Wild Celery (*Vallisneria americana*) Restoration Project

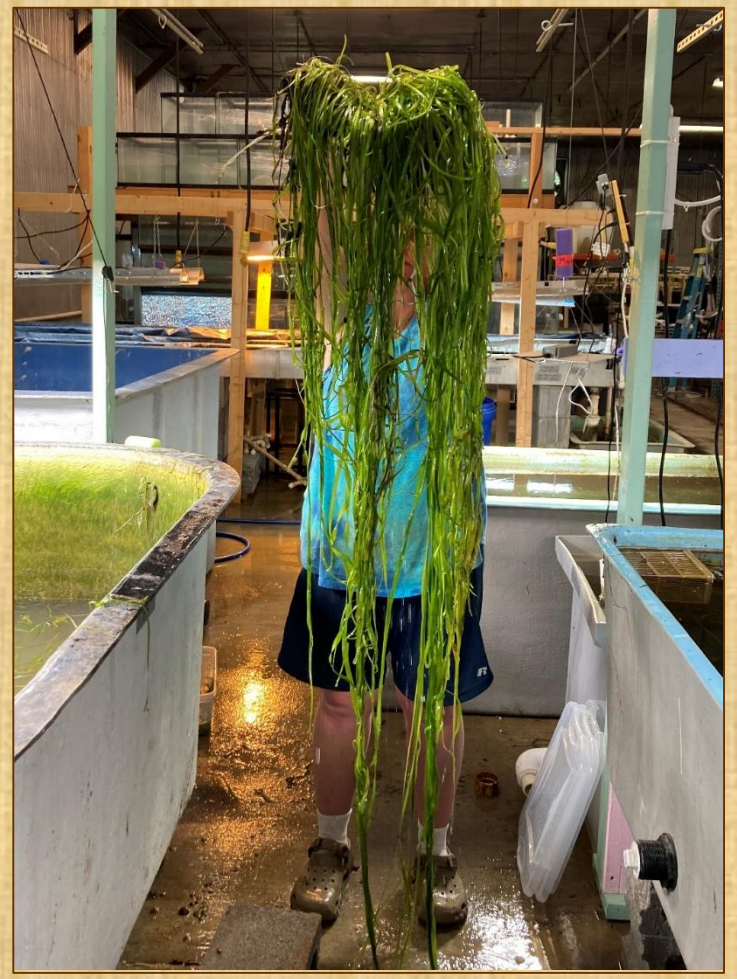
Chesapeake Bay SAV Workgroup

March 15, 2023

Sara Sweeten, Ph.D., Research Scientist, PI
Dept. of Fish and Wildlife Conservation
Virginia Tech
101 Cheatham Hall
Blacksburg, VA 24061
Cell Phone: (618)841-0219
Email: sweeten@vt.edu

A Unique Technique

- **Grown in aquaculture center**
  - Reduces risk of spreading other aquatic invasives
  - Does not remove much from the wild- just a few seed pods
- **Large, mature plants**
  - If the leaves are at/near surface**, turbidity isn't much of an issue**
  - Can handle harsher conditions better than small plants
- Transplanted like sod in one square foot sections
  - Instant SAV patch that will expand in the first growing season

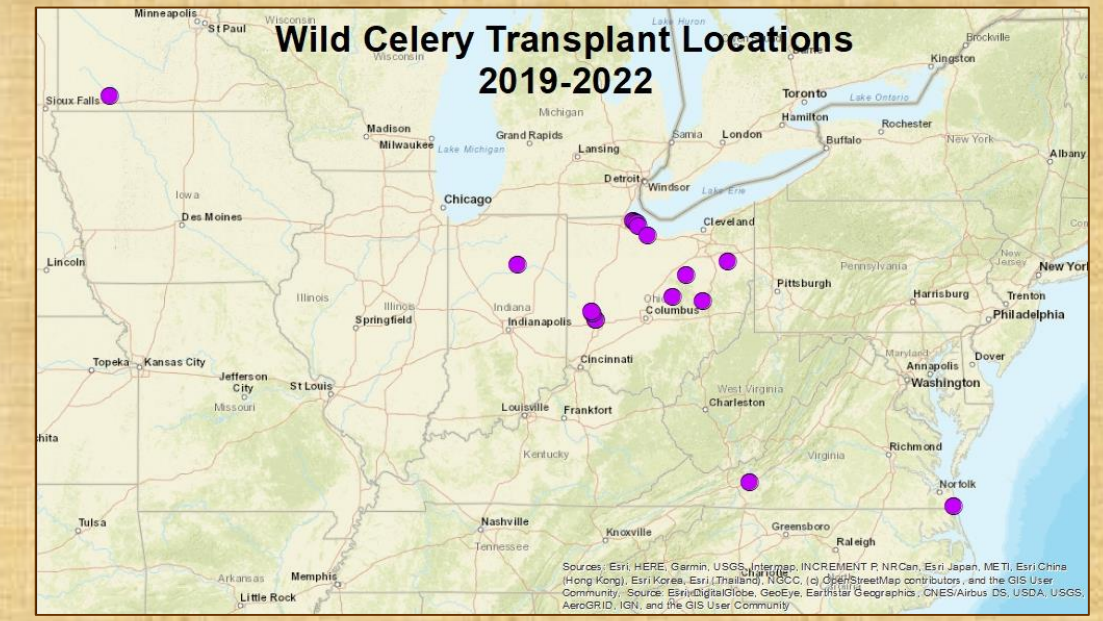


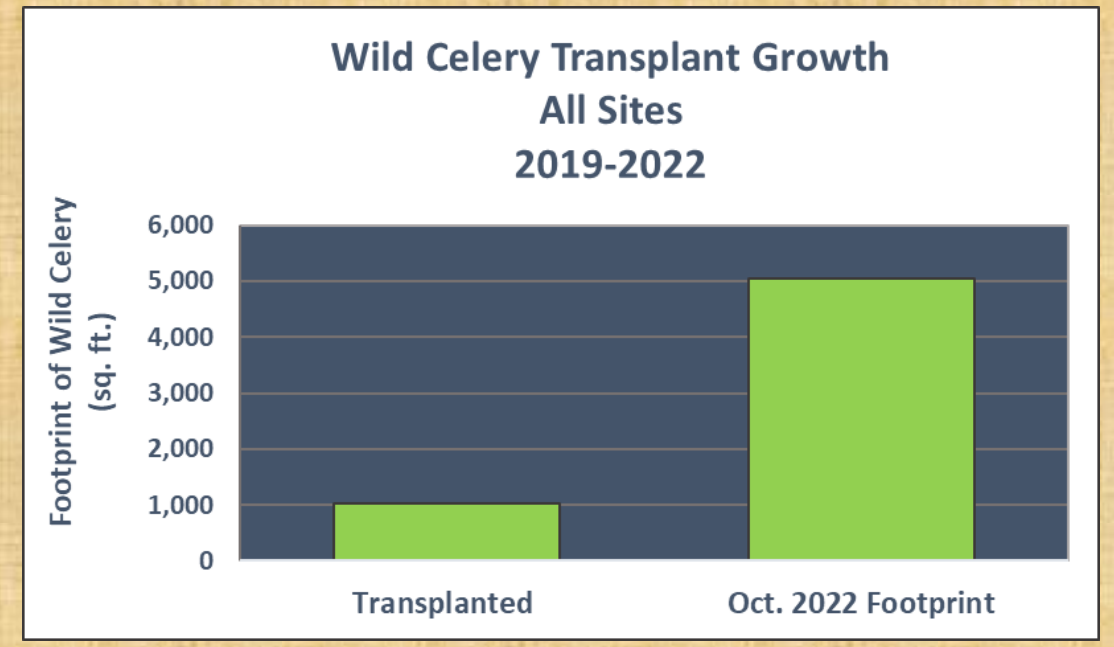
A Unique Technique

- Many have flowers and seed pods at planting
  - Promotes natural reproduction throughout system in first season
- Tubers are developed
  - Gives the plant resiliency
- Creation of protected “Founder Colonies”
  - Protected area of mature plants that can help regenerate a system naturally through direct spread and seed dispersal

Overall Results: 2019-2022

- All sites combined:
  - Since the start of the project in 2019:
    - **1,014 sq. ft.** of wild celery transplanted
  - Footprint as of Oct. 2022:
    - **5,042 sq. ft.** of wild celery (**397%** increase)
- These results are consistent across most locations
  - 31 waterbodies in four states





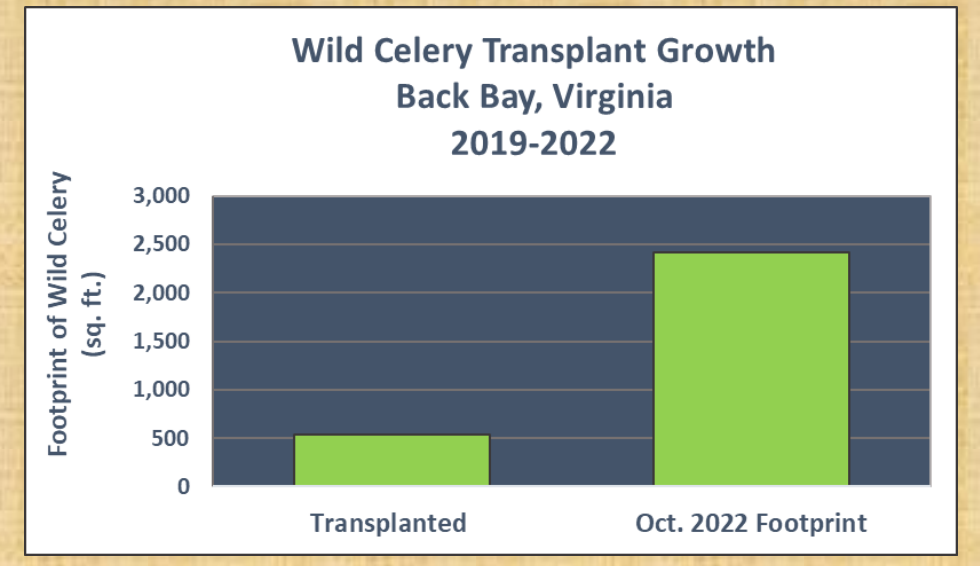
Successes: Back Bay, Virginia

(The "Other" Bay)

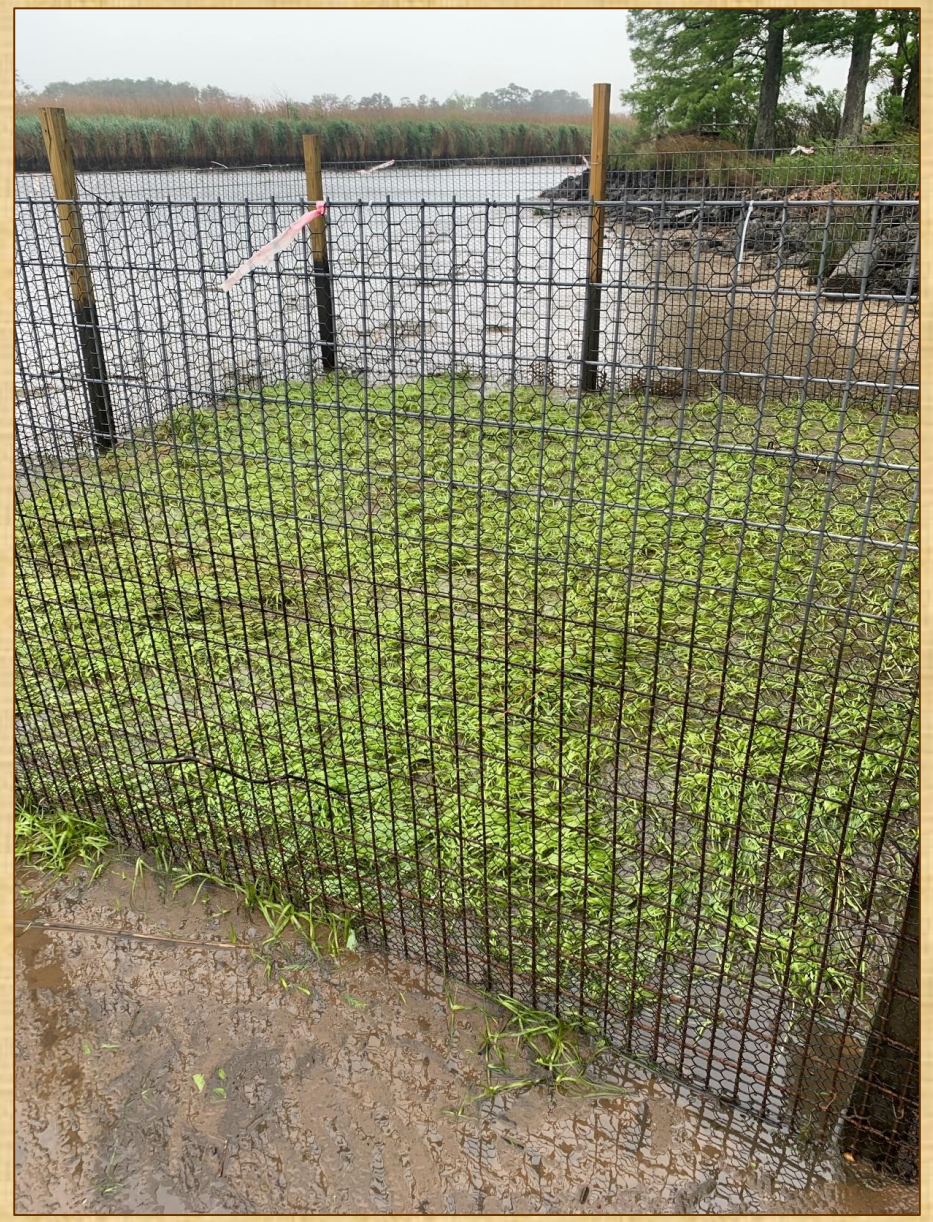
Transplanted (2019-2022): **538 sq. ft.**

Current Footprint: **2,414 sq. ft. (349% increase)**

- Challenges at this site:
  - High Turbidity 🙂
  - Harsh bay conditions 🙂
    - Marriage between gray and green infrastructure
  - Predation 💥
  - Multiple dry-outs from low water 🙂



Dry-out events: Back Bay

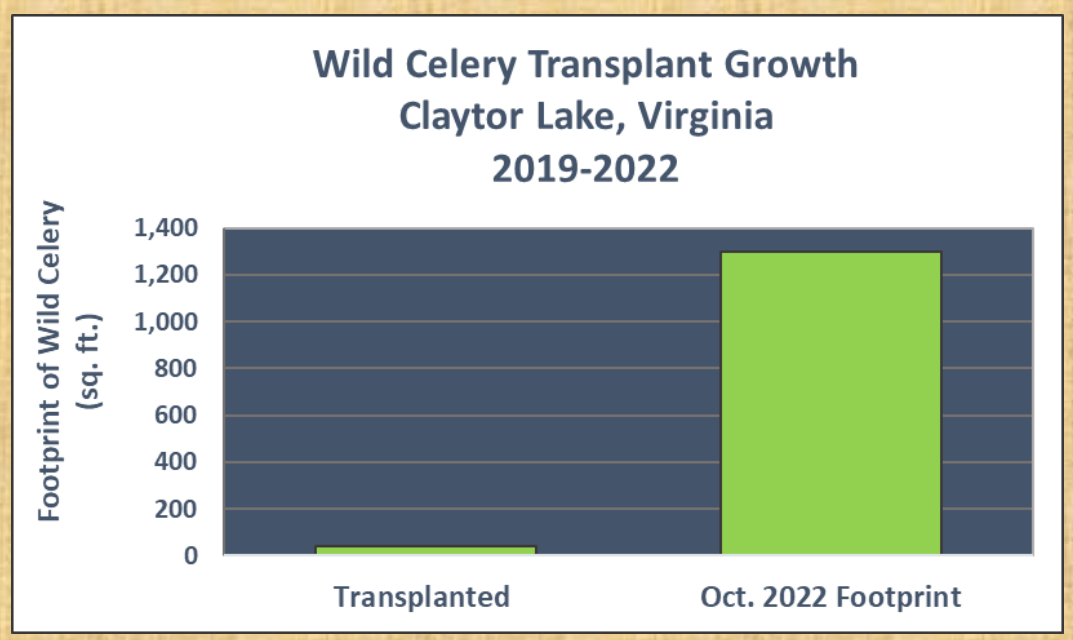


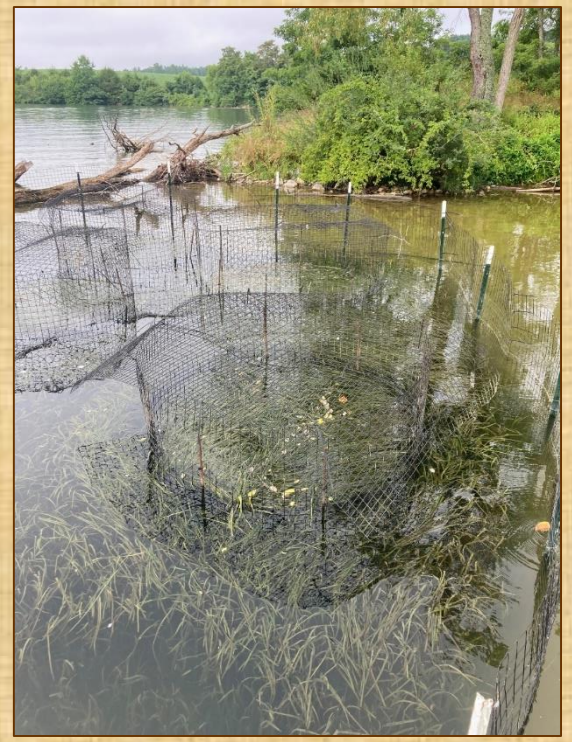
Successes: Claytor Reservoir, Virginia

Transplanted (2019): **39 sq. ft.**

Current Footprint: **1,300 sq. ft. (3,233% increase)**

- Challenges at this site:
  - High Turbidity ☺
  - Predation: Grass carp ✸
  - Multiple dry-outs ☺





Dry-out Events: Claytor Lake

Predation:
The Biggest Challenge to Wild Celery Restoration

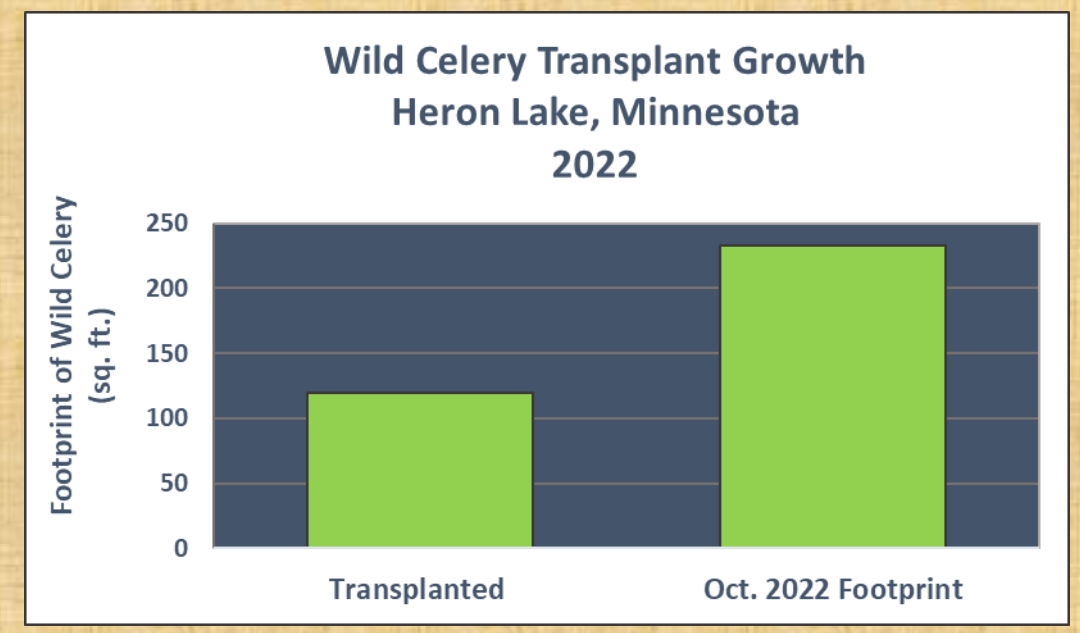
- Caging plants to prevent predation
  - The greatest thing about this plant is everything likes to eat it
  - The worst thing about this plant is everything likes to eat it
- Creation of founder colonies
  - Protected mature plants that ensure yearly seed production
  - Provides population source

Successes: Heron Lake, Minnesota

Transplanted (June 2022): **120 sq. ft.**

Current Footprint: **233 sq. ft. (94% increase)**

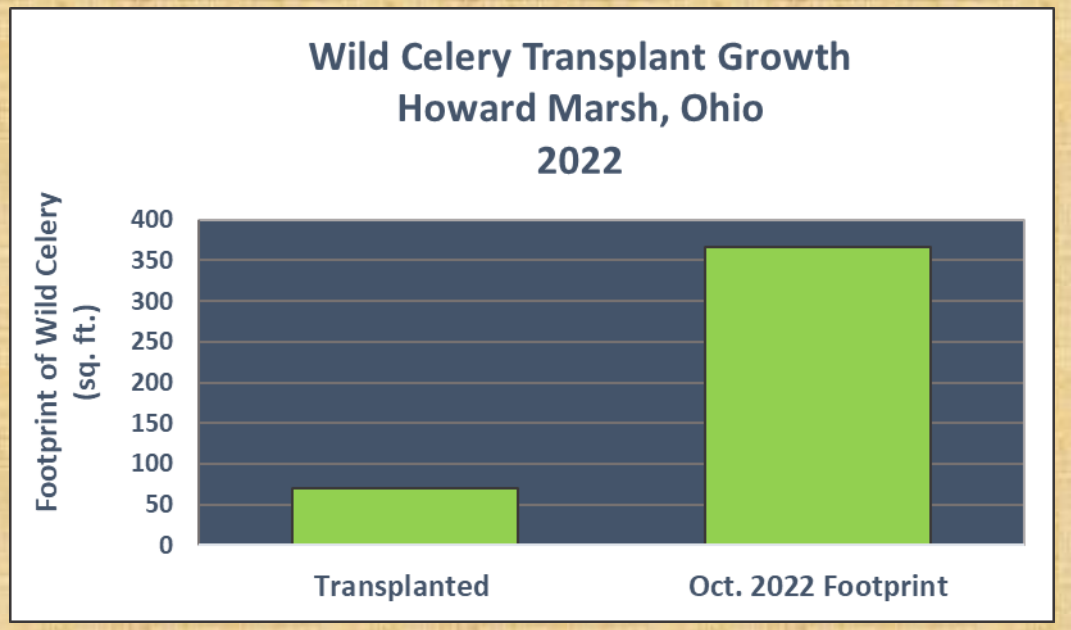
- Challenges at this site:
  - High Turbidity ☺
  - Predation ✸



Successes: Howard Marsh, Ohio

Transplanted (July 2022): **70 sq. ft.**
Current Footprint: **366 sq. ft.**

- A 423% increase in 12 weeks
- Most productive site of 2022



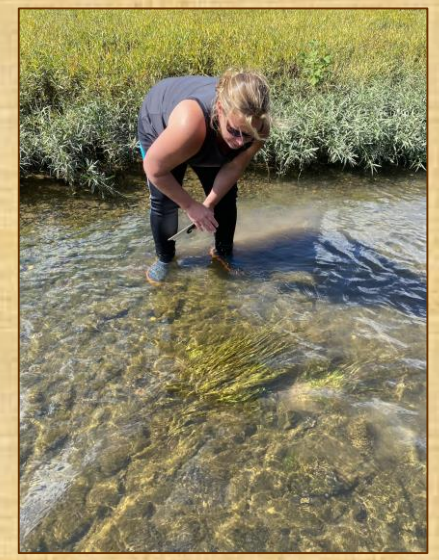
Competition/Planting Locations

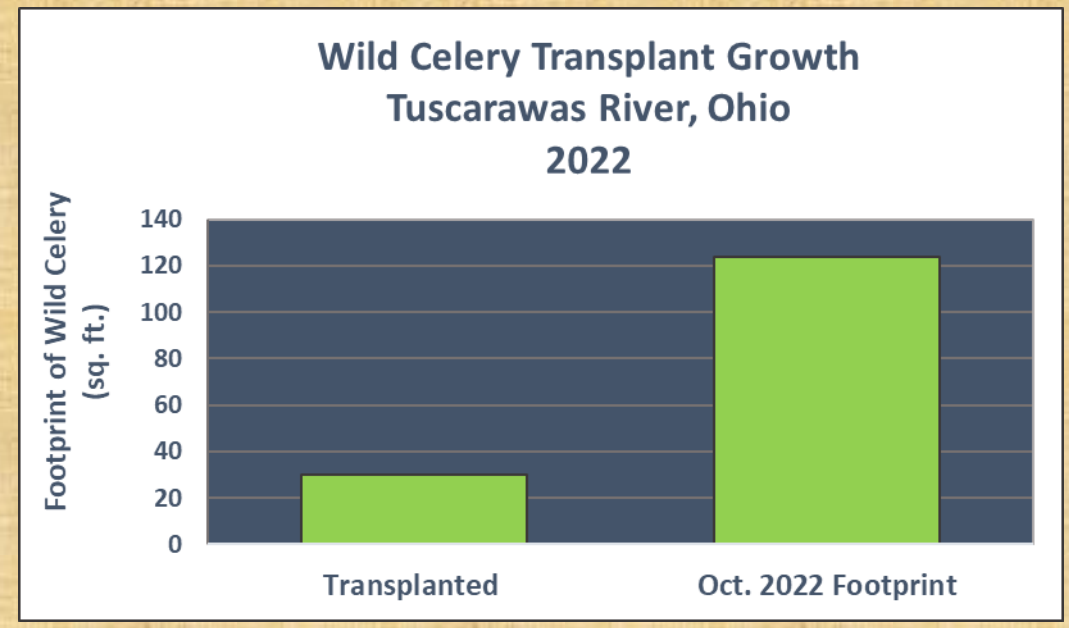
- High Energy Transplant Areas
  - Back Bay
    - Marriage between grey and green infrastructure: Success!

Successes: Tuscarawas River, Ohio

Transplanted (July 2022): **30 sq. ft.**
Current Footprint: **124 sq. ft.**

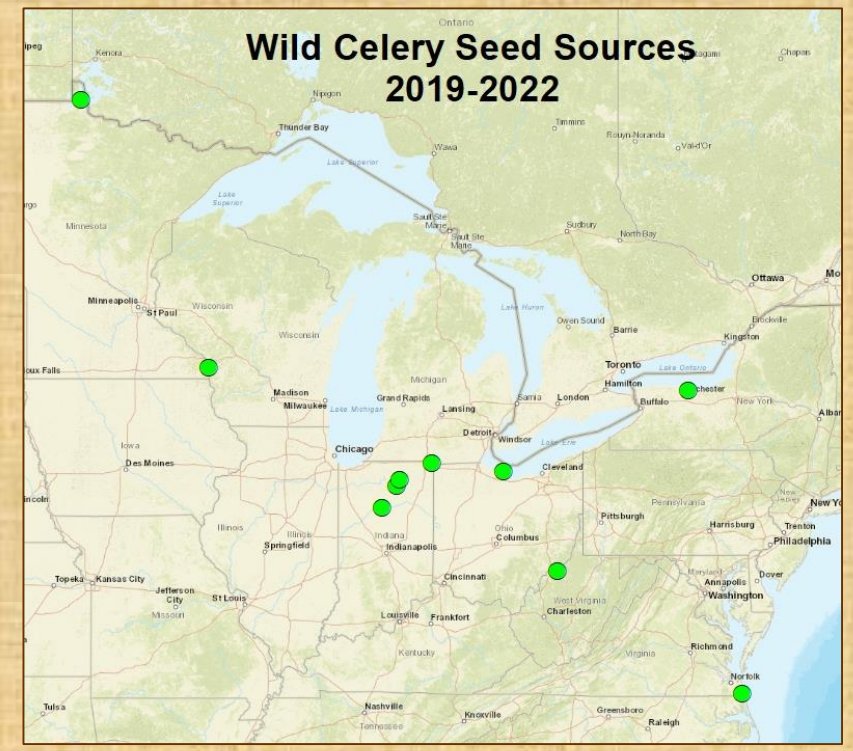
- A 313% increase in only 12 weeks
- Better understanding of riverine environment





Propagation Successes

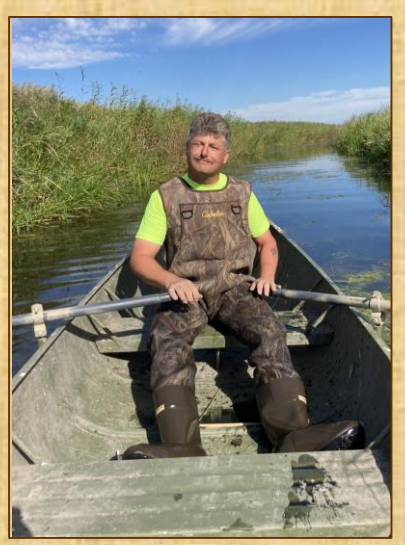
- Continuing to collect seed stock from throughout range
- Mobile Grow Facilities in two locations in 2021.
  - Worked well
  - Reduces the cost of the plants to grow at site
- Exploring new grow-out options to reduce cost
- Upped production in Lab
  - Doubled plant production each year
- Working on new matting techniques



Partners and Sponsors

- Waterfowl Research Foundation
- Private Donors
  - John Childs
  - Mike Mooney
  - Tim Robertson
  - Toby Buck
- The City of Virginia Beach
- U.S. Fish & Wildlife Service
  - Back Bay National Wildlife Refuge
  - Ottawa National Wildlife Refuge
  - Partners for Fish & Wildlife
  - Ohio Ecological Services
- Virginia Department of Wildlife Resources
- Ohio Department of Natural Resources
- Toledo Metroparks
- Muskingham Watershed Conservancy District
- Heron Lake Farms
- Ohio State University
- Winous Point Marsh Conservancy
- Ecosystems Connections Institute, LLC
- U.S. Geological Survey
- The Nature Conservancy
- Virginia House Delegate Barry Knight
- Back Bay Restoration Foundation
- Lynnhaven River NOW
- So many individual volunteers!









Questions for the Experts

- Genetics
  - Local vs. Bottleneck
- Predators
  - Who?
  - Ideas on how to identify?
- Better Caging Options