Molecular survey for a recently introduced genotype of hydrilla in the United States

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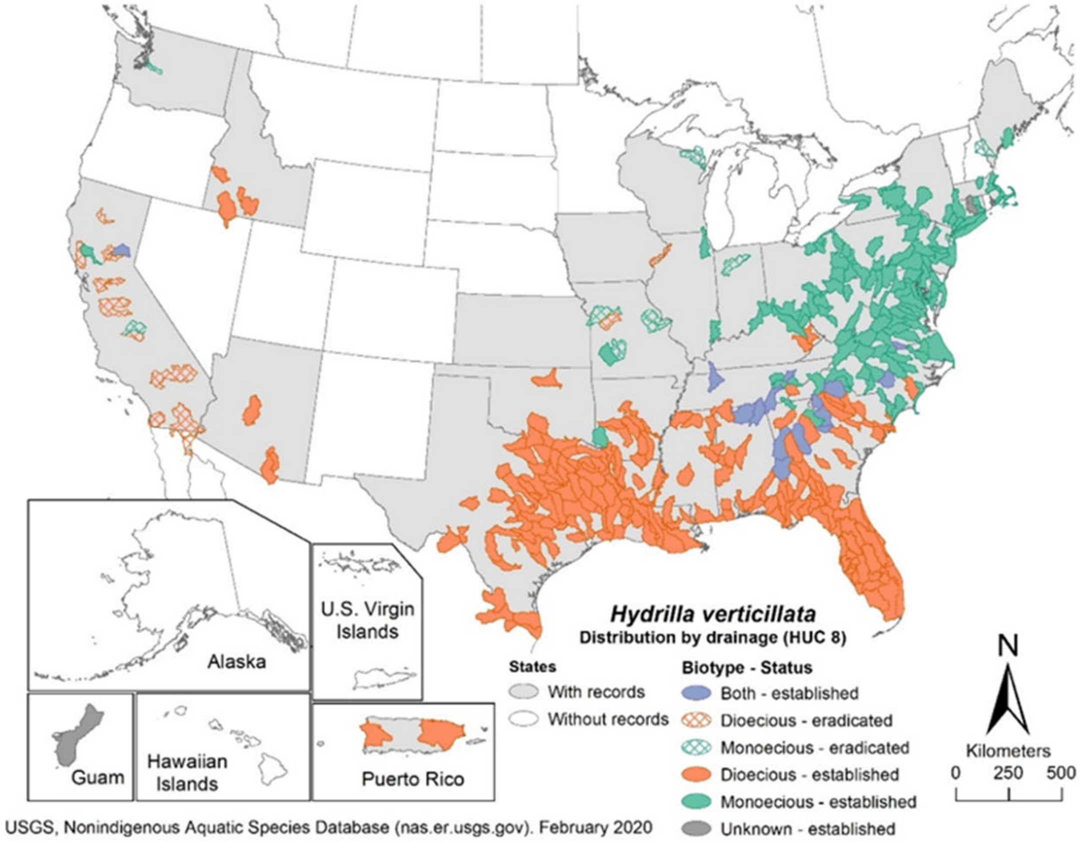
Distribution of invasive hydrilla biotypes



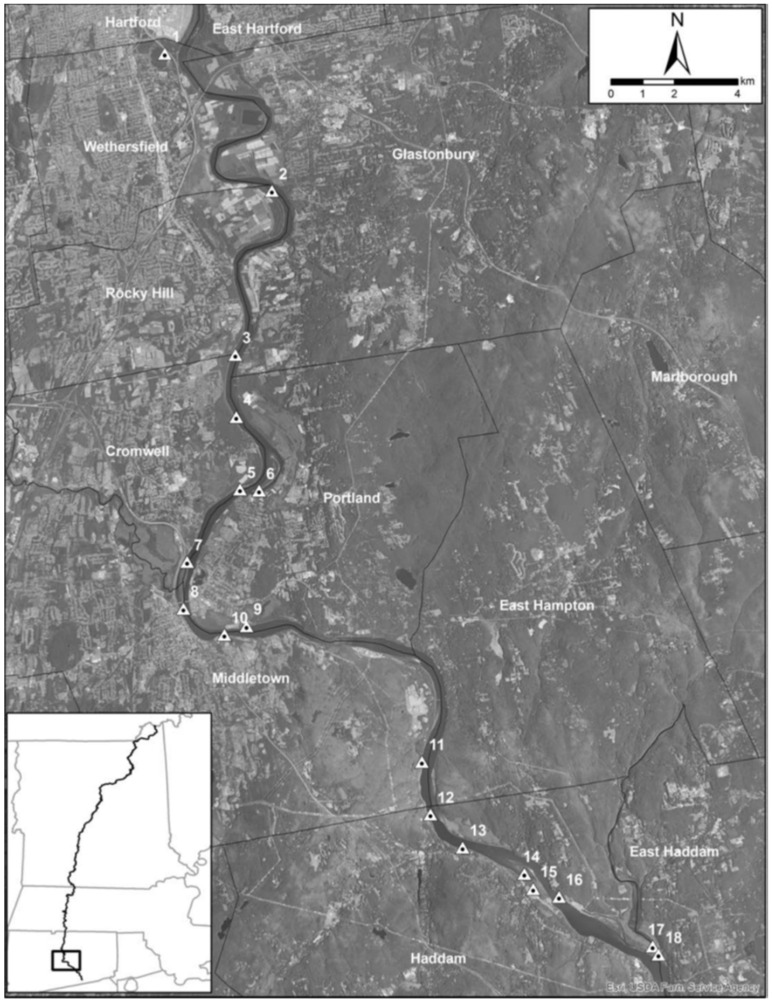
USGS, Nonindigenous Aquatic Species Database (nas.er.usgs.gov). February 2020

Monoecious genotype – native to Eastern China/South Korea

Dioecious genotype – native to India, Pakistan, China

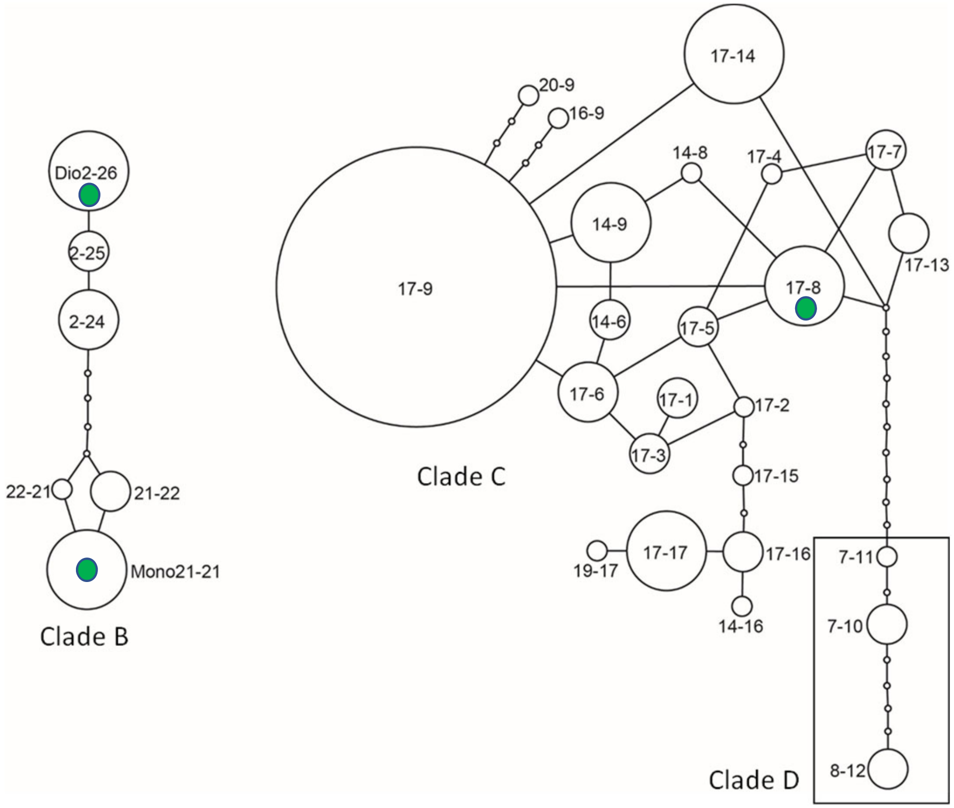
Worldwide, hydrilla can be grouped into 4 genetic clades (A, B, C, D)

Both Mono and Dio belong to clade B

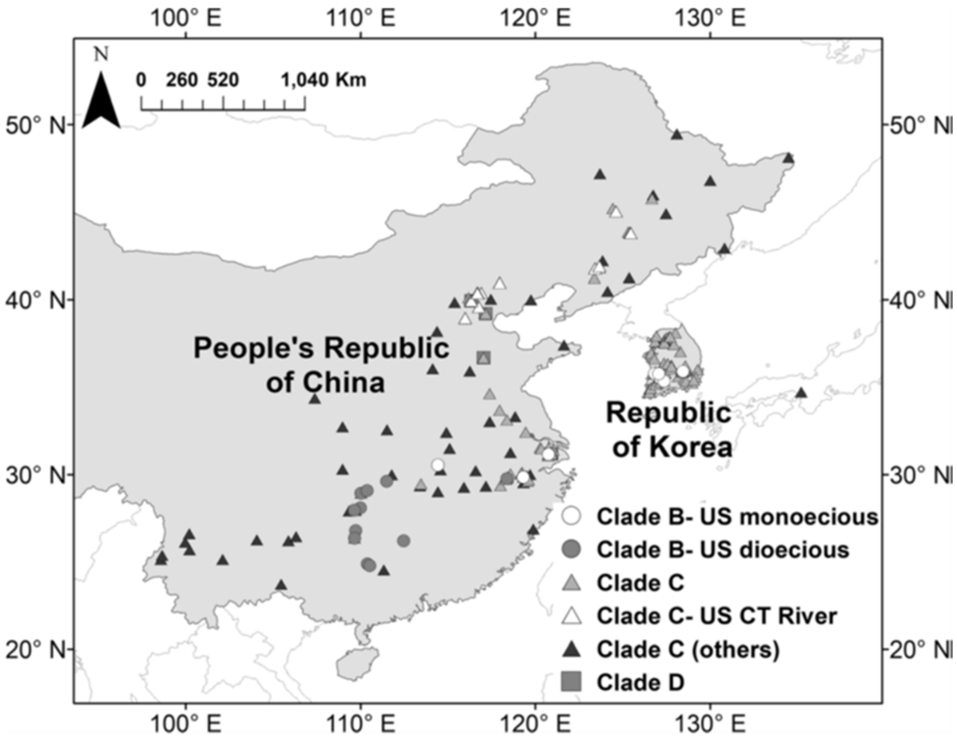


Evidence for a genetically distinct strain of introduced *Hydrilla verticillate* (Hydrocharitaceae) in North America (Tippery et al. 2020)

- Hydrilla was discovered in the lower Connecticut River in 2016
- Morphology seemed different
- Genetic testing indicated this hydrilla was from Clade C



*trn*L-F, *psb*M-*trn*D - cpDNA haplotype networks



- 17-8 has more northern distribution in China
- Some evidence from China that clade C can hybridize with clade B

Williams et al. 2018, Harms et al. 2020

1. Determine the geographic range of the new introduction by sampling the Connecticut River and water bodies within 50 miles of the river.
2. Determine the genetic diversity of the new Clade C hydrilla introduction.
3. Determine the biotypes (monoecious or dioecious) and genetic diversity present within and between 13 waterbodies of special concern to USACE.

Samples Received to Date
(n = 361)

NY – 54 (Nicole White, Mike Greer, USACE Buffalo)

PA – 89 (Nick Decker, Brody Adams, Staci Hall)

MA – 85 (Gabe Pelletier, Jake Riley, Ryan Robitaille, Tom Flannery)

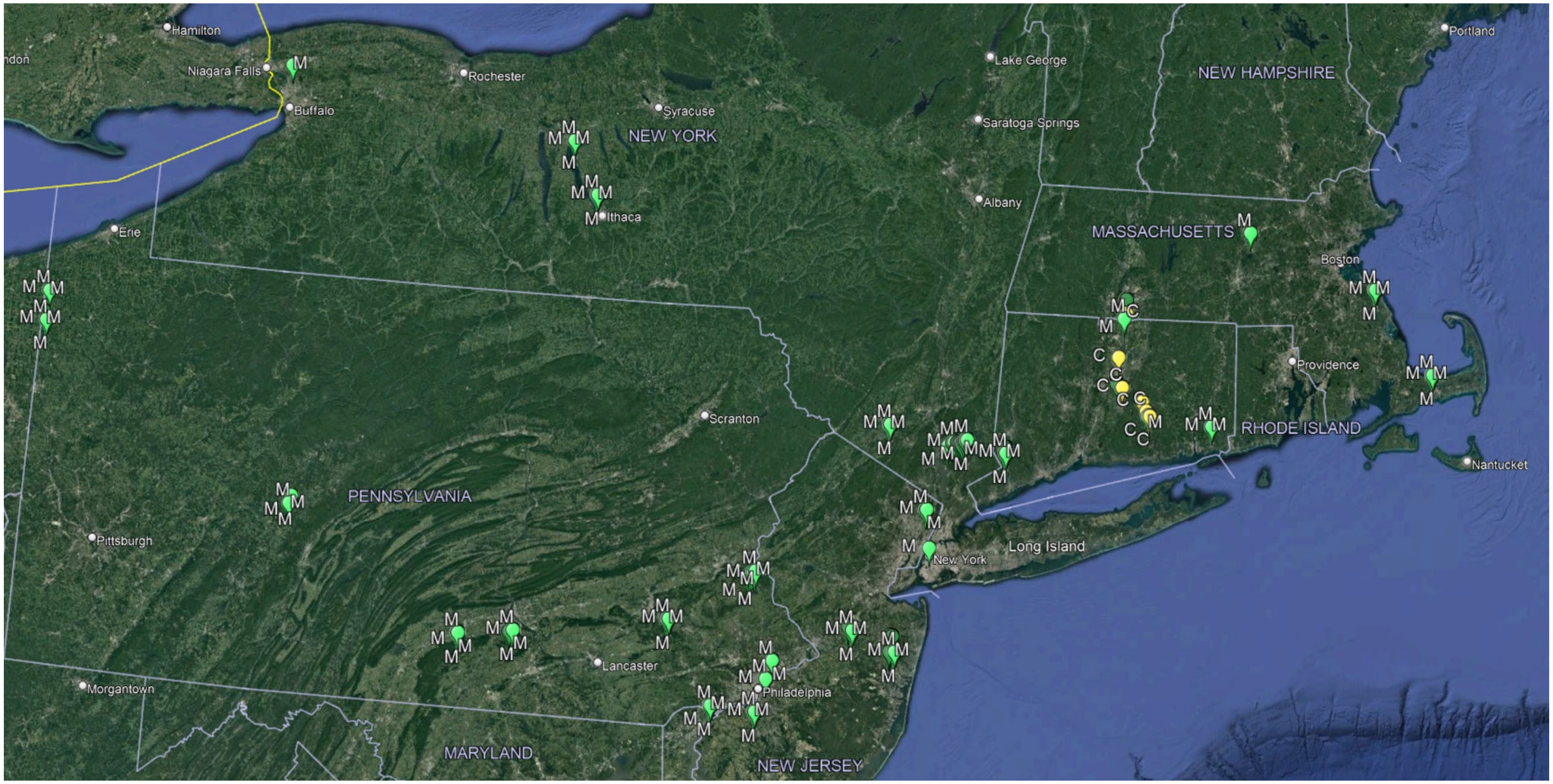
CT – 36 (Summer Stebbins, Greg Bugbee)

NJ – 97 (Heather Desko, Kyle Clonan)

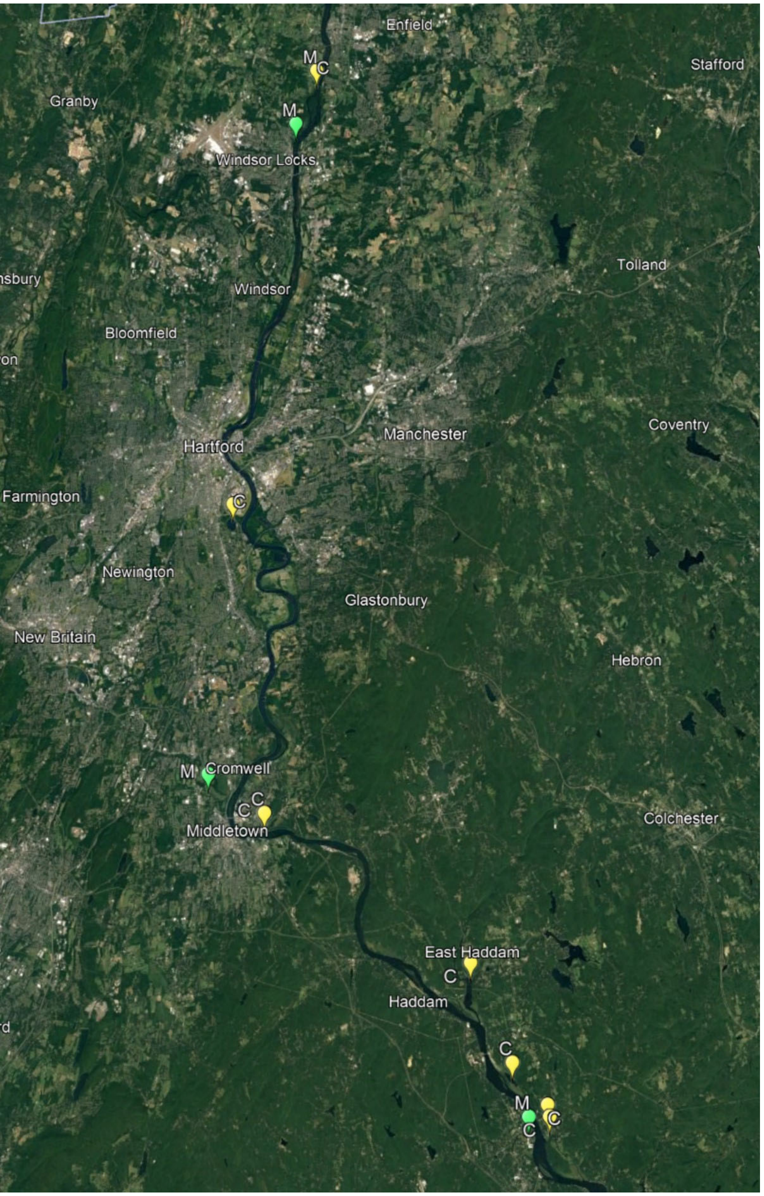
Genotyping

- DNA extraction
- Genotyping mononucleotide repeats in the cpDNA *trn*F region to determine clade, and mono versus dio
- Genotyping 6 nuclear microsatellite loci to determine clones

Results to Date



352 samples – Monoecious (green)
9 samples – Clade C (yellow)



Future Work

1. Continue genotyping samples as they arrive (can process ~1700 more)
2. Determine clonal lineages within monoecious and clade C hydrilla
3. In FY22, obtain more samples from within the 50-mile radius of where clade C was found and other areas

Acknowledgements

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