

Distinguishing Native from Invasive Phragmites

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Native Phragmites is an important component of a healthy wetland ecosystem. It grows amongst other macrophytes in marshes and unlike the invasive strain, does not typically develop into dense monocultures or degrade habitat quality. Native Phragmites has disappeared from a number of wetlands due to the more competitive invasive strain and there is a concern that the native population will unwittingly be removed from other wetlands due to well meaning control measures targeting the invasive plants. Fortunately morphological differences do exist between the native and invasive Phragmites but, caution must be exercised in the identification process. For instance, height, density and seed head size are useful characteristics when the stands are well established since the invasive strain is greater in all three categories. However, when invasive Phragmites are newly colonizing they may resemble native plants in stature. Also, native Phragmites has smooth, reddish stalks unlike the invasive plants that tend to have rough, brownish/yellowish stalks. But, in certain habitats such as on sandy beaches or in standing water, invasive Phragmites may also exhibit smooth, red tinged stalks. Two characteristics that should be consistently used to assist with identity are glume size and ligule width which, in conjunction with other characteristics, should provide a clear determination. These distinctions are detailed in a key developed by Catling et al. (2007) and in images provided by Swearingen (2006) and Swearingen and Saltonstall (2010) which are provided in the following slides. I have also included some images of native and invasive Phragmites from sites I have worked on to provide visual reference. If confusion still remains about the strain under question DNA analysis should be conducted.

Recent work by Catling *et al.* (2007) on *Phragmites* plants in eastern Ontario has identified three key plant features for separating the native and invasive *Phragmites* taxa. They suggest using the combination of : 1) lower stem internode colour, 2) lower glume lengths, and 3) middle leaf ligule height (see Figure 1).

Key for separating the subspecies of *P. australis* in northeastern North America (numbers in brackets represent unusual extremes).

1a. Lower stem internodes yellowish or yellowish-brown; lower glumes 2.6 – 4.2 (4.8) mm long; ligule of middle leaf excluding fringe 0.1 – 0.4 mm high
.....subsp. *australis* (introduced)

1b. Lower stem internodes reddish-purple; lower glumes 3.8 – 7.0 mm long; ligule of middle leaf excluding fringe (0.2) 0.4 – 0.9 mm high.....
subsp. *americanus* (native)

*note: Catling *et al.* use the scientific name *Phragmites australis subsp. australis* for the invasive *Phragmites* however, based upon recent genetic work by Kristen Saltonstall and Donald Hauber (Saltonstall and Hauber, 2007, *J. Bot. Res. Inst. Texas* 1(1)) it is recommended that just *P. australis* be used for the invasive strain since it is not genetically similar to the Australian strain.

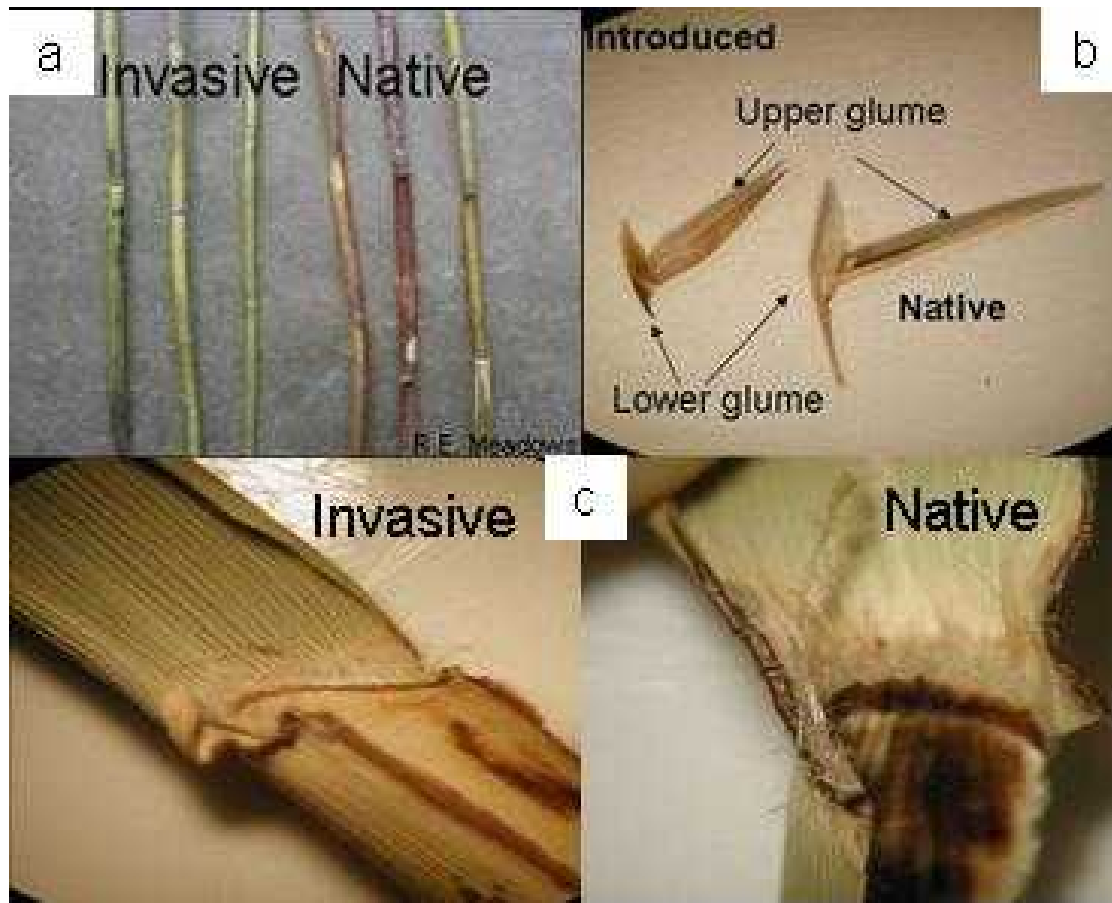
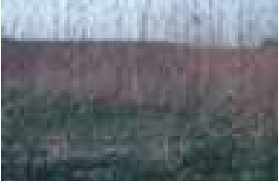









Figure 1. invasive and native *Phragmites* a) lower stem internodes b) lower glumes, and c) middle leaf ligules (adapted from Swearingen, 2006).

Native vs Invasive Phragmites

Trait	Native Haplotypes	Introduced Haplotypes (Haplotype M)	Gulf Coast (Haplotype I)
Stem density	 <p>Low</p>	 <p>High</p>	High
Time of Flowering	Early (July-August)	Intermediate (August September)	Late (October- November)
Inflorescence	 <p>Sparse</p> <p>Please note that sparse inflorescences not automatically indicate native status!</p>	 <p>Dense</p>	Not known

<http://www.invasiveplants.net/phragmites/morphology.htm>

Observed differences between native and introduced *Phragmites* clone

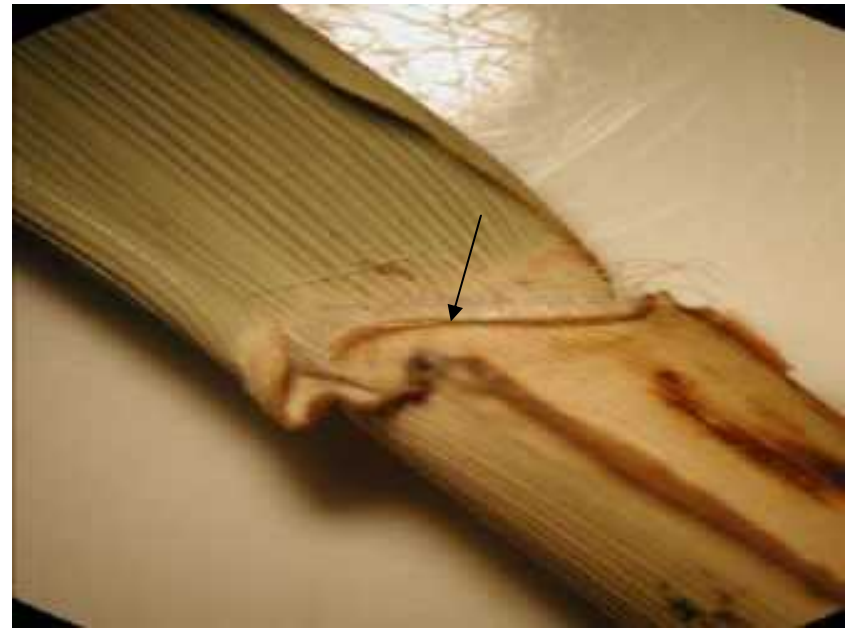
Trait	Native Haplotypes	Introduced Haplotypes (Haplotype M)	Gulf Coast (Haplotype I)
Leaf sheaths	Fall off in the fall or are very easy removed if they stay on the stem.	Leaf sheaths stay on the plant, occasionally basal ones fall off the stem. Leaf sheaths are difficult to remove (use a twisting motion)	Not known
Stem color at base (spring/summer) Note: Leaf sheath needs to be removed	 Red to Chestnut	Tan Very occasionally do lower internodes show a brownish coloration in the winter.	Not known
Stem color at base (winter) Note: Leaf sheath needs to be removed on introduced haplotype	 Light chestnut to light brown/gray	Tan 	Not known
Stem texture Note: Run your finger across and up and down the stem after removing the leaf sheath	 Smooth and shiny (Looks polished. Often with dark spots [fungal attack] clustered at nodes in winter). Stem fungus absent in currently known Western and southwestern populations)	Rough and dull (Stems are ribbed. Ridges visible with naked eye. Very Occasionally do basal internodes appear smooth).	Not known
Stem flexibility	High	Rigid	Not known
Stem toughness	Low	High	Not known

Native vs Invasive Phragmites

Native **Ligule Width** **Invasive**



> 1 mm
(1.0 - 1.7 mm)



< 1mm
(0.4 - 0.9 mm)

Glume Length

Introduced

Lower glume: 2.5-5.0 mm
(most <4.0)

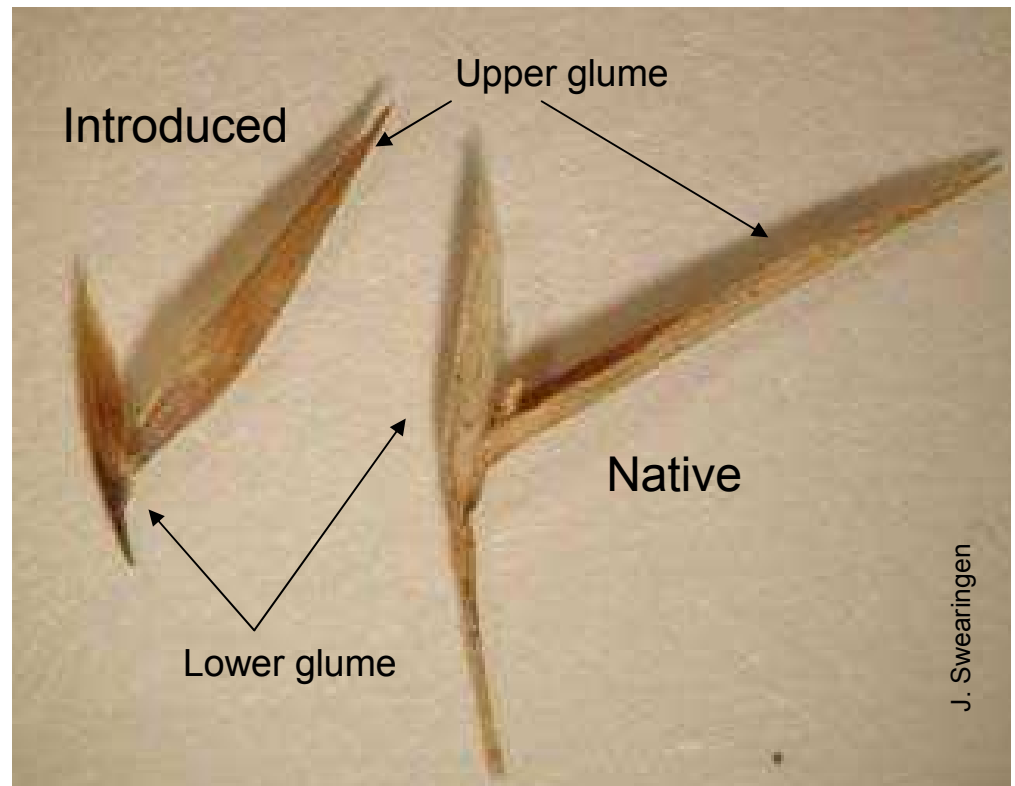
Upper glume: 4.5-7.5 mm
(most < 6.0)

Native

Lower glume: 3.5-6.5
(most >4.0)

Upper glume: 5.5-11.0
(most > 6.0)

Note: Measure from the base of the glume to its tip. Take measurements for at least 5 glumes (upper or lower) and then average.



Source: Phragmites Field Guide 2010, Jill Swearingen and Kristen Saltonstall



Invasive Phragmites



Be aware that stems of invasive Phragmites can be red and smooth in certain habitats such as on beaches and in water.



Established invasive Phragmites colony >7yrs
Turkey Point Provincial Park, Lake Erie 2010



Recent invasion of invasive Phragmites, <5 yrs
Point Farms Provincial Park, Lake Huron 2010



Point Farms Provincial Park, Lake Huron, Sep 2010



Invasive Phragmites



Rondeau Provincial Park, Lake Erie, Sep 2010

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Native Phragmites colony
Turkey Point Marsh
Long Point Bay, Lake Erie
2009

