

Spartina alterniflora [简体中文](#) [正體中文](#)

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

Common name	Atlantic cordgrass (English), salt-water cordgrass (English), saltmarsh cordgrass (English), smooth cordgrass (English)
Synonym	<i>Spartina alterniflora</i> , var. <i>glabra</i> (Muhl. ex Bigelow) Fern. <i>Spartina alterniflora</i> , var. <i>pilosa</i> (Merr.) Fern.
Similar species	<i>Spartina foliosa</i> , <i>Schoenoplectus maritimus</i> , <i>Triglochin maritima</i>
Summary	<i>Spartina alterniflora</i> commonly known as smooth cord grass is a species that inhabits marsh habitat in its native range, where introduced. It is known to establish itself in wave-protected mud and sand flats and grow very quickly into dense impenetrable stands. When introduced this species can have a negative effect on native species including some endangered. It can also hybridize with native non-invasive species of <i>Spartina</i> and offspring are known to have increased vigor and growth rates than either parent.



[view this species on IUCN Red List](#)

Species Description

S. alterniflora is an erect, perennial salt tolerant grass that characteristically grows in dense stands. The inflorescence is a flowering panicle made of many spikes and it is 10-40cm long with dense colourless flowers, which are closely appressed and overlapping. *S. alterniflora* blooms from July through November (The Invasive Spartina Project, 2003). Leaf blades which are grey-green in colour can be 20-55cm long and be up to 5cm in width. The stems range in height from 60-250cm and are upto 2cm wide at the base (Brian Silliman., pers. comm., 2005).

Uses

S. alterniflora is a dominant species in its native range, the salt marshes of the Atlantic and Gulf coasts of the USA. It plays an important role in sediment stabilization and serves as nursery grounds for estuarine fish and invertebrates. Marsh grasses like *S. alterniflora* are essential for land creation processes in areas such as the Chesapeake Bay (Taylor *et al.* 2001). *S. alterniflora* serves as a foundation species and is a critical carbon base for estuarine food-webs supplying carbon for the detrital and direct grazing food-web energy pathways (Brian Silliman., pers. comm., 2005).



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Spartina alterniflora*

Habitat Description

S. alterniflora grows within lower elevational marsh zones in its native range. In the San Francisco Bay area where it is introduced *S. alterniflora* and its hybrids have been observed growing both lower and higher than the native *S. foliosa*. The tidal range for *S. alterniflora* varies throughout the world, but it has the potential to grow from the mean higher high water to approximately 1 metre from mean low lower water (The Invasive Spartina Project, 2003).

The Western Aquatic Plant Management Society (2004) states that, "*S. alterniflora* is a plant of the intertidal zone, where it colonizes mud or sandflats in saline or brackish water. Found in areas of low to moderate wave energy, the species can colonize a broad range of substrates, ranging from sand and silt to loose cobble, clay, and gravel. The species can tolerate a wide range of environmental conditions, including: inundation up to 12 hours a day, pH levels from 4.5 to 8.5, and salinity from 10 to 60 ppt\".

Spartina can grow in terrestrial areas, but is excluded by competition from other plants. It can grow in the highest reached of the intertidal zone all the way down until ~ 1m from mean low water (Brian Silliman., pers. comm., 2005).

Reproduction

The Western Aquatic Plant Management Society (2004) reports that, "*Spartina alterniflora* can spread by seed, rhizome, or vegetative fragmentation (Daehler and Strong 1994). However, the plant does not produce seed in several areas where it has been introduced. No flowers have been observed in New Zealand or in Padilla Bay, and the Willapa Bay population was not observed to flower for almost 50 years after its introduction (Partridge 1987; Kunz and Martz 1993; Riggs 1992; Scheffer 1945). Low soil temperature can delay or suppress flowering and reduce seed production in *Spartina* spp. The species is protogynous, meaning that female flowers mature before male flowers (Bertness and Shumway 1992). This strategy helps ensure out-crossing\".

General Impacts

The Invasive Spartina Project (2003) list down the impacts of the introduced *Spartina alterniflora* in the San Francisco Bay Area:

S. alterniflora can invade mudflats and channels and convert this habitat to marshland. Loss of mudflat and channel habitat may seriously impact the foraging habitat for numerous residential as well as migrating shorebirds and waterfowl, including the federally and state endangered California clapper rail (see [Rallus longirostris obsoletus in Status: U.S Fish and Wildlife Service](#)). *S. alterniflora* is also invading high marsh habitat, degrading or eliminating pickleweed (*Salicornia virginica*) habitat, impacting habitat for the endangered salt marsh harvest mouse (see [Reithrodontomys raviventris in IUCN Red List of Threatened Species](#))

S. alterniflora hybridizes with the native *Spartina* spp. *S. alterniflora* is therefore a threat to the survival of native *Spartina* spp. Given the robust form and reproductive vigor of both the introduced *S. alterniflora* and their hybrids. Hybrids have variable morphology and may be more vigorous than *S. alterniflora*. Hybrids are difficult to distinguish from either parent species in the field. Molecular lab tests are required to confirm *S. alterniflora* or hybrid identification

S. alterniflora can cause increased rates of sedimentation, leading to the eventual clogging of flood control channels and natural sloughs, raising them to the overall elevation of the marsh plain.

Management Info

For details on preventative, physical, chemical and biological control of this species please read our pdf file on [management information](#).



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Pathway

S. alterniflora was introduced to Puget Sound, in the 1940s to stabilize shorelines and increase vegetative cover (Western Aquatic Plant Management Society, 2004). *S. alterniflora* was introduced into San Francisco Bay for salt marsh restoration in the 1970s (Ayres *et al.* 2003). *S. alterniflora* was deliberately introduced to New Zealand in the 1950's from the USA primarily for land reclamation purposes and alleged habitat enhancement (Champion and Clayton, 2004). *S. alterniflora* was apparently first introduced into Willapa Bay in 1894 in a shipment of eastern oyster spat originating from the east coast of North America. Initially, the species established on the west side of Long Island (Sayce 1988) (Western Aquatic Plant Management Society, 2004).

Principal source: [Invasive Spartina Project, 2003. Introduced *Spartina alterniflora*/hybrids \(smooth cordgrass\) Western Aquatic Plant Management Society, 2004. *Spartina alterniflora*](#)

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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Publication date: 2005-11-16

ALIEN RANGE

[1] AUSTRALIA

[1] FRANCE

[1] NETHERLANDS

[2] UNITED KINGDOM

[1] CHINA

[1] INDIA

[2] NEW ZEALAND

[13] UNITED STATES

Red List assessed species 4: EN = 1; VU = 2; LC = 1;

[Ammodramus caudacutus](#) **VU**
[Reithrodontomys raviventris](#) **EN**

[Charadrius leschenaultii](#) **LC**
[Sterna nereis](#) **VU**

BIBLIOGRAPHY

25 references found for *Spartina alterniflora*

Management information

[Champion, P.D.; Clayton, J.S. 2000. Border control for potential aquatic weeds. Stage 1. Weed risk model. Science for Conservation 141.](#)

Summary: This report is the first stage in a three-stage development of a Border Control Programme for aquatic plants that have the potential to become ecological weeds in New Zealand.

Available from: <http://www.doc.govt.nz/upload/documents/science-and-technical/sfc141.pdf> [Accessed 13 June 2007]

[Champion, P.D.; Clayton, J.S. 2001. Border control for potential aquatic weeds. Stage 2. Weed risk assessment. Science for Conservation 185. 30 p.](#)

Summary: This report is the second stage in the development of a Border Control Programme for aquatic plants that have the potential to become ecological weeds in New Zealand. Importers and traders in aquatic plants were surveyed to identify the plant species known or likely to be present in New Zealand. The Aquatic Plant Weed Risk Assessment Model was used to help assess the level of risk posed by these species. The report presents evidence of the various entry pathways and considers the impact that new invasive aquatic weed species may have on vulnerable native aquatic species and communities.

Available from: <http://www.doc.govt.nz/upload/documents/science-and-technical/SFC185.pdf> [Accessed 13 June 2007]

[Collins, J.N., May M., Grosso C. 2003. Smooth cordgrass *Spartina alterniflora*. Practical Guidebook to the Control of Invasive Aquatic and Wetland Plants of the San Francisco Bay - Delta Region.](#)

Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Available from: <http://legacy.sfei.org/nis/smoothcordgrass.html> [Accessed 22 May 2010].

[The Guidebook](#) is available from: <http://legacy.sfei.org/nis/index.html>

[Daehler, C. C., and D. R. Strong. 1996. Status, Predictions, and prevention of introduced cordgrass *Spartina* spp. Invasions in Pacific Estuaries, USA. Biological Conservation 78 \(1996\) 51-58.](#)

[Environment Waikato. 2002. *Spartina* \(*Spartina alterniflora*, *S. anglica*\).](#)

[Grevstad, F. S., D. R. Strong, D. Garcia-Rossi, R. W. Switzer, and M. S. Weckere. 2003. Biological control of *Spartina alterniflora* in Willapa Bay, Washington using the planthopper *Prokelisia marginata*: agent speci?city and early results. Biological Control 27 \(2003\) 32-42.](#)



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Spartina alterniflora*

[McEnnulty, F.R., Jones, T.E. and Bax, N.J. 2001, The Wed-Based Rapid Response Toolbox. Web publication](#)

Summary: Available from: <http://crimp.marine.csiro.au/NIMPIS/controls.htm> [Accessed 19 May 2005]

McEnnulty, F. R., N. J. Bax, S. Britta, and M. L. Campbell. UNDATED. A Literature review of rapid response options for the control of ABWMA listed species and related taxa in Australia. CSIRO Marine Research: Centre for Research on Introduced Marine Pests.

Murphy, K.C. 2001. Report to the Legislature: Progress of the 2001 Spartina Eradication Program. Washington State Department of Agriculture, Olympia, WA.

[National Introduced Marine Pest Information System \(NIMPIS\), 2002. Glyphosate \(eg. Roundup?\).](#)

Summary: Available from: <http://www.marine.csiro.au/crimp/nimpis/controlDetail.asp?ID=90> [Accessed 25 March 2005]

Olofson, P. 2004. Email Communication: Subject: [Aliens-L] Spartina Project Update . Director of the San Francisco Invasive Spartina Project (www.spartina.org).

Patten, Kim., 2002. Smooth Cordgrass (*Spartina alterniflora*) Control with Imazapyr Weed Technology. Volume 16:826-832

[Silliman and Newell 2003. PNAS vol. 100 no. 26](#)

[Western Aquatic Plant Management Society. 2004. Spartina alterniflora.](#)

Summary: Available from: <http://www.wapms.org/plants/spartina.html> [Accessed 25 March 2005]

General information

Ayres, D. R., D. R. Strong, and P. Baye. 2003. *Spartina foliosa* (Poaceae): A common species on the road to rarity?. Madrono. 2003; 50(3): 209-213.

Bortolus, Alejandro., 2008. Error Cascades in the Biological Sciences: The Unwanted Consequences of Using Bad Taxonomy in Ecology. Ambio Vol. 37, No. 2, March 2008

Craft, C., S. Broome, and C. Campbell. 2002. Fifteen years of vegetation and soil development after brackish-water marsh creation. Restoration-Ecology. 2002; 10(2): 248-258.

Darnell, T. M., and E. H Smith. 2002. Recommended design for more accurate duplication of natural conditions in salt marsh creation. Environmental-Management. 2002; 29(6): 813-823.

Invasive Spartina Project. 2003. Introduced *Spartina alterniflora* hybrids (smooth cordgrass). The San Francisco Estuary Invasive Spartina Project.

[ITIS \(Integrated Taxonomic Information System\). 2005. Online Database Spartina alterniflora](#)

Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=41267 [Accessed March 2005]

[Kiawah Island Natural Habitat Conservancy. 2002. Beck Island.](#)

Summary: Available from:

<http://www.kiawahconservancy.org/Habitat%20of%20Kiawah%20Island%20pages/Land%20Under%20Protection%20pages/Beck%20Island.html> [Accessed 25 March 2005]

Shah, G. L., and V. Badrinath. 1985. A contribution to the angiospermic flora of Dahanu forest division in Maharashtra state India. Journal of Economic and Taxonomic Botany. 1985; 6(1): 117-142.

Taylor, M. D., J. P. Sinn, D. D. Davis, and E. J. Pell. 2002. The impact of ozone on a salt marsh cordgrass (*Spartina alterniflora*). Environmental Pollution 120 (2002) 701-705

[USDA-GRIN \(Germplasm Resources Information Network\). 2005. Spartina alterniflora. National Genetic Resources Program \[Online Database\] National Germplasm Resources Laboratory, Beltsville, Maryland.](#)

Summary: Available from: http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?Spartina+alterniflora [Accessed 25 March 2005]

Vila, M., E. Weber, and C. M. D. Antonio. 2000. Conservation implications of invasion by plant hybridization. Biological Invasions 2: 207-217, 2000.