

Adaptive Management of Invasive Hybrid Cattails (*Typha x glauca*) at the Minnesota Landscape Arboretum

Introduction

Invasive hybrid cattails (*Typha x glauca*) displace native plants in wetlands across the Midwest. Hybrid cattails are the result of the cross-breeding of the native broadleaf cattail (*Typha latifolia*) and the invasive narrow-leaf cattail (*Typha angustifolia*). They form dense monocultures, reducing the diversity of flora and fauna in wetland communities.

Hybrid cattails have invaded multiple wetlands at the University of Minnesota Landscape Arboretum (Arb) located in Chaska, Minnesota. The Arb is 1,200 acres containing a mixture of display gardens, tree and shrub collections, and natural areas. One of our public-facing wetlands, Green Heron Pond, is a shallow open water pond part of a 32-acre wetland complex that includes the surrounding cattail marsh, shrub swamp, and sedge meadow communities. Vegetation surveys conducted in 2019 found that approximately 90% of the marsh was covered in hybrid cattail from shrub line to water's edge. There were scattered native species including swamp loosestrife (*Decodon verticillatus*), a state-listed Special Concern species that was planted here.

Project Goals

- Reduce hybrid cattail density and restore to native-dominated emergent marsh with greater plant diversity including bulrushes and sedges.
- Maintain the state-listed special concern swamp loosestrife population at the Arb.
- Restore plant species diversity and maintain with low-level effort by Arb staff.

Management Timeline

July 2020	Transplanted swamp loosestrife from Green Heron Pond to another pond on the Arb property (~125 plants)
Aug 2020	Herbicide spray from Marsh Master, a tracked amphibious vehicle*
Sept 2021	Herbicide spray via agricultural drone (Rantizo DJI Agras)*
June 2022	Planted over 1,000 plugs of native emergent marsh plants into cattail thatch
Sept 2022	Spot herbicide spray via backpack sprayers*
July/Sept 2023	Spot herbicide sprays via backpack sprayers*†

* 4 oz/gal aquatic glyphosate (MNL), † 2.5 oz/gal aquatic glyphosate (Arb)



Figure 1. Species planted in the cattail thatch included a. sweet flag (*Acorus americanus*), b. lake sedge (*Carex lacustris*), and c. giant bur-reed (*Sparganium eurycarpum*). Photo credits: Katy Chayka and Peter Dzuik via <https://minnesotawildflowers.info/>

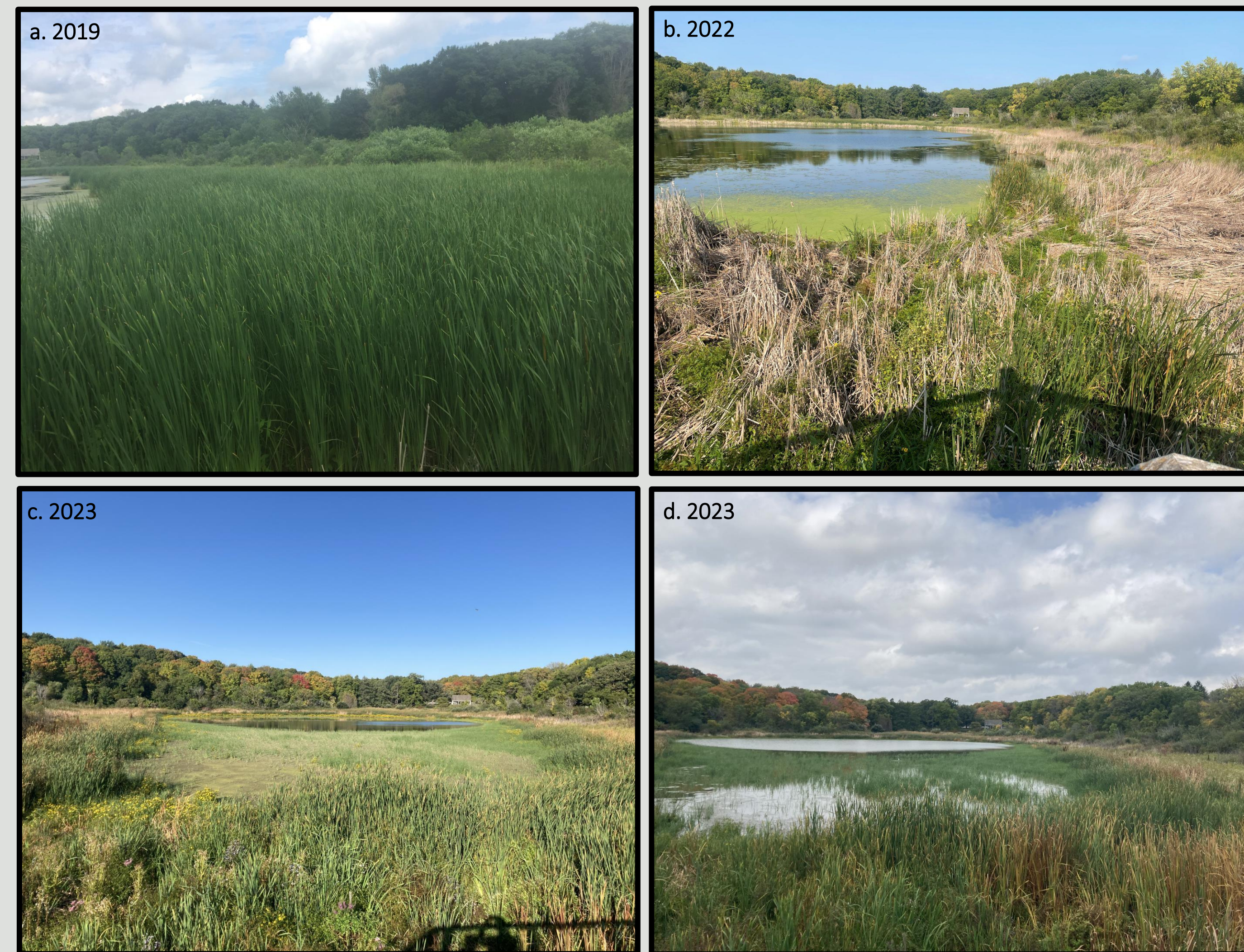


Figure 2. Progression of cattail cover from a. dense cattails in July of 2019, b. sparse cattails in Sept of 2022, c. expansion of cattails with extended drought in Sept of 2023, and d. expansion of cattails after heavy rain in Sept of 2023. Photo credits: Dan Tix and Sarah Rademacher.

Preliminary Results

- Following two intensive herbicide treatments there was a great reduction in cattail cover, but slow native plant recolonization in the cattail thatch
- **A reduction of cattails from 90% (2019) to about 25% cover or less (2022)**
- **An increase of native richness and cover (>90 species identified in 2022)**
- Successful establishment of numerous planted plugs, but not yet expanding
- Regrowth of cattail is primarily on the edge of the open water where it is more difficult to spray safely/effectively via backpack sprayer



Figure 3. Native perennial species that are recolonizing at the site include a. tufted loosestrife (*Lysimachia thyrsiflora*), b. Northern marsh fern (*Thelypteris palustris*), c. swamp loosestrife (*Decodon verticillatus*), and d. common boneset (*Eupatorium perfoliatum*). Photo credit: Sarah Rademacher.

Conclusions and Future Management

- **Two intensive herbicide treatments applied in August and Sept can significantly reduce the hybrid cattail cover with continued follow-up**
- Ongoing treatments are needed to further reduce cattail density and discourage resprouting; expanded area within open water may become a future challenge
- Supplemental plantings may be added into the cattail thatch to further encourage native plants and increase competition against hybrid cattails

Project Challenges

- Dropping water levels due to irrigation and drought allowed cattails to expand into the open water areas
- Tricky site access due to floating mat and muck
- Budget limited to grant funding to start project
- Public perception of project in highly visible area
- Thick cattail thatch slowing native plant response
- Increased abundance of invasive purple loosestrife (*Lythrum salicaria*) and yellow iris (*Iris pseudacorus*)
- Planted swamp loosestrife on site – MN special state concern

Treatment Pros & Cons

Marsh master

- + Good site access, could get close to waters edge
- + Can store large amounts of herbicide
- + Ability to spot spray and boom spray
- Possible impact to floating mat/soil
- Crushes vegetation needed to spray



Drone spray

- + Easy site access
- + No soil disturbance/impact
- + Ability to spray via georeference and manual view
- Needs repeated refills and battery changes
- Harder to avoid non-target species



Backpack spraying

- + Cheaper costs
- + Easier to avoid non-target species
- Limited access in periods of high water/muck
- Repeated sprays needed for thick patches
- Needs repeated refills



Figure 4. Herbicide sprays via a. Marsh Master, b. agricultural drone, and c. backpack sprayers. Photo credits: Steve Van Natta, Zach Glauert, and Annie Gunness.

Acknowledgments

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Scan for more info:

