



Invasive *Phragmites* in the Great Lakes Wetlands

A tall, invasive wetland grass, *Phragmites australis* alters fish and wildlife habitat, decreases biodiversity, affects shoreline use, and reduces property values. Early detection and management are critical due to rapid and aggressive expansion of *Phragmites*.

The USGS Great Lakes Science Center conducts *Phragmites*-control studies to assist managers reduce invasion and maintain diversity.

Biology

Found throughout the Great Lakes basin, *Phragmites* is a tall perennial wetland grass that can grow to over 4 m (13 ft) in height.



New *Phragmites* plant amidst dead thatch.

With thousands of seeds per cluster, it aggressively spreads through seed dispersal and fast-growing rhizomes

(underground horizontal stems).

While a native strain of *Phragmites* exists in the Great Lakes, a highly invasive introduced strain is creating a problem for managers by colonizing beaches, disturbed areas, and drier areas of coastal wetlands.

Impact

Phragmites can dominate wetland plant communities and reduce biodiversity. It alters the amount and type of fish and wildlife habitat as well as the hydrology and ecology of wetlands. By restricting shoreline views and recreational use, *Phragmites* introduction often leads to a decline in property value.



Phragmites at 3 m height.

An Emerging, Critical Issue

Water levels in the Great Lakes are predicted to drop dramatically due to global climate change. If this occurs, large expanses of lake bottom may be exposed, providing the opportunity for *Phragmites* to expand along the new shorelines, crowding out native wetland plant communities, and irreversibly altering habitats.



Exposed lake bottom that could be invaded by *Phragmites*.

Management

Due to the aggressive spread of *Phragmites*, early detection and management is critical. Complete removal of established stands is very difficult, and existing control methods (e.g., herbicides, prescribed fire, cutting, flooding) are costly. Combinations of these methods applied repeatedly over time are most effective. Therefore, alternative control treatments (e.g., biological control) are being developed.



Phragmites rhizomes spreading to exposed sediments.

New Frontiers

Studies involving USGS Great Lakes Science Center (GLSC) staff suggest that innovative control methods (e.g., microbial community alteration, gene manipulation) may be useful for managing *Phragmites* on a large scale in the future. GLSC staff are also forecasting *Phragmites* expansion along lake



bottoms exposed by climate-forced water-level fluctuations.

Recent Research

A recent study examined efforts to promote species establishment and maintain diversity in a *Phragmites*-dominated wetland at the USFWS Ottawa National Wildlife Refuge along the shore of western Lake Erie. USGS researchers tested combinations of cutting, raking, and additional hand spraying of *Phragmites* with herbicide as methods to promote growth of other wetland species and sustain a diverse plant community in established *Phragmites* stands previously treated with herbicide. The results of this study suggest that secondary treatments can help maintain a more diverse plant community in areas treated for *Phragmites*. This information is being used by resource managers to optimize control efforts.



2008 color-infrared aerial photograph of Crane Creek wetland complex in the Ottawa National Wildlife Refuge, western Lake Erie.