



Potential Impacts of Narrow-leaved Cattail on Wetlands in Minnesota

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I am concerned about the impact of narrow-leaved cattails on wetlands.

I am making this presentation in the hope that it will

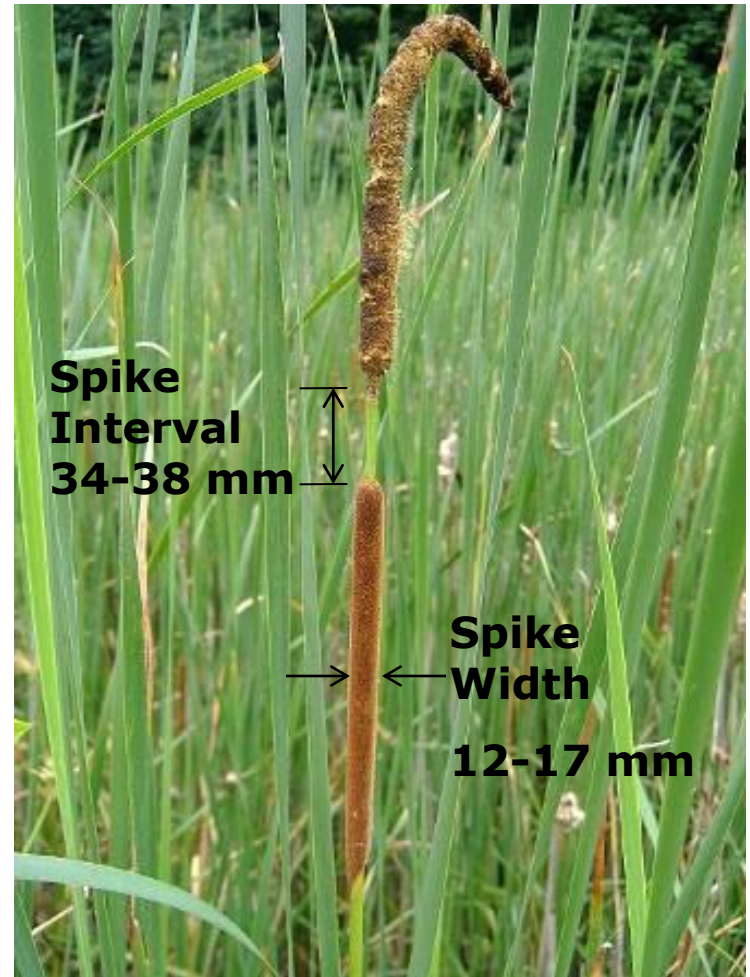
- 1) Raise awareness
- 2) Stimulate research into this species, its biological properties and its impacts on wetlands



The two species of cattail in Minnesota



Broad-leaved Cattail
(*Typha latifolia*)



Narrow-leaved Cattail
(*Typha angustifolia*)

Differences between cattails are quite obvious

Broad-leaved
cattail on left



Narrow-leaved
cattail on right

Hybrid cattail (*Typha x glauca*) is considered to be a sterile hybrid of narrow-leaved and broad-leaved cattail. (Galen Smith, personal comm.)



This presentation lumps narrow-leaved and hybrid cattail together

MNDNR Aquatic Plant Management Program views on narrow-leaved and hybrid cattail:

- Narrow-leaved and hybrid cattail are classified as native species
- MNDNR needs more evidence to be convinced that narrow-leaved cattail is an exotic
- All three cattails are considered to be desirable

Classifying a plant based on whether it is native or exotic does not address the real problem of invasiveness

- Some native plants can become invasive if environmental conditions change
- Biologists should consider the impacts a species has on community diversity, structure and function to determine if a species is invasive



- Narrow-leaved cattail was almost non-existent in the Twin Cities prior to 1970
- Almost all wetlands in the Twin Cities had become dominated by either narrow-leaved or hybrid cattails by 2000



The only wetlands that are not dominated by narrow-leaved cattail in south central Minnesota are wetlands that are in nutrient deficient soils with limited watersheds in non-agricultural areas, or wetlands that have been managed intensively.



Wetlands used to have extensive mud flats in late summer,
prior to invasion of narrow-leaved cattail

- Narrow-leaved cattail appears to be able to grow in deeper water than broad-leaved cattail
- Narrow-leaved cattail has become established throughout the zone of normal water level fluctuation.
- Annual moist soil plants are a rare commodity today.



Smartweed and soft-stem bulrush following an artificial drawdown



- 65 species of birds eat smartweed seed (Henderson 1995)
- Annual plants decompose rapidly in the spring providing nutrients for invertebrates and result in open water

- Muskrat populations appear to be in decline in the southern half of Minnesota despite an abundance of narrow-leaved cattail
- The boom/bust cycles of the past no longer occur in the same magnitude
- Muskrats don't appear to consume narrow-leaved cattails today to any significant degree



- Trappers agree that muskrat populations have decreased over the past 20 years
- No one appears to be studying muskrats anymore despite this decline in what should be considered a keystone species



Muskrats can return to their former abundance if the vegetation is restored



French mitigation site and adjacent narrow-leaved cattail marsh

All duck broods, mating toads and frogs and muskrats were found in the mitigation site, not in the much larger stand of cattails adjacent to it. The mitigation site is comprised of softstem, hardstem and river bulrush, giant bur-reed and arrowhead



Close up of French Regional Park mitigation site

Populations of almost all birds found in wetlands have declined in the Twin Cities area, including the Red-winged Blackbird



- The abundance of plants that produce edible seeds is reduced greatly in today's marshes
- There are fewer insects and other invertebrates in monotypic stands of cattail
- The structure of the emergent community has changed with transition to narrow-leaved cattail

Modern society has saturated the environment with soluble nitrogen



- Wetlands have become hypereutrophic for nitrogen
- Nutrient enrichment reduces species diversity in most plant communities (Townsend and Howarth 2010)
- This condition appears to favor narrow-leaved cattail

- Narrow-leaved cattail has allelopathic properties (Jarchow and Cook 2009)
- Broad-leaved cattail has different phenolics than narrow-leaved cattail. Phenolics are thought to be responsible for allelopathy
- The phenolics in broad-leaved cattail were not tested for allelopathy

Purple loosestrife

- Several beetles have been introduced as a biological control for purple loosestrife
- Purple loosestrife may also be in decline because it is being out-competed by narrow-leaved cattail



Reasons for the decline in wetland quality are numerous

- Rough fish
- Herbicides and pesticides
- Nutrient loading
- Increased salinity
- Changes in pH
- General pollution
- Changes in precipitation and runoff
- Exotic and/or invasive plants (narrow-leaved cattail)

With all these reasons for the decline in wetland quality, I am concerned that:

- Narrow-leaved cattail does not appear to be getting sufficient attention at the university, state or federal levels
- Consequently, narrow-leaved cattail is not being investigated to determine the impacts it may be having on wetlands and on associated wildlife

In summary, narrow-leaved cattail

- Has increased greatly in abundance since 1970
- Grows at greater depths than broad-leaved cattail
- Inhibits growth of annual moist-soil plants by occupying the zone of water fluctuation on a continuous basis
- Is not consumed by muskrats as much as is broad-leaved cattail
- Is allelopathic to some emergent plants
- Grows well in nutrient rich water

I hope this presentation results in the following:

- Increased discussion and evaluation of the potential impacts of narrow-leaved cattail
- Investigations into the relationship between muskrats and narrow-leaved cattail
- Experimentation into ways to increase diversity and function of wetlands dominated by narrow-leaved cattails.

People make comparisons between managing for reed canary grass and narrow-leaved cattail. In my opinion there is no comparison.



With the ability to manipulate water levels, there is a good opportunity to create a highly functional wetland with reed canary grass. The same is not true for narrow-leaved cattail.



QUESTIONS?

Literature Cited

Henderson, C. L. 1995. Wild about Birds, The DNR Bird Feeding Guide

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