Flowering Rush Biocontrol

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Montana Biocontrol Coordination Project

MT Biocontrol Coordination Project

- The Montana Biocontrol Coordination Project (MTBCP) is a soft-funded, grassroots effort initiated in 2013 by federal, state, county, non-profit, tribal, and private land managers throughout Montana who saw a need for increased coordination within the state's weed biocontrol program
- We conduct a program assessment every 5 years to ensure we are providing the deliverables that MT land managers are in need of

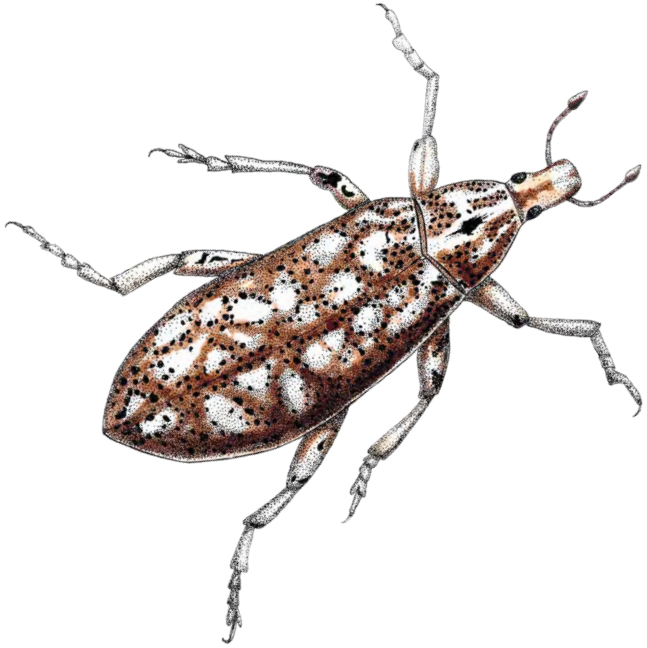
Mission: Provide the leadership, coordination, and education necessary to enable land managers across Montana to successfully incorporate biocontrol into their noxious weed management programs.

Current Focus Areas for MTBCP

- Insect collection and distribution
  - For abundant and effective biocontrol systems in MT
  - Work with a variety of land managers throughout MT to host collection days and ship insects to managers in need
- Education
  - Workshops, presentations, educational materials, share research updates, social media
- **Monitoring**
  - **New biocontrol systems are the priority**
  - Working with agencies to establish a comprehensive plan
  - **Research needs**

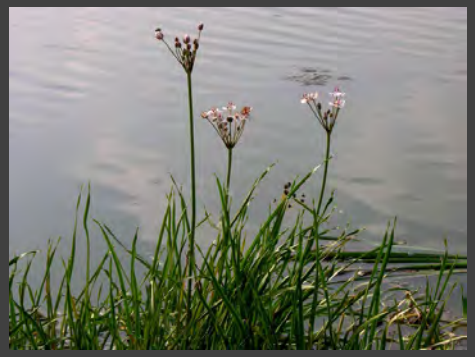
Classical Biological Control of Invasive Weeds

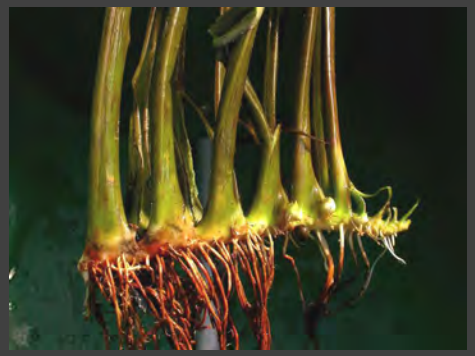
….is the deliberate release of specialized natural enemies from the weed's native range to reduce the weeds abundance or spread in its introduced range.



Flowering Rush

- Flowering Rush *(Butomus umbellatus)* is a non-native, aggressive freshwater invasive
  - Rapidly colonizing wetlands, lakes, slow-moving rivers, canals and irrigation ditches
  - Both emergent and submerged growth forms
  - Both triploid and diploid
  - Disperses through rhizome fragments and buds
- Current management options include herbicide, covering, hand-pulling, digging, diver assisted suction, and dredging
  - BUT MANAGEMENT IS DIFFICULT!!!!





Flowering Rush in Montana

- Currently, the upper most population of flowering rush in the Columbia Basin is in Montana
- Discovered in Flathead Lake in 1964
- In 2008, flowering rush had infested over 2,000 acres of the lake and has since dispersed up the main tributary of the Flathead River
- Also spread downstream into the Clark Fork River, which feeds Lake Pend Oreille in Idaho
    - First found in Lake Pend Oreille in 2007

Flowering Rush Biocontrol

- Flowering rush is an excellent candidate for biocontrol because it is the only species within Butomaceae family
- Consortium formed in 2013
  - CABI, WA, MT, MS, ID, AB, B.C.
  - Fundraising
- CABI – Overseas research & development
  - Literature and field surveys to find potential agents
  - Conduct host-specificity tests
  - Conduct impact studies
- Determine North American and native genotypes
  - Ensure potential biocontrol agents attack NA genotype
- 18 insects and 6 fungal pathogens were recorded to develop on flowering rush

Flowering Rush Biocontrol

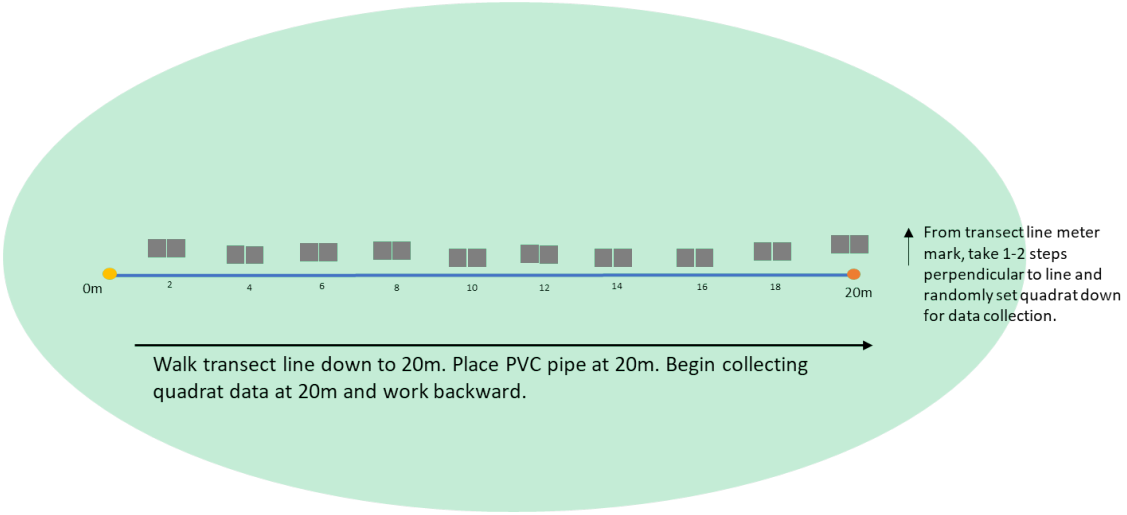
- Currently, the primary candidate biocontrol is *Bagous nodulosus* a leaf and rhizome-mining beetle
  - Adults live mainly underwater
  - Larvae develop in leaves & rhizomes (May-September)
  - Larvae leave plants and swim to other plants
  - Overwinter as adults
- Host-specificity tests completed in 2021
  - No-choice oviposition test
  - Adult feeding tests
  - No-choice larval establishment tests
- Rearing in quarantine began in 2022 at ARS in Sidney, MT
- Petition was submitted to USDA-APHIS in April 2022

Flowering Rush Weevil Release Sites

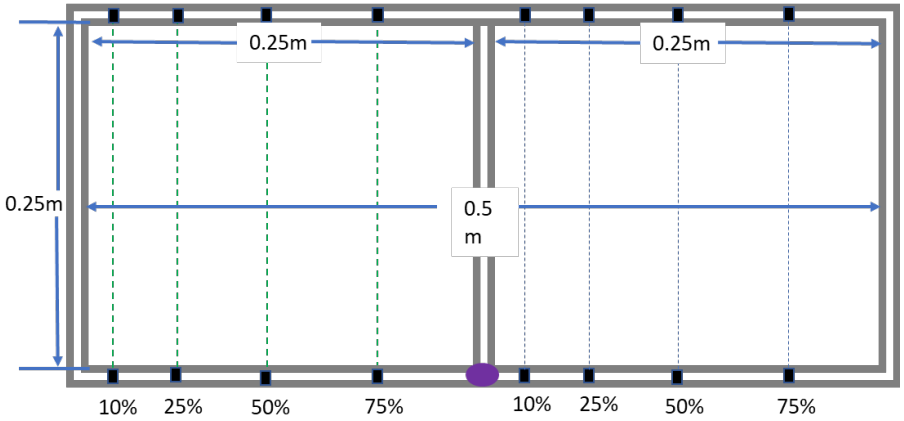
- Site searches on and around Flathead Lake began in 2022
- Looking for sites where 1) the water isn't more than 3 feet deep, 2) are under water all year, and 3) large enough infestations to establish 20 m transects
- Most ideal sites identified:
  - Ducharme Fishing Access – began monitoring in 2023
  - Thompson Reservoir – decided to drop
  - Fennon Slough – working towards access for monitoring in 2024

Flowering Rush Weevil Pre-Release Monitoring

- Collaborated with WSU Extension, USDA-ARS, and ID BLM to develop the pre/post-release monitoring protocol
  - Utilized a soil corer protocol developed by US Army Corps of Engineers



Flowering Rush Weevil Pre-Release Monitoring



Frame	% Cover Other Visible Vegetation	% Cover Open Water	% Cover Flowering Rush	Total (adds up to 100%)	Tallest Leaf (Measured from Water Surface)	Water Depth (Substrate to Water Surface)	# of Flowering Plants	# of Leaves	Feeding Damage Rating	Other Invasive Species Present (Y/N)?	Other Native Species Present (Y/N)?	Picture (Y/N)?	Notes
1													
2													
3													

Flowering Rush Weevil Pre-Release Monitoring – Next Steps

- Consistent monthly site visits for 12 consecutive months to gain insight to the variable nature of these aquatic sites
  - Water/ice/duff depth, water/duff temperature, flower rush state (emerging, green/growing, senescing, dormant), photo points
- Ideally obtain 3 years of pre-release data before releasing the weevils at sites
  - Anticipated approval for field release in 2025
  - Establish artificial ponds for mass rearing
- Soil cores will begin in 2024
- Cages will be fabricated and tested in 2024
  - Installed when initial releases are made

Questions

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