Landowners Guide for Controlling Phragmites

An aggressive, nonnative variety of phragmites *(Phragmites australis)*, also known as common reed, is threatening the ecological health of Lancaster County wetlands and riparian areas.

Phragmites with mature seed heads

This invasive variety of phragmites is becoming widespread throughout Lancaster County. Even though the infested acres are quite small, infestations are scattered throughout the county and have enough seed production to potentially infest any areas having a saturated soil condition sometime during the year. The infestations have been found along streams, wetlands, ponds, lagoons road ditches and railroads. Once started in these areas, it quickly forms a colony that completely crowds out all other plants including cattails. If these scattered infestations are not controlled, solid stands of phragmites will completely cover wetlands and the riparian areas along upland streams and Salt Creek. The rapid expansion of this variety of phragmites will result in adverse ecological, economic and social impacts on the natural resources, the people of Lancaster County and the entire Lower Platte River Basin.

The easiest way to control phragmites is to begin a control program as soon as it is observed on your property, before the plants become well established. With the cooperation of landowners, complete eradication of this early invasion of phragmites may be achievable. An aggressive approach is needed now to prevent the rapid expansion to all Lancaster County riparian areas including Salt Creek.

Contact our office to report an infestation and / or for assistance in developing a control plan.

Lancaster County Weed Control Authority
444 Cherry Creek Rd, Building B, Lincoln, Nebraska 68528
402-441-7817

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Understanding Phragmites

To better control and manage phragmites it is helpful to understand the physical characteristics of the plant, as well as how and when it reproduces and spreads. In Nebraska, phragmites is growing along rivers, streams, flood plains and lakeshores with heaviest concentrations in the central Platte area but is being found throughout the Platte River and other rivers. It now is also beginning to be found in ditches and other low wet areas. Phragmites continues to expand within Nebraska, in part because it reproduces through wind and water dispersal of seeds and vigorous vegetative reproduction through rhizomes which can grow 30 feet or more in one year. Rhizomes broken by natural actions, such as waves, or man-made actions, such as dredging or disking, readily reroot in new locations.

Phragmites stolons

Phragmites plants range from 6 to 15 feet in height, yet 80 percent of the plant is contained below ground in a dense mass of roots and rhizomes that can penetrate the soil to a depth greater than six feet. In the summer, its flat gray/green leaves are 2 to 2.5 inches wide, 8 to 15 inches long and alternate along the stem. Phragmites has a distinctive purple-brown seed head with plumes appearing by late July. These feathery plumes that form at the end of stalks are 6 to 20 inches long and up to eight inches wide with many branches.

Phragmites turns a tan color in the fall and most leaves drop off, leaving only the stalk and plume-topped shoot commonly seen throughout winter. Each mature plant can produce as many as 2,000 seeds annually. New stands of phragmites may develop from seed which is spread by water and the wind, although this is a slower process than spreading by rhizome fragments.

Currently, native phragmites has not been identified in Lancaster County. However, it may be present, so it is important to identify the native phragmites versus the non-native invasive variety before attempting control.
Additional information on how to identify native versus non-native phragmites can be found at http://www.invasiveplants.net/phragmites/phrag/morph.htm

Contact our office and we will make the identification and provide assistance in developing a control plan.

Recommended Management Strategies

Controlling the spread of phragmites is crucial to the restoration of native wetland plant communities and protection of vital fish and wildlife habitat. Phragmites can easily spread if improper control methods are used. The following guidelines will help ensure that phragmites control efforts are effective.
Phragmites can be controlled using an initial herbicide treatment followed by mechanical removal (e.g., cutting, mowing) and annual maintenance. *(It is recommended to wait for at least 12 months after herbicide application to mow or burn)* For large areas with dense stands of phragmites, prescribed burning used after herbicide treatment can provide additional control and ecological benefits over mechanical removal. However, phragmites burns very hot and fast, and prescribed burns should be performed only by trained personnel. A burn permit and approval is required from local fire departments. No biological control methods for phragmites are currently available. However, researchers at Cornell University are studying several insects native to Europe that are known to attack phragmites as possible biological controls. To date, field experience and research have shown that using herbicides is the most effective method and is recommended as the first step toward effective control of phragmites.
Glyphosate (Rodeo) and **imazapyr** (Arsenal or Habitat) are two herbicides known to be effective in controlling phragmites. These herbicides are non-selective and will affect any plant species through contact with the leaves and stems. However, when applied using the correct method and used according to chemical manufacturer's instructions, impacts to native plants, as well as mammals, birds, and fish can be minimized. The aquatic formulations of these herbicides are required for use in wetlands. A surfactant should be added to these aquatic formulations to improve the effectiveness of the treatment.

Herbicide Selection

While the cost per gallon of Arsenal or Habitat (imazapyr) can be higher than Rodeo or other glyphosate products, results from recent studies suggest that imazapyr used alone or in combination with glyphosate can control phragmites for a longer period of time. When using herbicides, phragmites should be treated in early to late summer (June – September) using imazapyr, or late summer (August – September) using either glyphosate or a glyphosate / imazapyr mixture, to achieve effective control. Indications are that earlier applications are the most effective.

Methods of Application

Numerous methods may be used to apply these herbicides, depending on the size of the phragmites stand and existing site conditions.

Herbicide application methods for scattered plants or isolated plant stands include: injecting stems, hand swiping or selective hand spraying.

Seed head before maturity

Spot treating areas with scattered plants or isolated stands can prevent the establishment of large dense stands and is more cost effective.

Large dense stands may require use of commercial equipment. The use of a licensed or certified applicator is recommended to minimize damage to native plants and to ensure that safety requirements are met. The use of a licensed applicator certified in aquatic pest management is recommended for herbicide application in wetlands. Commercial pesticide use certification is required prior to using Habitat according to the manufacturer's label and is recommended prior to using Arsenal or glyphosate.

As with most invasive plants and animals, complete eradication of phragmites is unlikely.

Phragmites control requires a commitment to an integrated and long-term management approach. To achieve desired results, herbicides must be used in conjunction with mechanical methods or burning, and re-applied in subsequent years to spot-treat individual plants or patches of plants that were not completely eliminated in the first application. Large, dense phragmites stands will likely require follow-up spot treatments, and phragmites will continue to re-establish from remnant and neighboring populations, as well as the existing seed bank.

Phragmites typically begins to recover two to three years after treatment and will re-establish unless follow-up annual maintenance occurs, including spot treatment with herbicides.

Application Rates

Wet Sites - Sites with standing water at the time of the application must use an aquatic labeled herbicide. Recommendations are based on information from the UNL Extension EC 130 Guide for Weed Management in Nebraska. Always read and follow labels directions.

ARSENAL / HABITAT (Imazapyr) Apply to actively growing green foliage after full leaf elongation and up to first killing frost, ensure 100% coverage. (i.e., July up to first killing frost) Earlier applications have shown to be most effective. If the stand has a substantial amount of old stem tissue you may need mow or burn and allow to regrow to approximately 5' tall before treatment.

Application rates for Imazapyr – 2.0 – 4.0 pints per acre. Always use a label recommended surfactant.

AQUATIC GLYPHOSATE - Apply after plants are in full bloom and up to first killing frost, ensure 100% coverage. (i.e., Late August up to first killing frost). Earlier applications have shown to be most effective. If the stand has a substantial amount of old stem tissue you may need to mow or burn and allow to regrow to approximately 5' tall before treatment.

Application rates for glyphosate – 3.0 – 4.0 quarts per acre. Always use a label recommended surfactant.

Commercial Applicators

We have a list of commercial applicators including aerial applicators that would apply herbicides for the control of phragmites. Contact our office for a list or other assistance in developing a control plan.

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Biology

Biology of native and non-native common reed is almost identical. Therefore, further description will be made only for the non-native common reed. Non-native common reed is a perennial grass that produces a vigorous system of roots, including rhizomes (below ground, *Figure 3*) and stolons (above ground, *Figure 4*), which all form dense stands of monotypic communities (*Figure 1*). Vegetative structures are the driving force for quick land invasion with annual lateral spread of the rhizomes ranging from 1 to 10 feet (*Figure 3*), and stolons growing up to 80 feet long (*Figure 4*). Roots can penetrate soils 3 to 9 feet deep and be very difficult to remove. Many times a single node can sprout and produce rhizomes that spread below the ground and stolons that spread above the ground (*Figure 5*). This growth pattern can produce up to 200 stems per square yard that can reach up to 12 feet in height (*Figure 6*) with a large fluffy seed head (inflorescence) (*Figure 7*). The upright, aerial stems are derived from rhizome buds which are formed during the previous year's growth. At the end of each growing season, all the aerial stems die and growth in the following year continues from pre-existing rhizome buds (*Figures 3 and 5*). Flowering occurs from July to September.

Figure 3. Rhizome of non-native common reed.

Figure 4. Stolon of non-native common reed.

Figure 5. Single stem producing rhizome (white color) and stolon (green color).

Although the predominant means of spreading is through rhizomes and stolons, seed dispersal also occurs. Along rivers and shorelines, fragments of both vegetative parts (rhizomes, stolons) and seeds (*Figure 8*) can be washed downstream to new sites where they can establish. Seeds also can be dispersed by wind and birds when they mature. Rhizome fragments also may be transported between sites by heavy machinery.

Figure 6. Author Stevan Knezevic standing in 12-foot tall non-native common reed along the Missouri River.

Figure 7. Inflorescence of non-native common reed.

Figure 8. Non-native common reed seeds.

Herbicides, recommended rates for spring applications, and percent phragmites control at 90 and 365 days after treatment (DAT).

Herbicide	Active Ingredient	Rate/Acre	Percent Control	
			90 DAT	365 DAT
1. Rodeo	Glyphosate	1 qt	80	60
2. Rodeo	Glyphosate	2 qts	92	80
3. Rodeo	Glyphosate	3 qts	100	85
4. Habitat	Imazapyr	1 pt	87	50
5. Habitat	Imazapyr	2 pts	97	95
6. Habitat	Imazapyr	3 pts	100	100
7. Rodeo + Habitat		0.5 qt + 0.5 pt	90	70
8. Rodeo + Habitat		1 qt + 1 pt	98	80

Polaris Herbicide - 1 Quart (Same as 2 lb formula Arsenal Herbicide) Polaris Herbicide is made by Nufarm. It is exactly the same active ingredient as 2 lb formula Arsenal by BASF. Polaris, however, carries both the Vegetation Management label for land and the Aquatic label for around water! Polaris Herbicide is a broad-spectrum weed control product for the control of several undesirable annual and perennial grasses, broadleaf weeds plus many brush and vine species. It also provides long-term control by preventing re-germination of labeled weeds within treated areas. Due to its chemical activity and low application rates, Polaris has minimal effect upon wildlife habitat and helps alleviate concerns due to vegetation management practices in public areas.

Polaris Herbicide (Aquatic) is a two-pound formula liquid, aquatic herbicide for the control of undesirable emergent and floating aquatic vegetation in and around standing and flowing water, including estuarine and marine sites. Polaris AQ improves the quality and value of wetland areas infested with difficult floating, emerged and terrestrial weed species.

Arsenal, Hbaitat & Polaris active ingredient is Imazapyr