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

<table>
<thead>
<tr>
<th>Trait</th>
<th>Native Haplotypes</th>
<th>Introduced Haplotypes (Haplotype M)</th>
<th>Gulf Coast (Haplotype I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem density</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Time of Flowering</td>
<td>Early (July-August)</td>
<td>Intermediate (August-September)</td>
<td>Late (October-November)</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>Sparse</td>
<td>Dense</td>
<td>Not known</td>
</tr>
</tbody>
</table>

Please note that sparse inflorescences not automatically indicate native status!

http://www.invasiveplants.net/phragmites/morphology.htm
<table>
<thead>
<tr>
<th>Trait</th>
<th>Native Haplotypes</th>
<th>Introduced Haplotypes (Haplotype M)</th>
<th>Gulf Coast (Haplotype I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf sheaths</td>
<td>Fall off in the fall or are very easy removed if they stay on the stem.</td>
<td>Leaf sheaths stay on the plant, occasionally basal ones fall off the stem. Leaf sheaths are difficult to remove (use a twisting motion)</td>
<td>Not known</td>
</tr>
<tr>
<td>Stem color at base (spring/summer)</td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
</tr>
<tr>
<td>Note: Leaf sheath needs to be removed</td>
<td>Red to Chestnut</td>
<td>Very occasionally do lower internodes show a brownish coloration in the winter.</td>
<td>Not known</td>
</tr>
<tr>
<td>Stem color at base (winter)</td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
</tr>
<tr>
<td>Note: Leaf sheath needs to be removed on introduced haplotype</td>
<td>Light chestnut to light brown/grey</td>
<td></td>
<td>Not known</td>
</tr>
<tr>
<td>Stem texture</td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
<td><img src="http://www.invasiveplants.net/phragmites/morphology.htm" alt="Image" /></td>
</tr>
<tr>
<td>Note: Run your finger across and up and down the stem after removing the leaf sheath</td>
<td>Smooth and shiny</td>
<td>(Stems are ribbed. Ridges visible with naked eye. Very Occasionally do basal internodes appear smooth).</td>
<td>Not known</td>
</tr>
<tr>
<td>Stem flexibility</td>
<td>High</td>
<td>Rigid</td>
<td>Not known</td>
</tr>
<tr>
<td>Stem toughness</td>
<td>Low</td>
<td>High</td>
<td>Not known</td>
</tr>
</tbody>
</table>

http://www.invasiveplants.net/phragmites/morphology.htm
Native vs Invasive Phragmites

Ligule Width

Native

Invasive

> 1 mm
(1.0 - 1.7 mm)

< 1 mm
(0.4 - 0.9 mm)

J. M. Swearingen, National Park Service
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 mm (most >4.0)
- **Upper glume**: 5.5-11.0 mm (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, Jil 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.

J.M. Gilbert
Established invasive Phragmites colony >7 yrs
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

J.M. Gilbert
Native Phragmites colony
Turkey Point Marsh
Long Point Bay, Lake Erie
2009

J.M. Gilbert