

*Glyceria maxima* [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

**Common name** great mann grass (English), Wasser schwaden (German), reed sweet grass (English), reed mannagrass (English), reed meadow grass (English), Glycérie aquatique (French)

**Synonym** *Glyceria spectabilis* , Mert. & Koch  
*Molinia maxima* , Hartman  
*Glyceria aquatica* , (L.) Wahlb  
*Panicularia aquatica* , (L.) Kuntze  
*Poa aquatica* , L. (see)

**Similar species** *Glyceria grandis*

**Summary** *Glyceria maxima* is a native to Europe and temperate Asia and has been intentionally introduced as livestock forage in seasonally inundated pastures, to temperate North America, New Zealand and Australia. In its native distribution in Europe, *Glyceria maxima* forms monocultures in wetlands that reduce plant species diversity. In areas of introduction, including North America and Australia, *Glyceria maxima* also forms monocultures and is now of conservation concern.



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

## Species Description

*Glyceria maxima* is bisexual, perennial and rhizomatous grass (Morisawa, 2000; USDA, NRCS, 2005). These plants prefer wet and nutrient-rich soil range (Peeters, 2005). They are characterized as big in size, hairless, cespitous. Stems are unbranched and can erect to 100-250cm high (Morisawa, 2000; Peeters, 2005). Leaf sheaths have prominent midribs, visible transverse veins and are closed near the top (Morisawa, 2000). Leaf blades are flat but are a little bit rough when large (10-18mm) (Morisawa, 2000; Peeters, 2005). The leaf blades are shallowly grooved with prominent midribs (Morisawa, 2000). Leaves are short (3-6mm), cut and pointed in the middle (Peeters, 2005). Leaf margins have short, stiff hairs which are rough to the touch (Morisawa, 2000). Leaves are bright green but sometimes tinged with red (Lambert, 1947). Spikelets are usually 4-9 flowered, 6-12mm long and compressed on the side (Peeters, 2005). The inflorescence is a panicle which can be opened or contracted and are symmetrical (Morisawa, 2000). The inflorescence branches also have short, stiff hairs similar to those of the leaf margins (Morisawa, 2000).

## Lifecycle Stages

*Glyceria maxima* are terrestrial, perennial with a life span of 3-10 years. *Glyceria* produces vast numbers of dark brown seeds throughout summer and autumn (DIPWE, 2005). Seeds may be spread on water, in mud on machinery, on livestock but not so much by wind (DIPWE, 2005). Majority of the seeds are able to germinate immediately while others remain dormant for several years (DPI, 2005). Lambert (1947) reports that "spikelets carrying well-developed caryopses in basal florets are generally detached entire above the non-flowering glumes as soon as caryopses are ripe; fertile florets subsequently easily separate from sterile florets above them. However, majority of the completely sterile spikelets remain attached to the panicle until it dies down at the end of the year".

## Habitat Description

In its native range *G. maxima* is found growing from the lowlands up to high elevations in the mountain areas (Peeters, 2005). Lambert (1947) suggests that, "These plants are typically a freshwater species and found in the bank of slow-flowing rivers. Exhibits a considerable vertical range in relation to water level, occur vigorously both as a reed swamp plant with roots and rhizomes immersed throughout the year. However, the presence of higher internal concentration of oxygen in the roots suggests for an immediate diphenylamine tests made on soil samples containing root fragments. Reaches best development both vegetatively and in production of flowering stems, in regions where summer water table is approximately at substrate level. When growing among other tall reed swamp species, they may produce excessively long vegetative stems. At the same time they are largely limited or excluded by the mechanical conditions of the habitat, where a diurnal tidal rise and fall of 20-30cm is combined with a loose, shifting substrate. These plants are found in fully exposed situations but are tolerant to slight shade".

## Reproduction

Reproduction in dense stands of *Glyceria maxima* seems to be entirely by vegetative means rather than by seed; but no germination of grains yet observed in such stands (Lambert, 1947). The only well-established seedlings yet found in natural habitats are those which colonise wet bare mud and are often initiated by grains transported on feet of wading birds (Walker, 1946) as cited in (Lambert, 1947).

## General Impacts

*Glyceria maxima* can be a troublesome drainage weed and although palatable it has been implicated in the cyanide poisoning of livestock (NIWA, 2005). *G. maxima* has been intentionally introduced as livestock forage in seasonally inundated pastures, to temperate North America, New Zealand and Australia. In its native distribution in Europe, *G. maxima* forms monocultures in wetlands that reduce plant species diversity. In areas of introduction, including North America and Australia, it also forms monocultures and is now of conservation concern. The large, dense monospecific stands are capable of crowding out native wetland vegetation (Clarke *et al.* 2004). Because it is both a poor food source and a poor nesting substrate for wetland wildlife, it has a significant potential to negatively affect wetland habitat dynamics (NIWA, 2005). *G. maxima* spreads aggressively in waterways and impedes water flow (Sainty and Jacobs 1994 in Clarke *et al.* 2004). It assimilates large amounts of nutrients and thrives in nutrient-enriched ecosystems (Sunblad and Robertson 1988 in Clarke *et al.* 2004).

Clarke *et al.* (2004) undertook a study of three upland streams in Gippsland, Victoria, Australia to infer the impacts of *G. maxima* on macroinvertebrate abundance, morphospecies density, and morphospecies and functional feeding group (FFG) composition. The results of their study concluded that invasion by *G. maxima* appears to drive changes in macroinvertebrate morphospecies composition and FFG composition, reducing a diverse array of macroinvertebrates to a more uniform fauna. The authors describe *G. maxima* as an autogenic ecosystem engineer, with the ability to convert sections of fast-flowing aerobic streams into partially anaerobic swamps. They further observe that by generating a root-mat swamp with a high capacity to process nutrients, *G. maxima* may facilitate its own growth and spread, as well as that of secondary invaders.

## Management Info

Chemical: Noble (2002) list Roundup Biactive or Weedmaster 360 as the permitted herbicide to use against *G. maxima*, the recommended technique is Foliar spray. The authors advise not to add surfactants. Clearance or drainage of growth area combined with dense revegetation with local native species is suggested for long-term results through stream shading. The authors warn of taking care Take extreme caution not to spread *Glyceria* seed through soil transport (e.g. on machinery).

## Pathway

Seeds may be spread on water, in mud on machinery, on livestock but not so much by wind (DIPWE, 2005).

## Principal source:



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Glyceria maxima*

**Compiler:** IUCN/SSC Invasive Species Specialist Group (ISSG) with support from the Terrestrial and Freshwater Biodiversity Information System (TFBIS) Programme ([Copyright statement](#))

**Review:** Expert review underway: \ Dennis O'Dowd, Reader Monash University Victoria Australia

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## ALIEN RANGE

[1] AUSTRALIA

[6] NEW ZEALAND

[1] UNITED KINGDOM

[1] CANADA

[1] SWEDEN

[2] UNITED STATES

## BIBLIOGRAPHY

23 references found for *Glyceria maxima*

### Management information

[Champion, P. Clayton, J. and Rowe, D. 2002. Alien Invaders Lake Managers Handbook. Ministry for the Environment.](#)

**Summary:** Available from: <http://www.mfe.govt.nz/publications/water/lm-alien-invaders-jun02.pdf> [Accessed 3 February 2005]

[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]

[DPIWE \(Department of Primary Industries, Water and Environment\). 2002. Weeds, Pests and Diseases: Glyceria/Reed Sweet Grass \(Glyceria maxima - Poa aquatica \[Hartm.\] Holmb.\)](#)

**Summary:** Available from: <http://webapps.lib.uconn.edu/ipane/browsing.cfm?descriptionid=54> [Accessed 8 September 2005].

[DAntonio, C.M & Vitousek, P.M., 1992. Biological Invasions by exotic grasses, the grass/fire cycle, and global change. Annu. Rev. Ecol. Syst. 1992.23. 63-87](#)

[IPANE \(Invasive Plant Atlas of New England\). 2004. Glyceria maxima \(Reed mannagrass , Reed sweetgrass\)](#)

**Summary:** Available from: <http://webapps.lib.uconn.edu/ipane/browsing.cfm?descriptionid=54> [Accessed 8 September 2005]

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[Taylor, M. J & G R Kelly., 2001. Inanga spawning habitats in the Wellington. Wellington Regional Council. NIWA Client Report: CHC01/67 Project No.: WRC01501](#)

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**Summary:** Available from: <http://tncweeds.ucdavis.edu/alert/alertglyc.html> [Accessed 28 October 2005]

### General information

[Clarke A; P. S. Lake, and Dennis J. O'Dowd, 2004. Ecological impacts on aquatic macroinvertebrates following upland stream invasion by a ponded pasture grass \(Glyceria maxima\) in southern Australia Marine and Freshwater Research 55\(7\) 709-713](#)

**Summary:** Available from: [http://www.publish.csiro.au/?act=view\\_file&file\\_id=MF04043.pdf](http://www.publish.csiro.au/?act=view_file&file_id=MF04043.pdf) [Accessed 8 September 2005]

[Freshwater Biodata Information System New Zealand \(FBIS\), 2005](#)

**Summary:** The Freshwater Biodata Information System (FBIS) contains fish, algae, aquatic plant and invertebrate data and metadata gathered from New Zealand's freshwater streams, rivers and lakes. FBIS provides different ways to search for biodata: choose a predefined search from a list of common searches; use the map view to draw a box on a map and search for biodata; or create your own search for maximum search flexibility. FBIS is offered as a nationally available resource for the New Zealand public, institutions and companies who need access to a well-maintained long-term data repository.

Available from: <https://secure.niwa.co.nz/fbis/validate.do?search=common> [Accessed 5 August 2005]



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Glyceria maxima*

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

**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=40846](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=40846) [Accessed March 2005]

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[Shaw W.B. and R.B. Allen, 2003. Ecological impacts of sea couch and saltwater paspalum in Bay of Plenty estuaries DOC SCIENCE INTERNAL SERIES 113 New Zealand Department of Conservation.](#)

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**Summary:** Available from: <https://www.rsnz.org/publish/nzjb/1986/35.pdf> [Accessed 8 September 2005]

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

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**Summary:** Available from: [http://plants.usda.gov/cgi\\_bin/topics.cgi?earl=noxious.cgi](http://plants.usda.gov/cgi_bin/topics.cgi?earl=noxious.cgi) [Accessed 8 September 2005].

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