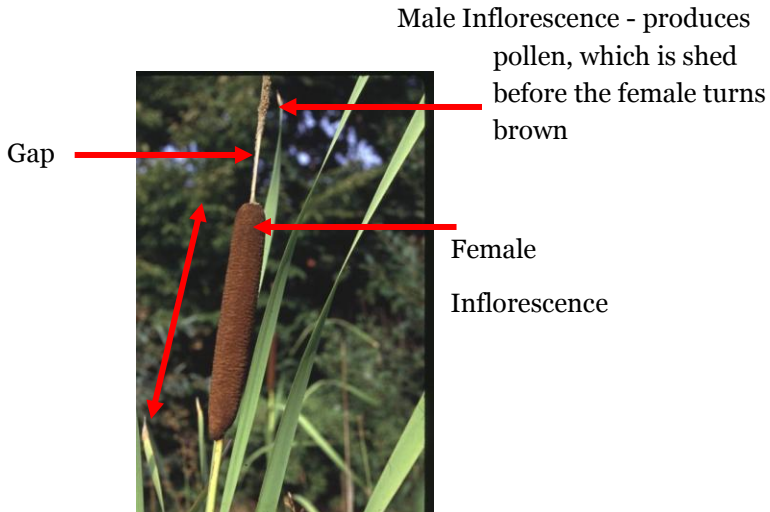


# Standard Methods for Measuring Cattail Plants in the Field



## → Measure the following in centimeters:



### 1. Plant Height

Measure from base of plant at soil level (even if under water) to the tip of the longest leaf.

### 2. Leaf Width

Measure the widest leaf at its widest point

### 3. Female Inflorescence Length

Measure the length of the cigar-shaped part of the plant that produces seeds.

### 4. Female Inflorescence Width

Measure the width of the female inflorescence at its widest point.

### 5. Gap Length

Measure the distance between the male and female inflorescence.

### 6. Water Depth

Measure if water is present. If soil is saturated, enter 0.

## → Cattail Pollen Collection and Analysis

Why collect cattail pollen? Pollen form and size is unique to plant species. Many paleobotanists drill cores in peat in order to find out what kinds of plants existed in the past several thousand years. Plant pollen can be analyzed under a microscope to

determine what species existed in the past at a location. It can also be correlated with climate change, since plants are fairly sensitive to temperature changes, especially cooling or warming of winter temperatures. Temperatures are associated with “plant hardiness zones” which the US Department of Agriculture uses to advise people which plants to grow at a particular latitude, in accordance with temperatures of the latitude.

There are three species of cattails in the U.S.: *Typha latifolia* (broad leaf cattail), *T. domingensis* (southern cattail), and *T. angustifolia* (narrow leaf cattail). The last one is considered an exotic introduced from Europe during the mid 1800s. The other two are native to North America. The southern cattail is more restricted to southern climates and is the common species in S. Florida.

However, researchers (Travis et al. 2010) have documented that hybridization occurs among these species. One of the consequences of plant hybrid formation is increased vigor of the plants, hence they can be more invasive than their parent species. Researchers are now testing this idea out using experiments on their growth and evaluating the genetic makeup of the plants using forensic techniques such as DNA molecular markers.

#### REFERENCES:

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.

#### → How to Collect Pollen Data

Cattail plants produce abundant pollen from the upper portion of the spike-shaped inflorescence. To collect the pollen, use small paper mailing envelopes, small coin envelopes, or plastic bags (about 2X3 inches or 3X5 inches). It is important that the pollen is dry to prevent mold from growing on it when stored in the bags. Also use bags that don't leak.

1. Locate a site where cattails are producing pollen. The upper half of the flower spike will be thick, and powdery yellow pollen will be readily apparent if you shake the stalk.
2. After finding a site with a cattail population that is shedding pollen, write the location using a GPS unit. Record the collector's name, date, time and GPS location using decimal degree units for latitude and longitude. Write the same information on the envelope.
3. Take a digital photo of the inflorescence with the male and female part.
4. Place a small coin envelope or small letter envelope over the inflorescence, gently bend the stalk sideways and shake the plant to release pollen into the bag. Tip the contents of the bag into the envelope and seal it shut so that the pollen can't escape. Make sure not to cross contaminate pollen when collecting from another plant. *Clean your hands thoroughly between plants, to prevent cross-contamination.*
5. Pick a plant AT THE SAME SITE about 2 meters from the first plant (*This can be modified to accommodate the molecular genetics study- that is,*

*collect pollen from plants destined for the molecular study*). Repeat as above.

6. Go to another site and repeat the sampling. The sites (two plants per site) can be anywhere from one mile to several miles apart. The important point is to record the location on the envelope, and to make sure that no contamination of pollen from one site gets into the envelope of the next site. Make sure each envelope is sealed shut; if you prefer not to lick the flap, use a wet sponge to moisten the glue.
7. Send the pollen as soon as possible in a mailer to:

Joy Marburger, Research Coordinator  
National Park Service, Indiana Dune National Lakeshore  
1100 North Mineral Springs Road  
Porter, IN 46304

*More questions?*

ph. 219-395-1544

email [joy\\_marburger@nps.gov](mailto:joy_marburger@nps.gov)

8. If the samples cannot be sent immediately, they can be stored briefly in the refrigerator. Do not store for more than a few days, as mold can begin to grow on the pollen.