

# Flowering Rush Biocontrol: Future Funding and Research



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# Flowering Rush Biocontrol Consortium

- Began in 2012
- Partnership between WA, MT, ID, B.C., AB, CABI, MN, MS...
- Updates provided to distribution list
- Outline
  - impact data needs
  - test plant list
  - funding



# Flowering Rush Impacts

- FR impact data needed
  - strengthen biocontrol petition
  - increase likelihood of additional funding
- Economic impact
  - herbicide, mechanical costs
- Ecological impact
  - system impacts?
  - salmonid impacts?!?!?
- Human health/  
recreational impacts

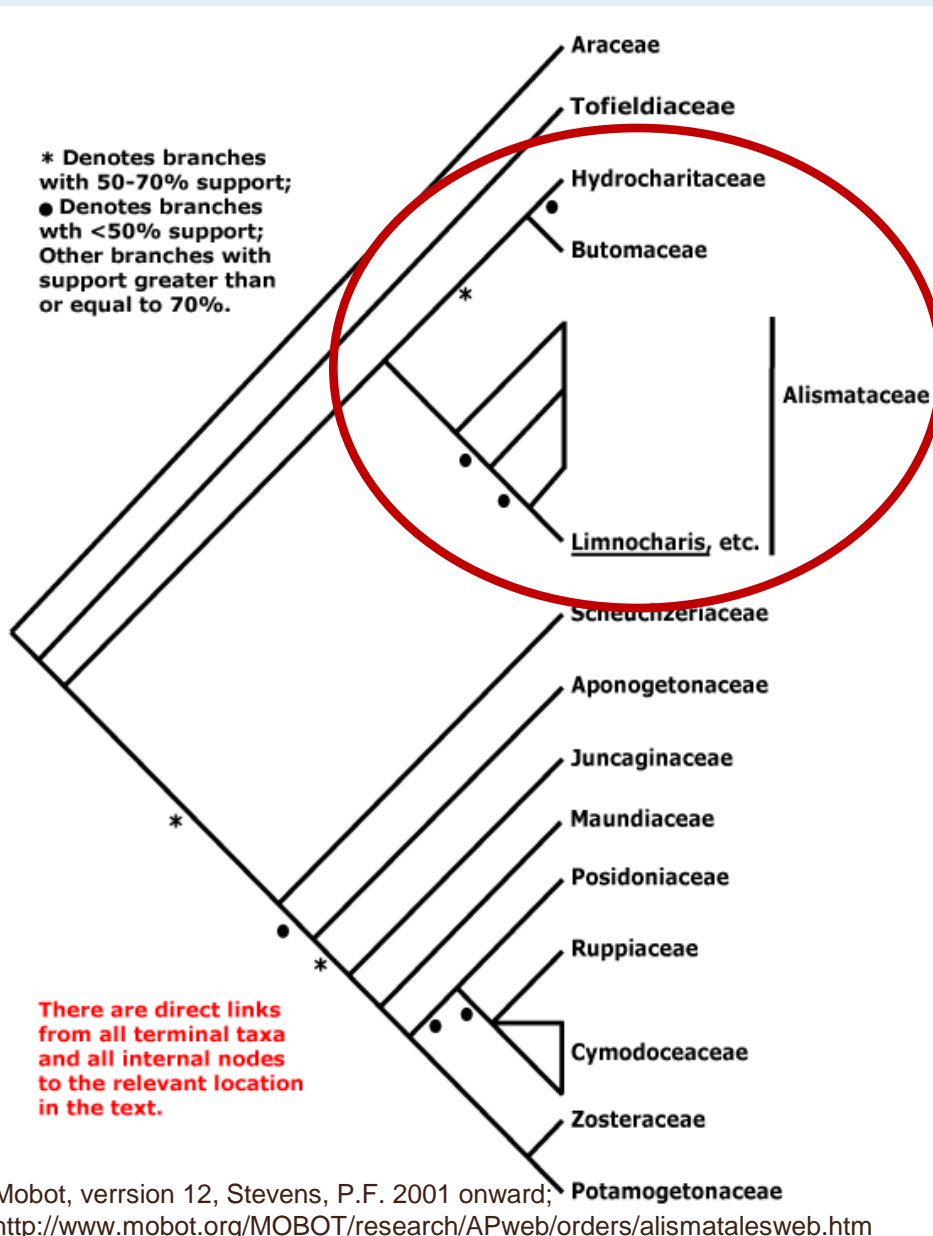


Mackey, Chelan CNWCB



Marcus Österberg/SXC

# Flowering Rush Taxonomy



- FR in subclass Alismatidae
- Mobot:
  - Order: Alismatales
  - 2 families closely related: Hydrocharitaceae & Alismataceae (includes Limnocharitaceae)
- USDA PLANTS Database
  - 3 orders: Alismatales, Hydrocharitales, Najadales
  - 3 families closely related

# Draft Test Plant List

- **42 test plant species selected**
- Category 1: genetic types of target weed species in North America
  - test at least most common genotype for both cytotypes
- Category 2: NA species in same genus
  - does not apply
- Category 3: NA species in other genera in same family
  - does not apply

# Draft Test Plant List

- Category 4: T&E species in same family as target weed divided by subgenus, genus & subfamily
  - does not apply but several species in closely related families (e.g. *Sagittaria* species), availability unclear
- Category 5: NA species in other families in same order that have some phylogenetic, morphological or biochemical similarities
  - 18 species
- Category 6: NA species in other orders that have some morphological/biochemical similarities
  - similarities unclear but approximately 15 species

# Draft Test Plant List

- Category 7: Any plant on which potential biocontrol agent or its close relatives (w/i same genus) have been previously found
  - not applicable for potential BCA
  - polyphagous *Bagous* sp. (including *Polygonum*, *Carex*, *Glyceria*) species in other genera in same family
  - 3 species
- Category 8: Plants in same habitat
  - not usually a category
  - 6 species

# Test Plant Shipments

- 1<sup>st</sup> shipment in Nov 2013
  - 5 species:
    - *Sagittaria graminea*
    - *S. platyphylla*
    - *S. latifolia*
    - *Echinodorus cordifolius*
    - *Schoenoplectus acutus*
  - phytosanitary certificate process clarified (WA)
- CABI would like additional species early 2014
- Volunteers needed



© Hunterweeds



Shelton Navie



# Draft Test Plant List

Family	Species
Butomaceae	<i>Butomus umbellatus</i>
Limncharitaceae	<i>Hydrocleys nymphoides</i>
Alismataceae	<i>Limncharis flava</i>
Alismataceae	<i>Alisma gramineum.</i>
Alismataceae	<i>Alisma plantago-aquatica</i>
Alismataceae	<i>Alisma subcordatum</i>
Alismataceae	<i>Alisma triviale</i>
Alismataceae	<i>Baldellia ranunculoides</i>
Alismataceae	<i>Damasonium californicum</i>
Alismataceae	<i>Echinodorus berteroi</i>
Alismataceae	<i>Echinodorus cordifolius</i>
Alismataceae	<i>Echinodorus tenellus</i>
Alismataceae	<i>Sagittaria cuneata</i>
Alismataceae	<i>Sagittaria graminea</i>
Alismataceae	<i>Sagittaria latifolia</i>
Alismataceae	<i>Sagittaria longiloba</i>
Alismataceae	<i>Sagittaria platyphylla</i>
Alismataceae	<i>Sagittaria rigida</i>
Hydrocharitaceae	<i>Blyxa aubertii</i>
Hydrocharitaceae	<i>Blyxa octandra</i>

Family	Species
Hydrocharitaceae	<i>Elodea bifoliata</i>
Hydrocharitaceae	<i>Halophila engelmannii</i>
Hydrocharitaceae	<i>Hydrilla verticillata</i>
Hydrocharitaceae	<i>Hydrocharis morsus-ranae</i>
Hydrocharitaceae	<i>Limnobium spongia</i>
Hydrocharitaceae	<i>Ottelia alismoides</i>
Hydrocharitaceae	<i>Thalassia testudinum</i>
Hydrocharitaceae	<i>Vallisneria americana</i>
Potamogetonaceae	<i>Potamogeton amplifolius</i>
Potamogetonaceae	<i>Potamogeton zosteriformis</i>
Potamogetonaceae	<i>Potamogeton pusillus</i>
Potamogetonaceae	<i>Potamogeton richardsonii</i>
Potamogetonaceae	<i>Stuckenia pectinata</i>
Ceratophyllaceae	<i>Ceratophyllum demersum</i>
Nymphaeaceae	<i>Nuphar lutea</i> ssp. <i>polysepala</i>
Nymphaeaceae	<i>Nymphaea odorata</i>
Polygonaceae	<i>Polygonum amphibium</i>
Pontederiaceae	<i>Heteranthera dubia</i>
Cyperaceae	<i>Carex obnupta</i>
Cyperaceae	<i>Schoenoplectus tabernaemontani</i>
Cyperaceae	<i>Schoenoplectus acutus</i>
Poaceae	<i>Glyceria borealis</i>

# Funding

- Phase I – Biocontrol Project
  - literature search
  - field surveys
  - begin prioritizing potential biocontrol agent species
- Funding in 2013 (\$67,500)
  - Montana Noxious Weed Trust Fund (\$25,000)
  - Washington Department of Ecology (\$20,000)
  - Washington Department of Agriculture (\$20,000)
  - British Columbia, Ministry of Forest, Lands and Natural Resources Operations (FLNRO) (\$2500)

# Funding

- Continue phase I & begin phase II with one agent
  - determine biology
  - develop rearing techniques
  - begin host-specificity testing
- Funding in 2014: \$50,000
  - WA Department of Agriculture (\$20,000)
  - MT Noxious Weed Trust Fund (\$25,000), not confirmed
  - B.C. Ministry of Forests, Lands and Nat. Resource Operations (\$5000)
- Shortfall of at least \$20,000, ideally \$80,000 total
  - Irrigation districts? State agencies? Utilities? Lake Associations?

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