

Chorizandra enodis

black bristlesedge

TASMANIAN THREATENED SPECIES LISTING STATEMENT



Image by James Wood

Scientific name: *Chorizandra enodis* Nees, *Pl. Preiss.* [J.G.C.Lehman] 2: 73 (1846)

Common Name: black bristlesedge (Wapstra et al. 2005)

Group: vascular plant, monocotyledon, family **Cyperaceae**

Status: *Threatened Species Protection Act 1995:* **endangered**

Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic status: **not endemic to Tasmania**

Tasmanian NRM Region: **North**



Figure 1. Distribution of *Chorizandra enodis* in Tasmania, showing NRM regions



Plate 1. *Chorizandra enodis*: habit (image by Natalie Tapson)

SUMMARY: *Chorizandra enodis* (black bristlesedge) is a perennial sedge which in Tasmania is restricted to the George Town/Low Head area in the north of the State. It forms locally dense stands in low-lying swampy ground, including in remnant stands of *Melaleuca ericifolia* (coast paperbark) where it is most abundant on the fringes and in clearings, and slashed road-side verges and road-side drains. The species has a linear range of less than 8 km, and occupies an area of less than 1 ha, making it susceptible to chance events. *Chorizandra enodis* is unreserved, being restricted to private land used mainly for agricultural purposes, and road verges managed by the local council. It is known to persist under quite intensive land management practices, but is at risk from clearing for residential and industrial development and road improvements, intensification of agricultural activities including improving drainage and intensive stock grazing, frequent cleaning or deep scraping of roadside drains and competition from weeds.

IDENTIFICATION AND ECOLOGY

Chorizandra enodis is a perennial sedge that recruits from seed and may spread via rhizomes. The seed is likely to have similar complex dormancy mechanisms to *Chorizandra australis*, which tends to only recruit from soil-stored seed when in shallow water with no or little vegetation (James Wood, pers. comm.). *Chorizandra enodis* has the capacity to recover from physical disturbance or browsing by stock. The species occurs under dense stands of *Melaleuca ericifolia* but is most abundant on the fringes of remnant patches and where the canopy has been disturbed suggesting that shade levels may inhibit the species (North 2001). The species flowers in spring and summer, with wind the most likely pollination vector (A. Hingston, pers. comm.).

Survey techniques

Surveys for *Chorizandra enodis* can be conducted at any time of the year, although the species is easier to detect and be able to be identified from spring to autumn, when its globular inflorescences are present.

Description

Chorizandra enodis is a perennial plant with a slender but tough spreading rhizome. The flowering stems (culms) are rigid, wiry, terete and erect, 20 to 55 cm tall, and 1 to 1.5 mm in diameter. The culms have internal tubes, and are grey-green and longitudinally striate, with usually two erect leaves. The innermost leaves are often longer than the culm, with an almost pungent apex and long open sheaths at the base. The outer leaves are represented by fawn to purplish-brown sheaths with the blades progressively smaller to absent in the shortest outermost one. The leaf blades also have internal tubes. The inflorescence is a terminal solitary head, more-or-less embedded in the base of an up to 20 cm long involucre bract which appears to be a continuation of the stem. The flowers are unisexual and grouped in small spikelets which are very densely aggregated to form a globose head. The flower-head is dark purplish-brown, 7 to 15 mm in diameter, with flowers surrounded by a few empty bracts equal in length to the fertile ones. The bracts (glumes) enclosing fertile flowers are spatulate, 3 to 3.5 mm long, with white hairs near the tips and red hairs on the margins. Eight to ten of the glumes subtend a single stamen, the latter having long-exserted salmon-pink anthers. The stigmas are dark purple and spreading. The fruit is almost globular, about 2.5 mm long, very dark red-brown to dark grey-brown, and bears 8 to 9 longitudinal ridges, the areas between the ridges being pitted and minutely papillose.

[description based on Curtis & Morris 1994, Walsh & Entwisle 1994]

Confusing species

Chorizandra australis is the more widespread of the two species in Tasmania but is often highly localised, and usually occurs in standing water, growing up to 2 m tall, unlike *Chorizandra enodis* which prefers drier conditions and rarely exceeds 55 cm in height. The glumes of *Chorizandra australis* are glabrous, whereas those of *Chorizandra enodis* are usually ciliate towards the apex and on the margins. The leaves and involucre bracts of *Chorizandra australis* are unitubular, while those of *Chorizandra enodis* are

Table 1. Population summary for *Chorizandra enodis* in Tasmania

	Location	Tenure	NRM Region	1:25000 Mapsheet	Year of census (year first recorded)	Area occupied (ha)	Number of individuals
1.1	Bell Buoy Beach	private land & George Town Council	North	Low Head	2001 (1986)	0.01	11
1.2	Aerodrome Road (east of Potato Hill)	George Town Council	North	Low Head	2005	0.006	16
2.1	near end of Aerodrome Road	private land	North	Low Head	2001	0.001	3
2.2	near end of Aerodrome Road	private land	North	Low Head	2001	0.01	4
2.3	near Long Flat	private land	North	Low Head	2001	0.009	6
3.1	Aerodrome Road (Slippers Hill)	private land & George Town Council	North	Low Head	2008	scattered	50+
3.2	Aerodrome Road (east side)	George Town Council (& private land?)	North	Low Head	2007 2005 (2001)	– 0.1832 0.055	40 640 25–100
3.3	Aerodrome Road (west side)	private land	North	Low Head	2001	0.3	1500–2500
4.1	Soldiers Settlement Road	private land & George Town Council	North	Low Head	2007 (2001)	0.075 0.075	700 100–350
4.2	near The Buffalo (south of Soldiers Settlement Road)	private land	North	Low Head	2007	0.0001	3
5.1	Low Head Road	George Town Council	North	Low Head	2001	0.02	30–50
5.2	Low Head Road	George Town Council	North	Low Head	2001	0.0025	10–25
5.3	North Street, George Town	George Town Council & private land	North	Low Head	2001	0.025	200–250
5.4	Low Head Road, George Town	George Town Council	North	Low Head	2002	0.006	–
5.5	Anne Street, George Town	George Town Council & private land	North	Low Head	2002	0.02	–

NRM = Natural Resource Management region

pluritubular. *Chorizandra enodis*, especially in the absence of inflorescences, is more likely to be confused with other sedge species such as *Baumea juncea* (bare twigsedge) or *Ficinia nodosa* (knotty clubsedge).

DISTRIBUTION AND HABITAT

Chorizandra enodis occurs in Western Australia, South Australia, Victoria and Tasmania (Walsh & Entwisle 1994). Within Tasmania it is known from near-coastal areas in the State's north near George Town and Low Head (Figure 1).

Chorizandra enodis occurs in damp areas, both natural and man made (Curtis & Morris 1994, Walsh & Entwisle 1994). In Tasmania the

species has been recorded from frequently slashed roadside vegetation and drains that were probably once wet heathland or stands of *Melaleuca ericifolia* (coast paperbark) (Plate 2), from poorly-drained vehicle tracks and cattle trails amongst damp vegetation, and from damp pastures (North 2001). It is known from paperbark stands where it is most abundant on their fringes and in clearings.

POPULATION PARAMETERS

In Tasmania *Chorizandra enodis* was first recorded in the George Town area in 1843 and despite several collections through to 1986, had been considered to be extinct until its presence was confirmed in 1997. It is now known from 15 sites (Table 1). These sites occur in five

clusters at locations separated from one another by distances of at least one kilometre. They appear to represent the vestiges of a single subpopulation which has been fragmented through land clearance and urban expansion. The species has a linear range of 7.8 km, an extent of occurrence of 14.8 km².

Estimating the total number of plants for *Chorizandra enodis* is problematic as the species tends to form clumps due to its rhizomatous nature. Where clumps coalesced, North (2001) assumed that each square metre occupied by the species represented an individual plant and estimated the total population to be between 1,900 and 3,300 plants for the ten sites recorded. He, however, acknowledged that numbers for some sites may well have been an order of magnitude higher, and subsequent surveys have uncovered a further five sites (Table 1). Given the uncertainty in the estimation of plant numbers, the area occupied by the species is a better guide to the size of the total subpopulation. The area of occupancy of the species is estimated to be about one hectare.

Surveys for *Chorizandra enodis* have not been conducted in some areas of potential habitat on private land in the George Town area. While it is likely that that minor range infillings will occur if these areas are surveyed, range extensions are considered unlikely given the survey effort to date.

RESERVATION STATUS

Chorizandra enodis is not known from any formal reserve.

CONSERVATION ASSESSMENT

Chorizandra enodis was listed as presumed extinct on the Tasmanian *Threatened Species Protection Act 1995* when the Act came into being. It was down-listed to vulnerable in 2003 following its rediscovery in 1997, and subsequently up-listed to endangered in 2008, meeting criterion B:

- extent of occurrence estimated to be less than 500 km²; and
- severely fragmented and known to exist at no more than five locations;

- a continuing decline inferred in the area, extent and/or quality of habitat, and the number of mature individuals.



Plate 2. Habitat of *Chorizandra enodis* (image by Oberon Carter)

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

As a result of land clearing and intensive primary production and road works, the current distribution of *Chorizandra enodis* has become severely fragmented with only remnant patches remaining of what appeared to have been a single occurrence. However, the fact that plants have persisted over time, despite quite intensive primary production and road maintenance activities, indicates that the species is relatively resilient to disturbance.

Historical land clearing: Land clearance since European settlement in the early 1800s has undoubtedly led to a reduction in available habitat in the George Town area, as well as fragmenting the distribution and reducing plant numbers and the area occupied by the species.

Agricultural practices: Intensification of cleared land for cropping and/or grazing is probably the greatest historical and contemporary threat to *Chorizandra enodis*. The species can recolonise pasture in some situations and can persist under some grazing regimes and stock trampling. However, drainage improvement leads to a reduction in habitat quality and ultimately loss of the species, restricting the species to sites with poor drainage such as artificial drains. While the species appears to be palatable to stock, it appears to thrive under a light grazing regime

(North 2011). However, continued intensive grazing will cause attrition if plants do not have the opportunity to recover, and will ultimately lead to the local extinctions.

Coastal development and urban expansion:

The George Town area is a rapidly expanding centre. At least one subpopulation has been affected by recent residential expansion. At present, other known sites are probably located in areas unsuitable for intensive development, but areas of potential habitat may be at risk. North (2001) noted that any major road improvements could be catastrophic for all roadside occurrences. Some occurrences are at risk from the installation of linear infrastructure such as pipelines and cables.

Roadside maintenance: At least half of the known sites occur wholly or in part on road reserves managed by the George Town Council. These sites have been subject to various management regimes, including slashing, scraping, drain clearance and presumably weed management and fence maintenance. North (2001) noted that these practices have historically probably not been incompatible with the persistence of the species and perhaps beneficial through a reduction in competition, but that more recent intensive practices such as drain cleaning may have a deleterious impact.

Weeds: Gorse (*Ulex europaeus*) and to a lesser extent other woody weeds are present at several of the sites supporting the species (North 2001), and most sites support a high diversity and abundance of herbaceous weeds and pasture grasses. Herbicide drift or vegetation management that inadvertently promotes the proliferation of species that may compete with *Chorizandra enodis* need to be avoided.

Management of paperbark stands: As the species is most abundant on the fringes of remnant dense stands of *Melaleuca ericifolia* and where the canopy has been disturbed (by wind-thrown trees, along fence-lines or where slashing or cattle trampling has occurred), some active management of remnant paperbark stands may be needed to allow *Chorizandra enodis* to thrive.

MANAGEMENT STRATEGY

Management objectives

The main objectives for the recovery of *Chorizandra enodis* are to prevent the inadvertent destruction of occurrences, maintain their viability, and promote conditions for recruitment.

What has been done?

Survey: Extension surveys were undertaken by with ten sites initially reported (North 2001), and further two sites found in 2002. Subsequent impact assessment surveys have located an additional three sites.

Ex situ conservation: A living plant collection has been established at the Royal Tasmanian Botanical Gardens, and seed has been collected from wild plants for long term storage at the Tasmania Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens.

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.

- redo a census at known sites;
- provide information and extension support to relevant Natural Resource Management committees, the George Town Council, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential habitat;
- negotiate a Public Authority Management Agreement under the Tasmanian *Threatened Species Protection Act 1995* with the George Town Council that includes provisions for the appropriate management of roadside occurrences, with monitoring of population trends after management events;
- undertake extension surveys of potential habitat on private land in the George Town area;
- monitor the species at selected sites to gain an understanding of the dynamics of the

population under various management regimes.

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Prepared in January 2013 under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Approved by the Secretary and published in April 2014.

Cite as: Threatened Species and Marine Section (2014). *Listing Statement for Chorizandra enodis (black bristlesedge)*. Department of Primary Industries, Parks, Water and Environment, Tasmania.

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