

Oregon Department of Agriculture  
Plant Pest Risk Assessment for Giant Reed  
*Arundo donax* L. February 2011  
Revised November 2019

**Name:** Giant reed (*Arundo donax*); a.k.a. giant cane, Spanish reed  
**Family:** Grass (Poaceae)

**Findings of this review and assessment:** Using a rating system adapted from United States Department of Agriculture, Animal and Plant Health Inspection Services, Plant Protection and Quarantine Weed Risk Assessment Guidelines, *Arundo donax* scored 57 out of a potential score of 90 (A-listing). Using the ODA Noxious Weed Rating System, it scored **19** out of 25 (low A-listing).

The scoring indicates that *Arundo* be listed as an “A” rated weed, however, it has been debated and decided within the Weed Control Program staff that it will be listed as a ”B” weed. The basis for this listing rests with its lack of seed production and its association with urban landscapes. **It should be noted also that the genus *Arundinaria* (variegated arundo) and dwarf or variegated cultivars are not considered in this document.**

**Introduction:** *Arundo donax* is a true giant in the grass family, often growing 20’ high under optimal conditions. It is considered a serious weed throughout the Southwest and Texas growing along streams, springs and in the floodplains of waterways. The thick-stemmed grass is perennial, growing each year from a large root mass. Seed production has not been observed in North America. Due to its use as an ornamental and the previous investment in large scale plantings in the Columbia Basin as an energy feedstock alternative at the coal fired powerplant in Boardman OR., it was evaluated in a 2011 risk assessment by ODA. As of 2016, all plantings have been eliminated due to marginal economic opportunities for its use. Currently, only two feral populations has been found in Western Oregon. It was observed growing vigorously in Jackson County along Bear Creek in Medford and along an irrigation canal near Talent. These sites do provide an indication of potential invasiveness at least in southwest Oregon.



**Growth characteristics:** *A. donax* is one of the world's largest herbaceous grasses growing in dense compact masses reaching a height up to 20'. It accomplishes this feat by utilizing C4 respiration, the same metabolic process found in sugar cane. Fleshy, almost bulbous creeping rootstocks anchor deep (3') into soils and form dense root mats that break up during flood events. Giant reed tolerates soil types and thrives especially well in sandy or moist well-drained soils commonly found in riparian zones subjected to annual flooding. The grass grows vigorously in tropical to warm temperate climates producing hollow stems 1-4 cm across. In colder temperate zones, reeds die back each winter or may take on a very ragged appearance during mild winters. In warmer climates the canes are perennial. Flowers are born on large plume-like panicles between March and September but flowering is extremely rare in North America and seed production is not known to occur. Leaves are alternate growing up to 70 cm in length and 2-6 cm wide. Populations established in riparian zones can creep outward into drier to droughty soils utilizing deep-growing roots to gather subsurface water. Dormant plants are resistant to freezing temperatures though new growth is impacted by frost events which may stunt overall height (Hoshovsky 1986).

Giant reed produces a host of compounds which are poisonous to grazing animals and insects. Studies have found this plant to be rich in active tryptamine compounds, Toxins such as bufotenidine[7] and gramine[6] have also been found.

**World Distribution:** *A. donax* is native to Europe from the central Atlantic coast of Portugal, inland along the major rivers of the Iberian Peninsula, along the Mediterranean coast from Spain to Greece, including the warmer parts of the Adriatic Coast. In north Africa along the Mediterranean, the populations are discontinuous from the Western Sahara, Morocco, Algeria, to the Arabian Peninsula (USDA ARS 2009). *Arundo donax* can now be found in most tropical regions, where it was introduced to produce basket weaving materials and windbreaks. Other early introductions are attributed to the French (Bir 2010). From these early introductions, additional plantings were established in waterways for erosion control. . Elsewhere it is weedy or is grown intentionally in New Zealand, Caribbean islands, southern Africa and SE Asia (Hafliger and Scholz 1981).

**United States distribution:** The majority of escaped populations reported as invasive occur in the southern half of the United States (Figure 2). Information regarding more northern escaped populations and its invasiveness in northern latitudes is not well documented. Further expansion in the United States can be expected if *Arundo* proves to be a viable bio-energy source. Ornamental plantings may contribute to spread by being introduced into riparian areas through dumping of yard debris or by being intentionally planted next to streams by homeowners who are unaware of the potential problems. Animals are causal agents of spread, as *Arundo* produces a host of compounds that serve to discourage grazing or insect feeding.

**Pacific Northwest Observations:** Gardeners and producers have some experience with *Arundo* in the Pacific Northwest. A five-acre plantation established near Junction City (Lane County Oregon) grew poorly in the clay soils normally utilized for grass seed production and was removed in 2009. The Lane County plot was established to determine *Arundo*'s suitability as an energy crop. The planting was not viable.

Small patches exist in landscapes and water gardens throughout the Northwest, including a xeric garden in a city park in Yakima, Washington where it is reported as doing well (Jacobson per. comm. 2011). Such plantings are not common and only one escaped population has been observed or reported in the Northwest.

It has not been observed spreading from ornamental plantings in the Willamette Valley, but it could survive and spread if introduced along the banks of the Willamette River. Yearly surveys by various groups would locate any patches rapidly if it did establish.

It is not entirely clear if it may thrive in the colder upland environment of Eastern Oregon without irrigation. Where it may thrive is in the lower elevation marshes and wetlands along the Columbia River, lower John Day River, lower Deschutes and the lower Umatilla rivers. Here the moist soils and standing water would insulate the roots, enabling them to survive periodic freeze events.

The climate of Jackson, Josephine, Coos and Curry Counties in southwest Oregon is mild, providing a long growing season with little risk of freeze damage, enabling giant reed to grow vigorously. Oregon's first documented escaped population was identified in 2006 on Bear Creek near Medford; it has since been eradicated (French pers. comm. 2006). The second population composed of two patches, was located along an irrigation canal in Jackson County near Talent OR. These two patches are eradicated.

Commercial plantings were established in 2011 on irrigated farmland near Boardman OR. It was more difficult to establish a commercially viable stand than originally thought (Porter 2019). The planting was initiated to provide an alternative fuel feedstock for the coal fired plant in Boardman. The economics of the operation failed to match the income level of other higher value crops and the last plantings were removed in 2016. In addition to being harder to establish commercially, *Arundo* proved to be difficult to fully eradicate. Remnant populations persisted through freezing temperatures, a lack of water, digging and spraying. Eradication was ultimately achieved. Such efforts indicate that should large populations establish, eradication may be difficult.

**Reproduction and dispersal:** Root fragments are the most viable plant material for propagation. Root fragments store easily and can be transported with little care. Sharing and planting of root material along streams throughout the southwest over a hundred years ago has led to the invasive problems of today. Periodic flood events dispersed root fragments throughout those stream systems creating monocultures. In the Pacific Northwest, ornamental sales to homeowners are currently the only long-distance dispersal mechanism. Plantings are rare though.

**Positive attributes:** *Arundo donax* is a highly versatile plant that has been cultivated for over 5,000 years (Perdue 1958). A previous rise in petroleum prices, climate change concerns, energy security, and a desire for renewable energy sources has increased global interest in biofuels. *Arundo* produces large quantities of biomass per acre and is being studied as a promising alternative energy source in Europe. Many countries are looking at biofuels as a key to help reduce reliance on foreign oil, lowering emissions of greenhouse gases and meeting economic development goals (Demirdas 2007). **At the time of this revision (2019), no reports were identified indicating a fully functioning, *Arundo* powered, energy generation plant**

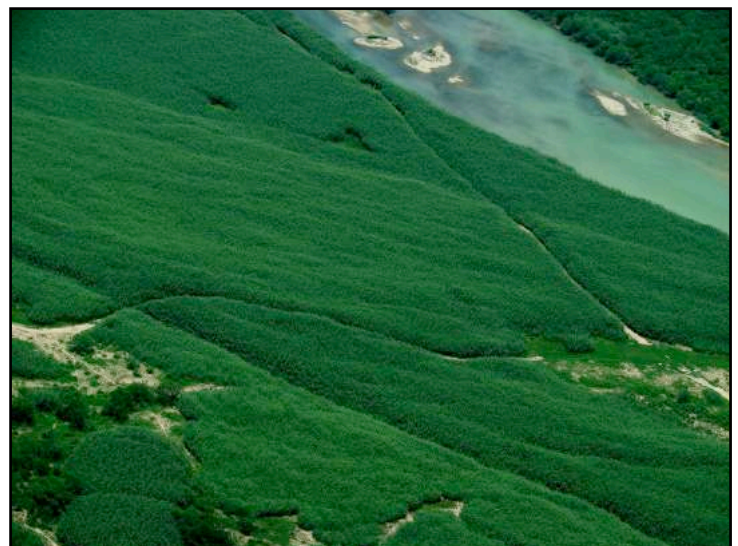
**operating anywhere in the world.** Factors including abundance of natural gas and fracking oil make biofuel to energy conversion currently less competitive, though in the long term, utilization of this alternative may one day become viable.

Historically *Arundo* has also played an important role in the development of music in Western culture (Perdue 1958). The hollow stems are used widely for flutes, pipes, clarinets, and bagpipes. Reeds for woodwind instruments are made from the culms and no satisfactory substitute had been developed. Canes and leaves provide an important source of building materials for roofing, shelter, shreens and fencing (Bir 2000). *Arundo* has been planted widely for windbreaks, erosion control and as an ornamental. It makes high quality paper and is used for the production rayon in Italy (Duke 1983). *Arundo* is grown commercially in Mediterranean Europe, South America, Caribbean Islands, and China. In Oregon, it is a minor nursery crop and can be found for sale and used as an accent plant in landscapes and water gardens.

**Negative Economic Impact:** Economic impacts are documented in California and the Southwestern resulting from flood damage, water loss, structural damage, and increased fire hazard. *Arundo* canes can create large debris piles that threaten the structural integrity of bridges and other in-stream structures that require expensive removal and cleanup following flood events. In some cases, *Arundo* completely dominates streams and flood channels forcing waters to cut away from the main channel. Water in the desert southwest is often in short supply. *Arundo* removes large amounts of in-stream and groundwater that could be used for irrigation, drinking water, native plants, and wildlife. Compared to native plants, it consumes three times as much the water. A Cal IPPC study estimated that water use by *Arundo* in California was 20 acre feet per acre per year! (Cal IPPC 2011)

**Ecological Impacts:** Streamside and riparian impacts occur from aggressive annual growth and the ability of giant reed to spread laterally by rhizomes to form monotypic stands that displace native species. *Arundo donax* dramatically alters the ecological processes in riparian systems and ultimately transforms most riparian habitats into pure stands of alien grass. By current estimates there are tens of thousands of acres of *Arundo* along the major coastal drainage systems of southern California (Bell 1997). Studies of native plant richness in areas invaded by *Arundo* show greatly decreased native plant cover (Cushman, Gaffney 2010), with willows, cottonwoods and streamside shrubbery suffering the most.

Many species of migratory songbirds including the threatened southwestern willow flycatcher and Bell's vireo require these native plants for feeding, nesting and cover (Humple, Geupel 2002). When *Arundo* invades their numbers decline. Additionally, native insects required by these songbirds for food no longer exist in sufficient numbers to sustain reproductive populations (Herrera and Dudley 2003). In addition to impacts on wildlife food webs through trophic level simplification, *Arundo* is believed to have microclimate effects on stream temperature through reduction in shading. Leaf litter



Aerial view of *Arundo* near Eagle Pass, Texas, along the Rio Grande

quality also decreases reducing food sources for aquatic invertebrates (Beerling, Dawah 1993).  
Right photo: *Arundo* along Rio Grande.

**Probability of Early Detection:** Most regions of Oregon have active weed control programs, watershed councils, or Soil and Water Conservation Districts that are actively engaged in early detection of invasive species. *Arundo* is a large, easily detected plant even in early stages of establishment. An informed public and weed professionals can readily identify and report this plant.

**Control:** Control requires the killing or removal of the root-mass. Small populations of *Arundo* can be controlled manually with a lot of effort, but care must be taken to completely remove all root fragments. Large-scale control programs require treatment with a systemic herbicide to achieve effective control. An effective treatment is a foliar application of glyphosate applied at 3-5% solution mid-August to early November prior to dormancy (Spencer et.al. 2008). Large infestations covering many river miles present challenges and many methods of vegetation removal are employed with varying degrees of success; these include prescribed fire, heavy machinery, mowing and cutting. Control costs using glyphosate applications can sometimes reach \$20,000 per hectare (Mack 2008).

The United States Department of Agriculture-Agricultural Research Service (USDA-ARS) is investigating four insects as classical weed biological control agents. Each of the four attacks giant reed at a different place. The scale insect, *Rhizaspidiotus donacis*, attacks the root; the wasp *Tetramesa romana* attacks the main stem; the *Arundo* fly *Cryptonevra* spp. feeds the inside of the new shoots; and the leaf sheath miner, *Lasioptera donacis*, attacks the leaves. The *Arundo* wasp, was released in Texas in 2009, the first natural enemy to be employed against *Arundo donax* (Agriculture Research 2009). Since that initial release, *Tetramesa* has dispersed widely and has significantly impacted *Arundo*, causing reductions in plant density (>32%) allowing for a return of native trees and shrubs into riparian zones (Moran, Vasec et. al. 2017).

**The future for commercialization of *Arundo*:** Interest continues to emerge from private companies to find ways to utilize *Arundo* for a variety of products and energy. Recent interest in Corvallis OR to grow the plant as a feedstock for biogas production at a vegetable processing plant or for IKEA panel board production among others indicates that companies will continue to look at commercial applications for *Arundo* into the future. A warming climate in addition to increased atmospheric carbon dioxide levels will favor increased dry matter production enhancing profitability.

### **Noxious Weed Qualitative Risk Assessment Oregon Department of Agriculture**

Common name: Giant reed  
Family: Poaceae  
Scientific name: *Arundo donax*

Total Score: **55**                      Risk Category: **A weed**

For use with plant species that occur or may occur in Oregon to determine their potential to become serious noxious weeds. For each of the following categories, select the number that best applies. Numerical values are weighted to increase priority categories over less important ones. Choose the best number that applies, intermediate scores can be used.

## GEOGRAPHICAL INFORMATION

1. 4      **Invasive in other areas**
- 0 Low- not know to be invasive elsewhere
  - 2 Known to be invasive in climates dissimilar to Oregon's current climates.
  - 6 Known to be invasive in geographically similar areas worldwide.
- Comments:** *Arundo* is well adapted to subtropical to warm temperate climates. The majority of Oregon is outside of the ideal climate zones. It has only been observed to grow vigorously in southwest Oregon. It can survive in lower elevation agricultural regions where prolonged or regular periods of freezing temperatures exist.
2. 6      **Habitat availability:** Are there susceptible habitats for this species and how common or widespread are they in Oregon?
- 1 *Low* – Habitat is very limited, usually restricted to a small watershed or part of a watershed (e.g., tree fern in southern Curry County).
  - 3 *Medium* – Habitat encompasses 1/4 or less of Oregon (e.g., oak woodlands, coastal dunes, eastern Oregon wetlands, Columbia Gorge).
  - 6 *High* – Habitat covers large regions or multiple counties, or is limited to a few locations of high economic or ecological value (e.g., threatened and endangered species habitat).
- Comments:** Prefers riparian habitats, wetlands, any undisturbed place with adequate moisture.
3. 3      **Proximity to Oregon:** What is the current distribution of the species?
- 0 *Present* – Occurs within Oregon.
  - 1 *Distant* – Occurs only in distant US regions or foreign countries.
  - 3 *Regional* – Occurs in Western regions of US but not adjacent to Oregon border.
  - 6 *Adjacent* – Weedy populations occur adjacent (<50 miles) to Oregon border.
- Comments:** California is the only bordering state with weedy populations. There are no weedy populations adjacent to the Oregon border. It is most abundant in central (Sacramento Valley, San Joaquin Valley, South Coast Regions) and southern California.
4. 10      **Current distribution:** What is the current distribution of *escaped* populations in Oregon?

- 0 *Not present* – Not known to occur in Oregon.
- 1 *Widespread* – Throughout much of Oregon (e.g., cheatgrass).
- 5 *Regional* – Abundant (i.e., occurs in eastern, western, central, coastal, areas of Oregon) (e.g., gorse, tansy ragwort).
- 10 *Limited* – Limited to one or a few infestations in state (e.g., kudzu).

**Comments:** There are historically two known escaped populations in Oregon. One escaped population at Bear Creek in Jackson County was eradicated by ODA in 2006 another near Talent OR was eradicated by the Talent Irrigation District

## BIOLOGICAL INFORMATION

5. 2 **Environmental factors:** Do abiotic (non-living) factors in the environment effect establishment and spread of the species? (e.g., precipitation, drought, temperature, nutrient availability, soil type, slope, aspect, soil moisture, standing or moving water).
- 1 *Low* – Severely confined by abiotic factors.
  - 2 *Medium* – Moderately confined by environmental factors
  - 4 *High* – Highly adapted to a variety of environmental conditions (e.g., tansy ragwort, Scotch broom).

**Comments:** Frost and freezing temperatures significantly impact the growth of *Arundo*. It is dependant on adequate soil moisture for establishment and spread.

6. 3 **Reproductive traits:** How does this species reproduce? Traits that may allow rapid population increase both on and off site.
- 0 *Negligible* – Not self-fertile, or is dioecious and opposite sex not present.
  - 1 *Low* – Reproduction is only by seed, produces few seeds, or seed viability and longevity are low.
  - 3 *Medium* – Reproduction is vegetative (e.g., by root fragments, rhizomes, bulbs, stolons).
  - 3 *Medium* – Produces many seeds, and/or seeds of short longevity (< 5 years).
  - 5 *High* – Produces many seeds and/or seeds of moderate longevity (5-10 years) (e.g., tansy ragwort).
  - 6 *Very high* – Has two or more reproductive traits (e.g., seeds are long-lived >10 years and spreads by rhizomes).

**Comments:** Reproduction is by root fragments only.

7. 2 **Biological factors:** Do biotic (living) factors restrict or aid establishment and spread of the species? (What is the interaction of plant competition, natural enemies, native herbivores, pollinators, and pathogens with species?)
- 0 *Negligible* – Host plant not present for parasitic species.
  - 1 *Low* – Biotic factors highly suppress reproduction or heavily damage plant for an extended period (e.g., biocontrol agent on tansy ragwort).
  - 2 *Medium* – Biotic factors partially restrict or moderately impact growth and reproduction, impacts sporadic or short-lived.

- 4 *High* – Few biotic interactions restrict growth and reproduction. Species expresses full growth and reproductive potential.

**Comments:** A native biological control insect has been dispersed by USDA-ARS. First identified in a small region of California, the species, *Tetramesa romana* (stem wasp) is negatively impacting *Arundo* in the Southwest.

8. 3 **Reproductive potential and spread after establishment - Non-human factors:**  
How well can the species spread by natural means?

- 0 *Negligible* – No potential for natural spread in Oregon (e.g., ornamental plants outside of climate zone).
- 1 *Low* – Low potential for local spread within a year, has moderate reproductive potential or some mobility of propagules (e.g., propagules transported locally by animals, water movement in lakes or ponds, not wind blown).
- 3 *Medium* - Moderate potential for natural spread with either high reproductive potential or highly mobile propagules (e.g., propagules spread by moving water, or dispersed over longer distances by animals) (e.g., perennial pepperweed)
- 5 *High* – Potential for rapid natural spread throughout the susceptible range, high reproductive capacity and highly mobile propagules. Seeds are wind dispersed over large areas (e.g., rush skeletonweed)

**Comments:** *Arundo* is spread by moving water during flood events.

9. 3 **Potential of species to be spread by humans.** What human activities contribute to spread of species? Examples include: interstate or international commerce; contaminated commodities; packing materials or products; vehicles, boats, or equipment movement; logging or farming; road maintenance; intentional introductions of ornamental and horticultural species, or biofuel production.

- 1 *Low* – Potential for introduction or movement minimal (e.g., species not traded or sold, or species not found in agricultural commodities, gravel or other commercial products).
- 3 *Medium* – Potential for introduction or off-site movement moderate (e.g., not widely propagated, not highly popular, with limited market potential; may be a localized contaminant of gravel, landscape products, or other commercial products) (e.g., lesser celandine, Canada thistle).
- 5 *High* – Potential to be introduced or moved within state high (e.g., species widely propagated and sold; propagules common contaminant of agricultural commodities or commercial products; high potential for movement by contaminated vehicles and equipment, or by recreational activities) (e.g., butterfly bush, spotted knapweed, Eurasian watermilfoil).

**Comments:** *Arundo* is not a popular ornamental in the nursery trade. It is not currently a contaminant in agricultural commodities or other products in Oregon.

## IMPACT INFORMATION



10. 8      **Economic impact:** What impact does/can the species have on Oregon's agriculture and economy?
- 0 *Negligible* – Causes few, if any, economic impacts.
  - 1 *Low* - Potential to, or causes low economic impact to agriculture; may impact urban areas (e.g., puncture vine, pokeweed).
  - 5 *Medium* – Potential to, or causes moderate impacts to urban areas, right-of-way maintenance, property values, recreational activities, reduces rangeland productivity (e.g., English ivy, Himalayan blackberry, cheatgrass).
  - 10 *High* – Potential to, or causes high impacts in agricultural, livestock, fisheries, or timber production by reducing yield, commodity value, or increasing production costs (e.g., gorse, rush skeleton weed, leafy spurge).

**Comments:** In the Southwest, *Arundo* uses significant volumes of water during each growing season. This same water use could be expected in Oregon especially along east-side rivers.

11. 6      **Environmental Impact:** What risks or harm to the environment does this species pose? Plant may cause negative impacts on ecosystem function, structure, and biodiversity of plant or fish and wildlife habitat; may put desired species at risk.
- 0 *Negligible* – None of the above impacts probable.
  - 1 *Low* – Can or does cause few or minor environmental impacts, or impacts occur in degraded or highly disturbed habitats.
  - 4 *Medium* – Species can or does cause moderate impacts in less critical habitats (e.g., urban areas, sagebrush/ juniper stands).
  - 6 *High* – Species can or does cause significant impacts in several of the above categories. Plant causes severe impacts to limited or priority habitats (e.g., aquatic, riparian zones, salt marsh; or T&E species sites).

**Comments:** Environmental impacts would likely occur in priority habitats and result in loss of plant, animal and insect species richness. Competition for water and increased stream temperatures may result from invasion. Well established weed control entities throughout Oregon would identify sites and eliminate them quickly, minimizing their potential effects.

12. 2      **Impact on Health:** What is the impact of this species on human, animal, and livestock health? (e.g., poisonous if ingested, contact dermatitis, acute and chronic toxicity to livestock, toxic sap, injurious spines or prickles, causes allergy symptoms)
- 0 *Negligible* – Has no impact on human or animal health.
  - 2 *Low* – May cause minor health problems of short duration, minor allergy symptoms (e.g., leafy spurge)
  - 4 *Medium* – May cause severe allergy problems, death or severe health problems through chronic toxicity, spines or toxic sap may cause significant injury. (e.g., giant hogweed, tansy ragwort).
  - 6 *High* – Causes death from ingestion of small amounts, acute toxicity (e.g. poison hemlock)

**Comments:** Toxic compounds in the leaves are harmful to livestock health .

#### CONTROL INFORMATION

13. 2 **Probability of detection at point of introduction:** How likely is detection of species after introduction and naturalization in Oregon?
- 1 *Low* – Grows where probability of early detection is high, showy and easily recognized by public; access to habitat not restricted (e.g., giant hogweed).
  - 5 *Medium* – Easily identified by weed professionals, ranchers, botanists; some survey and detection infrastructure in place. General public may not recognize or report species (e.g., leafy spurge).
  - 10 *High* – Probability of initial detection by weed professionals low. Plant shape and form obscure, not showy for much of growing season, introduction probable at remote locations with limited access (e.g., weedy grasses, hawkweeds, skeletonweed).

**Comments:** Plant are large and showy. Public would be able to recognize a species this large and report it. Sometimes, access to habitat for control may be limited or difficult.

14. 3 **Control efficacy:** What level of control of this species can be expected with proper timing, herbicides, equipment, and biological control agents?
- 1 *Negligible* – Easily controlled by common non-chemical control measures (e.g., mowing, tillage, pulling, and cutting; biocontrol is very effective at reducing seed production and plant density) (e.g., tansy ragwort).
  - 2 *Low* – Somewhat difficult to control, generally requires herbicide treatment (e.g., mechanical control measures effective at preventing flowering and but not reducing plant density; herbicide applications provide a high rate of control in a single application; biocontrol provides partial control).
  - 4 *Medium* – Treatment options marginally effective or costly. Tillage and mowing increase plant density (e.g., causes tillering, rapid regrowth, spread from root fragments). Chemical control is marginally effective. Crop damage occurs or significant non-target impacts result from maximum control rates. Biocontrol agents ineffective.
  - 6 *High* – No effective treatments known. Control costs very expensive. Species may occur in large water bodies or river systems where containment and complete control are not achievable.

**Comments:** Glyphosate applications have proven to be effective but control programs would need repeated applications Treatment costs are very high.

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#### Category Scores:

- 23 Geographic score (Add scores 1-4)
- 13 Biological Score (Add lines 5-9)
- 16 Impact Score (Add lines 10-12)
- 5 Control Score (Add Lines 13-14)

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**57 Total Score** (Add scores 1-14 and list on front of form)

**Risk Category:** 55-90 = **A** 24-54 = **B** < 24 = unlisted.

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This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species  
Vers. 3.6 12/2/2010

**OREGON DEPARTMENT OF AGRICULTURE  
NOXIOUS WEED RATING SYSTEM**

Giant reed  
**Common Name**

*Arundo donax*  
**Scientific Name**

**Points 19**      **Category A**

1.   2        **Detrimental Effects:** Circle all that apply, enter number of circles
- 1. **Health:** Causes poisoning or injury to humans or animals
  - 2. **Competition:** strongly competitive with crops, forage, or native flora
  - 3. **Host:** host of pathogens and/or pests of crops or forage
  - 4. **Contamination:** causes economic loss as a contaminate in seeds and/or feeds
  - 5. **Interference:** interferes with recreation, transportation, harvest, land value, or wildlife and livestock movement
2.   4        **Reproduction and Capacity for spread** Circle the number that best describes
- 1. Few seeds, not wind blown, spreads slowly
  - 2. Many seeds, slow spread
  - 3. Many seeds, spreads quickly by vehicles or animals
  - 4. Windblown seed, or spreading rhizomes, or water borne
  - 5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials
3.   3        **Difficulty to Control** Circle the number that best describes, enter
- 1. Easily controlled with tillage or by competitive plants
  - 2. Requires moderate control, tillage, competition or herbicides
  - 3. Herbicides generally required, or intensive management practices
  - 4. Intensive management generally gives marginal control
  - 5. No management works well, spreading out of control
4.   6        **Distribution** Circle the number that best describes, enter
- 1. Widely distributed throughout the state in susceptible habitat
  - 2. Regionally abundant in a part of the state, 5 or more counties, more than 1/2 of a county
  - 3. Abundant throughout 1-4 counties, or 1/4 of a county, or several watersheds
  - 4. Contained in only 1 watershed, or less than 5 square miles gross infestation

5. Isolated infestation less than 640 acres, more than 10 acres
6. Occurs in less than 10 acres, or not present, but imminent from adjacent state

5. 4      **Ecological Impact** Circle the number that best describes, enter
1. Occurs in most disturbed habitats with little competition
  2. Occurs in disturbed habitats with competition
  3. Invades undisturbed habitats and crowds out native species
  4. Invades restricted habitats (i.e., riparian) and crowds out native species

19      **TOTAL POINTS**

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Note: Noxious weeds are those non-native plants with total scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as “A” rated weeds. Ratings: 16+ = A, 15 – 11= B

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Photo credits: Bear Creek, Medford Oregon 2006, Ken French, Oregon Department of Agriculture; Aerial view of *Arundo* near Eagle Pass, Texas, along the Rio Grande, by John Goolsby, USDA-ARS

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