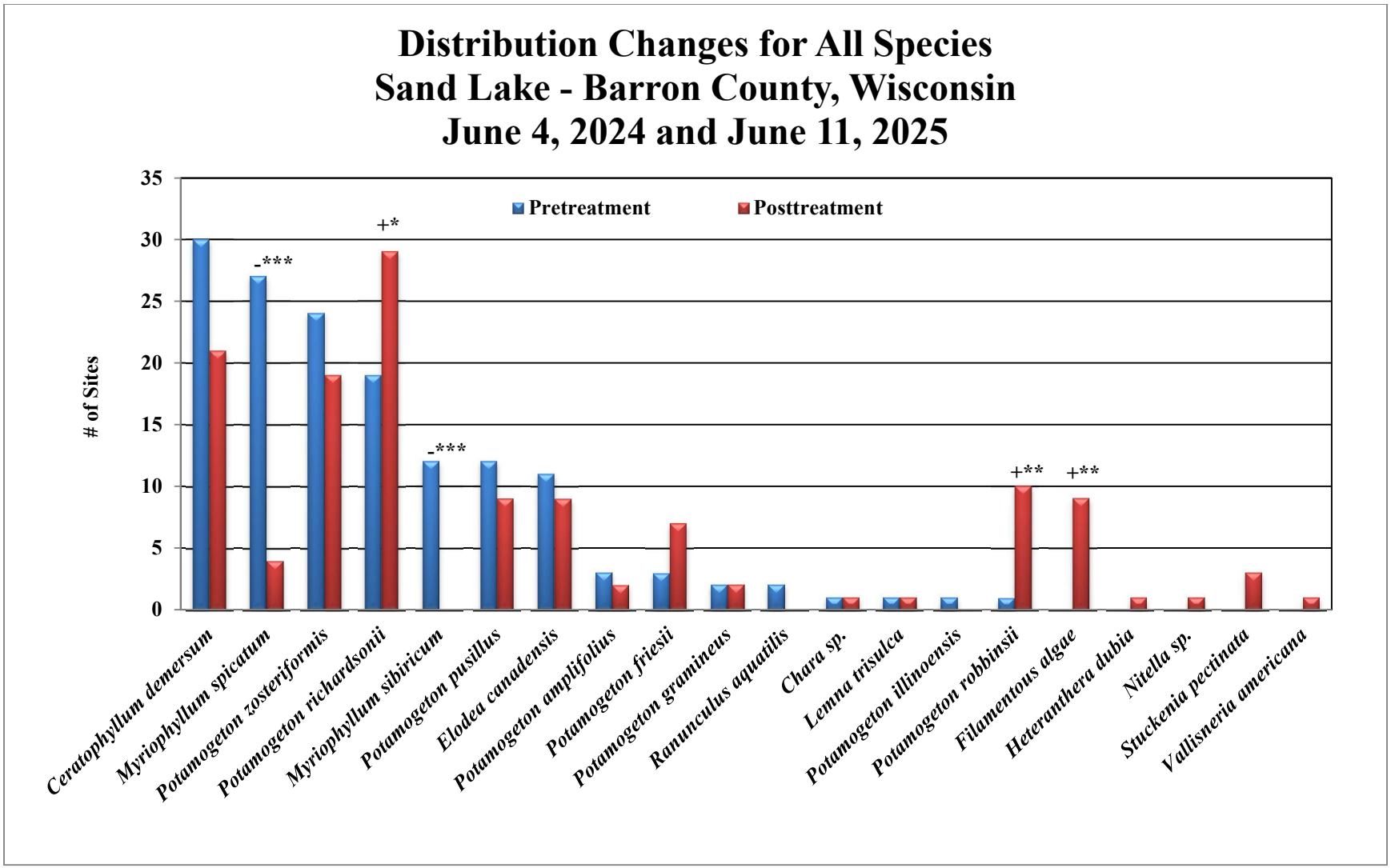
Table 4: Frequencies and Mean Rake Sample of Aquatic Macrophytes
Posttreatment Survey – Sand Lake – Barron County, Wisconsin
June 11, 2025

Species	Common Name	Total Sites	Relative Freq.	Freq. in Veg.	Freq. in Lit.	Mean Rake	Visual Sites
Potamogeton richardsonii	Clasping-leaf pondweed	29	24.17	63.04	61.70	1.41	0
Ceratophyllum demersum	Coontail	21	17.50	45.65	44.68	1.14	0
Potamogeton zosteriformis	Flat-stem pondweed	19	15.83	41.30	40.43	1.32	0
Potamogeton robbinsii	Fern pondweed	10	8.33	21.74	21.28	1.00	0
Elodea canadensis	Common waterweed	9	7.50	19.57	19.15	1.00	0
Potamogeton pusillus	Small pondweed	9	7.50	19.57	19.15	1.00	0
	Filamentous algae	9	*	19.57	19.15	1.22	0
Potamogeton friesii	Fries' pondweed	7	5.83	15.22	14.89	1.29	0
Myriophyllum spicatum	**Eurasian water-milfoil**	**4**	**3.33**	**8.70**	**8.51**	**1.25**	**1**
Stuckenia pectinata	Sago pondweed	3	2.50	6.52	6.38	1.33	0
Potamogeton amplifolius	Large-leaf pondweed	2	1.67	4.35	4.26	1.50	0
Potamogeton gramineus	Variable pondweed	2	1.67	4.35	4.26	1.00	0
Chara sp.	Muskgrass	1	0.83	2.17	2.13	1.00	0
Heteranthera dubia	Water star-grass	1	0.83	2.17	2.13	1.00	0
Lemna trisulca	Forked duckweed	1	0.83	2.17	2.13	1.00	0
Nitella sp.	Nitella	1	0.83	2.17	2.13	1.00	0
Vallisneria americana	Wild celery	1	0.83	2.17	2.13	2.00	0

* Excluded from the relative frequency calculation **Exotic Species in bold**

As previously reported, two species showed significant declines in distribution posttreatment. Both Eurasian water-milfoil and Norther water-milfoil suffered highly significant declines **($p<0.001$)**.

Conversely, two plants were more numerous after the treatment. Fern pondweed underwent a moderately significant increase **($p=0.004$)** in distribution; and Clasping-leaf pondweed underwent a significant increase **($p=0.04$)** (Figure 17) (Maps for all native species from the pre and posttreatment surveys can be found in Appendixes VI and VII).



Significant differences = * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Figure 17: Pre/Posttreatment Macrophyte Changes

CONSIDERATIONS FOR MANAGEMENT:

Eurasian water-milfoil:

Eurasian water-milfoil occupies a relatively low percentage of the lake's surface area – especially after the highly successful chemical treatments in 2022 and 24. Even with this recent management success, EWM is widely-established making eradication an unrealistic expectation. With this in mind, continuing to work to manage it in the most cost-effective manner possible, while simultaneously minimizing its impact on the lake's aquatic ecosystem will likely continue to be important goals for the lake association moving forward.

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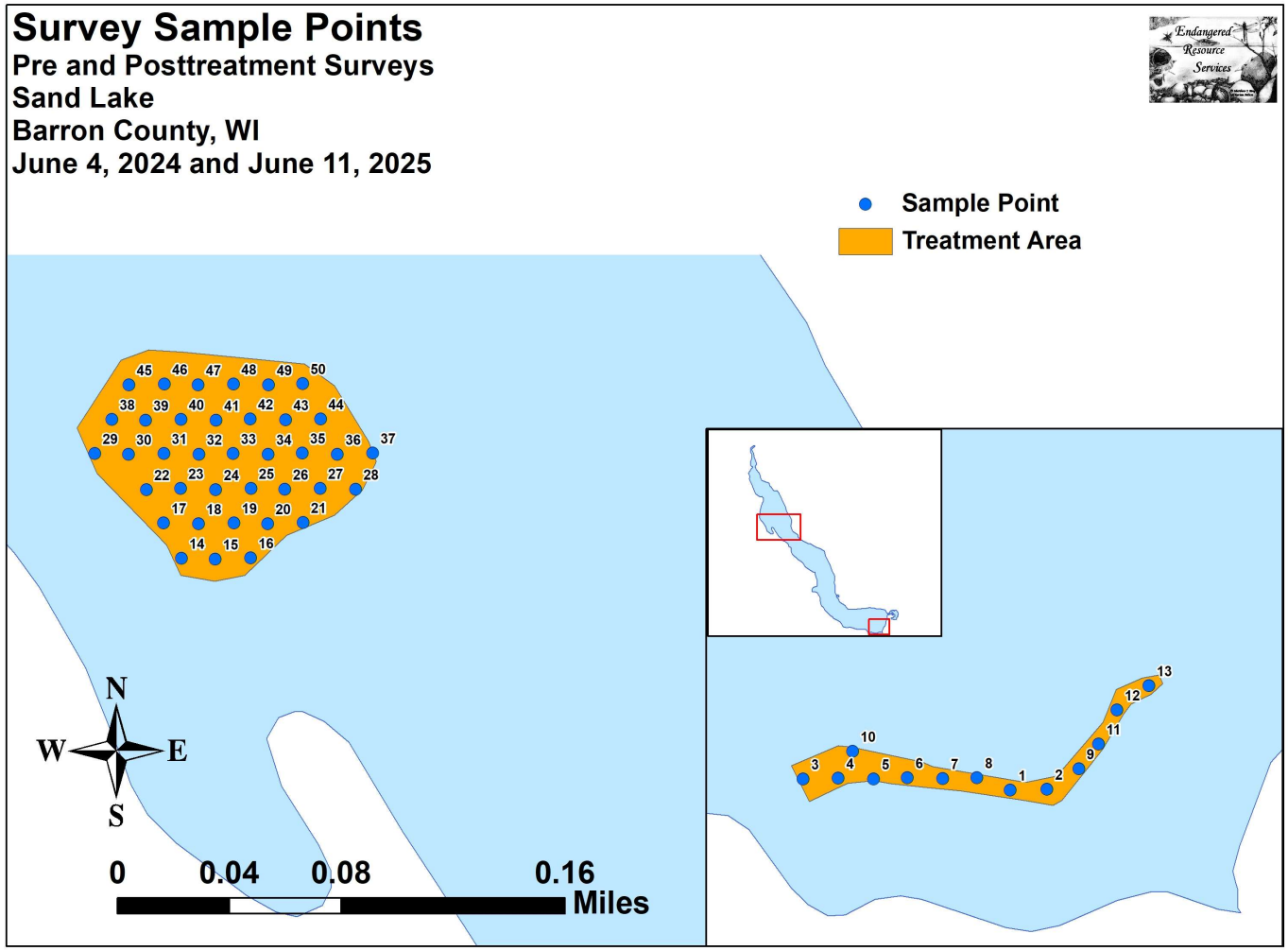
Appendix I: EWM Pre/Post Survey Sample Points and Treatment Areas


Survey Sample Points
Pre and Posttreatment Surveys
Sand Lake
Barron County, WI
June 4, 2024 and June 11, 2025
Endangered Resource Services
Sample Point
Treatment Area
45 46 47 48 49 50
38 39 40 41 42 43 44
29 30 31 32 33 34 35 36 37
22 23 24 25 26 27 28
17 18 19 20 21
14 15 16
10 3 4 5 6 7 8 1 2 9 11 12 13
N
W E
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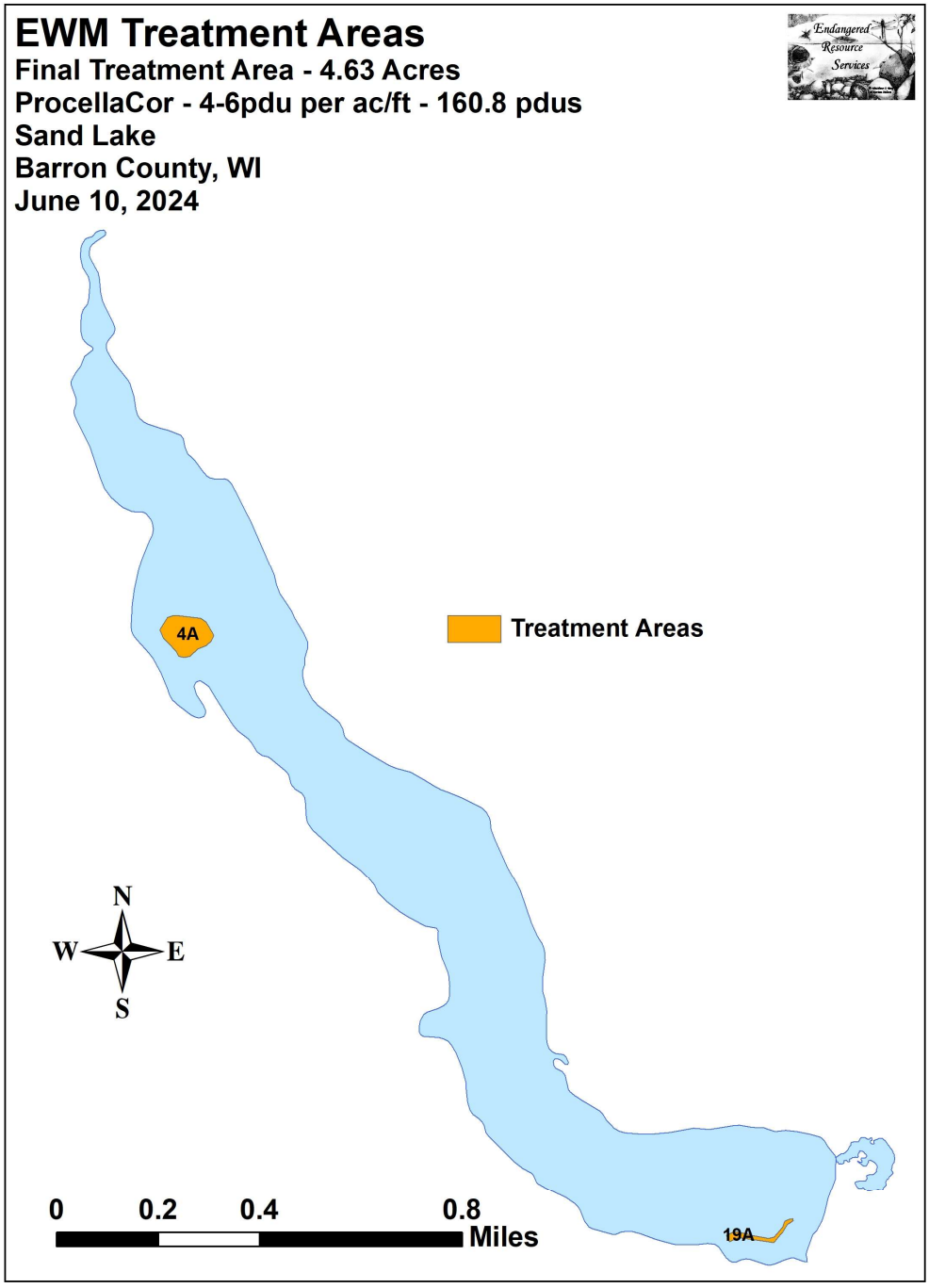
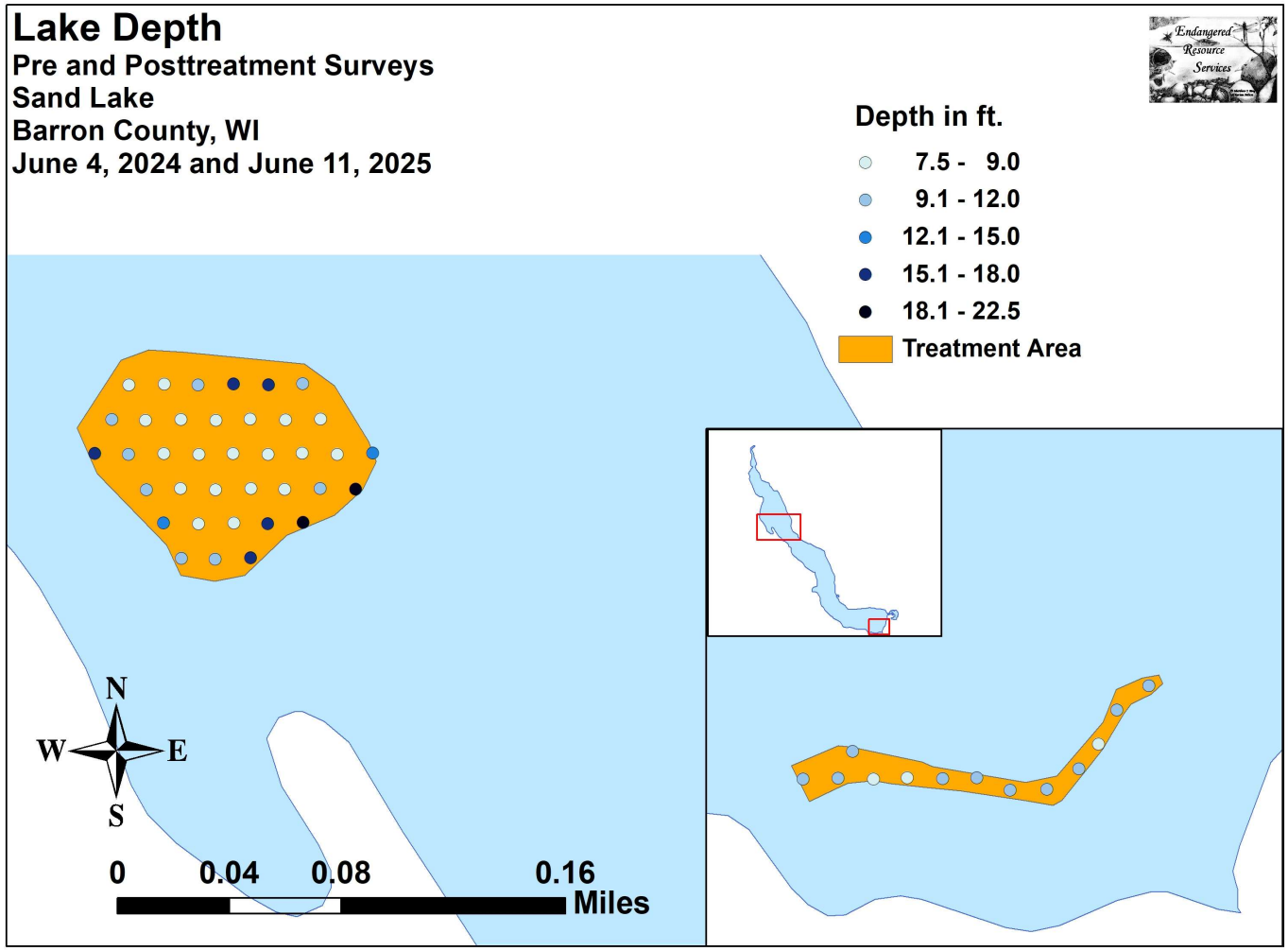
0 0.04 0.08 0.16
Miles

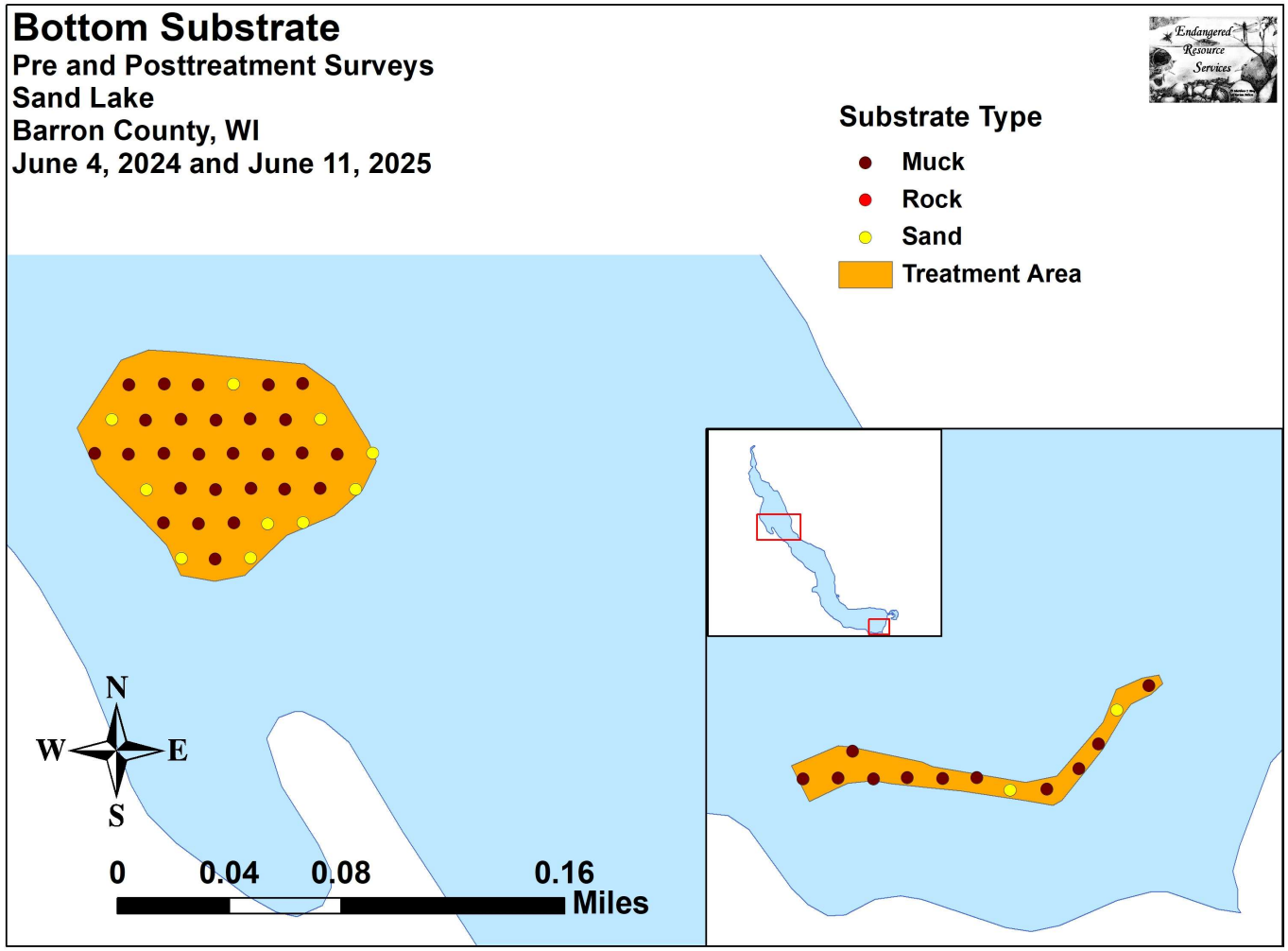

EWM Treatment Areas
Final Treatment Area - 4.63 Acres
ProcellaCor - 4-6pdu per ac/ft - 160.8 pdus
Sand Lake
Barron County, WI
June 10, 2024
Endangered Resource Services
4A
Treatment Areas
N
W
E
S
0
0.2
0.4
0.8
Miles
19A

Appendix II: Vegetative Survey Datasheet

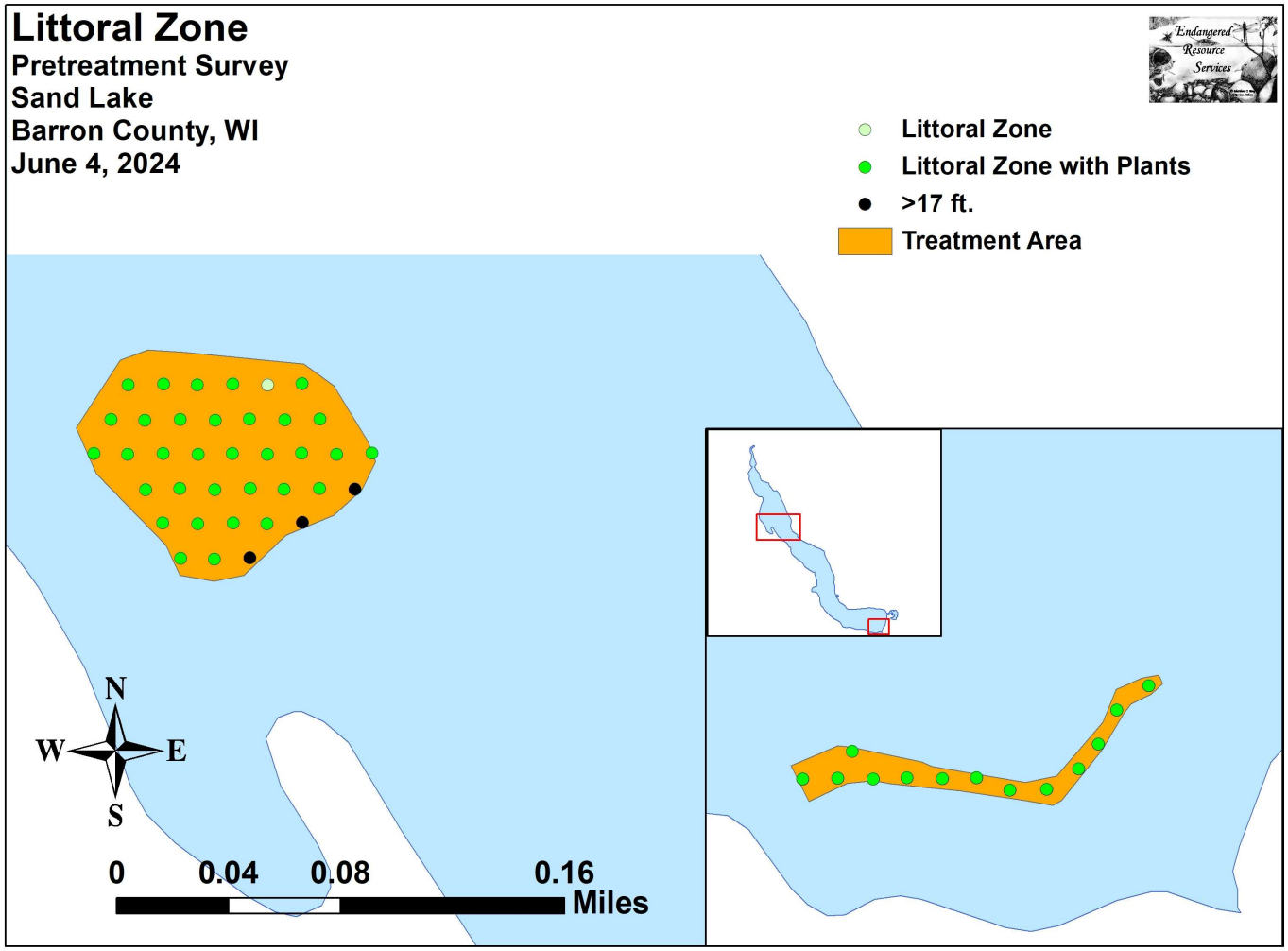
Observers for this lake: names and hours worked by each:																												
Lake:									WBIC										County							Date:	
Site #	Depth (ft)	Muck (M), Sand (S), Rock (R)	Rake pole (P) or rake rope (R)	Total Rake Fullness	EWM	EWM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									

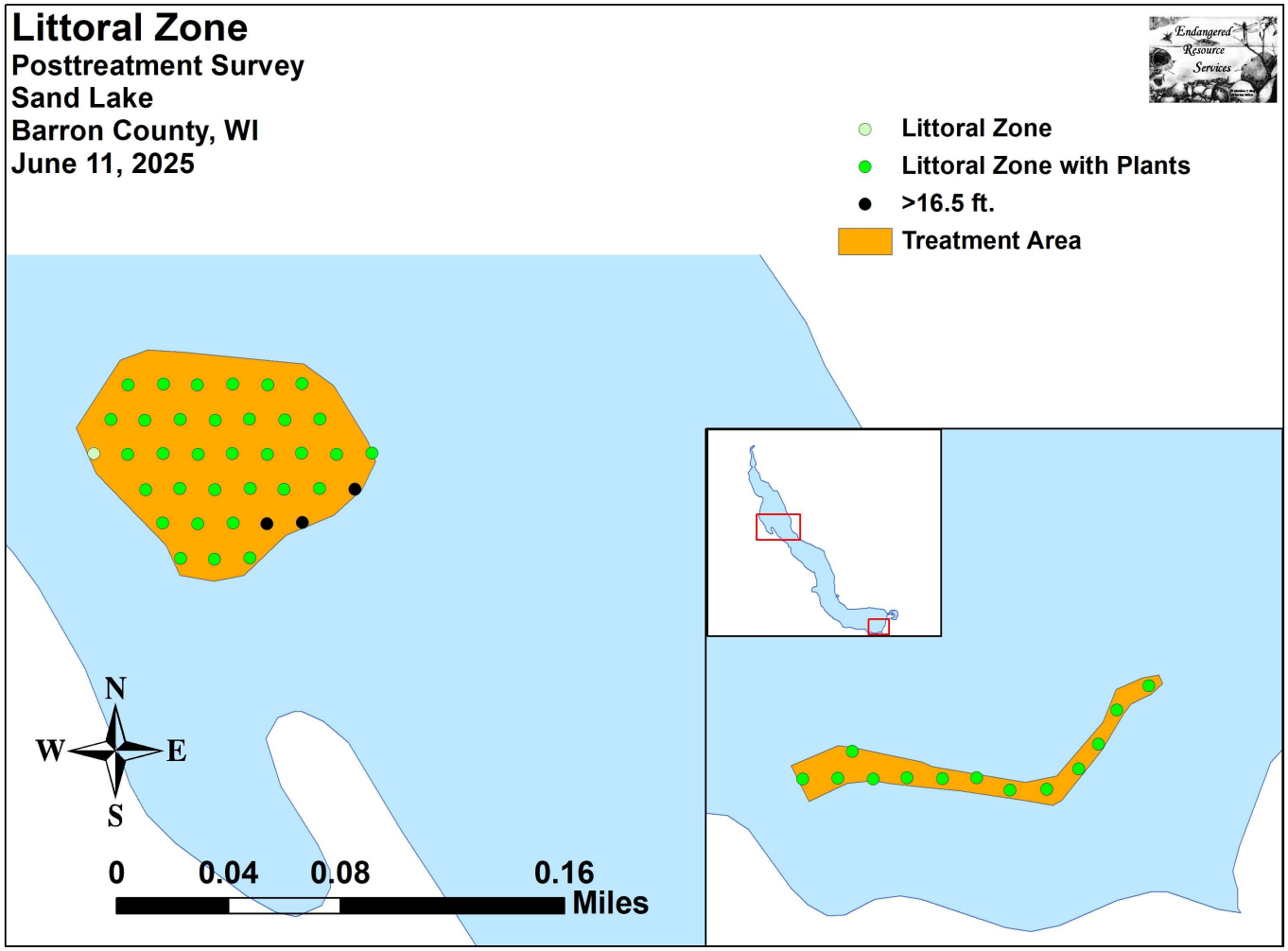
Appendix III: Pre/Post Habitat Variables

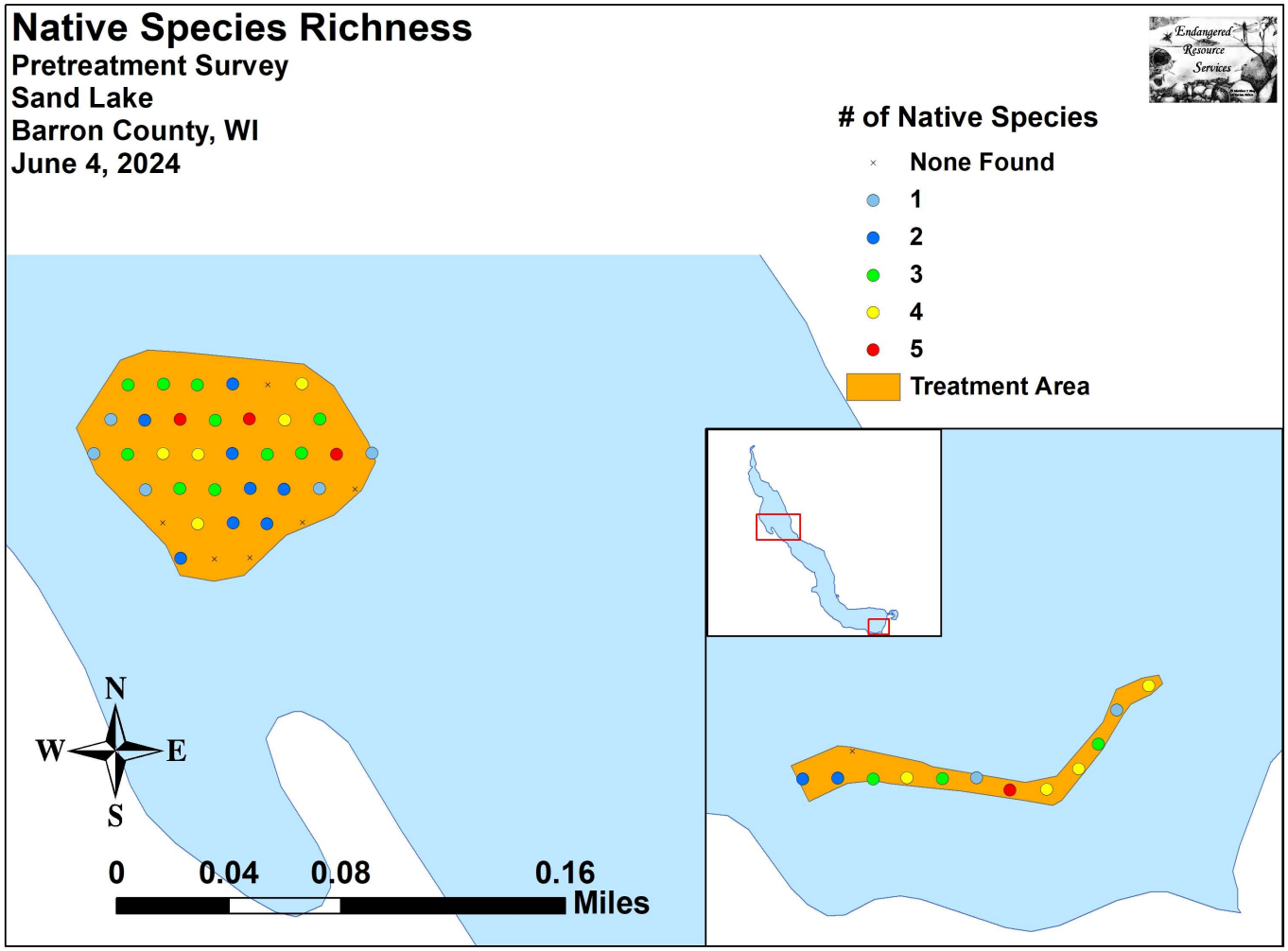

Lake Depth
Pre and Posttreatment Surveys
Sand Lake
Barron County, WI
June 4, 2024 and June 11, 2025
Endangered Resource Services
Depth in ft.
7.5 - 9.0
9.1 - 12.0
12.1 - 15.0
15.1 - 18.0
18.1 - 22.5
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

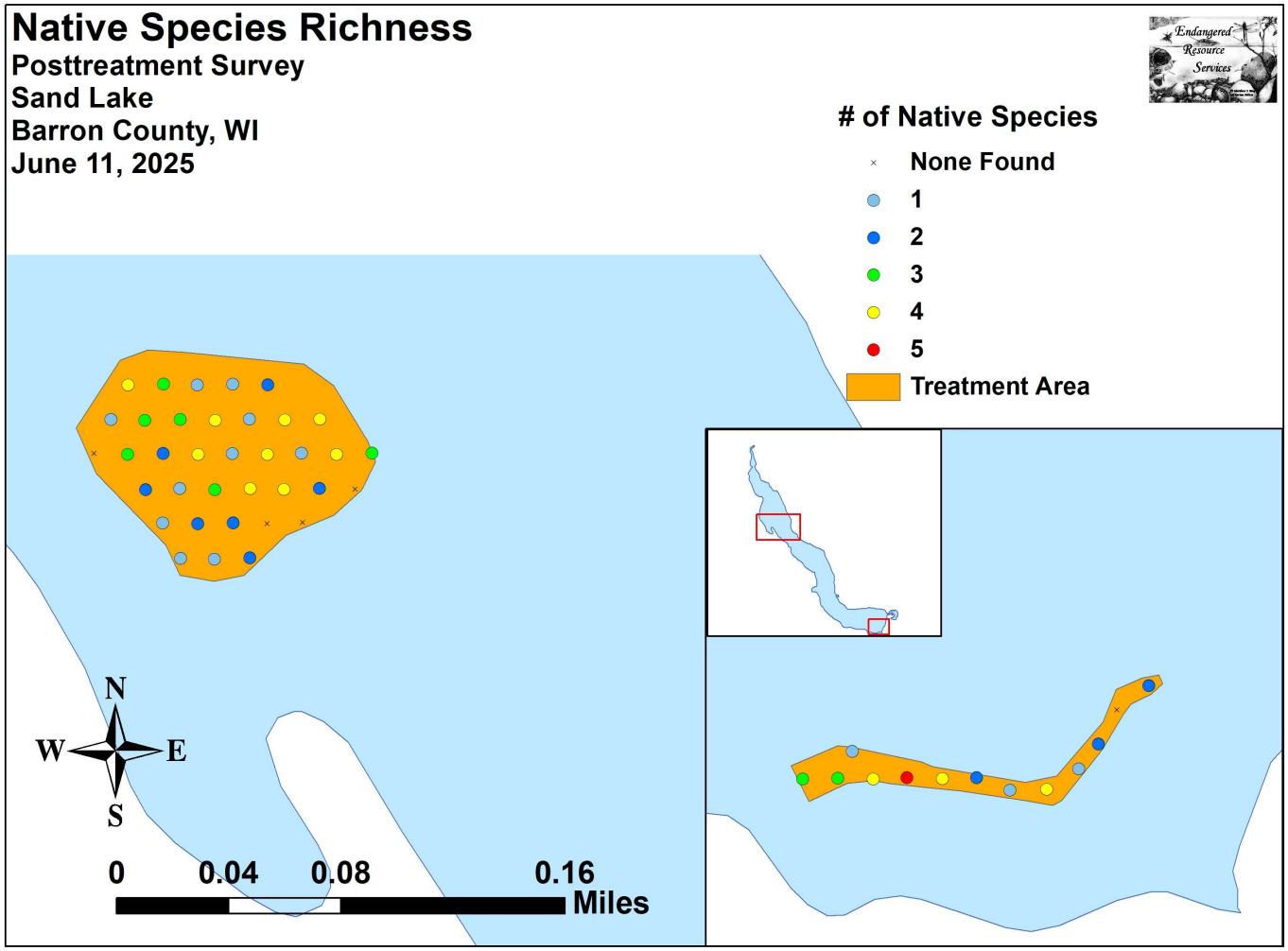

Bottom Substrate
Pre and Posttreatment Surveys
Sand Lake
Barron County, WI
June 4, 2024 and June 11, 2025
Endangered Resource Services
Substrate Type
Muck
Rock
Sand
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

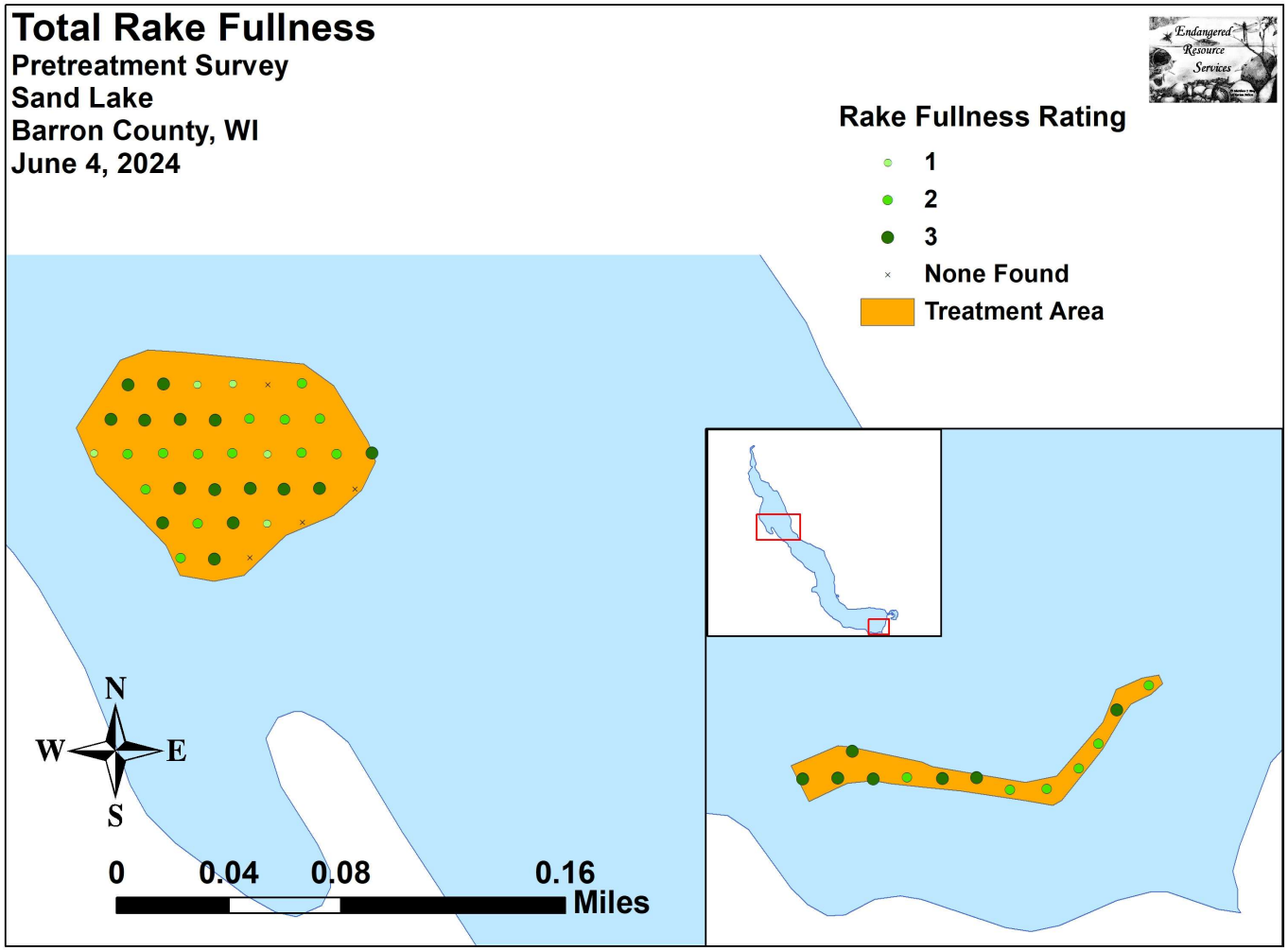
Appendix IV: Pre/Post Littoral Zone, Native Species Richness, and Total Rake Fullness

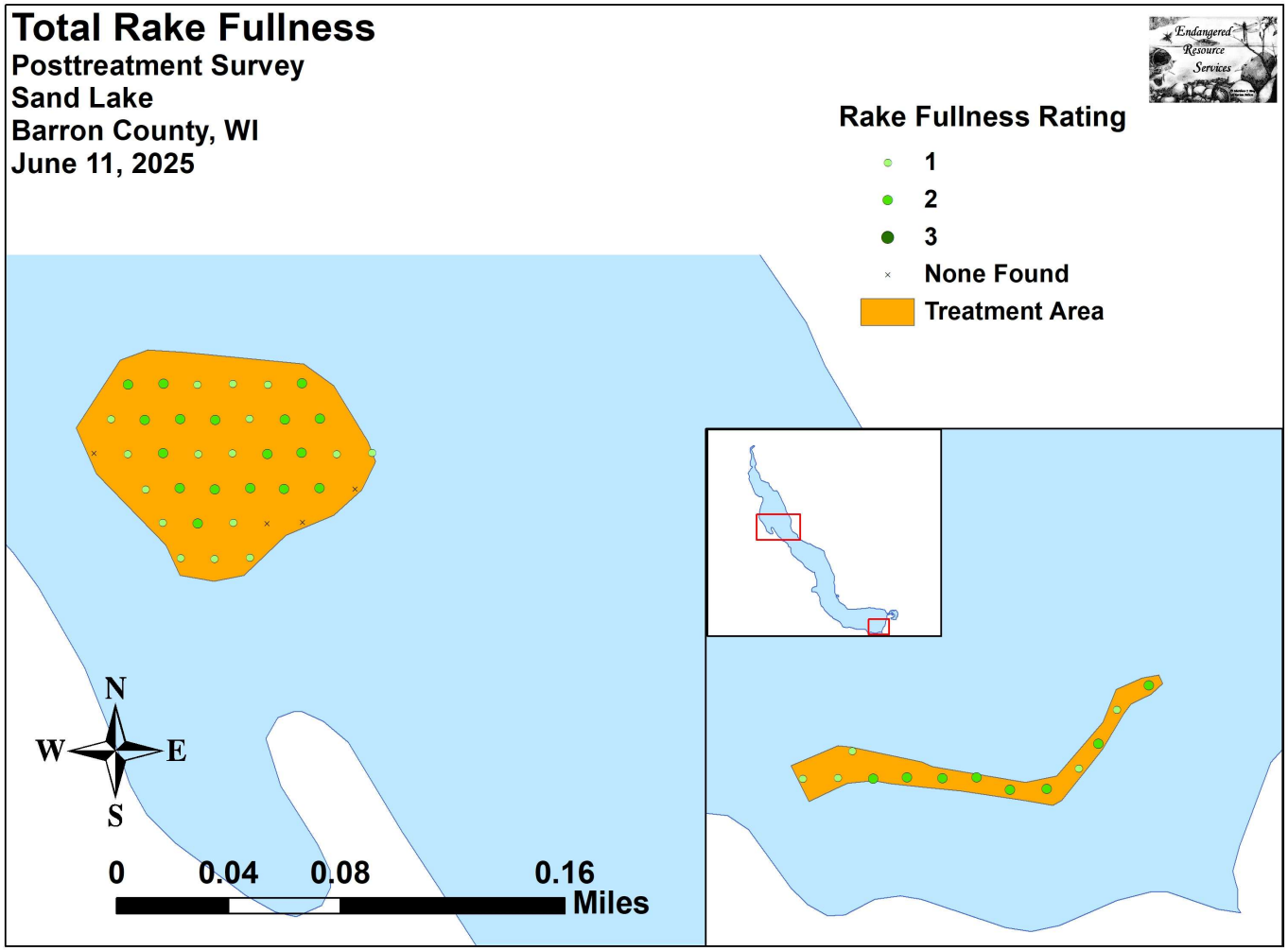

Littoral Zone
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Littoral Zone
Littoral Zone with Plants
>17 ft.
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Littoral Zone
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Littoral Zone
Littoral Zone with Plants
>16.5 ft.
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

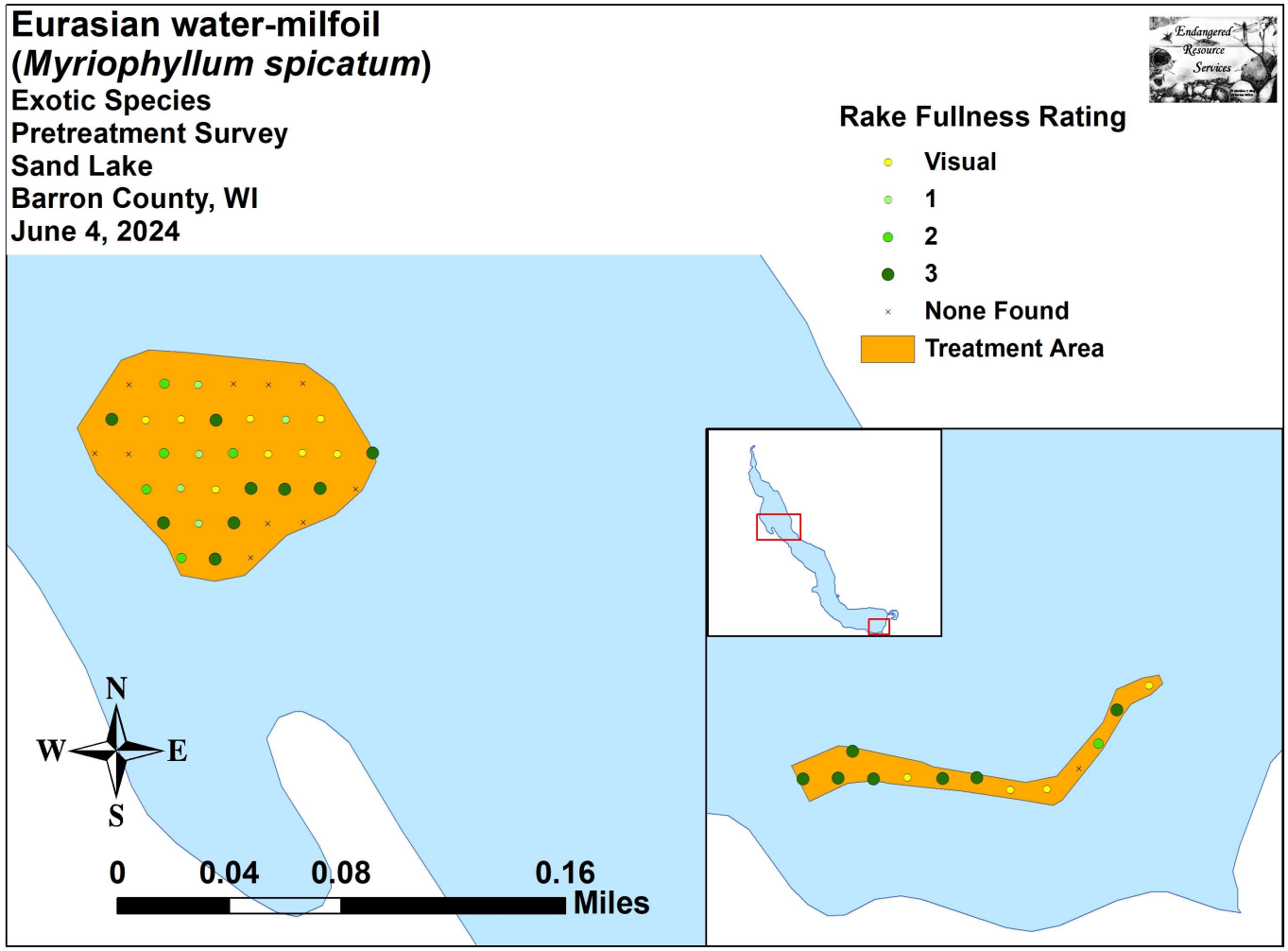

Native Species Richness
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
# of Native Species
None Found
1
2
3
4
5
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

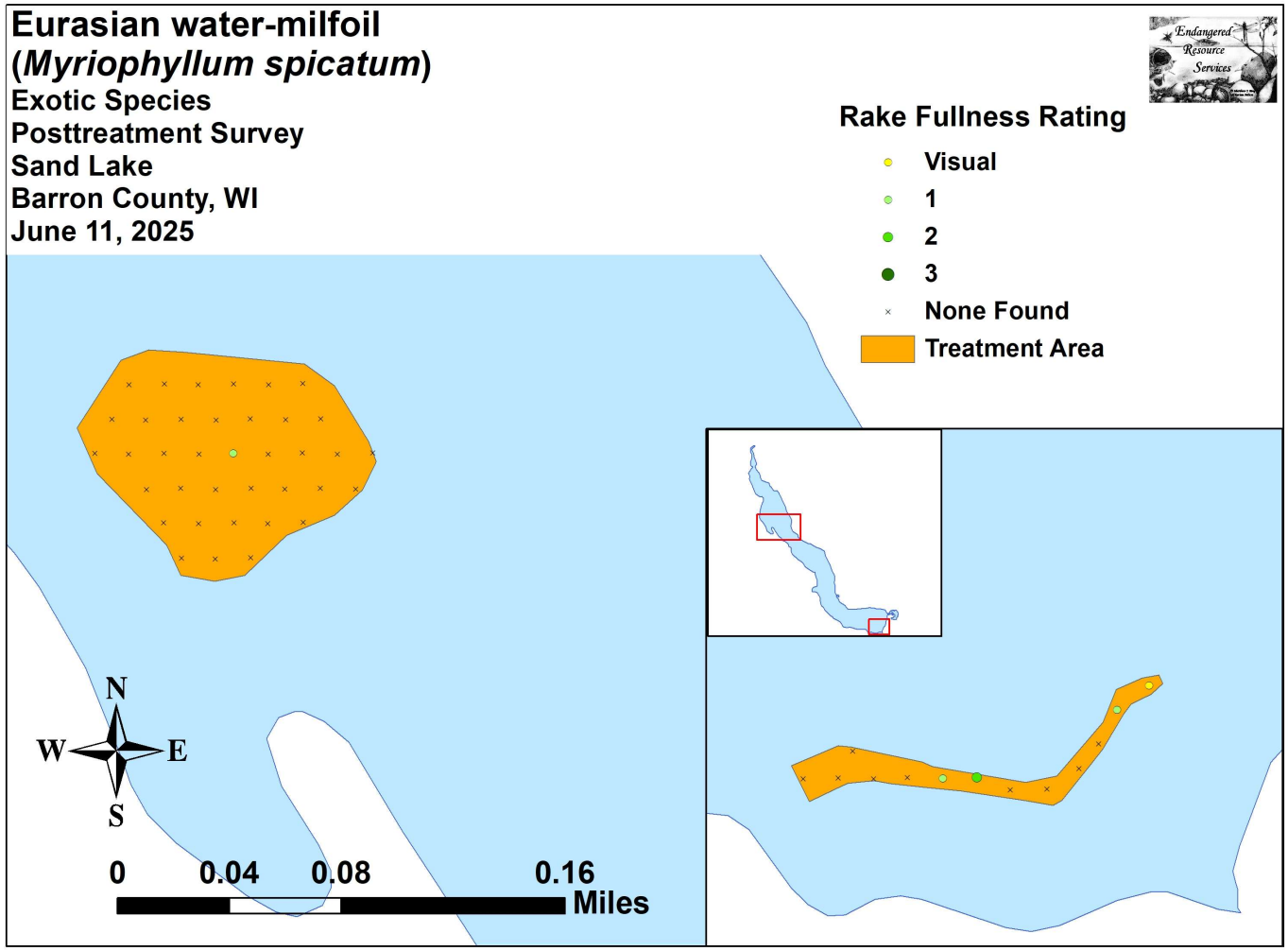

Native Species Richness
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
# of Native Species
None Found
1
2
3
4
5
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Total Rake Fullness
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

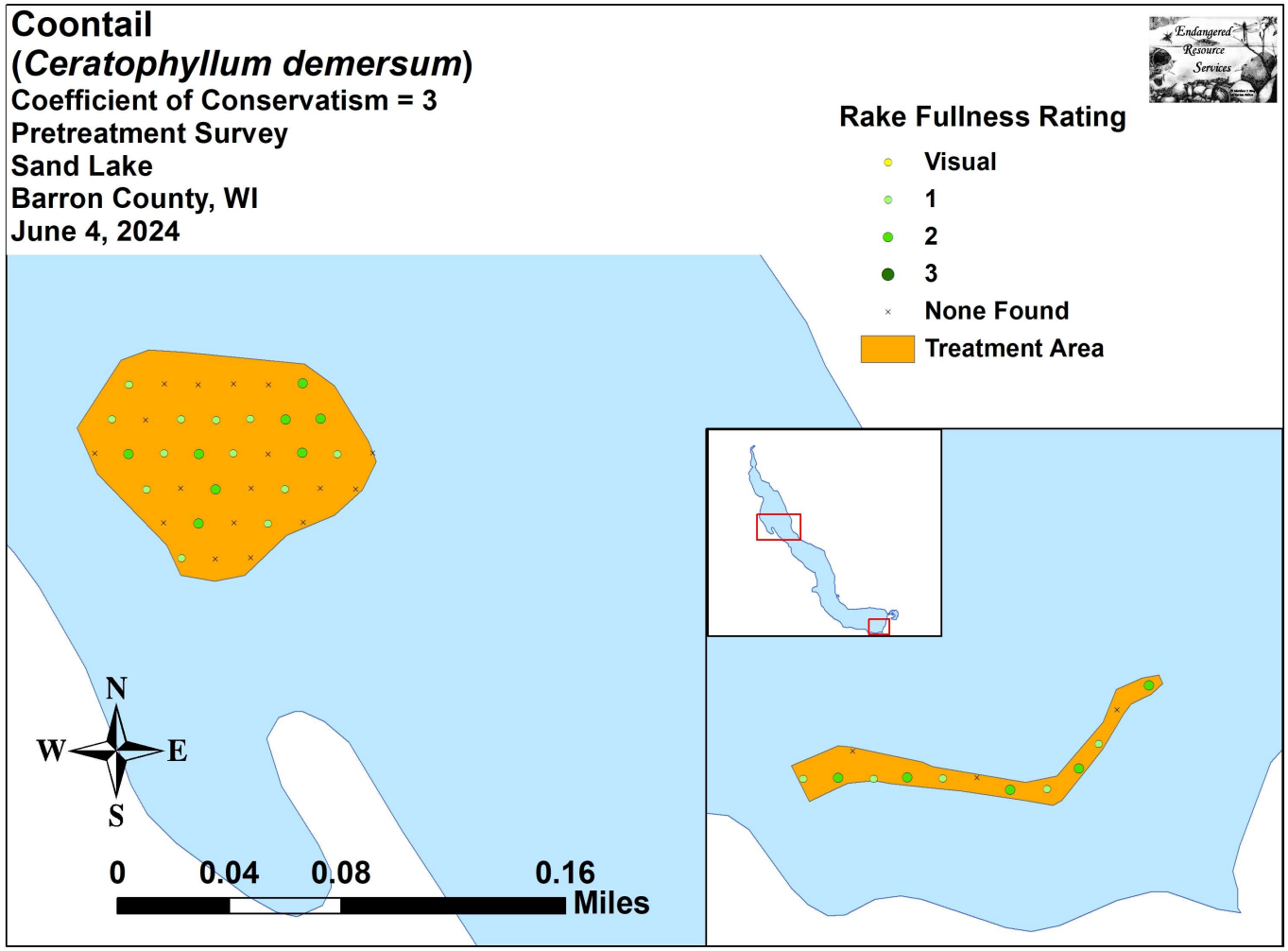

Total Rake Fullness
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

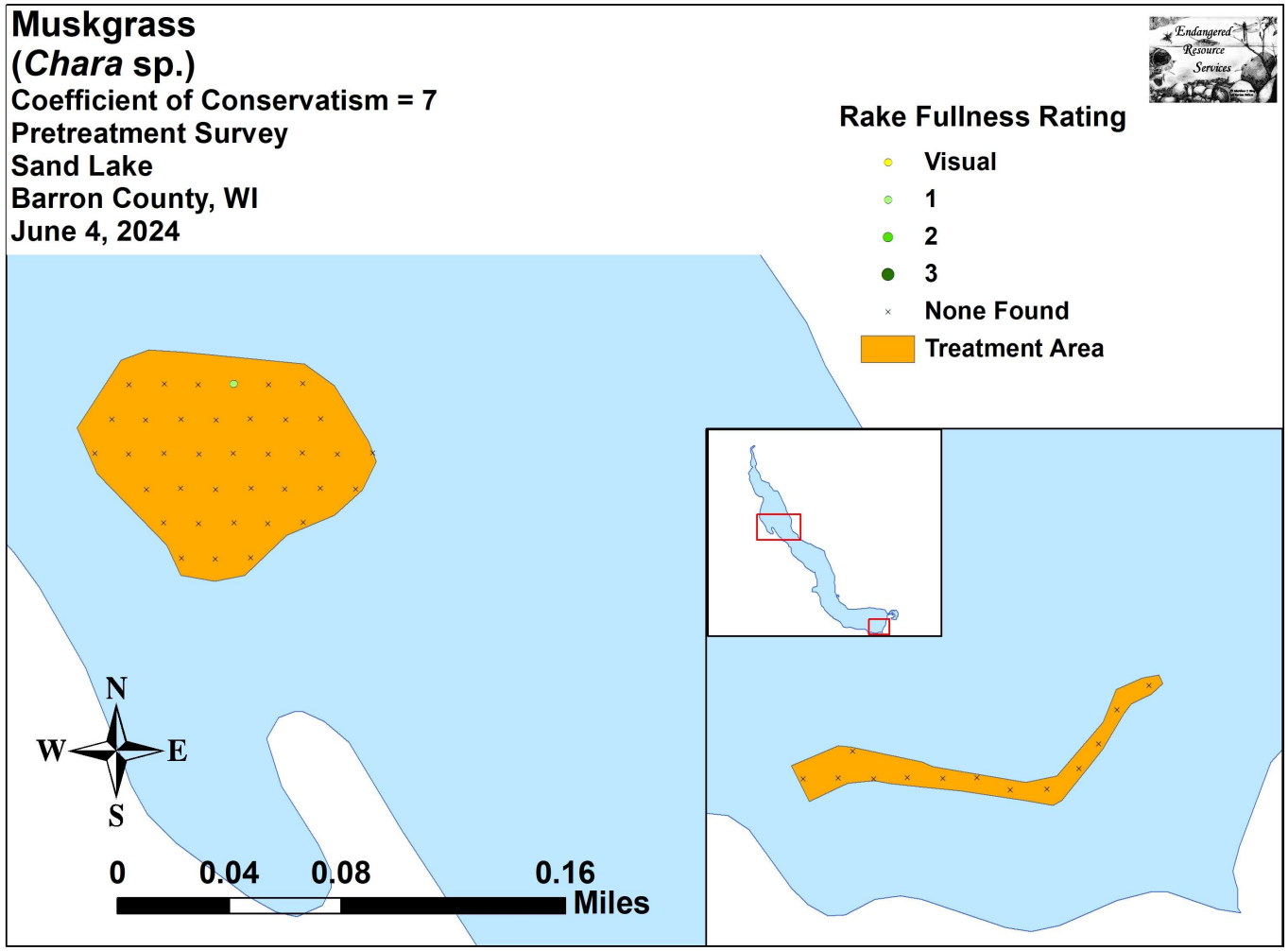
Appendix V: EWM Pre/Posttreatment Density and Distribution

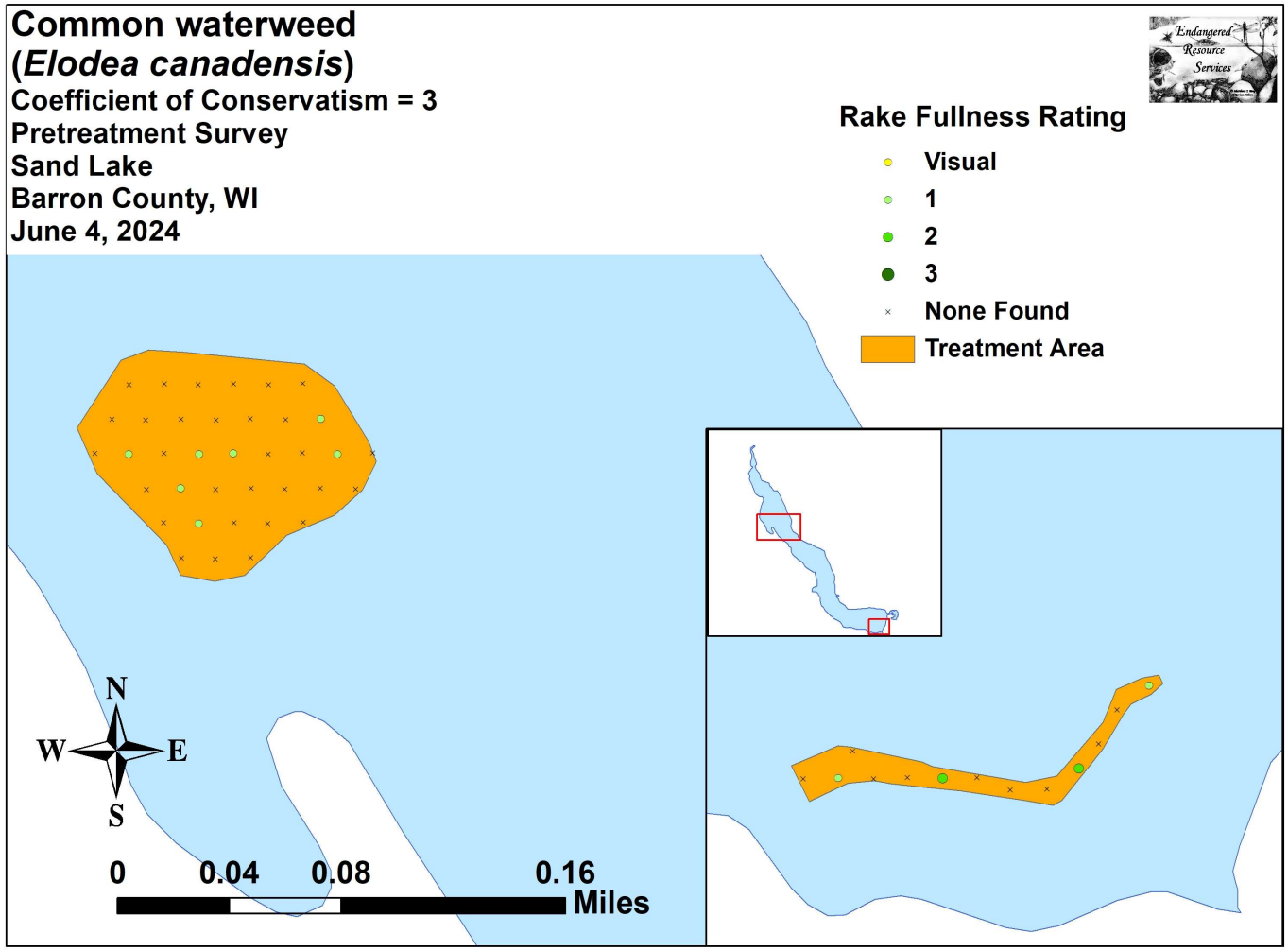

Eurasian water-milfoil
(Myriophyllum spicatum)
Exotic Species
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

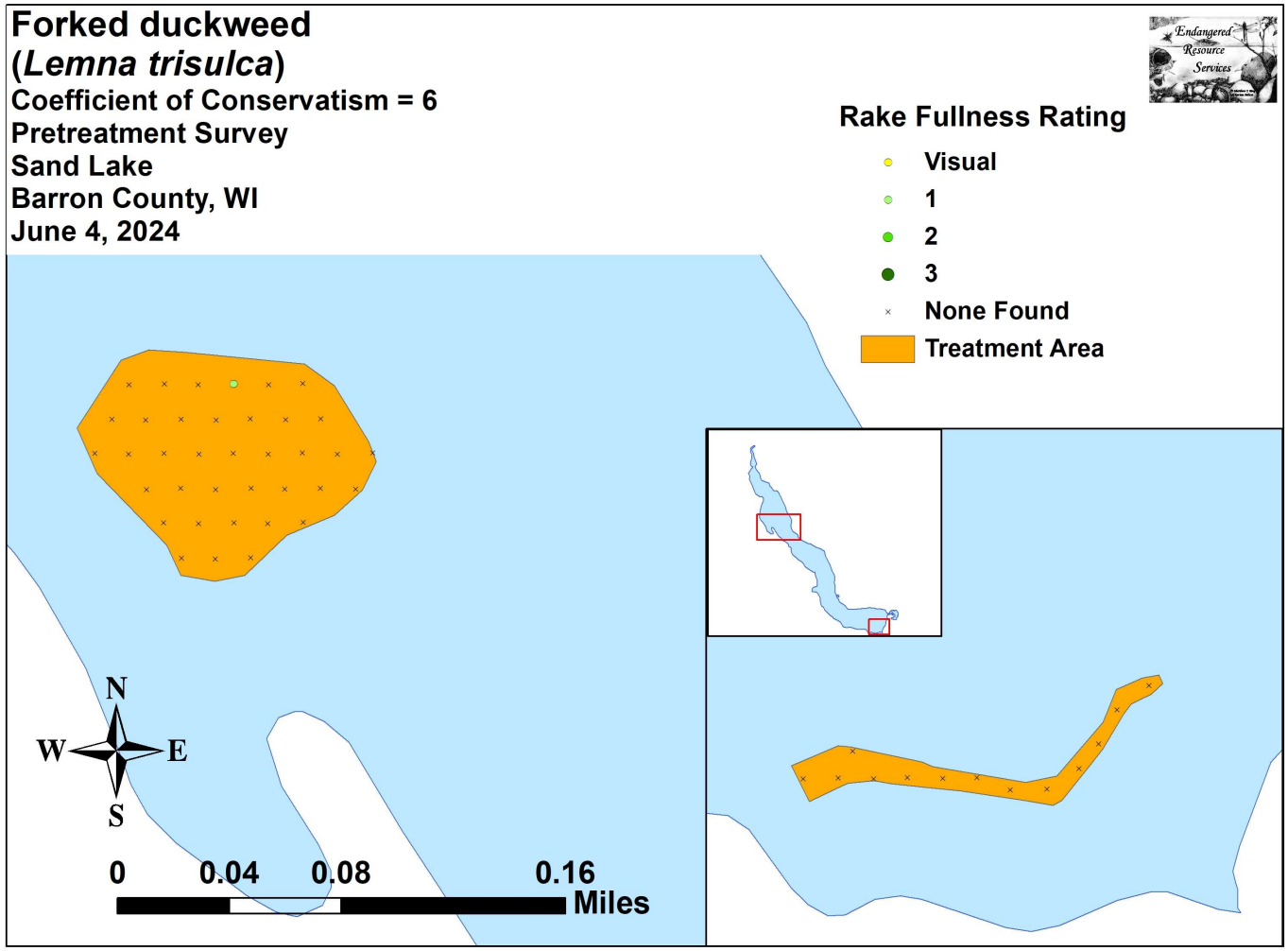

Eurasian water-milfoil
(Myriophyllum spicatum)
Exotic Species
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

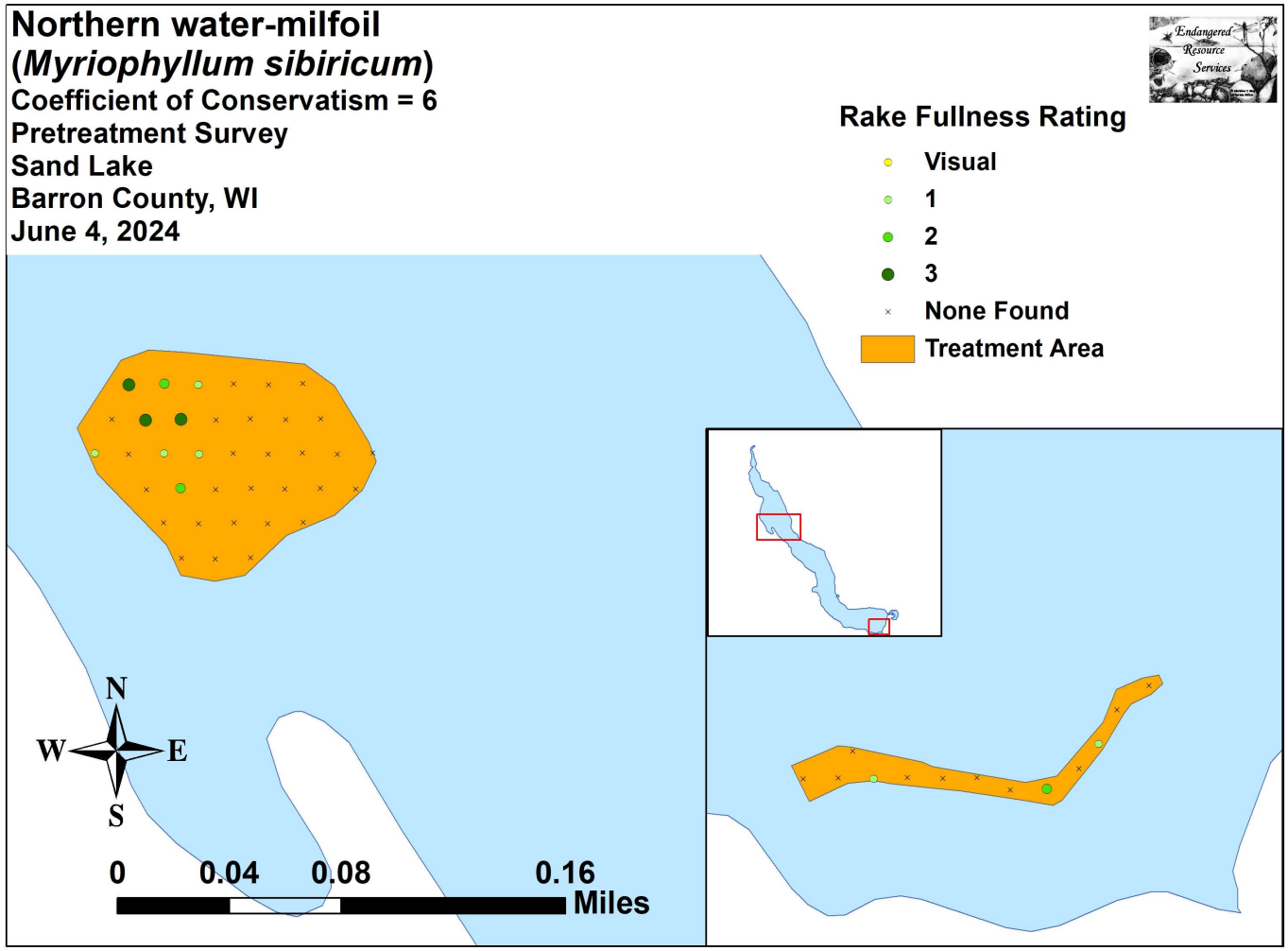
Appendix VI: Pretreatment Native Species Density and Distribution

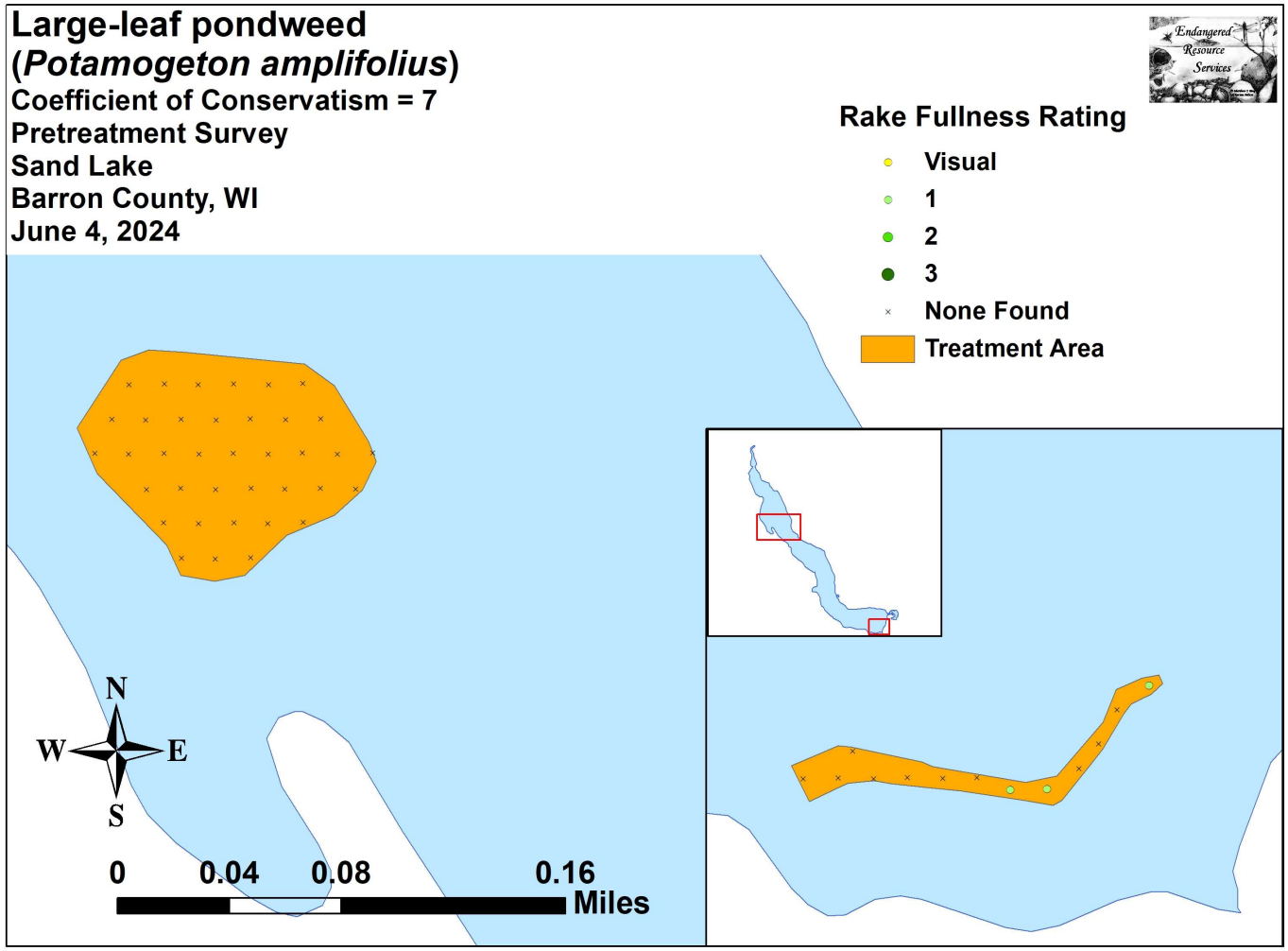

Coontail
(Ceratophyllum demersum)
Coefficient of Conservatism = 3
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

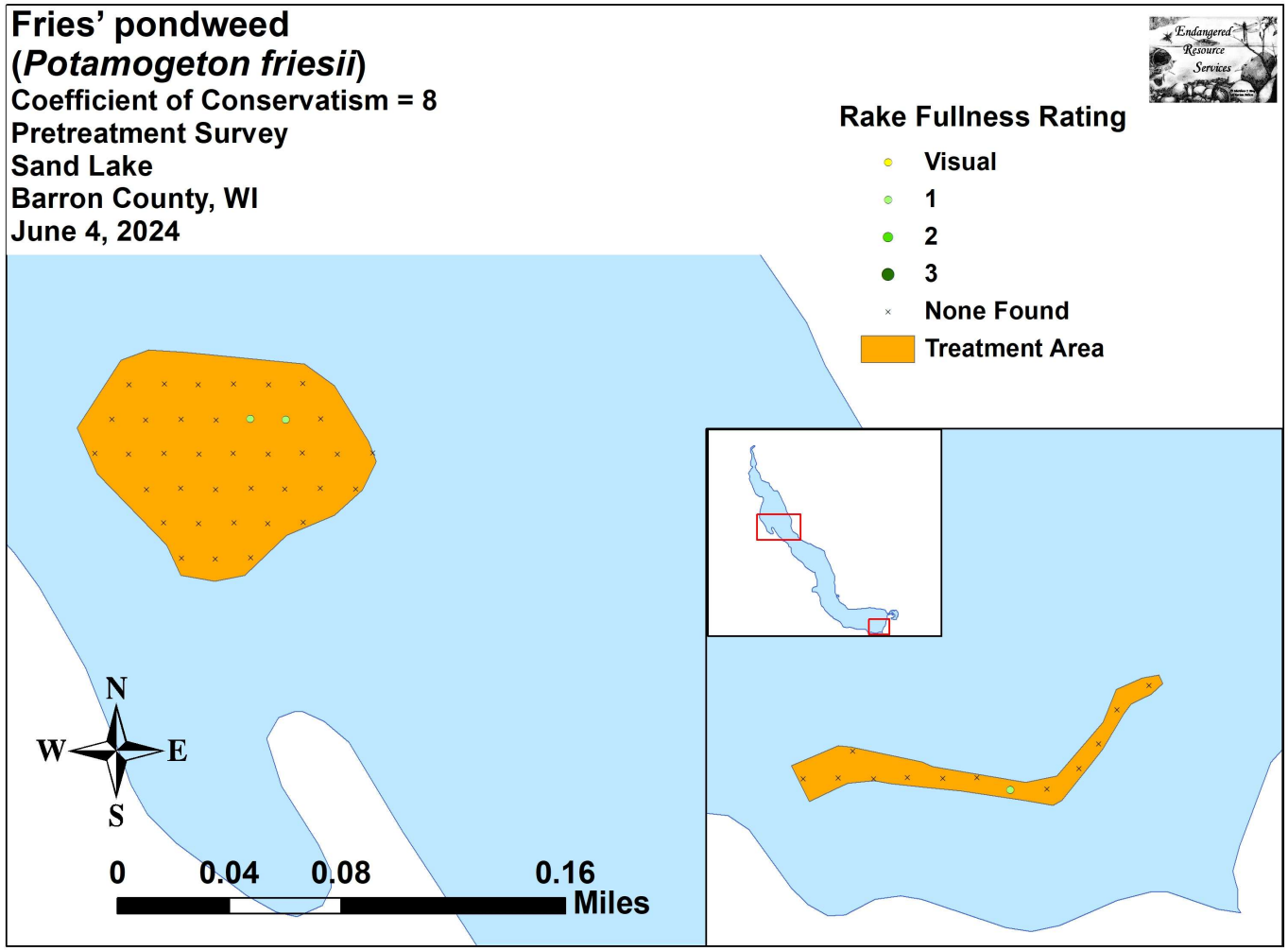

Muskgrass
(Chara sp.)
Coefficient of Conservatism = 7
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

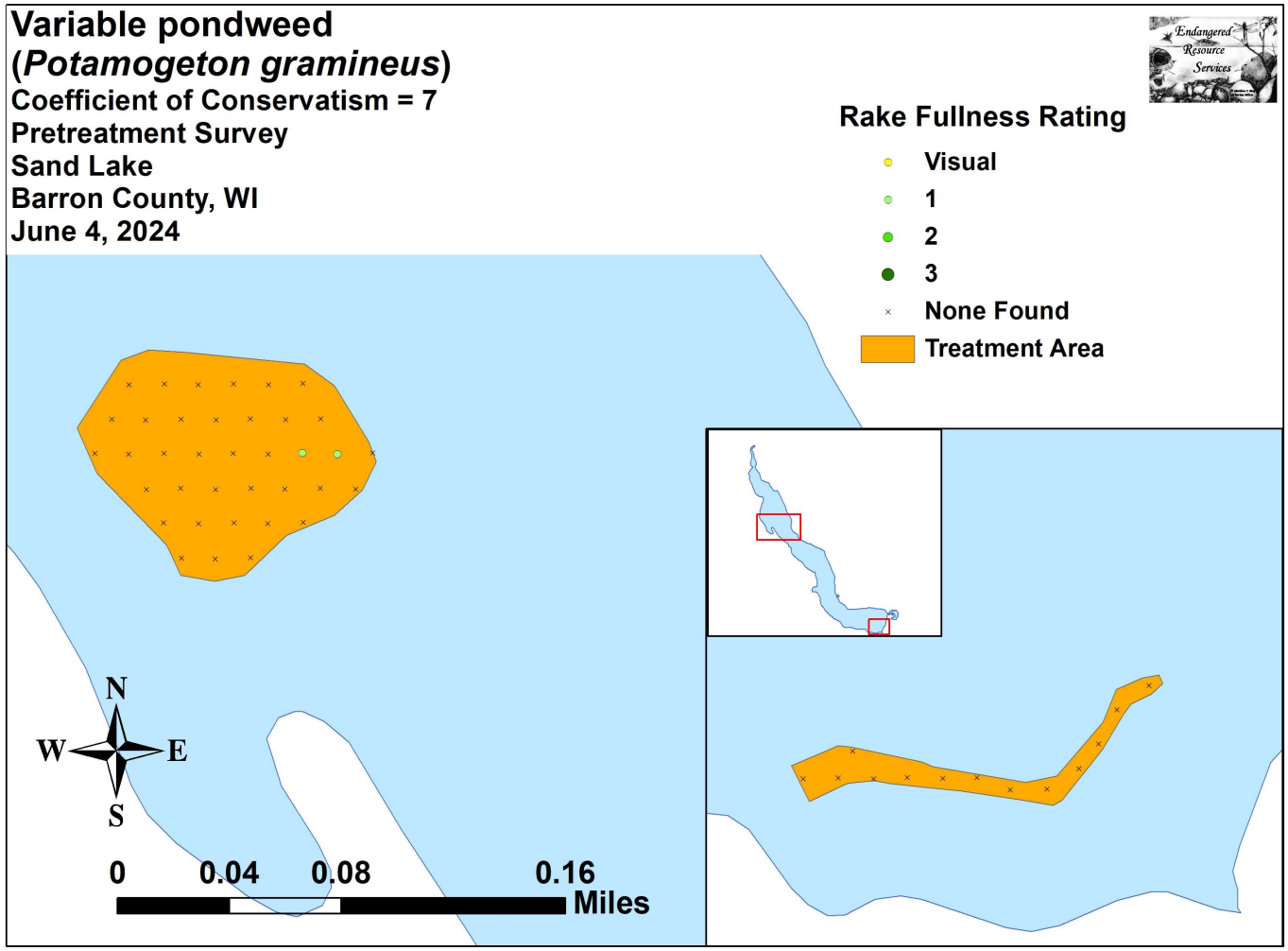

Common waterweed
(Elodea canadensis)
Coefficient of Conservatism = 3
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

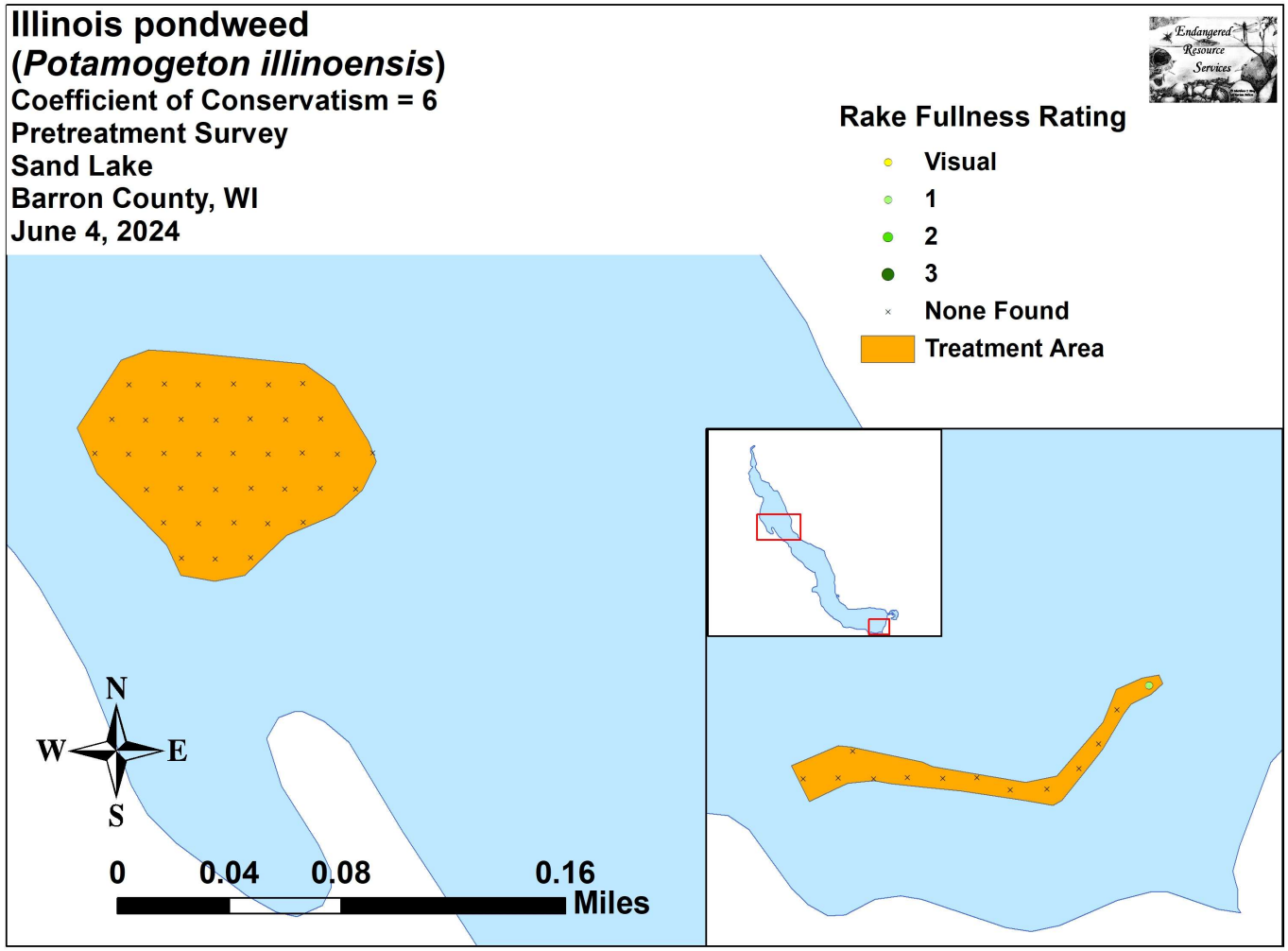

Forked duckweed
(Lemna trisulca)
Coefficient of Conservatism = 6
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

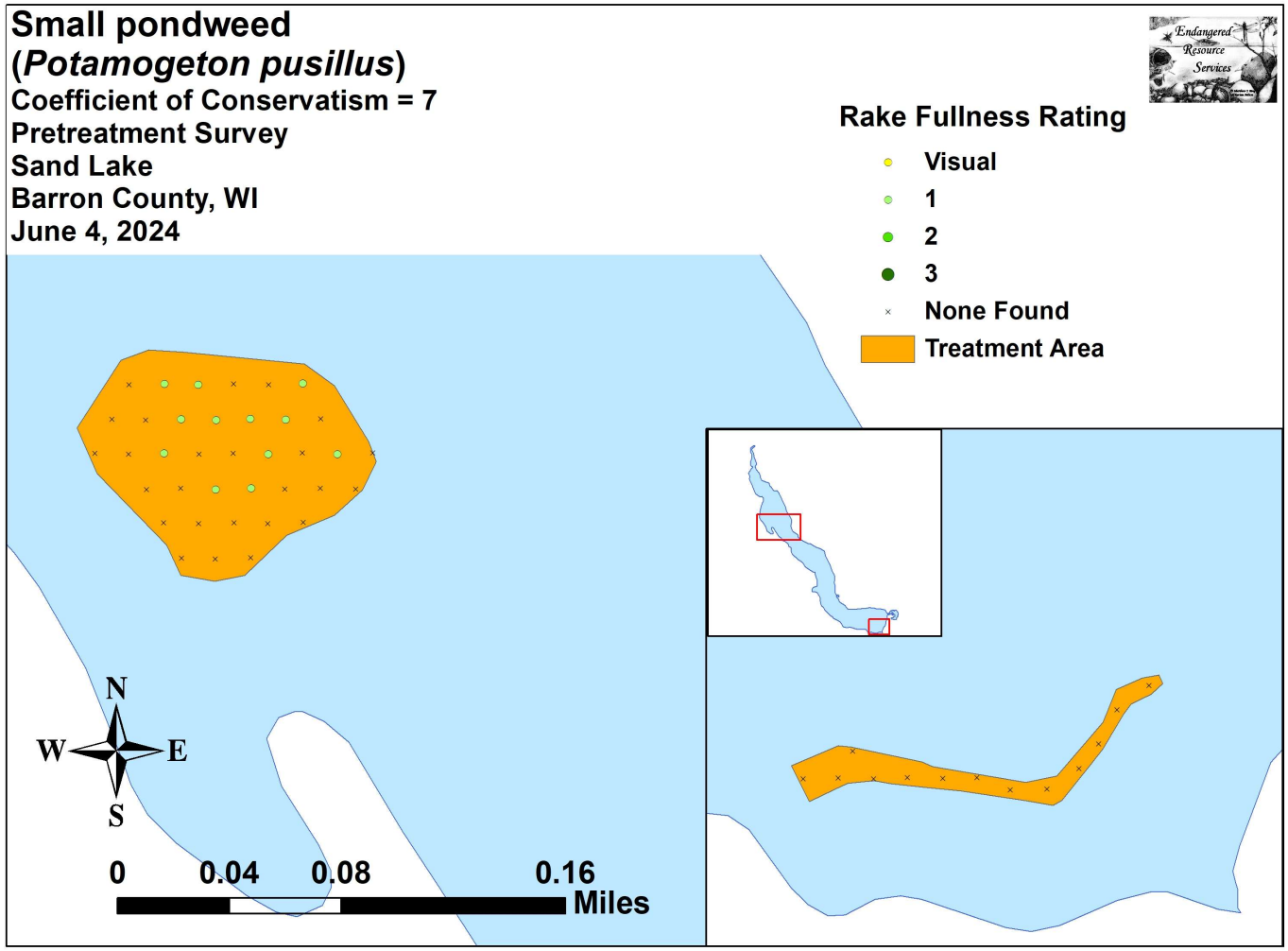

Northern water-milfoil
(Myriophyllum sibiricum)
Coefficient of Conservatism = 6
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

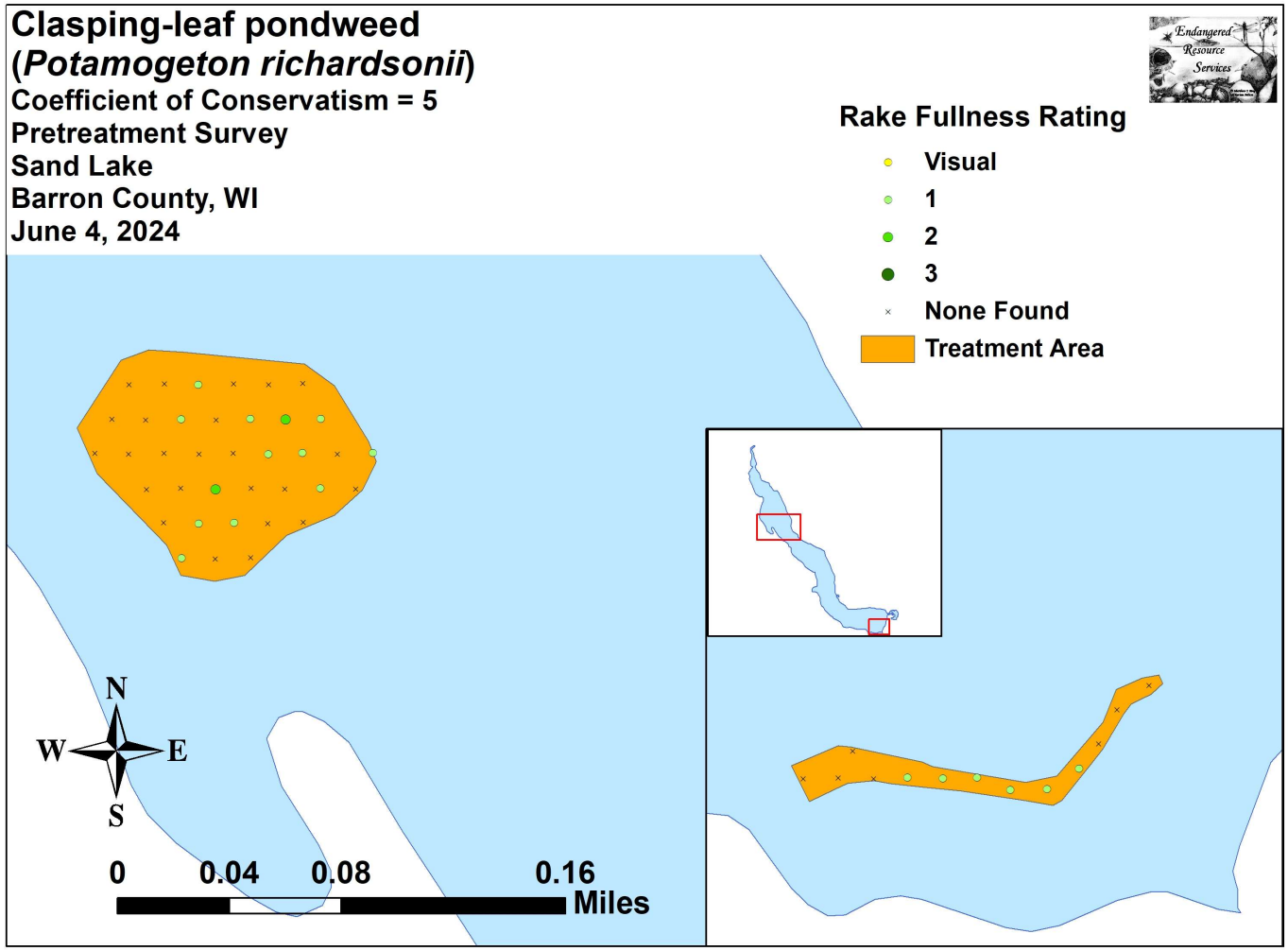

Large-leaf pondweed
(Potamogeton amplifolius)
Coefficient of Conservatism = 7
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

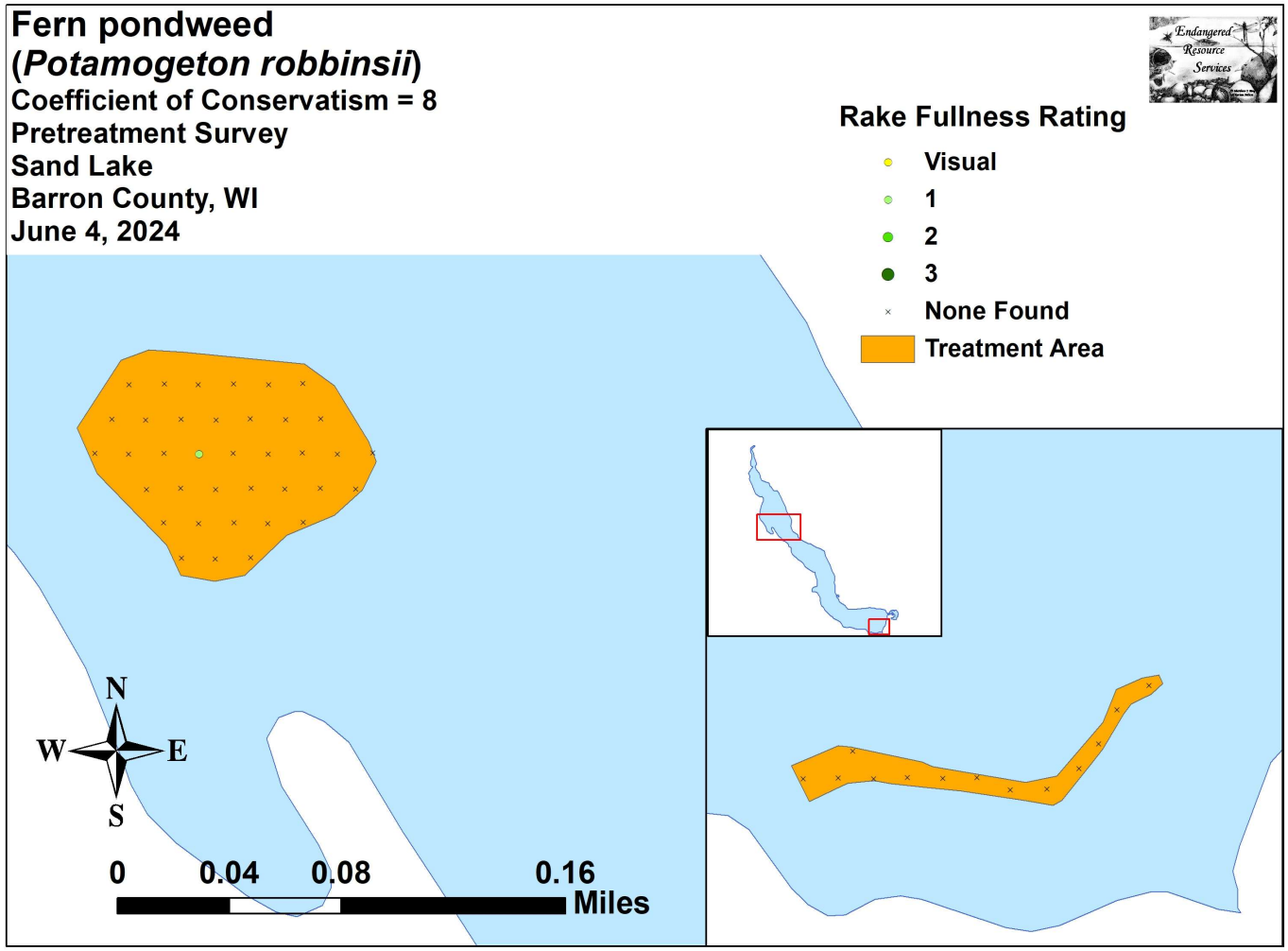

Fries' pondweed
(Potamogeton friesii)
Coefficient of Conservatism = 8
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

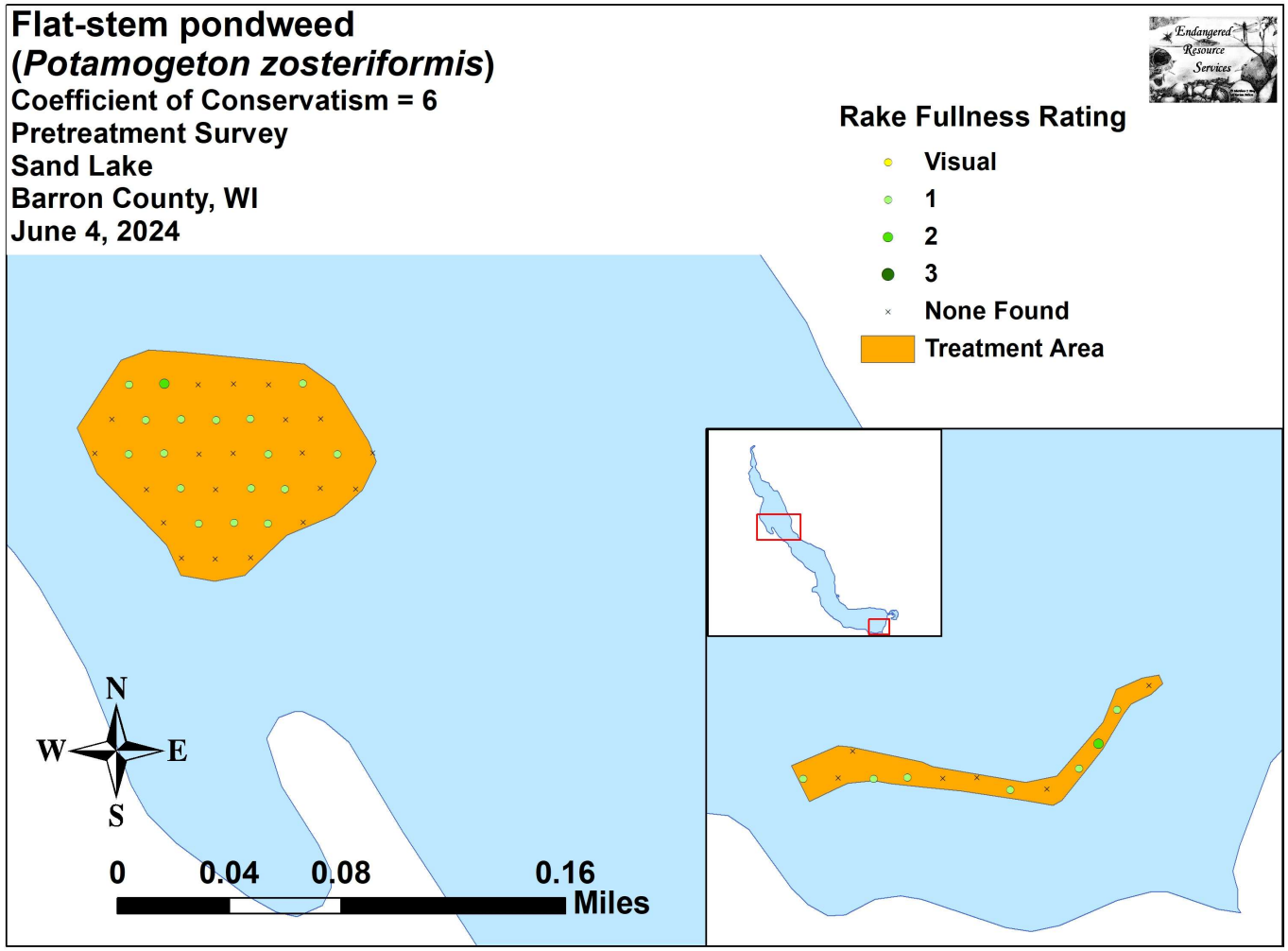

Variable pondweed
(Potamogeton gramineus)
Coefficient of Conservatism = 7
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

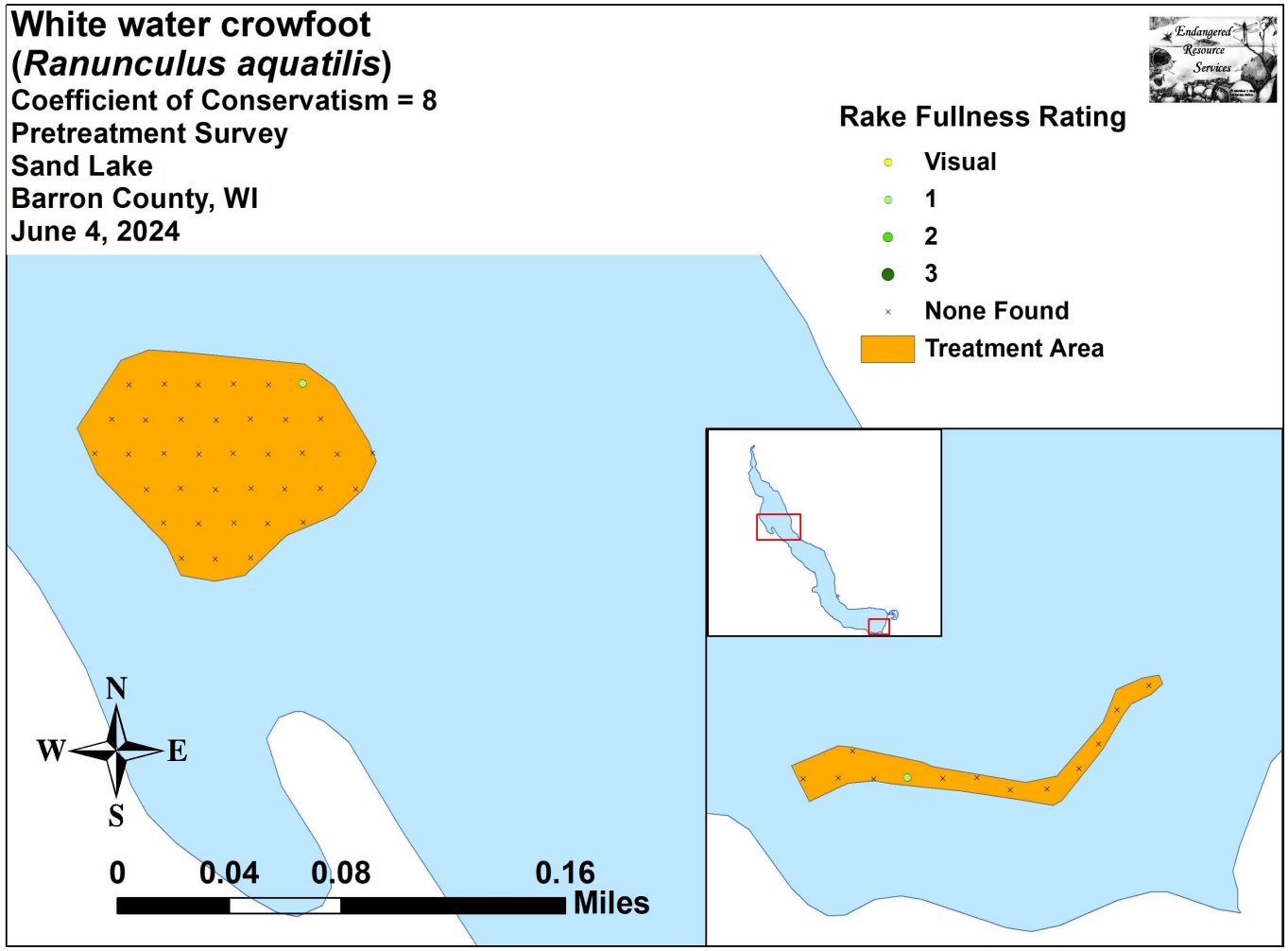

Illinois pondweed
(Potamogeton illinoensis)
Coefficient of Conservatism = 6
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Small pondweed
(Potamogeton pusillus)
Coefficient of Conservatism = 7
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

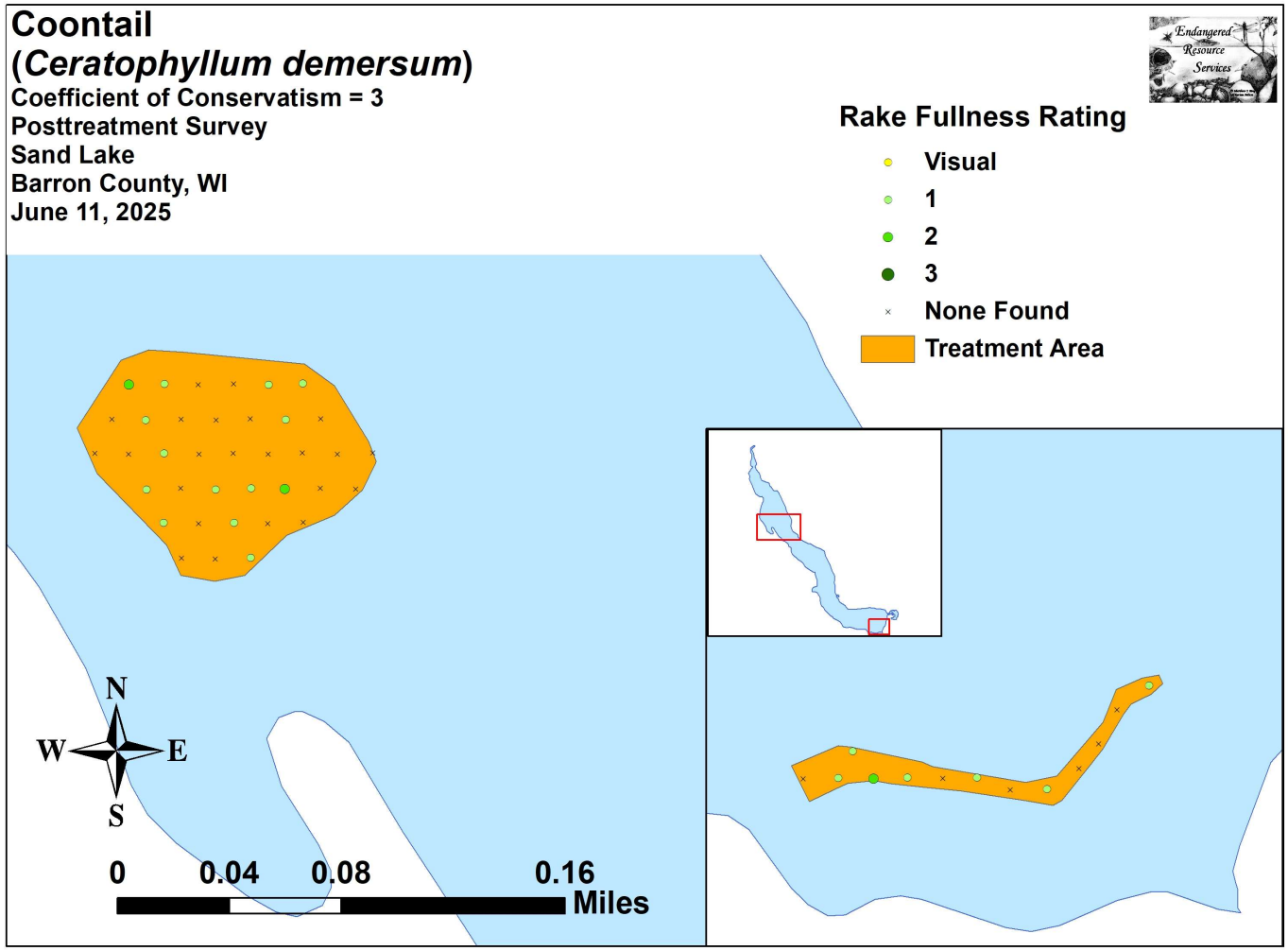

Clasping-leaf pondweed
(Potamogeton richardsonii)
Coefficient of Conservatism = 5
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

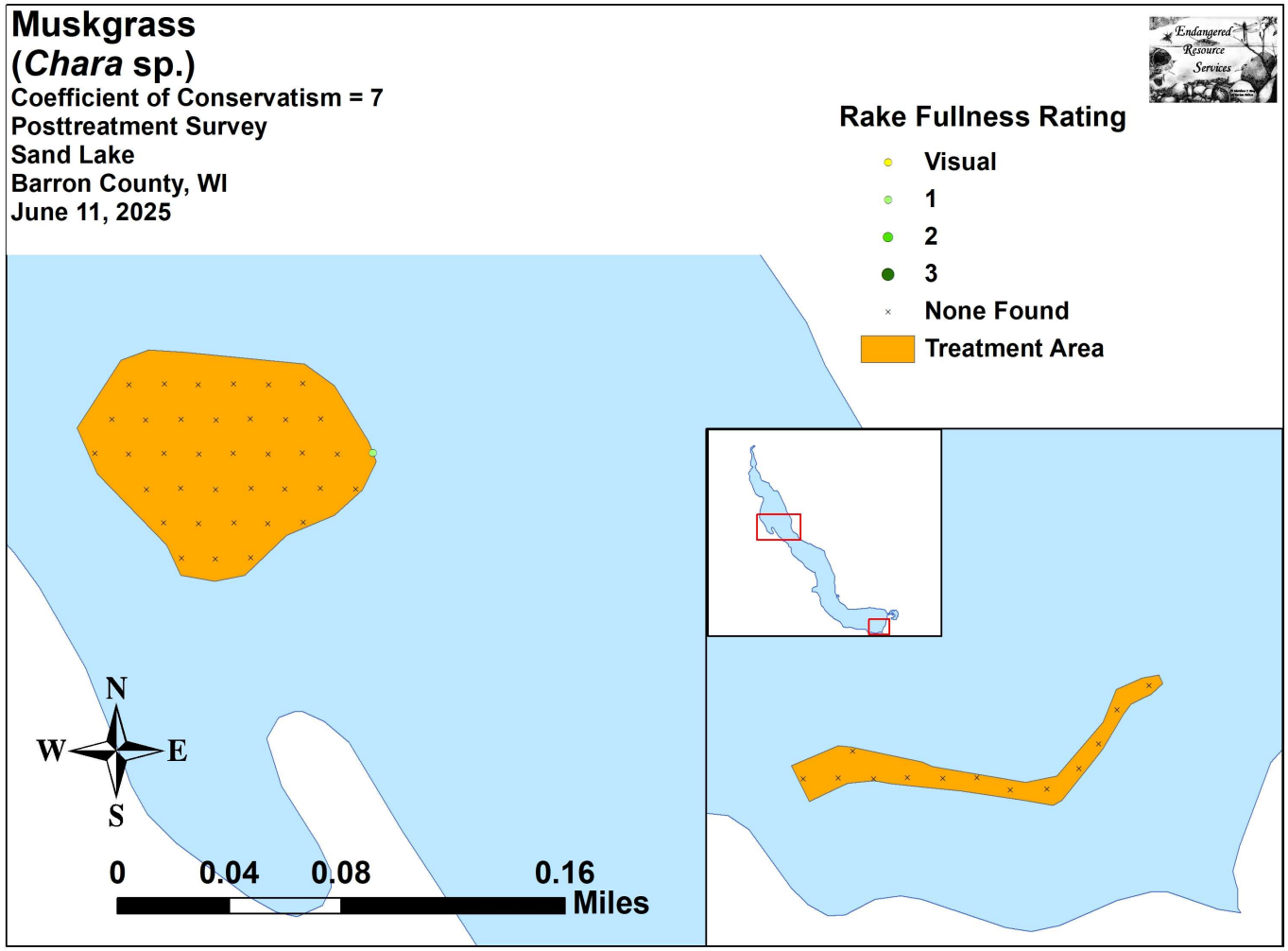

Fern pondweed
(Potamogeton robbinsii)
Coefficient of Conservatism = 8
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

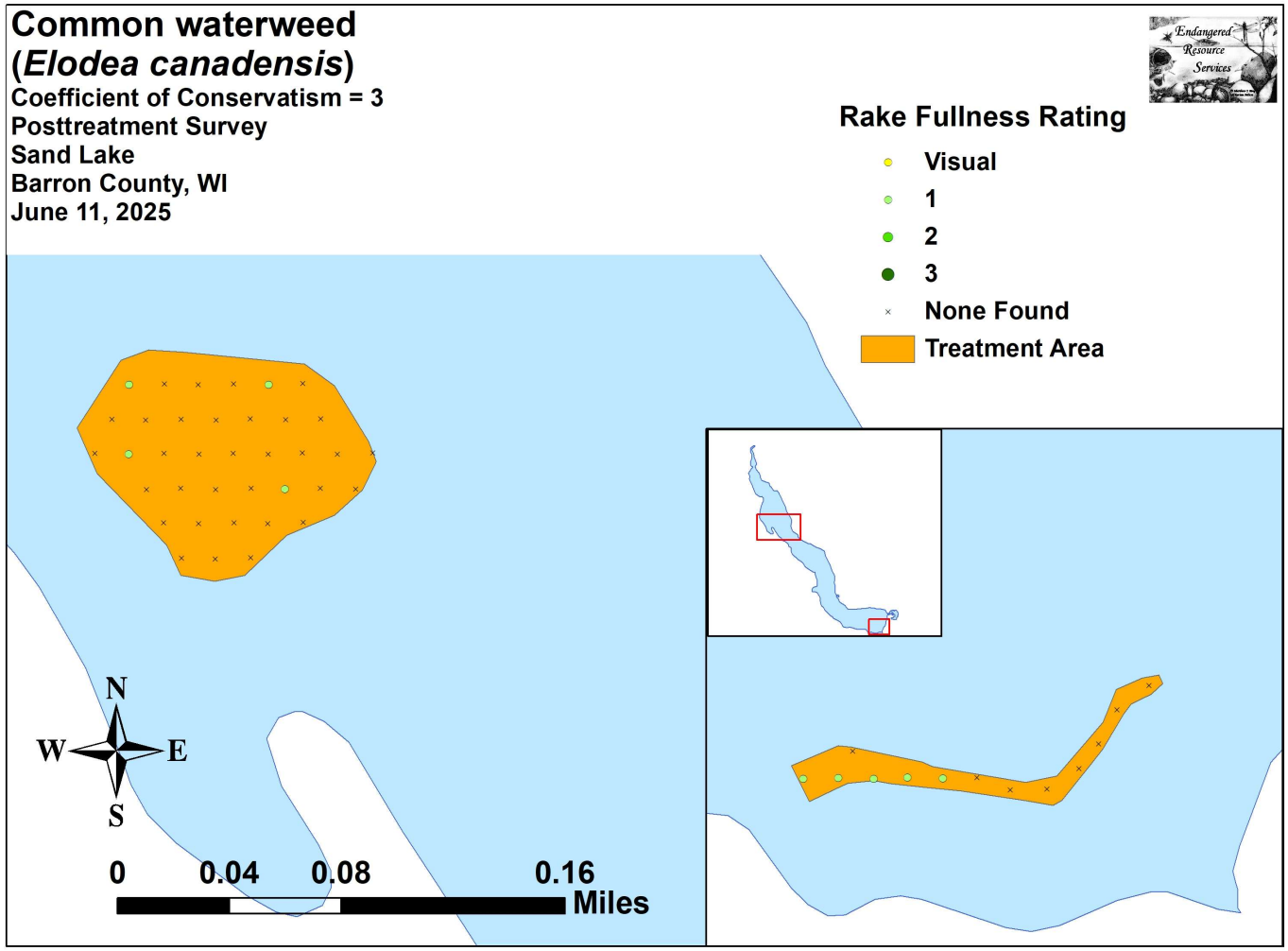

Flat-stem pondweed
(Potamogeton zosteriformis)
Coefficient of Conservatism = 6
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

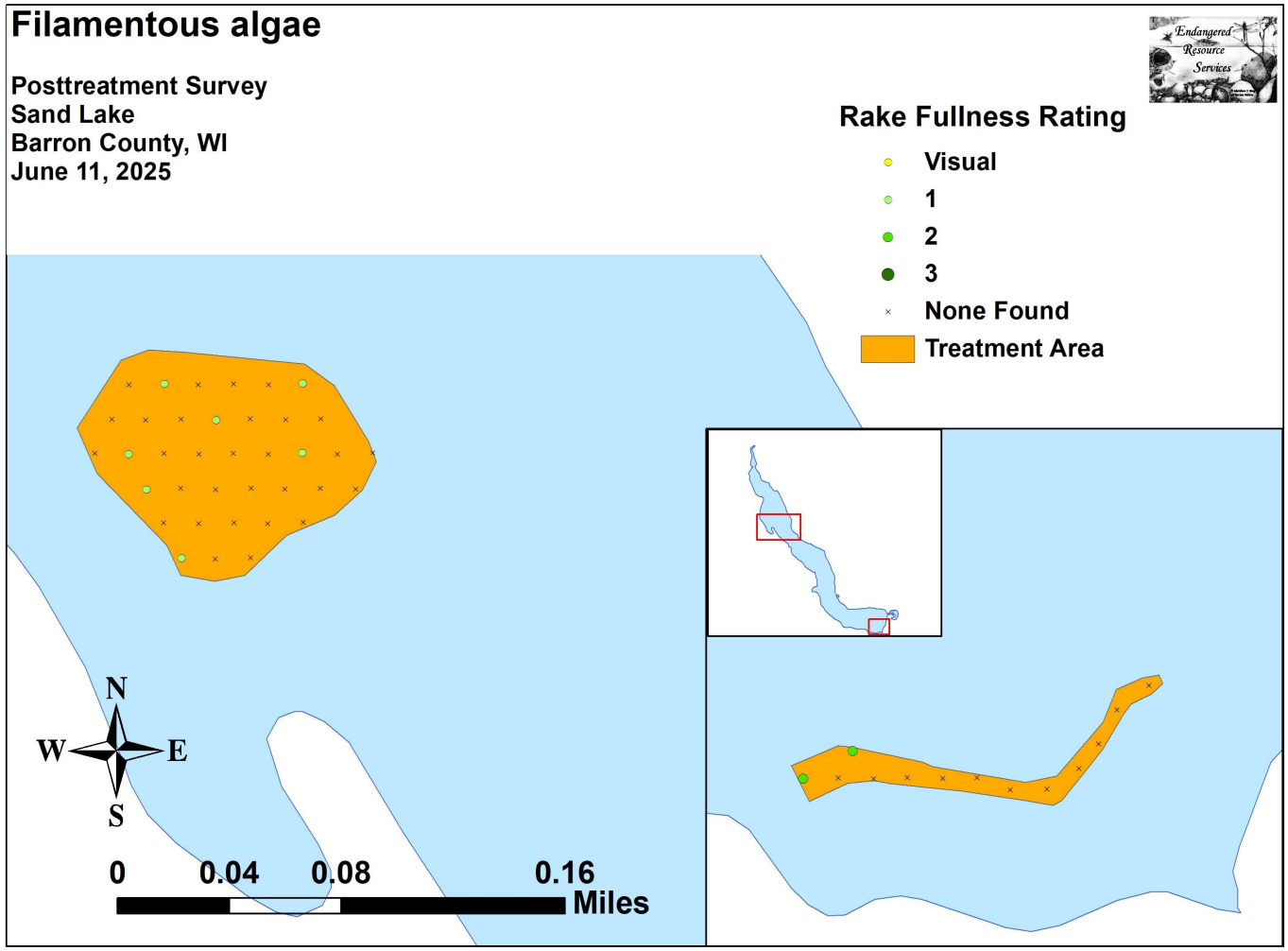

White water crowfoot
(Ranunculus aquatilis)
Coefficient of Conservatism = 8
Pretreatment Survey
Sand Lake
Barron County, WI
June 4, 2024
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

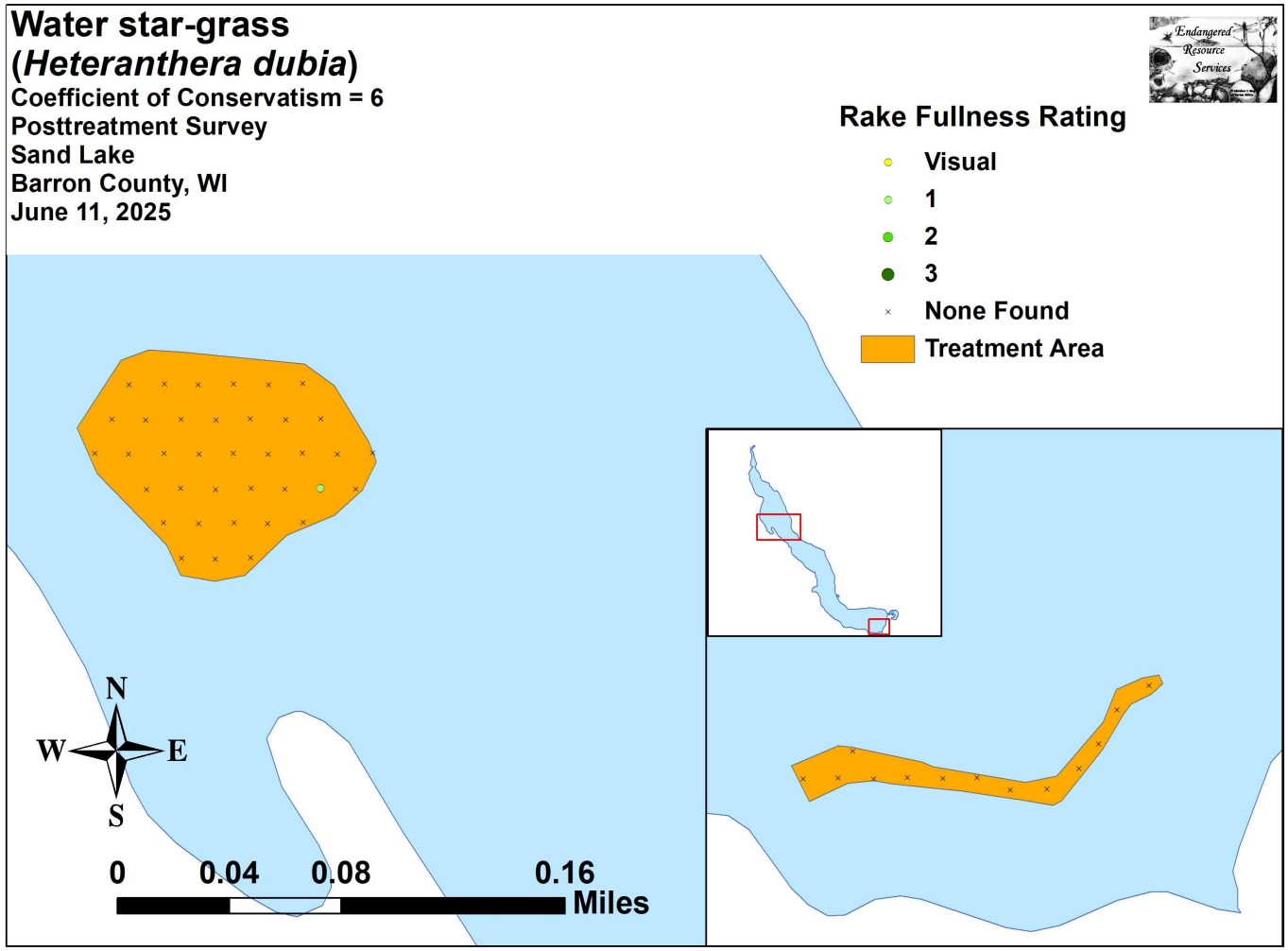
Appendix VII: Posttreatment Native Species Density and Distribution

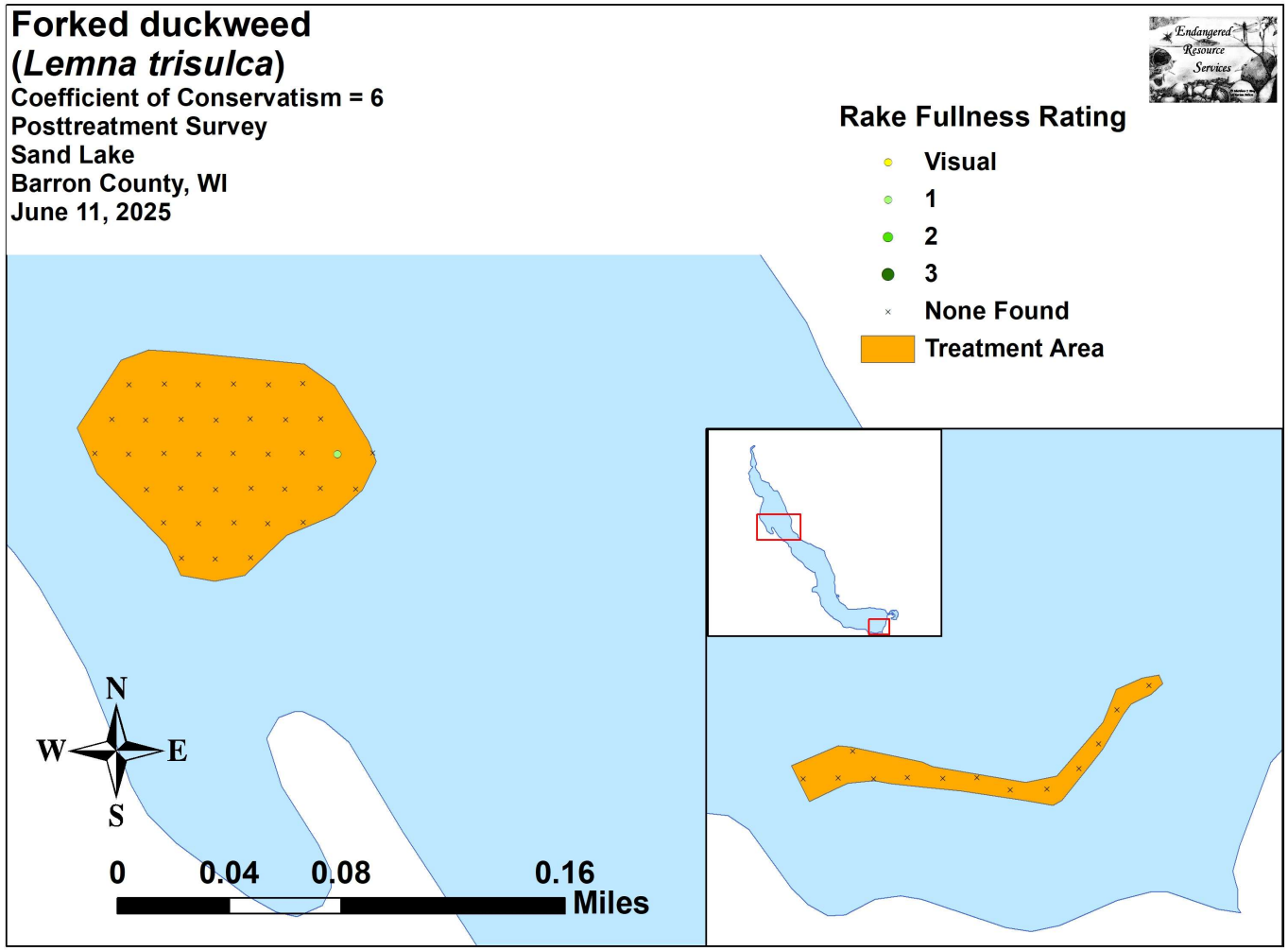

Coontail
(Ceratophyllum demersum)
Coefficient of Conservatism = 3
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

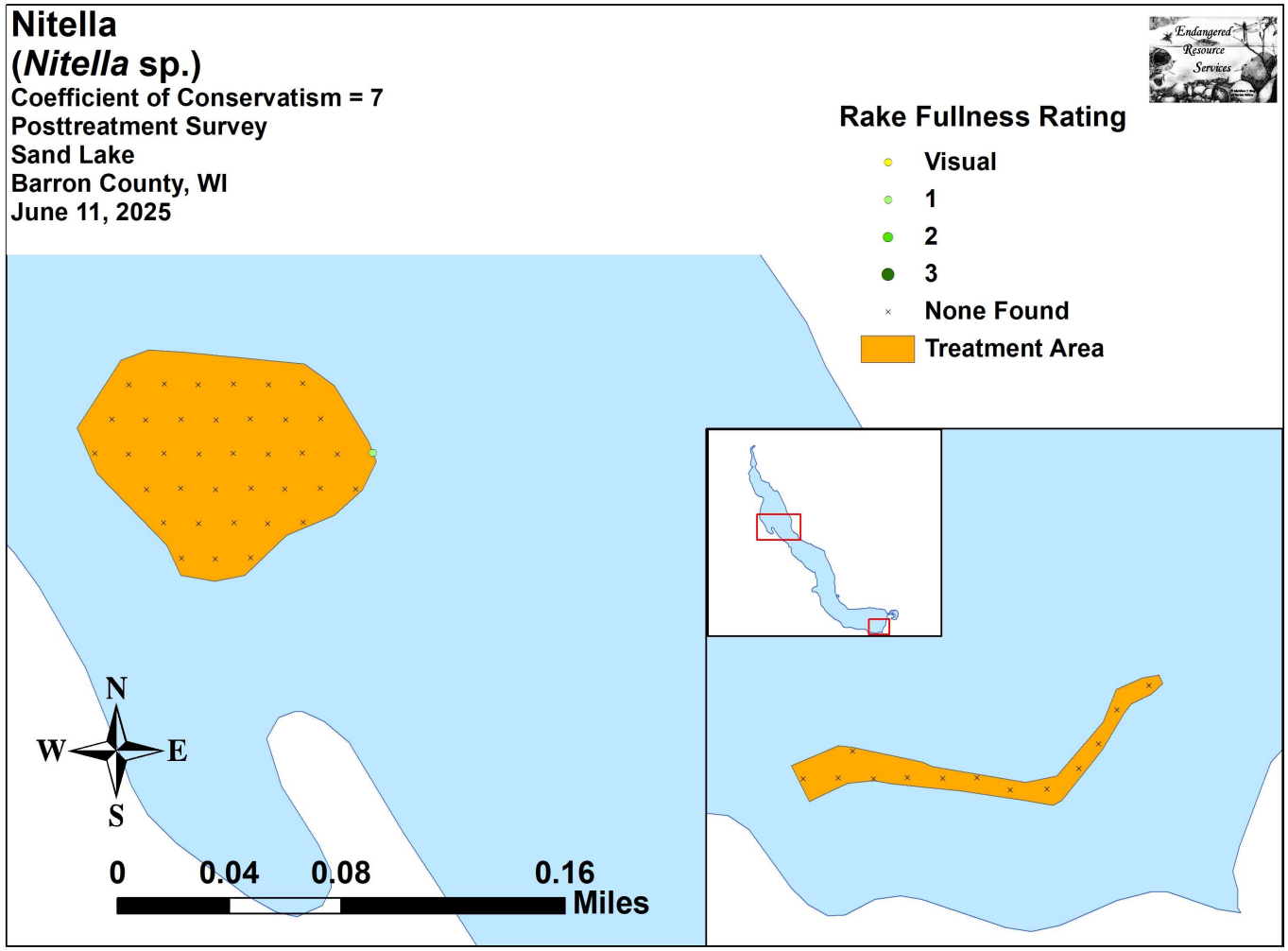

Muskgrass
(Chara sp.)
Coefficient of Conservatism = 7
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles

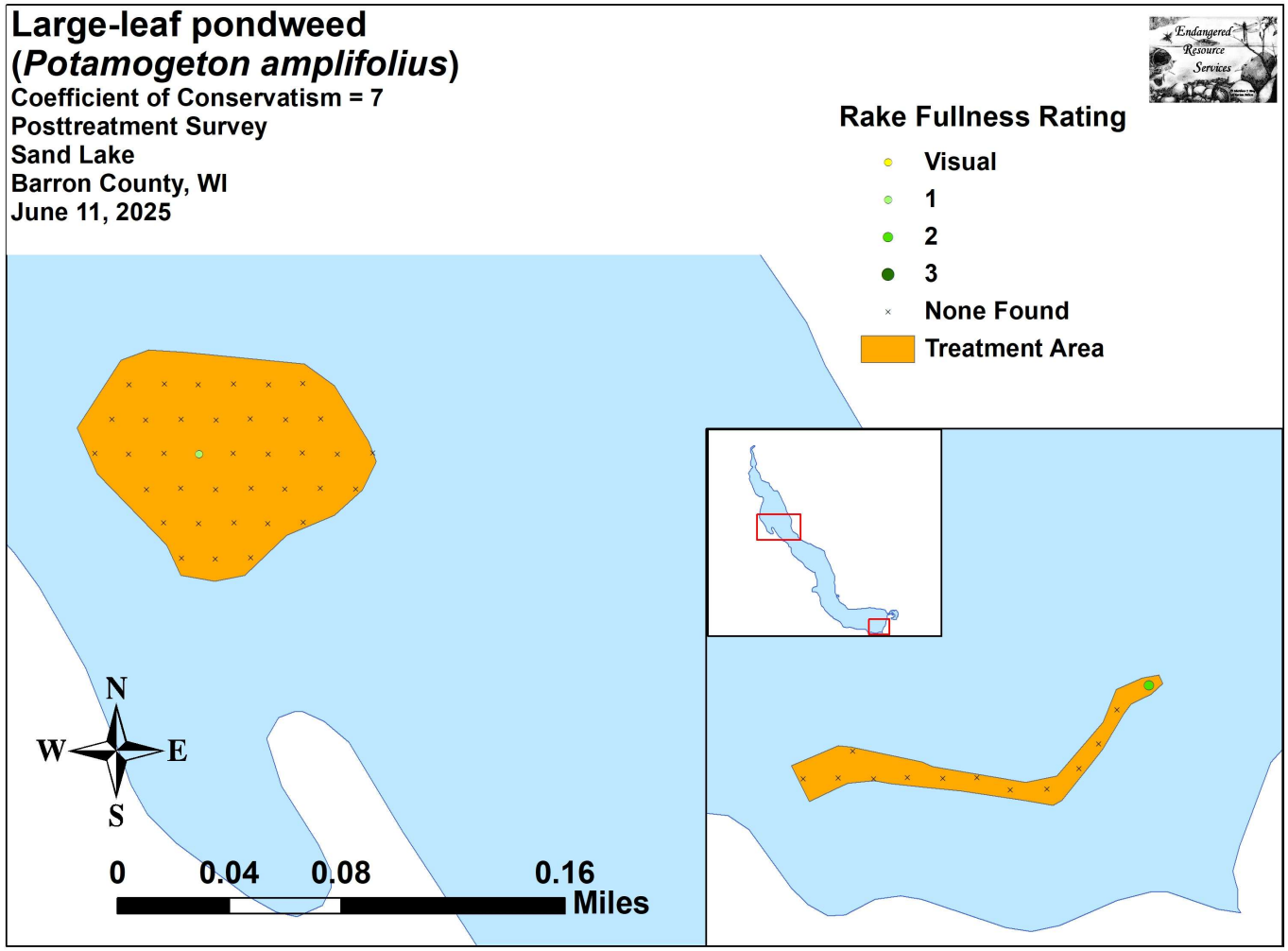

Common waterweed
(Elodea canadensis)
Coefficient of Conservatism = 3
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Filamentous algae
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Water star-grass
(Heteranthera dubia)
Coefficient of Conservatism = 6
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Forked duckweed
(Lemna trisulca)
Coefficient of Conservatism = 6
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Nitella
(*Nitella* sp.)
Coefficient of Conservatism = 7
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
N
W
E
S
0
0.04
0.08
0.16
Miles


Large-leaf pondweed
(Potamogeton amplifolius)
Coefficient of Conservatism = 7
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
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0.04
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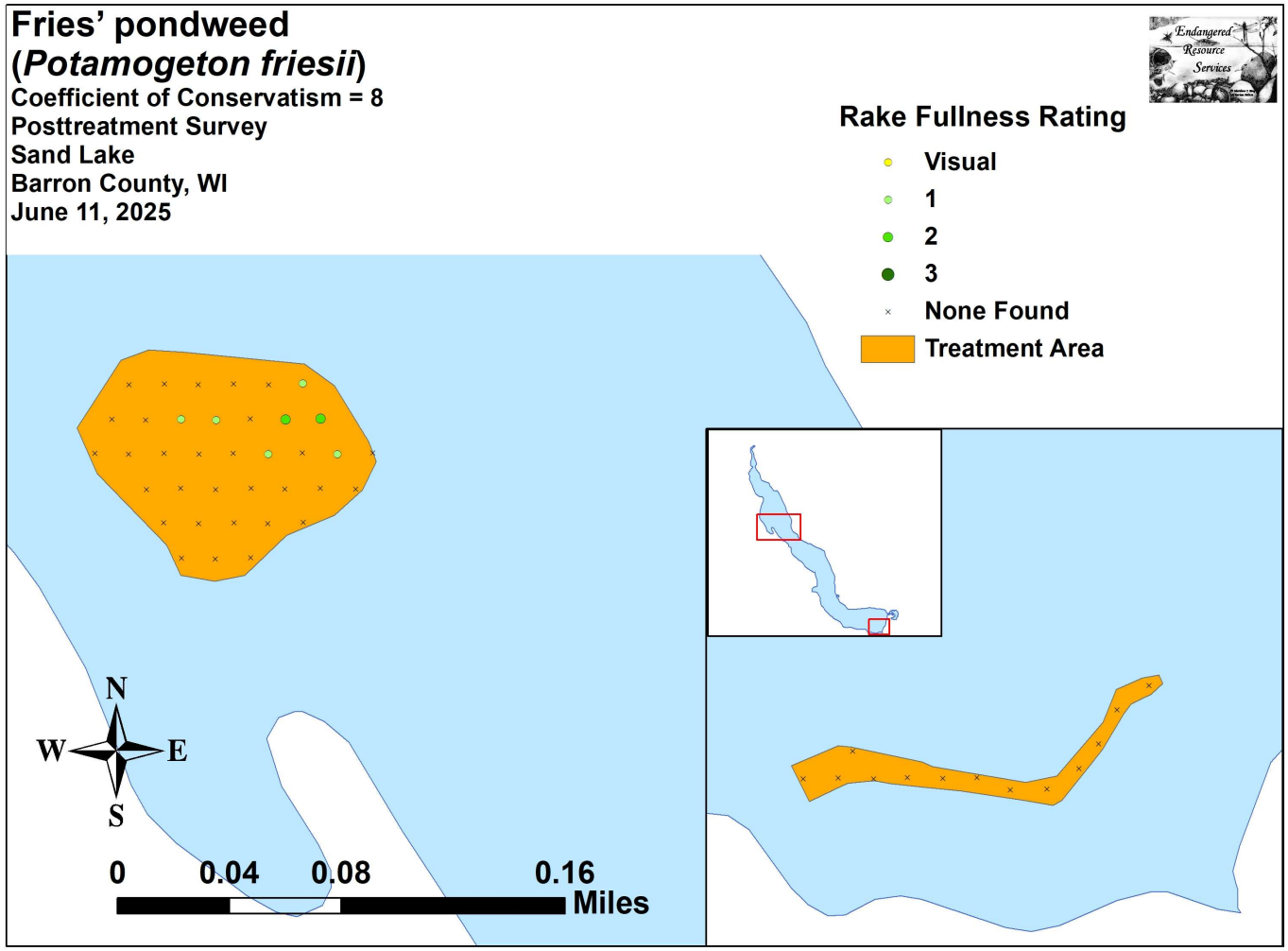
0.16
Miles


Fries' pondweed
(Potamogeton friesii)
Coefficient of Conservatism = 8
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
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0.04
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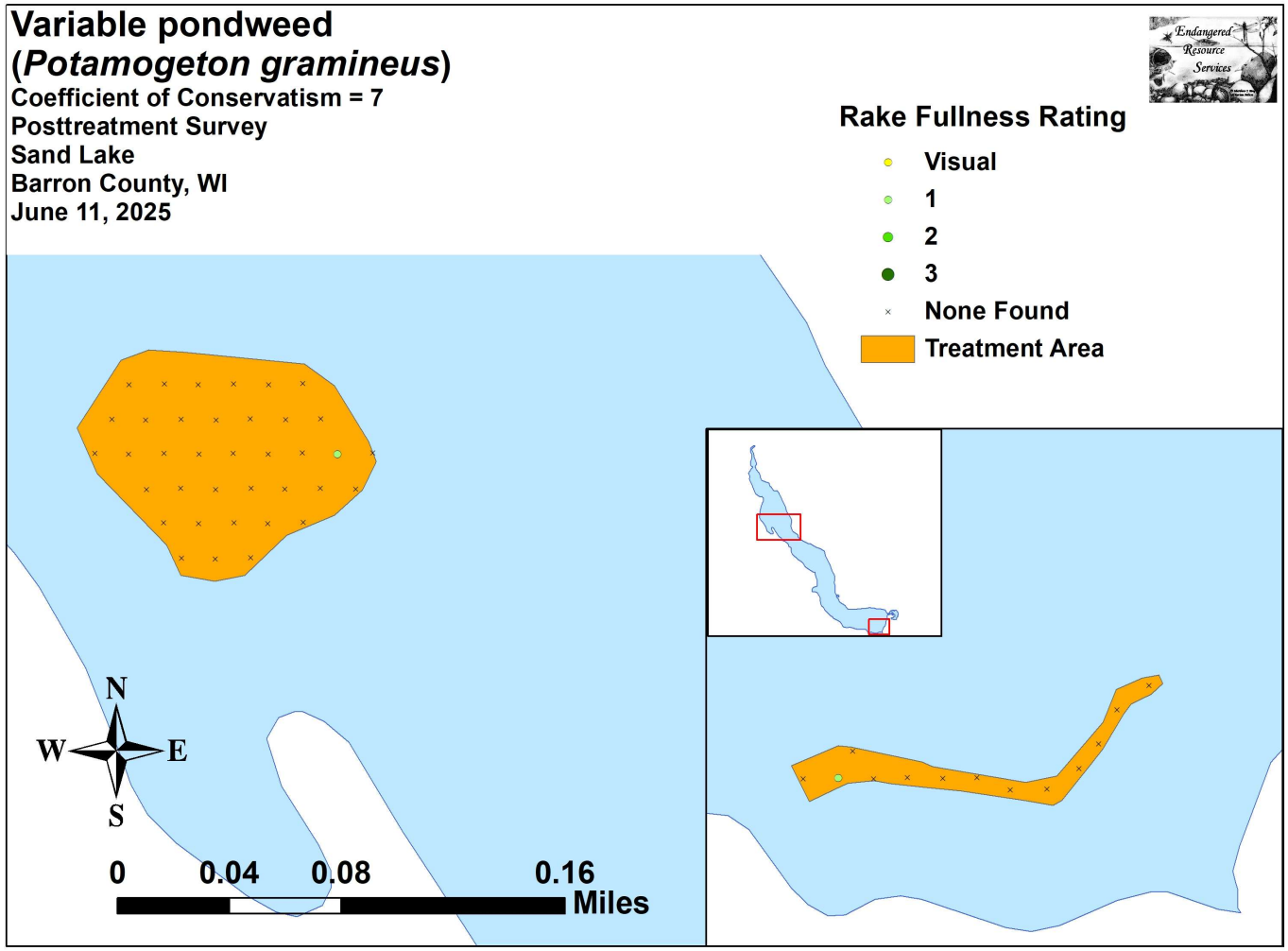
0.16
Miles


Variable pondweed
(Potamogeton gramineus)
Coefficient of Conservatism = 7
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
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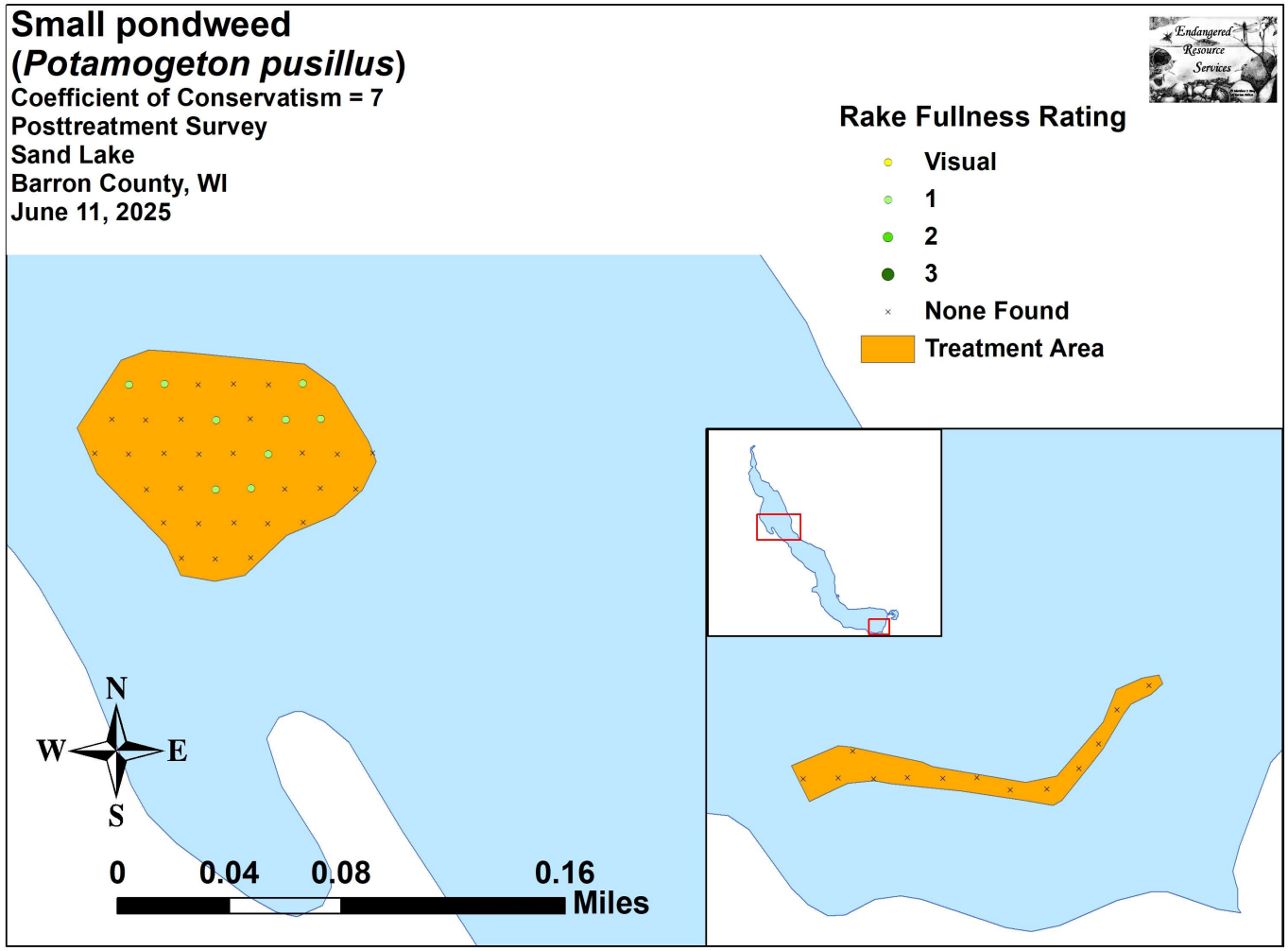
0.08
0.16
Miles


Small pondweed
(Potamogeton pusillus)
Coefficient of Conservatism = 7
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
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None Found
Treatment Area
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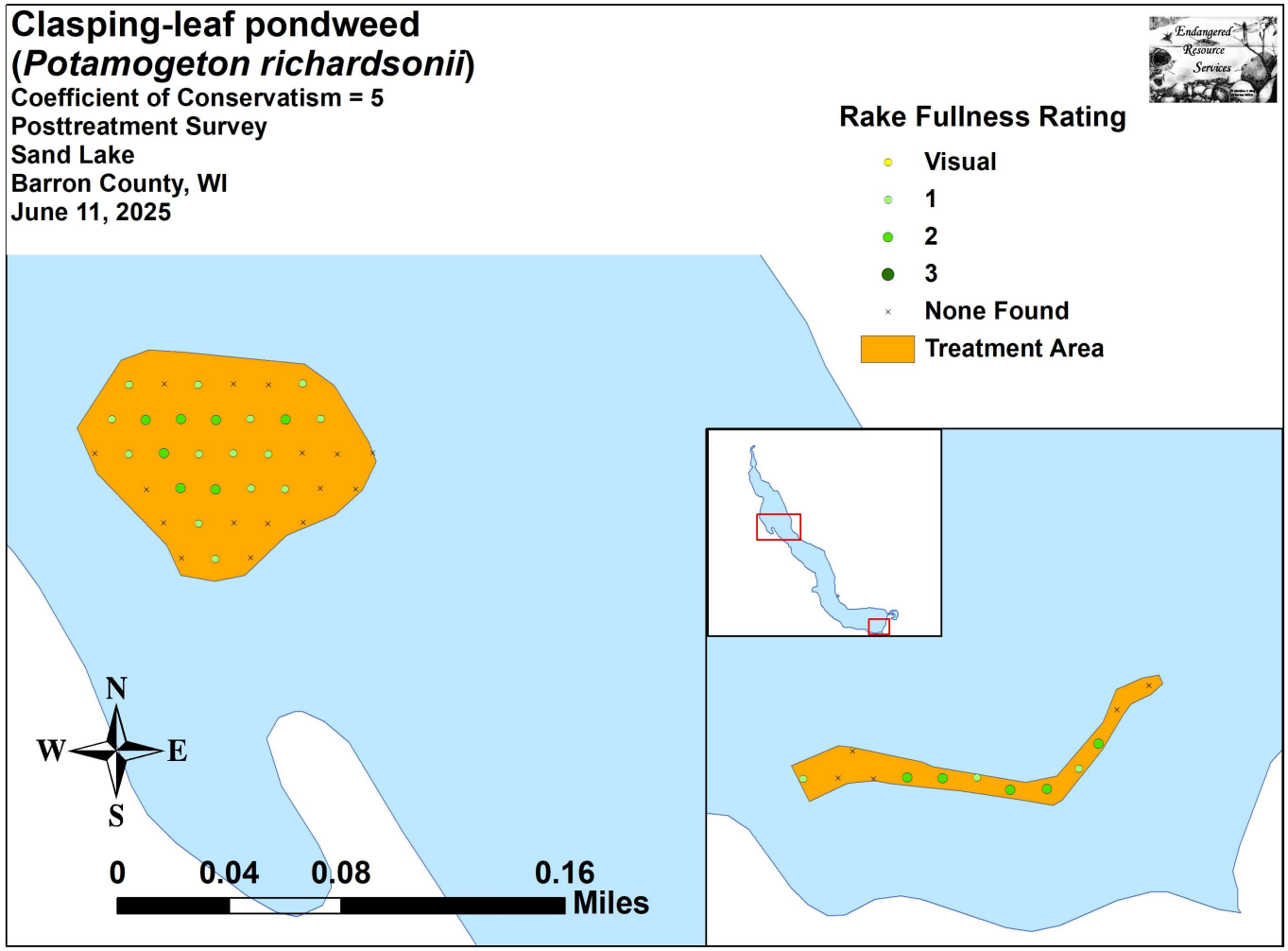
Miles


Clasping-leaf pondweed
(Potamogeton richardsonii)
Coefficient of Conservatism = 5
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
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None Found
Treatment Area
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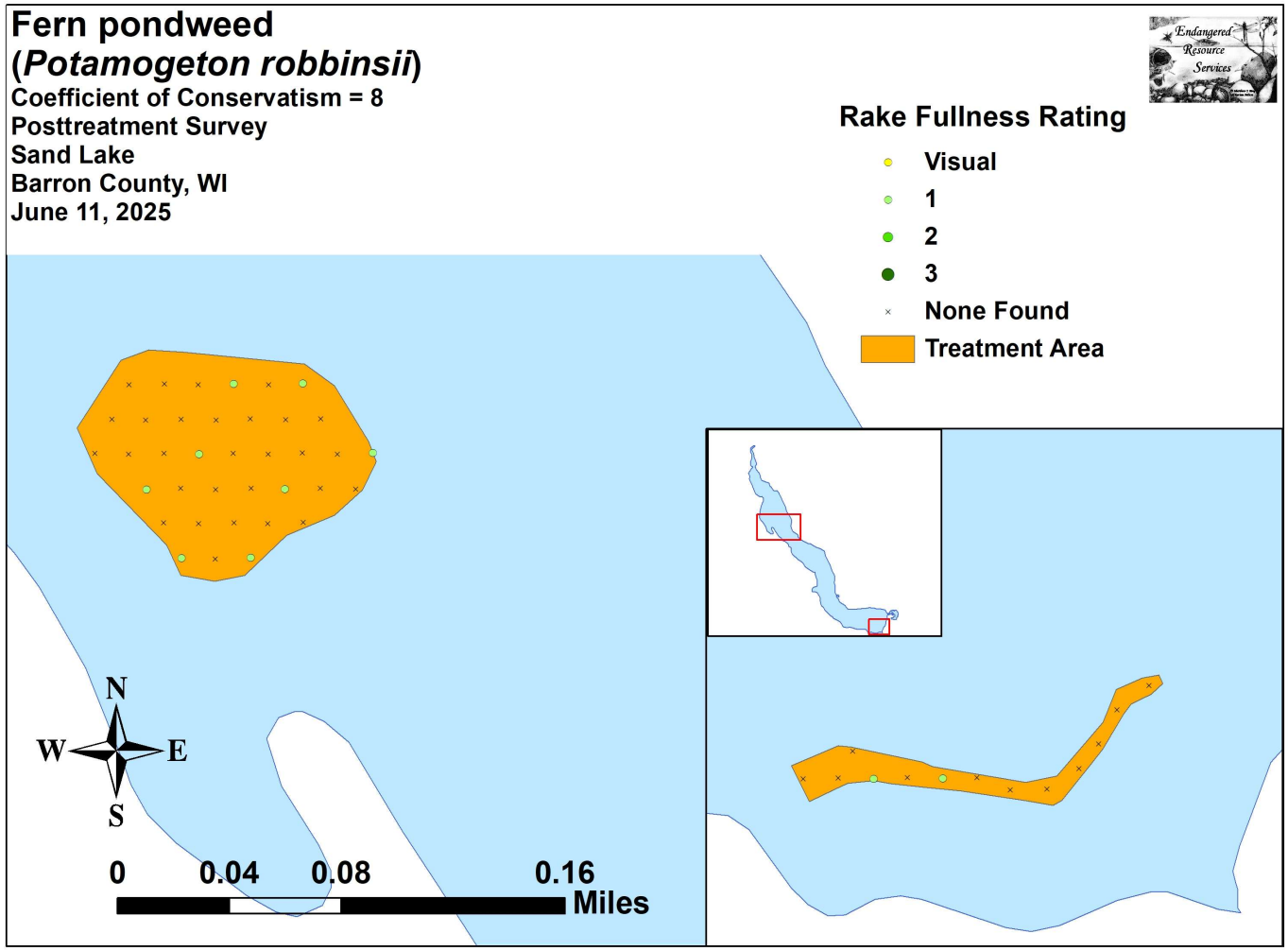
Miles


Fern pondweed
(Potamogeton robbinsii)
Coefficient of Conservatism = 8
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
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None Found
Treatment Area
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0.04
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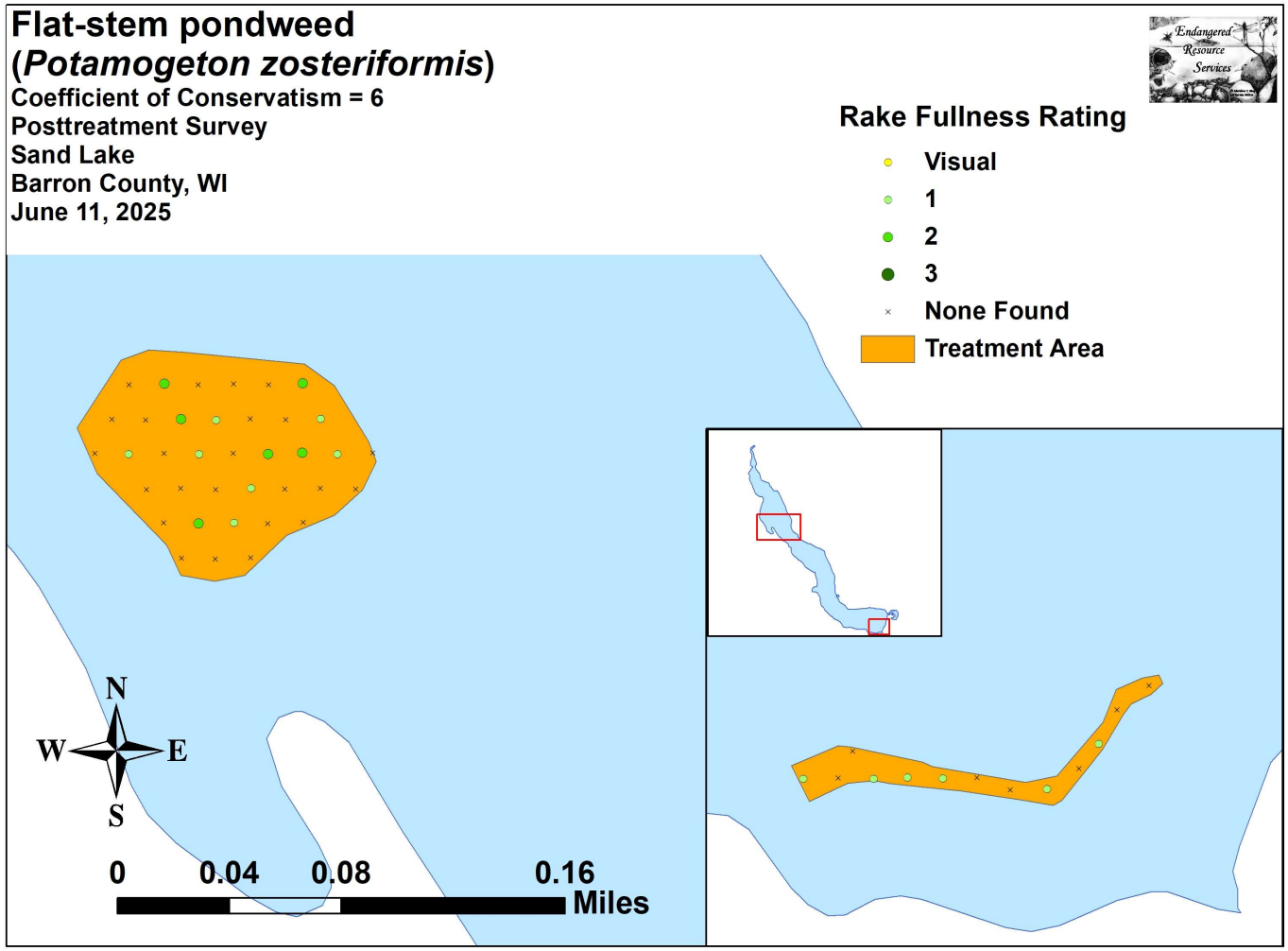
0.16
Miles


Flat-stem pondweed
(Potamogeton zosteriformis)
Coefficient of Conservatism = 6
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
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None Found
Treatment Area
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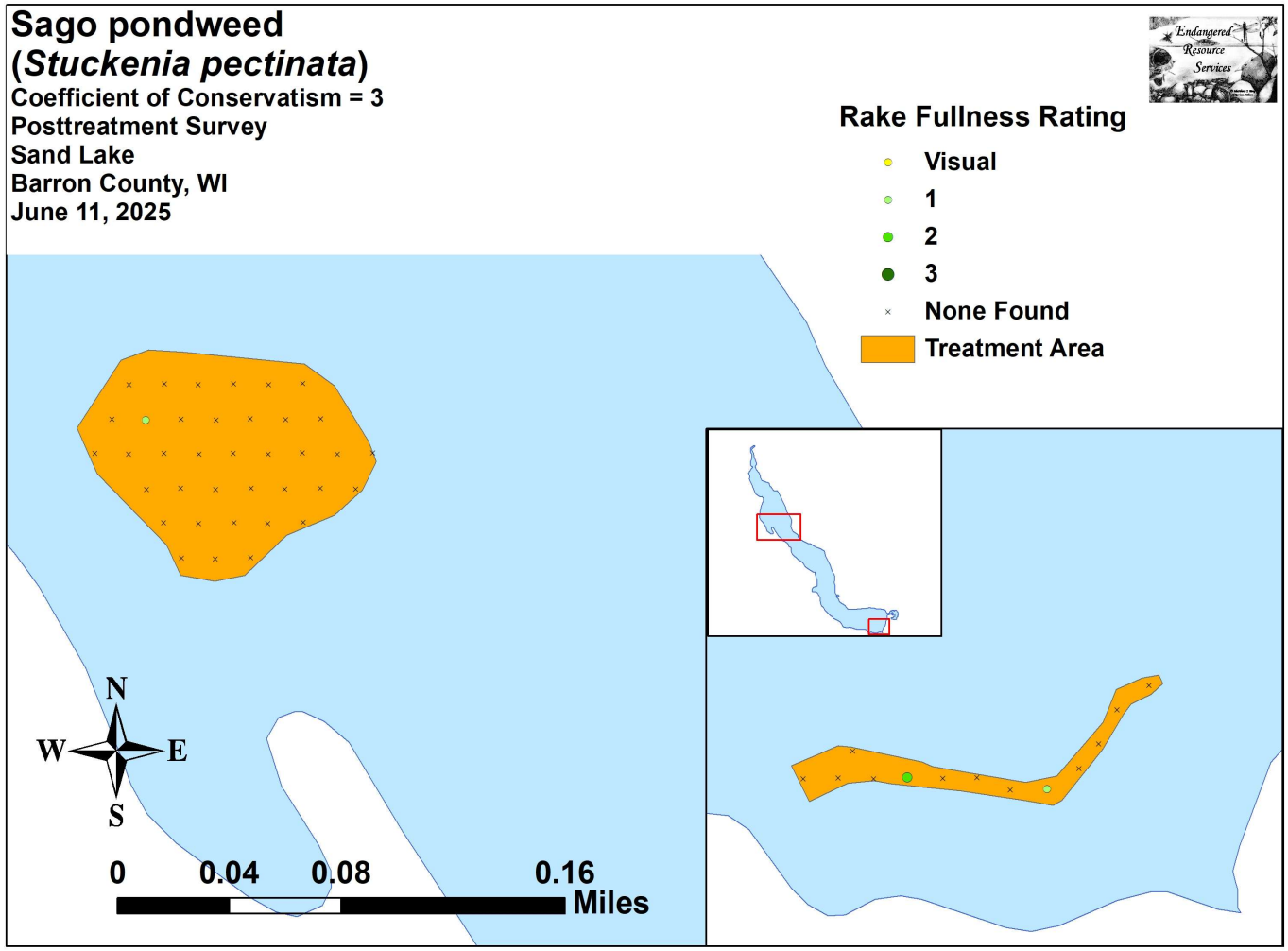
0.16
Miles


Sago pondweed
(Stuckenia pectinata)
Coefficient of Conservatism = 3
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
3
None Found
Treatment Area
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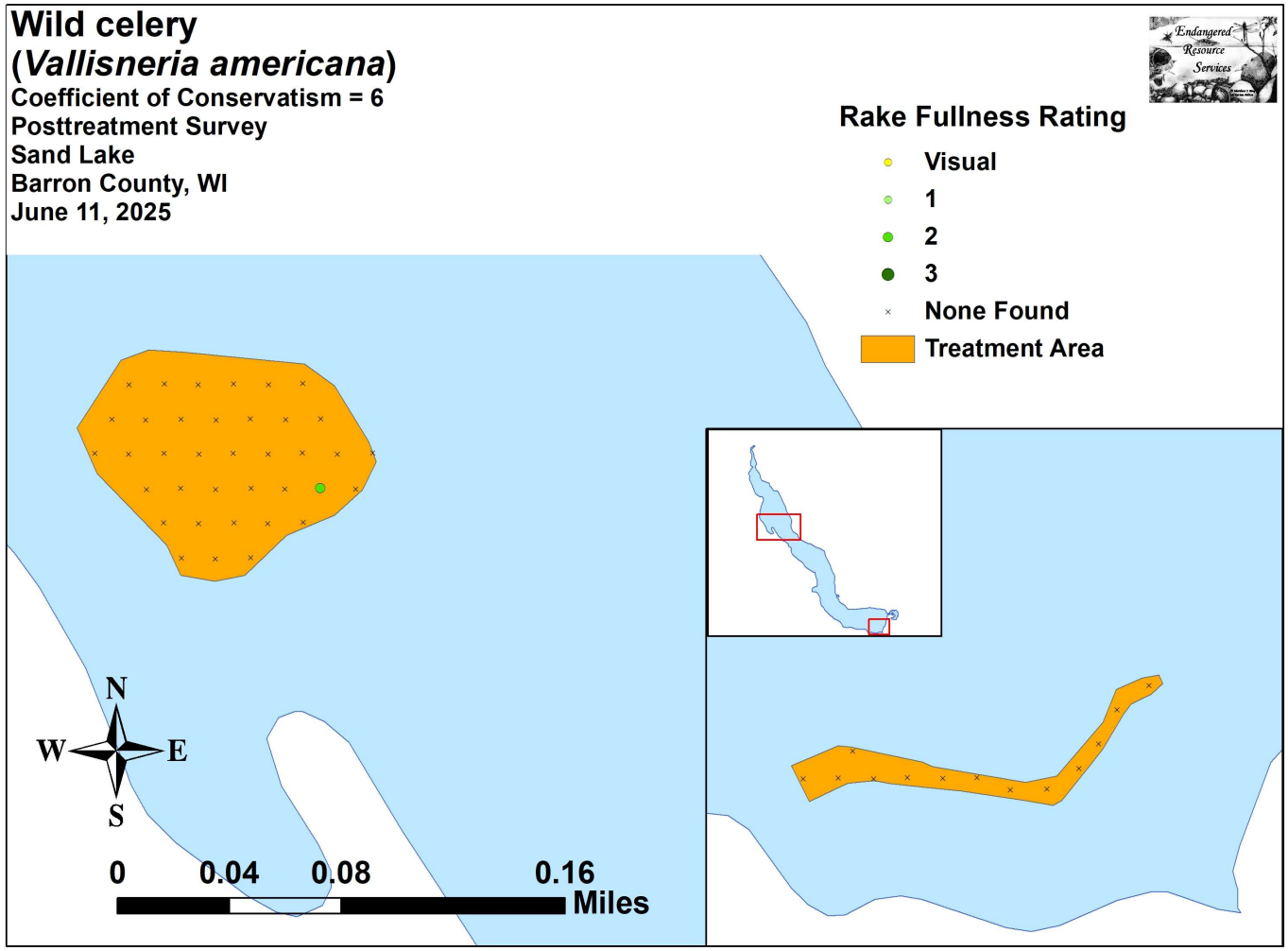
0.16
Miles


Wild celery
(Vallisneria americana)
Coefficient of Conservatism = 6
Posttreatment Survey
Sand Lake
Barron County, WI
June 11, 2025
Endangered Resource Services
Rake Fullness Rating
Visual
1
2
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None Found
Treatment Area
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0.08
0.16
Miles