

# Painted Hills Lake Management Update-2022



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# Outline

- Company Introduction
- History of Relationship with Painted Hills
- 2022 Harmful Algal Bloom (HAB) Monitoring Summary
- 2022 Lake Management Operations
- 2023 Treatment plans





# Company Overview and Introduction

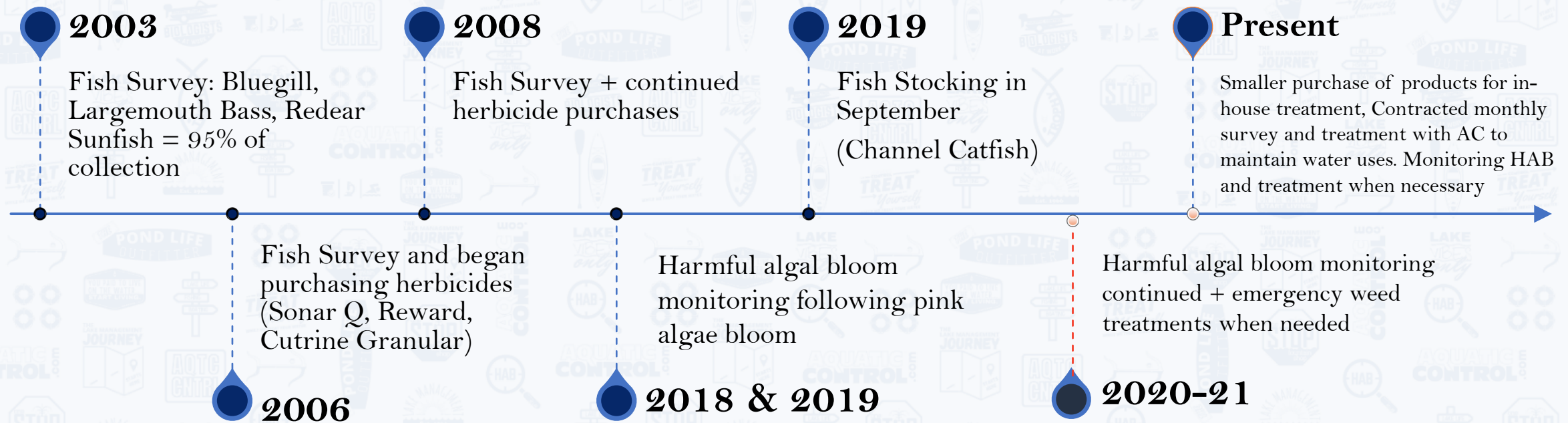
# Aquatic Control Inc.



- Private lake and pond management company
- Started in 1966
- Specialize in aquatic vegetation and algae management, fountain and aeration systems sales/service, fisheries management, aquatic product sales, application and distribution
- 500 years experience on staff solving lake and pond management issues
- Seven regional offices



# Timeline of work with Painted Hills





# 2022 HAB Monitoring

- Initiated in early 2018 following *Planktothrix* (pink algae) bloom in the winter
- In 2018 and 2019, we conducted bi-monthly sampling at Holiday Lake and Nebo Lake
- In 2020, we transitioned to monthly throughout warmer season to stagger data to more critical months (in absence of winter blooms)
- In 2021-22, we continued to monitor monthly and assisted in identifying areas of the lake that could benefit from aquatic weed and algal treatments
- Analysis at our laboratory for identification and enumeration of algae present and toxin (microcystin) testing
- Goal: detect presence of blue-green algae at low densities to trigger an algaecide treatment if needed and minimize potential for risks

# April Results

- Harmful Algae detected in Nebo
  - Aphanizomenon: 36,000 cells/ml
    - Potential toxin producer
- Toxin Testing
  - All samples tested negative for microcystins.

**Due to the time of year and lack of toxin production, our recommendation was to continue to visually monitor the situation and perform an algaecide treatment on Nebo Lake. For Holiday and Nebo Lakes, the recommended treatment action density is 20,000 cells/mL. Proactive, early season treatments can greatly minimize the risk of toxin production and exposure to residents and animals.**



# May Results

- Harmful Algae Identified in Nebo
  - *Aphanizomenon sp.*- 47,500 cells/mL
    - *Potential toxin producer*
- Toxin Testing
  - All samples tested negative for microcystins.

**Due to sufficiently higher cell densities, our recommendation was to perform another algaecide treatment on Nebo Lake. At the time, the recommended action threshold density had been greatly exceeded by ~ 2x and treatment was strongly recommended and scheduled with Holiday weed treatment to save cost.**



# June Results

- Harmful Algae Identified in Nebo
  - *Dolichospermum sp.*- 107,500 cells/mL
    - *Potential toxin producer*
- Toxin Testing
  - All samples tested negative for microcystins.

**HAB species had shifted from *Aphanizomenon* to *Dolichospermum* at significantly higher density. However, *dolichospermum* is often a much more sensitive species to algaecide exposure despite higher densities. 3<sup>rd</sup> treatment was scheduled to coincide with weed treatment to save cost.**

# July Results

- No Harmful Algae Identified in either lake
- Toxin testing
  - All samples tested negative for microcystins.

**Due to non-detection of blue-green algae and lack of detectible toxin production, an algaecide treatment was not necessary for potentially toxic and harmful species. Filamentous algae were observed in the shoreline of Nebo and treated as part of the monthly lake maintenance contract.**



# August Results

- No Harmful Algae Identified in either lake
- Toxin testing
  - All samples tested negative for microcystins.

**Due to non-detection of blue-green algae and lack of detectible toxin production, an algaecide treatment was not necessary for potentially toxic and harmful species.**

# September Results

- No Harmful Algae Identified in either lake
- Toxin testing
  - All samples tested negative for microcystins.

**Due to non-detection of blue-green algae and lack of detectible toxin production, an algaecide treatment was not necessary for potentially toxic and harmful species.**



# HAB Monitoring Summary

- Samples collection complete for 2022 unless additional visits requested
- Residents are encouraged to continue to watch for signs of blue-green algae even in “off-season”
- Addition of chelated copper with weed treatments in Holiday likely provided additional benefit of suppression of HAB species through the year.
- Total HAB expenditure: \$4,105.59



# 2022 Lake Treatments

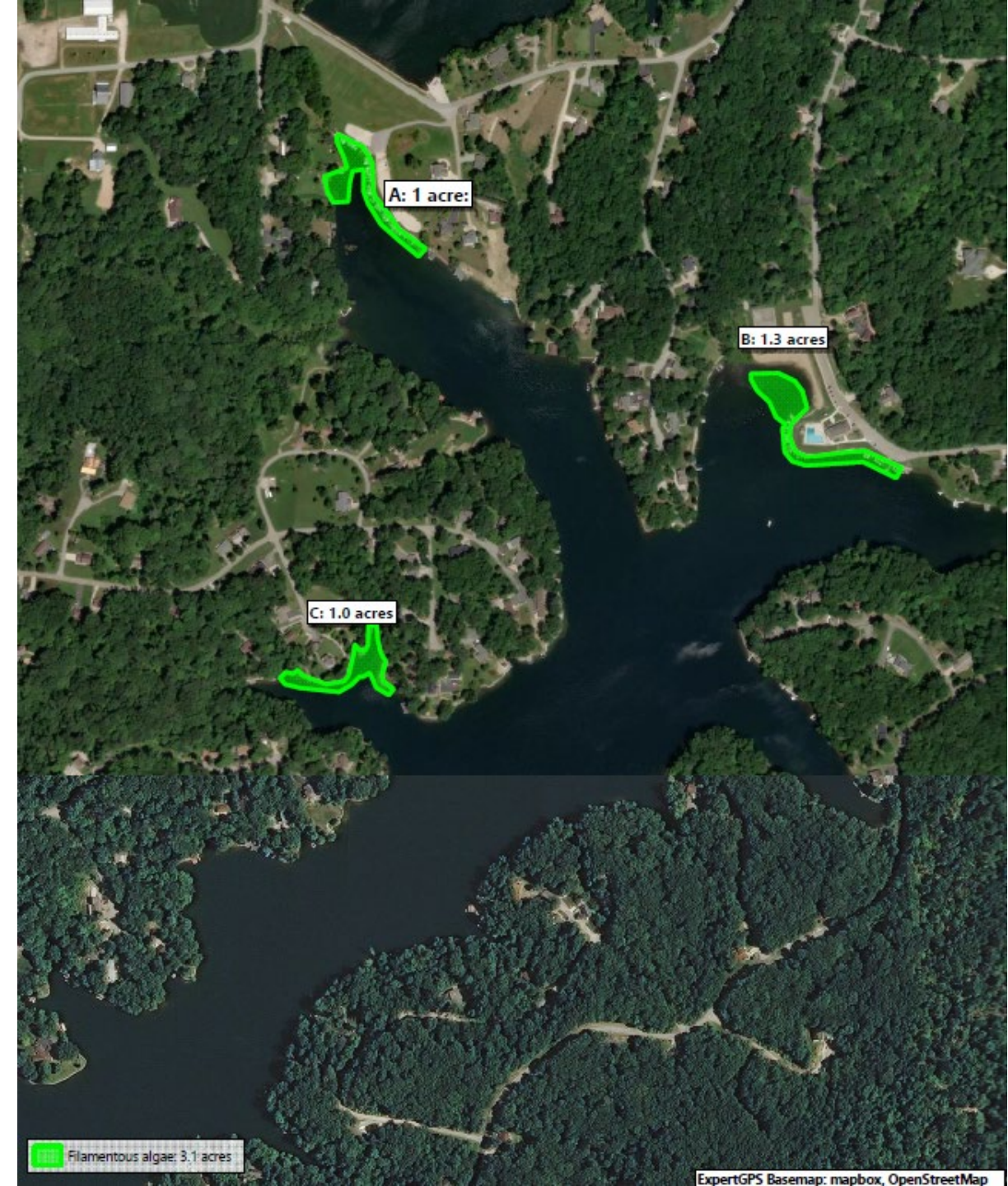


# Lake Management Plan-2022

- Monthly surveys on both lakes coinciding with HAB sampling events
- Map areas of impairing or potentially impairing submersed vegetation growth or filamentous algae
  - Focus of developed/improved shoreline areas, leave un-improved shorelines for habitat.
  - Send to Tina and PH office for approval
- Treatment within 10 days of survey
- Treatments billed at up to \$550/acre
- Total contract invoices not to exceed \$30,000.66
  - Includes \$2,175 for surveys
  - Separate form HAB treatments

# April Treatment

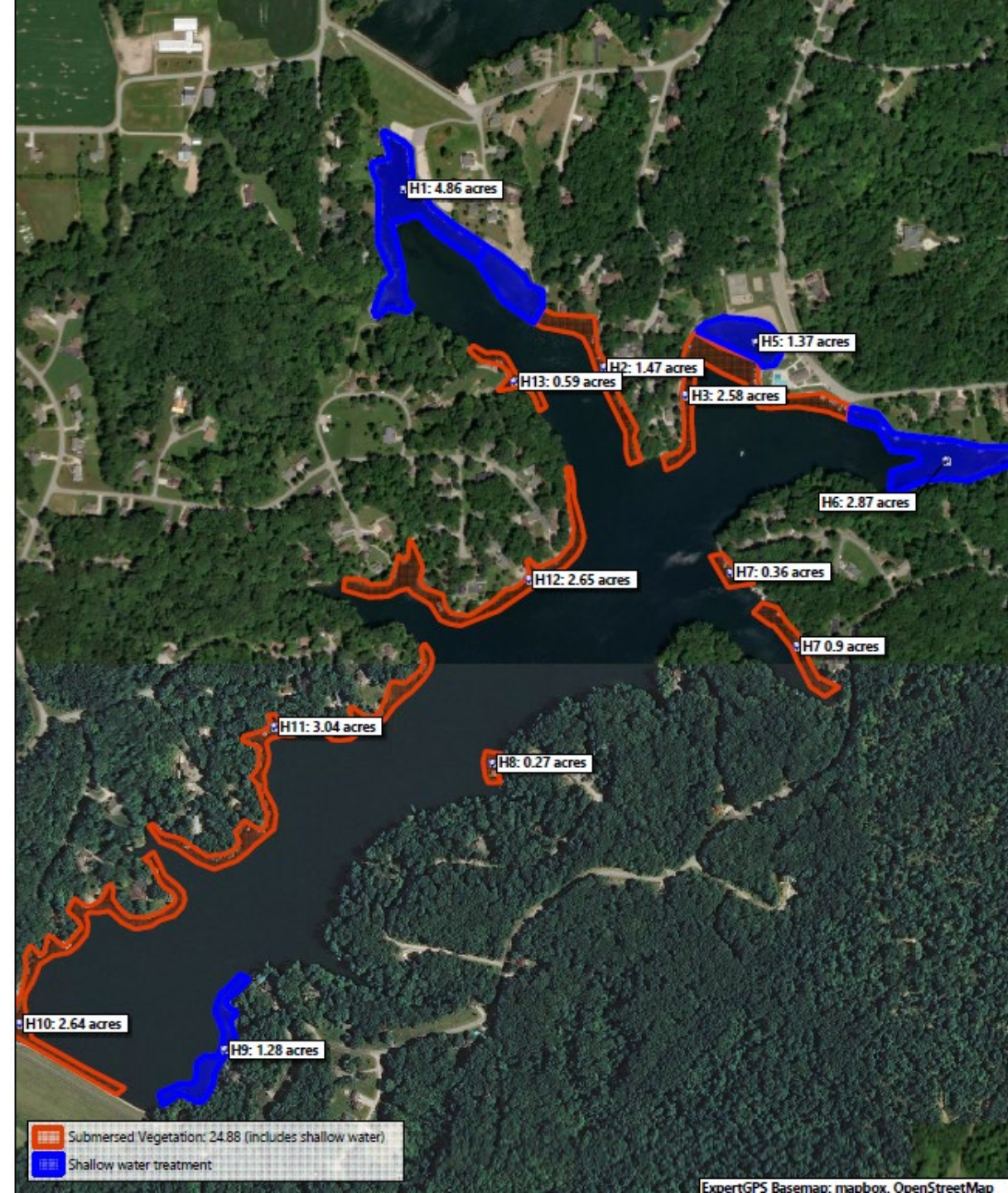
- 3.3 acres filamentous algae on Holiday
  - No submersed weeds
  - Treated 4/11
- Copper sulfate and Chelated copper algaecide (Captain XTR)
- No water use restriction
- \$219.68/acre
  - \$724.93 treatment cost





# May Survey/Treatment

- 24.88 acres curly leaf pondweed (invasive)
  - Some areas with mixed algae
  - Treated 5/19
- AquaStrike herbicide for curly leaf pondweed (endothall/diquat mix)
  - Mixed w/ Captain XTR if lyngbya present
  - Mixed with copper sulfate if chara present
- 3 day turf irrigation, day garden irrigation
- \$440/acre
  - \$11,713.50 (incl. tax)



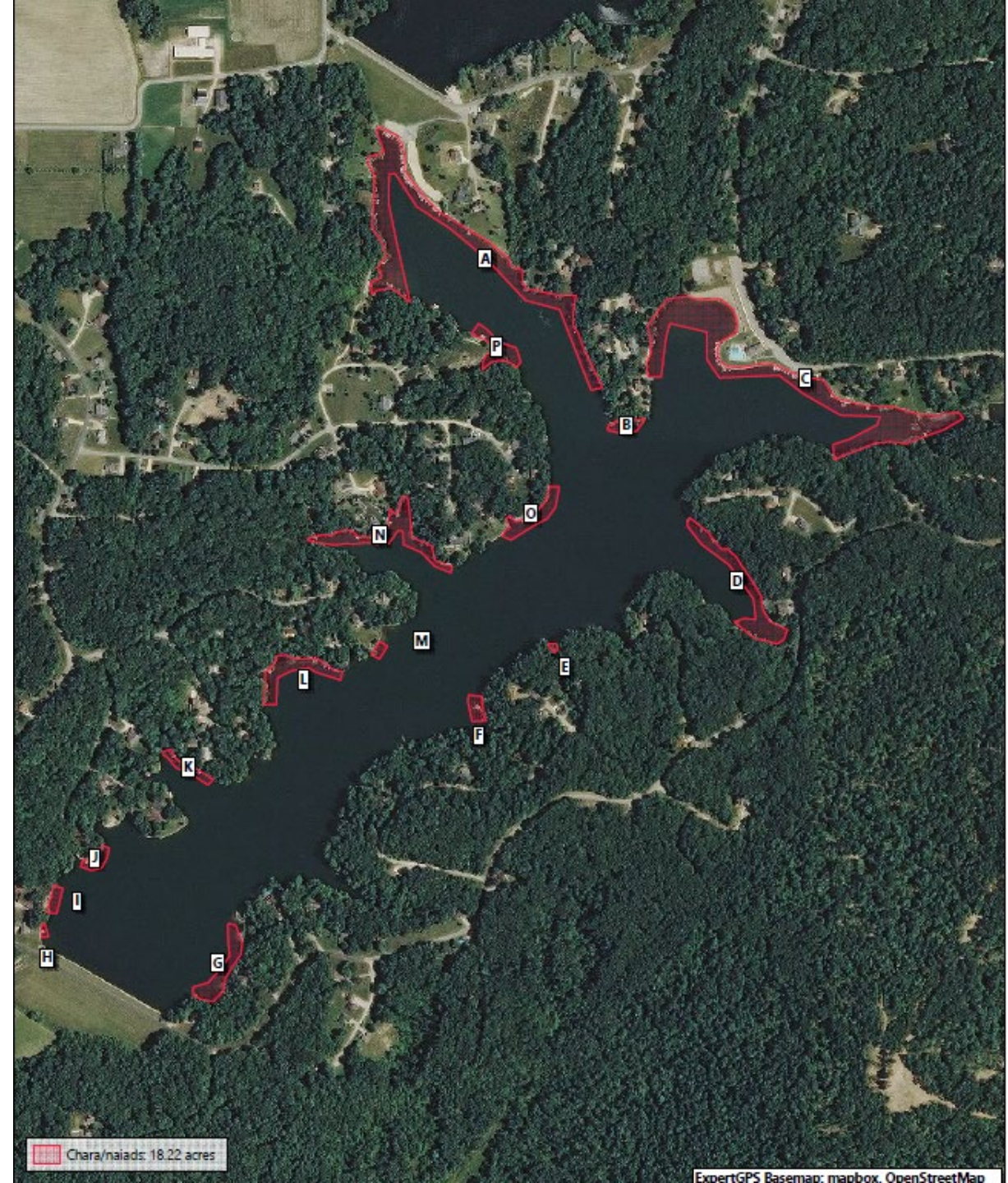






# June Survey/Treatment

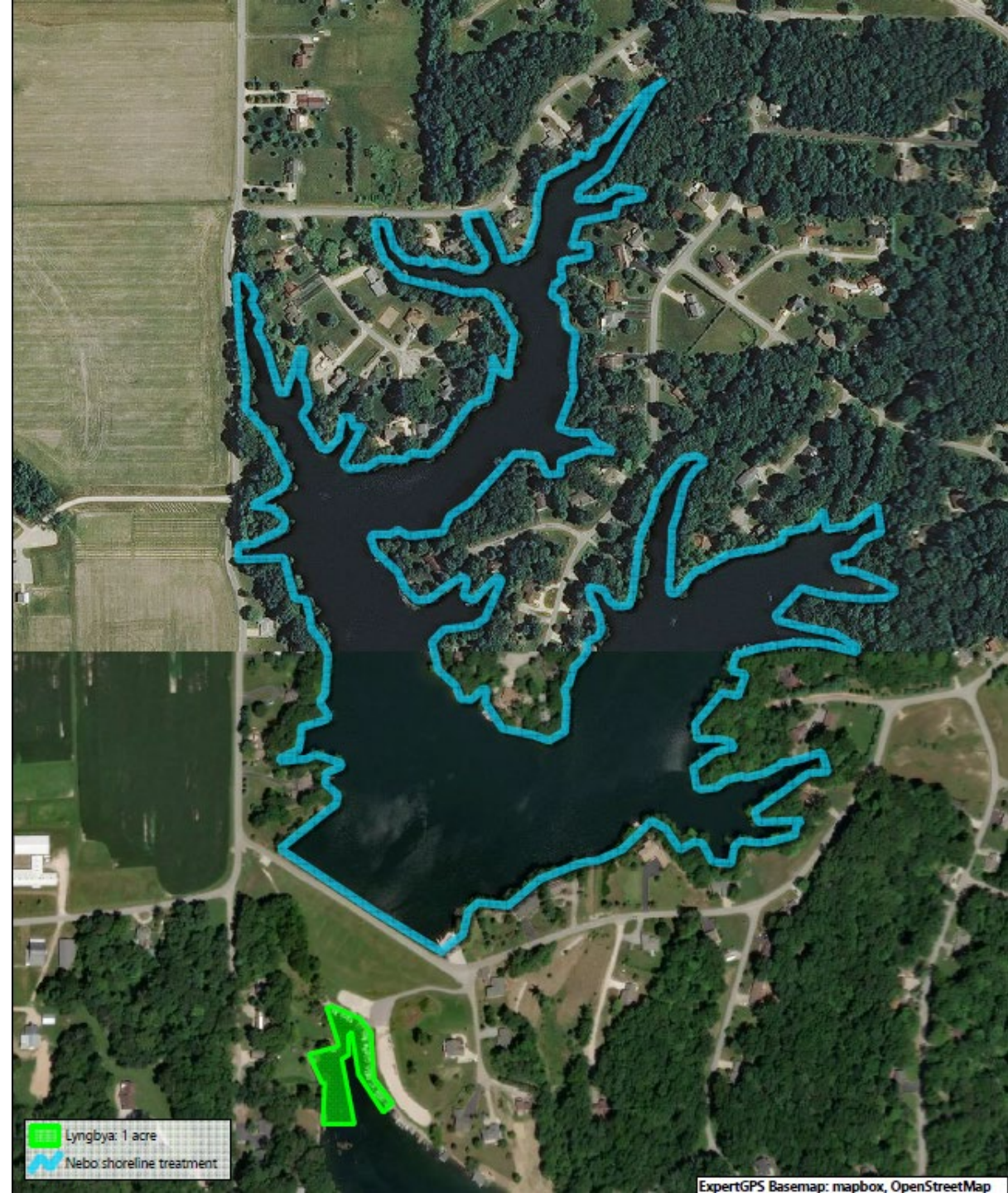
- 18.22 acres mixed Naiads and Chara
  - Some areas with other algae growth
  - Treated 6/21
- Flumioxazin herbicide
  - Used alone if no other algae growth
  - Mixed with copper sulfate or XTR if lyngbya/epiphytic algae present
- 3 day turf irrigation, 5 day garden irrigation
- \$200-333/acre
  - \$5,665.15





# July Survey/Treatment

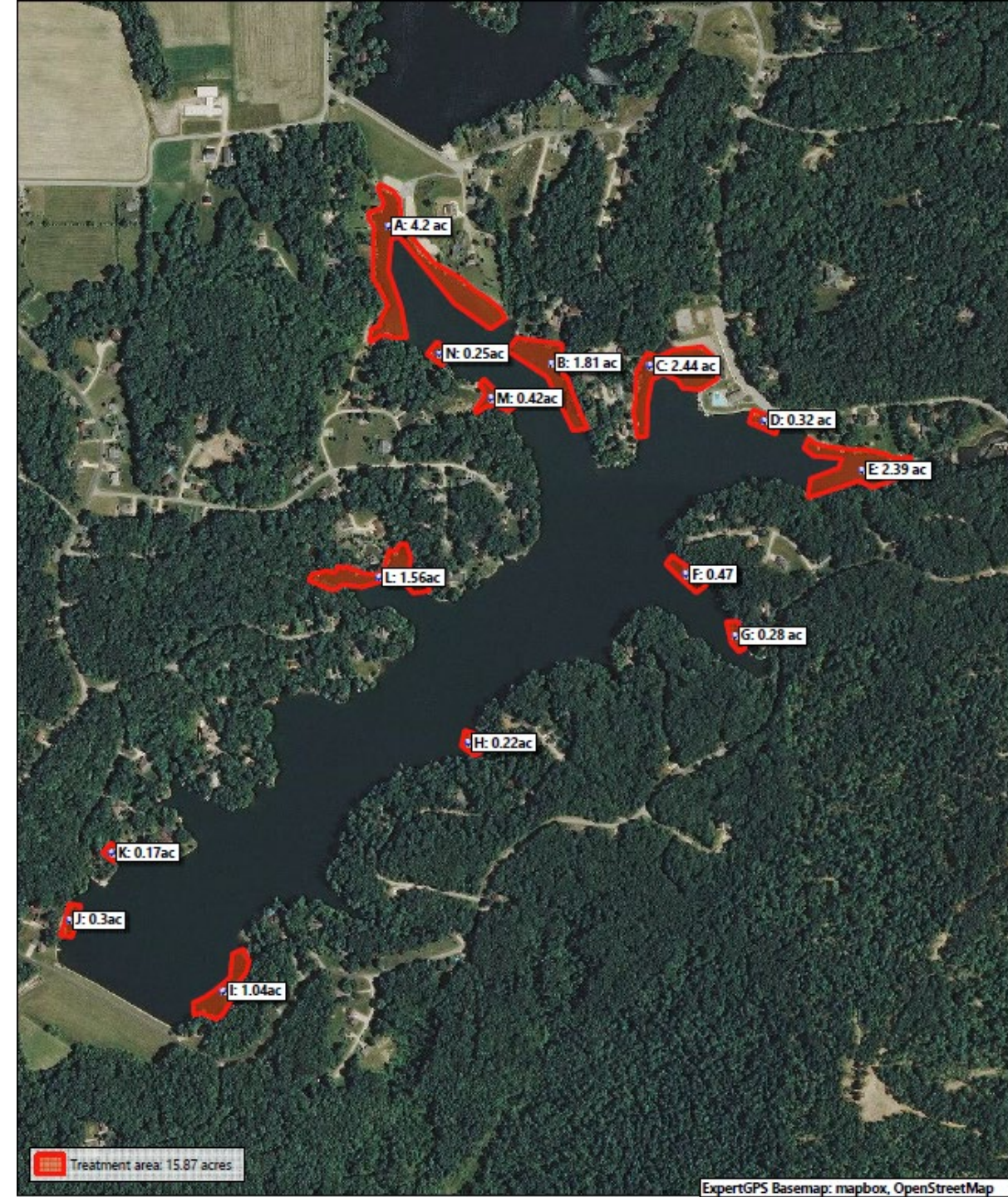
- 1.0 acres dense lyngbya+Nitella near Holiday ramp
  - Other areas not impaired or potentially so
  - Treatment w/Nebo shoreline filamentous algae
- Flumioxazin w/ Captain XTR
- Copper sulfate on Nebo
- 3 day turf irrigation, 5 day garden irrigation
- \$2,059.75 total





# August Survey/Treatment

- 15.87 acres mixed chara/lyngbya and chara/naiads
  - Spot treatment of a few areas on Nebo (no charge)
- Cutrine Ultra+Flumioxazin for chara/lyngbya mix
- Nautique+Reward for Chara/Naiad mix
- Copper sulfate on Nebo
- 3 day turf irrigation, 5 day garden irrigation
- \$286-\$378/acre
  - \$5,297.82 total



# September Survey/Treatment

- No areas surveyed to be impaired or in need of treatment
- Water temperatures cooling w/shortening day length reducing ability to grow
- Leafy pondweed growth along Nebo dam
  - Recommended not to treat due to time of year and growth not impairing water use
  - Provides critical late summer/fall habitat for young of year/hatchling fish



# Lake Treatment Review

- Stayed within budget (\$28,007.00)
  - \$1,993.66 surplus
- Monthly treatments seem to have suppressed HAB species in Holiday
- Prevention of impaired conditions achieved by monthly treatments
- Cutrine Ultra seems to have worked better than Captain XTR for Lyngbya control
- After spring invasive weed treatment main issue was chara (macro algae) growth

# Thank you!

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