

Noxon Rapids Reservoir and Cabinet Gorge Reservoir Herbicide Treatment Survey Report

2019 Season

Prepared for: The Sanders County Aquatic Invasive Plants Task Force

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THE **OUTSIDE** IS IN US ALL.

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Overview

Montana Fish, Wildlife, & Parks partnered with The Sanders County Aquatic Invasive Plants Task Force to survey multiple plots within Noxon Rapids Reservoir and Cabinet Gorge Reservoir. This effort helps guide treatment of Eurasian watermilfoil within the reservoirs each year. Nineteen plots were surveyed during the week of July 8th, 2019. Those locations are noted in Figure 1.

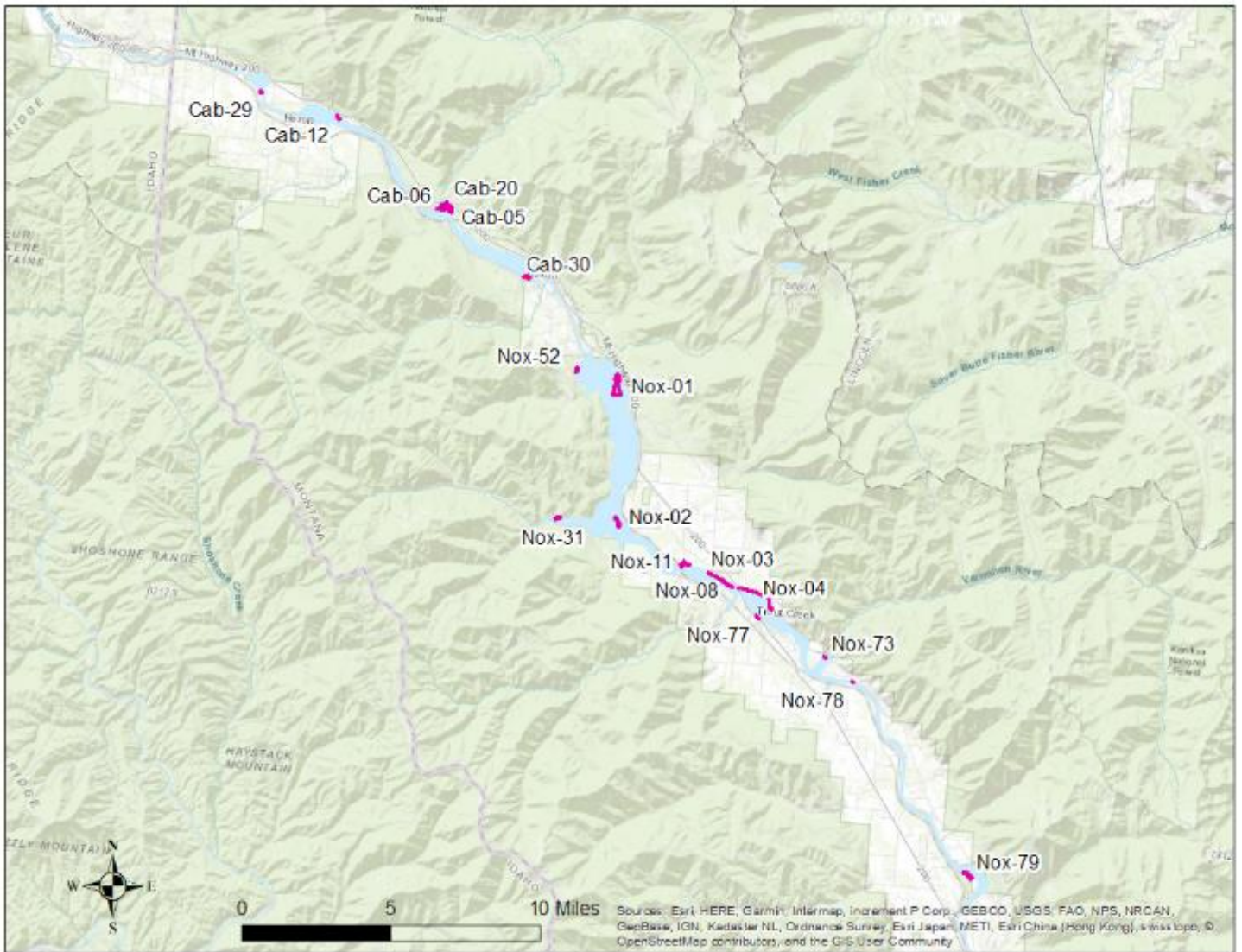


Figure 1. Locations of Survey Plots on Noxon Rapids and Cabinet Gorge Reservoirs, 2019.

Sampling Method:

Within each plot a predetermined number of random points were sampled. Table 1 shows each plot, acreage, and number of points sampled. Plots sizes were based on previous survey efforts. The number of points within each plot were based upon the acreage of the plot with larger plots having more points.

At each point samples were collected with rakes attached to telescoping poles dropped to the bottom. One sample was collected on each the starboard and port sides. The rakes were spun 720 degrees and then the crew members provided a percent of rake fullness. This method allows a consistent sampled area for each sample.

These scores were then averaged together and a cover class was assigned to each point. Similar to a Daubenmire Method of estimating cover percentages (Coulloudon et al, 1999¹), we utilized a predefined set of cover classes. The cover classes used for 2019 analyses are listed in Table 2. They modified from 2018 as 2018 cover classes seemed to coarse to detect changes among years.

These points were used to find the average canopy cover of each species within each plot. Potential areas of treatments were then determined based upon Eurasian watermilfoil and curlyleaf pondweed densities and are provided in the maps within the results section.

In addition, the 2018 pretreatment results were compared with the 2019 pretreatment results. The percent change was calculated between 2018 and 2019. The sampling in 2018 followed a different cover class set (Table 3) so results could have inconsistencies between years. However, calculations of 2018 cover class were manipulated so that the 2018 results are comparable to 2019 results in the following section.

Table 1. List of plots and their approximate acres and number of sample points.

Plot	Approx. Plot Size (ac)	#Sample Points
C05	12	40
C06	4	30
C12	1.5	16
C20	1	10
C29	0.5	10
C30	2	20
N01	34	47
N02	21	24
N03	1.5	18
N04	7.5	30
N08	8	39
N11	9.5	31
N31	4	22
N52	1	10
N73	1	10
N77	0.5	10
N78	0.15	6
N79	1	12

Table 2. Cover class and range of coverage for 2019 sampling efforts.

Cover Class - 2019	Range of Coverage	Midpoint of Range
0	0	0.0
1	1 to 2	1.5
2	3 to 5	3.6
3	6 to 15	10.1
4	16 to 25	20.1
5	26 to 40	32.6
6	41 to 60	50.1
7	61 to 75	67.6
8	76 to 85	80.1
9	86 to 95	90.1

Table 3. Cover class and range of coverage for 2019 sampling efforts.

Cover Class - 2018	Range of Coverage	Midpoint of Range
0	0	0.0
1	1 to 20	10.5
2	21 to 40	30.5
3	41 to 60	50.5
4	61 to 80	70.5
5	81 to 100	90.5

¹ Coulloudon, B. et al. 1999. Sampling Vegetation Attributes, Technical Reference 1734-4. Bureau of Land Management, Denver, CO.

Results:

Table 4 contains the survey results showing acreage of Eurasian watermilfoil within the potential treatment areas in 2019 as well as 2018 for reference. Table 5 shows the 2019 estimated cover based on rake fullness calculations. Table 6 shows the 2018 estimated cover based on the same calculations used in 2019 to make the two years comparable.

Table 4. Calculated pre-treatment acres of Eurasian watermilfoil within each plot for 2019 and in 2018.

Plot	Acres of EWM - 2019	Acres of EWM - 2018	Plot Location
Cab-05	12.1	11.4	SE of Bull River Bridge on Hwy 200
Cab-06	4.2	6.1	SW of Bull River Bridge on Hwy 200
Cab-12	1.7	1.2	Big Eddy Campground
Cab-20	0.0	0.4	Bull River Campground
Cab-29	0.5	0.8	Heron Boat Ramp
Cab-30	2.3	3.4	Noxon Community Park
Nox-01	34.0	12.3	Near Rock Island - Mid Lake
Nox-02	21.3	2.1	Mid Lake at entrance to Marten Creek Bay
Nox-03	1.4	2.3	North Shore Campground
Nox-04	7.7	6.2	North Shore Shoreline E of Hwy 200 Bridge
Nox-08	8.2	10.6	North Shore Shoreline W of Hwy 200 Bridge
Nox-11	9.6	6.7	W of Train Bridge on N side
Nox-31	3.7	2.3	Marten Creek Campground
Nox-52	0.8	1.9	South Shore Campground
Nox-61	Did Not Survey	0.0	Flatiron Fishing Access Site
Nox-73	0.6	0.0	Vermillion Bay Boat Ramp
Nox-77	0.4	0.5	Trout Creek Boat Ramp
Nox-78	0.1	0.2	Kirby Gulch Boat Ramp
Nox-79	0.7	1.1	Finley Flats Campground

Table 5. 2019 calculated % canopy cover (based on modified Daubenmire Method using rake fullness as a substitute of percent cover).

2019	C05	C06	C12	C20	C29	C30	N01	N02	N03	N04	N08	N11	N31	N52	N61	N73	N77	N78	N79
Elodea spp.	7	19	24	30	31	5	6	40	0.2	19	3	9	12	1	NA	20	2	44	6
Coontail	18	14	17	0.2	0	2	17	27	10	23	18	53	12	12	NA	27	2	0.25	21
Eurasian watermilfoil	7	3	5	0	1	2	33	26	1	5	2	26	4	1	NA	26	3	6	0.3
Curlyleaf pondweed	10	0.1	4	10	0	0	0.03	0.1	2	5	7	1	28	1	NA	2	0	0	0.1
Native narrow-leaved pondweed spp.	0.1	0.2	0	0	0	3	1	1	0.3	0.1	1	2	0.4	1	NA	0	0	1	7
White water buttercup	6	5	0.1	0	0	0	1	0.1	0	0.4	0.5	0.6	0	0	NA	1	1	2	0.1
Chara spp.	1	0	0.1	0	0	0.2	0.1	0.1	0	0.1	0.2	0.3	0	1	NA	0	0	0	1
Richardson's pondweed	0	0	0	0.2	0	1	0.03	0	0	0	0.1	0.1	0	1	NA	0	0.2	0	0.1
Flowering rush	0	0	0	0	0	0.1	0	0	0	0	0	0.05	0	1	NA	0	0	0	0
White-stemmed pondweed	0	0	0	0	0	0	0	0.1	0	0	0.2	0	0	0	NA	0	0	0	0
Northern watermilfoil	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	NA	0	0	0	0
Grass leaved pondweed	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	NA	0	0	0	0
Waternymph spp.	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	NA	0	0	0	0

Table 6. 2018 calculated % canopy cover based on modified Daubenmire Method using rake fullness as a substitute of percent cover.

2018	C05	C06	C12	C20	C29	C30	N01	N02	N03	N04	N08	N11	N31	N52	N61	N73	N77	N78	N79
Elodea spp.	19	30	11	24	7	7	25	8	2	11	6	12	15	2	0	10	2	17	9
Coontail	25	29	19	0	0	11	13	15	29	16	25	19	32	4	0	19	6	0	20
Eurasian watermilfoil	22	18	21	5	25	9	23	6	13	11	19	28	14	13	0	6	7	7	2
Curlyleaf pondweed	23	3	5	4	0	0.6	2	1	8	6	8	6	1	0	0	4	1	0	3
Leafy pondweed	0.5	3	1	2	0	7	6	7	0.5	6	14	15	14	4	0	0	1	7	2
White water buttercup	7	5	2	0.6	0	0	4	0	0	0	0	2	0	0	0	1	0	2	0
Chara spp.	5	0	1	0	0	3	3	0.5	0.5	8	9	8	0	20	0	4	3	0	0
Richardson's pondweed	0	2	2	1	0	9	4	7	2	2	2	3	0	5	0	1	3	0	0
Flowering rush	0	0	0	0	0	0.6	0.6	3	0	0	1	0	0	4	0	0	0	2	0.6
Northern watermilfoil	2	0	0	0	0	0	5	1	0.5	1	0	0.6	0	2	0	0.9	2	0	0.6
Grass leaved pondweed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Isoetes spp.	0.5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alpine pondweed	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Ribbon leaf pondweed	0	0	0	0	0	0	2	0	0	0	0	0	0	0.5	0	0	0	0	0.6
Sheathed pondweed	0	0.5	0	0	0	3	0	0	0.5	0	0	0	0	0	0	0	0	0	0

2018 versus 2019

Percent change between years were calculated and results are in the tables below for each species. It is difficult to make much inference of change due to herbicide treatments alone as several different factors could contribute to said changes. Natural environmental variations such as water flows, temperatures, and hybridization strains could cause significant local macrophyte community variations and responses to herbicide between years. Additionally, sample methods varied with the use of a rake attached to a rope in 2018 versus a pole-attached rake in 2019. More sampling points per plot were collected in 2019 as it felt that too few points were collected per size of plots in 2018. We switched to the pole-attached rake to have a repeatable sample method with regards to sample area. A rope attached rake can have variations in sampled area due to distance the rake was tossed, the depth of the water thus changing the angle of retrieval, and the rate of retrieval. In general, the pole-attached method appears more precise, but anecdotal evidence suggests it underestimates plant cover at the plot level. Subsequent consistent sampling among years will improve the overall sampling effort's precision but accuracy needs to be further evaluated. Even if the sampling method inaccurately underestimates cover in 2019, inference of variations among years can still be made in the future. Further refinement of the sampling plan such as including control plots could help tease out some of these unknowns and inaccuracies and help determined changes due to environmental or herbicide related variables.

	<i>Myriophyllum spicatum</i> Eurasian watermilfoil			<i>Potamogeton crispus</i> Curlyleaf pondweed			<i>Butomus umbellatus</i> Flowering Rush			<i>Ceratophyllum demersum</i> Coontail		
	2018	2019	% Change	2018	2019	% Change	2018	2019	% Change	2018	2019	% Change
C05	21.9	7.4	-66	23.3	10.1	-57	0.0	0.0	0	25.4	18.2	-28
C06	17.9	3.4	-81	2.6	0.1	-96	0.0	0.0	0	28.9	14.5	-50
C12	21.0	5.2	-75	4.8	4.3	-9	0.0	0.0	0	18.9	17.3	-9
C20	4.6	0.0	-100	3.5	9.7	176	0.0	0.0	0	0.0	0.2	0
C29	24.8	0.9	-97	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
C30	8.7	1.9	-79	0.6	0.0	-100	0.6	0.1	-86	10.7	1.6	-85
N01	23.0	33.1	44	1.7	0.0	-98	0.6	0.0	-100	12.8	17.4	36
N02	6.2	26.0	319	1.1	0.1	-88	3.1	0.0	-100	15.4	27.0	75
N03	13.3	0.5	-96	7.9	1.5	-80	0.0	0.0	0	29.0	10.2	-65
N04	11.4	4.7	-59	6.3	4.8	-24	0.0	0.0	0	15.8	22.7	44
N08	19.4	1.9	-90	7.6	6.5	-14	1.1	0.0	-100	24.6	18.3	-25
N11	27.8	26.0	-7	6.1	0.8	-87	0.0	0.0	0	18.8	53.1	183
N31	14.1	4.2	-70	0.6	28.2	5010	0.0	0.0	0	32.1	12.4	-61
N52	12.8	0.8	-94	0.0	1.0	1	4.2	1.0	-76	4.2	12.2	193
N61	0.0	No Survey	N/A	0.0	No Survey	N/A	0.0	No Survey	N/A	0.0	No Survey	N/A
N73	6.1	25.9	323	3.5	2.0	-42	0.0	0.0	0	18.8	26.7	42
N77	6.6	3.4	-48	1.0	0.0	-100	0.0	0.0	0	5.7	1.5	-74
N78	7.0	5.6	-20	0.0	0.0	0	1.8	0.0	-100	0.0	0.3	0
N79	1.7	0.3	-82	2.8	0.1	-95	0.6	0.0	-100	20.2	20.9	3

	<i>Chara</i> species		
	Muskgrass species		
	2018	2019	% Change
C05	4.5	0.9	-80
C06	0.0	0.0	0
C12	1.4	0.1	-93
C20	0.0	0.0	0
C29	0.0	0.0	0
C30	3.3	0.2	-93
N01	3.3	0.1	-98
N02	0.5	0.1	-76
N03	0.5	0.0	-100
N04	8.2	0.1	-99
N08	8.6	0.2	-98
N11	8.0	0.3	-96
N31	0.0	0.0	0
N52	19.8	1.5	-93
N61	0.0	No Survey	N/A
N73	4.3	0.0	-100
N77	2.9	0.0	-100
N78	0.0	0.0	0
N79	0.0	0.5	1

	<i>Elodea</i> species		
	Waterweed species		
	2018	2019	% Change
	19.4	6.6	-66
	29.9	18.7	-37
	11.1	24.3	120
	24.3	30.0	24
	6.9	30.6	345
	6.6	5.3	-20
	25.1	5.8	-77
	8.3	39.6	377
	2.0	0.2	-92
	10.8	18.5	72
	6.1	3.0	-51
	11.9	9.4	-21
	14.5	11.6	-20
	1.6	0.5	-68
	0.0	No Survey	N/A
	10.3	20.0	95
	1.9	1.7	-13
	17.0	43.6	157
	8.6	5.9	-31

	Narrow leaved <i>Potamogeton</i> Pondweed species (sago, leafy, etc.)		
	2018	2019	% Change
		0.5	0.1
	2.6	0.2	-94
	1.4	0.0	-100
	1.8	0.0	-100
	0.0	0.0	0
	7.0	2.7	-62
	6.0	1.0	-84
	6.8	1.4	-79
	0.5	0.3	-50
	5.7	0.1	-99
	14.1	0.8	-94
	15.1	1.8	-88
	13.8	0.4	-97
	4.2	0.5	-88
	0.0	No Survey	N/A
	0.0	0.0	0
	1.0	0.0	-100
	7.0	0.8	-88
	2.2	6.8	213

	<i>Potamogeton epiphydrus</i>		
	Ribbon leaf pondweed		
	2018	2019	% Change
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	1.7	0.0	-100
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.5	0.0	-100
	0.0	No Survey	N/A
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.6	0.0	-100

	<i>Isoetes</i> species		
	Quillwort species		
	2018	2019	% Change
C05	0.5	0.0	-100
C06	0.0	0.0	0
C12	1.4	0.0	-100
C20	0.0	0.0	0
C29	0.0	0.0	0
C30	0.0	0.0	0
N01	0.0	0.0	0
N02	0.0	0.0	0
N03	0.0	0.0	0
N04	0.0	0.0	0
N08	0.0	0.0	0
N11	0.0	0.0	0
N31	0.0	0.0	0
N52	0.0	0.0	0
N61	0.0	No Survey	N/A
N73	0.0	0.0	0
N77	0.0	0.0	0
N78	0.0	0.0	0
N79	0.0	0.0	0

	<i>Myriophyllum sibiricum</i>		
	Northern watermilfoil		
	2018	2019	% Change
	1.6	0.0	-100
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	4.9	0.0	-100
	1.1	0.0	-100
	0.5	0.0	-100
	1.1	0.0	-100
	0.0	0.0	0
	0.6	0.2	-60
	0.0	0.0	0
	1.6	0.0	-100
	0.0	No Survey	N/A
	0.9	0.0	-100
	1.9	0.0	-100
	0.0	0.0	0
	0.6	0.0	-100

	<i>Najas guadalupensis</i>		
	Common waternymph		
	2018	2019	% Change
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.1	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	No Survey	N/A
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0

	<i>Potamogeton alpinus</i>		
	Alpine pondweed		
	2018	2019	% Change
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	2.7	0.0	-100
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	No Survey	N/A
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0
	0.0	0.0	0

<i>Potamogeton gramineus</i>				<i>Potamogeton praelongus</i>				<i>Potamogeton richardsonii</i>				<i>Ranunculus aquatilis</i>			
Grassy pondweed				White-stemmed pondweed				Richardson's pondweed				White water buttercup			
	2018	2019	% Change	2018	2019	% Change	2018	2019	% Change	2018	2019	% Change	2018	2019	% Change
C05	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	7.3	5.9	-20			
C06	0.0	0.0	0	0.0	0.0	0	1.6	0.0	-100	4.7	4.7	0			
C12	0.0	0.0	0	0.0	0.0	0	2.1	0.0	-100	2.0	0.1	-95			
C20	0.0	0.0	0	0.0	0.0	0	1.2	0.2	-87	0.6	0.0	-100			
C29	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0			
C30	0.0	0.0	0	0.0	0.0	0	8.7	1.2	-87	0.0	0.0	0			
N01	0.0	0.0	0	0.0	0.0	0	3.9	0.0	-99	3.9	0.9	-77			
N02	0.0	0.1	0	0.0	0.1	0	6.7	0.0	-100	0.0	0.1	0			
N03	0.0	0.0	0	0.0	0.0	0	1.5	0.0	-100	0.1	0.0	0			
N04	0.0	0.0	0	0.0	0.0	0	1.6	0.0	-100	0.0	0.4	0			
N08	0.0	0.0	0	0.0	0.2	0	2.2	0.1	-96	0.0	0.5	1			
N11	0.0	0.0	0	0.0	0.0	0	3.3	0.1	-96	2.2	0.6	-75			
N31	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0			
N52	0.0	0.0	0	0.0	0.0	0	4.7	1.0	-79	0.0	0.0	0			
N61	0.0	No Survey	N/A	0.0	No Survey	N/A	0.0	No Survey	N/A	0.0	No Survey	N/A			
N73	0.0	0.0	0	0.0	0.0	0	0.9	0.0	-100	0.9	0.5	-42			
N77	0.0	0.0	0	0.0	0.0	0	2.8	0.2	-95	0.0	1.2	1			
N78	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	1.8	1.9	10			
N79	0.0	0.0	0	0.0	0.0	0	0.0	0.1	0	0.0	0.1	0			

Plot Narratives

Notes from each plot that were collected while in the field are included below. They provide some context to what sampling crews were seeing at each plot.

Cab 05 – Scattered EWM at fairly low levels; curlyleaf in dense patches east of sandbar

Cab 06 – 2 smaller patches of EWM with low- medium densities; little curlyleaf pondweed. Recommend not to treat.

Cab 12 - Main patch on southern end; sporadic band of EWM in 5'-8' range along shore; very little curlyleaf pondweed

Cab 20 – No EWM found; one point of curlyleaf found. Recommend not to treat

Cab 29 – Mainly elodea plants with scattered EWM with a narrow band along shoreline; no curlyleaf pondweed

Cab 30 – Very little EWM on western side of plot; most of patch was located upstream and east of ramp; most of this was outside survey area but noted patch; no curlyleaf pondweed found

Nox 01 – Large patch of dense EWM; no curlyleaf pondweed found.

Nox 02 – Larger patch of EWM than put in survey area. Patches variable from scattered plants to approx. 90%. Added additional sample points to this plot; almost no curlyleaf pondweed found

Nox 03 – Depths less than 5' have no vegetation. Very little EWM; Sporadic dense patches of curlyleaf pondweed west of dock in 7-8' depths.

Nox 04 – EWM in bands along shoreline in the 5-8' depths; sporadic curlyleaf pondweed patches at lower densities.

Nox 08 – Spotty patches of dense EWM (80% cover) mixed with lower densities (10-20% avg); curlyleaf pondweed also with spotty patches of dense areas mixed with lower densities.

Nox11 – Additional dense areas of EWM outside of the sample area (60-80% cover); very little curlyleaf pondweed

Nox 31 – EWM most dense (50-60% cover) from east edge of plot to dock; curlyleaf pondweed most dense (80%) from dock to west edge

Nox 52 – Very little EWM found; Very little curlyleaf pondweed found. Recommend not to treat

Nox 73 – 2-3meter wide band of dense EWM (80-100%) found from dock around corner to the north in 2-8' depths; low densities of curlyleaf pondweed.

Nox 77 – No EWM found east of swim area; dense patch (80-90% cover) on northwestern edge of sampled area; no curlyleaf pondweed found.

Nox 78 – Narrow 2m wide band with only denser patch right of ramp; no curlyleaf pondweed found

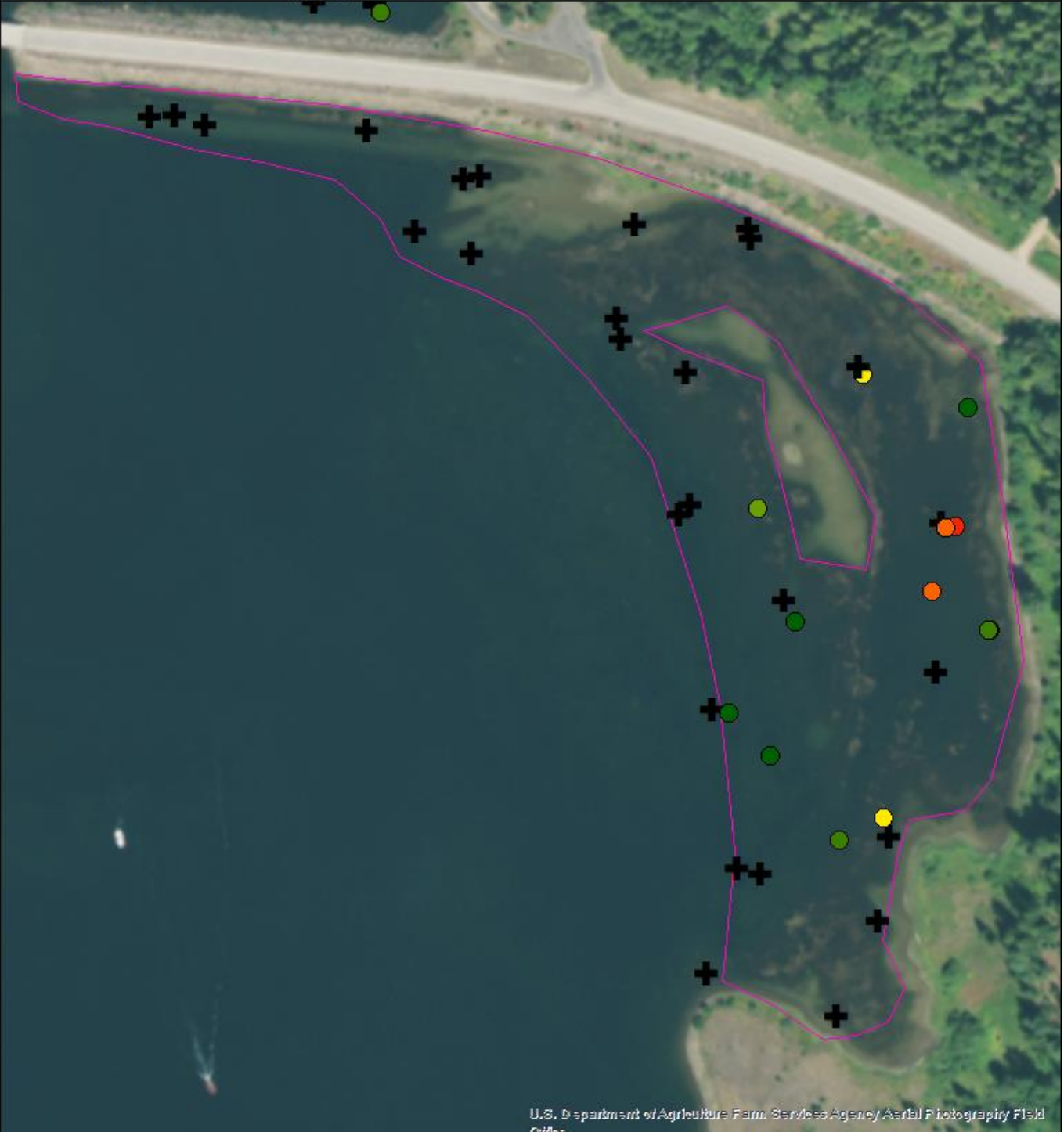
Nox 79 – Very little EWM found in sampled points; found a slightly denser patch out from boat ramp; almost no curlyleaf pondweed found.

Plot Maps

The following maps show the 2019 results for individual sample points in each plot for curlyleaf pondweed (orange heading) and Eurasian watermilfoil (black heading).

Sampled July 8-10, 2019

Plot: Cab-05



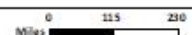
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLaye2019

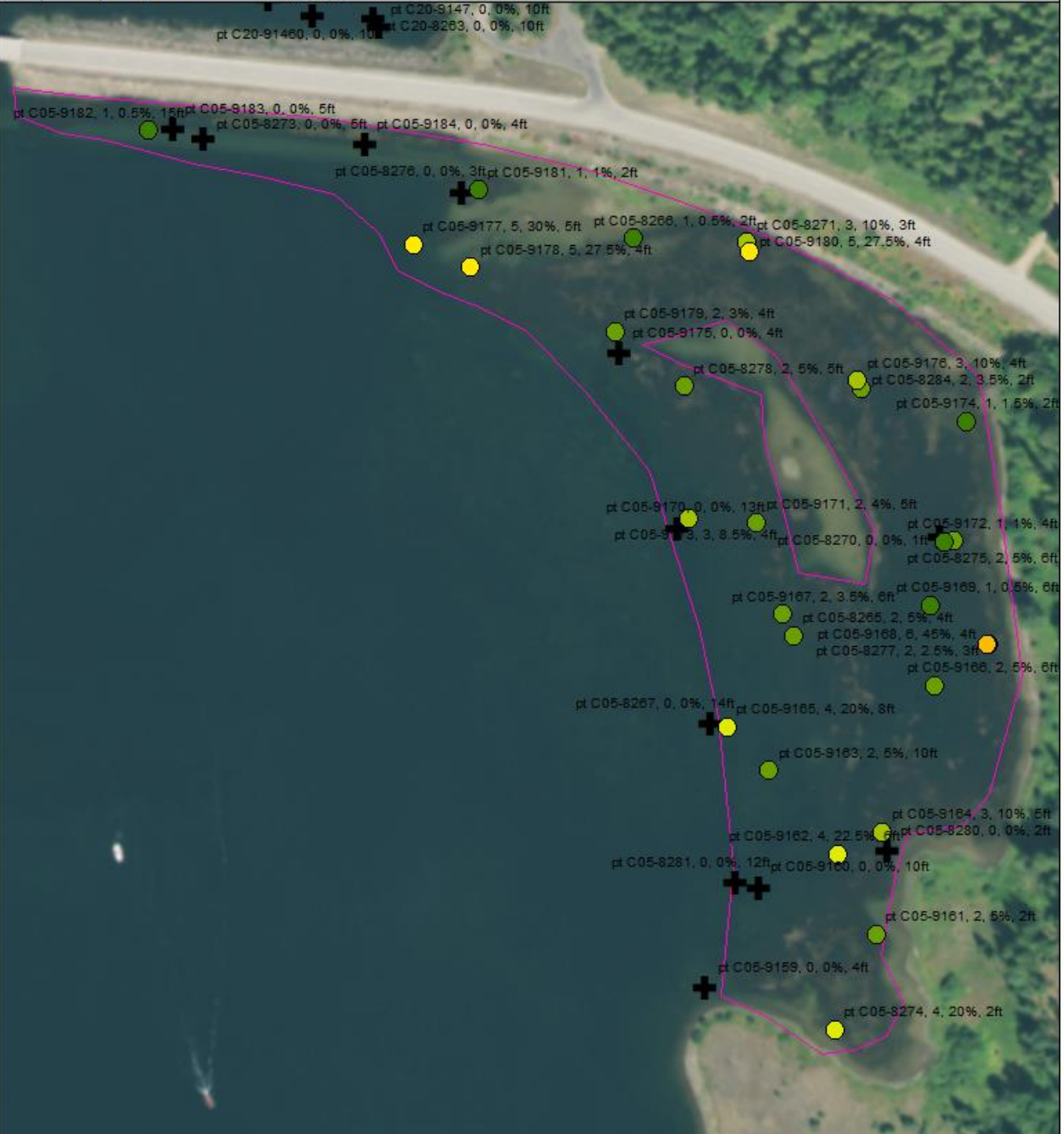


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-05



Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- ◆ Additional Plot Boundary
- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- Potential Treat Layer 2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-06



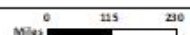
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLaye2019

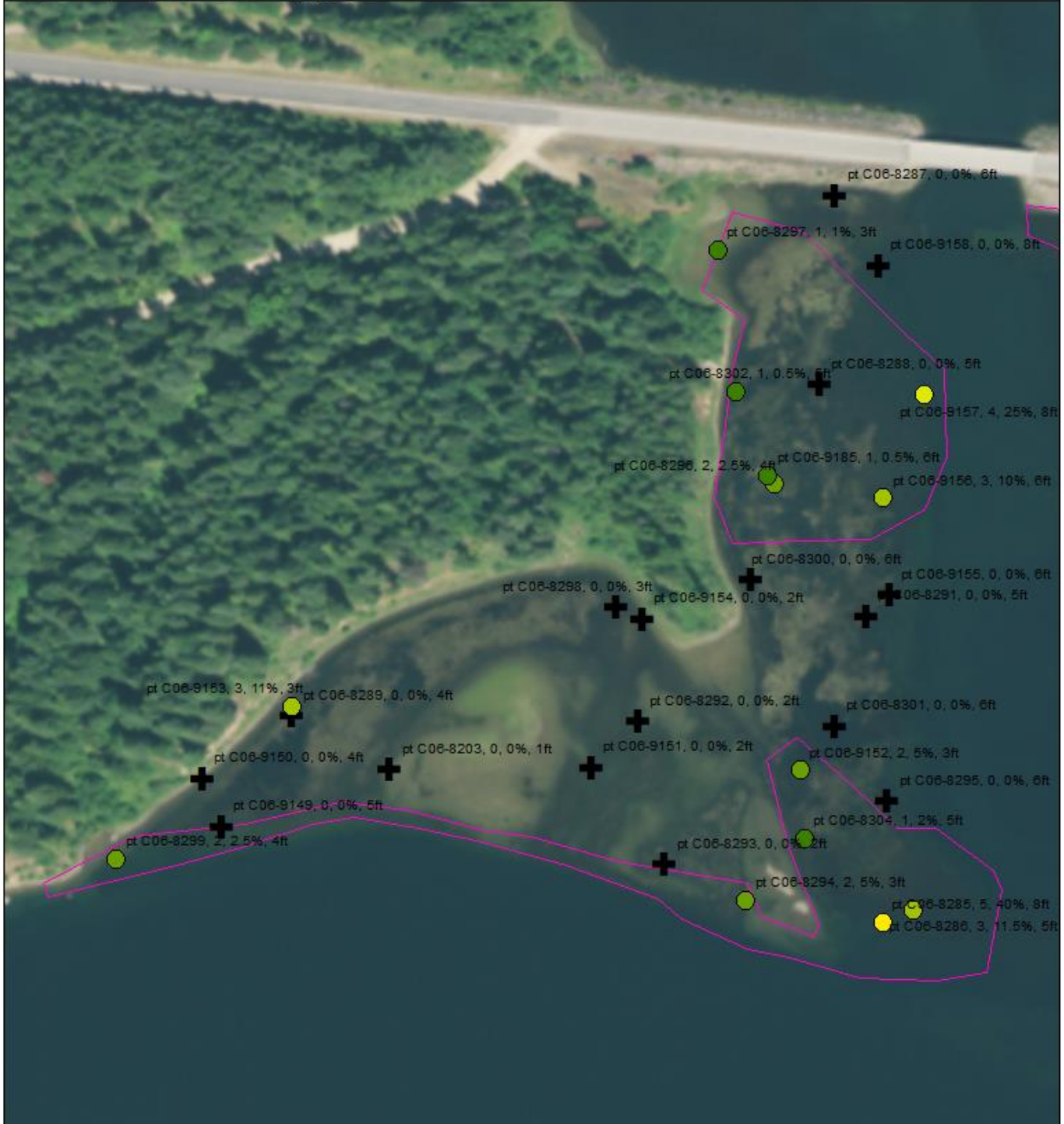


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-06

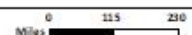


Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- ◆ AdditionalPlotBoundary
- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-12



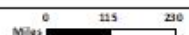
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLaye2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-12

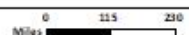


Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- ◆ AdditionalPlotBoundary
- ⊕ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- PotentialTreatLaye2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-20



U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- | | | | |
|---|-------------|--------------|------------------------|
| + | Not Present | 4 - (16-25%) | 8 - (76-85%) |
| ● | 1 - (1-2%) | 5 - (26-40%) | 9 - (86-95%) |
| ● | 2 - (3-5%) | 6 - (41-60%) | 10 - (96-100%) |
| ● | 3 - (6-15%) | 7 - (61-75%) | PotentialTreatLaye2019 |



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-20

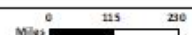


Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- PotentialTreatLaye2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-29



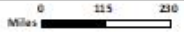
U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-29



Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fullness Range)

- Not Present
 3 - (6-15%)
 7 - (61-75%)
- 1 - (1-2%)
 4 - (16-25%)
 8 - (76-85%)
- 2 - (3-5%)
 5 - (26-40%)
 9 - (86-95%)
- 6 - (41-60%)
 PotentialTreatLay2019

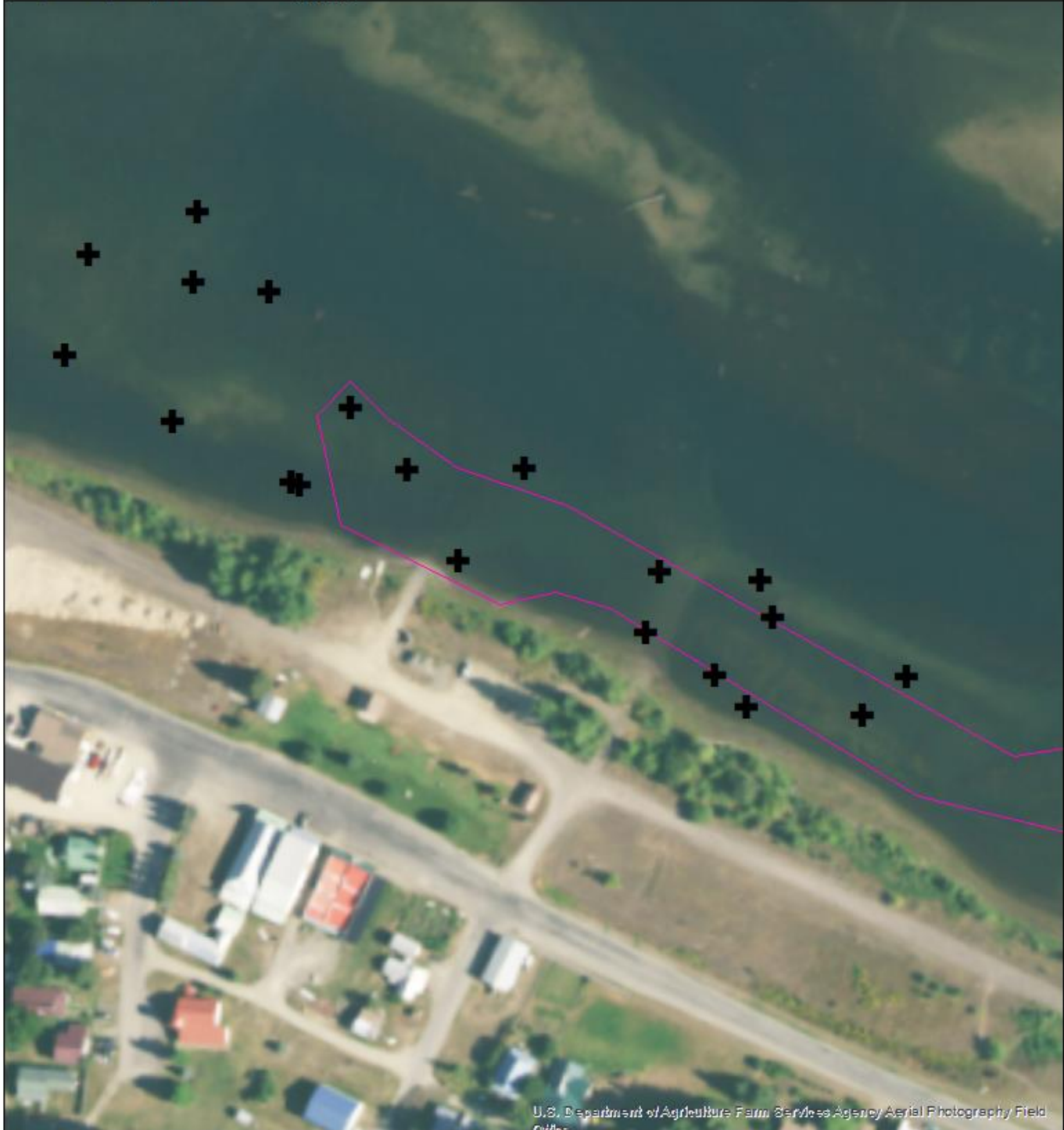


Each point labeled as: Point Name, Rake Fullness Rank, Percent Rake Fullness, Water Depth



Sampled July 8-10, 2019

Plot: Cab-30



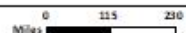
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-01



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Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLaye2019

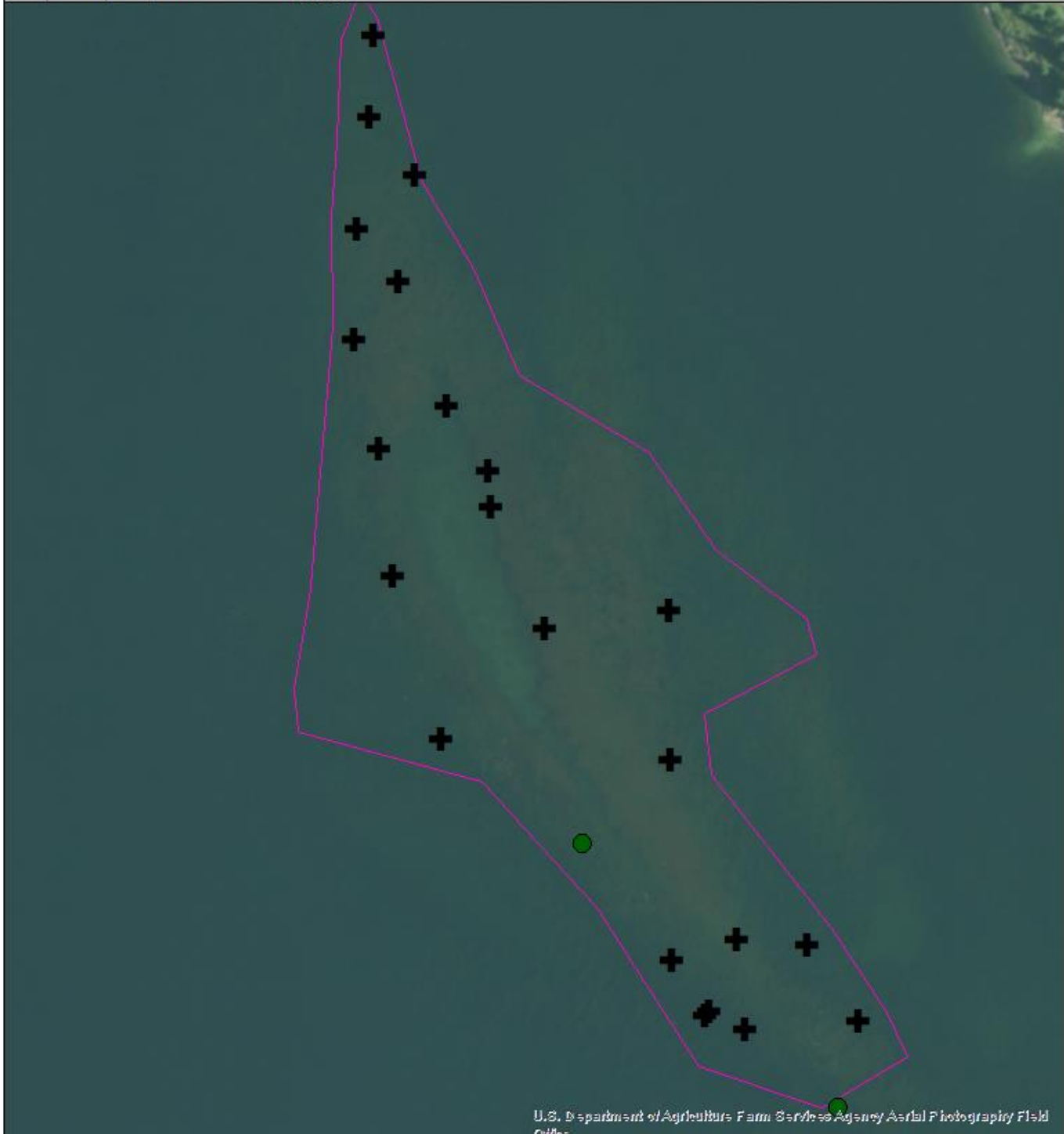


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-02



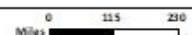
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-02



Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- Potential Treat Laye 2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-03



U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- Potential Treat Layer 2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-03



U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office

**Sample Results for Eurasian watermilfoil
Rank - (Percent Rake Fulness Range)**

- Not Present
 3 - (6-15%)
 7 - (61-75%)
- 1 - (1-2%)
 4 - (16-25%)
 8 - (76-85%)
- 2 - (3-5%)
 5 - (26-40%)
 9 - (86-95%)
- 6 - (41-60%)
 PotentialTreatLaye2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-04



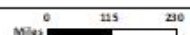
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-04



U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- | | | | | | |
|---|-------------|---|--------------|---|----------------------------|
| + | Not Present | ● | 3 - (6-15%) | ● | 7 - (61-75%) |
| ● | 1 - (1-2%) | ● | 4 - (16-25%) | ● | 8 - (76-85%) |
| ● | 2 - (3-5%) | ● | 5 - (26-40%) | ● | 9 - (86-95%) |
| | | ● | 6 - (41-60%) | □ | Potential Treat Layer 2019 |

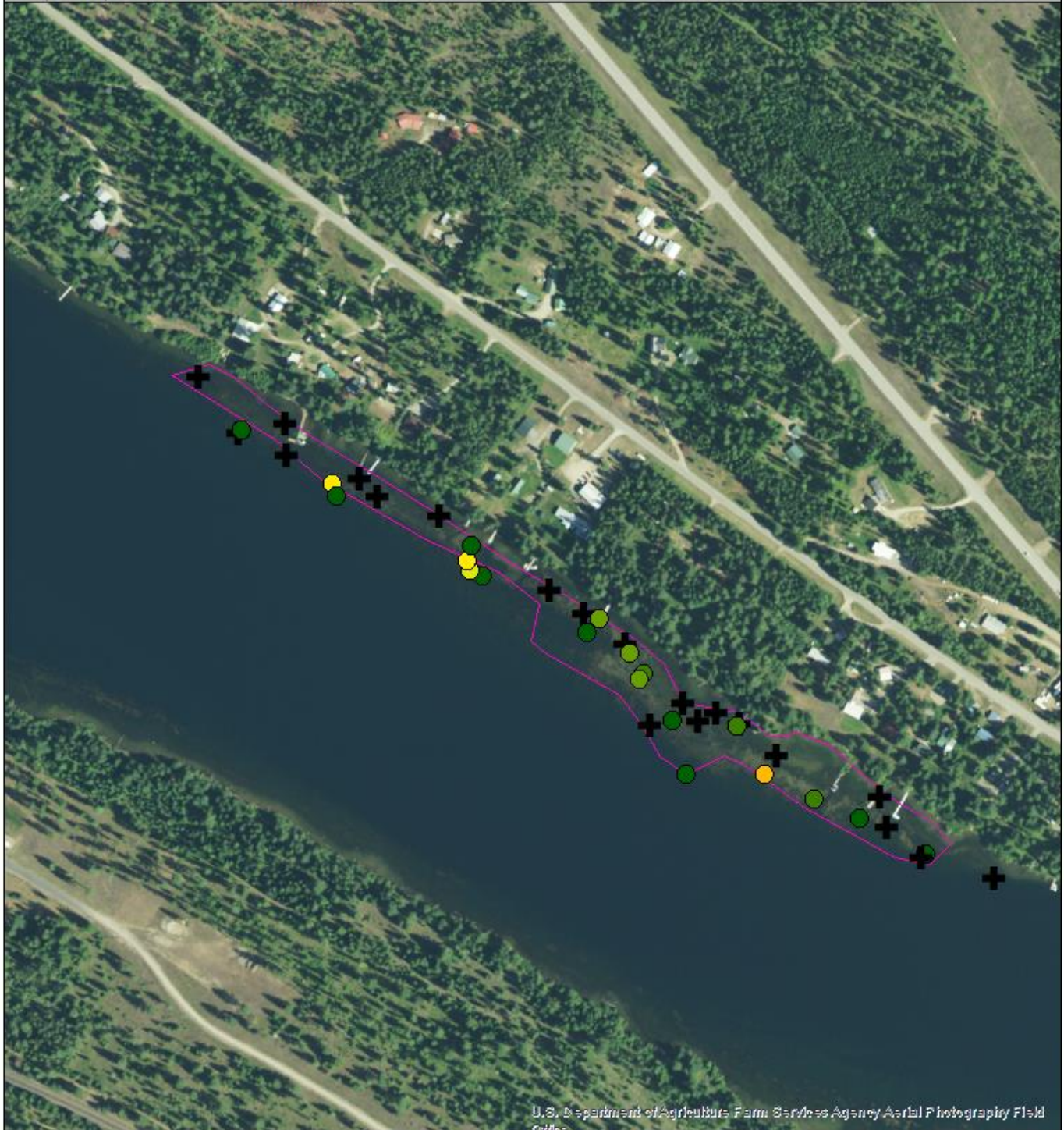


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-08



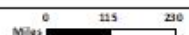
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-11



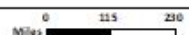
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019

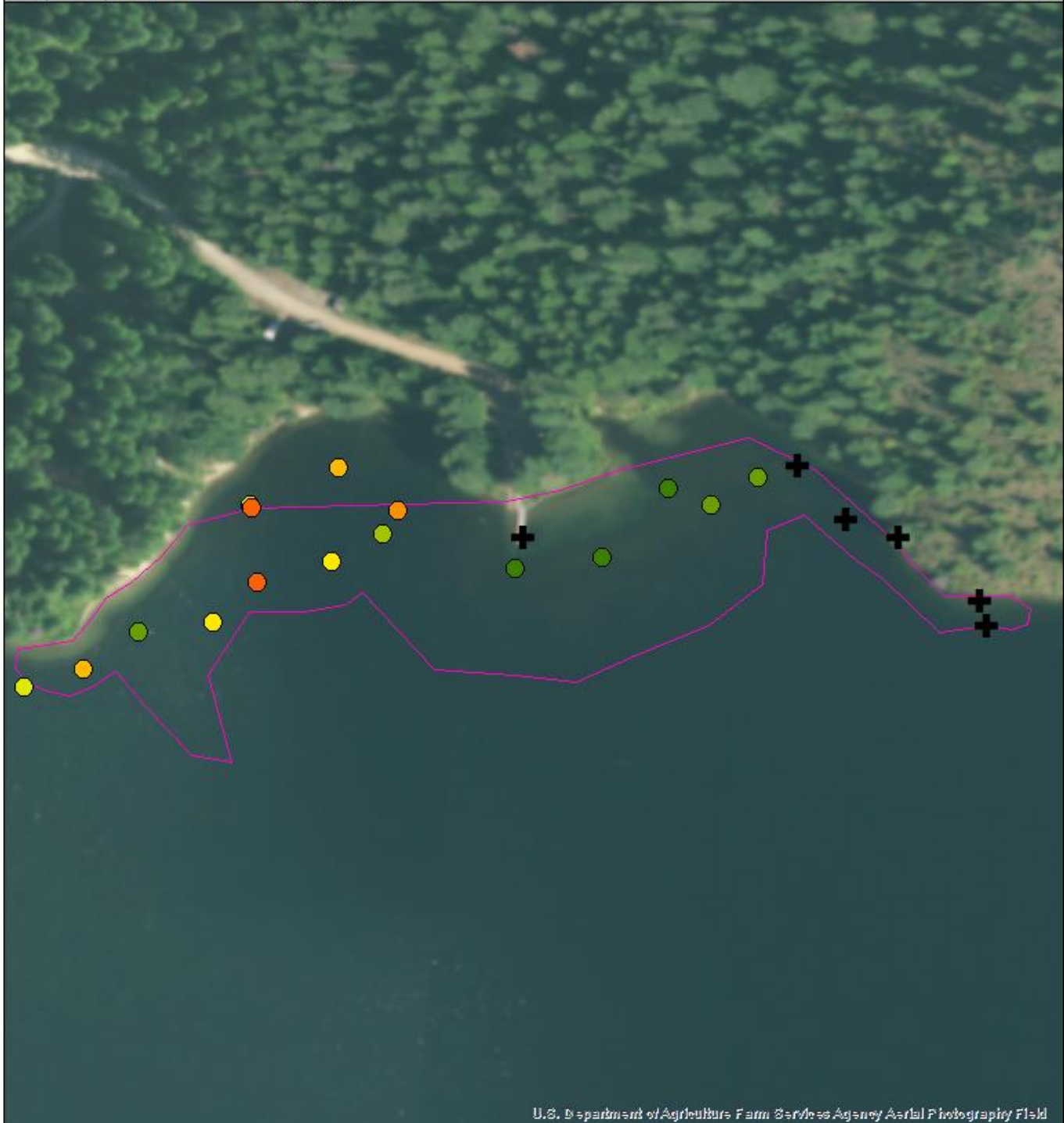


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-31



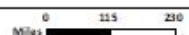
U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fullness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fullness Rank, Percent Rake Fullness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-31



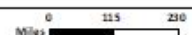
U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office

**Sample Results for Eurasian watermilfoil
Rank - (Percent Rake Fulness Range)**

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- Potential Treat Layer 2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-52



U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- | | | | |
|---|-------------|--------------|-----------------------|
| + | Not Present | 4 - (16-25%) | 8 - (76-85%) |
| ● | 1 - (1-2%) | 5 - (26-40%) | 9 - (86-95%) |
| ● | 2 - (3-5%) | 6 - (41-60%) | 10 - (96-100%) |
| ● | 3 - (6-15%) | 7 - (61-75%) | PotentialTreatLay2019 |



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-52



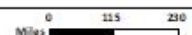
U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office

Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- | | | | | | |
|---|-------------|---|--------------|---|----------------------------|
| + | Not Present | ● | 3 - (6-15%) | ● | 7 - (61-75%) |
| ● | 1 - (1-2%) | ● | 4 - (16-25%) | ● | 8 - (76-85%) |
| ● | 2 - (3-5%) | ● | 5 - (26-40%) | ● | 9 - (86-95%) |
| | | ● | 6 - (41-60%) | □ | Potential Treat Layer 2019 |



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-73



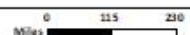
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLaye2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-73



U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

**Sample Results for Eurasian watermilfoil
Rank - (Percent Rake Fulness Range)**

- Not Present
 3 - (6-15%)
 7 - (61-75%)
- 1 - (1-2%)
 4 - (16-25%)
 8 - (76-85%)
- 2 - (3-5%)
 5 - (26-40%)
 9 - (86-95%)
- 6 - (41-60%)
 PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-77



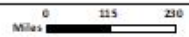
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- PotentialTreatLay2019

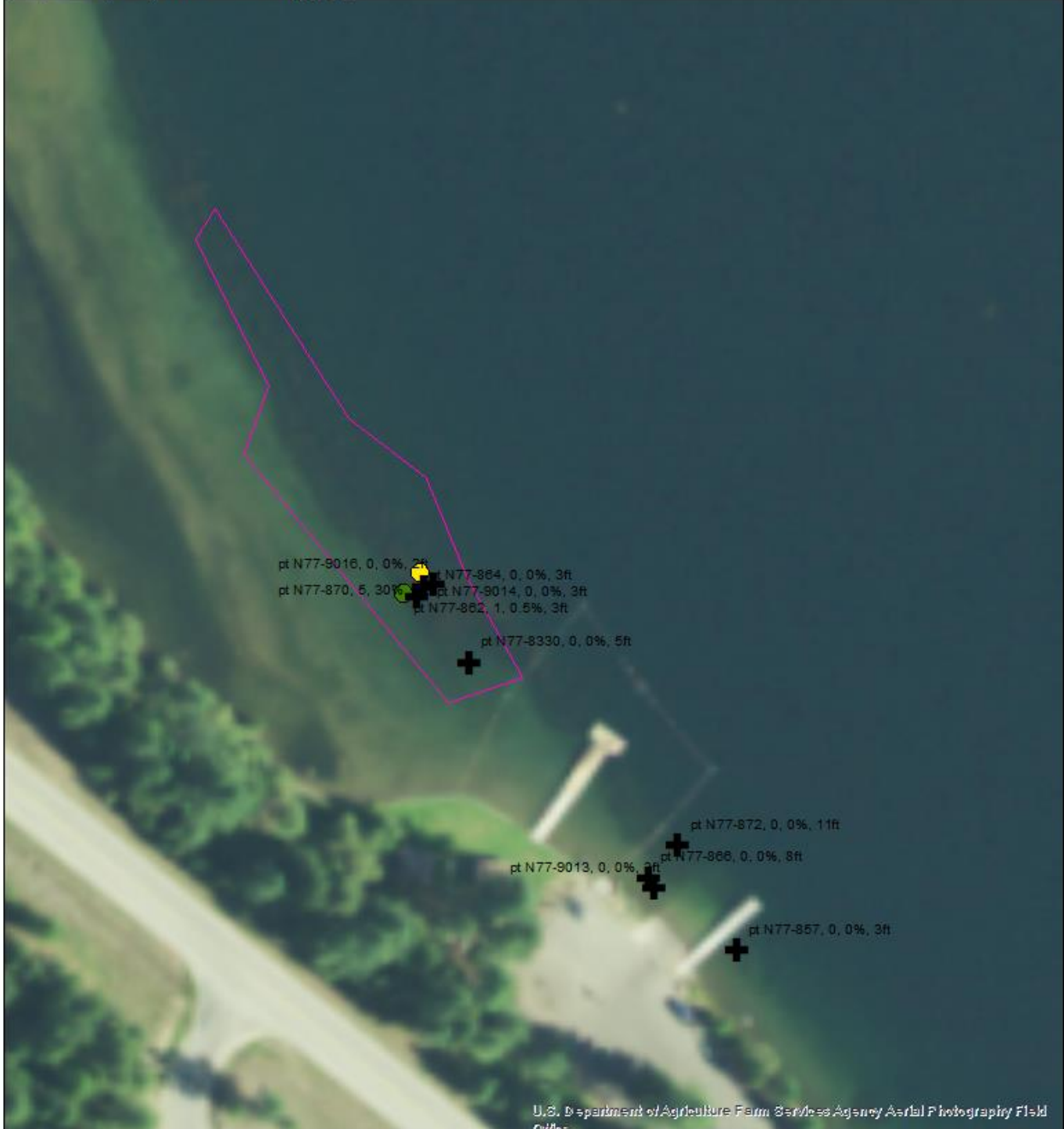


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-77



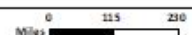
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- Not Present
 3 - (6-15%)
 7 - (61-75%)
- 1 - (1-2%)
 4 - (16-25%)
 8 - (76-85%)
- 2 - (3-5%)
 5 - (26-40%)
 9 - (86-95%)
- 6 - (41-60%)
 Potential Treat Layer 2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-78



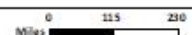
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fulness Range)

- ✚ Not Present
- 1 - (1-2%)
- 2 - (3-5%)
- 3 - (6-15%)
- 4 - (16-25%)
- 5 - (26-40%)
- 6 - (41-60%)
- 7 - (61-75%)
- 8 - (76-85%)
- 9 - (86-95%)
- 10 - (96-100%)
- Potential Treat Layer 2019

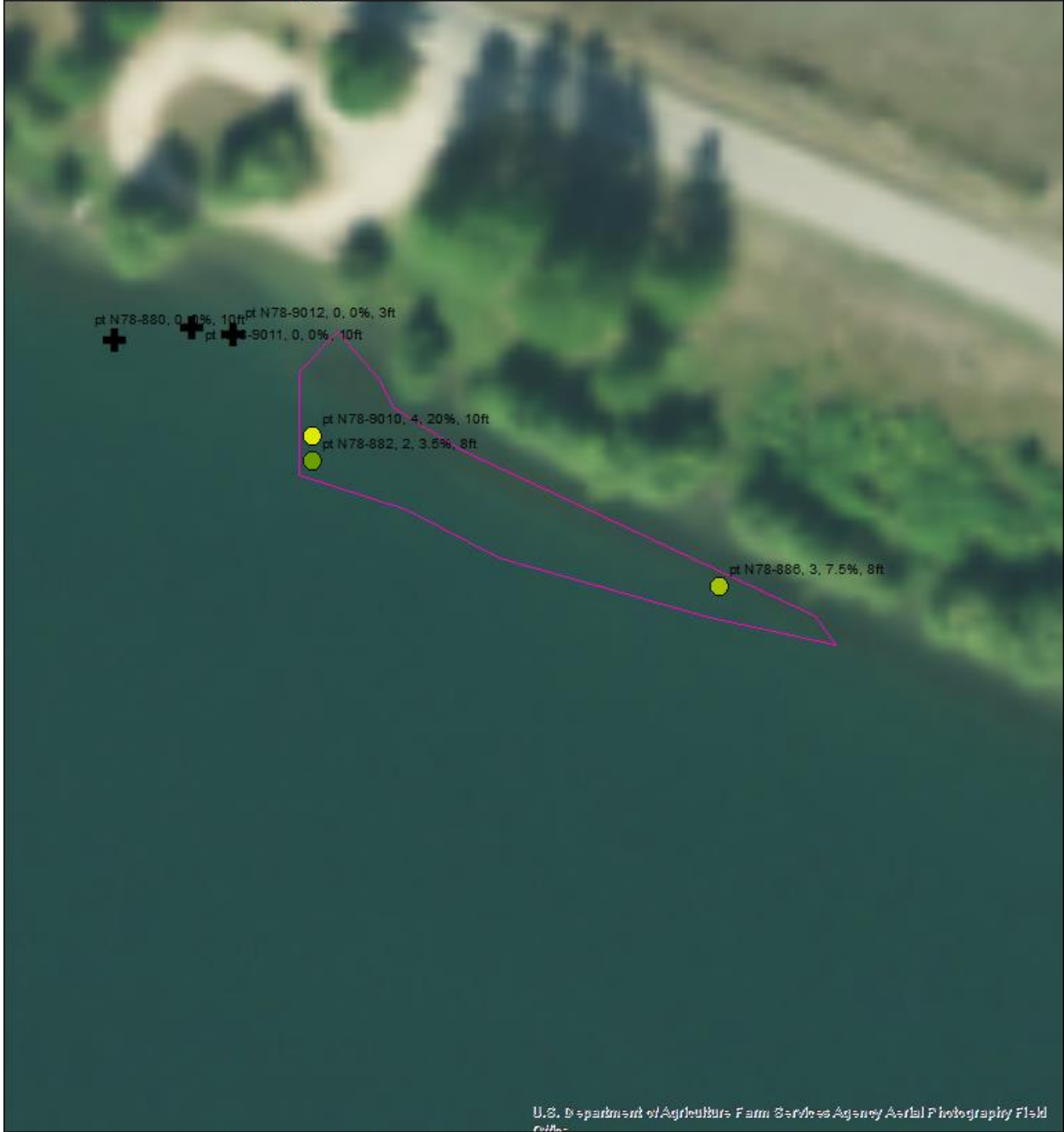


Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-78



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**Sample Results for Eurasian watermilfoil
Rank - (Percent Rake Fulness Range)**

- | | | | | | |
|---|-------------|---|--------------|---|----------------------------|
| + | Not Present | ● | 3 - (6-15%) | ● | 7 - (61-75%) |
| ● | 1 - (1-2%) | ● | 4 - (16-25%) | ● | 8 - (76-85%) |
| ● | 2 - (3-5%) | ● | 5 - (26-40%) | ● | 9 - (86-95%) |
| | | ● | 6 - (41-60%) | □ | Potential Treat Layer 2019 |



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-79



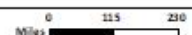
U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office

Sample Results for Curlyleaf Pondweed Rank - (Percent Rake Fullness Range)

- | | | | |
|---|-------------|--------------|------------------------------|
| + | Not Present | 4 - (16-25%) | 8 - (76-85%) |
| ● | 1 - (1-2%) | 5 - (26-40%) | 9 - (86-95%) |
| ● | 2 - (3-5%) | 6 - (41-60%) | 10 - (96-100%) |
| ● | 3 - (6-15%) | 7 - (61-75%) | □ Potential Treat Layer 2019 |



Each point labeled as: Point Name, Rake Fullness Rank, Percent Rake Fullness, Water Depth



Sampled July 8-10, 2019

Plot: Nox-79



Sample Results for Eurasian watermilfoil Rank - (Percent Rake Fulness Range)

- Not Present
 3 - (6-15%)
 7 - (61-75%)
- 1 - (1-2%)
 4 - (16-25%)
 8 - (76-85%)
- 2 - (3-5%)
 5 - (26-40%)
 9 - (86-95%)
- 6 - (41-60%)
 PotentialTreatLay2019



Each point labeled as: Point Name, Rake Fulness Rank, Percent Rake Fulness, Water Depth

