Rumex bidens

mud dock

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Richard Schahinger

Scientific name: ***Rumex bidens*** R.Br., *Prodr. Fl. Nov, Holland.:* 421 (1810)
Common Name: mud dock (Wapstra et al. 2005)
Group: vascular plant, dicotyledon, family **Polygonaceae**

Status: *Threatened Species Protection Act 1995*: **vulnerable**
Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic: **not endemic to Tasmania**
Tasmanian NRM regions: **North, South**

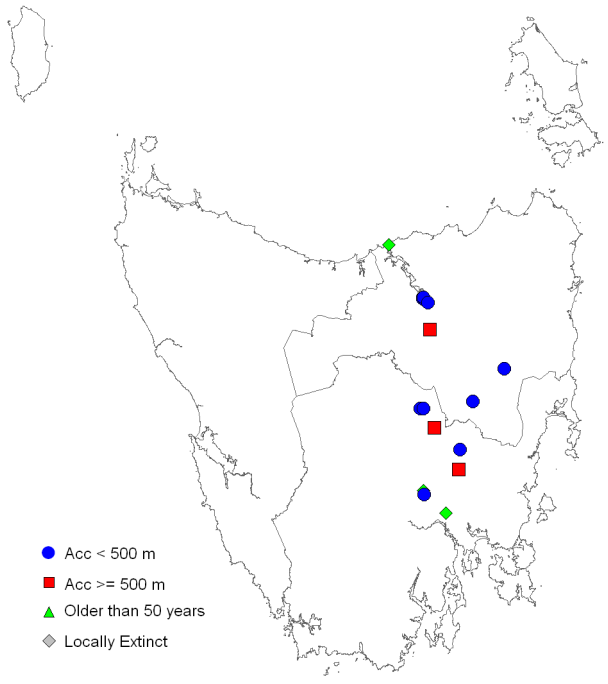

Figure 1. Distribution of *Rumex bidens* in Tasmania, showing Natural Resource Management regions

Plate 1. Upper leaves and fruit of *Rumex bidens* (scanned image by Richard Schahinger)

SUMMARY: *Rumex bidens* (mud dock) is a distinctive aquatic to semi-aquatic species, known in Tasmania from about a dozen sites ranging from Low Head in the north to Pontville in the south, though many sites have not been seen in recent years. Available information suggests that subpopulations are very small in numbers and the area that they occupy placing the species at risk of losses from chance events. The risk of inadvertent losses is exacerbated as the species may not emerge when its habitat is dry, sometimes for many years. Threats to the species and its wetland habitat include changes to hydrological processes for irrigation and conversion for agriculture, stock browsing and trampling, and competition. The species would benefit from retention of buffering vegetation surrounding its waterway and wetland habitat, and known occurrences would benefit from stock management.

ECOLOGY AND IDENTIFICATION

Rumex bidens flowers from November to February, and fruits from December to March. In exposed but wet conditions the species may adopt a procumbent habit with stems rooting freely from the lower nodes, whereas when inundated it forms floating mats supported by hollow bladder-like stems (Plate 2). The species is capable of surviving environmental fluctuations, including extended periods of drought, due to its underground rhizomes and soil-stored seed. Dispersal of seed is likely to be by waterbirds and, within local catchments, by floods (Kirkpatrick & Harwood 1981). *Rumex bidens* has a relatively high phylogenetic distinctiveness score, being one of only 3 native species in the *Rumex* genus and 10 in the family Polygonaceae in Tasmania (Baker & de Salas 2013).

Survey techniques

Surveys for *Rumex bidens* are best undertaken during its peak flowering and fruiting period (November to March) in years when its wetland habitat has not dried out.

Description

Rumex bidens is a distinctive aquatic or semi-aquatic perennial herb with bladder-like floating stems and erect flower heads. The stems are about 1.2 m long and root at the nodes. They float horizontally on or just beneath the water surface, the upper portion erect and extending 20 to 50 cm above the water surface. The leaves towards the base of the plant are 20 to 25 cm long, stalked and oblong-shaped with blunt tips. The upper leaves are narrower and more sharply pointed, passing into smaller and almost linear floral bracts. The flowers are arranged in crowded whorls in the axils of the upper leaves. The upper clusters are usually male and the lower clusters female. The flowers have six perianth segments and are 2 to 4.5 mm long on 2 to 10 mm long slender stalks. The male flowers have six creamy-yellow stamens. The female flowers have a deeply three-branched style and three white, tuft-like stigmas. The straw or fawn-brown fruit is a three-sided nut that is ovate in outline, 3 to 3.5 mm long, and enclosed by three fruiting valves each 5 to 6 mm long with 1 to 2 spines at the base.

[description based on Curtis 1967, Aston 1973, Walsh & Entwisle 1996]

Confusing species

Rumex bidens is readily distinguished from other *Rumex* species in Tasmania by its inflated floating stems and distinctive fruit (see thumbnail image on cover page).

Plate 2. *Rumex bidens* at Lake Dulverton, in November 2009 (image by Richard Schahinger)

Table 1. Population summary for *Rumex bidens* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) recorded	Area occupied (ha)	Number of mature plants
1	Low Head	private land?	North	Low Head	1955	status unknown	
2a	Tamar Island wetlands	Tamar Conservation Area	North	Launceston	2006 (2003)*	unknown	very low numbers
2b	Tamar Estuary	private land	North	Launceston	2005*	unknown	20 & 10
2c	Tamar Cut	Tamar Conservation Area	North	Launceston	2009*	unknown	10
3	Longford	private land?	North	Longford	1978	unknown	unknown
4	Benham Lagoon	private land	North	St Pauls Dome	2010		6 in 2 patches, now presumed extinct
5	Macquarie River (Ross)	private land	North	Ellinthorp	1984	unknown	'common at pool margins'
6a	Lake River	private land	North	Penny	2009	unknown	2
6b	Micks Creek	private land	North	Penny	2009	unknown	2
7	Lake Crescent	unknown	South	Interlaken	1971	unknown	unknown
8	Lake Dulverton	Dulverton Conservation Area	South	Oatlands	2012 2010 (2009)	unknown 0.01	lots < 10
9	Lake Tiberias	Lake Tiberias Game Reserve	South	Stonor	1978	unknown	unknown
10	Jordan River	Heathy Hills Nature Reserve	South	Elderslie	1998**	0.001	< 10, possibly extinct now
11	Pontville	unknown	South	Tea Tree	1870s	status unknown	

* first collected near Launceston by Stuart in the 1800s (Rechinger 1984)
**collected from an unknown locality on the Jordan River by Leonard Rodway in 1893 and 1908

DISTRIBUTION AND HABITAT

On mainland Australia *Rumex bidens* occurs in New South Wales, South Australia and Victoria (Walsh & Entwisle 1996). In Tasmania the species has been recorded at Low Head in the north to Pontville in the south (Figure 1). The species grows at the margins of lakes, swamps, and slow-moving rivers and streams, and may also occur in drainage channels (Curtis 1967, Aston 1973). Associated species include *Phragmites australis* (southern reed), *Triglochin procerum* (greater waterribbons), *Eleocharis sphacelata* (tall spikesedge), *Myriophyllum* species (watermilfoil) and *Azolla filiculoides* (pacific azolla).

POPULATION PARAMETERS

Rumex bidens has been recorded from about a dozen sites in Tasmania. The limited data available suggests that subpopulations are very small both in number and area occupied (Table 1). The linear range of the species is 184 km and the extent of occurrence 6,500 km^2. Insufficient data are available to estimate the area occupied by the species.

The species is believed to have been lost from at least two sites in the past 15 years: Jordan River at Heathy Hills in the early 2000s due to (illegal) channel improvements, and Benham Lagoon in 2012 to 2013 due to the construction of a dam. The status of several sites last recorded before the mid 1980s is unknown (Table 1). The Lake River and Micks Creek records require verification as they were identified from non-reproductive material.

The lack of sightings for a species as distinctive as *Rumex bidens* suggests that it is genuinely rare in Tasmania. However, it is considered likely that additional sites will be found given a targeted survey effort, albeit in small numbers, bearing in mind that conditions may be

unsuitable for the species at a given site for several years. Plants were first recorded at Lake Dulverton in November 2009 (Plate 2), the lake having been virtually dry from 1993 to 2008.

RESERVATION STATUS

Rumex bidens has been recorded from Heathy Hills Nature Reserve where it is now possibly extinct, Lake Dulverton Conservation Area, Lake Tiberias Game Reserve and Tamar Conservation Area.

CONSERVATION ASSESSMENT

Rumex bidens was listed as rare on schedules of the Tasmanian *Threatened Species Protection Act 1995* in 2002, given the stochastic risk of endangerment because of a naturally small population size. The species was uplisted to vulnerable in April 2016, meeting criterion C: the total population is estimated to number fewer than 10,000 mature individuals and

- a continuing decline is observed, projected or inferred in the number of mature individuals combined with extreme fluctuations in the number of mature individuals.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

The major threat to *Rumex bidens* is permanent drainage and loss of its wetland habitat, the risk of inadvertent losses exacerbated as the species may not emerge during dry periods, sometimes for many years.

Hydrological changes and loss of habitat: Kirkpatrick & Harwood (1981) noted that the species in a particular wetland may partially depend on the maintenance of bird migration pathways and local movement, which may be disrupted by local or overall reductions in the area of wetlands. This may lead to reduced populations of particular bird species, reducing opportunities for particular wetlands to receive propagules spread by birds or their droppings. Many wetlands in Tasmania's Midlands have become isolated due to the cultivation of surrounding land, meaning that dispersal of species such as *Rumex bidens* becomes increasingly difficult. The trend to isolation has accelerated with the advent of large pivot irrigators and has the potential to increase further with the anticipated expansion of irrigation schemes. Allied to the increase in irrigation are the indirect threats to the species' wetland habitat posed by fertilisers, pesticides and herbicides, as well as the risk of increasing salinity. Sites may also be at risk during the construction of associated infrastructure such as pipelines. Wetlands are listed as a threatened vegetation community under the Tasmanian *Nature Conservation Act 2002*. However, they remain at some risk, as clearance and conversion of wetlands is only regulated where a Forest Practices Plan is required or in some circumstances where a dam approval is required.

Stochastic events: The small size of many subpopulations exposes them to a risk of extinction due to inadvertent or chance events, the risk exacerbated as the species may not emerge when their habitat is dry, sometimes for many years.

Stock grazing and trampling: The species is known to be palatable to stock, with impacts by cattle noted at at least one site (2b in Table 1). Browsing may reduce the species' reproductive capacity.

Competition: The wetland habitat of *Rumex bidens* is considered to be relatively resistant to weed invasion (Kirkpatrick & Harwood 1981), though in riparian situations the species may be at risk from infestations of willow (*Salix* spp.) and cumbungi (*Typha latifolia*). Competition by the native species *Triglochin procerum* is suggested to be the cause of the species not being seen at Lake Dulverton since 2009.

Climate change: Climatic trends for the 21st century in areas in Tasmania supporting *Rumex bidens* are predicted to include warmer temperatures and more extreme events (Grose et al. 2010) leading to a drying out of its habitat. It is possible that this may affect the ability of the species to colonise new sites or to recolonise sites from which it has been lost. It may also favour species that have the potential to outcompete *Rumex bidens* e.g. *Triglochin procerum*.

MANAGEMENT STRATEGY

Management objectives

The main objectives for the recovery of *Rumex bidens* are to prevent the inadvertent destruction of subpopulations, maintain existing subpopulations, and promote conditions for the species' successful recruitment.

What has been done?

Ex situ site: The Benham Lagoon site for the species fell within the footprint of a proposed dam. An artificial wetland is to be constructed in same subcatchment as part of an offset and is to include *Rumex bidens* plants translocated from within the dam footprint, as well as plants propagated from seed.

Seed collection: Seed has been collected from the West Tamar and Lake Dulverton subpopulations for long-term storage at the Tasmanian Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens in Hobart.

What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions. Coordinated efforts may achieve the best and most efficient results.

- provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of the known subpopulations and areas of potential habitat;
- survey sites not seen in recent years to determine their status and to inform the development of appropriate management strategies;
- verify the Lake River and Micks Creek sites;
- monitor selected subpopulations for longevity, recruitment, condition and response to disturbance;
- encourage landowners to retain buffering vegetation around waterways and wetlands supporting the species, and ensure that stock do not have access to sites;
- undertake extension surveys of potential habitat within the species' recorded range, particularly in the Tamar wetlands.

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Permit: It is an offence to collect, disturb, damage or destroy this species unless under permit.