2022 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 as well. 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)).

Methods

The AWCP completed a full-lake survey of Lake Tillery September 15th – 16th and September 20th – 22nd. Using a point intercept method, a total of 204 points were sampled in 2022 (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 89 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 76, or 37%, of the points (Table 1;Figure 2). Species found during the survey include Hydrilla (*Hydrilla verticillata*), Proliferating Spikerush (*Eleocharis baldwinii*), Southern Naiad (*Najas guadalupensis*), Coontail (*Ceratophyllum demersum)*, Small Waterwort (*Elatine minima*), Chara (*Chara spp.*) and Lyngbya (*Microseira wollei*) (Table 1;Figures 3-10). All these species have been found during previous surveys, except for Small waterwort (Table 1).

Hydrilla acreage greatly increased from 2021 to 2022. The estimated coverage of Hydrilla in 2021 was 5 acres compared to 130 acres in 2022 (Figure 11). The estimated coverage of Lyngbya is 17.5 acres (Figure 12).

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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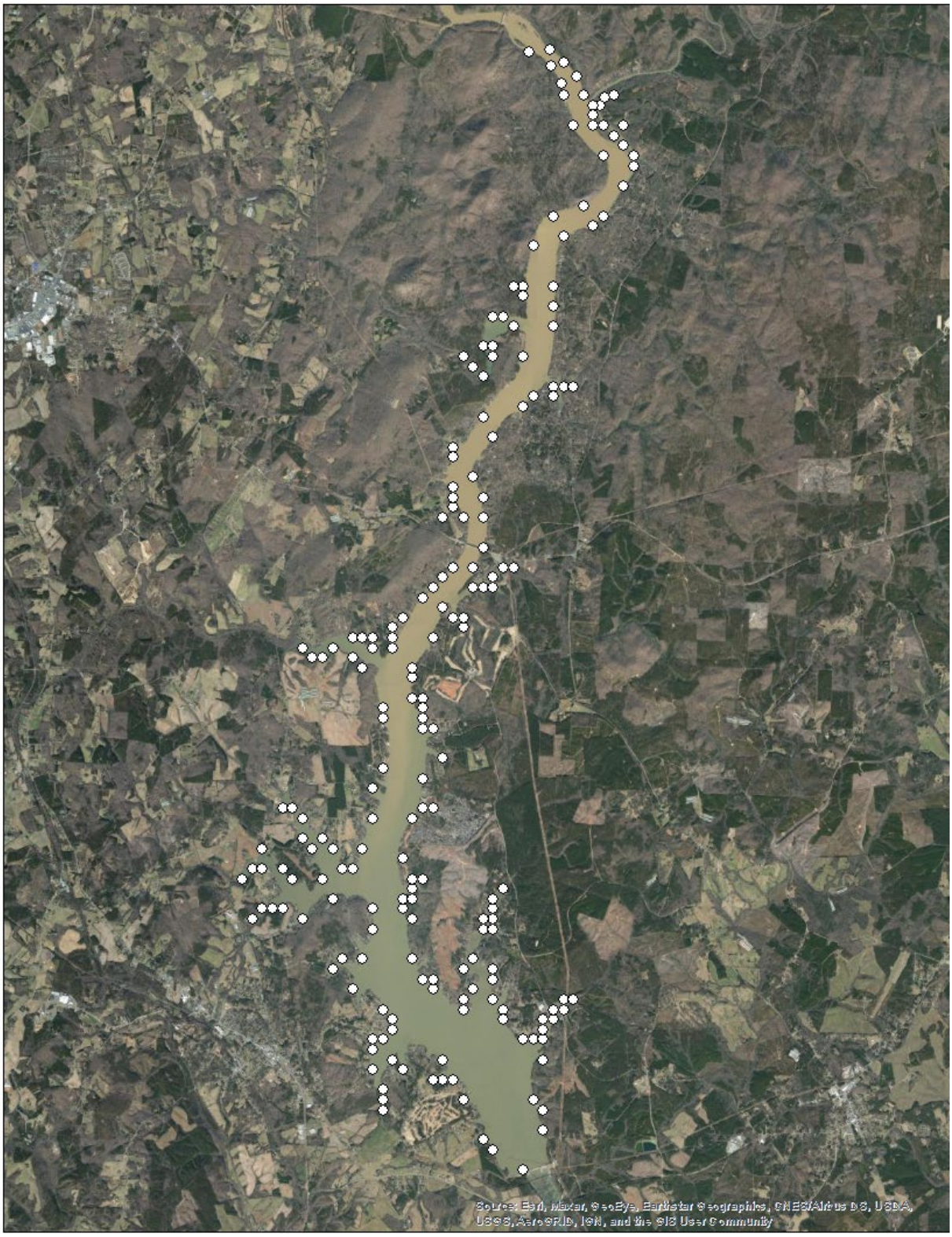

Figure 1. Map showing location of pre-determined rake toss points.

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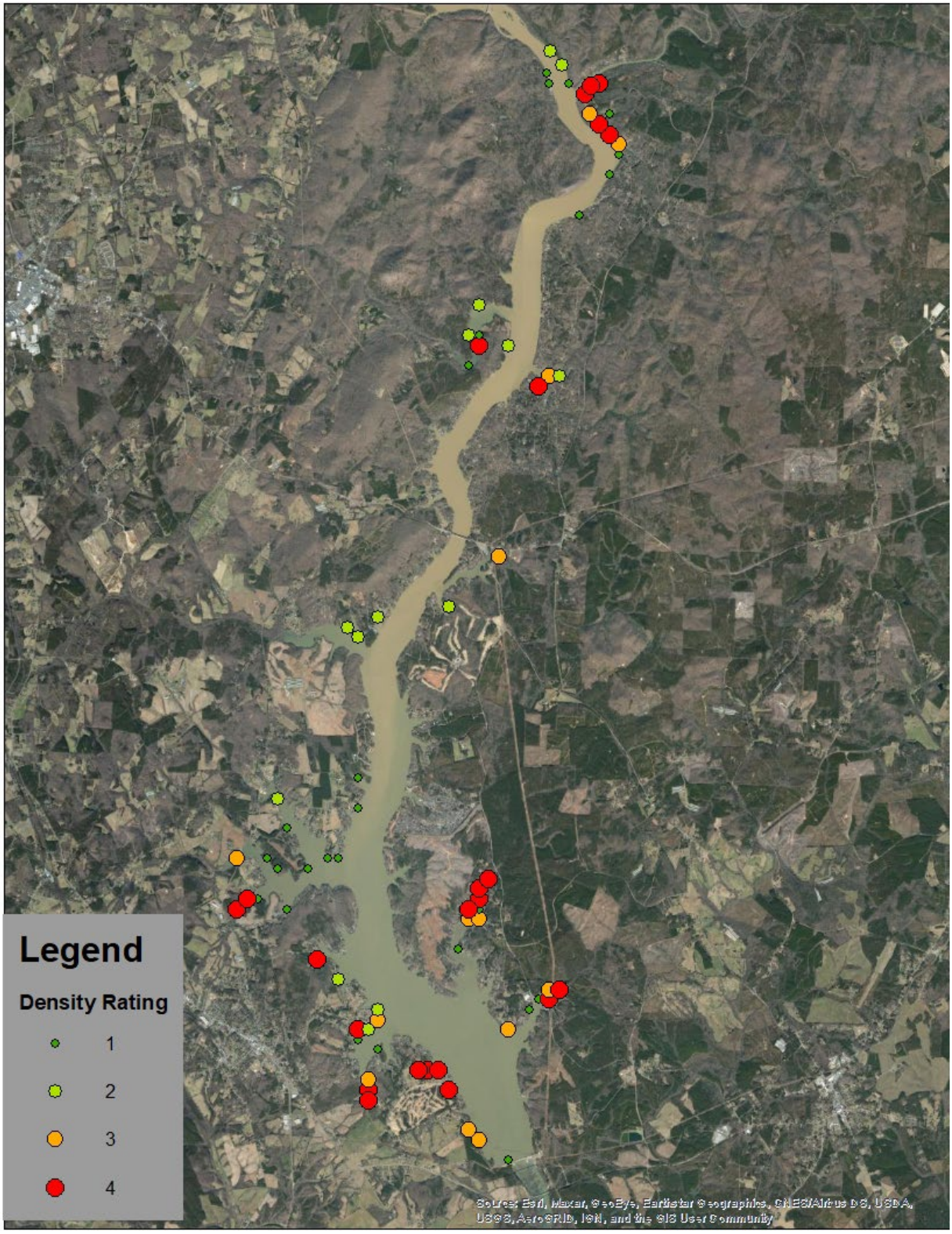

Figure 2. Map showing location of SAV and associated density rating.

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Species	Total	Density Rating							
		Trace		Sparse		Moderate		Dense	
		Number of points	%	Number of points	%	Number of points	%	Number of points	%
Chara (*Chara spp.)*	11	2	18%	2	18%	2	18%	5	45%
Coontail (*Ceratophyllum demersum)*	5	5	100%	0	0%	0	0%	0	0%
Hydrilla (*Hydrilla verticillata*)	33	7	21%	8	24%	4	12%	14	42%
Lyngbya (*Microseira wollei*)	29	13	45%	12	41%	2	7%	2	7%
Proliferating Spikerush (*Eleocharis baldwi*	5	1	20%	4	80%	0	0%	0	0%
Small waterwort (*Elatine minima*)	3	2	67%	1	33%	0	0%	0	0%
Southern naiad (*Najas guadalupensis*)	6	3	50%	3	50%	0	0%	0	0%
Vegetated points	76	26	34%	14	18%	13	17%	23	30%

Table 1. Species abundance during 2022 Lake Tillery survey.

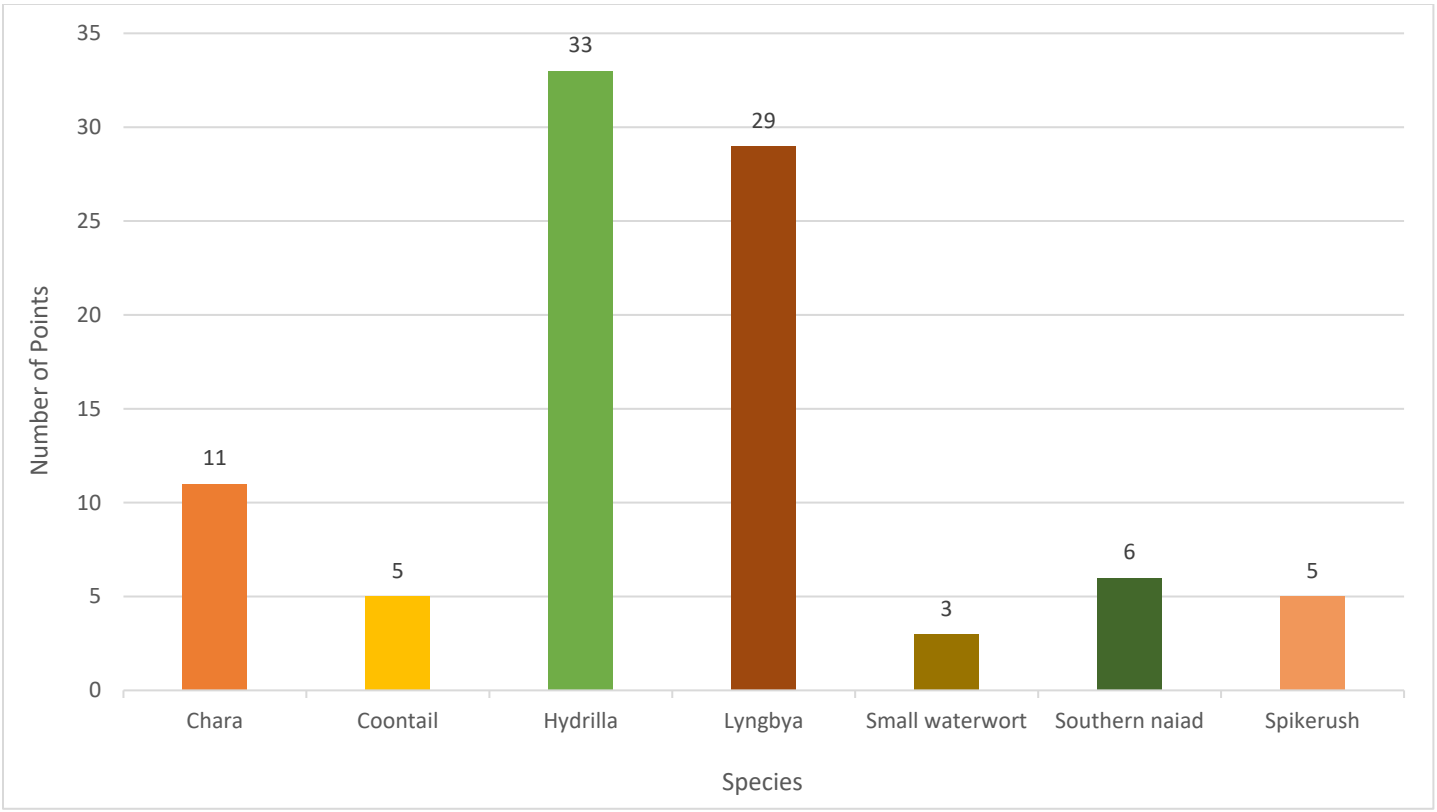

Figure 3. Relative abundance during the 2022 Lake Tillery survey.

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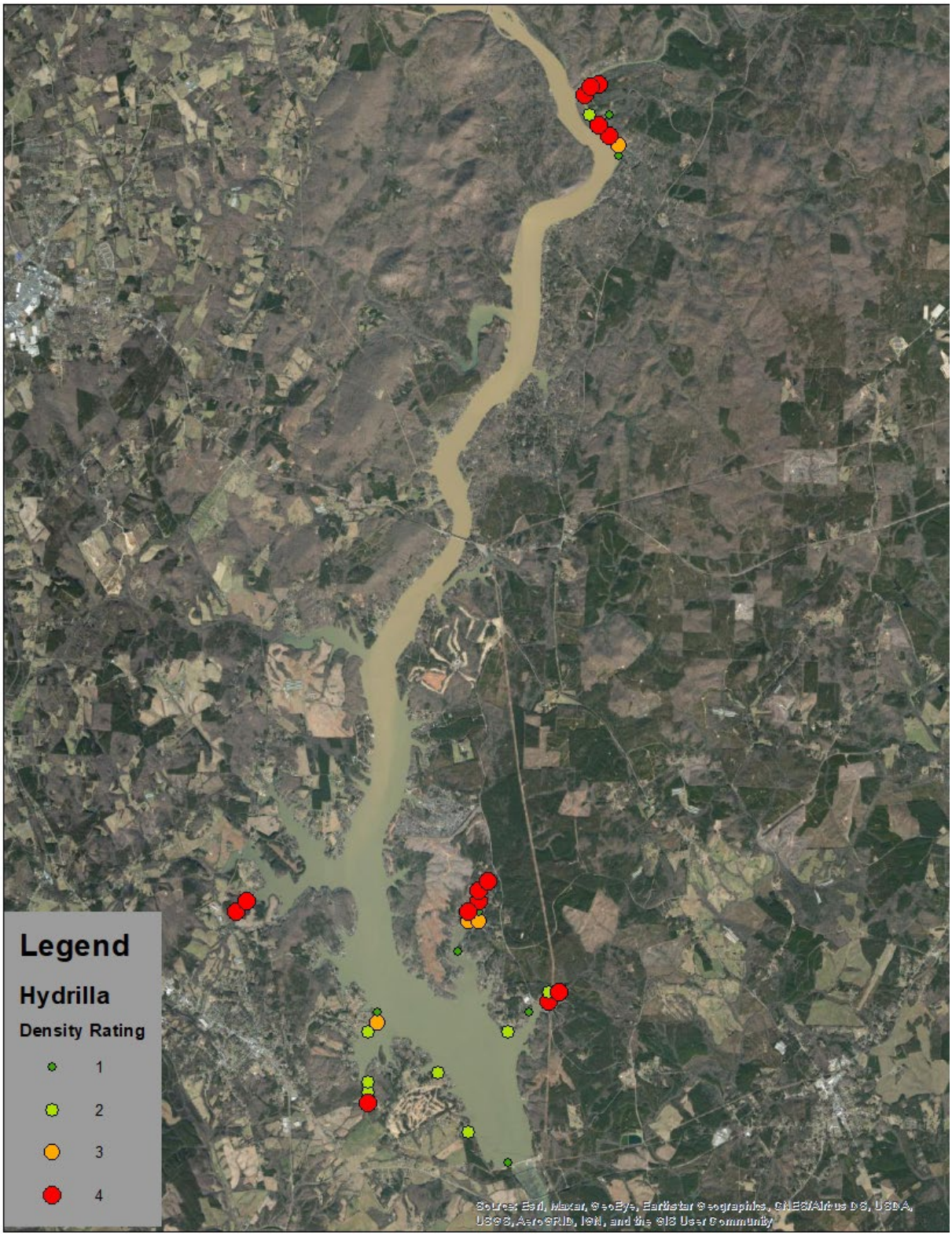

Figure 4. Map showing Hydrilla locations and density ratings.

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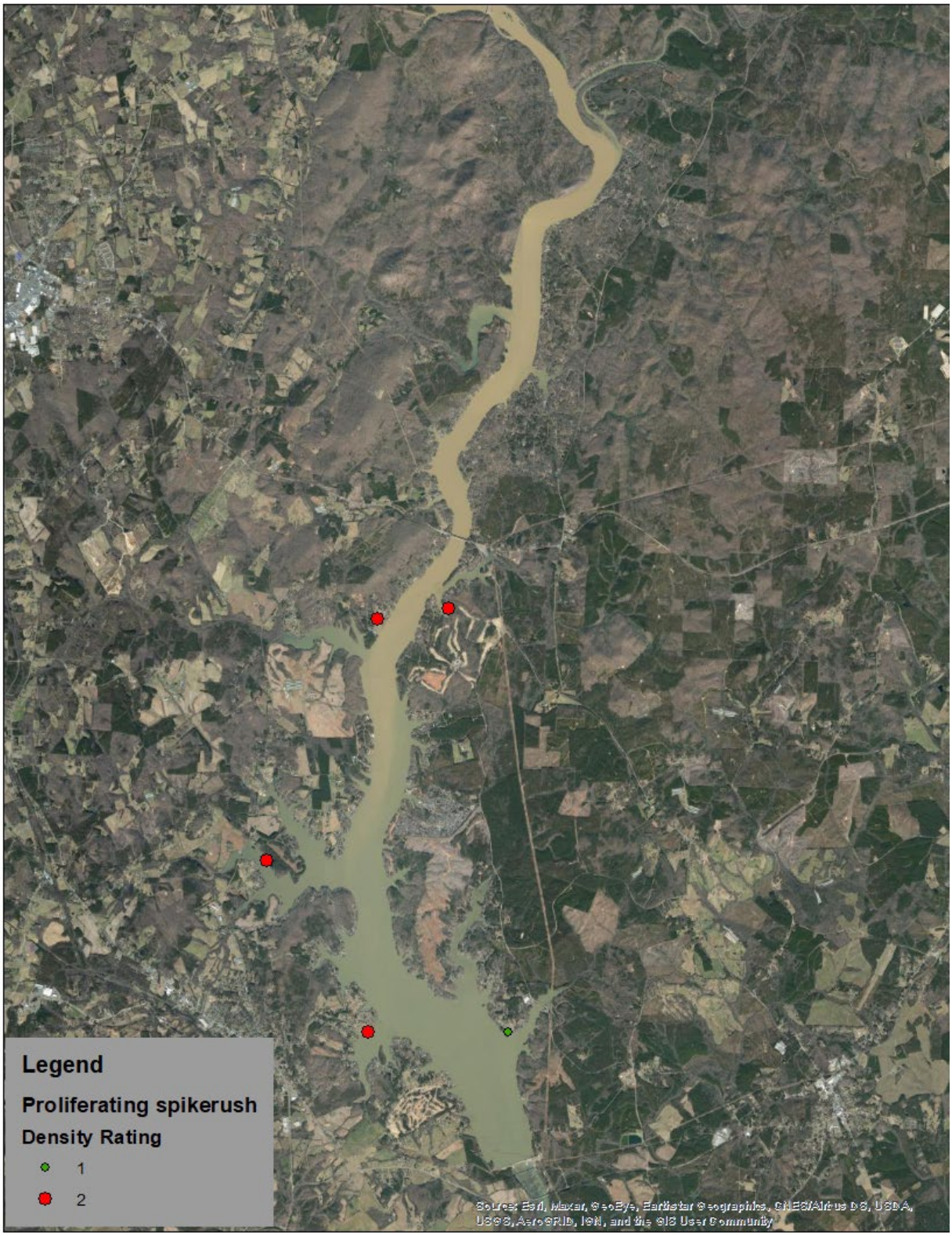

Figure 5. Map showing location of Proliferating Spikerush and density rating.

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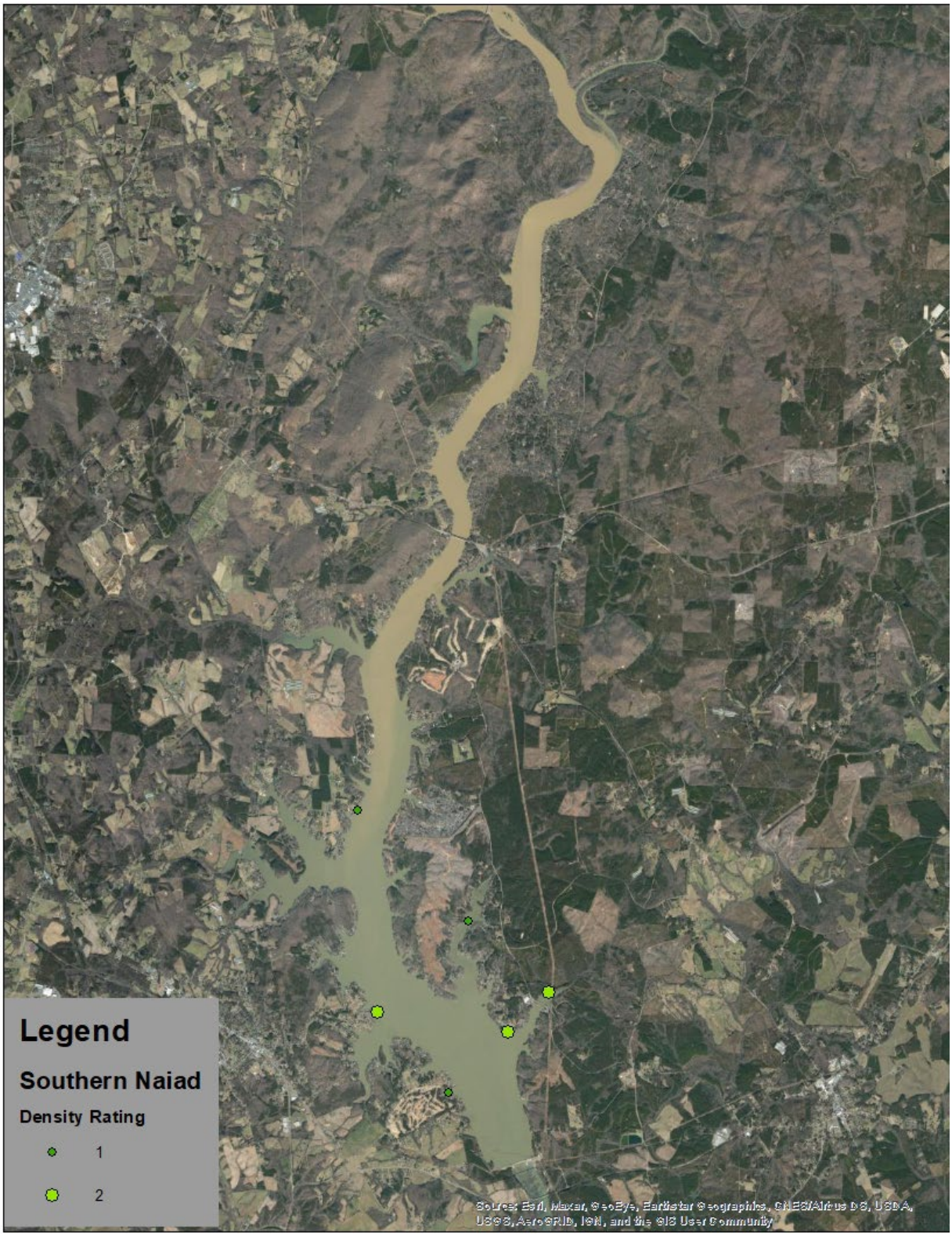

Figure 6. Map showing location of Southern Naiad and density rating.

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

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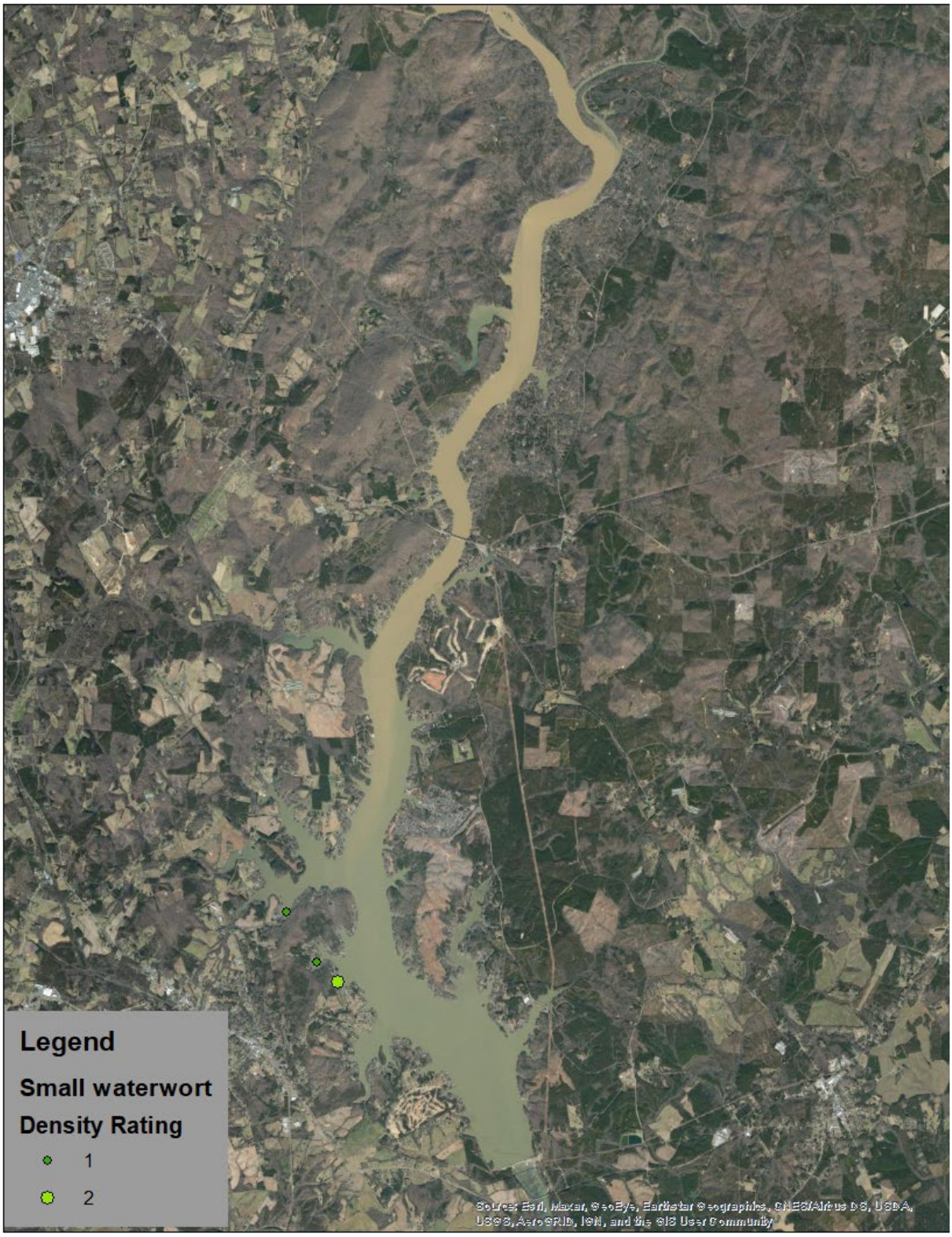

Figure 8. Map showing location of Small waterwort and density rating.

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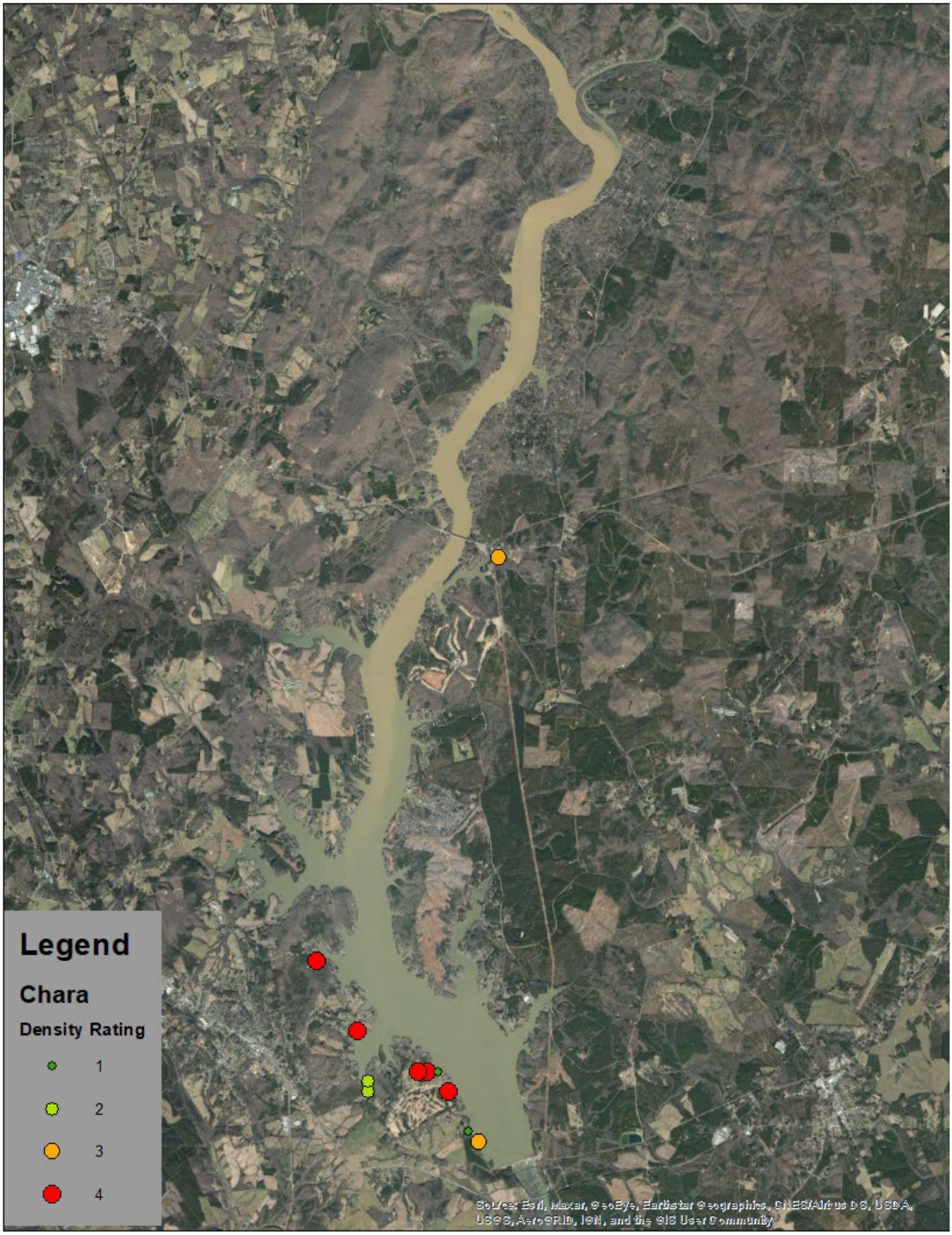

Figure 9. Map showing location of Chara and density rating.

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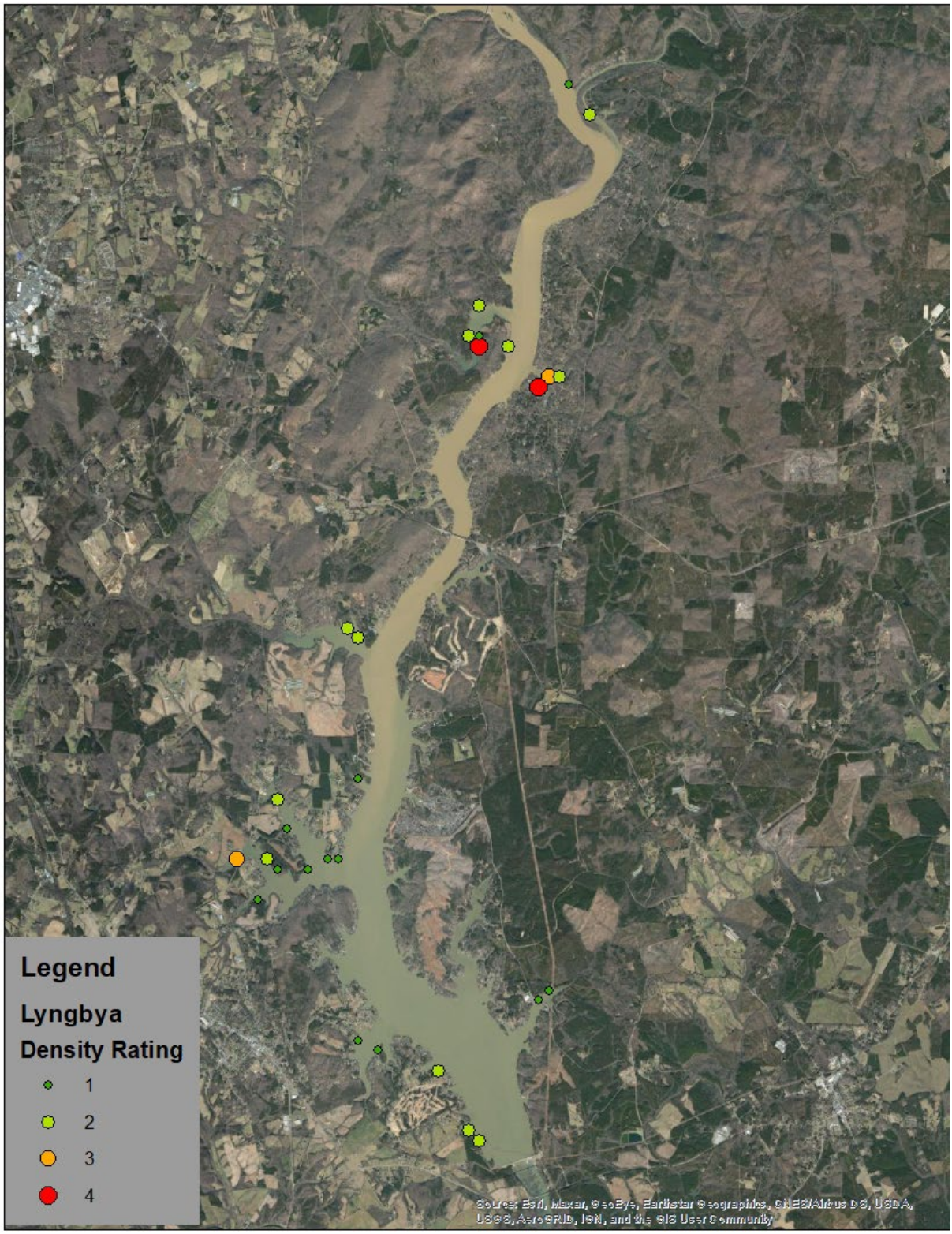

Figure 10. Map showing location of Lyngbya and density rating.

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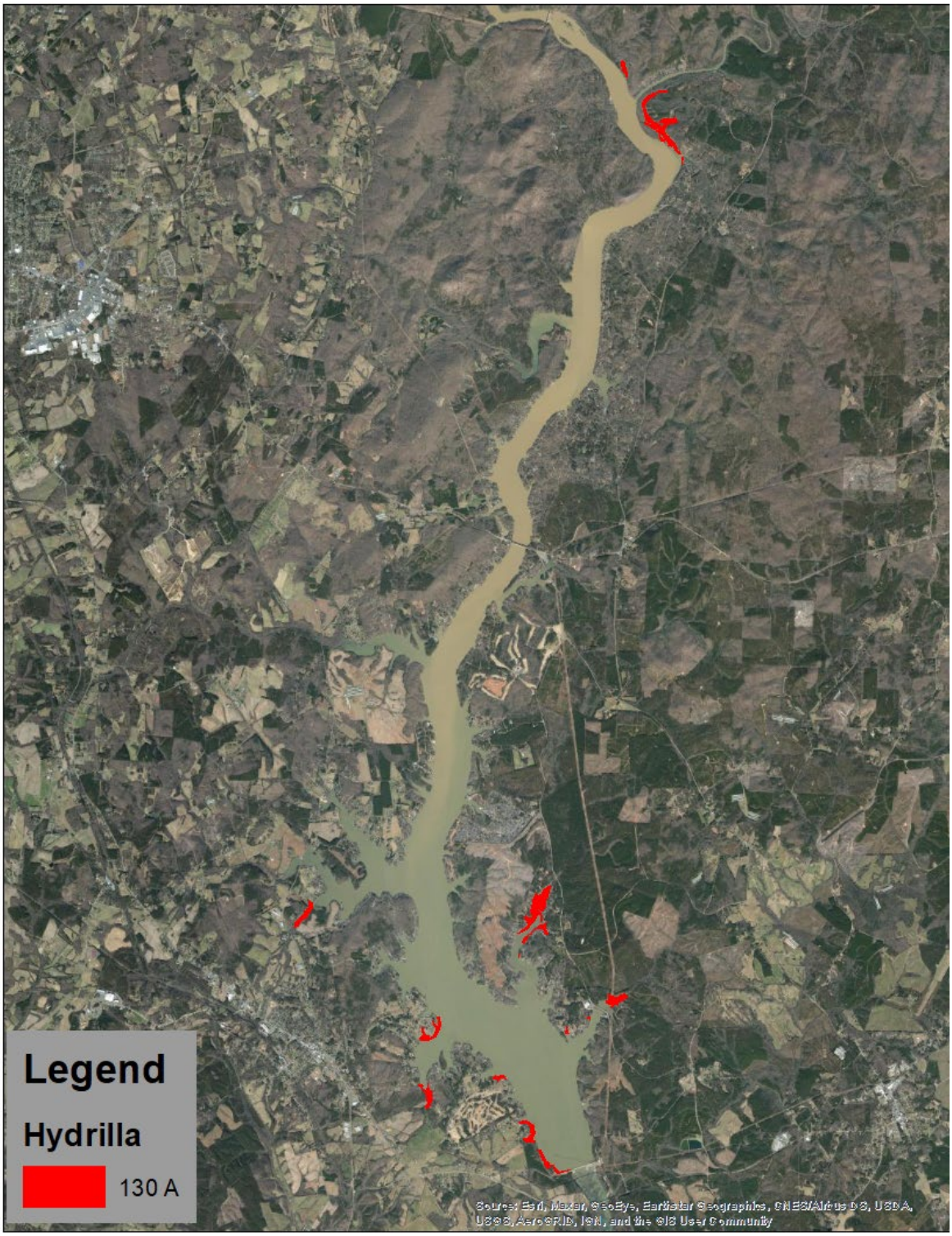

Figure 11. Map showing Hydrilla coverage (130 acres).

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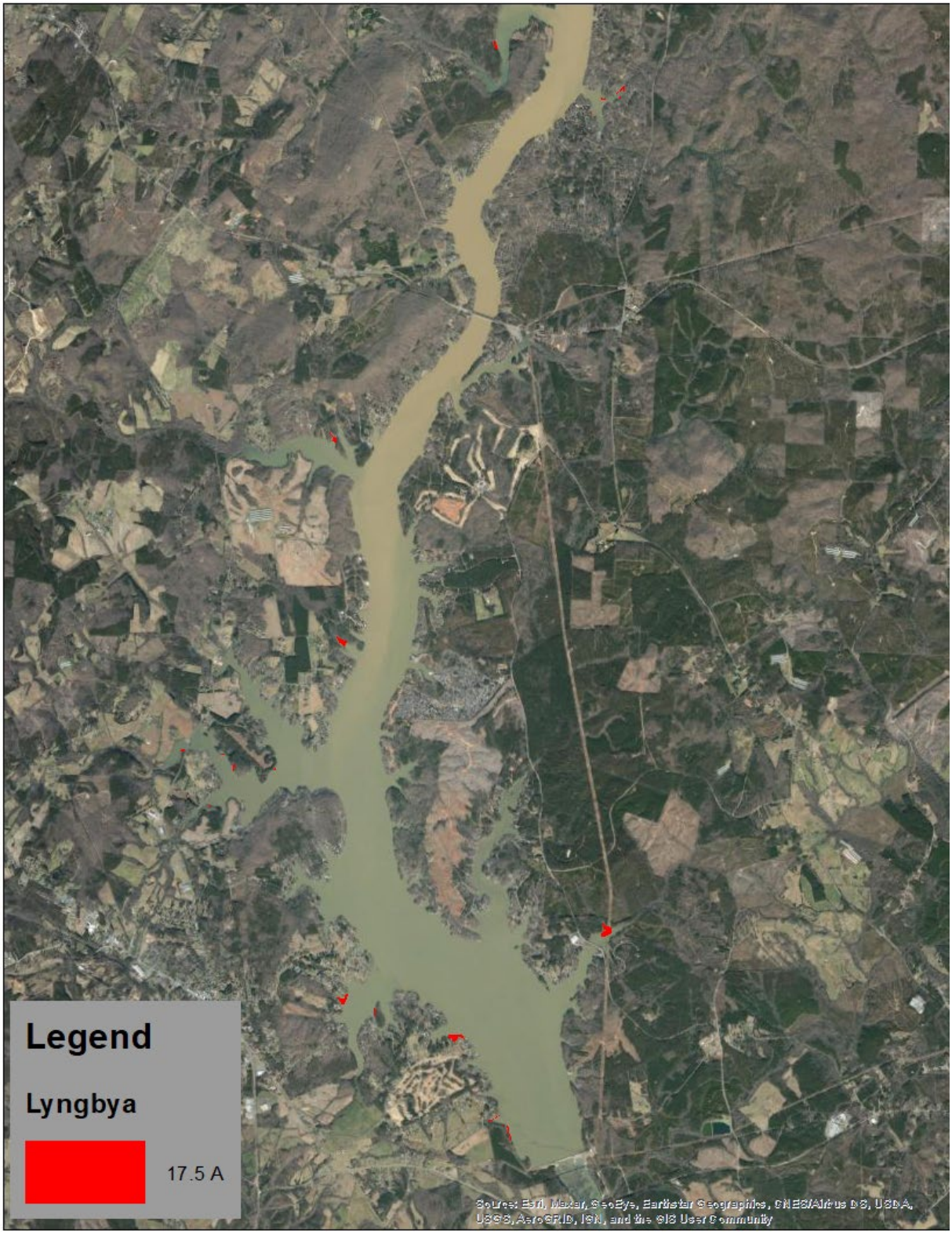

Figure 12. Map showing Lyngbya coverage (17.5 acres).