



EXOTIC PHRAGMITES IN UTAH

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Phragmites, pronounced “frag-my-tees,” is a common reed-like plant in Utah’s wetlands and waterways. It is a tall perennial grass having a single hollow, stiff vertical stem, slender leaves, and distinctive bushy, feathery plumes of flowers and seed heads. This robust grass is one of the most widely distributed wetland plants in the world. The phragmites genus includes 4 species and several genetic lineages or subspecies. Utah has one native subspecies and one invasive subspecies that was introduced from Eurasia.

In the last few decades, the invasive Eurasian subspecies of phragmites (*Phragmites australis* subspecies *australis*) has become well established in Utah, irrevocably changing many of the state’s wetlands. Eurasian phragmites are taller, produce more seeds, and grow faster and more vigorously than all other subspecies, including Utah’s native subspecies *Phragmites australis* subspecies *americanus*.

The invasive phragmites first reached North America around two hundred years ago and, since the 1900s, has become increasingly problematic as its range has extended across the continent. Once reaching Utah, it quickly spread along lakeshores, roads, and waterways, displacing the native phragmites along with other plants and animals. It also began consuming limited groundwater resources in vital wetlands.

Distinguishing native from invasive phragmites can be challenging, but physical and habitat differences between the two can help in identification. The most effective way to tell them apart is by comparing various plant features. For example, native phragmites is shorter and has a smaller flower/seed head than the invasive phragmites. However, features between the two subspecies have some overlap, so several plants in a stand should be inspected before determining whether they are native or invasive.

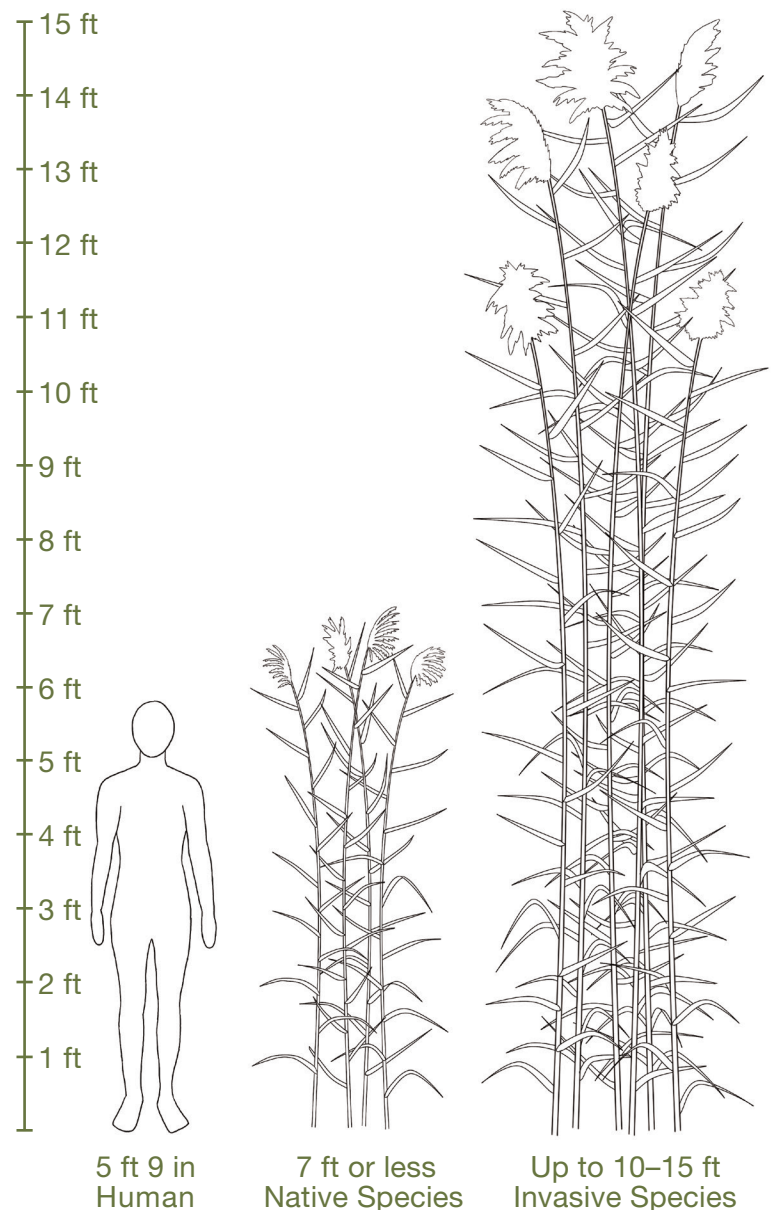


Image courtesy of Elisabeth Stimmel.

NATIVE VS. INVASIVE PHRAGMITES CHARACTERISTICS

Feature	Native	Invasive
Location	Isolated pockets at lakes, riverbanks, seeps, springs, and marshes	Disturbed areas, drainage ditches, roadsides, lake shores, and salty and seasonal wetlands
Plant Community	Loose stands with other species	Dense stands without other species
Leaf	Leaves easily pulled off, especially lower stem	Leaves difficult to twist off
• Attachment	• Longer attachment points (ligule)	• Shorter attachment points <1mm/ thinner than a dime)
• Color	• Lighter, yellow green	• Darker, blue green
• Persistence	• Drop off in winter	• Remain through winter
Height	3 to 7 feet	5 to 15 feet
Stem	Shiny and smooth	Dull tan with vertical ridges
Flower/Seed Head	Smaller, asymmetrical flower head	Larger flower head, usually symmetrical like a Christmas tree

LIFE STRATEGY OF INVASIVE PHRAGMITES

In Utah, the Eurasian subspecies of phragmites is legally classified as a Class III Noxious Weed that must be contained to prevent its spread. It invades disturbed landscapes, colonizing marginal and barren grounds, and moves into areas after flooding, fire suppression, and native vegetation removal. It is versatile and can grow in wet, seasonally dry, submerged, and saturated soil. Invasive phragmites are well adapted to growing in slightly salty water, in acidic or alkaline soil, and oxygenated or oxygen-free (anoxic) water.

Phragmites propagate by seed or runners (a process called cloning). Invasive phragmites have a robust, dense network of stolons (above-ground stems) and rhizomes (horizontal subterranean stems) that advance swiftly in a single season. On average, rhizomes spread about 16 inches a season, and stolons can grow over 4 inches in a single day. Fragments of rhizome or stolon can successfully relocate during floods or when transported by heavy machinery. Although runners are the main way phragmites establish new territory, its individual seed heads can produce up to 2,000 seeds that can disperse via wind or water transport.



Phragmites rhizomes along an estuary shoreline. Photo courtesy of Delaware Division of Fish and Wildlife.

GREAT SALT LAKE

In 1993, the first invasive phragmites specimen was collected and formally identified in the Great Salt Lake watershed at the Jordan River near Camp Williams. Researchers believe the invasive phragmites population around Great Salt Lake surged after the 1980s wet years, when prolonged flooding killed vast areas of native wetland vegetation along the east side of the lake, leaving behind vacant lands ripe for invasion. Its colonization around the eastern side of Great Salt Lake also coincided with a surge in development and population growth, which caused substantial landscape disturbance and a several-fold increase in two key plant nutrients: phosphorus and nitrogen. Today invasive phragmites represent more than 90% of the phragmites in the Great Salt Lake drainage basin. It is also well established across the state along rivers, agricultural landscapes, and lakeshores such as Bear and Utah Lake.

WHY SHOULD WE ELIMINATE INVASIVE PHRAGMITES?

Invasive phragmites may use more than twice as much water as native vegetation. The Utah Division of Water Quality estimates that this phragmites consume 3.26 feet of water annually, in comparison to 1.55 feet for inland saltgrass, a widespread wetland species of Great Salt Lake. Recent field studies indicate it may use even more water when in permanently flooded sites. The tightly packed stems of the phragmites, upwards of 60 stems per square yard, crowd and shade out native plants, resulting in a wetland “dead zone” within invasive phragmites-dominated areas. Phragmites also release toxins into the soil that can prevent seedlings of other plants from taking hold. Invasive phragmites affect the hydrology of wetlands, stagnate water, and provide an ideal breeding ground for mosquitoes. Phragmites rhizomes amass on top of each other over time, trapping sediments—up to several pounds per square yard a season—resulting in a rise in the ground elevation and moving the ground surface of a wetland farther from the water table. Invasive phragmites diminish habitat for most fish, shorebirds, waterfowl and marsh birds, and many other animals. It clogs canals and culverts and limits access for recreational opportunities such as fishing, hunting, and swimming. Stands of invasive phragmites also present a significant fire hazard. At the end of the growing season the stalks and leaves die, dry out, and rapidly burn when ignited.

Invasive phragmites may use more than twice as much water as native vegetation.



Dense thicket of invasive phragmites.



Loose stand of native phragmites in Arch Canyon, San Juan County.

Problem	Invasive Phragmites:
Habitat and biodiversity loss	Eliminates native plants and the wildlife that depends on them
Impacts on water resources	<ul style="list-style-type: none">• May use more than twice as much water as native vegetation in Utah wetlands• Clogs ditches and culverts• Impacts water quality
Economic costs	<ul style="list-style-type: none">• Obstructs shoreline views, reducing property values• Blocks recreational access• Utah spends over \$500,000/year on treatment of Great Salt Lake wetlands
Fire hazard	Dormant stands are highly flammable, burning hot and fast
Safety hazard	People regularly get lost in expansive thickets

METHODS FOR MANAGING PHRAGMITES

Controlling phragmites early, when infestations are small, is much easier than controlling large, established populations. A multi-year, multi-treatment approach is the most effective way to restore wetlands. Preserving intact native vegetation helps ensure a future mature plant community that is resistant to the advance of invasive phragmites.

Treatment	Timing	Details	Notes
Chemical	Late summer	Herbicides including glyphosate (e.g., Roundup) or imazapyr (e.g., Ortho GroundClear)	More effective when applied to well-watered, healthy (not drought stressed) plants
Mowing	30 days after chemical treatment	In standing water, cut stems below waterline	Bag and disposal of plant material
Prescribed fire	Late summer to winter	Requires permits	Stimulates native plant growth, very effective
Excavation	After mowing	Dig out roots and rhizomes	Feasible for small, pioneering stands; labor and time intensive; dispose of plant material
Tarping	During growing season after mowing or burning	Use thick (4–6 mil) plastic	Tarping kills all plants, not just phragmites; best for small patches after vegetation removal
Grazing and trampling	Over 30 days after chemical treatment	Cows, horses, sheep, goats, and deer graze on young shoots and leaves	Grazing and trampling allows light for native plants and depletes root systems
Flooding	Mid spring to late summer	Submerge entire plant	Prolonged and deep submergence is best, at least to 12 inches and for 4–6 weeks
Restoring native vegetation	Late summer, fall, or spring, best after several years of other treatments	Establish native plants by seed or planting	Native plants include bulrushes, saltgrass, cattail, pickleweed, nodding beggartick, golden dock, and fringed willowherb



A controlled burn removes a dense stand of invasive phragmites. Photos courtesy of Utah Division of Forestry, Fire & State Lands.

In the last 20 years, three-quarters of invasive phragmites coverage has been eliminated on Utah Lake and tens of thousands of acres eliminated from around Great Salt Lake. The Department of Natural Resources has invested significant time and money in removing phragmites around Great Salt Lake, treating more than 6,000 acres in 2022 alone. In 2024 the state allocated \$1.4 million for invasive species management on sovereign lands.

Although Utah has turned a corner in phragmites treatment, stopping expansion and restoring significant acreage of invaded marshes, the work has only just begun. Effective follow up treatment requires up-to-date mapping showing where phragmites is growing during the current year, a challenge given the size of waterfowl management areas. To help identify these areas of new growth, the UGS, in partnership with the Utah Division of Forestry, Fire & State Lands and the U.S. Fish and Wildlife Service, is developing computer models that can use drone and satellite imagery to map phragmites in a 30,000-acre wildlife management area to direct large-scale phragmites treatments each season.