

Lake Gaston Weed Control Council

2020 NCSU Summary

March 3rd, 2021

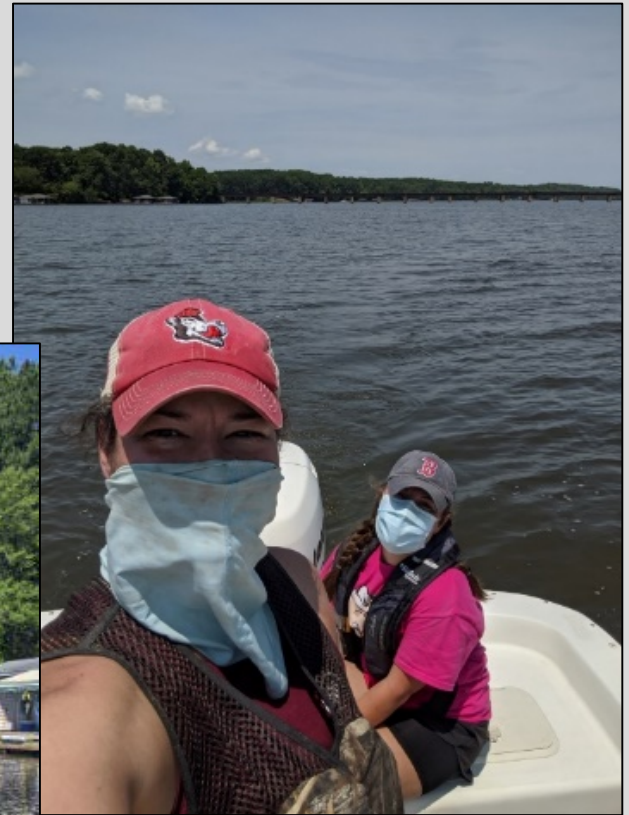


Jessica R. Baumann

Extension Associate, Lake Gaston
Aquatic Plant Management Program



Covid-19 Life

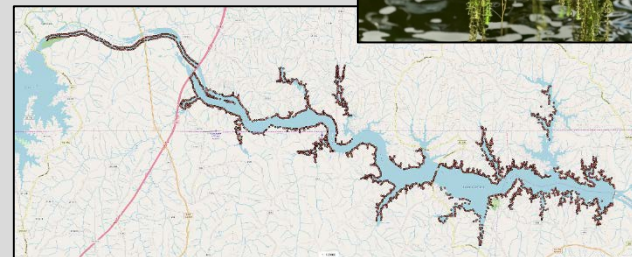


**Kara Foley
Tyler Harris
Andrew Howell**



Outline

- **2020 Overall Vegetation Survey**
- **Hydrilla**
 - **2020 Hydrilla Treatments**
 - **2020 Hydrilla Survey**
 - **2021 Proposed Treatments**
- **Lyngbya**
 - **2020 Lyngbya Treatments**
 - **2020 Lyngbya Survey**
 - **2021 Proposed Treatments**



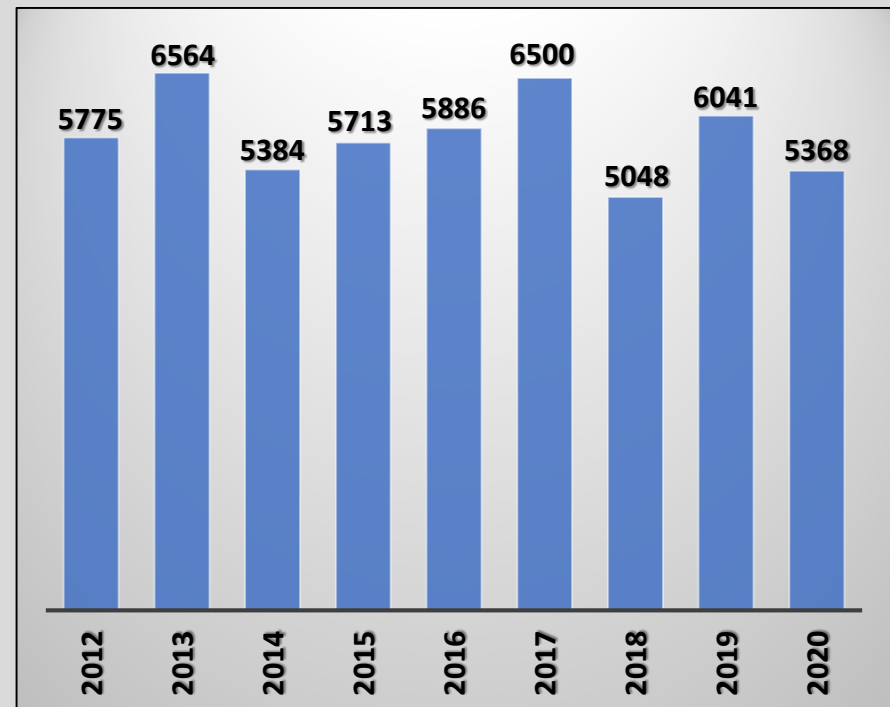
Fall Volunteer Survey

- **Covid-19 Challenges**
 - Video Training for Volunteers
- **65+ Volunteers**



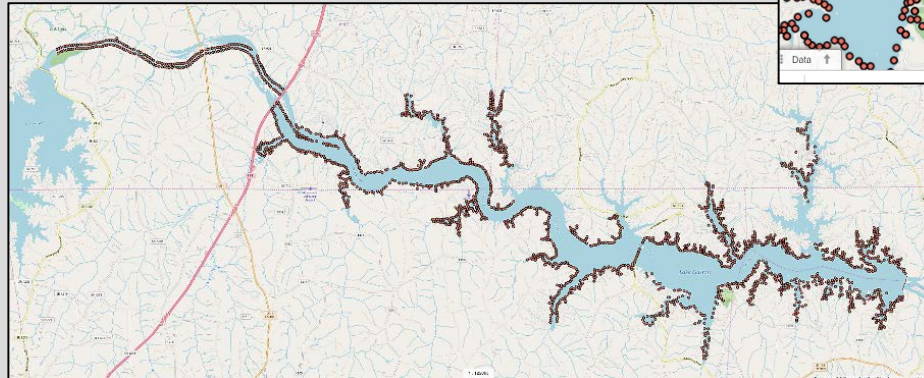
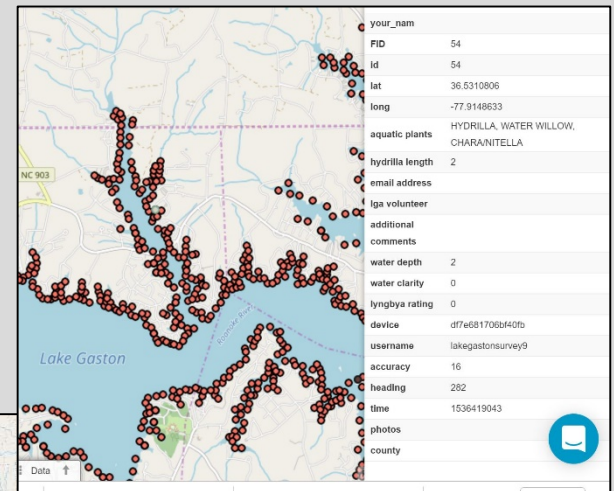
Fall Volunteer Survey

- Covid-19 Challenges
- 60+ Volunteers
- Conducted from Sept. 1st to Oct 31st
- Put in ~400 Volunteer hrs
- 5,368 Points Collected
 - Goal Every 200 ft



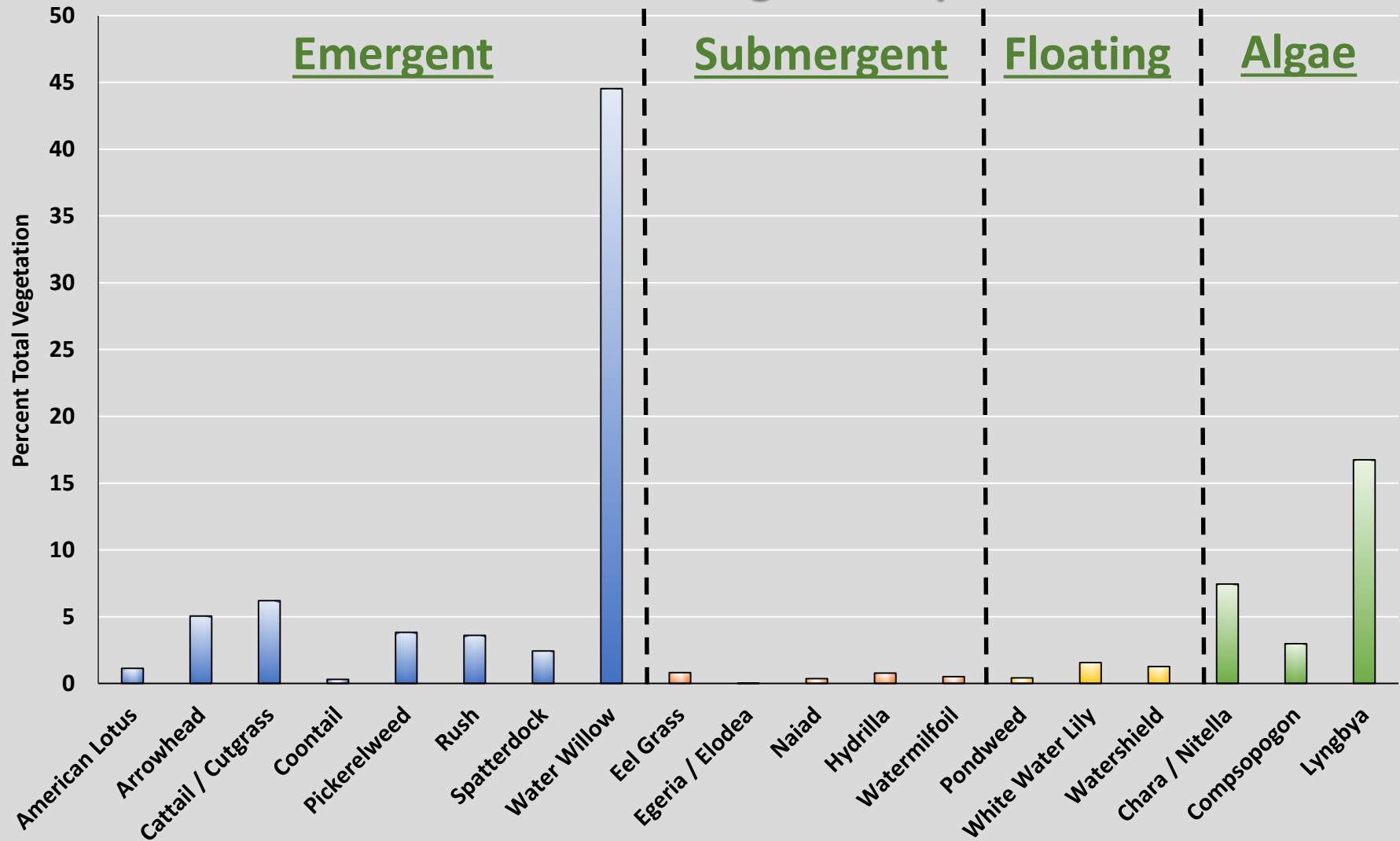
Fall Volunteer Survey

- Covid-19 Challenges
- 60+ Volunteers
- Conducted from Sept. 1st to Oct 31st
- Put in ~400 Volunteer hrs
- 5,368 Points Collected
- All Data Uploaded to Cloud Server

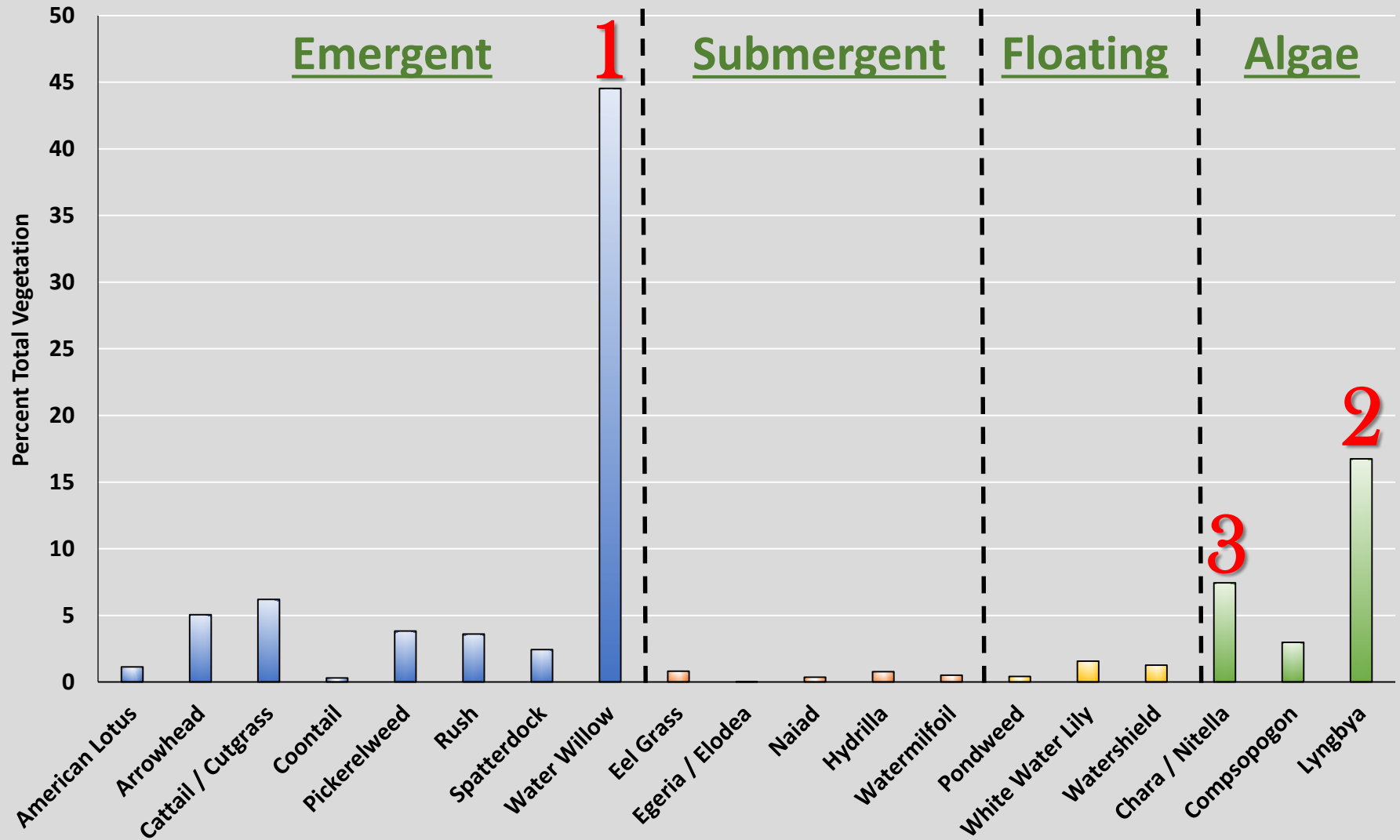


2020 Plant Community

71 % of sites had vegetation present

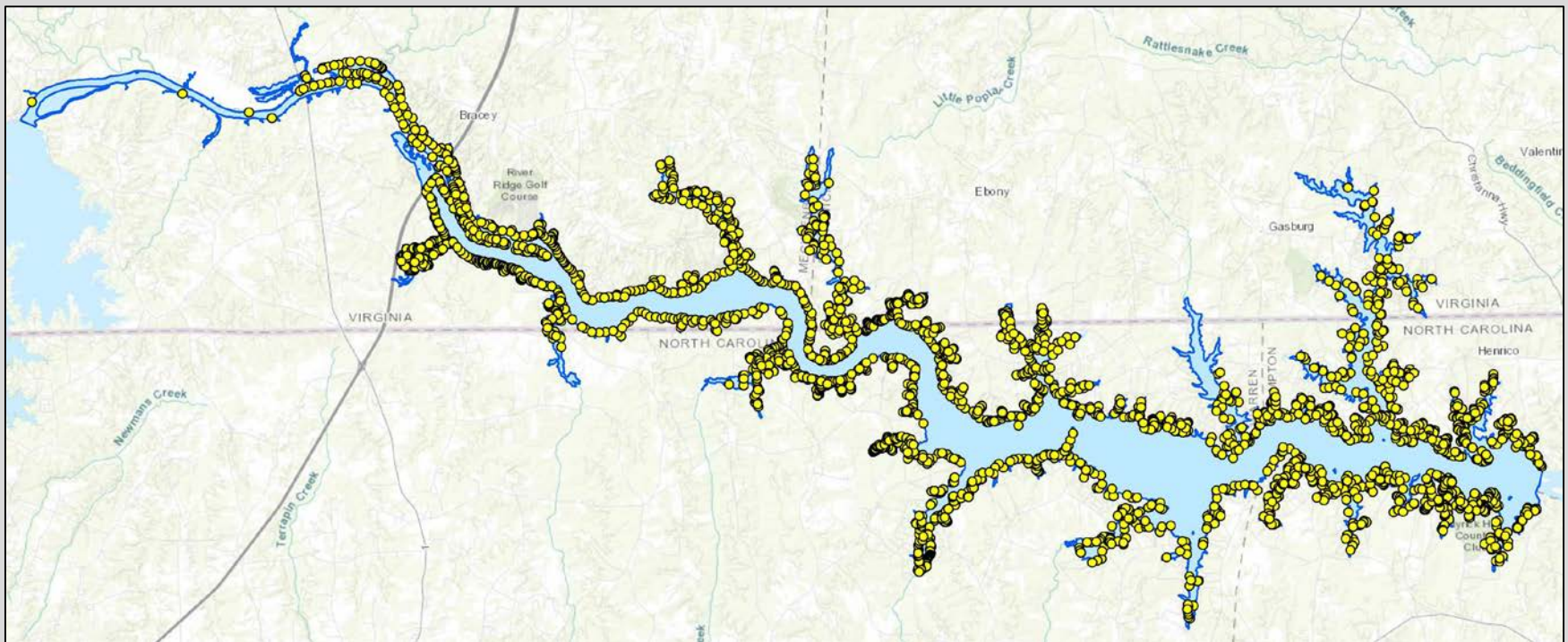


2020 Plant Community



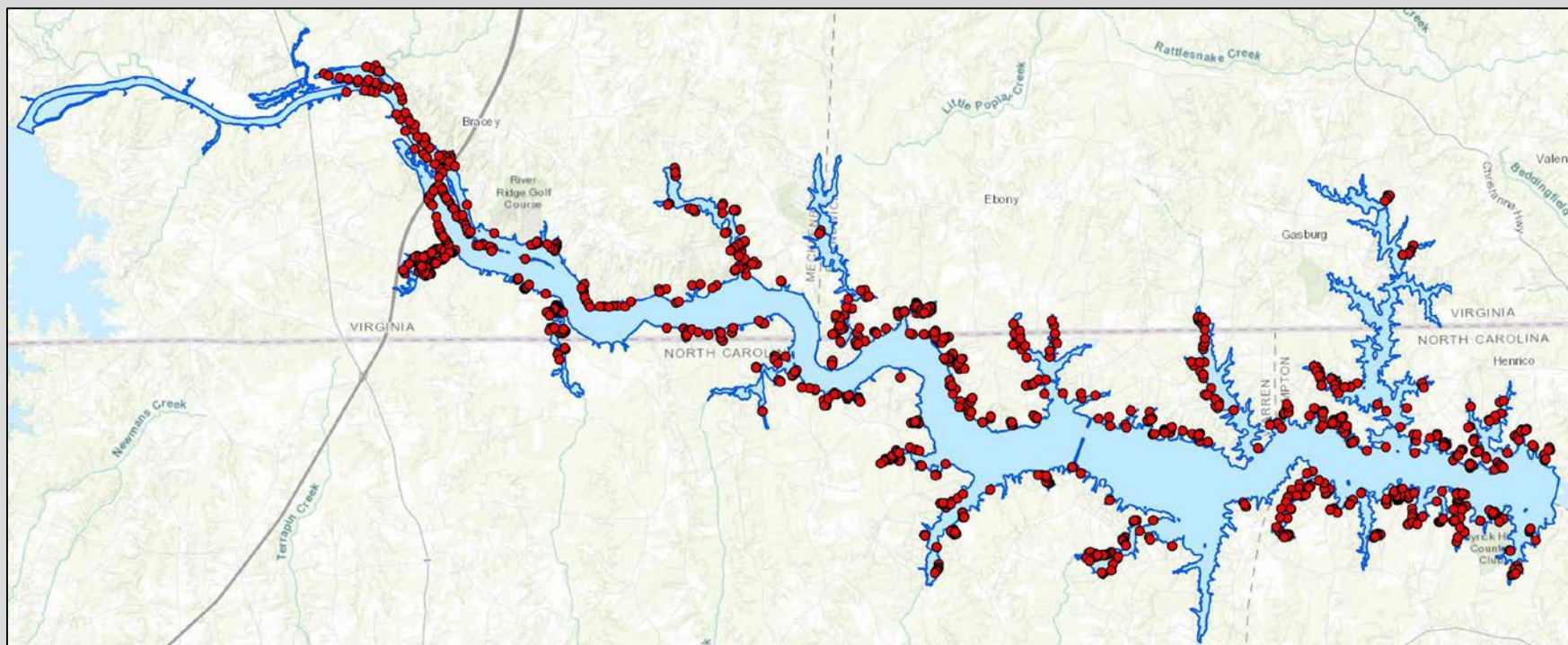
2020 Plant Community

Water Willow



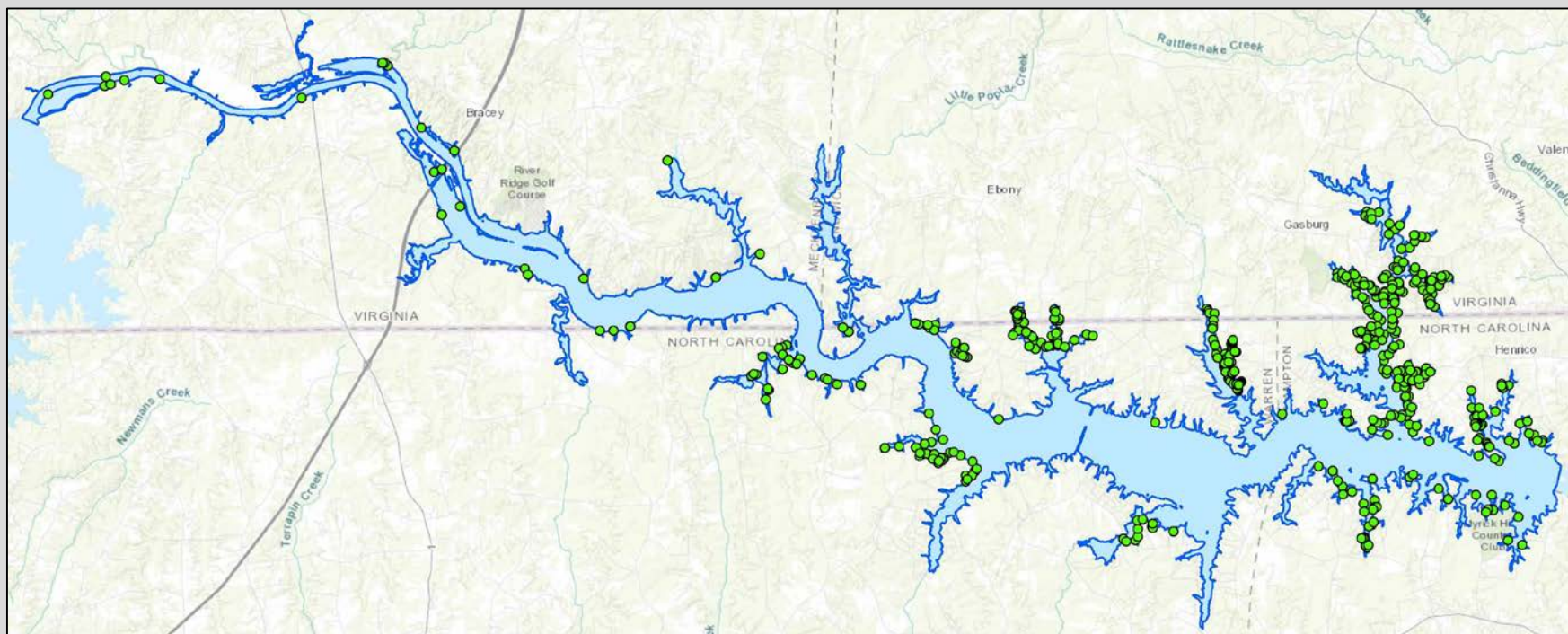
2020 Plant Community

Lyngbya

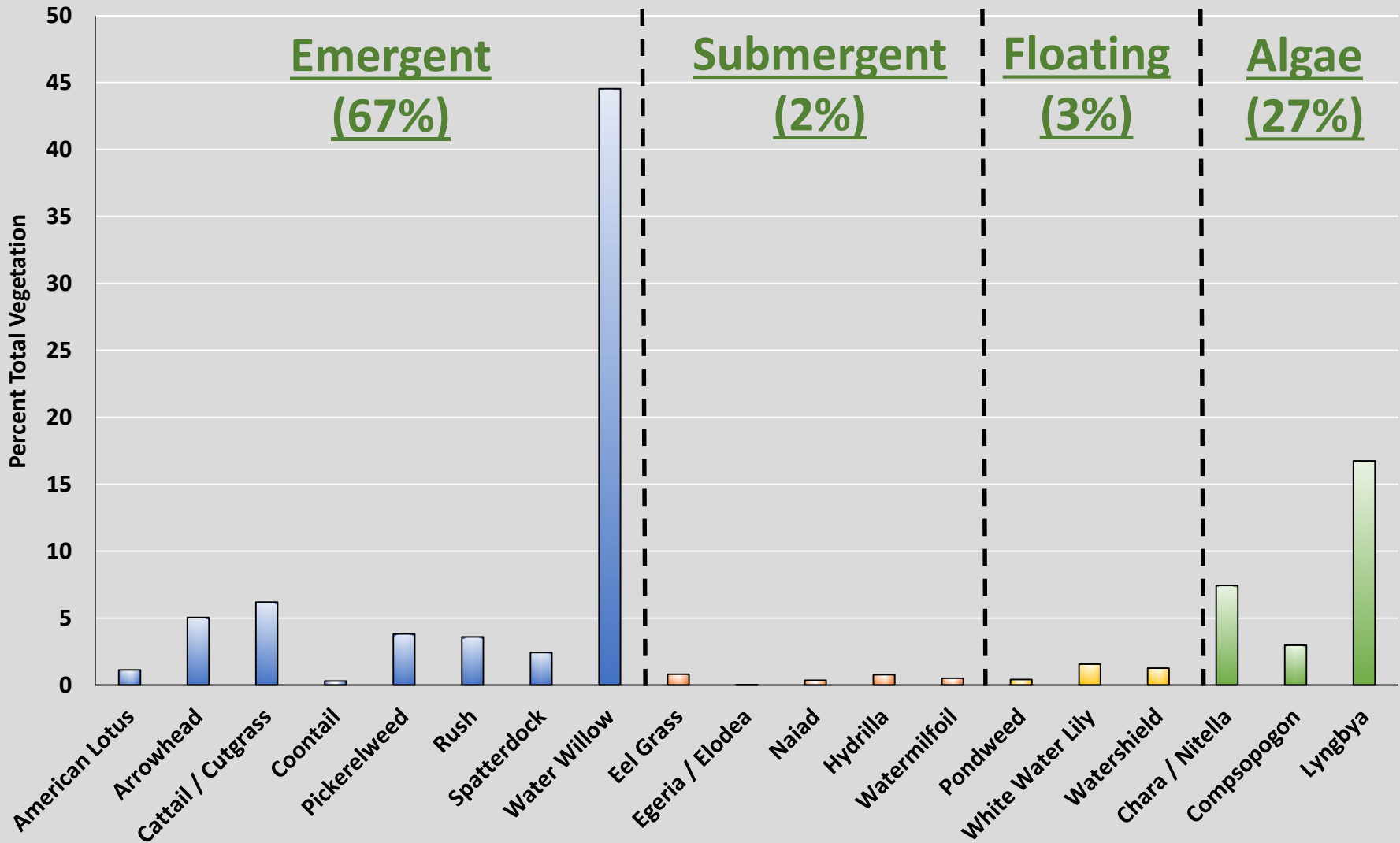


2020 Plant Community

Chara

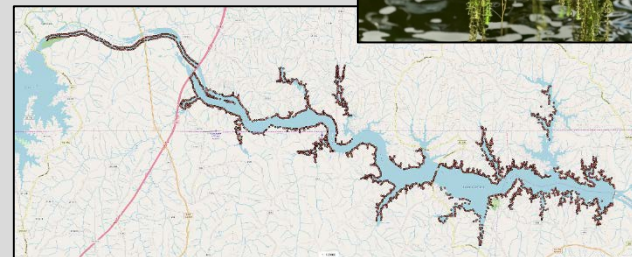


2020 Plant Community



Outline

- 2020 Overall Vegetation Survey
- **Hydrilla**
 - 2020 Hydrilla Treatments
 - 2020 Hydrilla Survey
 - 2021 Proposed Treatments
- Lyngbya
 - 2020 Lyngbya Treatments
 - 2020 Lyngbya Survey
 - 2021 Proposed Treatments



Hydrilla Treatments

- **2020 Herbicide Treatments**
 - **Sonar (June – August)**
 - **Contact (September)**



Hydrilla Treatments

- 2020 Herbicide Treatments
 - **Sonar (June – August)**
 - Lizard Creek
 - 78 acres



Hydrilla Treatments

- 2020 Herbicide Treatments
 - **Sonar (June – August)**
 - Lizard Creek
 - 78 acres
 - Beechwood Flats – Cages
 - 6 acres



Hydrilla Treatments

- **2020 Herbicide Treatments**
 - **Sonar (June – August)**
 - Lizard Creek
 - 78 acres
 - Beechwood Flats – Cages
 - 6 acres
 - **Contact (September)**
 - Unforeseen Acreage
 - Boat Ramps
 - Water Hydrants Sites
 - Not Needed



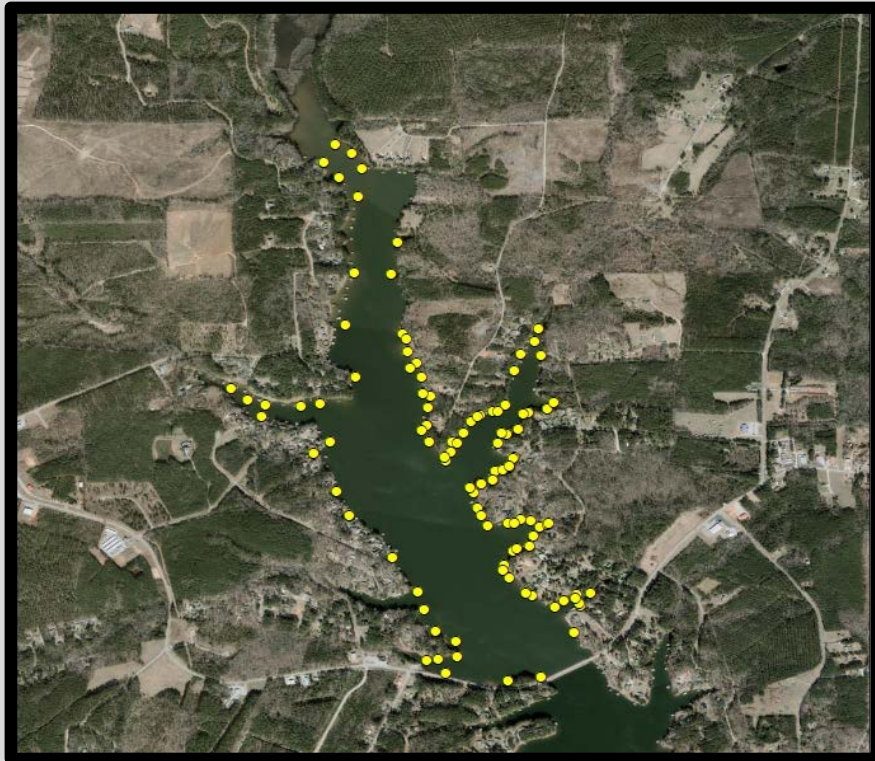
Hydrilla Treatments

- **Biological Control**
 - **0 Grass Carp in 2020**

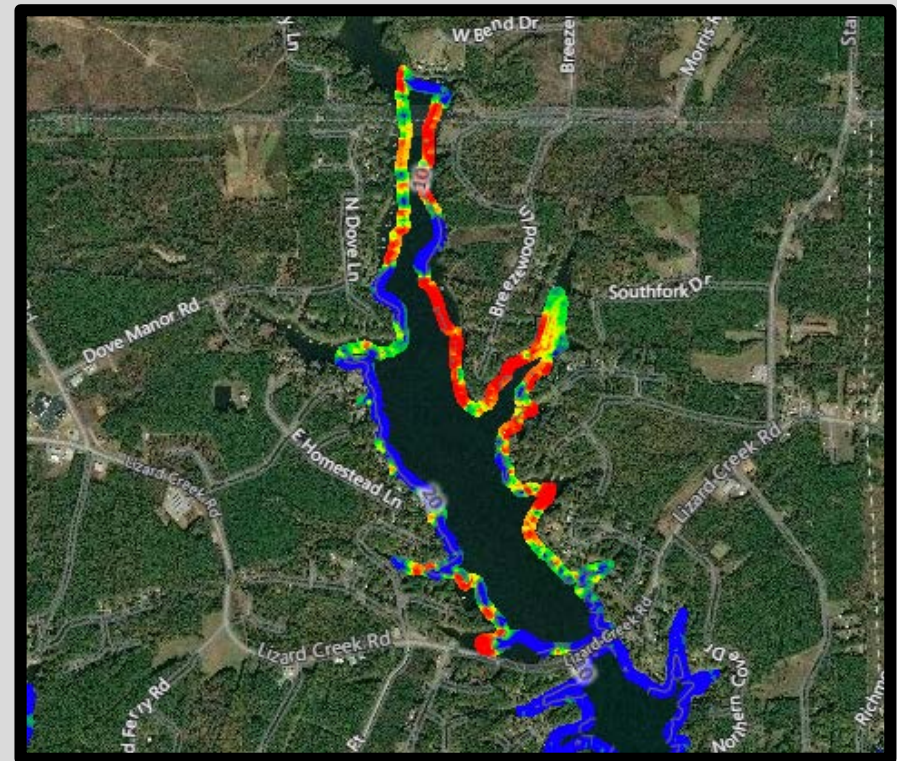


Hydrilla Management

2020 Acreage Estimates

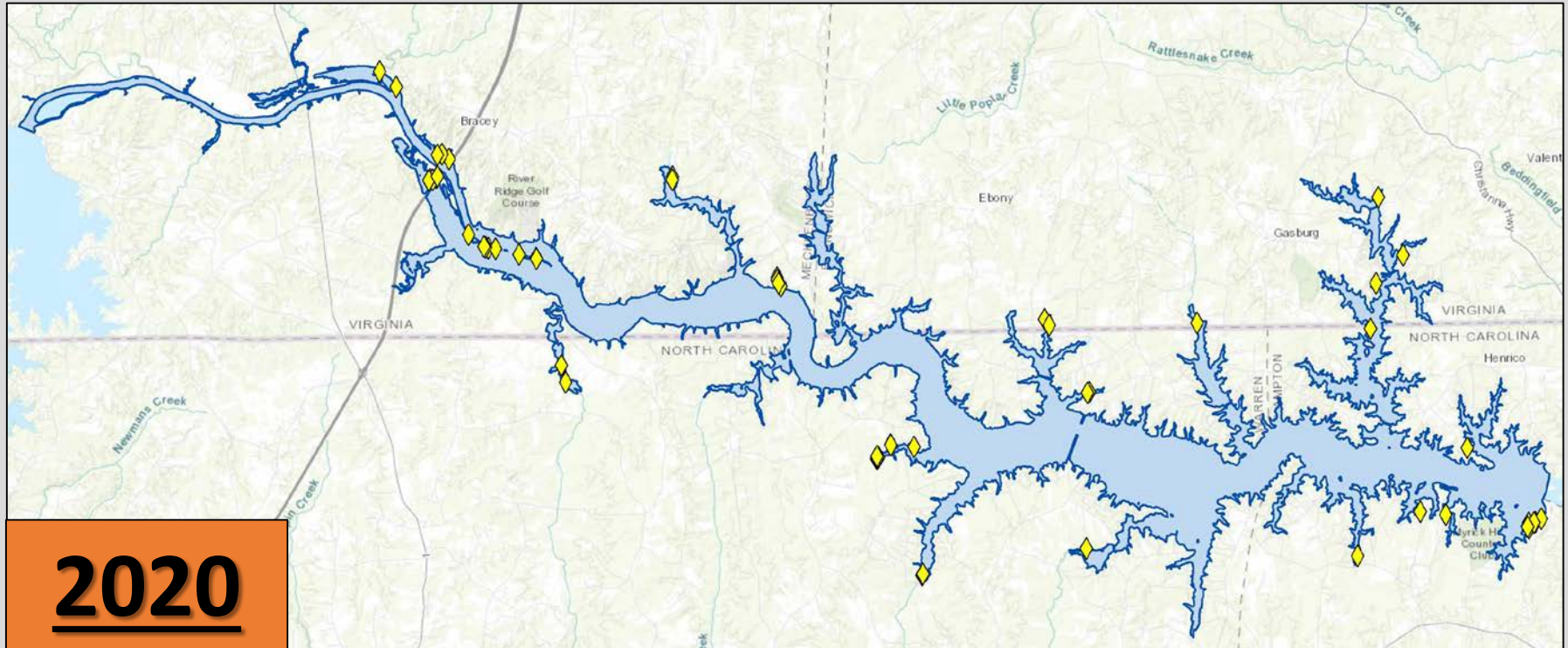


Vegetation Survey
Presence Data



Sonar Survey
Volume Data

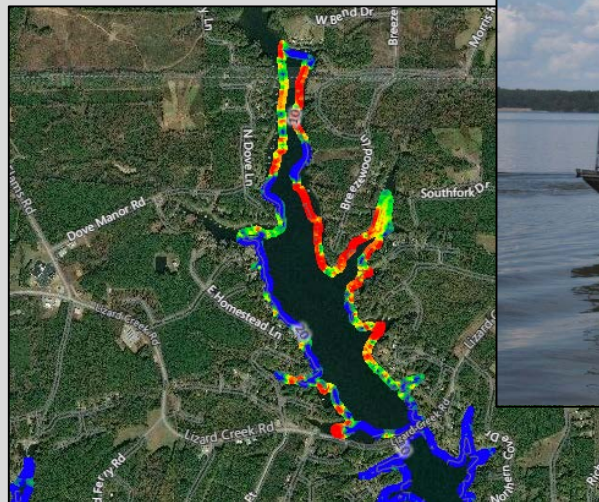
Hydrilla Vegetation Survey



1 % Total Vegetation Sites

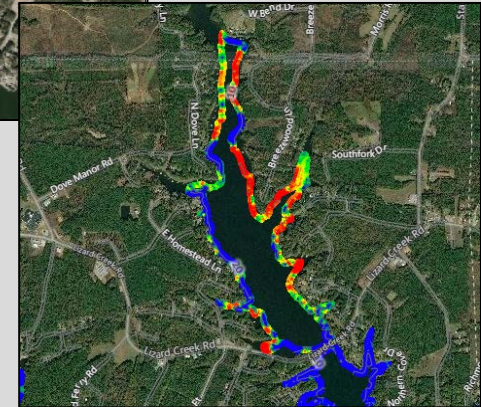
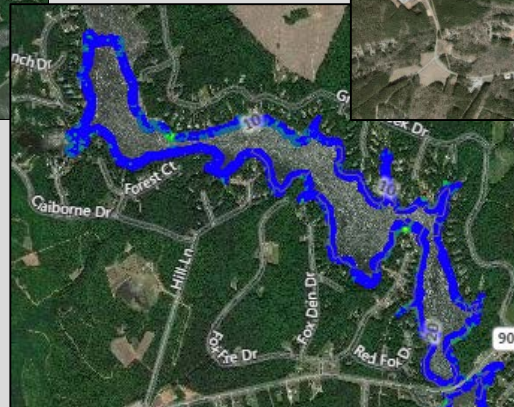
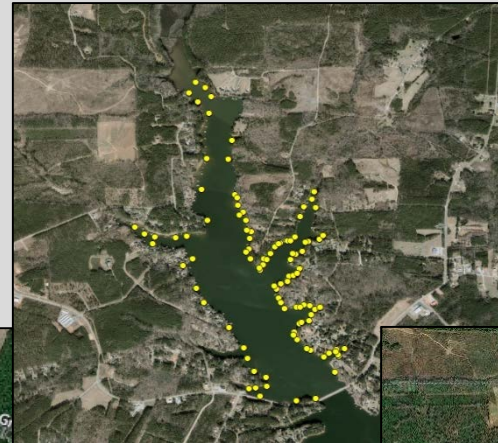
Fall Sonar Survey

- Entire Shoreline Sampled
- Dual Track Sonar
- September and October
- Data uploaded to BioBase
 - Calculate BioVolume

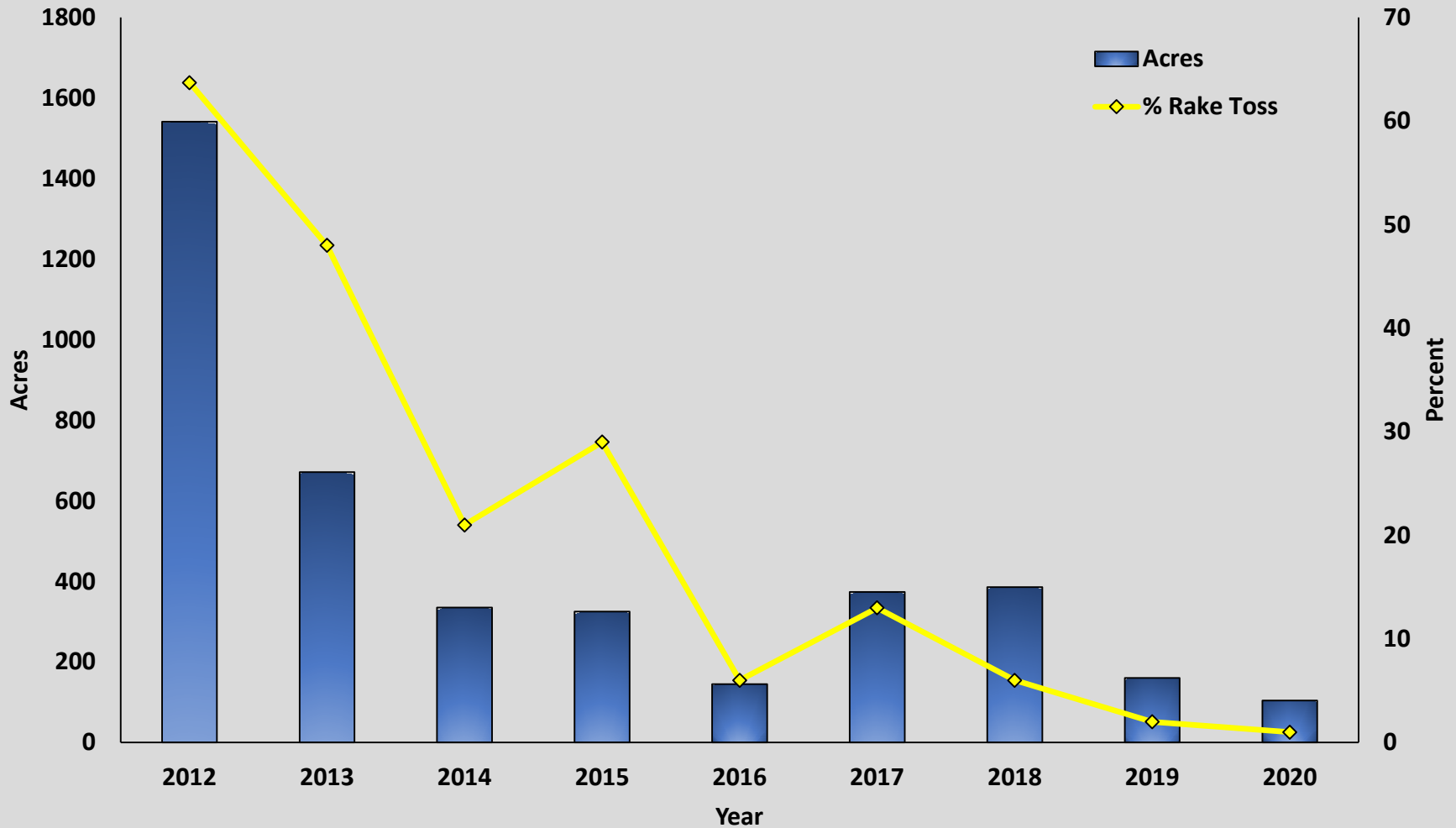


Hydrilla Management

- Acreage Estimates
 - 2020 Total Estimated Acreage: **104 acres**



Hydrilla Management



Hydrilla Management

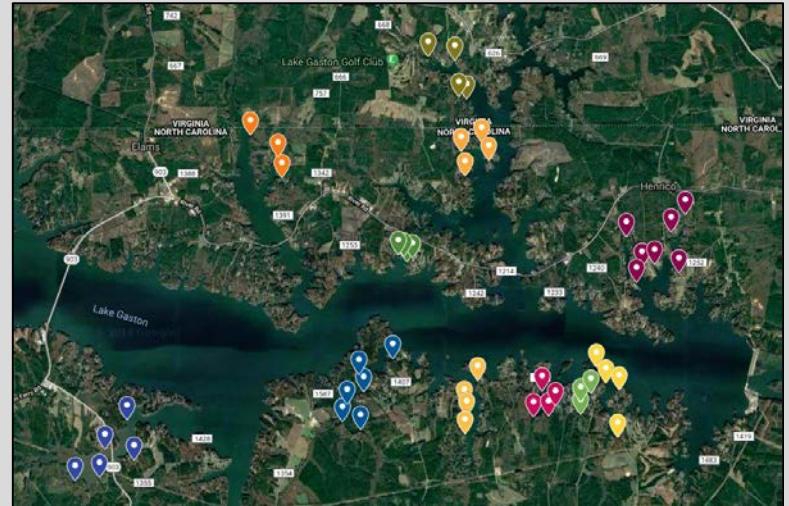
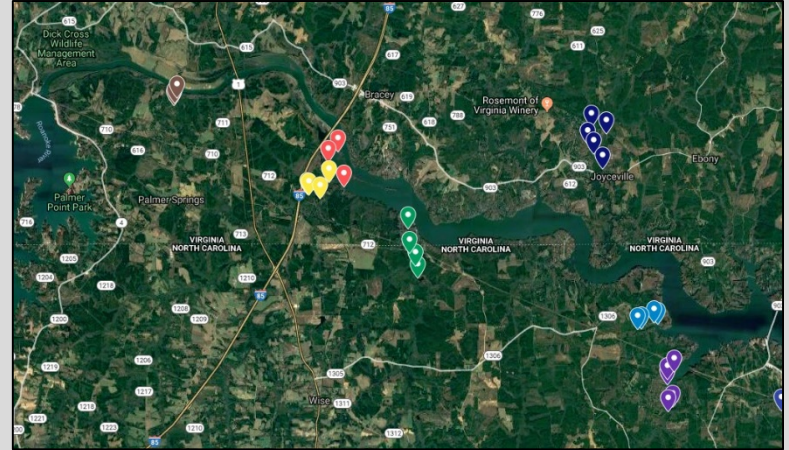
Tuber Surveys

- Sonar/Vegetation Surveys
 - Current Hydrilla Situation
- Tuber Surveys
 - Future Hydrilla Situation



Tuber Survey

- Sampled December 2020
- 18 Total Creeks
 - Selected Based on Hydrilla Presence
 - 3 – 6 Sample Sites per Creek



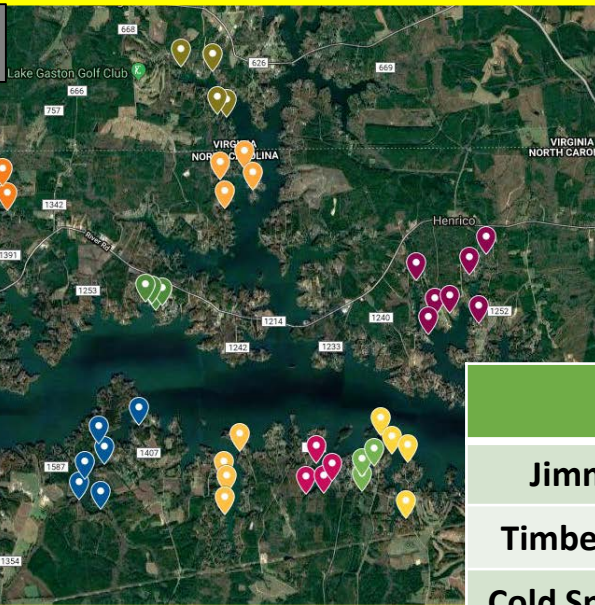
Tuber Survey

- Sampled December 2020
- 18 Total Creeks
 - Selected Based on Hydrilla Presence
 - 3 – 6 Sample Sites per Creek
- **Samples are Collected Using Core Sampler**
- **Samples Rinsed over Screen to Exposed Tubers**
- **Tuber Densities Calculated per Site**



Tuber Survey

East Side

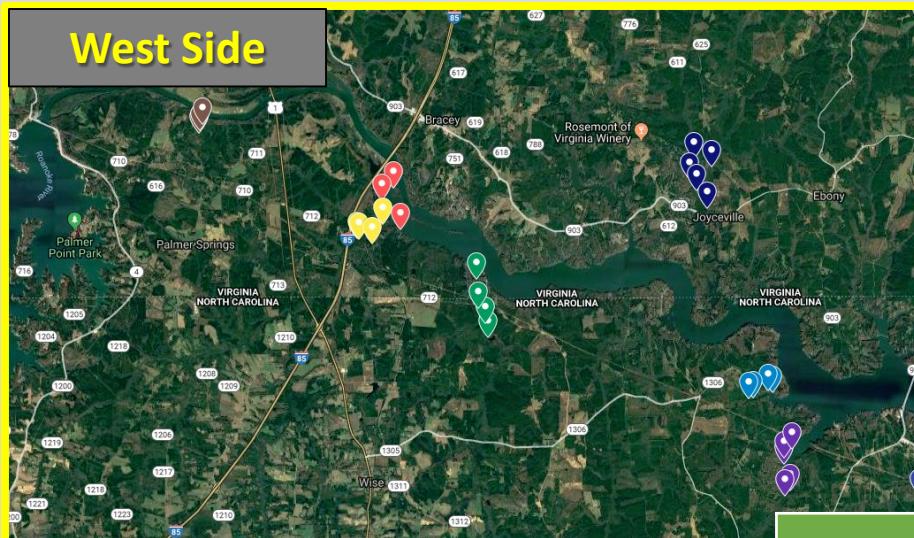


Tuber Density (m2)

	2012	2017	2018	2019	2020
Jimmies Creek	36.41	0	0	0	0
Timberline Shores	3.08	0	0.82	0	0
Cold Springs Branch	34.95	0	1.23	0.82	0
Lakeview	124.37	0	0	0	0
Lizards Creek	N/A	0	49.34	18.91	0
Big Stone House	31.25	0	0	0	0
Pretty Creek	38.72	0	0	0	0
Poe Creek	125.40	0	0	0.82	0
Woodland Hurst	135.67	0	4.93	0	0
Sledge Creek	8.22	0	0	0	0.82
Hamlin	446.08	16.03	6.78	14.80	0



Tuber Survey



Tuber Density (m2)

	2012	2017	2018	2019	2020
Hubquarter	292.73	14.14	6.78	1.64	1.64
Lyons Creek	293.96	21.58	29.33	7.40	0
Poplar Creek	89.63	19.12	0	0.82	8.22
Hawtree	38.03	123.13	59.41	37.0	6.58
Smith Creek	8.22	0	0	0	0
Flats	119.23	7.40	2.47	0	0
Cotton Creek	217.90	76.74	67.15	115.11	42.48

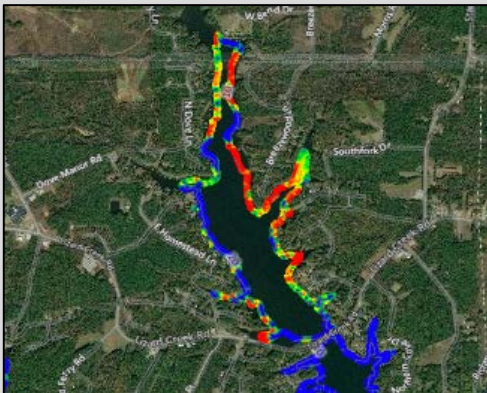


2021 Proposed Treatment



Biological Control

- **Grass Carp Stocking Model - NCWRC**
 - 2020 Standing Hydrilla Acreage: 104 acres
 - Number of Grass Carp Stocked Previous Year
 - Natural Mortality
 - **0 Grass Carp**



2021 Hydrilla Treatments

- **Treatments Recommendations**
 - **Sonar / Komeen**
 - Targeted Acreage (0 acres)
 - Unexpected Infestations (104 acres)
 - **Cages**
 - 0 acres



2021 Hydrilla Treatments

- **Treatments Recommendations**
 - **Sonar / Komeen**
 - Targeted Acreage (0 acres)
 - Unexpected Infestations (104 acres)
 - **Cages**
 - 0 acres

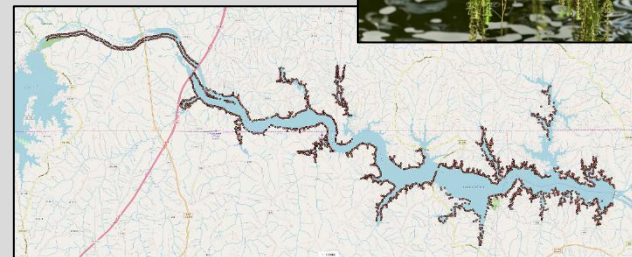


TAG RECOMMENDATION

Maximum Treatable Acreage: 104 acres

Outline

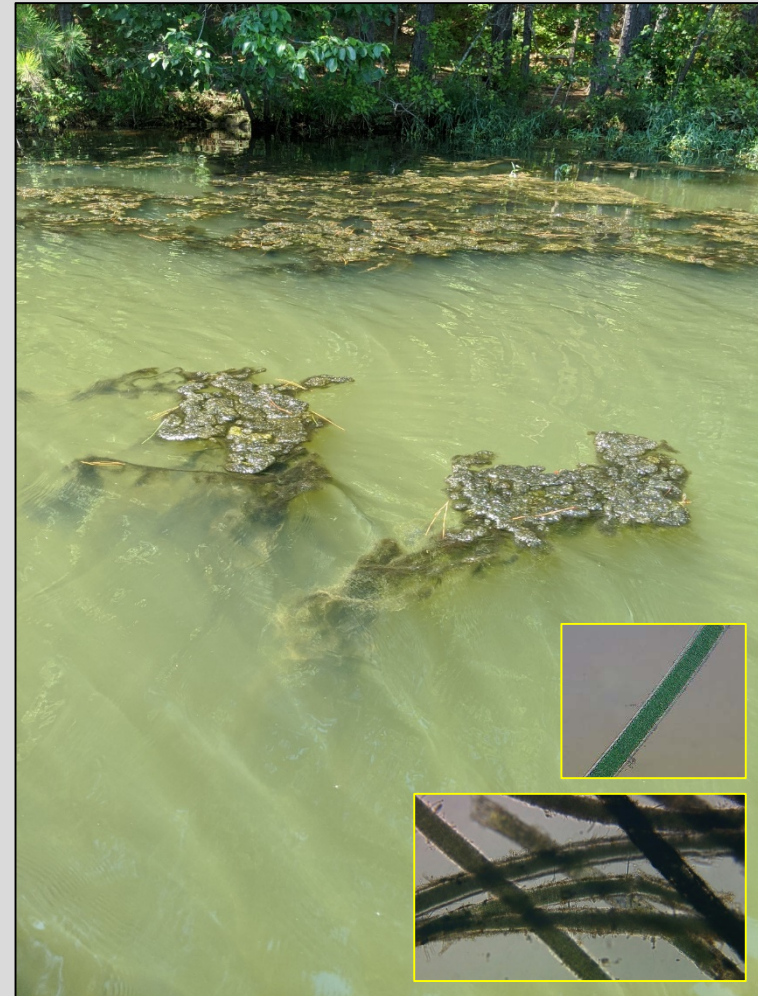
- 2020 Overall Vegetation Survey
- Hydrilla
 - 2020 Hydrilla Treatments
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- **Lyngbya**
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 - 2020 Lyngbya Treatments
 - 2021 Proposed Treatments



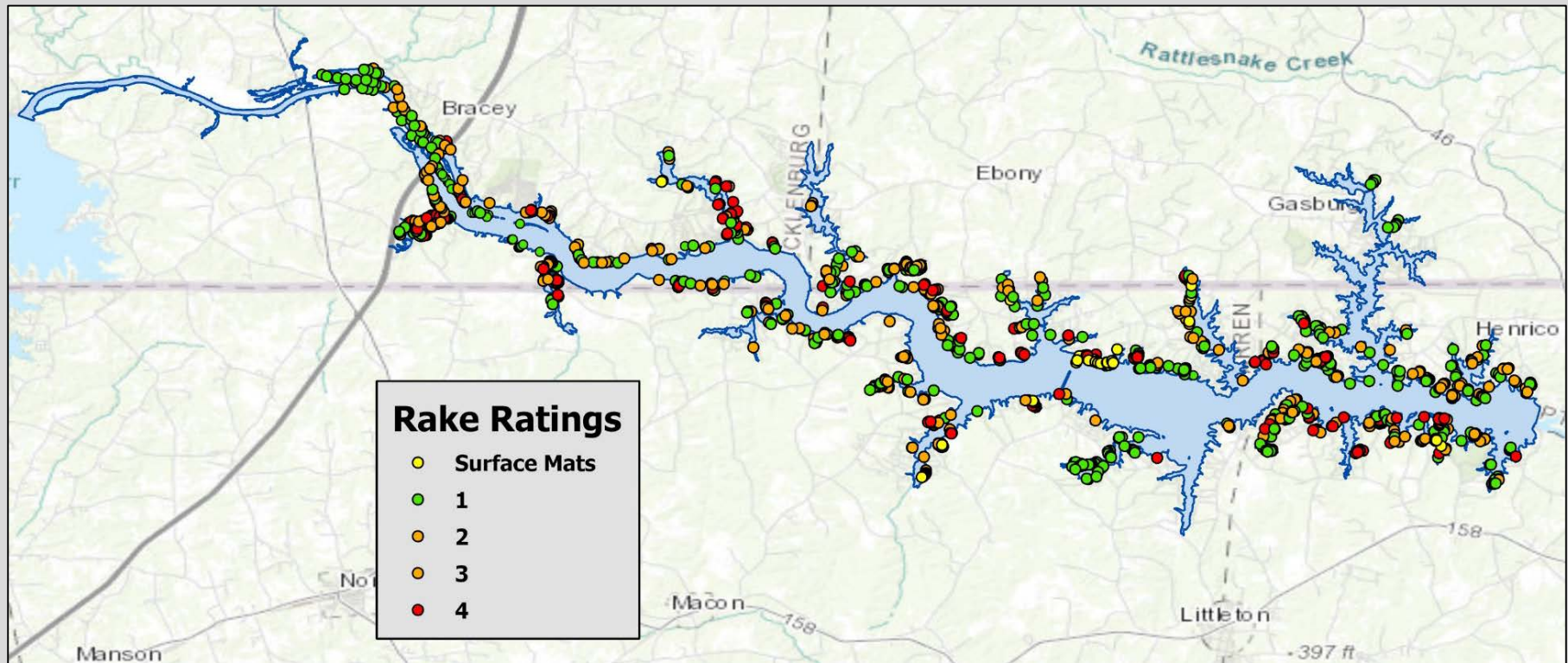
Lyngbya

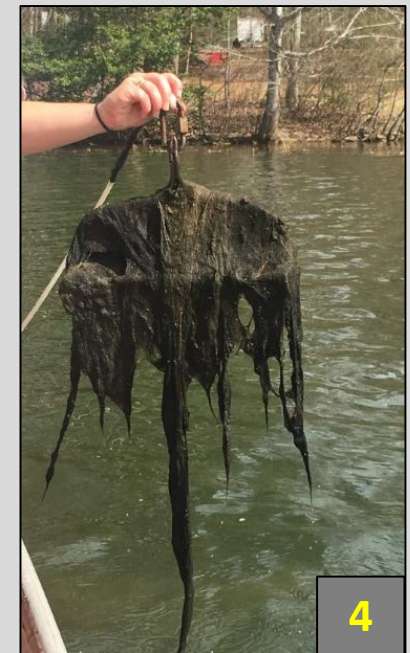
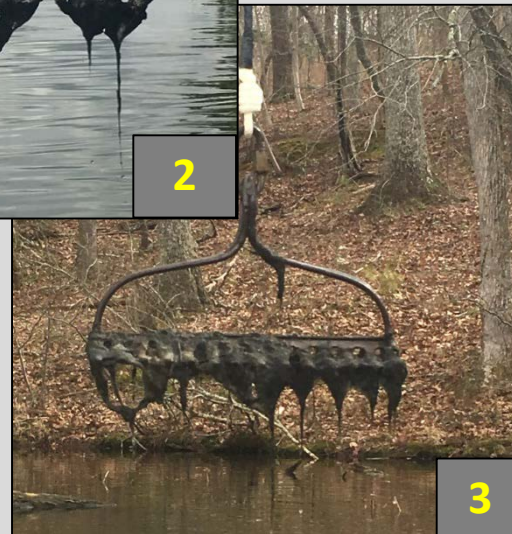
Background

- Filamentous, Cyanobacteria (Blue/Green Alga)
- Native
 - *But, Behaving like an Invasive*
- Colder Winter Months – Benthic
- Warmer Summer Months – Surface
- Problematic throughout the Southeast

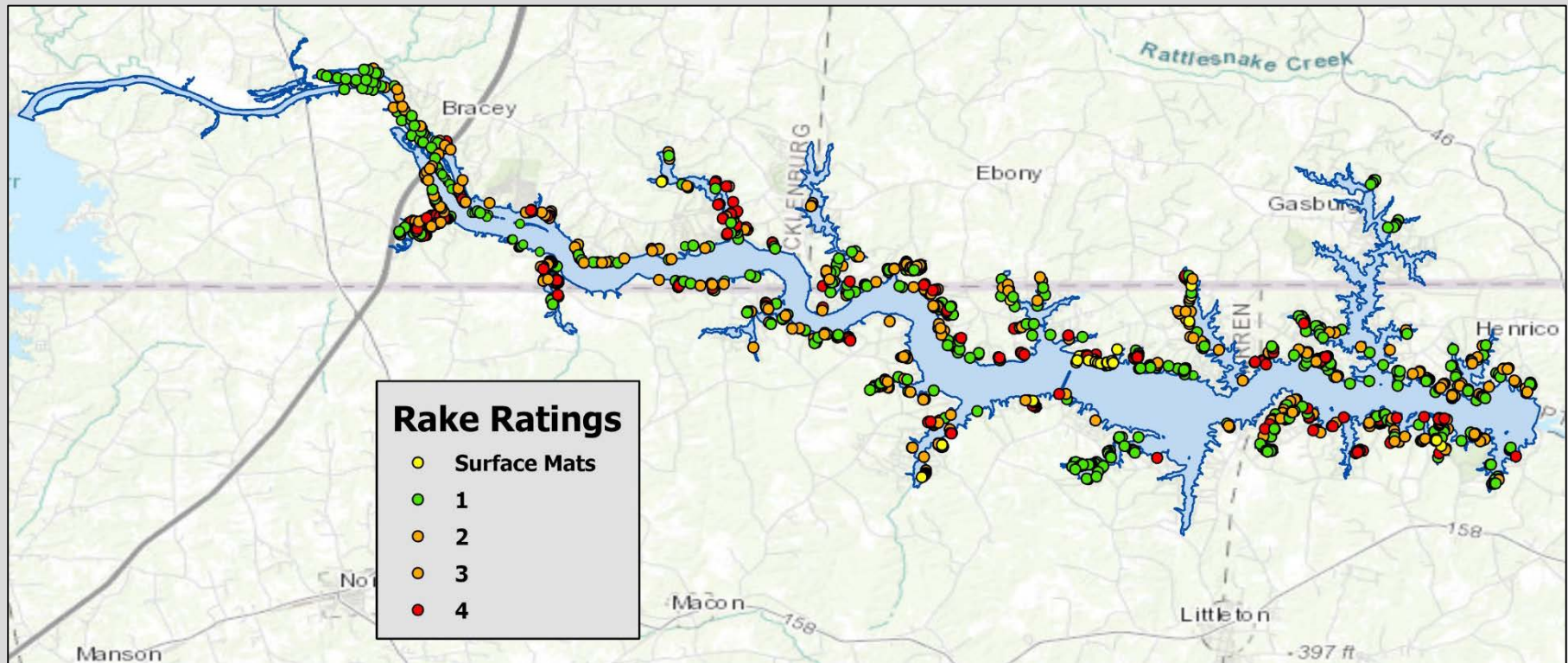


2020 Survey Results





2020 Survey Results



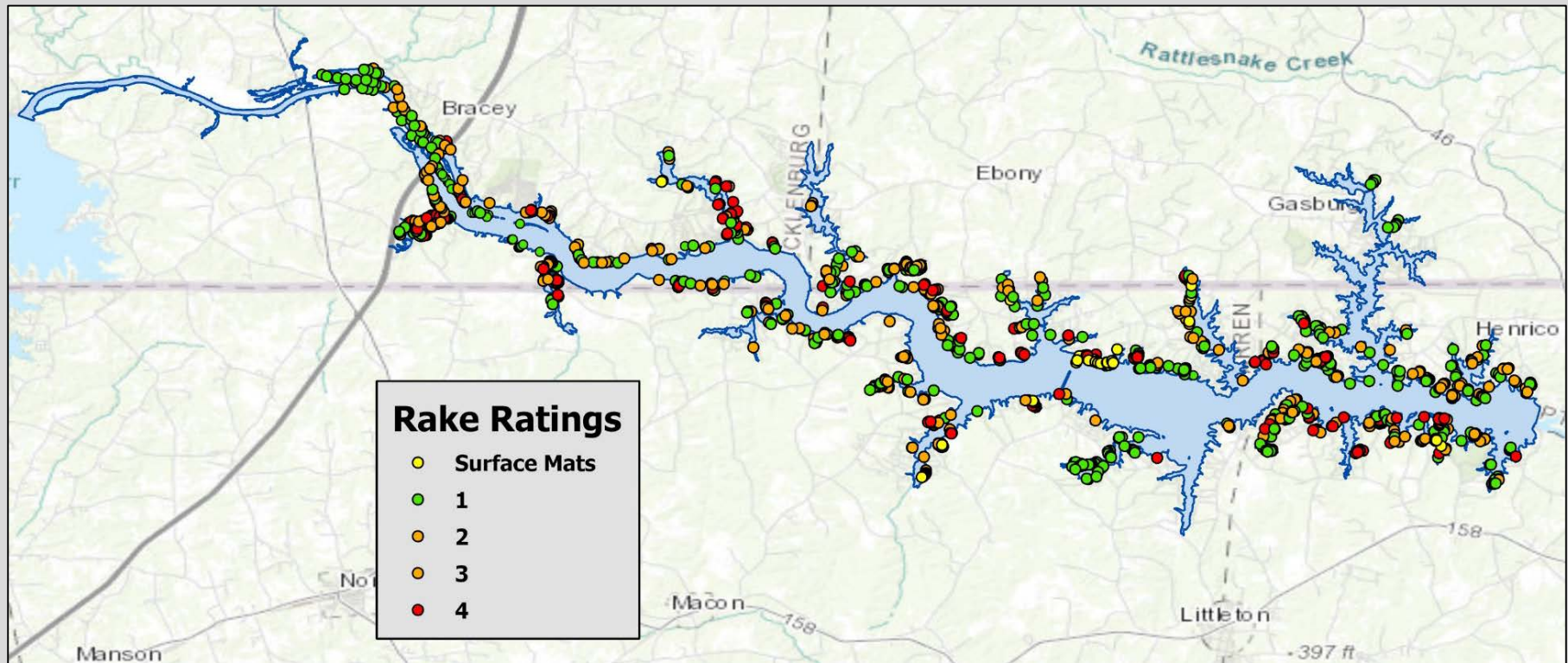
Total Survey Sites: 5,368

Lyngbya: 1,158

22% of all survey sites

30% of vegetated sites

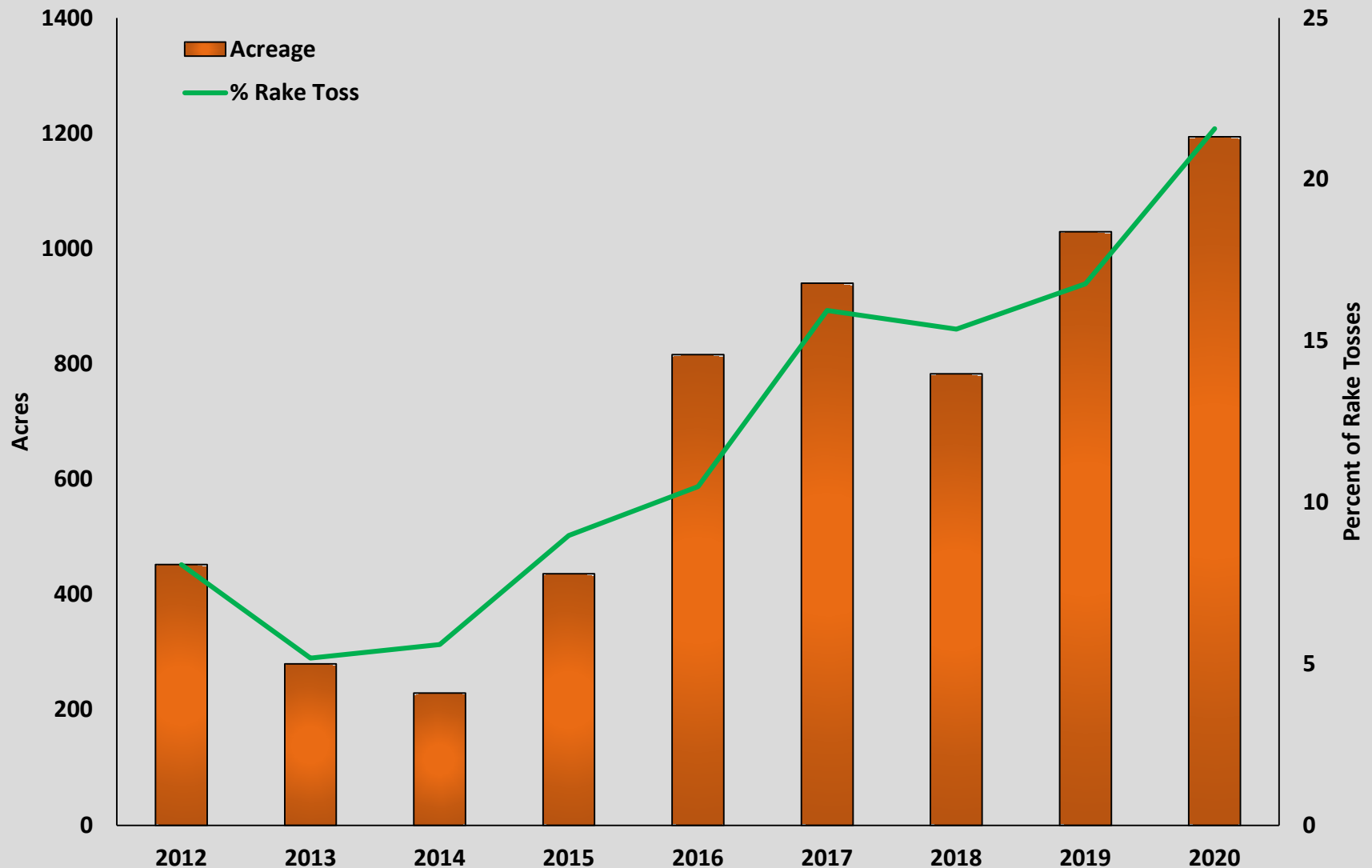
2020 Survey Results



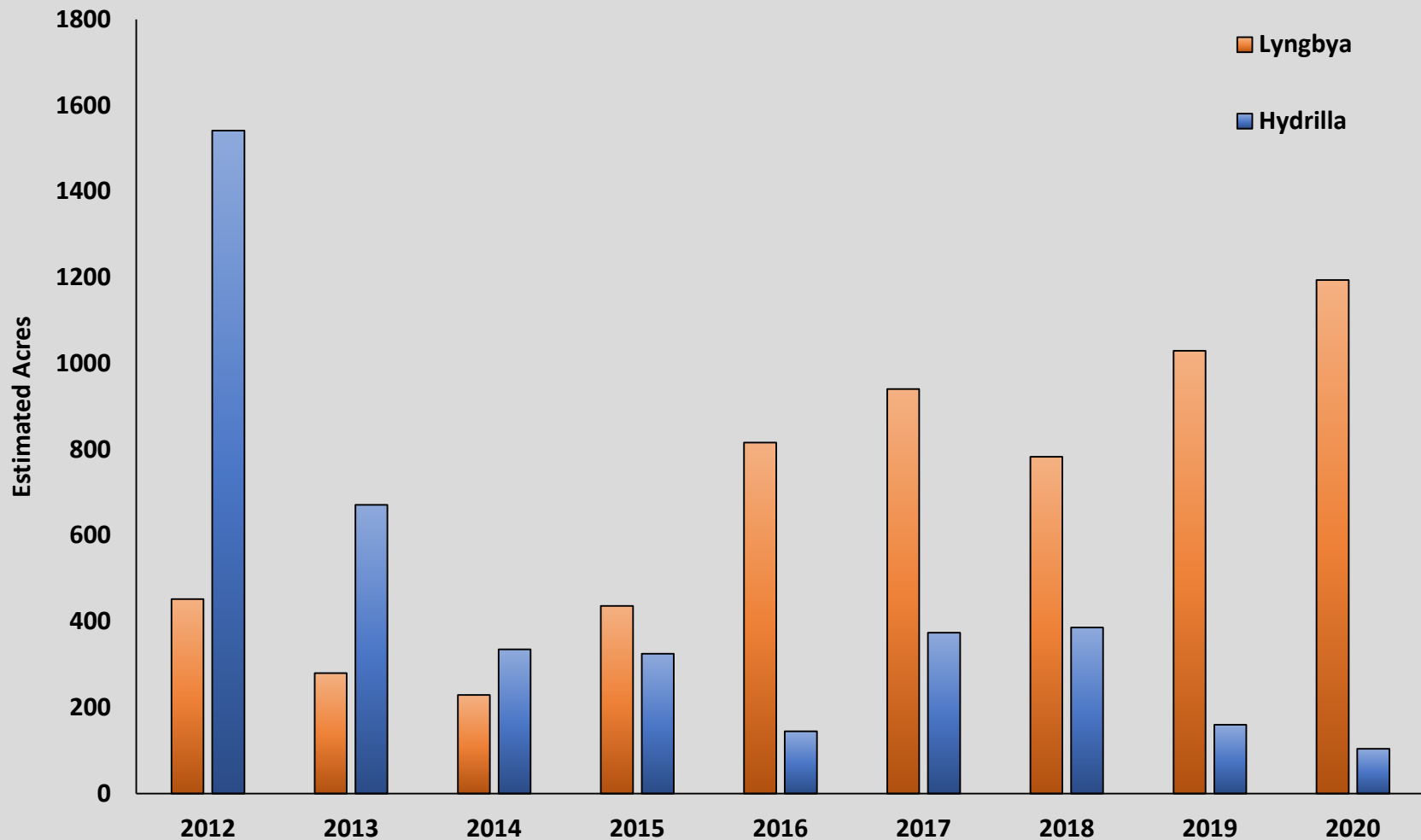
2020 Lyngbya Acreage

1,194 Acres

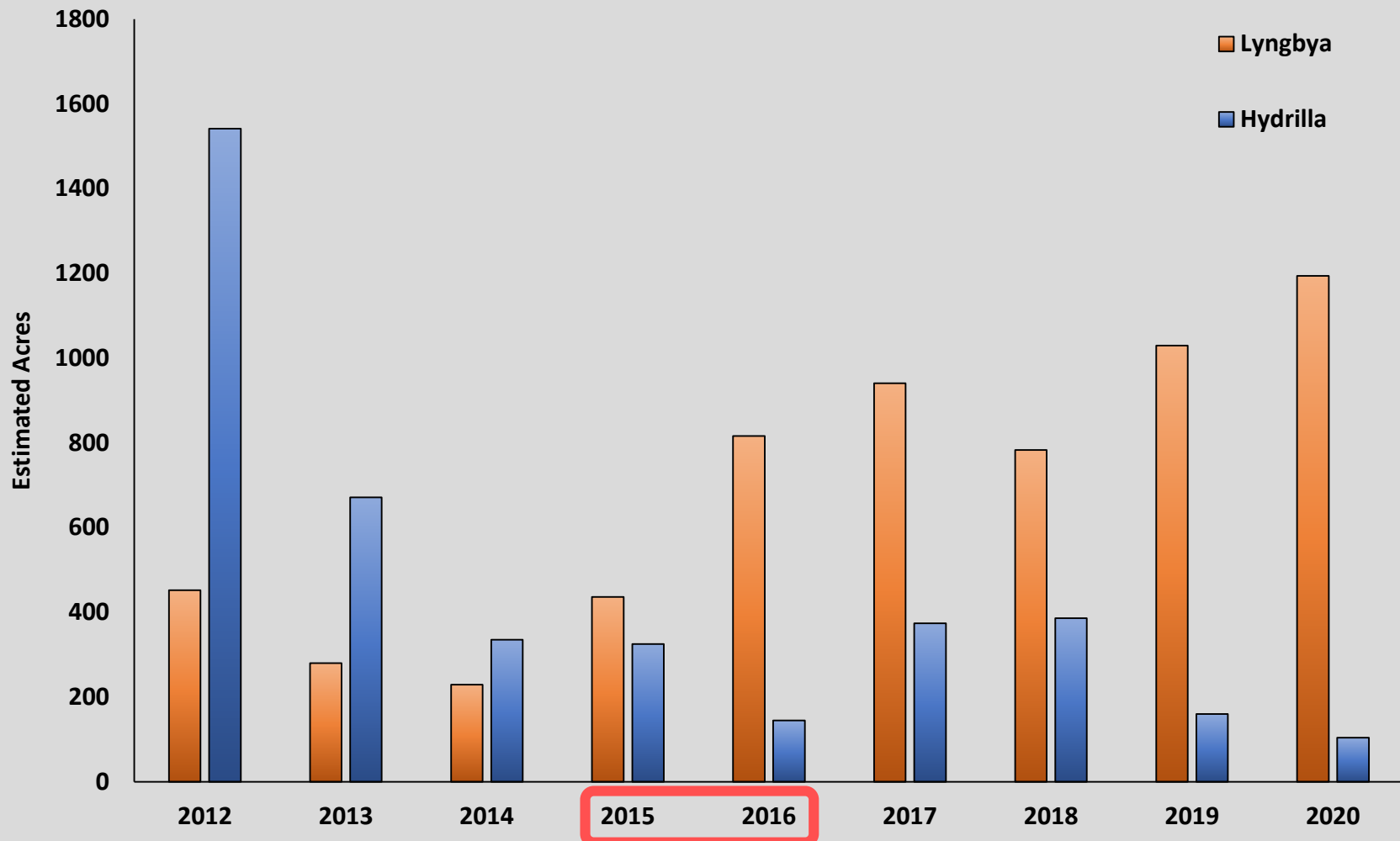
Lyngbya



Lyngbya vs. Hydrilla



Lyngbya vs. Hydrilla



Lyngbya Treatments

2020 Treatments:

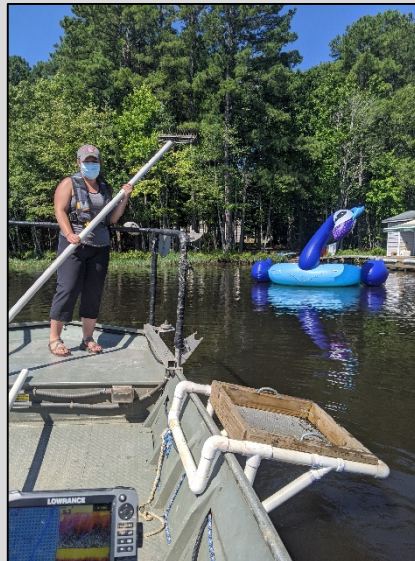
- Occurred monthly between April and September
 - Historical Sites (~100 acres)



Lyngbya Treatments

2020 Treatments:

- Occurred monthly between April and September
 - Historical Sites (~100 acres)
 - Historical Treatment Combinations
 - Captain XTR & Diquat / Algimycin & AMP
 - **Cutrine Ultra & AMP**



Lyngbya Treatments

2020 Treatments:

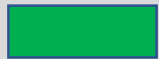
- Occurred monthly between April and September
 - Historical Sites (~100 acres)
 - **Experimental Plots**



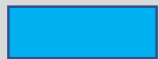
Experimental Plots



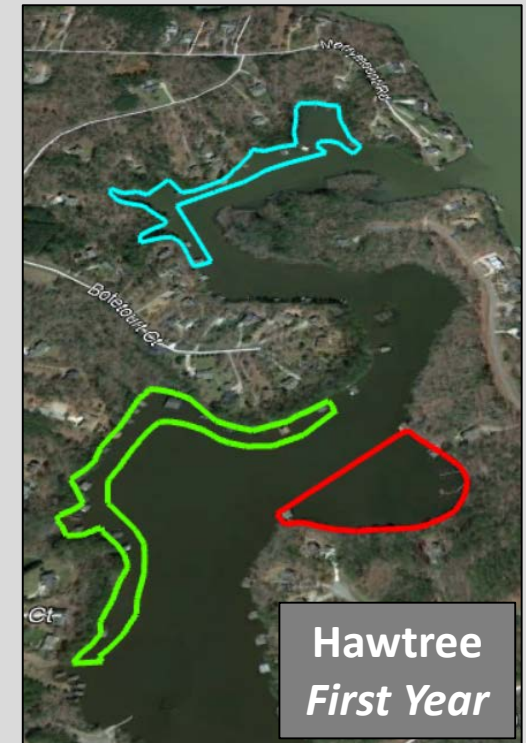
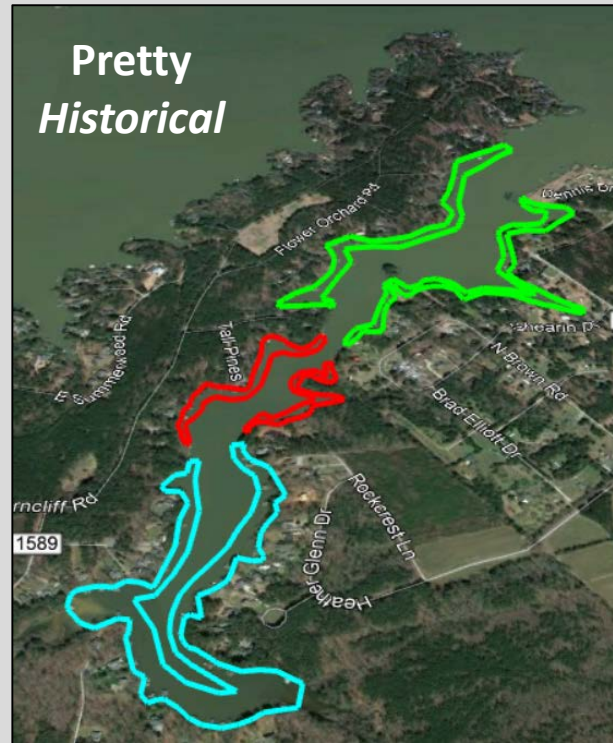
Control



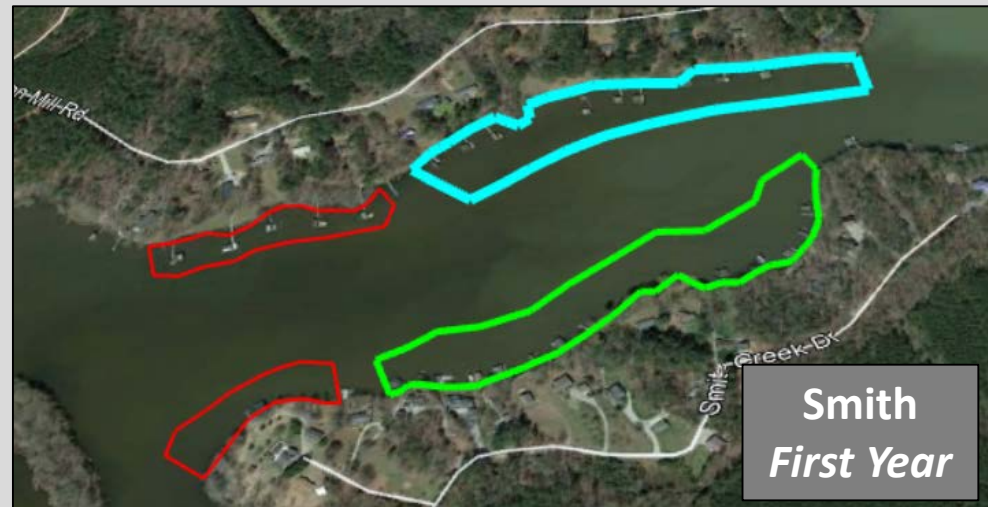
Cutrine Ultra
Algimycin



Captain XTR



**Hawtree
First Year**



**Smith
First Year**

Lyngbya Treatments

Methods of Evaluation:

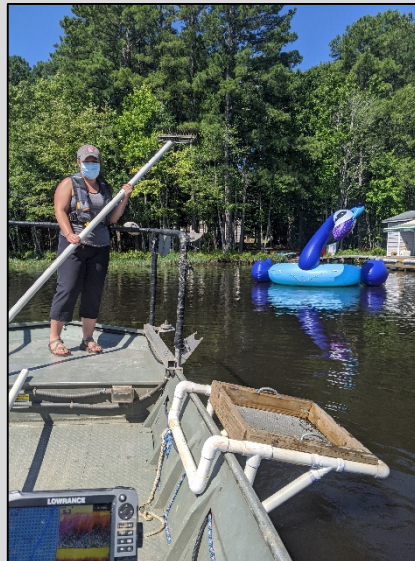
- Yearly Volunteer Vegetation Survey (September – October)
- Monthly Biosonic Scans (April – Present)
- Monthly Biomass Sampling (July – October)
- Viability Samples (December)

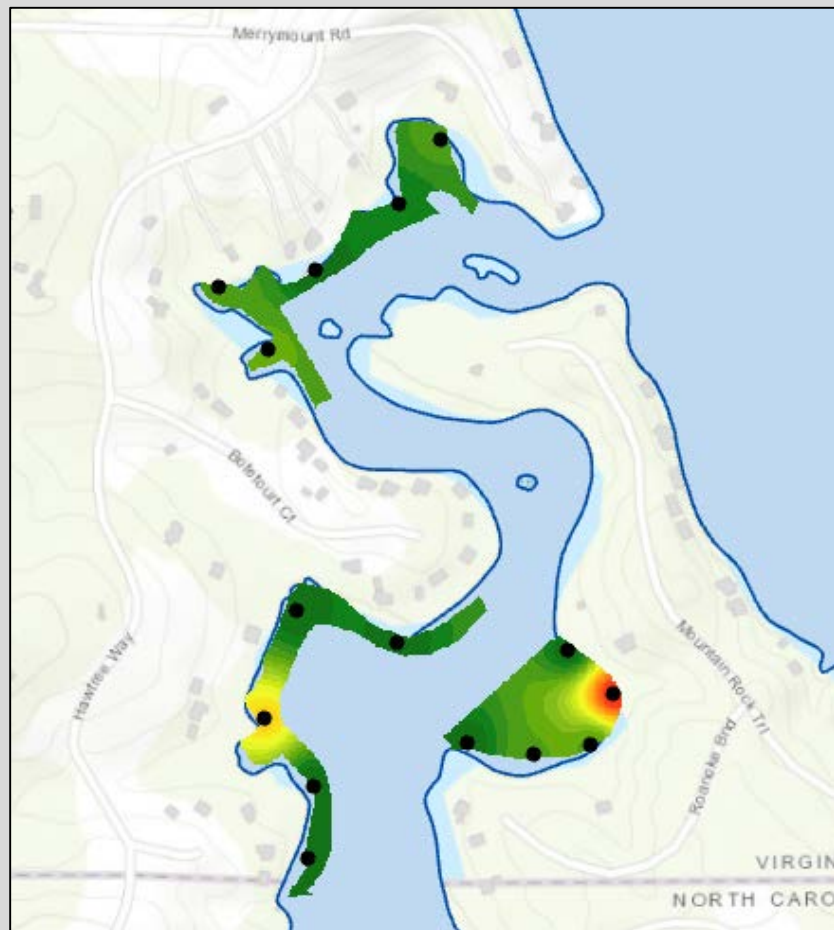


Lyngbya Treatments

Methods of Evaluation:

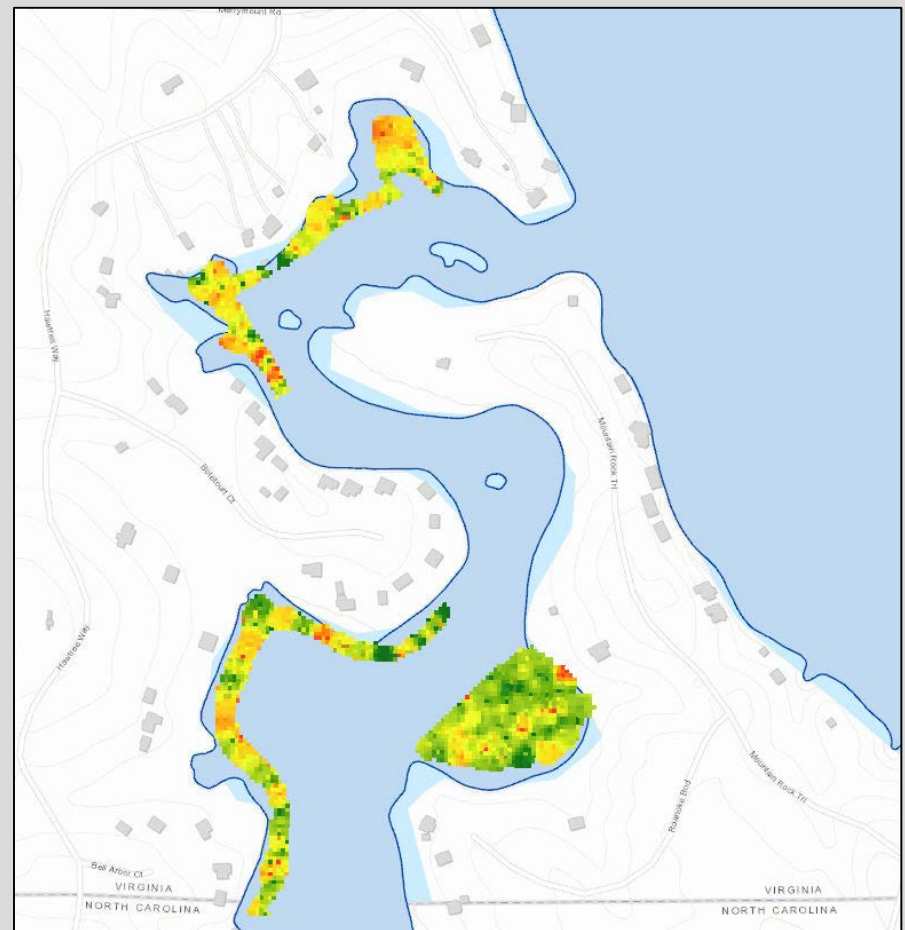
- Yearly Volunteer Vegetation Survey (September – October)
- **Monthly Biosonic Scans (April – Present) -- *COVID-19 Restrictions***
- Monthly Biomass Sampling (July – October)
- Viability Samples (December)





Biomass

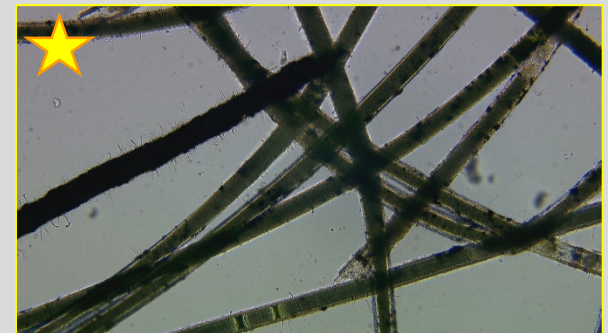
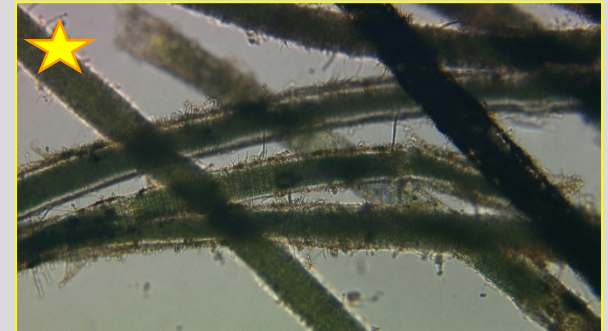
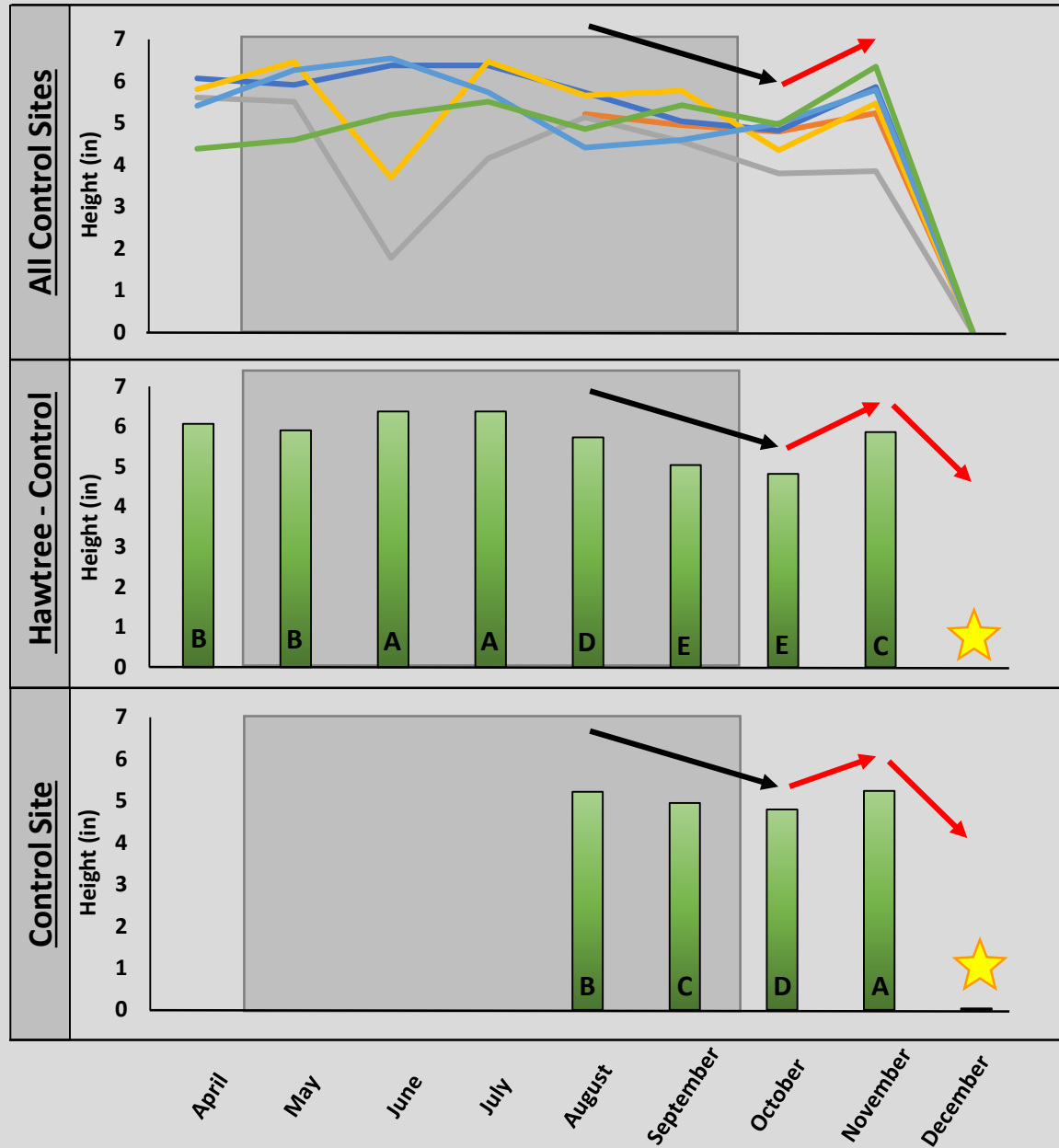
Interpolation based on 5 sites



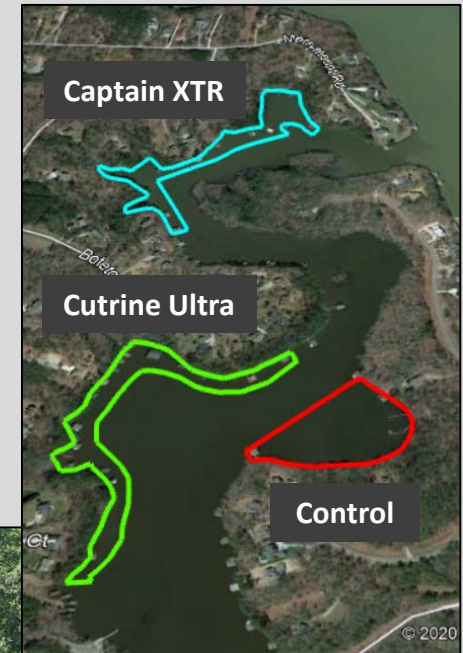
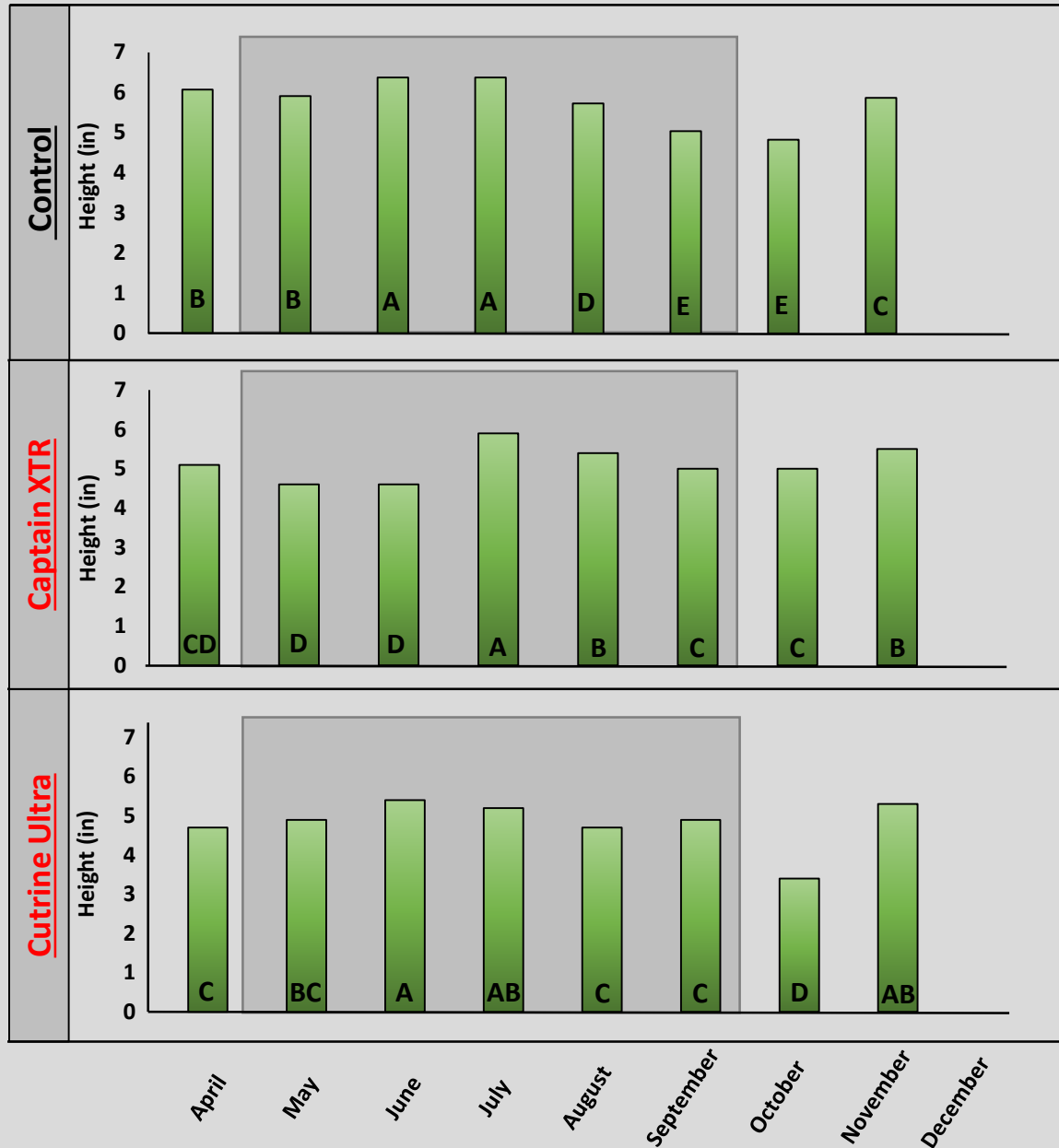
Biosonics

Interpolations based on
321 – 460 data points

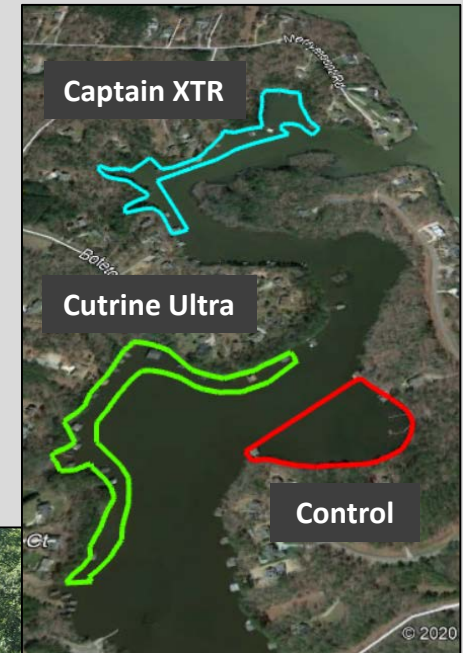
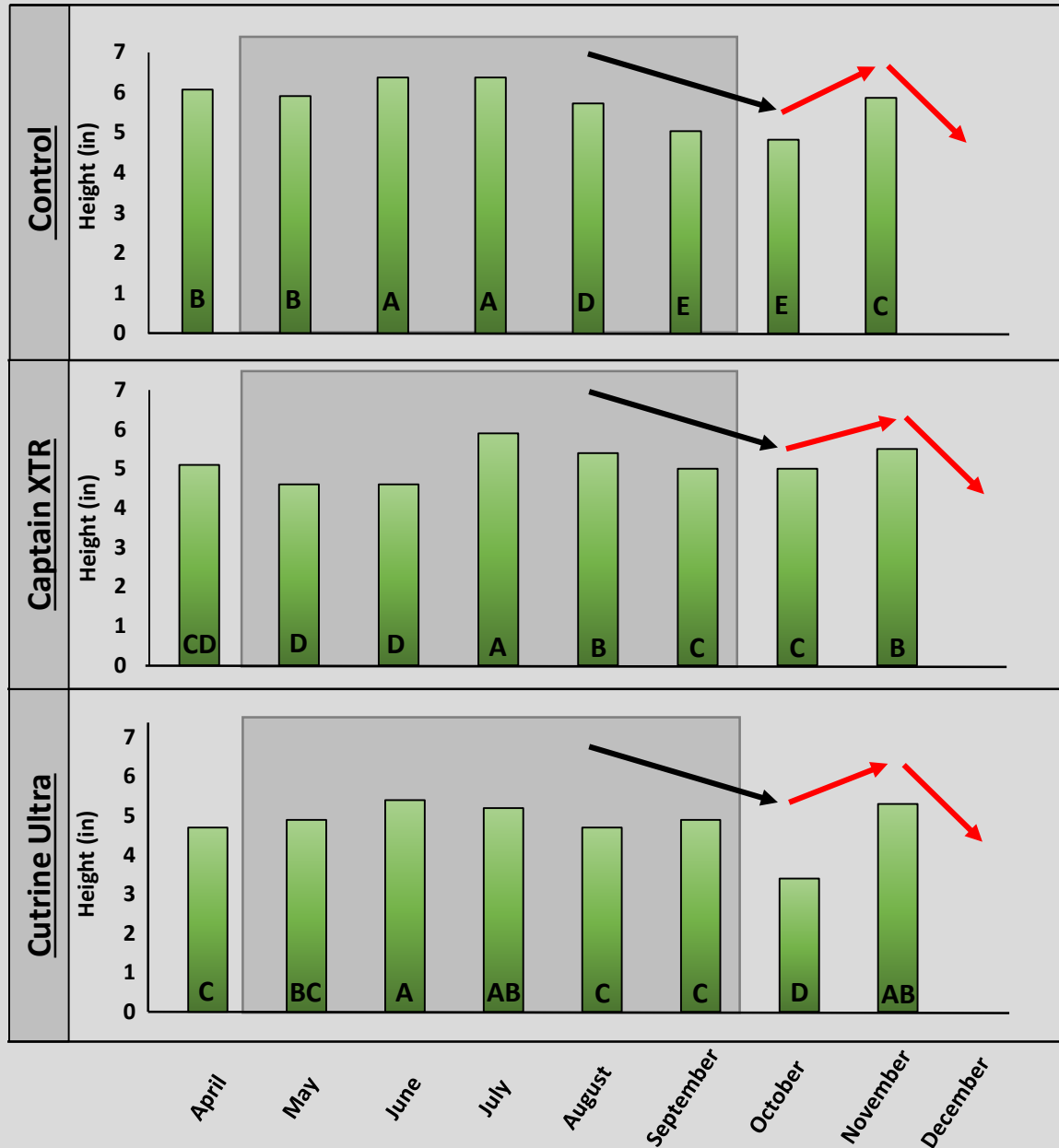
Control Sites – Lyngbya Mat Height



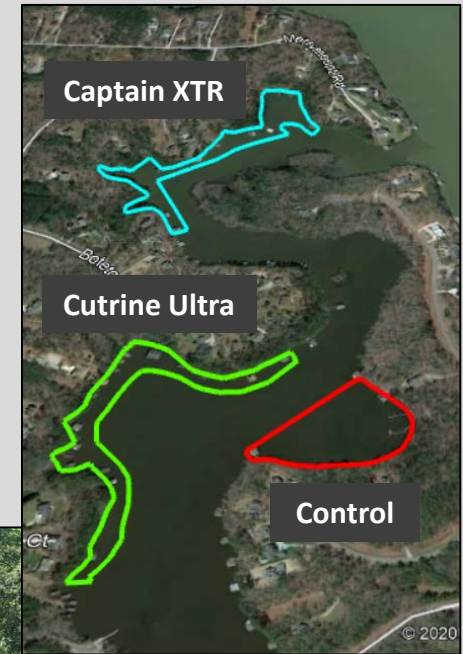
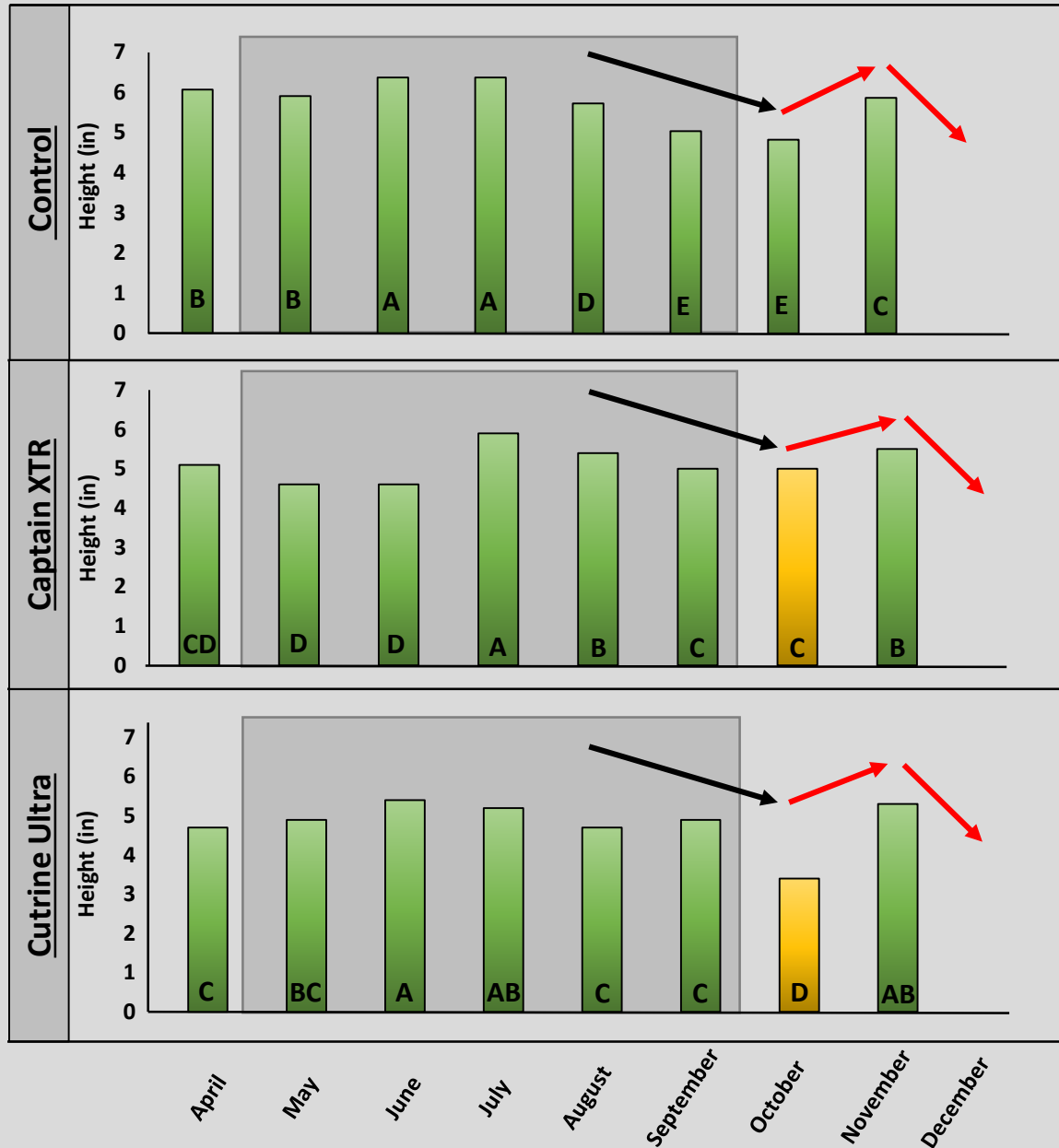
Hawtree – Lyngbya Mat Height



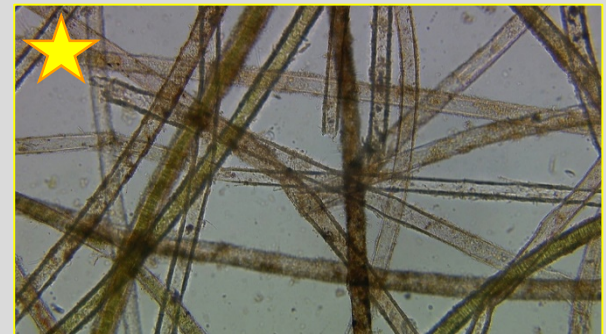
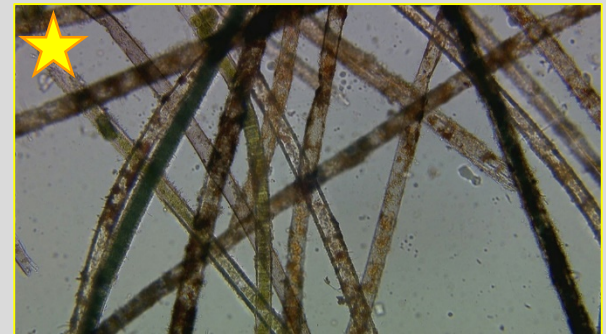
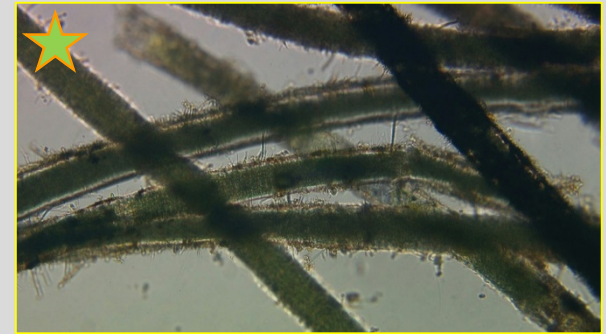
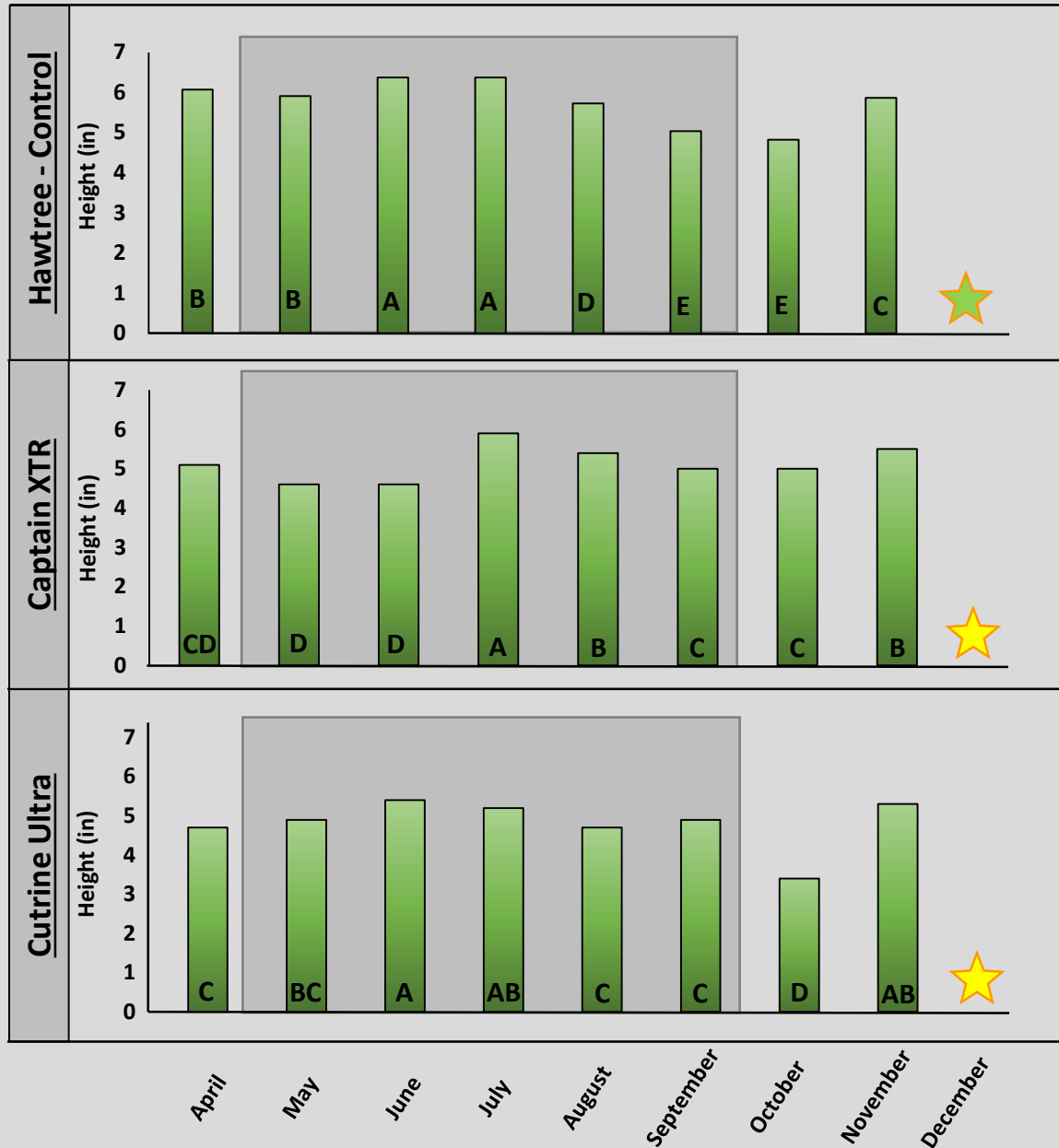
Hawtree – Lyngbya Mat Height



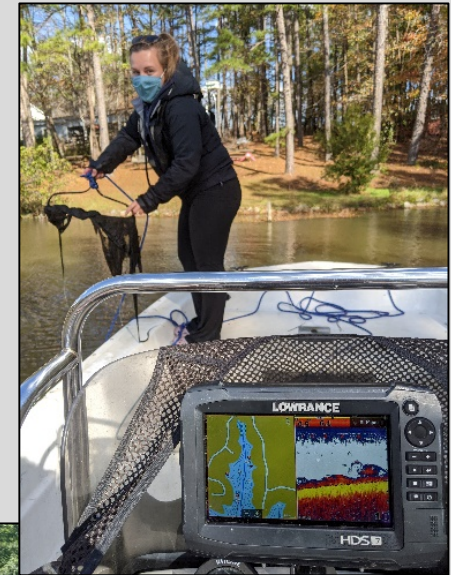
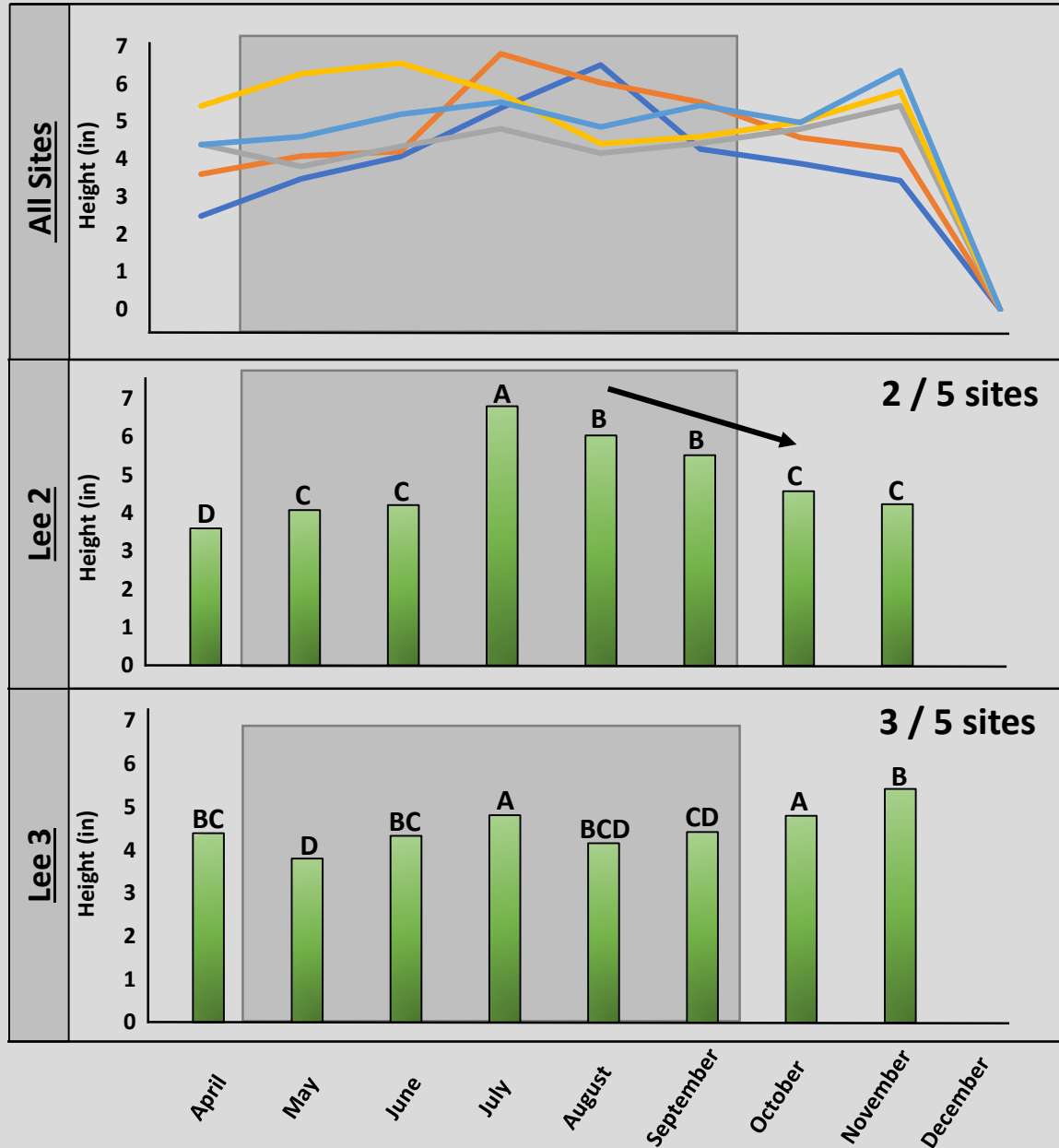
Hawtree – Lyngbya Mat Height



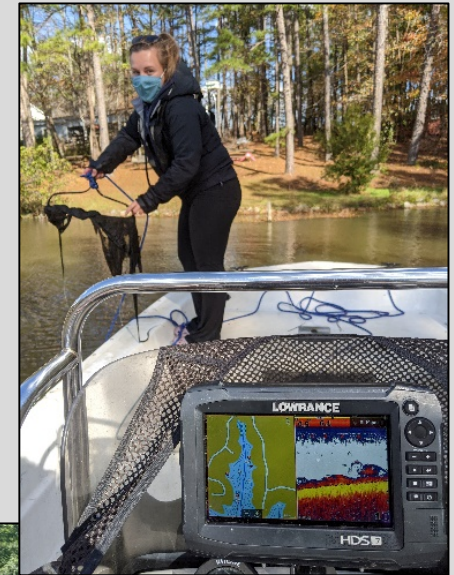
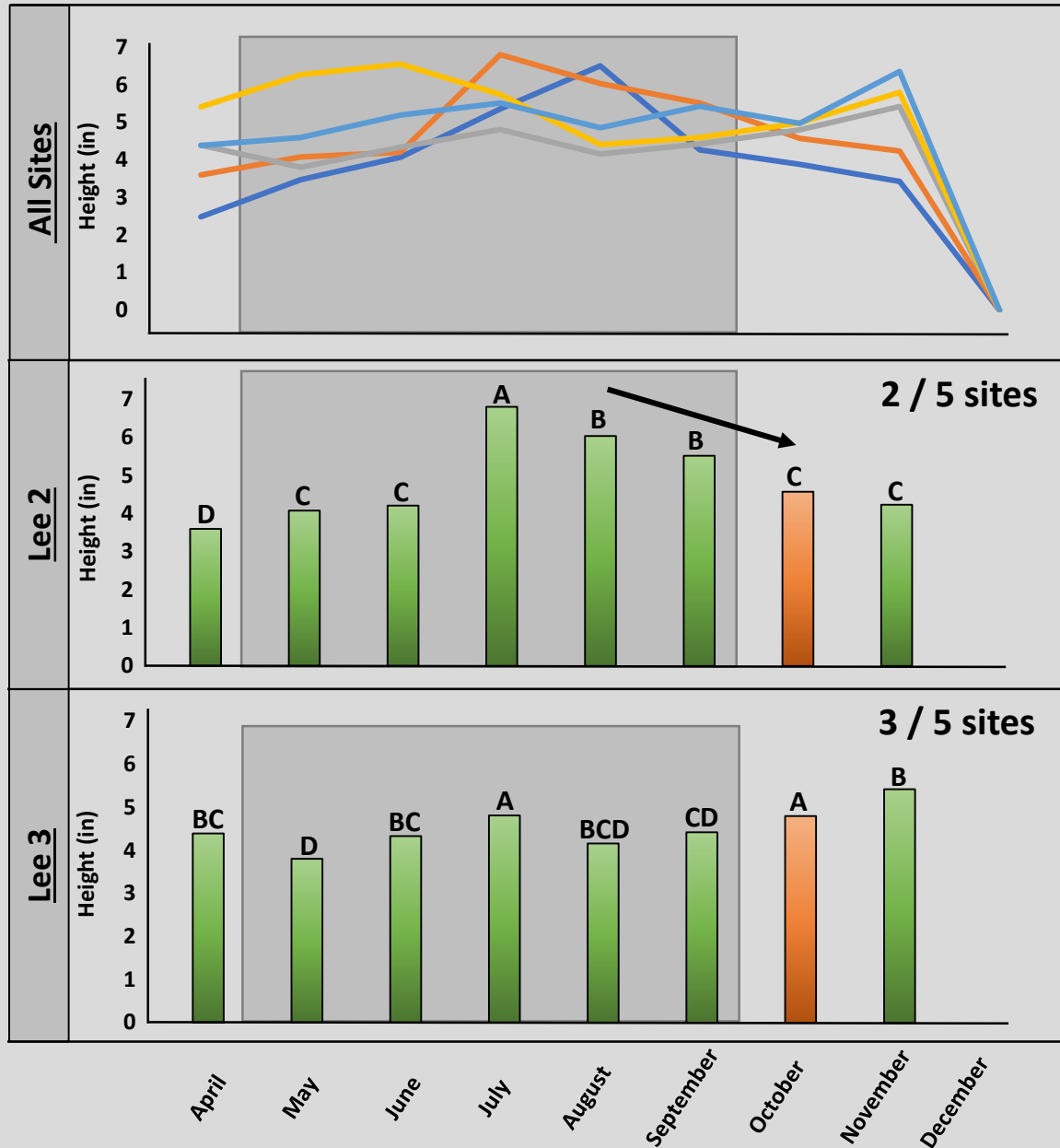
Hawtree – Lyngbya Mat Height



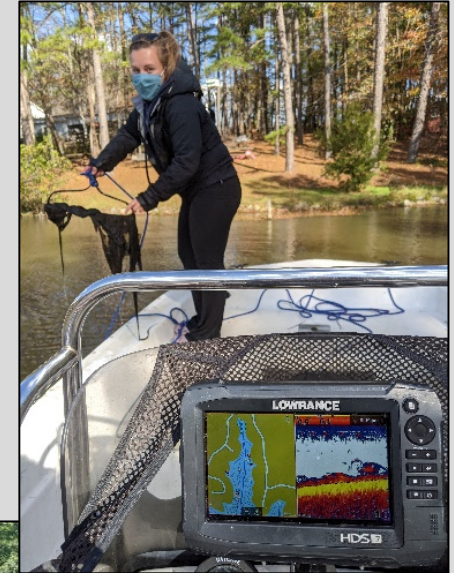
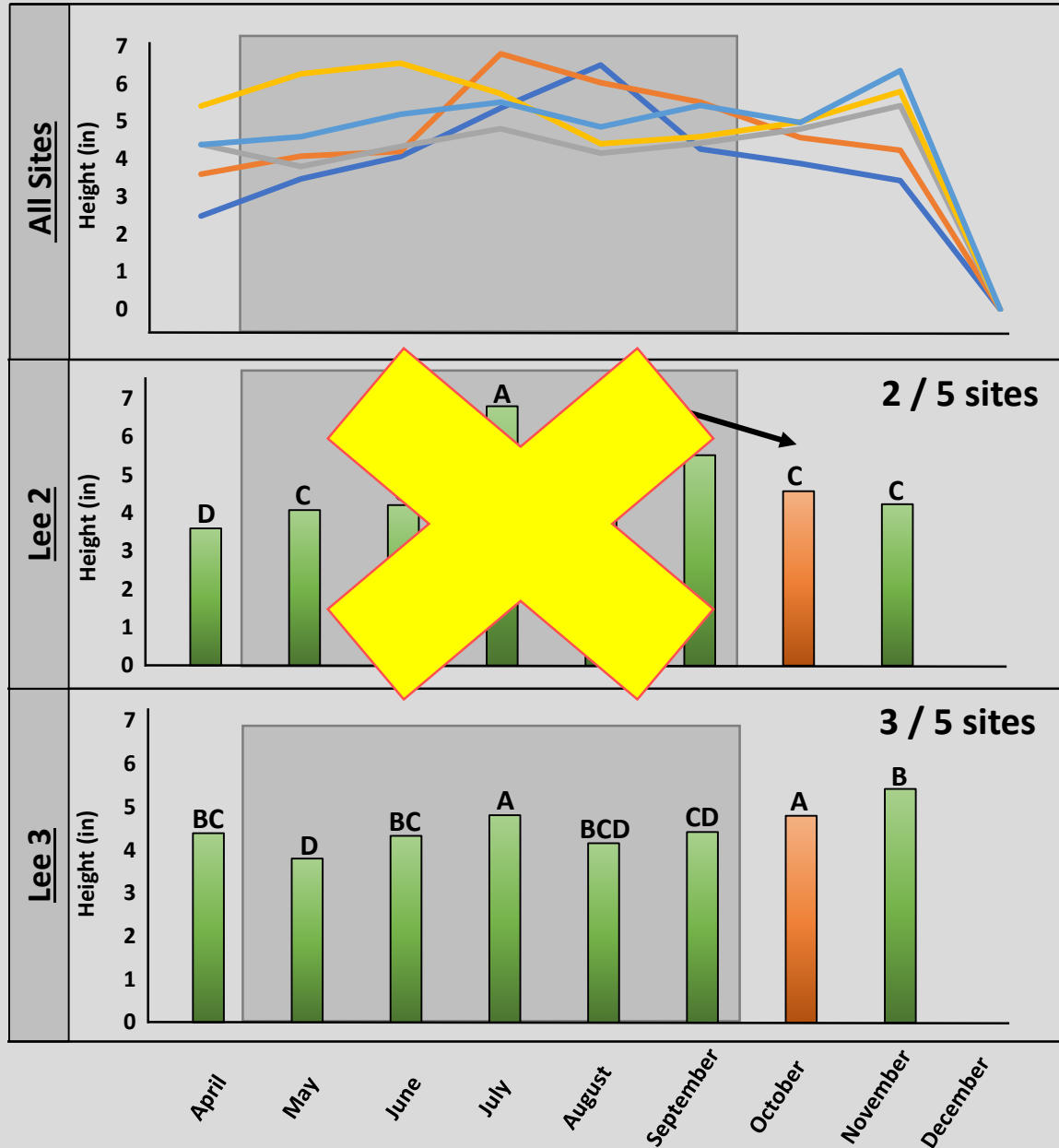
Algimycin – Lyngbya Mat Height



Algimycin – Lyngbya Mat Height



Algimycin – Lyngbya Mat Height



2020 Survey Results

Survey Results

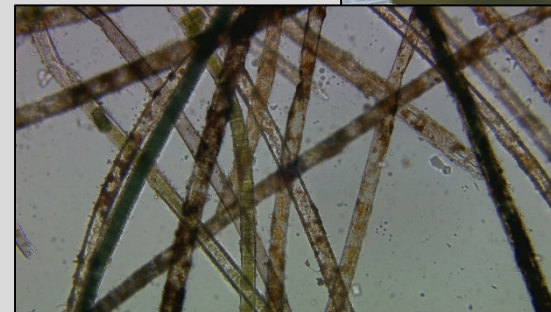
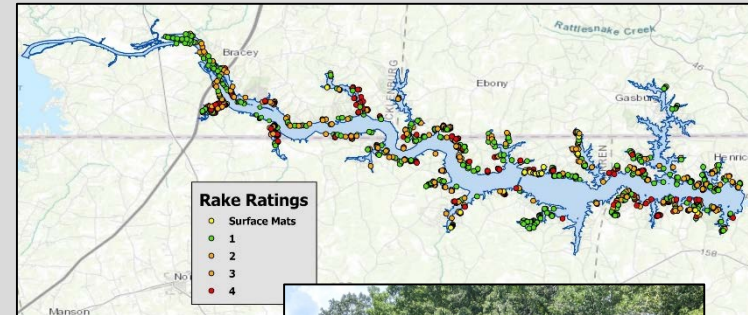
- Increasing trend in both acreage and % occurrence in rake tosses

Biosonics

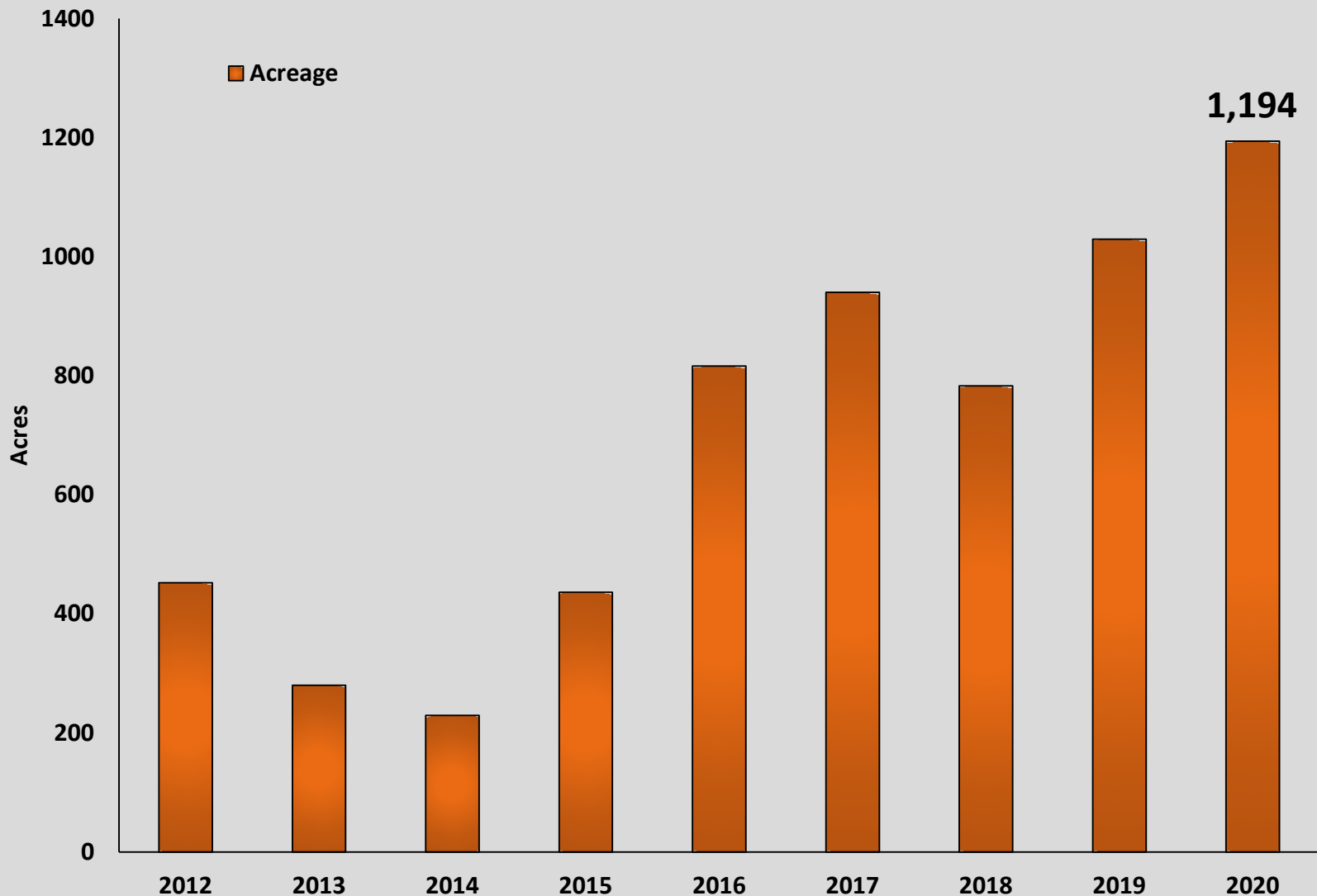
- Downward or neutral trend in mat heights for Captain XTR & Cutrine Ultra

Viability Samples

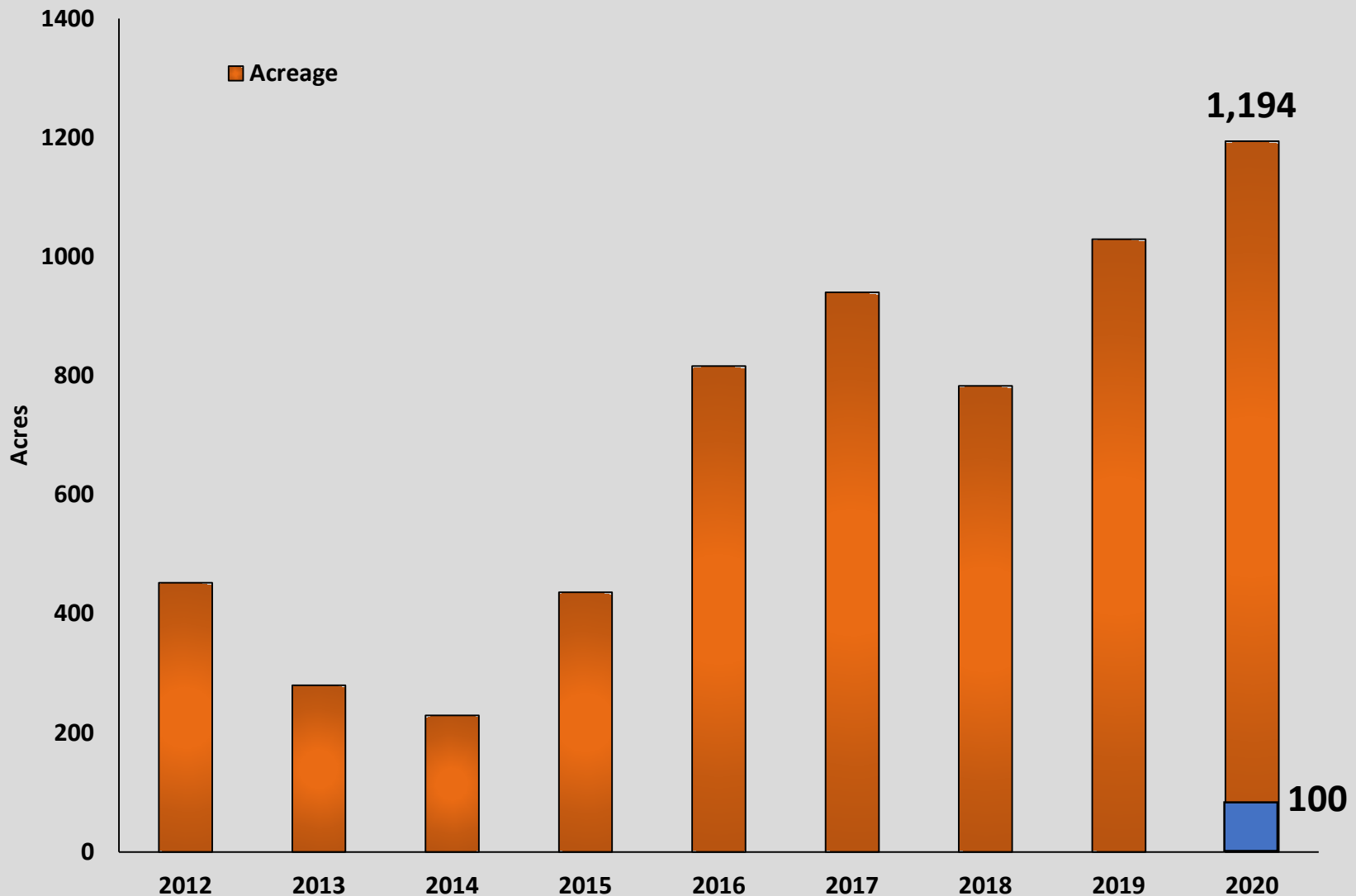
- Some level of cellular damage for Captain XTR & Cutrine Ultra



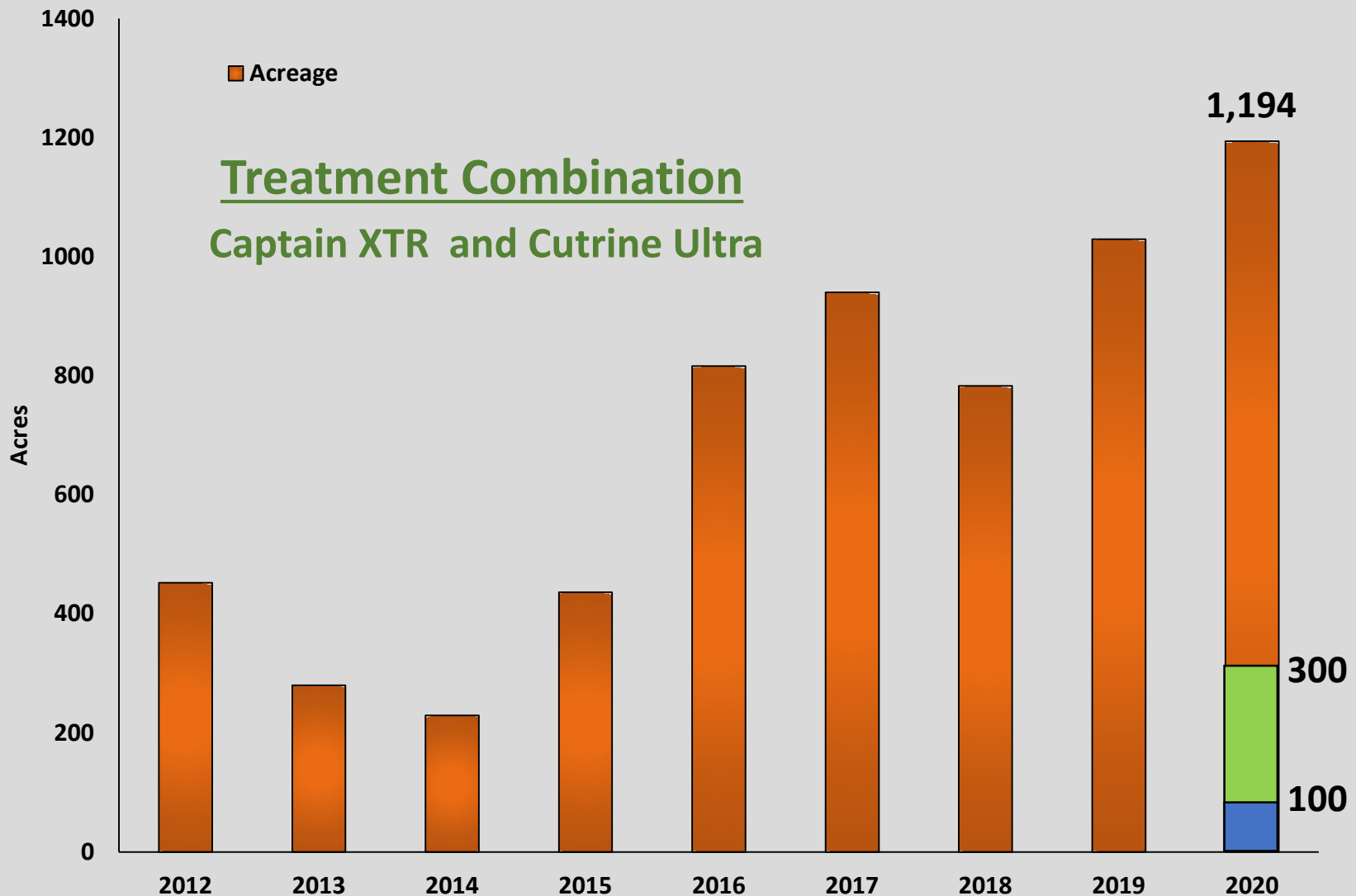
2021 Treatments



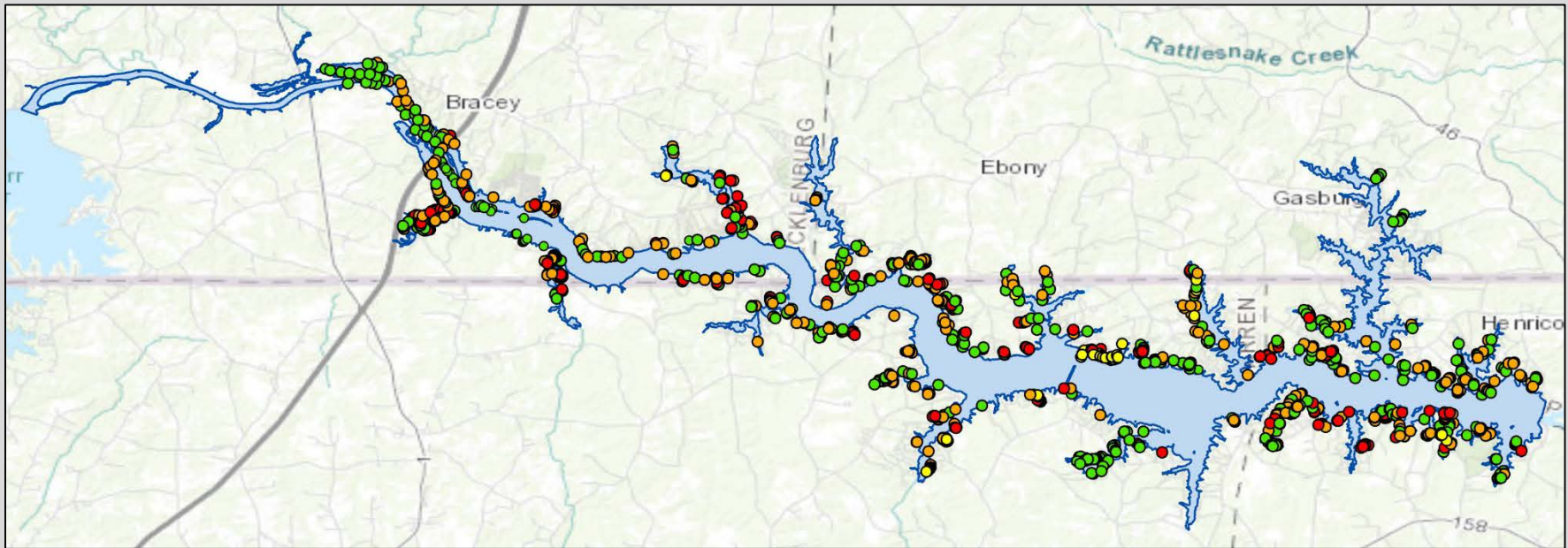
2021 Treatments



2021 Treatments

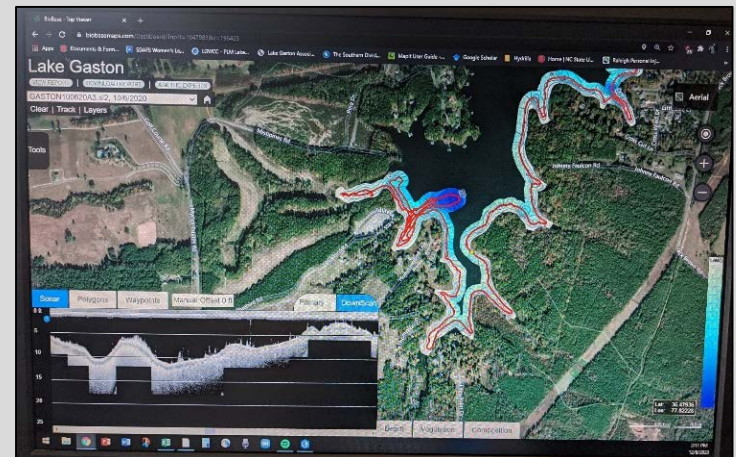


2021 Site Selection Process

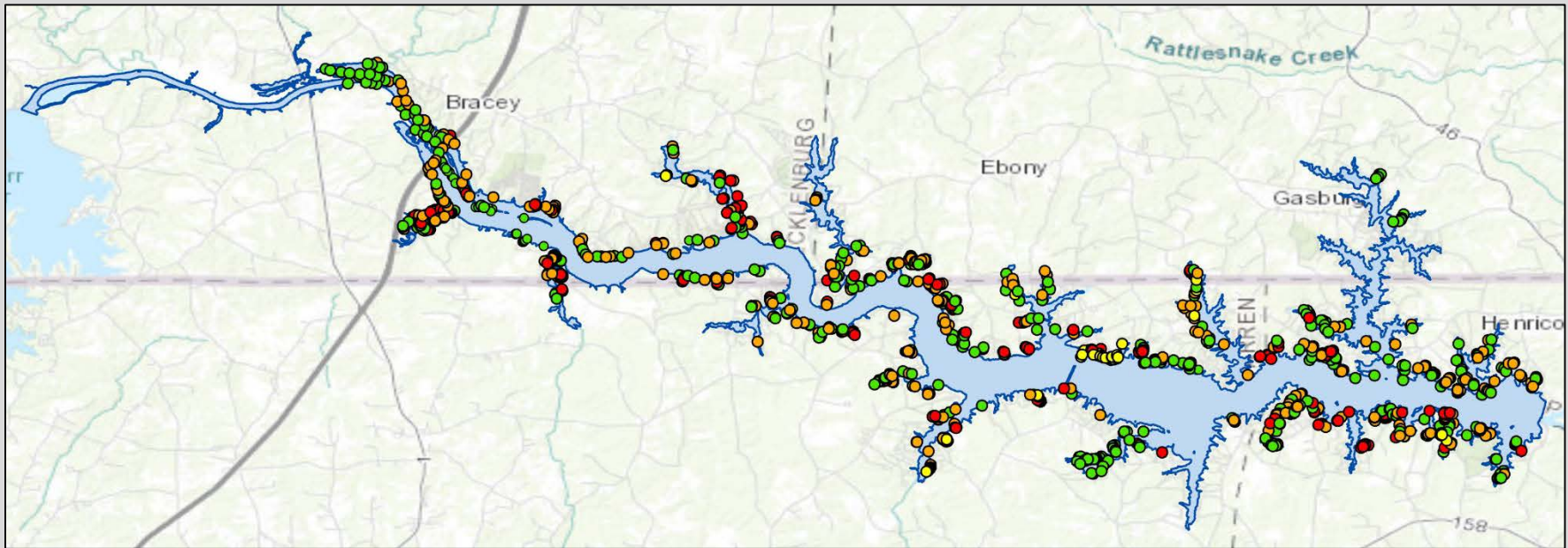


Selection Factors

- Total acreage
- Boat ramps present
- Number boat docks
- Longevity of mat
- Public complaints



2021 Site Selection Process

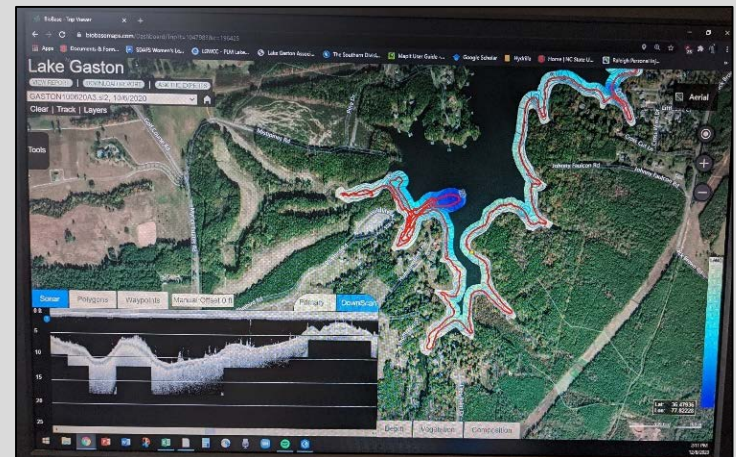


Final Site Selection

- NCSU recommendations
- Applicator
- Chemical Company

Final Sites

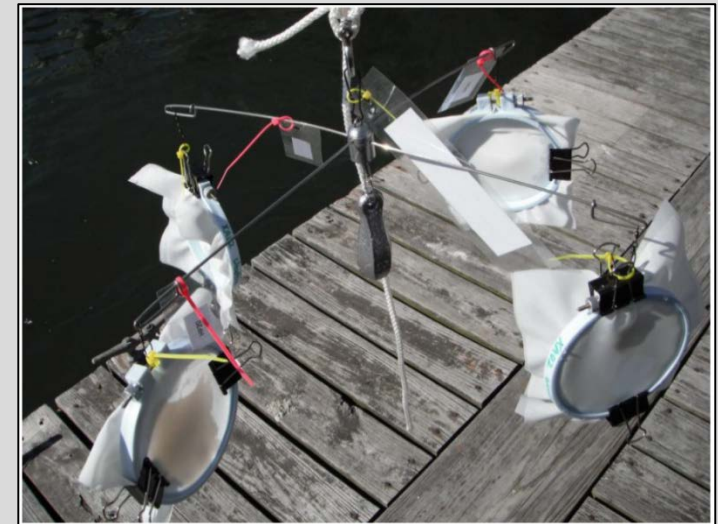
- Provided on WCC website



2021 Research

Toxin Work

- Working with Old Dominion University Phytoplankton lab
- Use of SPATT technology
 - Passive absorption of biotoxins onto porous synthetic resin filled bags
- Testing Treatment Sites and Control Sites
 - Timed interval testing post lyngbya treatments



2021 Lyngbya Treatment

TAG Recommendations

- 1) Treat no more than 300 acres**
- 2) Move forward with treatment protocols using combinations of Captain XTR, Cutrine Ultra, Diquat, and AMP**
- 3) Continued evaluations of treatment efficacy**
- 4) Begin treatment at a water temperature of 64° F**
- 5) Sample for common cyanotoxins within treatment and control areas**

Questions?



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