

smooth cordgrass
Spartina alterniflora Loisel.

common cordgrass
Spartina anglica C.E. Hubbard

denseflower cordgrass
Spartina densiflora Brongn.

marshhay cordgrass
Spartina patens (Ait.)Muhl.

Family: Poaceae

Introduction

Over the last 25 years, introduced *Spartina* species have spread rapidly, becoming established in numerous intertidal habitats on the west coast of the U.S. We treat these species together because they have very similar ecological impacts, biological attributes, and invasive potentials.

Invasiveness Rank: 86 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Synonyms for *Spartina alterniflora*: *Spartina alterniflora* Loisel. var. *glabra* (Muhl. ex Bigelow) Fernald, *S. alterniflora* Loisel. var. *pilosa* (Merr.) Fernald, *S. glabra* Muhlenberg ex Elliott var. *alterniflora* (Loiseleur) Merrill, *S. maritima* (Curtis) Fernald var. *alterniflora* (Loiseleur) St.-Yves, *S. stricta* Roth var. *alterniflora* (Loiseleur) A. Gray, *Trachynotia alterniflora* (Loiseleur) Candolle
Other common names: Atlantic cordgrass, saltmarsh cordgrass

Synonyms for *Spartina anglica*: *Spartina townsendii* H. Groves & J. Groves var. *anglica* (C. E. Hubbard) Lambinon & Maquet.
Other common names: none

Synonyms for *Spartina densiflora*: none
Other common names: none

Synonyms for *Spartina patens*: *Spartina patens* (Aiton) Muhl. var. *juncea* (Michx.) Hitchc., *S. patens* (Aiton) Muhl. var. *monogyna* (M.A. Curtis) Fernald
Other common names: saltmeadow cordgrass

Description

Cordgrass is a deciduous, strongly rhizomatous, perennial grass that grows 61 to 122 cm tall. Stems and leaves are hairless. Leaves are tough and 6 to 15 mm wide with sharply pointed tips, ribbed upper surfaces, and smooth lower surfaces. Spikes are 5 to 7 ½ cm long

with largely exposed rachises (Hitchcock 1971, Baird and Thieret 1993, Daehler 2000, WAPMS 2004).



Infestation of *Spartina alterniflora* Loisel. Photo by USDA.

Ecological Impact

Impact on community composition, structure, and interactions: *Spartina* species form extensive colonies to the exclusion of other species such as seawrack (*Zostera marina*), Virginia glasswort (*Salicornia virginica*), and seaside arrowgrass (*Triglochin maritima*). Stands of cordgrass decrease light levels and reduce algae production (Walkup 2004). Subsequently, cordgrass causes significant decreases in available habitat and food sources for clams, fish, crabs, waterfowl, and other marine life (Daehler 2000, WAPMS 2004). In Alaska, chum salmon

(*Oncorhynchus keta*), English sole (*Pleuronectes vetulus*), and Dungeness crab (*Cancer magister*) depend on mud-flat habitats that may be particularly affected by cordgrass invasion (Jacono 1998).

Impact on ecosystem processes: *Spartina* species increase sediment deposition in coastal and interior marshes (Hitchcock 1971). Large, dense populations of cordgrass can decrease water flow and cause flooding at the mouths of rivers. The establishment of *Spartina* species in mudflats will favor invertebrate species associated with salt marshes over those associated with unvegetated mudflats (Jacono 1998, Daehler 2000, WAPMS 2004).

Biology and Invasive Potential

Reproductive potential: *Spartina* species reproduce sexually by seeds and vegetatively from rhizomes. Seeds contribute to the colonization of new areas, but the expansion of established stands is primarily a result of vegetative reproduction. Clones can spread laterally by more than three feet per year, producing a nearly circular growth pattern. Seeds cannot withstand desiccation and remain viable for only 8 to 12 months; these species do not have persistent seed banks (Daehler 2000, Daehler and Strong 1994, WAPMS 2004).

Role of disturbance in establishment: Cordgrass readily colonizes unvegetated intertidal areas.

Potential for long-distance dispersal: Seeds can be dispersed by water, and waterfowl can transport seeds far from the parent plants (Sytsma et al. 2003). Vegetative fragments can be spread from sites prone to erosion (Daehler 2000).

Potential to be spread by human activity: Cordgrass has been intentionally and accidentally introduced to the Pacific Coast of the U.S. It was first introduced into Washington in a shipment of oyster spat from the east coast of North America. A few cultivars have been developed for erosion control and are sold commercially (USDA 2002).

Germination requirements: Seeds must soak for approximately six weeks before they can germinate. Most seeds germinate in the spring. Germination rates

are variable. Seed viability ranges from 0% to 59% in San Francisco and Willapa Bays (Daehler and Strong 1994).

Growth requirements: *Spartina* species can colonize a broad range of substrates from sand or silt to loose cobble, clay, or gravel. They can tolerate a wide range of environmental conditions, including pH levels from 5.4 to 7, salinities from 3% to 5%, and water tables up to 10 cm above ground level (Walkup 2004, WAPMS 2004).

Legal Listings

- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states (all four species are considered noxious in Oregon and Washington)
- Federal noxious weed
- Listed noxious in Canada or other countries

Distribution and Abundance

Spartina species are very invasive in intertidal zones; they colonize bays, lagoons, ponds, and ditches (Walkup 2004, WAPMS 2004).

Native and current distribution: Smooth cordgrass is native to the Atlantic and Gulf Coast marshes of North America. It has been introduced to the West Coast of North America, Europe, and New Zealand (Baird and Thieret 1993, Daehler 2000, WAPMS 2004). These species are not known to occur in Alaska (AKEPIC 2010).

Management

Smooth cordgrass can grow on very soft, deep mud, making infestations inaccessible by foot or boat. Hand pulling or digging seedlings is suggested for small infestations (those less than 2 ha). Special care must be taken to remove both shoots and roots. Shading small *Spartina* clones with woven geotextile fabric has proven successful in Oregon. Mowing and herbicide treatments can reduce growth and limit seed sets (Daehler 2000, Sytsma et al. 2003).

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