

Spartina anglica  

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

Common name Englishes Schlickgras (German), rice grass (English), townsend's grass (English), common cord grass (English)

Synonym *Spartina x townsendii*, fertile amphidiploid
Spartina x townsendii, agg.
Spartina x townsendii sensu lato

Similar species

Summary *Spartina anglica* is a perennial salt marsh grass which has been planted widely to stabilize tidal mud flats. Its invasion and spread leads to the exclusion of native plant species and the reduction of suitable feeding habitat for wildfowl and waders.



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

Species Description

"A deep-rooting perennial, 30-130cm high, spreading by soft stout fleshy rhizomes, forming large clumps and extensive meadows. Culms erect, stout, many-noded, smooth. Leaves green or greyish-green; sheaths overlapping, rounded on the back, smooth; ligules densely silkily ciliate, with hairs 2-3mm long; blades with a fine hard point, 10-45cm long, 6-15mm wide, flat or inrolled upwards, firm, closely flat-ribbed above, smooth, the upper widely spreading. Panicles erect, finally contracted and dense, 12-40cm long, of 2-12 spikes, overtopping the leaves. Spikes erect or slightly spreading, stiff, up to 25cm long; axis 3-angled, smooth, terminating in a bristle up to 5cm long. Spikelets closely overlapping, in two rows on one side of and appressed to the axis, narrowly oblong, flattened, 14-21mm long, mostly 2.5-3mm wide, 1- rarely 2- flowered, falling entire at maturity, loosely to closely pubescent. Glumes keeled, pointed; lower two-thirds to four-fifths the length of the upper, 1-nerved; upper as long as the spikelet, lanceolate-oblong, tough except for the membranous margins, 3-6 nerved. Lemma shorter than the upper glume, lanceolate-oblong, 1-3 nerved, with broad membranous margins, shortly hairy. Palea a little longer than lemma, 2-nerved. Anthers 8-13mm long. Grain with a long green embryo, enclosed between the lemma, palea, and glumes. Ch. no. 2n = 122-124" (Hubbard, C.E. 1968, Grasses, Penguin Books Ltd, England).

Lifecycle Stages

'Die-Back' has occurred since the mid 1920's in several sward areas in the south of Britain. In Poole Harbour, England for example, 208ha of *S. anglica* recorded in 1924 was reduced to about 63 ha by 1984 (Gray & Raybould: in Patten 1997). Die-back is due to death caused by soft-rotting of the rhizomes and a gradual decline in vigour of old populations. The definitive cause of die-back is unknown. It however tends to occur in waterlogged, fine sediments, which induce anaerobiosis and toxic sulphide levels.

Habitat Description

S. anglica growth may have perceived benefits other than coastal protection and land reclamation. The increase in elevation level and sediment stabilization caused by *S. anglica* growth may enable native salt marsh species to establish and may facilitate transitions / successions to other vegetation types. This process will lead to the development of new salt marsh areas. *S. anglica* has high productivity. Growth and death results in a large amount of energy and organic matter entering the ecosystem. *S. anglica* may form the basis of many food webs and is a possible food source for many grazers. *S. anglica* growth may exclude several animal species but it also provides habitat for many others e.g. rails. *S. anglica* also has the potential to be used for economic benefits e.g. biofuel, paper making, fish food, green manure, or health products (Chung 1993).

Reproduction

Spartina anglica spread occurs in two phases, initial invasion and establishment of seedlings or vegetational fragments, and then expansion of tussocks by radial clonal growth (up to 30cm per year). Spreading tussocks fuse to form clumps that can expand into extensive meadows. Expansions may experience a lag phase. When expansions are occurring it can be very rapid. For example at Poole Harbour, England, *S. anglica* introduced in 1899, expanded to cover over 200ha (more than 60% of the intertidal mud flat) by 1924 (Gray & Raybould: in Patten 1997).

Spartina anglica is known for the unpredictable production, viability and germination of its seeds. Seed production of *S. anglica* is variable both temporally and spatially (Gray *et al.* 1991). It appears that *S. anglica* has a self-incompatibility system that requires to be broken down for seed set to occur (possibly by higher than average temperatures and humidity). Seed does not set in most years resulting in periods of spread by clonal expansion. Successful seed set has the potential to result in high seed numbers. *S. anglica* can produce up to 5 million spikelets per hectare. Less than 5% of these spikelets are likely to produce viable seed. *S. anglica* seeds do not form a seed bank. Seeds failing to germinate in their first season do not remain viable.

General Impacts

S. anglica has been used world-wide as an agent for coastal protection / stabilization and land reclamation. Its invasion and spread leads to exclusion of native plant species such as *Zostera* and *Salicornia* species. It also leads to the loss of feeding habitat for wildfowl and waders. The spread of *S. anglica* also threatens the economic interests of commercial oyster fisheries and tourism industries (due to invasion into amenity areas).

Management Info

Physical: Smothering with plastic sheeting, burying and repetitive burning have achieved kill rates of over 90%. They however, are more costly than herbicides and have practical problems e.g. sheeting may become dislodged by tidal currents. These methods are therefore only suitable for use on small areas. Seedlings or young plants can be dug out. In Northern Ireland the largest plant to be dug out successfully was 50cm in diameter. Attempts to dig up larger clumps have been unsuccessful. Other possible control methods being researched include steam treatment.

Chemical: Herbicide application is the most frequently used control method due to its practical ease of use and cost effectiveness. The herbicides Fluazifop (Fusilade) and Haloxyfop (Gallant) both regularly achieve over 90% kill after one application. Complete eradication requires repeated treatment application.

Biological: Other possible control methods being researched include biological control using an insect (*Prokelisia spp.*).

Pathway

Coastal protection and land reclamation schemes.

Principal source:

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ALIEN RANGE

[1] IRELAND

[2] UNITED KINGDOM

[1] NEW ZEALAND

BIBLIOGRAPHY

24 references found for *Spartina anglica*

Management information

Aberle, B. 1990. The biology, control, and eradication of introduced *Spartina* (cordgrass) worldwide and recommendations for its control in Washington. Report to Washington State Department of Natural Resources, Washington.

Summary: Information about three species of *Spartina* that have been introduced into the intertidal areas of Washington. Includes *Spartina* biology and a review of *Spartina* control methods.

[Alien Plants in Ireland, 2007. *Spartina anglica*](#)

Summary: The database of alien plants in Ireland contains detailed information on 715 alien plant taxa currently occurring in (semi-) natural habitats in Ireland (both the Republic and Northern-Ireland). This database was developed in 2006 at the School of Natural Sciences, Trinity College Dublin, as part of the BioChange project, funded by the Environmental Protection Agency (EPA), Ireland.

Available from: <http://www.biochange.ie/alienplants/index.php> [Accessed April 26 2007]

This page available from: http://www.biochange.ie/alienplants/result_species.php?species=1009&volg=i&lang=latin&p=i [Accessed 26 April 2007]

[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]

[Daehler, C. C. and Strong, D. R. 1996. Status, predication, and prevention of introduced cordgrass *Spartina* spp. invasions in Pacific estuaries, U.S.A.. *Biological Conservation* 78: 51-58.](#)

Summary: This paper uses *Spartina* species characteristics to predict which *Spartina* species will invade specific sites along the U.S. Pacific coast. Mean tidal ranges were then used to predict the extent of spatial spread of a *Spartina* sp. after colonization.

[Doody, P. 1984. *Spartina anglica* in Great Britain. Focus on nature conservation No. 5. Nature Conservancy Council, Attingham, Britain.](#)

Summary: A report of a meeting held at Liverpool University in 1982. Contains papers about *Spartina* history in Britain, the effects of *Spartina* on nature conservation, *Spartina* population studies and control attempts.

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

[Esselink, P., Zijlstra, W., Dijkema, K. S. and van Diggelen, R. 2000. The effects of decreased management on plant-species distribution patterns in a salt marsh nature reserve in the Wadden Sea. *Biological Conservation* 93: 61-76.](#)

Summary: A report on vegetation development in a man-made dutch salt marsh after the artificial drainage system was discontinued and cattle grazing was reduced. *Spartina anglica* populations decreased partly through competitive replacement by *Phragmites australis* and partly due to herbivory by greylag geese (*Anser anser*).

[Frid, C. L. J., Chandrasekara, W. U. and Davey, P. 1999. The restoration of mud flats invaded by common cord-grass \(*Spartina anglica* CE Hubbard\) using mechanical disturbance and its effects on the macrobenthic fauna. *Aquatic Conservation: Marine and Freshwa*](#)

[Garnett, R. P., Hiron, G., Evans, C. and O Connor, D. 1992. The control of *Spartina* \(Cord-grass\) using glyphosate. *Aspects of Applied Biology* 29: 359-364.](#)

[Hammond and Cooper., 2002. *Spartina anglica* eradication and inter-tidal recovery in Northern Ireland estuaries. In *Turning the tide: the eradication of invasive species*: 124-131. Veitch, C.R. and Clout, M.N.\(eds\). IUCN SSC Invasive Species Specialist Group. IUCN. Gland, Switzerland and Cambridge, UK.](#)

Summary: Eradication case study in Turning the tide: the eradication of invasive species.

[Hammond, M. E. R. 2001. The experimental control of *Spartina anglica* and *Spartina x townsendii* in estuarine saltmarsh. Ph.D. Thesis. University of Ulster, Northern Ireland.](#)

Summary: Ph.D. thesis examining the effectiveness of various *Spartina* control techniques and their effect on associated flora and benthic fauna. Includes a management strategy section.

[Kriwoken, L. K. and Hedge, P. 2000. Exotic species and estuaries: managing *Spartina anglica* in Tasmania, Australia. *Ocean and Coastal Management* 43: 573-584.](#)



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Spartina anglica*

Mumford, T. F., Peyton, P, Sayce, J. R. and Harbell, S. 1990. *Spartina* workshop record. Washington State University and Washington Sea Grant Program, Seattle, Washington.

Summary: Collection of papers from a workshop in Seattle 1990. Includes papers about *Spartina* biology and ecology, distribution and impacts, control methods and programs and regional studies.

Patten, K. 1997. Second International *Spartina* Conference Proceedings. Washington State University, Olympia, Washington.

Summary: Collection of papers about; The biology and natural history of *Spartina*; Impacts of *Spartina* infestation; Public activism and *Spartina*; Risks of control techniques; and Improving efficacy of control techniques and new approaches on the horizon.

Rash, J. E., Williamson, R. C. and Taylor, S. J. 1995. How green is your mudflat? Proceedings of the Australasian conference on *Spartina* control. Department of Conservation and Natural Resources, Yarram, Victoria, Australia.

Summary: Collection of papers about the history of *Spartina* invasions in Australia and New Zealand and subsequent control attempts.

Shaw, W. B. 1999. Options for *Spartina* control in Northland. Conservation Advisory Science Notes: 253, Department of Conservation, Wellington, New Zealand.

General information

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

Chung, C. H. 1993. Thirty years of ecological engineering with *Spartina* plantations in China. *Ecological Engineering* 2: 261-289.

Summary: A review of *Spartina* plantations in China and their effects on coastal morphology, soils, animals and human beings.

Gray, A. J. and Benham, P. E. M. 1990. *Spartina anglica*: A Research Review. ITE Research Publication No. 2, Natural Environment Research Council and HMSO, London.

Summary: Contains various papers about *S. anglica* biology, competitive ability against *Puccinellia maritima*, use as biofuel, and the effect on bird populations.

Gray, A. J., Marshall, D. F. and Raybould, A. F. 1991. A century of evolution in *Spartina anglica*. *Advances in Ecological Research* 21: 1-62.

Summary: A comprehensive review of *S. anglica* research prior to 1991. Includes, the history of *S. anglica*, the origin of *S. anglica*, variations in *S. anglica*, and the ecology of *S. anglica* (includes control).

Gray, A. J., Warman, E. A., Clarke, R. T. and Johnson, P. J. 1995. The niche of *Spartina anglica* on a changing coastline.. *Coastal Zone Topics: Process Ecology and Management* 1: 29-34.

Summary: Description of a simple *S. anglica* niche model based on multiple regression of 27 physical and tide-related variables (south and west Britain).

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

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.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Spartina+anglica&p_format=&p_ifx=plgt&p_lang=
[Accessed March 2005]

[State Noxious Weed Control Board](#)

Summary: Available from: http://www.nwcb.wa.gov/weed_info/dnsflrcordgrass.html [Accessed 24 September 2004]