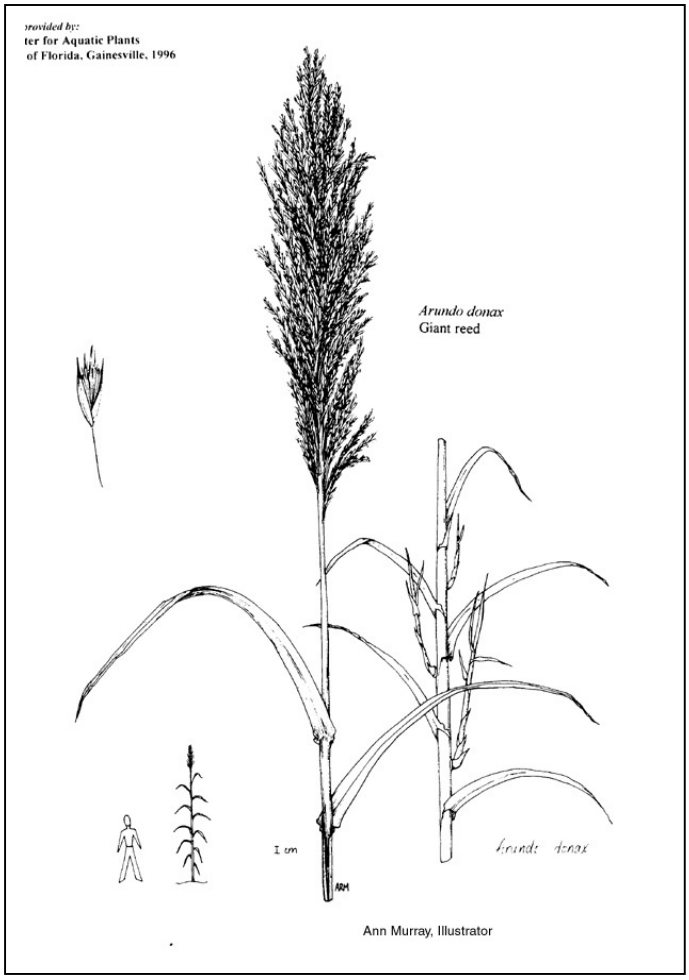
GIANT REED GRASS
Arundo donax

Life History/Identification:



Giant reed grass, also known as wild cane, is a tall, perennial, bamboo-like, grass that prefers stream banks and other wet areas. It has the ability to flourish in a wide variety of soils, including coarse sands, gravelly soil, heavy clay, and river sediment. Giant reed attains heights of 25 feet and once established forms large, continuous root systems. A single clump typically has hundreds of stems that grow very close together and very rapidly--several inches per day in the spring and summer months. The plant reproduces vegetatively by spreading outward and/or from clumps that break off from an adult plant. In the event of a flood, giant reed can float miles downstream where root and stem fragments may take root and initiate new infestations. Due to its rapid growth rate and vegetative reproduction, it is able to quickly invade a new ecosystem and form pure stands at the expense of other species. Giant reed can out-compete and completely suppress native vegetation. Individual stems (or culms) are tough and hollow, and, like bamboo, are divided by partitions. Culms are un-branched or have single lateral branches. Culms may remain green throughout the year but often fade with semi-dormancy during the winter months or in drought. The leaves are pale green to blue-green and they clasp the stem with a heart-shaped base. Leaves are elongate, 1 to 2 inches wide at the base, and about a foot long. During August and September, giant reed produces a tall, plume-like flower head at the upper tips of the stems. The flowers are closely packed in a cream to brown colored cluster. Little is known about the importance of sexual reproduction in giant reed, or about its seed viability, dormancy, germination, and seedling establishment. Research on these topics may yield some additional improvements in the management of giant reed.

Northern Arizona Localities:

Although giant reed has done the most damage in southern California, there are infestations in Arizona that need immediate attention. The plant has been found along drainages and wet areas in the Coconino, Kaibab, and Prescott National Forests, including Camp Verde and Sedona. It grows in warm, sunny areas below 5,000 feet in elevation on either steep or flat ground. Research indicates that giant reed does not appear to tolerate high elevation or continental environments where regular freezing occurs.

Origin & Impacts:

Giant reed is often considered indigenous to the Mediterranean Basin or to the warmer regions of the Old World, but it is apparently an ancient introduction into Europe from the Indian sub-continent. It was introduced into the United States in the early 1800's, where it was used for roofing material and fodder. Incidentally, giant reed still has a variety of uses in our modern world. Woodwind instruments are made from its culms, for which no satisfactory substitute is known. It is also used in basketry, for fishing rods, livestock fodder, medicine, and soil erosion control. Outside of its native habitats, however, giant reed is a destructive and insistent pest. Because of its ability to replace native riparian vegetation, native plant, animal and bird species are threatened. Unlike native riparian plants, giant reed provides

little shading, leading to increased water temperatures and reduced habitat quality for aquatic wildlife. It reduces groundwater availability, constricts water flow, and drops stream navigability. Dense growths also present fire hazards, more than doubling the available fuel for wildfires.

Control:

Cultural Control:

Native plant species that are adapted to local conditions should be used in restoration projects and as a substitute for giant reed in landscapes and for erosion control practices. Unfortunately, the use of native plants to increase competition with giant reed provides an insufficient level of control, and in fact seems to offer little resistance against this invasive exotic reed.

Mechanical Control:

Very small infestations can be eradicated by manual methods, especially where sensitive native plants and wildlife may be damaged by other means. Hand pulling works with new plants, but care must be taken that all stem and root materials (rhizomes) are removed. Plants can be dug up using hand tools in combination with cutting the weed near the base with pruning shears, machete, or chainsaw. For larger infestations on accessible terrain, heavier tools, such as a rotary brush-cutter or a tractor-mounted mower (Pestmaster™), may facilitate biomass reduction followed by rhizome removal or a chemical treatment. Such methods may be of limited use on complex, sensitive, or sloped terrain, and may interfere with the re-establishment of native plants and animals. Ultimately, purely mechanical eradication is extremely difficult, as rhizomes buried under the soil readily resprout, and the removal of all viable material is unfeasible, especially where extensive soil disturbance would negatively effect the environment. Burning is problematic because of the risks of uncontained fire, the possibility of damage to beneficial species, and the fact that giant reed sprouts vigorously from surviving rhizomes following a fire.

Chemical Control (Noted here are chemical control techniques that have been used in other areas. Always check with weed specialists or chemical suppliers before treatment to ensure correct dosage and application. Mention of these products does not imply endorsement by the USDA Forest Service, Northern Arizona Weed Council or The Nature Conservancy):

In many situations it may be necessary to use chemical methods to achieve true eradication, usually in combination with mechanical removal. The most common herbicidal treatment against giant reed is Rodeo™ (chemical name: glyphosate), which is approved for use in the wetlands. Because glyphosate is a broad-spectrum herbicide, care should be taken to avoid application or drift onto desirable vegetation.

a) Spray only The standard treatment is a foliar spray application of 1.5% by volume glyphosate with a 0.5% non-ionic surfactant. The most effective application time is post-flowering and pre-dormancy, usually late July to early October when plants are translocating nutrients into the roots and rhizomes. Small patches can be treated from the ground using backpacks or towed sprayers.
b) Cut and spray (cutting stems and spraying or painting herbicide on to cut stem surface)
c) Cut, resprout, and spray (cutting stems, letting plants resprout, and spraying resprouts with herbicide).

Biological Control (No exotic species should be introduced into an ecosystem without extensive research into the long-term effects. Mention of the species below does not imply appropriateness for use in Northern Arizona):

No biological control agents have been introduced against giant reed. In fact, insects and other pathogens are unlikely to be introduced because the plant is commercially used. Grazers such as sheep and cattle may be useful, and Angora goats have been partially successful in reducing the reed in southern California. Grazers alone are unlikely to reduce population size to sufficiently eliminate the risks posed by giant reed.

Note: No single control method, or any one-year treatment program, will ever achieve effective control of an area infested with giant reed. The fast growth, aggressive nature, and fast rate of spread of this plant require long-term cooperative integrated management programs to prevent new giant reed infestations and control existing.

Species Management Plan
Giant Reed
Arundo donax

Status: Giant Reed Grass is not recognized as a noxious weed on the Coconino, Kaibab and Prescott National Forests. It is not on the Arizona state list of noxious weeds. There are no entries for it in the SWEMP database. This species is of local concern in areas such as the Verde Valley, where its' presence is a major ecological impact along certain waterways.

Life History/Identification: Giant reed is a member of the grass family, Poaceae. It is one of the largest perennial grasses. The height of individual plants can be from 6 to 18 feet in height. The leaves are blue-green, about one inch wide and can be as long as twelve inches. The surface of the leaves can be glabrous (smooth) or scabrous (rough to the touch). The thick stems can be ¼ to 2 inches in diameter and two feet long. The inflorescence is a panicle. Extensive fibrous roots form dense mats in the soil. The plants form seeds, but reproduction is mostly from rhizomes. Plant fragments can float many miles downstream establishing new populations. Giant reed is a native of the Mediterranean area. It was first introduced into the United States in the 1800's. It is used as an ornamental and many varieties of this plant are available from commercial sources. In wild land situations it is primarily a riparian species, but may also grow in areas where the water table is near the surface. This includes roadsides and ditches. The plant grows on a variety of soils at elevations below 5000 feet. It can grow on steep slopes as well as flat areas. Uses for giant reed include ornamental plantings, basketry, livestock fodder and musical instruments including primitive pipe organs and woodwind instruments. No suitable substitute material has been found for the musical instruments (Alien Plants Working Group).

Known Locations: This plant is found along various waterways in the Verde Valley. Other locations may be found along drainages and wet areas in the Coconino, Kaibab and Prescott National Forests.

Impacts: The giant reed has been intentionally introduced in some areas for erosion control. However, it out competes native vegetation and can form dense monocultures. In some areas of the southwest, it is replacing the native common reed *(Phragmites communis)*. Giant reed competes with and eliminates native riparian vegetation in the areas where it becomes established. This impacts native vegetation and the animals that are dependent upon them. The giant reed can provide nesting and hiding cover for waterfowl but eliminates native riparian vegetation, which is important to native animal species. Giant reed can clog culverts and other structures along waterways, causing flooding and structural failure. This can lead to resource damage and costly repairs. . Giant reed generates a lot of biomass and the dried plant material from previous years is highly flammable. This leads to increased fire risk along the waterways and other areas where it is found. (Fire Effects Database). This could possibly introduce

fire into areas and vegetation types that did not evolve with fire. This could be destructive to native species that are not fire tolerant.

Control: Some natural control exists for giant reed in the Southwest. The species is dependent upon frequent flooding and periodic drought has helped restrict the distribution of this species (Fire Effects Database).

1. Cultural Control:

Education may be one of the easiest ways to control the spread of this species. Local gardeners and nurserymen should be encouraged to use local native species in ornamental plantings in the Verde Valley area and other areas throughout Northern Arizona where there might be potential for establishing new populations. Gardening with local **native species** or less invasive exotics should be encouraged.

2. Mechanical Control:

Digging, pulling or hand cutting could fragment the roots of giant reed plants and exasperate control efforts. Any topsoil disturbance can lead to fragmentation of the rhizomes, therefore more plants. **Mowing** can be used to control the plants but must be done several times to ensure depletion of energy stored in the rootstalk. Care must be taken when mowing not to fragment the roots and the mower should be cleaned before leaving the area to ensure that plant fragments are not carried to new sites where they might establish new populations.

There is conflicting data on the use of **fire** to control giant reed**.** Information from the website of the Alien Plants Working Group states that prescribed fire may be effective in the control of giant reed. The plants could be burned, and then when sufficient material is removed, native species could be re-seeded. However, data in the Fire Effects Database indicates that giant reed regenerates readily from rhizomes after burning. Fire removes the upper portions of the plants, but the underground rhizomes survive most fires allowing plants to regenerate following a fire.

3. Chemical Control: *Noted here are chemical control techniques in use in other areas. Always check with weed specialists or chemical suppliers to ensure correct dosage and application. Mention of these products does not imply endorsement by the Northern Arizona Weed Council, San Francisco Peaks Weed Management Area, the USDA Forest Service, nor the Nature Conservancy. Currently the use of herbicides is not allowed on lands administered by the Coconino, Kaibab and Prescott National Forests. Always check with your local land manager before using herbicides on public lands.*

Glycophosphate has been used in the control of giant reed. This herbicide is biodegradable but is a nonselective systemic herbicide. It will affect all plants present in the area, which is sprayed. Foliar application or application to the cut stems has been used. Success rates for foliar spraying is 10 to 90% and 100% for the cut stem method (Fire Effects Database).

4. Biological Control: No biological control agents are approved for use on giant reed.

5. Integrated Control:

Cutting stems and treating the cut ends with **glycophosphate** is useful for the treatment of giant reed. The success rate for this method as described above in the herbicide portion is very successful.

Prescribed fire and herbicide treatment may useful in the control of giant reed. This method was mentioned in the Alien Plants website and in the Invasive Plants of Virginia website. However, no details were given on how the treatment was initiated. It is assumed that the top parts of the plant are removed by burning, and then the remainder would be treated with herbicide.

A method of **mowing and mulching** several weed species including giant reed is used by a private company called Pestmaster. The information displayed on the Pestmaster website shows a mower which is pulled

behind tractor. This mower cuts the weeds and grinds them into pieces, which are left at the site. The company advertises that it hand cuts the weed species from around native plants and uses "environmentally friendly" herbicide where needed.

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