

The Trouble with *Typha* – The Story of Cattail Invasions in Midwest National Parks.

Typha is the scientific name, or genus, of all the cattail species found in wetlands of the world. There are about 30 species of cattails, which are monocots belonging to the family, Typhaceae. *Typha* is the only genus in this family. In North America there are three species, broadleaf cattail (*T. latifolia*), narrowleaf cattail (*T. angustifolia*), and southern cattail (*T. domingensis*). Broadleaf and southern cattails are considered native to North America. All three species are early colonizers of wetlands and compete with native wetland herbs because of their wind-dispersed seeds and rapid growth of their underground stems (rhizomes). There is another taxon that has developed as a result of hybridization of at least two of the three species, *T. latifolia* and *T. angustifolia*, and this taxon is called *Typha x glauca* (Figure 1). In the early 1950s through the 1970s taxonomists recognized the difficulty in identifying the species based on morphological measurements. By the 1990s several molecular tools were developed that have helped identify the species and hybrids. Other tools such as cytological characteristics of the cattail pollen can be used to identify the species from hybrids. These tools were important because they helped taxonomists and managers recognize that hybrids were developing between the species and that these hybrids were more aggressive in wetland colonization than the parental species.

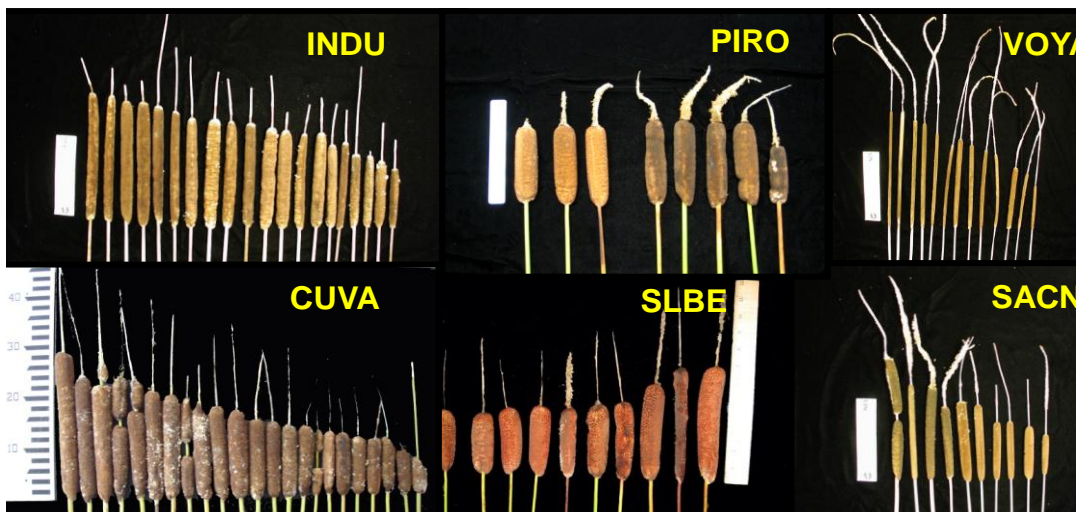


Figure 1. *Typha latifolia* (left) and *Typha angustifolia* (right), with hybrids found in Great Lakes parks. In the hybrids, note the variation in female seed producing part (cigar-shaped structure) and the presence of a gap between male (top part) and female (lower part) of inflorescence. The gap is typical of *T. angustifolia* and *T. domingensis* (not shown).

The Great Lakes Research and Education Center partnered with the USGS National Wetlands Research Center and began evaluating the cattail populations in the Great Lakes national parks. Between 2004 and 2012 scientists and student interns assessed cattail populations in 7 Midwest parks: Apostle Islands NL (APIS), Cuyahoga Valley NP (CUVA), Indiana Dunes NL (INDU), Pictured Rocks NL (PIRO), Sleeping Bear Dunes NL (SLBE), St. Croix National Scenic Riverway (SACN), and Voyageurs NP (VOYA). The results indicated that hybridization indeed was occurring in these parks based on DNA molecular markers that are specific to each species. Hybrids show a mixed molecular pattern, indicating that they have DNA from both parental species (Figure 2). These hybrids also spread more rapidly than the parent species due to hybrid vigor. This was shown in the conversion of Cowles Bog at Indiana Dunes from a sedge meadow complex to a cattail dominated wetland between 1936 and 2002. Restoration efforts are underway to remove cattails from Indiana Dunes National Lakeshore in order to protect wetland plant biodiversity in the park. This requires long-term application of mechanical and herbicide control methods to reduce cattails and prevent them from re-establishing from wind-blown seeds carried from the surrounding landscape (Figure 3). Tradeoffs must be considered between costs of total removal and management of cattails at levels that allow development of plant diversity.

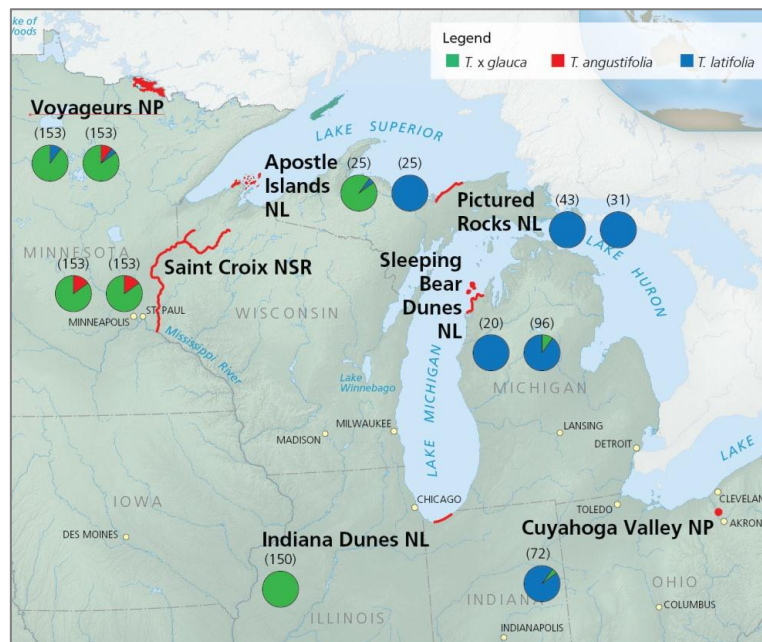


Figure 2. Genetic results of cattail populations sampled in 7 Midwest national parks. Numbers represent samples analyzed in the study. Even though no hybrids or *T. angustifolia* were found in the limited number of samples at Pictured Rocks National Lakeshore, it does not mean that they were not present.



2004



2012

Figure 3. Comparison of a section of Cowles Bog Wetland Complex, Indiana Dunes National Lakeshore, before (2004) and after cattail control measures (2012) were applied to the 200 acre site using mechanical means and herbicide treatments applied since 2000. The cattail removal process is ongoing. Many native plant species can grow once the tall cattails are removed. Nursery grown native plants are also installed at the site.

For more information about this project see:

Marburger, Joy E. 2013. Use of pollen to identify cattail (*Typha* spp., Typhaceae) in Indiana. *Plant Science Bulletin* 59(4): 174-178.

Marburger, J. and S. Travis. 2013. Cattail hybridization in national parks: an example of cryptic plant invasions. *Park Science* 30(2):1-13.

Travis, S.E., J.E. Marburger, S. Windels, and B. Kubátová. 2011. Clonal structure of invasive cattail (*Typhaceae*) stands in the upper midwest region of the US. *Wetlands* 31:221-228.

Travis, S.E., J.E. Marburger, S. Windels, and B. Kubátová. 2010. Clonal diversity and hybridization dynamics of invasive cattail (*Typhaceae*) stands in the Great Lakes Region of North America. *Journal of Ecology* 98:7-16.

Volunteers and Citizen Scientists Are Needed for Cattail Studies

Little is known about the degree of cattail hybridization in other national parks and regions. If you are interested in helping monitor where hybrid cattails are occurring, contact:

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See YouTube Video at:

<https://www.youtube.com/watch?v=d87RFvV60tU>

