

COLLECTING HISTORY, DISTRIBUTION, HABITAT AND CONSERVATION STATUS OF *SENECIO* *CAMPYLOCARPUS* (BULGING FIREWEED) IN TASMANIA

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ABSTRACT

Senecio campylocarpus (bulging fireweed) is a poorly known native species of *Senecio*, known only in recent times from the Elizabeth River in Cambell Town and the North Esk River in Launceston, and in earlier times from somewhere near Launceston and the Cressy area. It also occurs in Victoria, ACT and NSW. The species inhabits poorly-drained flood-prone sites such as river flats and banks. The limited extent of occurrence, area occupied by the extant populations, and presumed low population numbers, combined with historical and contemporary threats that include land clearing, and modifications to major river systems and associated riparian habitats, suggests a threat status of 'endangered' on the Tasmanian *Threatened Species Protection Act 1995* is warranted.

INTRODUCTION

There are now thirty-seven native taxa (including infrataxa such as varieties and subspecies) and four exotic taxa of *Senecio* recognised in Tasmania (see Thompson 2006 and references therein; Duretto & Baker 2011), which is significantly more than the eighteen recognised in *The Student's Flora of Tasmania* (Curtis 1963).

During the production of a State-based key to *Senecio* (Wapstra et al. 2008), which included a review of specimens held by the Tasmanian Herbarium, it became apparent that several species were represented by very few formal collections. This is probably a reflection of both a limited number of collections of the genus from some habitat types (e.g. swampy areas on private land) and the close similarity of some species to one another. However, familiarity with the revised taxonomy by several field botanists, and re-examination of the

collection held at the Tasmanian Herbarium by the author, is leading to a better understanding of the distribution of many species.

Some of these poorly known species are already recognised with a legislated conservation status on the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. However, most other species have not been formally assessed against conservation status criteria since their recognition in the Tasmanian census (Duretto & Baker 2011).

This is the third in a series of papers (see also Wapstra 2010a, 2010b) on the species of *Senecio* represented by a low number of collections in Tasmania, and describes the collecting history, distribution and habitat of *Senecio campylocarpus*, a species only recently "re-discovered" (2006) after a long period (61 years) of no collections.

TAXONOMY, NOMENCLATURE & ETYMOLOGY

Senecio campylocarpus has also been known as *Senecio glandulosus* (see Thompson (2004a, 2004b) for a discussion of the synonymy). Prior to the resurrection of the species by Thompson (2004a), the species was not recognised as present in Tasmania, and was not included in any State floras (e.g. Hooker 1858; Rodway 1903; Curtis 1963). Thompson (2004b) applied the name epithet *campylocarpus* when it was recognised that the earlier name was illegitimate.

Senecio campylocarpus is commonly known as the ‘bulging fireweed’ (Wapstra et al. 2005), a reference to the flowerheads that bulge out at the base to accommodate the ripening seeds. The term ‘fireweed’ is applied to many species of *Senecio*, native and exotic, and refers to the ability of many of the species to rapidly exploit disturbed ground (e.g. after fire). The specific epithet is derived from the Greek *campylos* (bent, curved) and *carpos* (seed), alluding to the curved marginal seeds (fruit) that are typical of the species, and are more curved than in any closely related species (the curvature of the dark seeds is apparent to the naked eye in mature flowerheads).

IDENTIFICATION

Wapstra et al. (2008) provides a key to Tasmanian species of *Senecio*. Thompson (2004a) provided a detailed description of *S. campylocarpus* (as *S. glandulosus*). The species is most similar to the widespread and common *Senecio quadridentatus* (and indeed earlier collections were attributed to that species) but differs by its sparsely haired to glabrous leaves and stems (*S. quadridentatus* is usually dense-white cottony), broader leaves tapering

distinctly to each end, broader phyllaries reflexed rather than spreading at maturity (Plate 1), shorter florets with more corolla-lobes, curved fruits (this is one key character), and the smaller taproot and fleshier secondary roots (Thompson 2004a). The receptacle undergoes relatively little expansion as the achenes develop and, because of this, the capitula become slightly more uccolate (urn-shaped, bulging) than those of other species (Thompson 2004a). Of note, also, is that *Senecio campylocarpus* often has its “feet wet”, growing in poorly-drained sites, a habitat occupied by only a small number of superficially similar, and all equally rare, species of *Senecio*.



Plate 1. Mature capitulum of *Senecio campylocarpus* – note the very dark curved outer achenes (image: M. Wapstra)

COLLECTING HISTORY AND DISTRIBUTION IN TASMANIA

Senecio campylocarpus occurs in Tasmania, Victoria, southern New South Wales and the Australian Capital Territory (Thompson 2004a, 2004b). Within Tasmania, the species is known from only four confirmed collections (Table 1). The first collection was in 1888 from “near Launceston” by an unknown collector. The species then went uncollected until 1943, when 2 separate

collections from a “swamp near Cressy” were made. Another period of non-collection ensued, until it was collected along the Elizabeth River in the heart of Campbell Town in 2006 (Wapstra et al. 2006), followed by additional collections from the same section of river bank in 2008 (collection of seed for the Millenium Seed Bank project), and 2011 (slight range extension downstream of the public park made by the author). Only one additional site outside the Cressy and Campbell Town area has been found, along the North Esk River near Launceston in 2010.

HABITAT

Thompson (2004a) described the habitat of *Senecio campylocarpus* as “loam to clay soils in forest and woodland, usually in seasonally inundated areas”. While the specific habitat of the sites of older Tasmanian collections is not known (although one is described as a “swamp”), the more recent sites are both from riparian habitats.

The population along the Elizabeth River in Campbell Town occurs on the immediate banks of the river subject to periodic flooding and amongst river rocks forming small shallow rapids (Plates 2 & 3).



Plate 2. Habitat of *Senecio campylocarpus* along the banks of the Elizabeth River in Campbell Town – the species occurs amongst the sedges and grasses on the river bank (image: M. Wapstra)

The fringes of the river are all grassy and weedy including willows, blackberries, slashed old pasture and mown lawns of a public park.



Plate 3. Habitat of *Senecio campylocarpus* along the banks of the Elizabeth River in Campbell Town – the species occurs amongst river rocks forming a small series of rapids in drier times (image: M. Wapstra)

The habitat of the site near the North Esk River was described as “overgrown paddock” and was on a broad grassy floodplain of a major river subject to periodic inundation. It is reasonable to assume that the historic collections from “near Launceston” and “swamp near Cressy” were from similar habitats because both areas are dissected by major flood-prone rivers through low-lying pastoral lands.

RESERVATION STATUS

Senecio campylocarpus is not known from any gazetted reserves. No populations are subject to active management.

THREATENING PROCESSES AND MANAGEMENT

Extensive areas of the low-lying poorly-drained parts of Tasmania, especially through the Northern Midlands, have been developed for primary production since the earliest times of European settlement. It is likely that such habitat

Table 1. Collection details of *Senecio campylocarpus* in Tasmania
[HO = Tasmanian Herbarium; MEL = National Herbarium of Victoria]

Site No.	Location [as per HO/MEL label]	Collector	Date	Tenure	Comments
1	"Near Launceston" (MEL)	unknown	21 Mar. 1888	unknown	No population details known
2	"Cressy" (HO)	H.D. Gordon	18 Jan. 1943	unknown	No population details known
3	"swamp near Cressy" (HO)	J.H. Wilson	Feb. 1843	unknown	No population details known
4	"Elizabeth River, Campbell Town" (HO)	M. Wapstra	12 Apr. 2006	Council	Several (20+) discrete patches of c. 1-20 plants along c. 200-400 m of river bank, either side of the Midland Highway bridge
5	"Campbell Town, banks of Elizabeth River near Lions Club Park" (HO)	M. Visoui, J. Wood, M. Van Slagaren	8 Jan. 2008	Council	Same sites as above; c. 50 plants noted; seed collected as part of the Millenium Seed Bank project
6	"near Hoblers Bridge, close to N. Esk River, sth of Distillery Creek" (HO)	A. North	30 Apr. 2010	Council?	Collected from "overgrown paddock"; no population details provided

modification, which has included vegetation clearing, hydrological changes, fertilising and cultivation, and stock grazing to river banks and in swampy areas, has resulted in the elimination of some population, although there is no way of quantifying this impact. However, the persistence of the species along the banks of the Elizabeth River and North Esk River close to agricultural and residential areas suggests that there may be additional populations in Tasmania in similar situations.

Contemporary threats probably include similar agricultural practices, inadvertent disturbance from activities such as weed removal along river banks) and inundation of potential habitat. On this latter point, the call by the Tasmanian

government to "make Tasmania the food bowl of the nation" involving several major irrigation developments, may result in the flooding of relatively large areas of potential habitat and hydrological changes to sites downstream of impoundments and irrigated areas. Having said this, such development proposals are subject to intense pre-disturbance botanical assessment.

Even though *Senecio campylocarpus* is not currently listed as a threatened species, such that detection would not have necessarily resulted in permit conditions to mitigate loss of individuals and/or habitat, I have not been made aware of any new populations of the species by botanical colleagues related to such dam proposals (many botanists do

send me material to examine and I frequently examine submitted material to the Tasmanian Herbarium).

A warmer climate and longer periods of drought may deleteriously impact on the habitat of *Senecio campylocarpus*, through effects such as drying out of low-lying areas and competition with weeds.

Lack of knowledge on the distribution of the species is also a concern because many potentially suitable sites are probably subject to ongoing intensive primary production activities. It is likely that minor modifications to agricultural practices would result in a significantly higher level of security for the species: as with most species of *Senecio*, some level of disturbance is acceptable, if not necessary, for persistence of populations. Small populations separated by long distances supporting unsuitable habitats are also not conducive to genetic exchange and potentially exacerbate the risk of stochastic events eliminating populations of *Senecio campylocarpus* in Tasmania.

CONSERVATION STATUS

Senecio campylocarpus is not currently listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

While the species may meet the criteria for listing on the Tasmanian *Threatened Species Protection Act 1995*, formally listing the species should be approached with caution, as was suggested by Wapstra et al. (2010) in relation to many other species of recently recognised species of *Senecio*, where familiarity is leading to additional collections. Potential habitat for *Senecio campylocarpus* (poorly-drained habitats such as flood-prone pastures, grasslands and river

banks) is still relatively common and the species appears to have a widespread distribution so range extensions and infillings are likely. However, the species technically meets the criteria for endangered on the Tasmanian *Threatened Species Protection Act 1995*, and a conservative approach to conservation management is warranted.

The extent of occurrence of *S. campylocarpus* is c. 600 km², based on a minimum convex polygon that includes three nominal sites at Cressy, Campbell Town and Launceston, but this is reduced to an estimate of linear extent of about just 60 km if only the confirmed extant sites at Campbell Town and Launceston are used. The area of occupancy is presumably less than 1 ha, but this is based on limited surveys. On present estimates, the total population of mature individuals is less than 100, but again this is based on limited surveys.

Senecio campylocarpus meets the criteria for listing as endangered, meeting criterion B (extent of occurrence realistically estimated to be less than 500 km²), specifically, B1 (severely fragmented) and B2c (continuing decline in area, extent and/or quality of habitat); and criterion D (total population extremely small or area of occupancy very restricted), specifically D1 (total population estimated to number fewer than 250 mature individuals).

DISCUSSION

The recent taxonomic changes to the *Senecio* flora of Tasmania (e.g. see Wapstra et al. (2008) for a summary) makes it difficult to determine the contemporary conservation status of many species, especially those represented by few collections. Listing species as “presumed extinct” before the botanical community has had an

opportunity to come to grips with so many similar species is perhaps pre-emptive but at the same time conservative, if it turns out that some of the species are indeed long gone.

Further collections of specimens of *Senecio* from poorly-drained low-lying terrain throughout Tasmania (particularly the northern Midlands, but also coastal hinterlands and Bass Strait islands) are needed to further clarify the status of species such as *S. campylocarpus*, *S. tasmanicus* (one collection from the mid 1800s), *S. psilocarpus* (Wapstra 2010a), *S. macrocarpus* (one 1800s record) and *S. longipilus* (three records, only one from the 1800s with collection details, which suggests a lowland distribution). Of these, only *S. macrocarpus* and *S. psilocarpus* are formally listed as threatened on both the State and Commonwealth legislation. Targeted survey of potential habitat radiating out from known locations at an appropriate time of year (e.g. late summer) is likely to be a productive method of detecting further sites for species such as *Senecio campylocarpus*. A kayak-based assessment of the banks and flood levees of major rivers of the broader Midlands region such as the South Esk, North Esk, Macquarie, Elizabeth, Clyde, Ouse and Derwent is likely to yield many records of poorly-collected species.

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