Phragmented Phragmites

Distinguishing Exotic and Native Forms of Common Reed (*Phragmites australis*)

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Description

Phragmites is a tall, perennial grass that can grow to over 15 feet in height. In North America, both native Phragmites (*Phragmites australis americanus* Saltonstall, P.M. Peterson & Soreng) and introduced subspecies occur.

Visual Comparison of Exotic and Native Forms

Non-native *Phragmites australis*

Background

Preserved remains of native *Phragmites* that are 40,000 years old have been found in the Southwest indicating that it is a part of the native flora of that region.

In coastal areas, preserved rhizome fragments dating back 3000-4000 years have also been found in salt marsh sediments indicating that it is also native to these habitats.

Native American uses of *Phragmites* include use of stems for arrow shafts, musical instruments, ceremonial objects, cigarettes, and both leaves and stems for constructing mats.

European forms of *Phragmites* were probably introduced to North America by accident in ballast material in the late 1700s or early 1800s.

Exotic *Phragmites* first established along the Atlantic coast and then spread across the continent over the course of the 20th century. *Phragmites* is grown commercially in Europe and is used for thatching,

fodder for livestock, and cellulose production. Ironically, it is declining in parts of Europe and its long term survivability is a concern to natural resource managers there.

Ecological Threat

At this time, there is no evidence for the occurrence of hybrid native/introduced populations occurring in the field.

...Ecological Threat

Non-native forms of *Phragmites* are vigorous growing plants that once introduced can establish and take over a wetland, becoming a monoculture within several years.

Introduced Phragmites

...as far as the eye can see

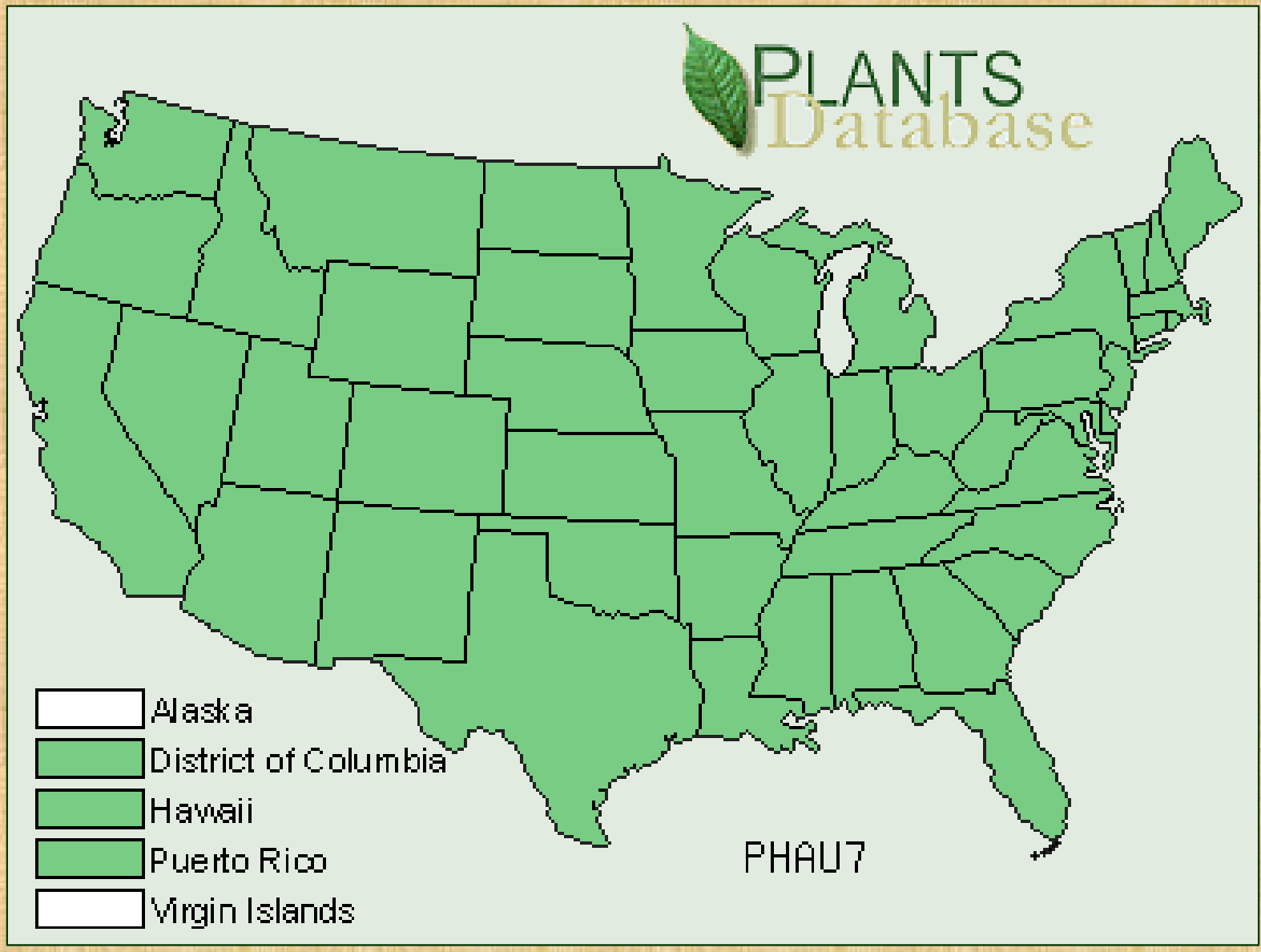
...Ecological Threat

Phragmites crowds out native plants (including the native *Phragmites*), alters wetland hydrology, degrades wildlife habitat, and increases fire potential.

...Ecological Threat

Phragmites plants grow vigorously and densely, creating great biomass that consumes almost all available growing space and significantly reduces the amount of light reaching the ground.

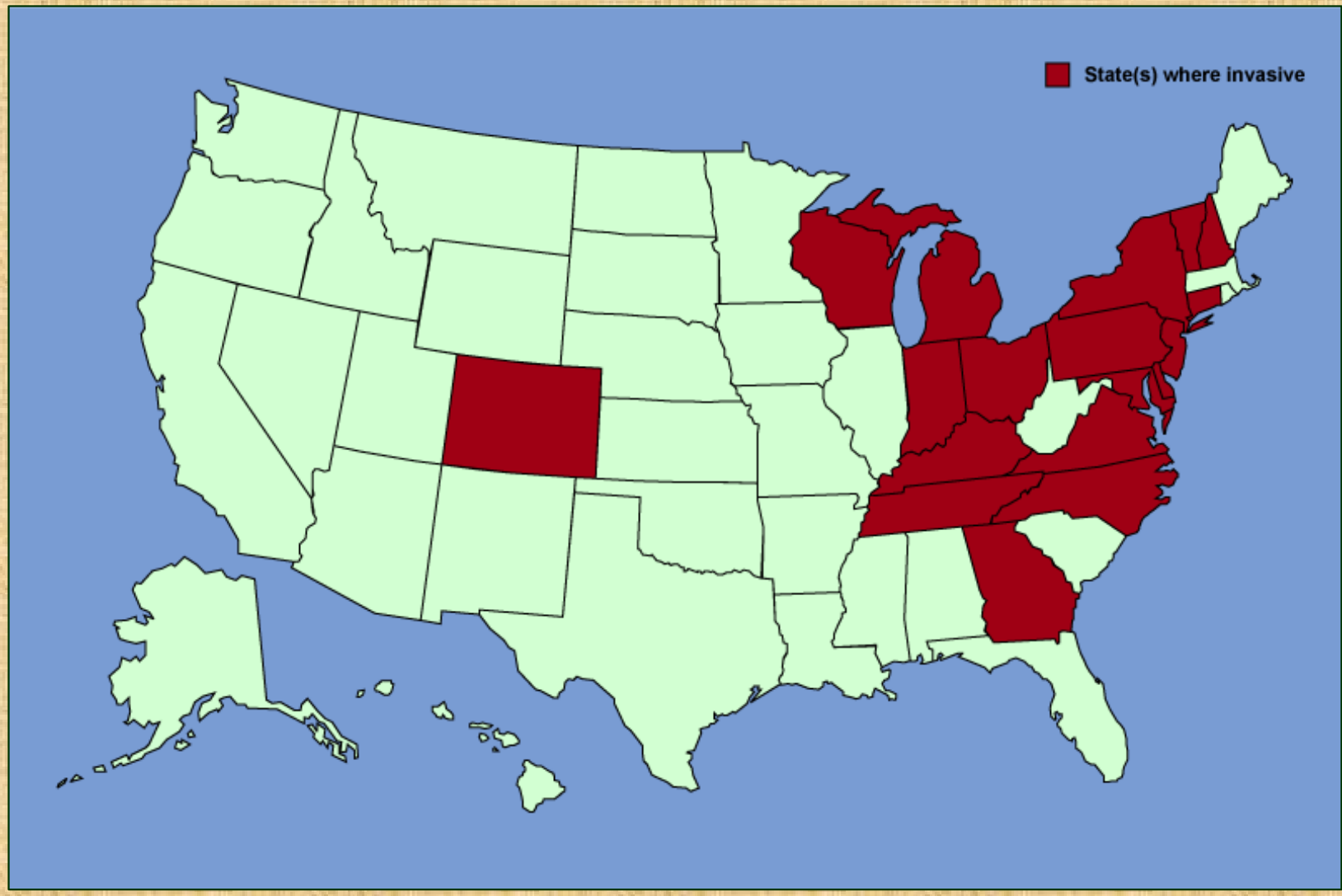
Distribution in the U.S.



Phragmites australis occurs throughout the lower 48 states and southern Canada.

Source: USDA Plants Database

Distribution in the U.S.



Phragmites australis is reported to be invasive in natural areas in 18 states (CO, CT, DE, GA, IN, KY, MD, MI, NC, NH, NJ, NY, OH, PA, TN, VA, VT, and WI, and DC). Source: PCA-APWG WeedUS Database www.nps.gov/plants/alien

Habitat in the U.S.

disturbed areas

tidal and nontidal wetlands

brackish and freshwater marshes

river edges

shores of lakes and ponds

roadsides

Growth and Spread

Below ground, *Phragmites* forms a dense network of roots and rhizomes which can extend downward several feet. It spreads horizontally by sending out rhizome runners which can grow 10 or more feet in a single growing season if conditions are optimal.

How does *Phragmites* spread locally?

Rhizomes

Introduced Phragmites

Growth and Spread

New populations of the introduced type of *Phragmites* may appear sparse for the first few years after establishment but the plant's rapid rate of growth and spread allows it to form a pure stand fairly rapidly.

Growth and Spread

Spread of *Phragmites* to new locales is largely through seed which is dispersed by wind and water and through movement of rhizomes or rhizome fragments that break off and are transported by water, vehicles or other means.

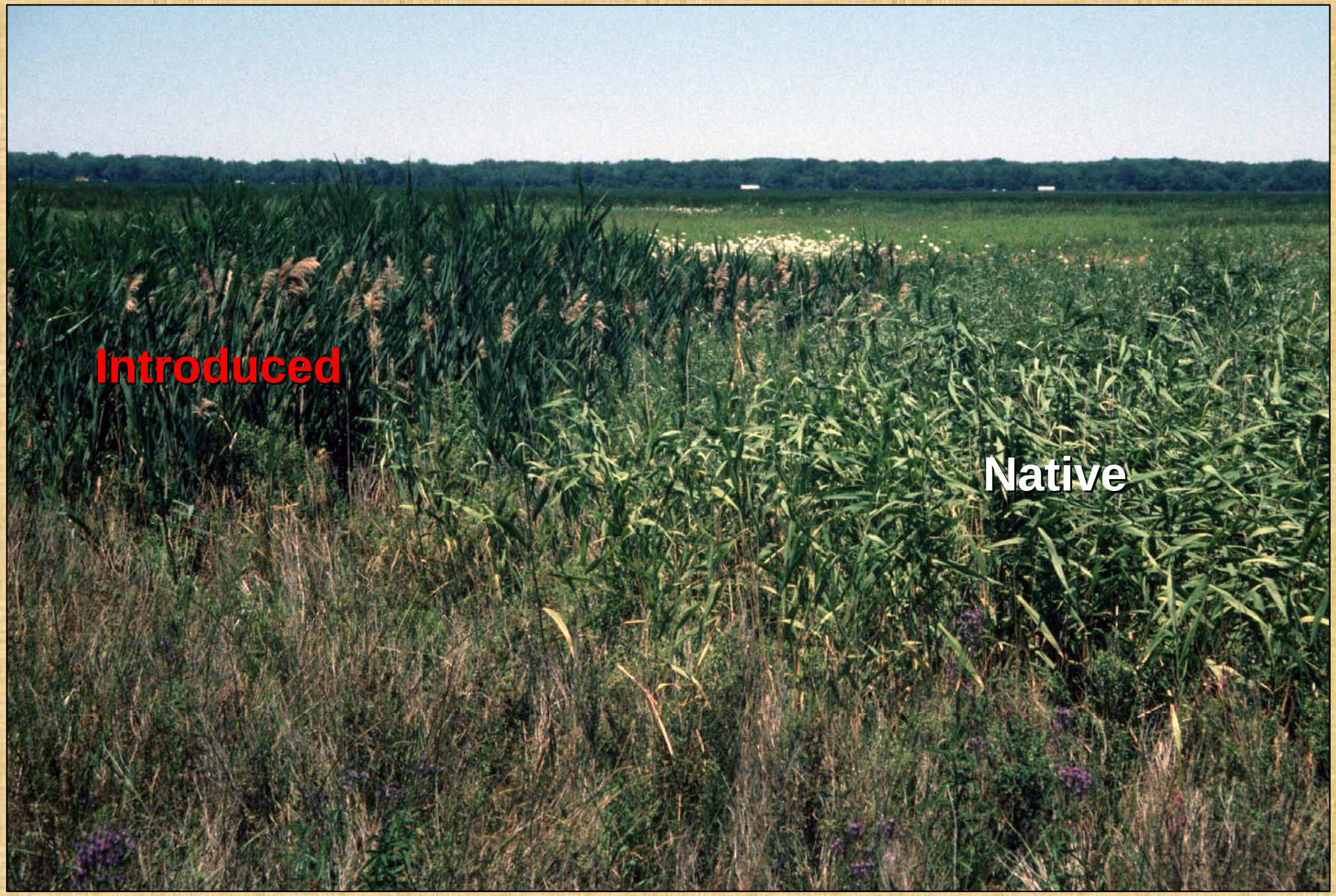
Growth and Spread

Individual *Phragmites* plants produce hundreds to thousands of seeds per year. While seed viability is typically Low, and there appears to be a great deal of interannual variation in fecundity, sufficient seed is dispersed to overcome these obstacles.

Growth and Spread

Along rivers and shorelines fragments of rhizomes may be transported to new sites, settle, and become rooted. Rhizomes fragments may also be moved to uninfested areas by heavy machinery.

Native vs. Exotic *Phragmites*



A Note of Caution

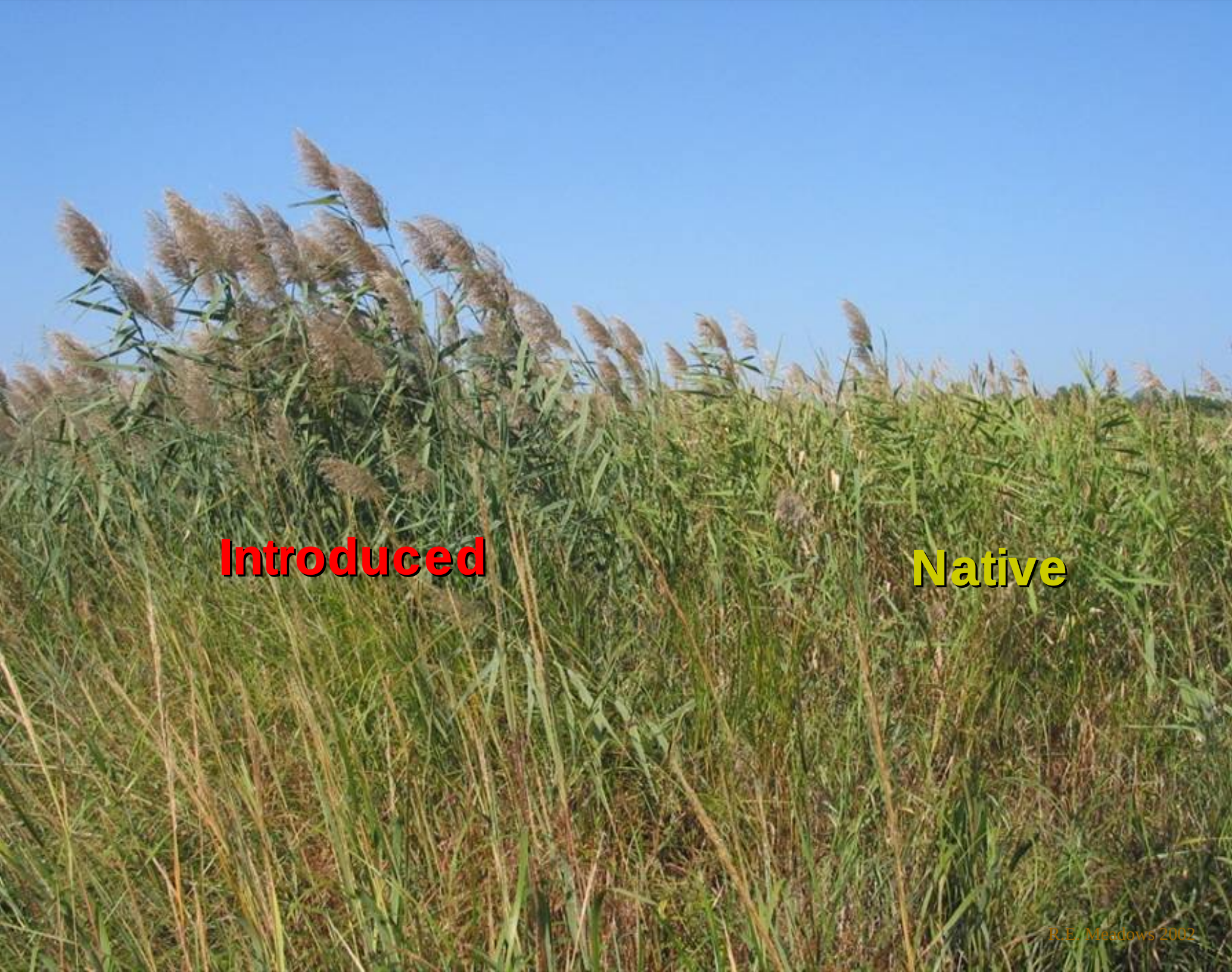
Due to the plasticity of the species and its ability to adapt to a wide range of conditions, it is difficult to distinguish definitively the native and introduced forms of *Phragmites* without genetic testing.

However, a number of morphological characteristics have now been identified that can be used to determine a population's type. These characters can be subtle (e.g. color variation) and subjective making positive identification difficult.

Given this, an assignment of native or introduced status to a population should not be made unless several characters clearly match the patterns shown in the following slides.

WARNING

This information should not be used to distinguish between *Phragmites* populations along the Gulf Coast where another type of *Phragmites*, the Gulf Coast type, which looks similar to introduced *Phragmites*, is also found.


Introduced
Native
R.E. Meadows 2002

Native Phrag

Native *Phragmites* occurs in low density stands often comingled with other native plants.

Stems grow to a maximum of about 8ft high, are somewhat delicate, very smooth to the touch, and often have a red to chestnut color towards the base.

Native Phrag

Leaves are pale to yellow-green. The leaf sheaths fall off in the Autumn; stems often do not survive standing through the winter.

Native Phrag

Flowering occurs July to August; the inflorescences are generally sparse, in comparison to the introduced forms.

Exotic Phrag

Introduced forms of *Phragmites* form very dense stands which include both live stems and standing dead stems from previous year's growth.

Stems often reach 15 feet in height, are very rigid, somewhat rough to the touch.

Exotic Phrag

Leaves are blue green and darker than the native forms; elongate, typically 1-1.5 inches wide at their widest point. Leaf sheaths adhere tightly to stem and persist through the winter.

Exotic Phrag

Flowers form bushy panicles in August and September and are usually purple or golden in color. As seeds mature, the panicles begin to look "fluffy" due to the hairs on the seeds and they take on a grey sheen.

Morphological Characters Used to Distinguish Native and Exotic *Phragmites australis*

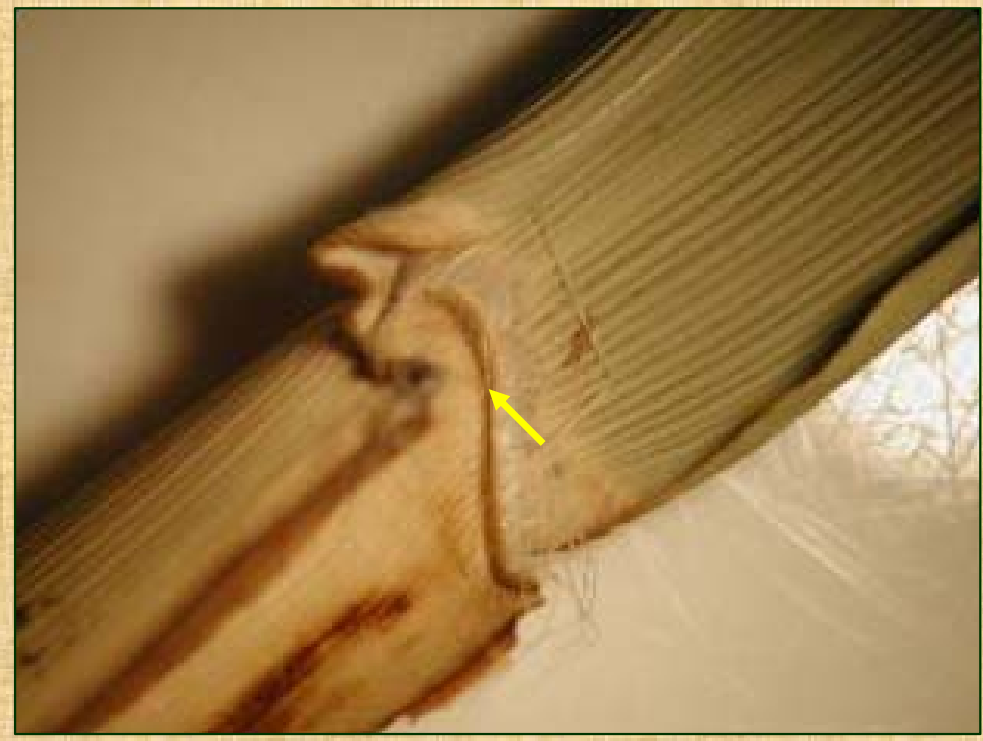
- Ligule width
- Leaf sheath adherence
- Stem color
- Stem spots
- Stem density
- Leaf color
- Habitat

Ligule width

Native

> 1 mm
(1.0 - 1.7 mm)

Introduced



< 1mm
(0.4 - 0.9 mm)

Leaf Sheath Persistence

Most leaf sheaths are missing or very loosely attached to overwintering culms.

Nearly all leaf sheaths are present and tightly adhering to culms.

Stem coloration

Red-purple coloration is more common on native form

Stem Spots

Plant Color

Native

Lighter yellow-green

Introduced

Darker blue-green

Stem Density

	Native	Introduced
	May occur as a mono-culture but often co-occurs with other plant species	Typically grows as a monoculture, young newly established populations and those in areas of high salinity may be less dense

Management Options

- Biological control
- Burning
- Chemical
- Mechanical – Mowing
- Hydrologic manipulation
- Combinations of the above

Acknowledgements

REFERENCES

Saltonstall, K. 2006. Phragmites: Native or Introduced? Integration and Application Network, University of Maryland Center for Environmental Science, 4pp. http://ian.umces.edu/pdfs/ianewsletter7.pdf

Meadows, R. and Saltonstall, K. 2007. Distribution of native and introduced *Phragmites australis* in freshwater and oligohaline tidal marshes of the Delmarva Peninsula and southern New Jersey. Journal of the Torrey Botanical Society. 134(1)

Ecology and Management of Invasive Plants Program http://www.invasiveplants.net/phragmites/morphology.htm

IMAGES

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