

2023 Lake Tillery 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 Lake Tillery in 2006, around the Swift Island boat ramp, and herbicide applications began that year. Since then, multiple partners including the Aquatic Weed Control Program (AWCP), the NC Wildlife Resources Commission (WRC), and Duke Energy have worked together to manage Hydrilla in the reservoir. More information concerning past management activities can be found on the AWCP online database ([NCDEQ-DWR :: Aquatic Weed Control \(ncwater.org\)](https://ncdeq-dwr.org/AquaticWeedControl)).

Methods

The AWCP completed a full-lake survey of Lake Tillery September 25th – 27th and October 3rd – 4th. Using a point intercept method, a total of 210 points were sampled in 2023 (Figure 1). Three rake tosses were conducted at each point along the shoreline to determine presence/absence of SAV as well as quantify rake coverage. 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 101 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 a 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

SAV was found at 78, or 37%, of the points (Table 1; Figure 2). Species found during the survey include Bladderwort (*Utricularia spp.*), Brittle Naiad (*Najas minor*), Chara (*Chara spp.*), Coontail (*Ceratophyllum demersum*), filamentous algae (*Spirogyra spp.*), Hydrilla (*Hydrilla verticillata*), Lyngbya (*Microseira wollei*), Proliferating Spikerush (*Eleocharis baldwinii*) and Southern Naiad (*Najas guadalupensis*) (Table 1; Figures 3-12). Hydrilla was by far the most common SAV found during the survey accounting for 60% of the vegetation found at the rake toss points where vegetation was present.

Hydrilla acreage greatly increased from 2022 to 2023. The estimated coverage of Hydrilla in 2022 was 130 acres compared to 257 acres in 2023 (Figure 13). The estimated coverage of Lyngbya is 38 acres (Figures 14-16).

Water Willow was observed growing along much of the shoreline. Other emergent vegetation observed during the survey was Cattail (*Typha spp.*), Alligatorweed (*Alternanthera philoxeroides*) and Creeping water primrose (*Ludwigia grandiflora*).

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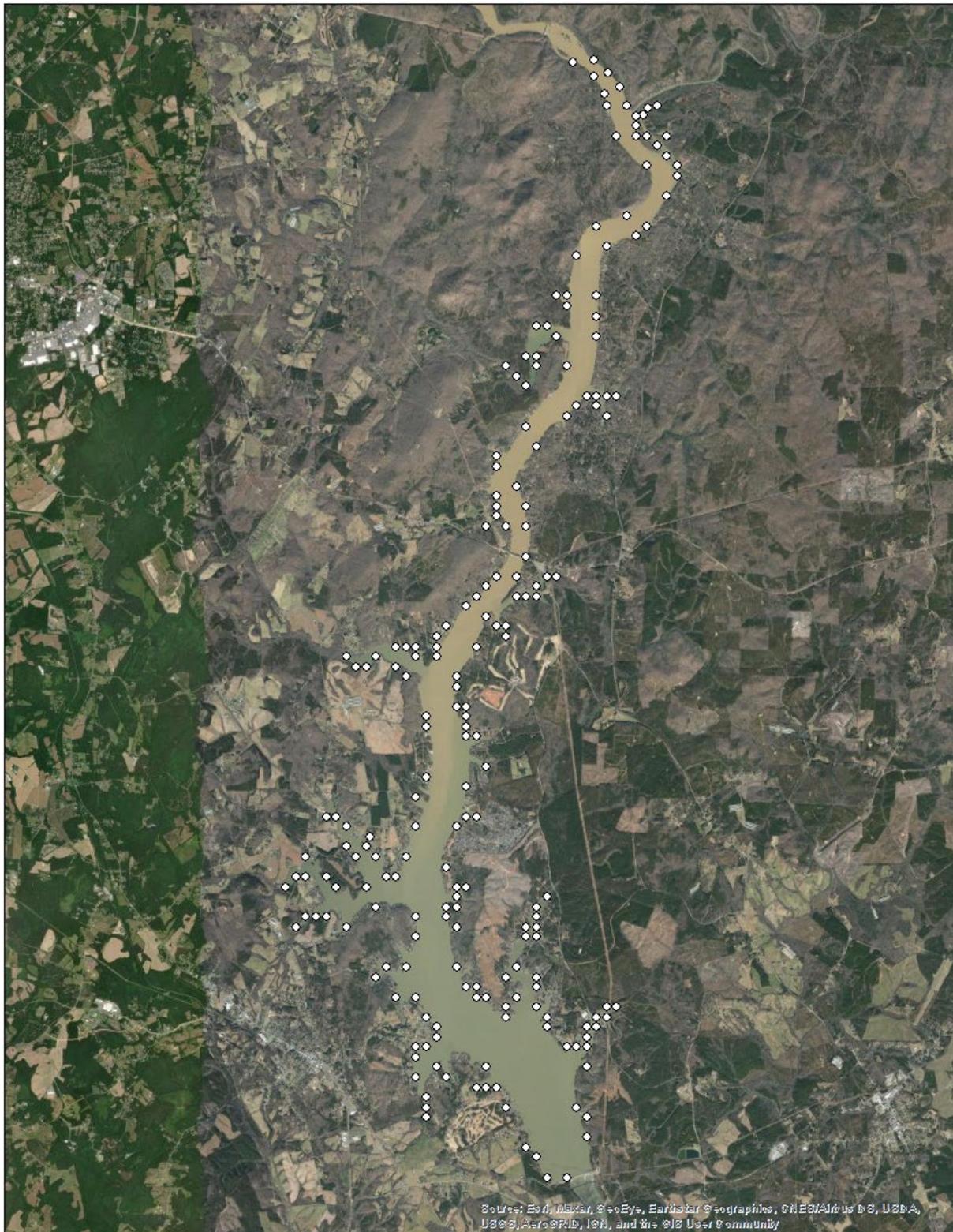


Figure 1. Map showing location of pre-determined rake toss points.

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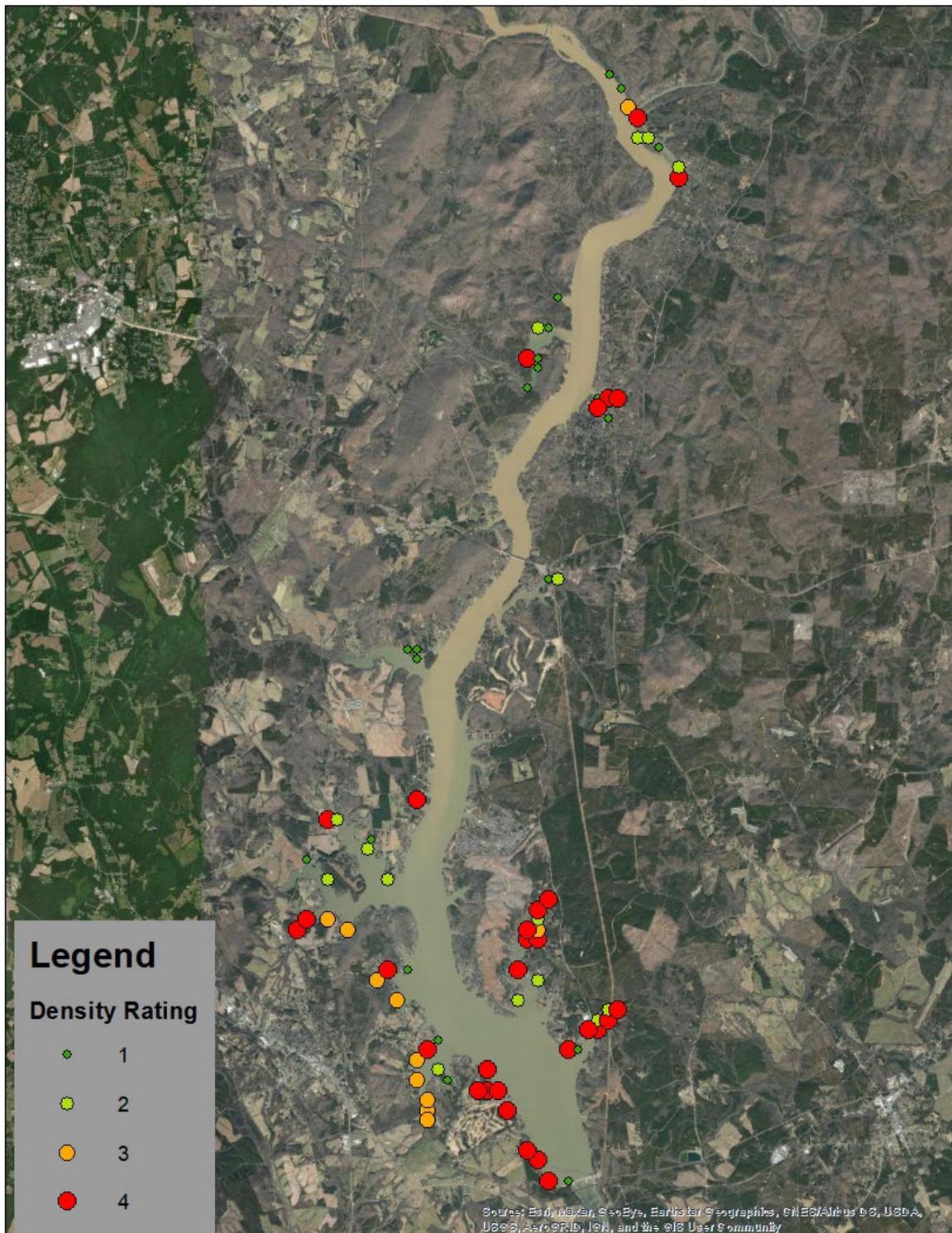


Figure 2. Map showing location of SAV and associated density rating.

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Species	Total	Density Rating							
		Trace		Sparse		Moderate		Dense	
		Number of points	%						
Bladderwort (<i>Utricularia spp.</i>)	5	2	40%	2	40%	0	0%	1	20%
Brittle Naiad (<i>Najas minor</i>)	1	1	100%	0	0%	0	0%	0	0%
Chara (<i>Chara spp.</i>)	5	0	0%	3	60%	0	0%	2	40%
Coontail (<i>Ceratophyllum demersum</i>)	5	1	20%	3	60%	0	0%	1	20%
Filamentous aglae (<i>Spirogyra spp.</i>)	7	4	57%	3	43%	0	0%	0	0%
Hydrilla (<i>Hydrilla verticillata</i>)	47	8	17%	14	30%	8	17%	17	36%
Lyngbya (<i>Microseira wollei</i>)	26	12	46%	7	27%	1	4%	6	23%
Proliferating Spikerush (<i>Eleocharis baldwinii</i>)	1	0	0%	1	100%	0	0%	0	0%
Southern naiad (<i>Najas guadalupensis</i>)	2	1	50%	1	50%	0	0%	0	0%
Vegetated points	78	21	27%	15	19%	11	14%	31	40%

Table 1. Species abundance during 2023 Lake Tillery survey.

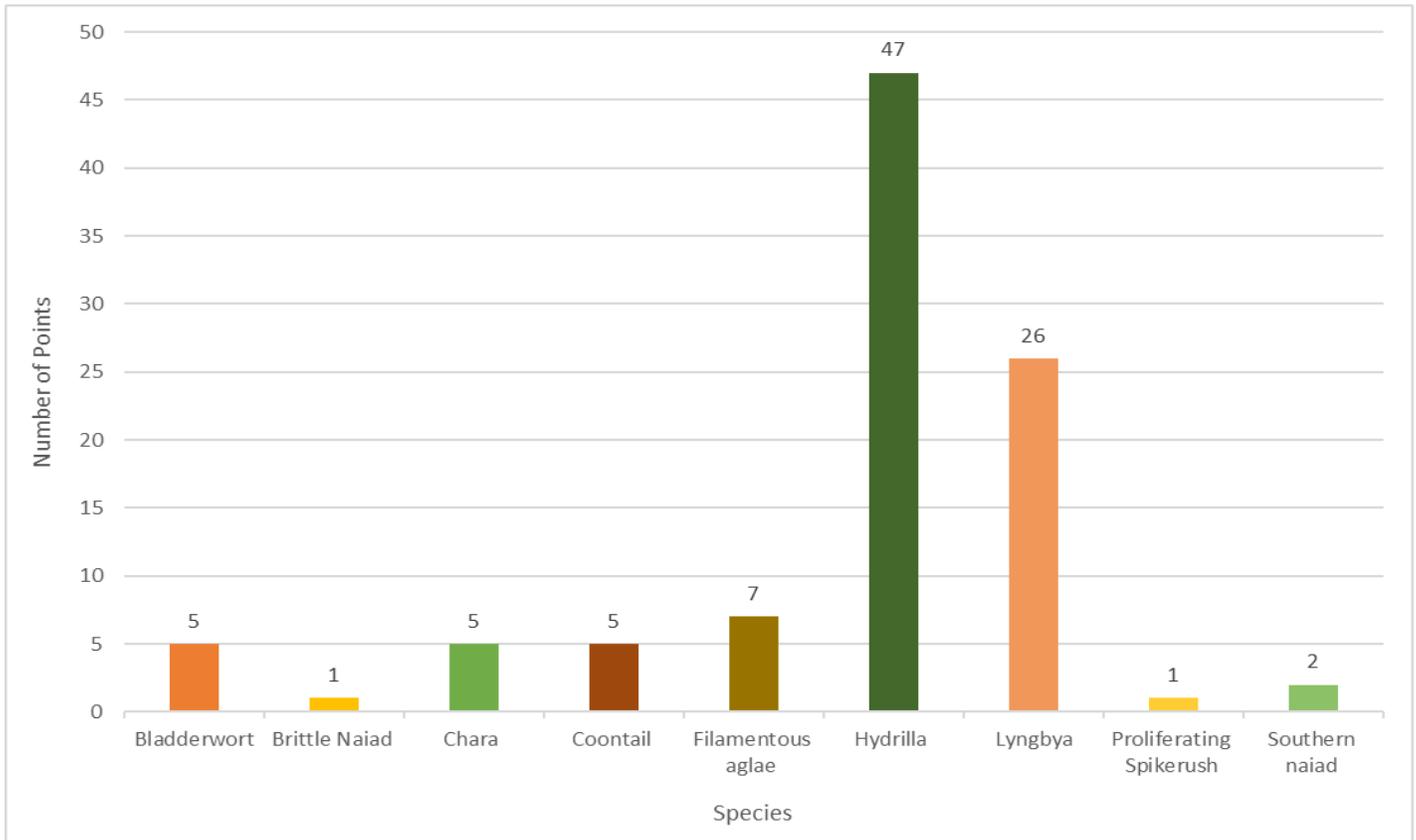


Figure 3. Relative abundance during the 2023 Lake Tillery survey.

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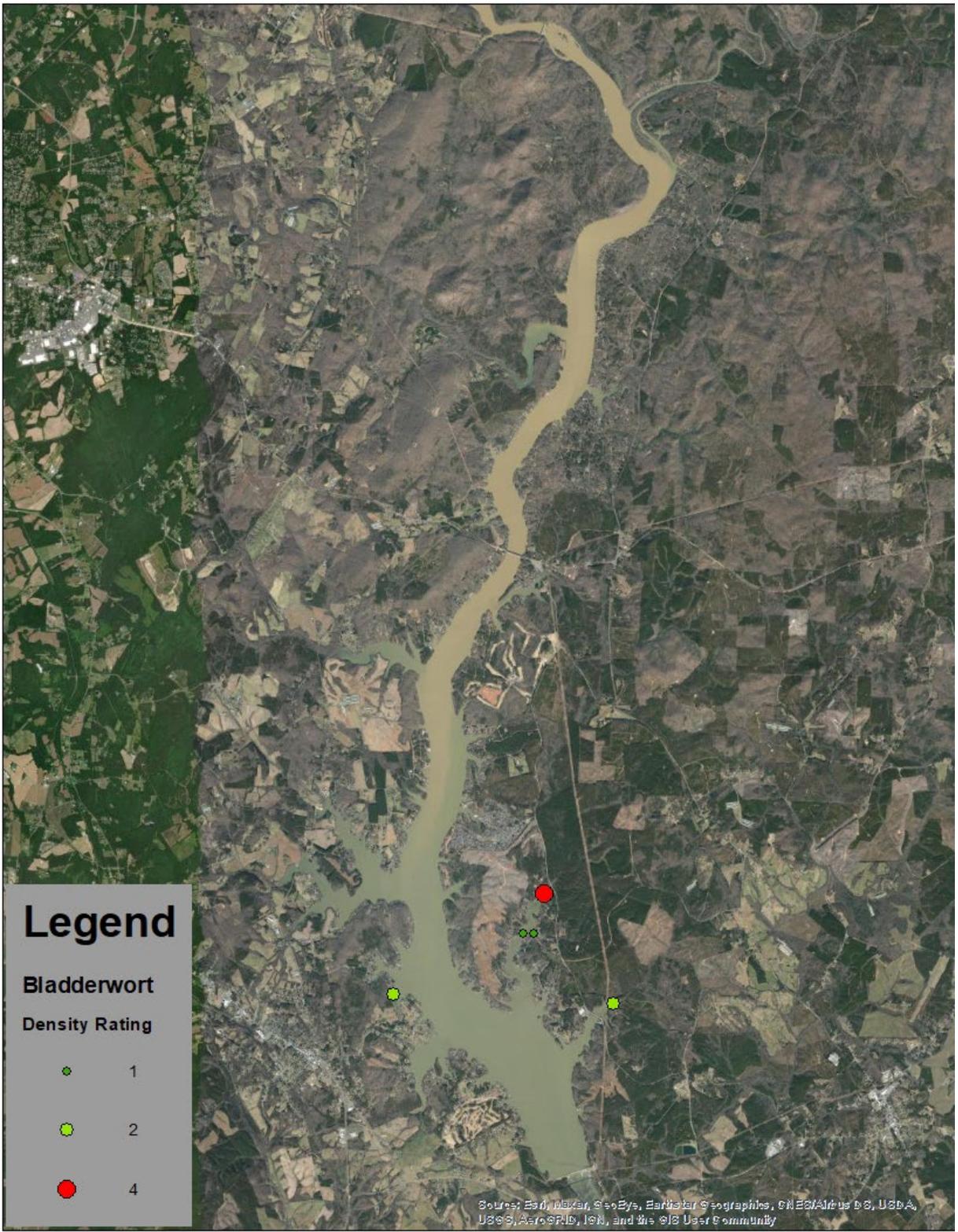


Figure 4. Map showing Bladderwort locations and density ratings.

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Figure 5. Map showing location of Brittle Naiad and density rating.

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Figure 6. Map showing location of Chara and density rating.

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Figure 7. Map showing location of Coontail and density rating.

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Figure 8. Map showing location of filamentous algae and density rating.

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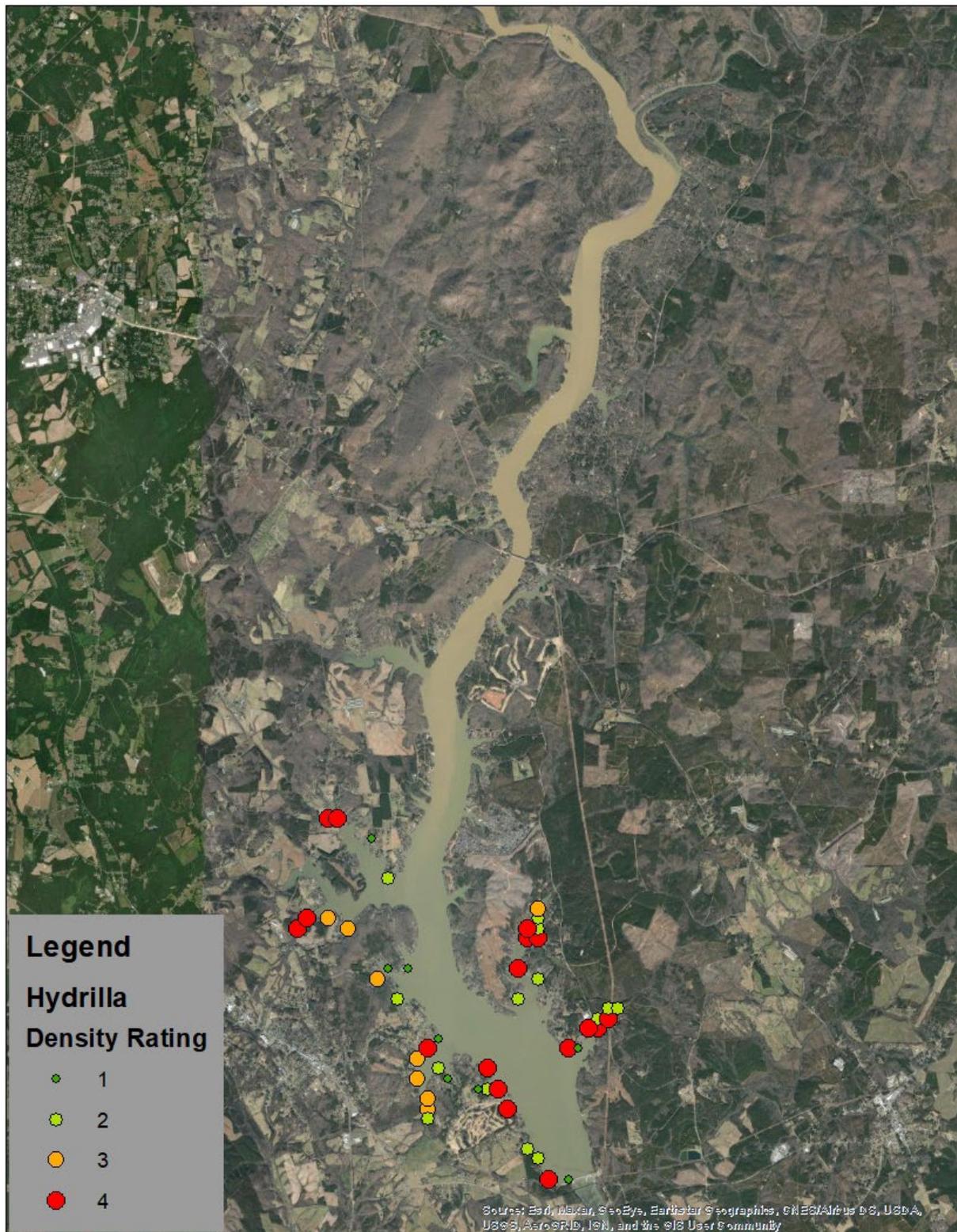


Figure 9. Map showing location of Hydrilla and density rating.

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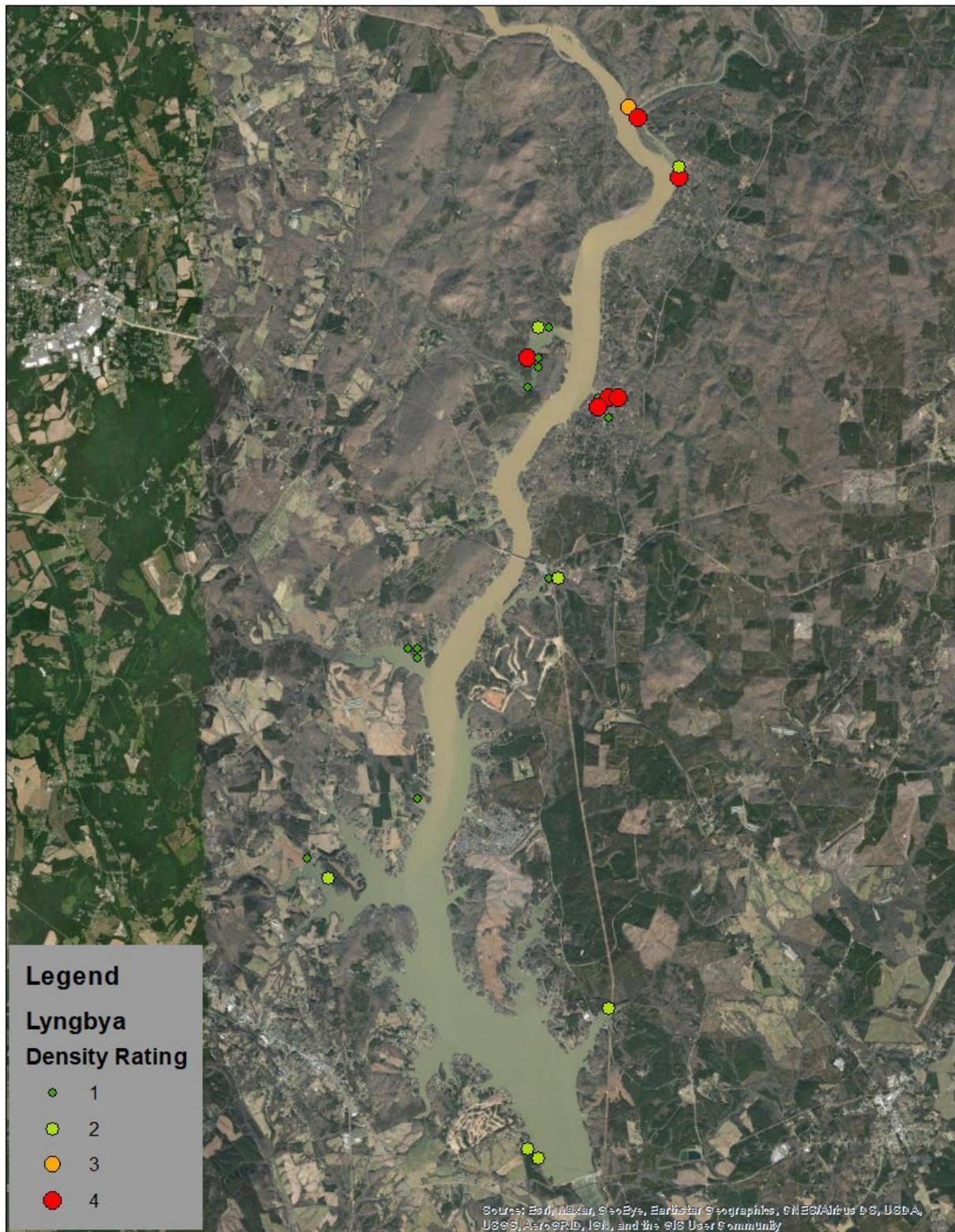


Figure 10. Map showing location of Lyngbya and density rating.

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Figure 11. Map showing location of Proliferating Spikerush and density rating.

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Figure 12. Map showing Southern Naiad location and density rating.

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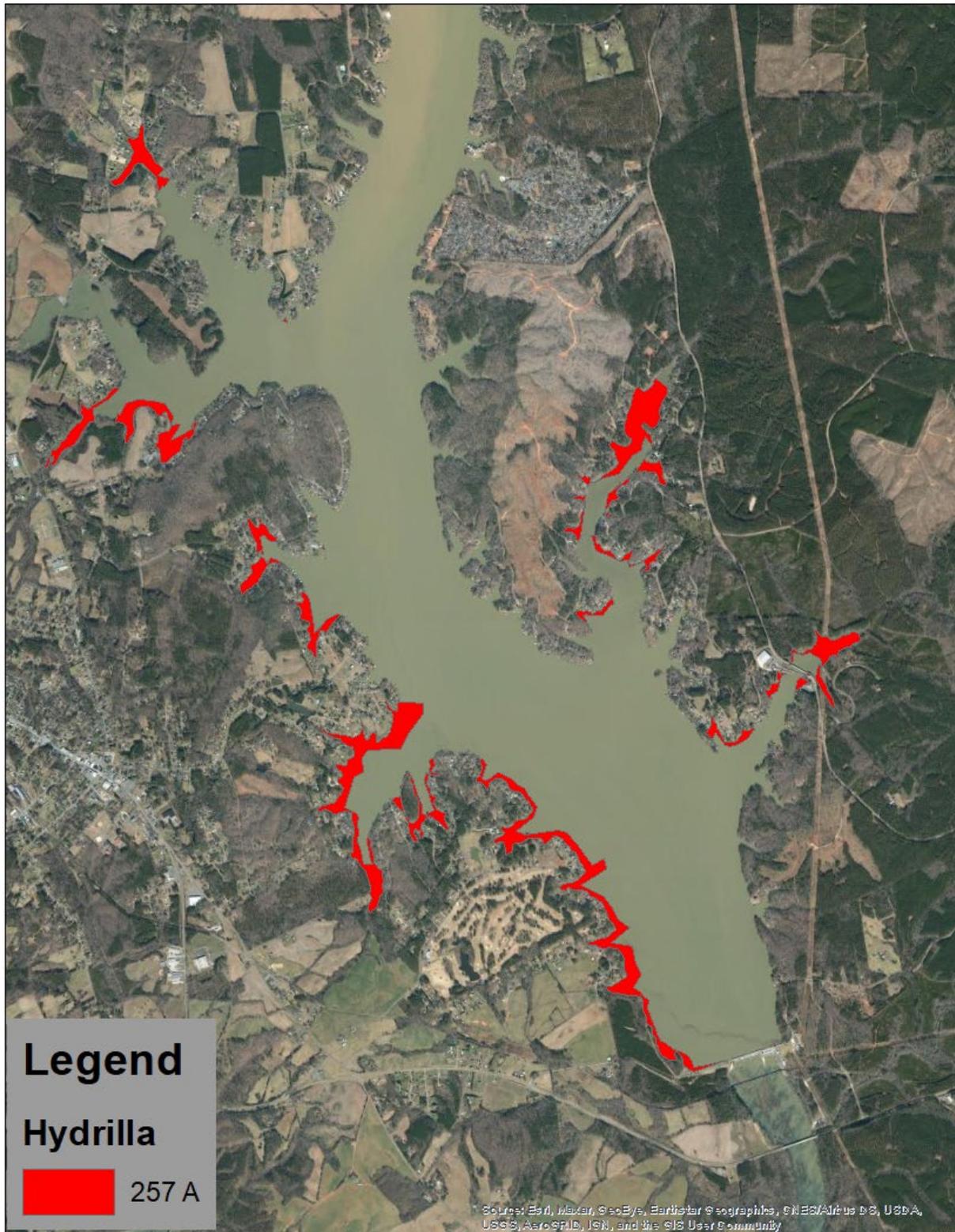


Figure 13. Map showing Hydrilla coverage (257 acres).

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Figure 14. Map showing Lyngbya coverage in the lower end of the lake.

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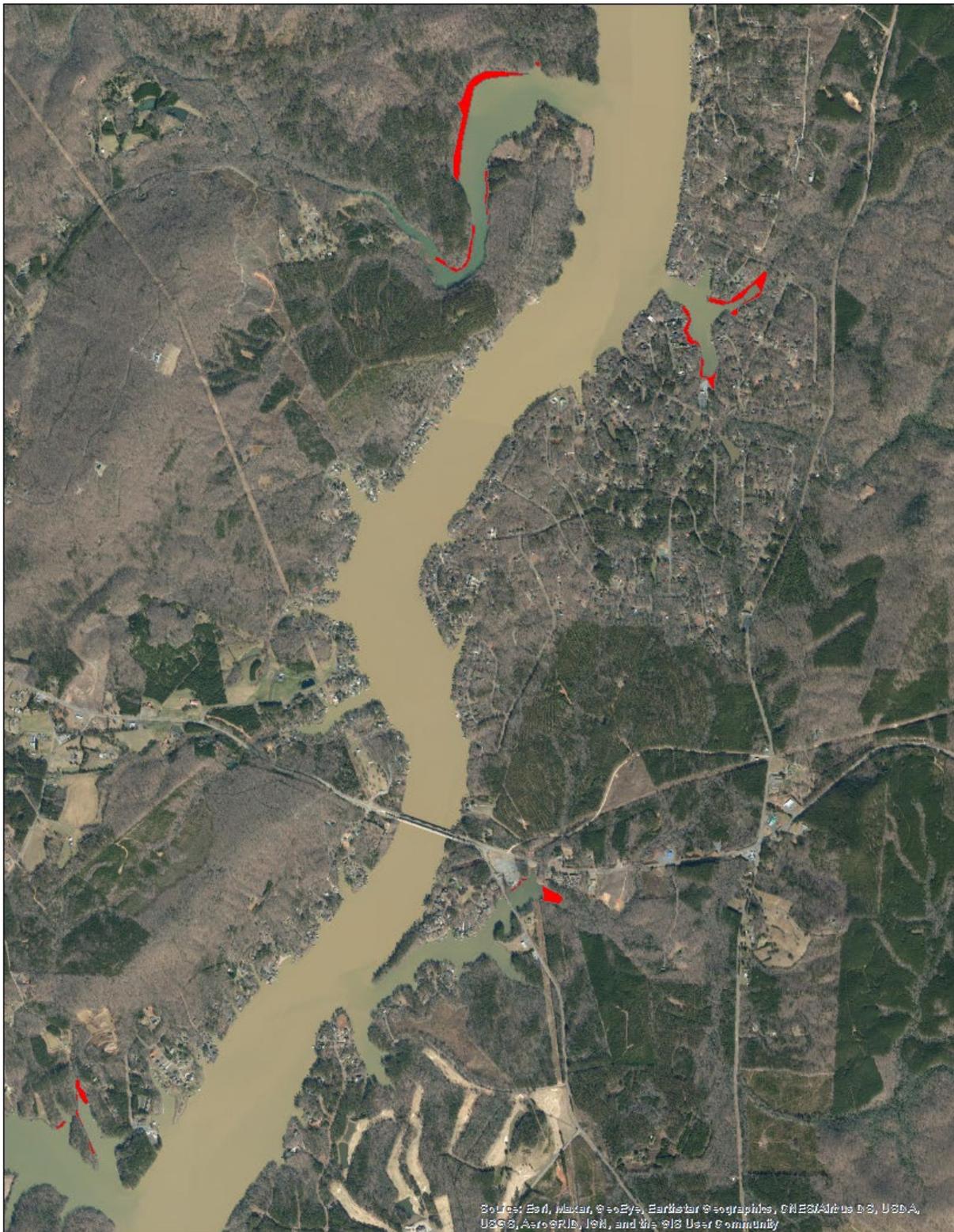


Figure 15. Map showing Lyngbya coverage mid lake.

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Figure 16. Map showing Lyngbya coverage in the upper end of the lake.