2023 Cane Creek Reservoir Submerged Aquatic Vegetation (SAV) Survey
NC Division of Water Resources

Introduction

Hydrilla, (*Hydrilla verticillata*), is one of the most economically and ecologically damaging invasive plants in the world and can lead to many undesirable outcomes. These include the forming of dense monocultures that crowd out native vegetation, reducing the habitat quantity and quality for aquatic organisms, clogging of municipal water intakes, and severely impacting recreational activities such as boating and swimming. For these reasons, it is considered a federal and state noxious weed which prohibits the import, sale, and movement of Hydrilla without a permit. Hydrilla was first reported in Cane Creek in 2016 adjacent to the boat launch. Since then, the Aquatic Weed Control Program (AWCP) and Orange Water and Sewer Authority have worked together to manage the infestation. More information concerning past management activities can be found on the AWCP online database (NCDEQ-DWR :: Aquatic Weed Control (ncwater.org)).

Methods

The AWCP completed a lake-wide vegetation survey of Cane Creek Reservoir October 11th – 12th. Using a point intercept method, a total of 93 points were sampled in 2023 (Figure 1). Low water levels prevented us from accessing one of the points that was sampled last year. A quick visual inspection along with three rake tosses were conducted at each point along the shoreline to determine the presence/absence of SAV as well as quantify species abundance. Rake coverage was quantified using a scale from 0 to 4 (0 = no vegetation; 1 (Trace) = <25%; 2 (Sparse)= 25% - 50%; 3 (Moderate)= 50% - 75%; 4 (Dense) = 75% - 100%). Additionally, a recording fathometer (SONAR) was used to map and record the bottom. Roughly 21 miles of SONAR were logged. The SONAR data was uploaded to a third-party company, Biobase, to quantify the depth and biovolume data. Biovolume is the percentage of the water column taken up by vegetation when vegetation is present. All of this was then combined with the rake-toss data using GIS software to estimate coverage.

Results

Overall, Cane Creek Reservoir has a substantial amount of SAV throughout the lake. SAV was found at 84, or 90%, of the rake toss points (Table 1; Figure 2). Since 2021, there has been a steady increase in Hydrilla, and it is now the dominant SAV in the lake (Table 2). Hydrilla was found at 80, or 86%, of the rake toss points in 2023 (Table 1; Figures 3-4). 51, or 64%, of the samples were in the "dense" category (Table 1; Figure 5). Hydrilla acreage significantly increased again from 2022 to 2023. The estimated coverage of Hydrilla in 2022 was 52 acres compared to 85.5 acres in 2023 (Figure 6).

Brittle naiad, which is another noxious weed recognized by the Department of Environmental Quality (DEQ), has seen a significant decrease in abundance since 2021 (Table 2). Brittle naiad was found at 7, or 8%, of the rake toss points in 2023 (Table 1; Figures 3 & 7). The coverage of Brittle Naiad was 10 acres in 2023 compared to 29 acres in 2022 (Figure 8).

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Proliferating Spikerush (*Eleocharis baldwinii*) and Slender Pondweed (*Potamogeton pusillus*), both native and beneficial SAV, were abundant in the lake but are now below detectable levels (Table 2). Southern naiad (*Najas guadalupensis*), also native and beneficial, saw a slight increase in abundance from 2022 to 2023 but is still well below 2021 levels (Table 2). Southern naiad was found at 13, or 14%, of the rake toss points in 2023 (Table 1; Figure 3 & 9).

Two other species of note found during the survey include the macroalga Chara (*Chara spp.*) and the cyanobacteria Lyngbya (*Microseira wollei*). Chara was found at 5, or 5%, of the rake toss points in 2023 (Table 1; Figures 3 & 10). This was the first year that Lyngbya was detected in the reservoir. It was found at 6, or 6%, of the rake toss points in 2023 (Table 1; Figures 3 & 11).

Alligatorweed (*Alternanthera philoxeroides*) and Creeping Water Primrose (*Ludwigia grandiflora*), both species on the DEQ noxious weed list, were also found during the survey. They were found scattered along the shoreline in multiple locations throughout the reservoir.

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Figure 1. Map showing pre-determined rake toss points.

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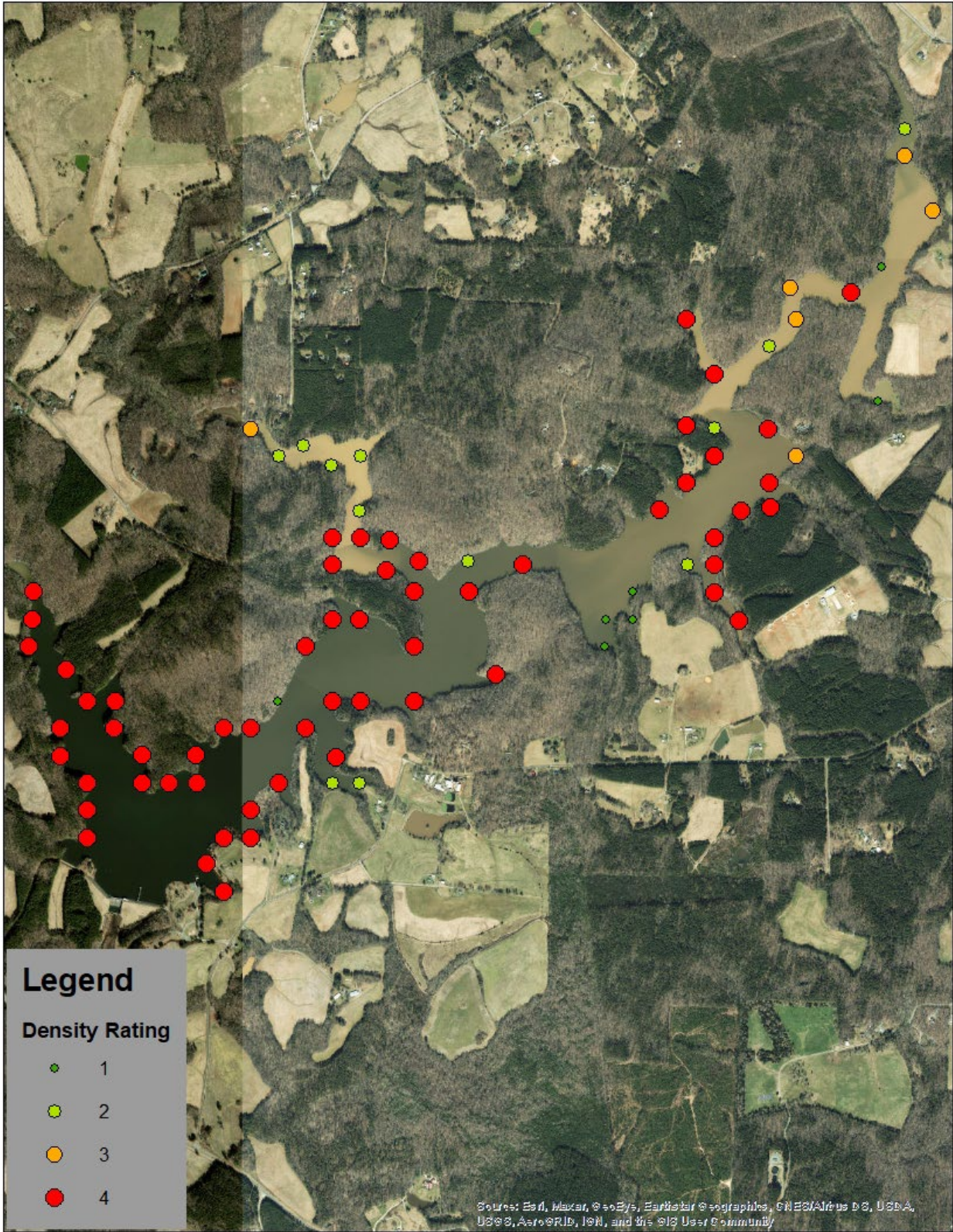## NC Division of Water Resources

Figure 2. Map showing location of SAV and associated density ratings.

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| Species | Total | Density Rating | | | | | | | |
| | | Trace | | Sparse | | Moderate | | Dense | |
		Number of points	%	Number of points	%	Number of points	%	Number of points	%
Brittle naiad (*Najas minor*)	7	1	14%	6	86%	0	0%	0	0%
Chara (*Chara spp.*)	5	2	40%	3	60%	0	0%	0	0%
Hydrilla (*Hydrilla verticillata*)	80	7	9%	18	23%	4	5%	51	64%
Lyngbya (*Microseira wollei*)	6	5	83%	1	17%	0	0%	0	0%
Southern naiad (*Najas guadalupensis*)	13	6	46%	6	46%	1	8%	0	0%
Vegetated points	84	7	8%	12	14%	6	7%	59	70%

Red indicates DEQ noxious weed

Table 1. Species abundance during 2023 Cane Creek Reservoir survey.

| Species | 2021 | | 2022 | | 2023 | |
	number of points	% change	number of points	% change	number of points	% change
Brittle naiad (*Najas minor*)	30	-	27	-10%	7	-74.07%
Chara (*Chara spp.*)	13	-	34	162%	5	-85.29%
Hydrilla (*Hydrilla verticillata*)	20	-	65	225%	80	23.08%
Lyngbya (*Microseira wollei*)	0	-	0	-	6	-
Proliferating Spikerush (*Eleocharis baldwinii*)	45	-	0	-100%	0	-
Slender Pondweed (*Potamogeton pusillus*)	0	-	24	-	0	-100.00%
Southern naiad (*Najas guadalupensis*)	36	-	9	-75%	13	44.44%
Total vegetated points	72	-	83	15%	84	1%

Red indicates DEQ noxious weed

Table 2. Change in species presence over time at Cane Creek Reservoir.

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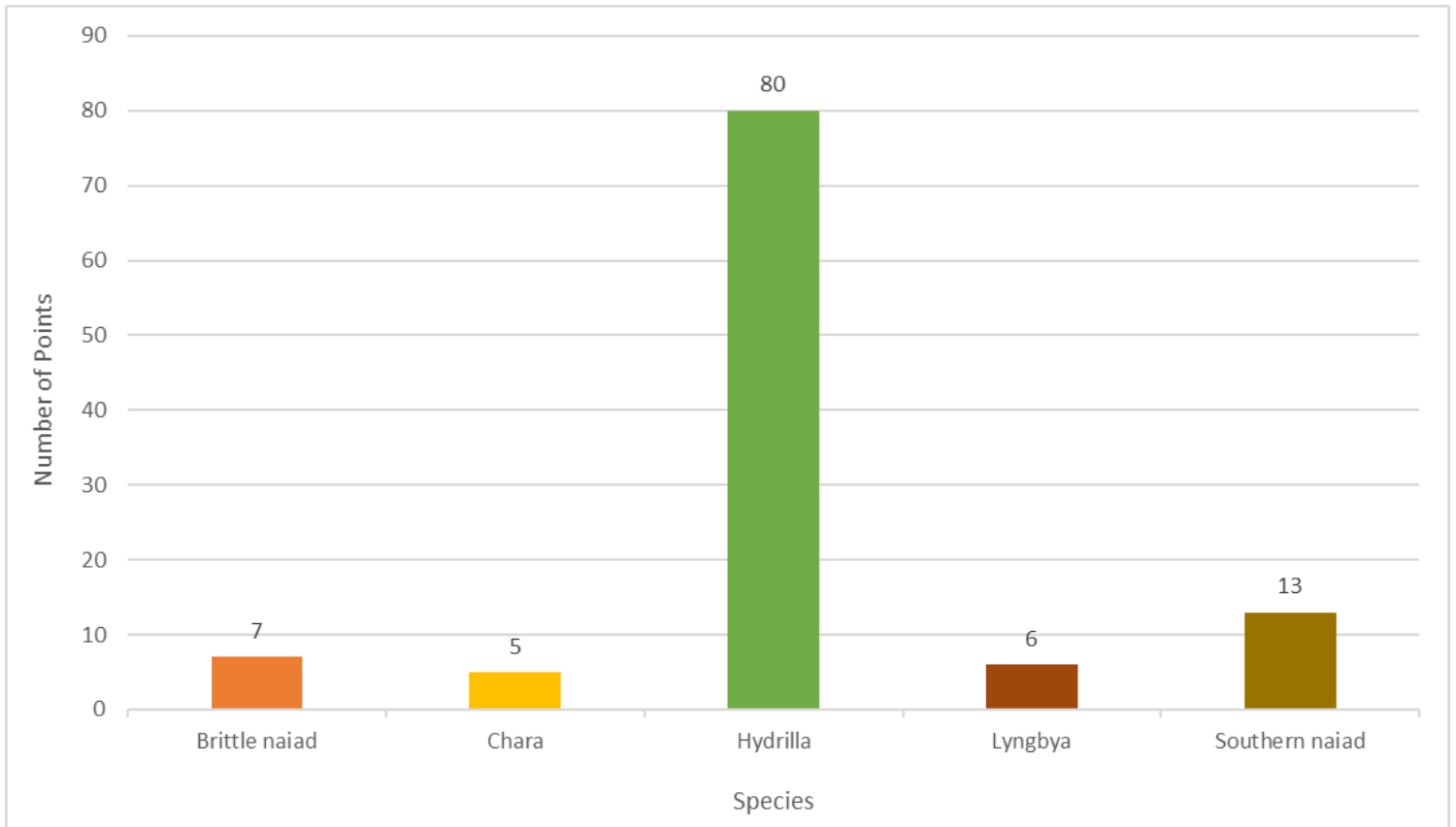## NC Division of Water Resources

Figure 3. Relative abundance during the 2023 Cane Creek Reservoir survey.

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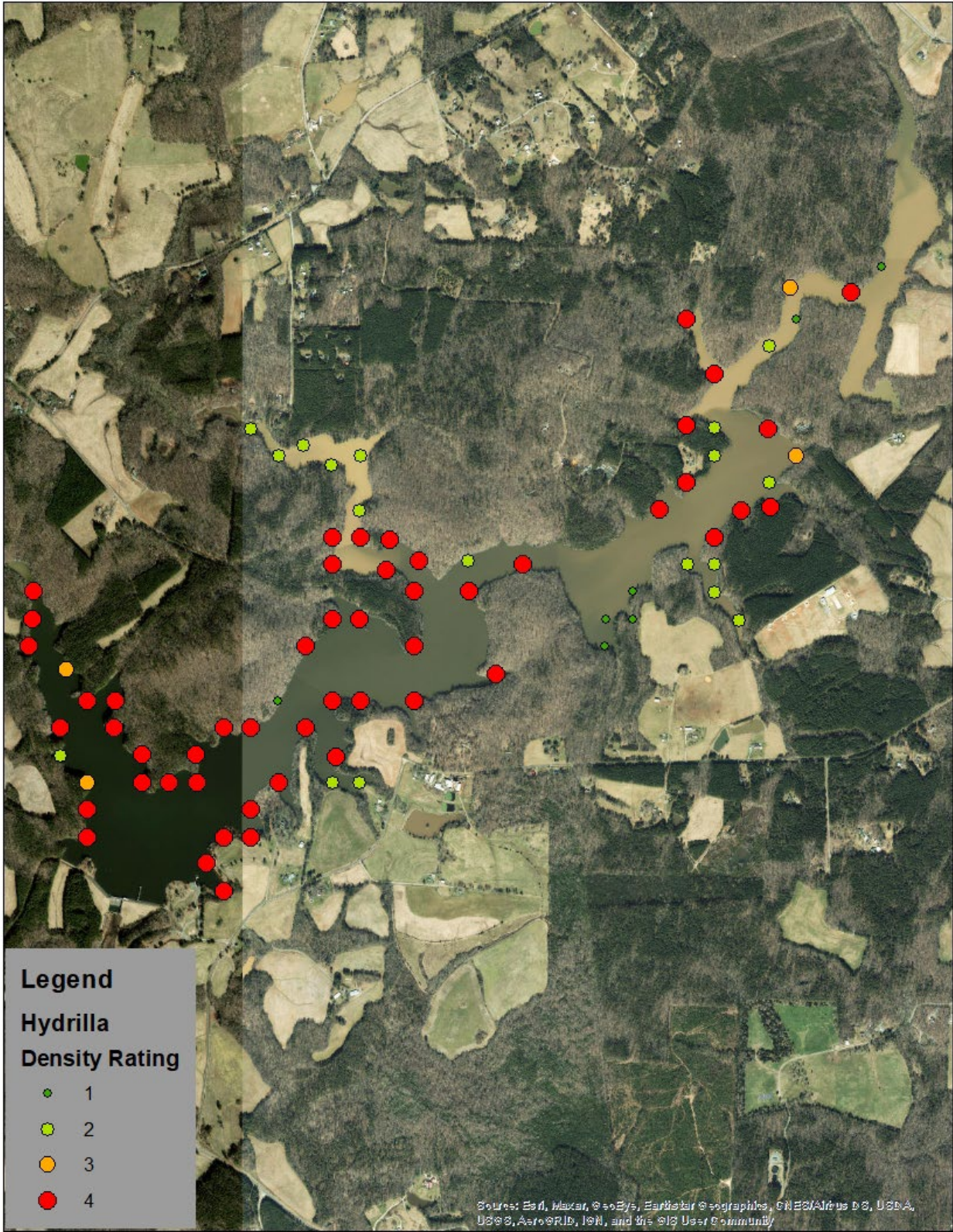## NC Division of Water Resources

Figure 4. Map showing Hydrilla locations and density ratings.

Figure 5. Photo showing "dense" rating at one of the pre-determined rake toss points.

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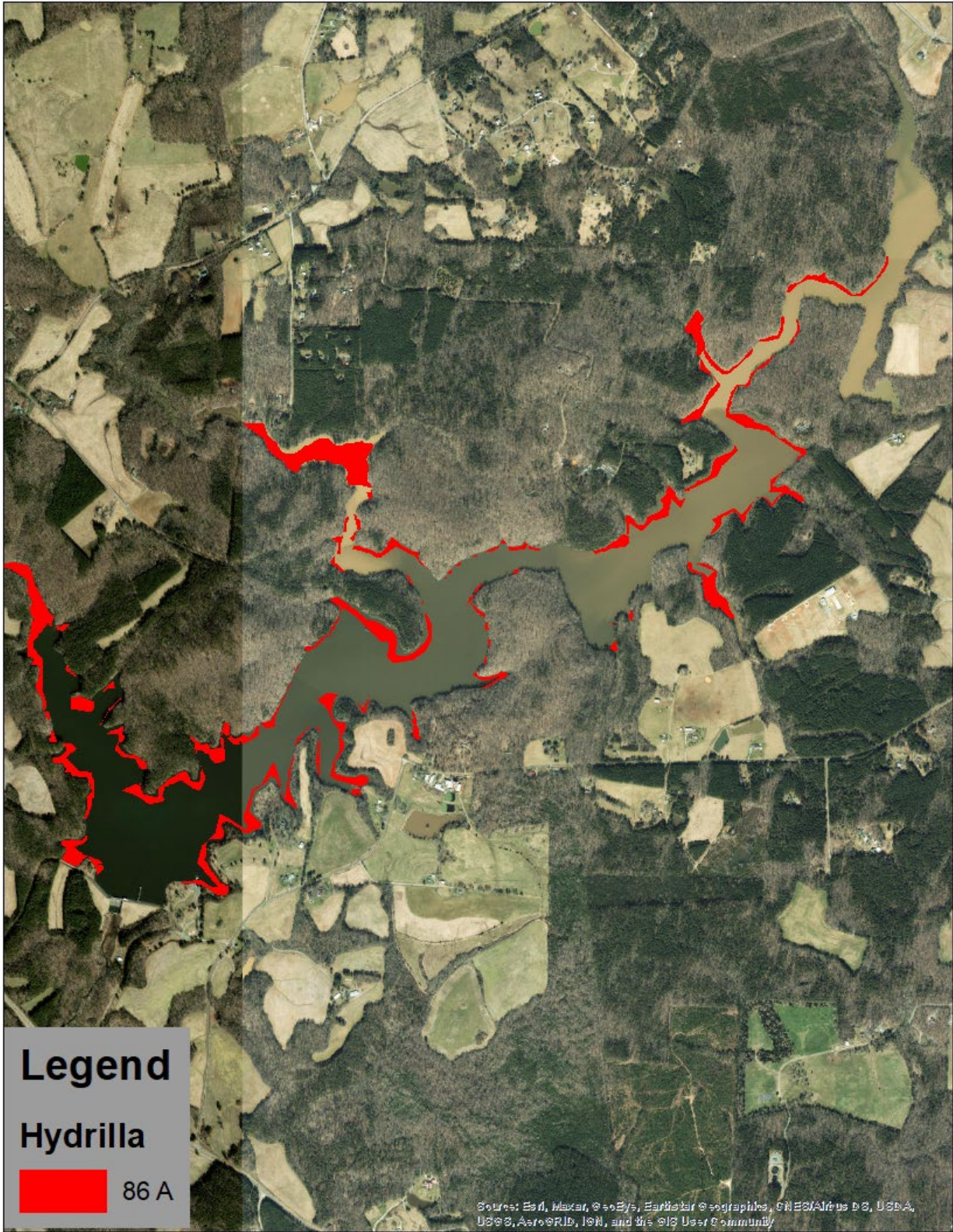## NC Division of Water Resources

Figure 6. Map showing coverage of Hydrilla.

2023 Cane Creek Reservoir Submerged Aquatic Vegetation (SAV) Survey
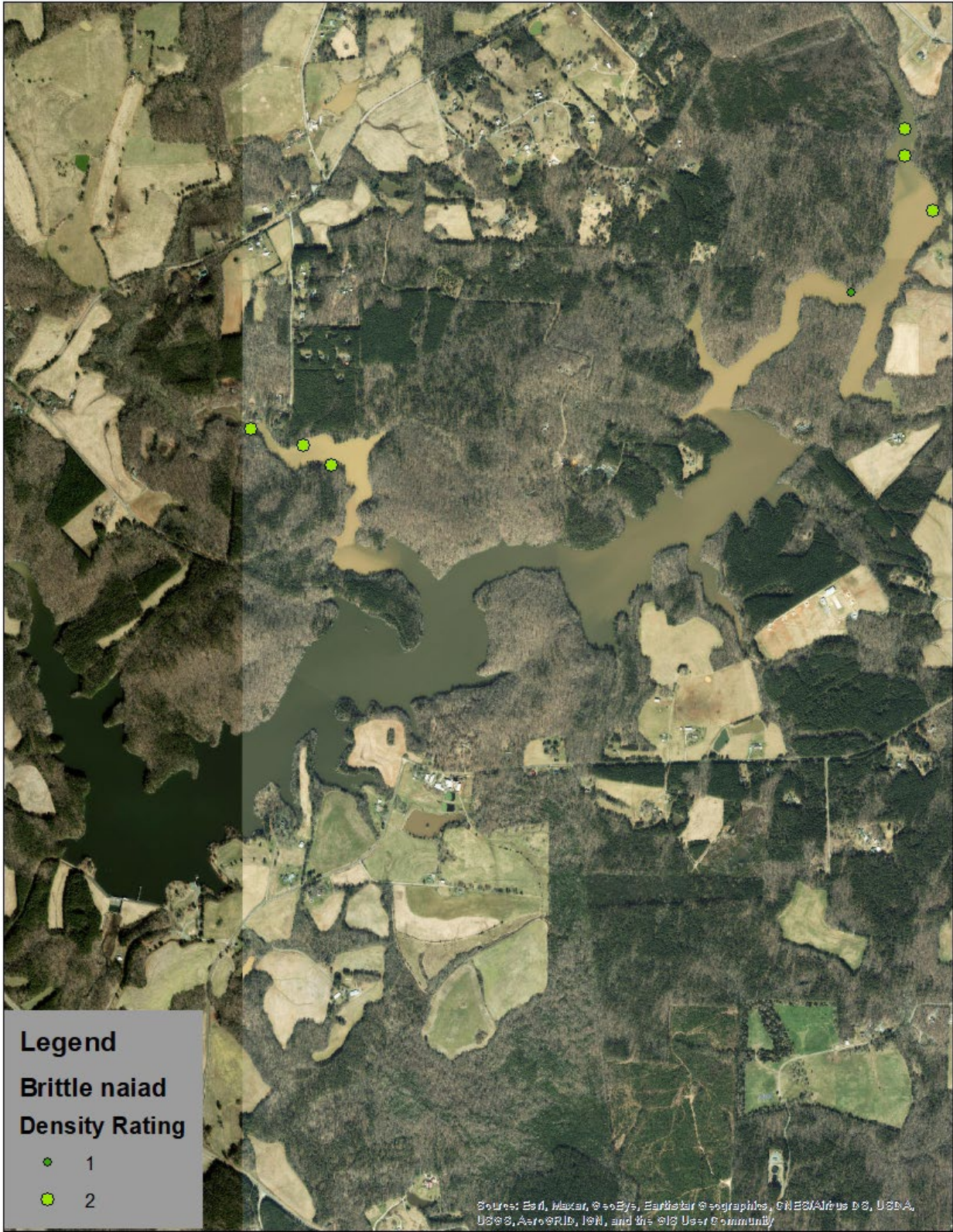## NC Division of Water Resources

Figure 7. Map showing location and density of Brittle naiad.

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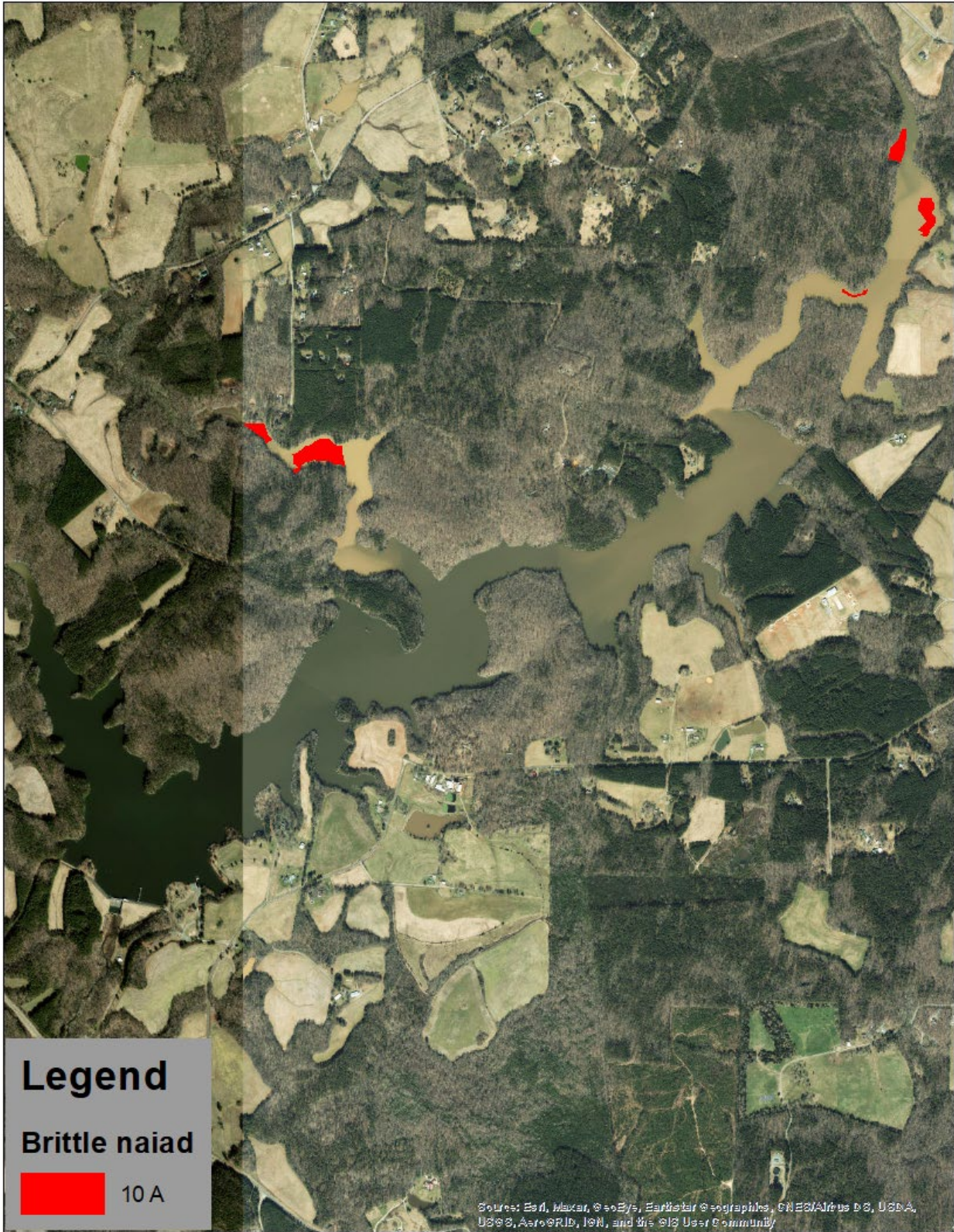## NC Division of Water Resources

Figure 8. Map showing coverage of Brittle naiad.

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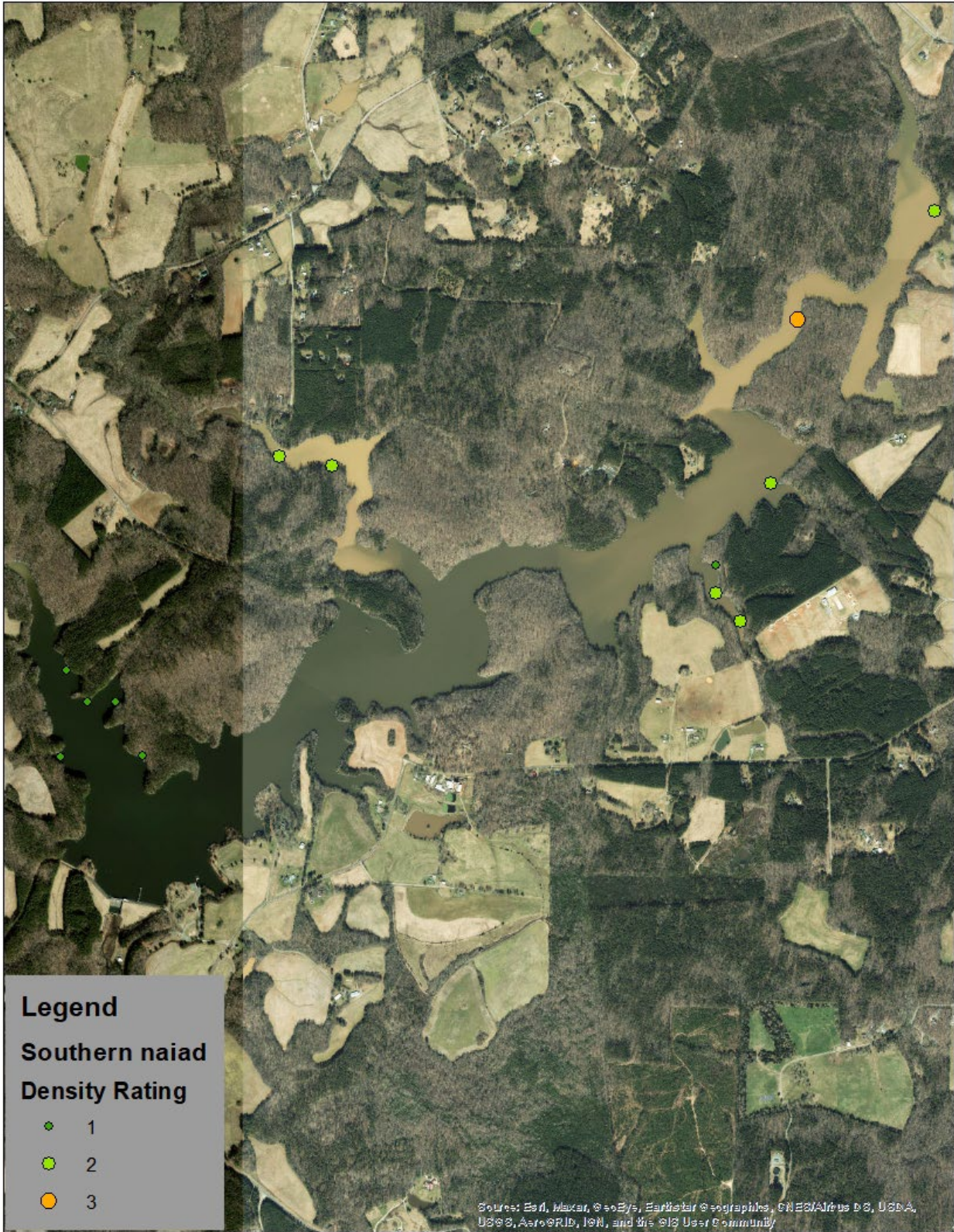## NC Division of Water Resources

Figure 9. Map showing location of Southern Naiad and density rating.

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Figure 10. Map showing location of Chara and density rating.

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Figure 11. Map showing location of Lyngbya and density rating.