Gunnera manicata **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Haloragales	Gunneraceae

Common name Brazilian rhubarb (English), Brazilian giant-rhubarb (English), giant rhubarb (English), giant gunnera (English), Chilean rhubarb (English), poor man's umbrella (English, Ecuador), parasol de los pobres (Spanish)

Synonym *Gunnera brasiliensis* , Schind.

Similar species *Gunnera tinctoria, Gunnera morae*

Summary *Gunnera manicata* is a rhizomatous perennial native to Brazil. Its large size (up to 3 m), and distinctive leaves makes it attractive to gardeners and it is widely planted for ornamental reasons. While the invasiveness of *G. manicata* is in unknown in many regions, its similarity to weedy *G. tinctoria* makes it a target for control, along with *G. tinctoria*. Further to this, *G. tinctoria* plants are sometimes sold under the name *G. manicata*. *Gunnera* are the only known angiosperms to have a symbiosis with nitrogen-fixing cyanobacteria, a relationship that gives *G. manicata* plants the ability to fulfil their own nitrogen needs. This may contribute to its invasiveness.

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Species Description
Gunnera manicata belongs to the *Gunnera* subgenus *Panke* (Mol.) Schindl. which includes 20-40 species. The subgenus includes large, sometimes gigantic plants with short and stout erect stems. Leaves of plants in this group are mostly deeply, often palmately lobed. The stem is covered by large, triangular, often frilled scales. Large inflorescences bear hermaphroditic flowers (Wanntorp *et al*., 2001).\r\n
G. manicata is a large, herbaceous clump-forming perennial that grows up to 3 m in height and spreads up to 4 m. Leaves are deep green, round to kidney-shaped, pleated and can grow up to 2.5 m long and 2 m wide (Carter *et al*., 2007; Huxley, 2001). Leaves are palmately lobed, sharply toothed and have very prominent, prickly veins underneath (Huxley, 2001). Stems are long (up to 2.5m) and have short, rubbery prickles that are reddish in colour. Rhizomes are stout and horizontal, and house cyanobacteria. \r\n\r\n
G. manicata flowers in summer on stiff, straight and closely branches concial panicles 1-2 m. Flowers are minute, epigynous and green or rusty red in colour. *G. manicata* exhibits a combination of perfect and unisexual flowers (Wanntorp & Klackenberg, 2006). Fruit are drupes, 2-3 mm, red-green in colour rounded and barely fleshy (Huxley, 2001).\r\n\r\n\r\n
The bracts of *G. manicata*, which are a diagnostic feature, are up to 12 cm long, whitish green in colour and are very thin. Apart from the veins, the bracts are transparent when dry and deeply laciniate with long lobes also from near the base. These primary lobes (laciniae) are often one third to half the length of the bract and are in their turn laciniately divided into secondary lobes with fimbriate margins. Only the adaxial side of the bract is hairy (Wanntorp & Klackenberg, 2006).

Notes
Gunnera manicata: Brazilian or Colombian?: While the commonly cultivated *G. manicata* originates from Brazil, in the past the name '*Gunnera manicata*' has been misapplied to a Gunneraceae from Colombia (Stapf 1919; Wanntorp *et al*. 2002a). In 2002 Wanntorp *et al*. made use of molecular and phylogenetic analyses to confirm that the Brazilian *G. manicata* and the Colombian '*G. manicata*' were not the same species (Wanntorp *et al*. 2002a). The Colombian *Gunnera* was subsequently named *G. morae* L. Wanntorp & Klackenberg (Wanntorp & Klackenberg 2006).
G. manicata author citations: Two different authorities have been given for *G. manicata*, 'Linden ex André' and 'Linden ex Delchevalerie'. Validation of Linden's plant was carried out in 1867 by Delchevalerie and in 1873 by André. Nevertheless, both names are in common use (Shaw 2007; Stapf 1919).\r\n
In New Zealand *G. manicata* is poorly differentiated from *G. tinctoria*, with both often referred to as “Chilean rhubarb”. While *G. tinctoria* is widely naturalised in New Zealand and a problematic weed of conservation land (Williams *et al*., 2005), *G. manicata* is cultivated but is not established in the wild (C.Howell, pers. comm.). Management plans of several regional councils do not make the distinction between the two species when recommending control options (Environment Waikato, 2010; Taranaki Regional Council, Undated; Horizons Regional Council, 2007).

Uses
Gunnera manicata's large size (up to 3m), and distinctive leaves makes it attractive to gardeners and it is widely planted for ornamental reasons.

Habitat Description
Gunnera manicata is able to grow in a wide range of climates and soil conditions. However, if winter conditions are severe *G. manicata* may die down - new leaves then grow in spring. *G. manicata* is tolerant of salt spray and is often grown near permanent water sources in areas with low rainfall. (Osborne *et al*. 1991; TRC undated).

Reproduction
Gunnera manicata flowers are borne on a long stalk (up to 1m long. Inflorescenses are mainly bisexual, are both symmetric and assymetric and have well-developed sepals and petals. Staminate and pistillate flowers are located in different parts of the inflorescense. Flowers are then followed by tiny, globular (or slightly compressed) fruit. Fruit is abundant, with each seedhead producing an excess of 80,000 seeds. Wind pollinated (Environment Waikato 2010; TRC undated; Wanntorp & Ronse De Craene 2005; Wilkinson & Wanntorp 2007).

General Impacts
Gunnera manicata can reduce natural biodiversity and compete with native species. The large leaves of *G. manicata* can prevent native species from growing underneath them and it may also form dense stands. *Gunnera* are the only known angiosperms to have a symbiosis with nitrogen-fixing cyanobacteria (Johansson & Bergman 1994). Unlike most symbioses between plants and cyanobacteria, in the case of the Gunneraceae the cyanobacteria are located intercellularly (Bergman 2002). The nitrogen fixing ability the cyanobacteria impart *Gunnera* species, makes the dicot nitrogen-independent (Osborne & Sprent 2002). This may contribute to the invasiveness of the Gunneraceae *G. manicata* and *G. tinctoria* since the symbiosis can fulfil the plants' nitrogen needs in nitrogen-deficient soils, especially during early stages of growth (Osborne *et al*. 1991). This could also give these Gunneraceae an advantage over native species.

Management Info
While the invasiveness of *Gunnera manicata* is in unknown in many regions, its similarity in appearance to weedy *G. tinctoria* makes it a target for control, along with *G. tinctoria* (ARC 2008; Environment Waikato 2010; Harris & Skilton 2007; NPPA 2008; TRC 2010).
G. manicata can be removed mechanically, but care must be taken to remove the whole rhizome, as the plant can resprout from fragments. Smaller plants can be treated with herbicide, and a combination of physical and chemical measures can be used on larger specimens. Follow up monitoring of areas and treatment of any seedlings or resprouting is recommended. (Harris & Skilton 2007; Williams *et al*. 2005).

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ALIEN RANGE

[2] AUSTRALIA
[1] IRELAND
[1] SWITZERLAND
[1] GERMANY
[7] NEW ZEALAND
[1] UNITED KINGDOM

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