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Illinois
Nature Preserves Commission

VEGETATION MANAGEMENT GUIDELINE

Common Reed (*Phragmites australis* (Cav.) Trin. ex Steud.)

SPECIES CHARACTER

DESCRIPTION

Common reed, giant reed, giant reedgrass, roseau, roseau cane or yellow cane (*Phragmites australis*) is a perennial, emergent grass (Poaceae) with annual stems. The stems are erect, smooth, rigid, tough, hollow and 6–13 feet tall. The perennial rhizomes have horizontal and vertical components, can live 3–6 years and extend to a depth of 8–39 inches. These horizontal rhizomes grow laterally for three or more feet at which point the terminus upturns, becomes dormant until spring and grows into a vertical stem. More rhizomes grow laterally from buds on the vertical rhizomes. Stolons are sometimes produced in young stands or over open water. The leaves are alternate, flat, smooth, 10–20 inches long, up to 2 inches wide at the base, tapering to a point at the apex. Leaf bases form overlapping, smooth sheaths around the stems. Ligules are 1/16 to 1/8 inch and may be membranous or hairy. The inflorescence is a terminal, many-branched, purplish-brown panicle that becomes open and feathery at maturity. The panicle is 16 or more inches long and bears many spikelets with numerous silky hairs. The fruit, a caryopsis, is less than 1/8 inch long. Hairs below the seeds are almost as long as the seed. Seeds are usually not viable.

SIMILAR SPECIES

Phragmites australis can be difficult to distinguish from its congener *P. karka* (Retz.) Trin. ex Steud. from the Old World tropics. *P. karka* has biennial or perennial shoots while they are annual in *P. australis*. *P. karka* also has more branches on the lowest node of the panicle and the branches are bare of spikelets at the base. Common reed is also similar to *Arundinaria gigantea* (Walter) Chapman (giant cane), *Arundo donax* L. (giant reed) and *Zizania* spp. (wild rice). *Arundinaria gigantea* is a native woody perennial that stays green throughout much of the year and occurs in the southern one-third of Illinois. *Arundo donax* is a common exotic in the southern U.S. and occurs in Alexander, Pope and Pulaski counties of Illinois. It can be distinguished from *P. australis* by its more robust and broader leaves, taller shoots, larger panicles and pubescent glumes (glumes of *P. australis* are glabrous). The roots of *Zizania* spp. are shallow compared to the extensive rhizome system of *P. australis* and *Zizania* spp. *Zizania* spp. has monoecious inflorescences with unisexual spikelets unlike *P. australis* that has hermaphroditic flowers. Common reed should be accurately identified before attempting any control measures. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable individual or by consulting plant identification manuals or keys.

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DISTRIBUTION

Common reed has a nearly worldwide distribution occurring on every continent except Antarctica. In North America, it ranges from Nova Scotia to British Columbia southward into most of the United States and Mexico. It occurs in most counties in Illinois. While this species is native to North America, a nonnative, invasive genotype has been identified and is thought to be the cause for the spread of this species over the last 30 years. The invasive common reed occurs along the Atlantic coast to North Carolina, has been found in all eastern states and is expanding into the Midwest.

HABITAT

Common reed occurs along streambanks and ditches, pond and lake edges, sloughs, alkaline and brackish environments, acidic wetlands, marshes, oil production sites, dredge and spoil piles and reclaimed strip mine sites. Although common reed can occur in pristine areas, habitat manipulations and disturbances are thought to favor this species as it preferentially colonizes devegetated areas in wetlands that result from natural or cultural disturbances.

Common reed has difficulty establishing itself in permanently inundated areas. However, it can become established on sites with a seasonally high water table or are seasonally flooded. Air spaces in aboveground stems are believed to facilitate air transfer to belowground portions, thus allowing it to survive in stagnant water or poorly aerated soils. Once established, common reed can persist in permanently flooded areas where the water depth is less than 2 feet. Small apparently stable populations of common reed may expand rapidly if water levels are lowered and may persist as large colonies after water levels return to previous levels.

LIFE HISTORY

Common reed is a robust perennial grass that reproduces by rhizomes and seeds. Reproduction is predominately vegetative with annual lateral spread of the rhizomes ranging from 16 inches to 8 feet. Rhizome fragments can be spread by animals, machinery or flooding.

Flowering occurs from July - September. Aboveground portions of plant die back after seed set and nutrients are then translocated to and stored in the rhizomes. Common reed usually does not reproduce from seed. In most instances, reproduction is the result of vegetative sprouting of inflorescence fragments that are shed from November - January with sprouting occurring in spring. After germination, seedlings may remain small for two or more years and resemble other grasses. Once established, creeping rhizomes form dense colonies.

EFFECTS UPON NATURAL AREAS

Common reed is considered noxious in Alabama, South Carolina, Vermont, and Washington. Once established, populations can expand rapidly to form dense stands. These monospecific stands can alter the structure and function of marshes because of nutrient and hydrological alterations. Build up of leaf and stem litter can reduce plant species diversity and prevent colonization by more desirable species. Mammalian and avian diversity is usually low in dense stands of common reed. The increased fuel load can increase fire risk and make control more difficult.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN NATURAL COMMUNITIES OF HIGH QUALITY

Monitoring is highly recommended since common reed can spread rapidly and readily re-invade treated areas.

CHEMICAL CONTROL

Glyphosate, tradename Rodeo or Accord, is licensed for use over standing water and can provide 90 - 95% control when applied as a foliar spray. A 1.5% solution of Rodeo (9.6 ounces Rodeo + water to make 5 gallons) is recommended for hand-held equipment and 4 - 6 pints/acre with is recommended for broadcast equipment. A 2% solution of Accord (12.8 ounces Accord + water to make 5 gallons) is recommended for hand-held equipment and 2 - 4 quarts/acre is recommended for broadcast equipment. For best results, the initial treatment should be thorough and conducted when plants are tasseling (August - October). In most stands, follow-up treatments over several years will be necessary to eliminate the occurrence. If a large number of dead stems are present, the stand should be mowed or cut and allowed to regrow to a height four or five feet to ensure adequate herbicide coverage. Rodeo and Accord are nonselective herbicides, so care should be taken to avoid contacting nontarget plants. **Do not spray so heavily that herbicide drips off the target species.** The herbicide should be applied while backing away from the area to avoid walking through wet herbicide. Personal protective wear is recommended when applying herbicide. By law, herbicides may only be applied as per label instructions and by licensed herbicide applicators or operators when working on public properties.

Rodeo and Accord are rainfast six hours after application. Chlorosis may not be visible for two or more weeks after application and complete kill may not occur for several weeks. Rodeo or Accord will not control plants that are completely or have a majority of their foliage under water. In all applications, DO NOT exceed the maximum label rate of 6 pints (1.5 lb ai/acre) of Rodeo/acre/ year. Label rates for Accord are 5 quarts/acre over open water for a single broadcast application or 10.6 quarts/acre/year with repeated applications with Accord. Rodeo and Accord should not be applied to irrigation ditches or within one-half of an active potable water intake.

For small stands or scattered stems, a 25% solution of Rodeo with 2.5% nonionic surfactant (2.5 gallons Rodeo + 1 quart surfactant + 7.25 gallons water) applied to individual stems with a cotton glove or sponge during August has been found to be effective. Mix only the amount of solution that can be used in one day as reduced activity may result from use of leftover solution. To apply the herbicide, a cotton glove worn over neoprene gloves or sponge are dipped into the herbicide solution and the excess is squeezed out. The stems are then wiped with the cotton glove or sponge. In some treatment areas, a chemical protective suit with hood, may be needed to keep the applicator free of herbicide. Care should be exercised to avoid spilling the herbicide solution. In areas with standing water, the applicator may need assistance from another person for transport of the herbicide and to steady the container while the glove or sponge is saturated and wrung. A 30% solution of Accord with 10% nonionic surfactant (1.5 gallons Rodeo + 0.5 gallon surfactant + 3 gallons water) applied to individual stems during August may also be effective.

Isopropylamine salt of Imazapyr, tradename Habitat, is also approved for use in or around standing water. Habitat is also a nonselective herbicide. A 5% solution of Habitat (2 pints Habitat + 1.6 ounces nonionic surfactant + water to make 5 gallons) is recommended for hand-

held equipment. Application methods are the same as described for Rodeo. Habitat is rainfast one hour after application. Chlorosis may not be visible for two or more weeks after application and complete kill may not occur for several weeks. Habitat will not control plants that are completely or have a majority of their foliage under water. DO NOT exceed the maximum label rate of 6 pints (1.5 lb ai/acre) per year. Habitat should not be applied to irrigation ditches or within one-half mile of an active potable water intake.

MECHANICAL

Cutting at the end of July every year for several years may reduce colonies. Stems with panicles should be removed to prevent the spread of seed.

BURNING

Fire reduces dead standing stems and litter, but does not damage the rhizomes under normal burning conditions. Burns conducted in early to midsummer, when carbohydrate reserves are low and the soil is dry, can reduce stem density and biomass for 2-4 growing seasons. Prescribed burning may reduce, but not completely eliminate, common reed stands.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

CHEMICAL CONTROL

Recommendations are the same as those for high quality sites.

PLASTIC MULCH

Cutting in early summer followed by a covering of 4 or 6 mil plastic mulch for 3 - 10 days is moderately effective. Either clear or black may be used though black is somewhat more effective. Plastic mulch can be cumbersome to install, needs to be staked or weighted down to prevent winds from blowing it away and should be checked at least once per day to ensure that it has not become damaged or dislodged. Plastic mulching can be unsightly, expensive, and labor intensive to install and maintain, so it is best suited for small populations.

BIOLOGICAL CONTROL AGENTS

There are 26 and 140 herbivores known to attack *P. australis* in North America and Europe, respectively. As of 2002, no herbivores had been intentionally released for the control of *P. australis*, but 21 species have been accidentally introduced in North America. Some of these accidentally introduced herbivores feed strictly on the nonnative genotype of *P. australis* and are thus potential control agents for this species. Research into the life history, host specificity, and current U.S. distribution of these herbivores is currently being conducted.

INEFFECTIVE, FAILED, NOT RECOMMENDED PRACTICES

Burning will eliminate common reed only if the roots are burned which happens rarely because of the depth of the rhizome. Severe fires during unusually dry or drought conditions may be of sufficient intensity to damage common reed rhizomes. However, burning under severe conditions makes containment difficult, can pose safety concerns for personnel or adversely affect

desirable vegetation and is not recommended. However, burning reduces aboveground biomass and removes litter which may allow for more efficient application of herbicide and colonization by more desirable species. Late winter or spring burns may increase shoot density.

Mowing or discing reduces standing aboveground biomass and can prevent seed production if conducted several times per year, but these practices may not be practical in wet areas. A single mowing or discing in late winter or early spring may increase stem density. Mowing and discing equipment may also transport rhizome fragments if not thoroughly cleaned.

Digging the rhizomes is very labor intensive as the entire rhizome must be removed and is only practical for very small colonies growing in loose or sandy soils. Digging disturbs the soil which may provide excellent conditions for re-invasion.

Prolonged heavy grazing may reduce stand size and aboveground biomass by removing young buds and shoots. However, primary shoots that are grazed may produce secondary shoots; thus increasing stem density after grazing is stopped. Grazing animals may also trample desirable vegetation, dislodge or fragment rhizomes and increase turbidity in wetlands.

Common reed has a high tolerance to salinity, but increased salinity can decrease its biomass. While the reduction of common reed biomass by this method has been shown to increase oxygen availability and species diversity in salt marshes, it is not recommended as a control method. Most common reed populations in Illinois occur on sites where the natural salinity is low. Increasing the salinity of those sites may have adverse effects on native plant and animal species that utilize the area.

Control of common reed by water level manipulation, such as increased flooding beyond normal levels has been successful in salt marshes. The water level may need to be maintained at two or more feet above the normal level for one or more years to be effective. Prolonged flooding may have adverse effects on desirable native vegetation and animal populations.

REFERENCES

Blossey, B., Schwarzlander, M., Hafliger, P., Casagrande, R., and Tewdsbury, L. 2002. Common reed *In*: Biological control of invasive plants in the eastern United States, Publication FHTET-2002-04. R. Van Driesche, S. Lyon, B. Blossey, M. Hoddle, and R. Reardon [eds.]. USDA Forest Service, Forest Health Technology Enterprise Team, Morgantown, WV.

Galatowitsch, S. M., Anderson, N. O., and Ascher, P. D. 1999. Invasiveness in wetland plants in temperate North America. Wetlands 19(4): 733–755.

Mal, T. K., and Narine, L. 2004. The biology of Canadian weeds. 129. *Phragmites australis* (Cav.) Trin ex Steud. Canadian Journal of Plant Science 84: 365–396.

Marks, M., Lapin, B., and Randall, J. 1994. *Phragmites australis (P. communis)*: Threats, management, and monitoring. Natural Areas Journal 14(4): 285–294.

Mohlenbrock, R.H. 2002. Vascular flora of Illinois. Southern Illinois University Press, Carbondale, IL.

Mortensen, C. E. 2002. Invasive plants of the southern tier, USFS Region 9. U.S. Forest Service, Region 9 and Leech Lake Band of Ojibwe, Division of Resources Management, Cass Lake, MN.

Swink, F. and G. Wilhelm. 1994. Plants of the Chicago region. 4th ed. Indiana Academy of Science.

Uchytil, R. J. 1992. *Phragmites australis*. In: Fire Effects Information System, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Available: http://www.fs.fed.us/database/feis/ (Accessed online: November 3, 2004).

USDA, NRCS. 2004. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874–4490 USA.

U.S. Department of Agriculture. Midwestern wetland flora: Field office guide to plant species. U.S.D.A. Soil Conservation Service, Midwest National Technical Center, Lincoln, Nebraska. Jamestown ND: Northern Prairie Wildlife Research Center Home Page (http://www.npwrc.usgs.gov/resource/othrdata/plntguide.htm) Version16JUL97.

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Phragmites australis

USDA-NRCS PLANTS Database / Hitchcock, A.S. (rev. A. Chase). 1950. Manual of the grasses of the United States. USDA Misc. Publ. No. 200. Washington, DC.