

***DISCOCHAROPA VIGENS* (LEGRAND, 1871), A THREATENED  
TASMANIAN CHAROPID LAND SNAIL**

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*Abstract.* This paper discusses the history of knowledge, identification, known distribution, ecology and conservation of *Discocharopa vigens* (Legrand, 1871), currently classified as Vulnerable at state level. The very few reliable records of the species come exclusively from wet and dry sclerophyll forests in the greater Hobart area in south-eastern Tasmania. The species may be locally extinct at some former localities, and may be susceptible to a range of side-effects of urban sprawl. The species' conservation status remains unclear, and comprehensive surveying will be required before its management can be effectively planned.

**INTRODUCTION**

Tasmania has a very diverse fauna of small land snails in the family Charopidae. Bonham (2003) recognised 66 species, about two-thirds of these undescribed. Subsequent searches and studies suggest at least another seven undescribed species (author's data). The charopids comprise approximately two-thirds of the state's known native land snail diversity, and are very diverse at genus level, with many apparently relict taxa and a high proportion of localised species.

The three Tasmanian taxa incorrectly placed together in the genus *Discocharopa* resemble each other by having small, loosely coiled, flat shells with very wide umbilici. All were poorly known for the majority of the twentieth century. *D. mimosa* (Petterd, 1879), a widely distributed species found on the trunks of a wide range of Tasmanian wet forest trees, was rediscovered in 1982 (Bonham, 1995) and is now known to be present statewide and relatively common, with records from over 50 known localities (author's records). The taxon originally described as *Helix lottah* (Petterd, 1879) has been formally considered a synonym of *D. mimosa* but is clearly distinct and redescription as a species is intended as soon as a correct placement at genus level is possible. It has been

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recorded from five localities surrounding the Tamar Valley in central northern Tasmania, chiefly in wet forest.

The third member of the group, *D. vicens*, does not appear to have fared well following European settlement and is probably the state's most threatened known charopid. Known to late nineteenth century collectors as a rare species, it went unrecorded for most of the twentieth century. Following inclusion in a well-known field guide (Smith and Kershaw, 1981), records of *D. vicens* were occasionally made in the 1980s and 1990s, but the vast majority of these proved to be misidentifications, frequently of undescribed species. During this time, searches of several dozen localities in the Hobart area resulted in just one find of three dead shells. Under these circumstances, the species was listed as Vulnerable on the schedules of the *Tasmanian Threatened Species Act 1995* in 2002. The nomination (written by the author) commented that the species may qualify for Endangered status but more evidence was required. One living population has since been discovered, and at least one more is likely to exist, but the species still appears to be at a high level of risk and further research is required.

#### TAXONOMIC HISTORY

Published descriptions and reallocations of *D. vicens* and its synonyms are as follows:

*Helix (Charopa) ammonitoides* - Brazier, 1871 [non *Helix ammonitoides* Reeve, 1854]

*Helix (Discus) vicens* - Legrand, 1871 (sp. 30)

*Helix (Charopa) bassi* - Legrand, 1871 (sp. 50) [nom. nov. for *H. ammonitoides*]

*Endodonta bassi* - Petterd and Hedley, 1909 [*vicens* incorrectly considered junior synonym]

*Discocharopa bassi* - Iredale, 1913 [*vicens* incorrectly considered junior synonym]

*Discocharopa vicens* - Smith and Kershaw, 1979

Brazier (1871) described *H. ammonitoides* and gave the type locality as "Mt Nelson". Two lots of syntypes exist in the Australian Museum collection, AM C17975 and AM 63495 (2 specimens). Subsequently, Legrand (1871) renamed *H. ammonitoides* as *H. bassi* because the original name was preoccupied, but also described and figured *H. vicens* from "Mt Wellington". No type material of *H. vicens* is known and Legrand commented that the species was "badly figured". Petterd (1879) considered *H. bassi* and *H. vicens* identical, but incorrectly considered *H. bassi* to have priority.

Iredale (1913) erected the genus *Discocharopa*, which originally contained

both a Kermadec Island taxon and *D. vicens* (as *D. bassi*). Subsequently many other superficially similar charopids were added (Solem 1983) but all of these except for the three Tasmanian taxa and the type species *D. aperta* (Mollendorff 1888) have since been reallocated. As Solem comments, the Tasmanian taxa are incorrectly placed, because *D. aperta* is distinguished by the absence of spiral elements in the adult sculpture. Stanisic (1990) illustrated this feature. Furthermore the protoconch of *D. vicens* is dominated by strong radial ribbing, but the protoconch sculpture of *D. mimosa* is of weak spiral traces and that of *D. lottah* is smooth at x60 magnification. Protoconch differences of this sort are significant at genus level in charopids. Proper placement of these taxa to genus will require at least two new genera, perhaps three, but reallocation of *D. vicens* is not attempted at this stage. There is not sufficient live-collected material.

### RECOGNITION

Specimens of many charopid species have sometimes been misidentified as *D. vicens*, including *Roblinella gadensis* (Petterd, 1879), *Planilaoma luckmanii* (Brazier, 1871), various species of *Pernagera* and an undescribed north-eastern Tasmanian snail known informally as Charopidae sp. "Skemps". However, Tasmanian charopids assigned to the genus *Allocharopa* Iredale, 1937 have caused the most problems. A significant radiation of such species occurs in the state, especially in the south-eastern quarter. At least 18 Tasmanian species are known (most of these undescribed), but more research may reveal many more. Tasmanian *Allocharopa* vary primarily in the degree of elevation of the spire, the density and coarseness of primary adult sculpture, shell size and number of whorls, and most significantly the width of the umbilicus. Undescribed *Allocharopa* spp. with wide umbilici have often been misidentified as *D. vicens*.

For such a rare snail, *D. vicens* is quite variable. Adult specimens usually have between 3.5 and 3.9 whorls and are 2.5-3.0 mm wide, but some specimens are larger. The Mt Wellington specimen figured by Legrand was "0.14 of an inch" (c. 3.6 mm) wide and had 4.5 whorls. In contrast, none of the potentially confusing "wide umbilicus" *Allocharopa* species have shells more than 2.4 mm wide, and a shell of even that size would be much more tightly coiled relative to its size (c. 4.5 whorls). The ratio of shell width to umbilicus width (D/U) in *D. vicens* is usually between 2.5 and 3.0, making it one of the most widely umbilicated Tasmanian charopids, but the sole known specimen from Poimena Reserve, Austins Ferry, only has a medium-wide umbilicus (D/U = 3.4). The shell is very flat (height/diameter ratio c. 0.3) and the aperture is in the plane of the body whorl or nearly so. The primary ribs are slightly curved, and vary between specimens in prominence and spacing, with between 80 and 130 ribs being present on the final whorl. The protoconch is dominated by strong radial riblets.

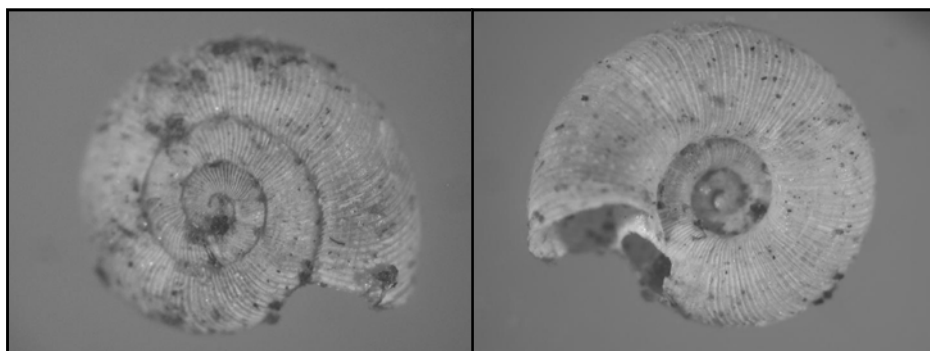
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The shell is uniformly pale greyish white, yellow-grey or yellow-horn in colour. There are never any colour rays.

Figure 1 illustrates a dead-collected specimen of *D. vigens* from Romilly Street. Dead shells found in the field tend to have a very tatty appearance. The periostracum often peels, and many specimens have holes or are crumpled.



**Figure 1.** *Discocharopa vigens* shell from Romilly Street block. Shell width 2.4 mm.

### DISTRIBUTION

The following are all the known records of *Discocharopa vigens*. All seven records come from the Hobart metropolitan area. Only one (Grass Tree Hill) is from east of the River Derwent.

“Mount Wellington. – Petterd” (Legrand, 1871). The term “Mt Wellington” was broadly used by nineteenth-century naturalists and could have referred to the lower, drier foothills of the mountain. No specimen labelled “Mount Wellington” is known in museum collections.

“Mount Nelson, Tasmania, under stones in moist places. – Petterd” (Legrand, 1871). Petterd and Hedley (1909) figure a specimen “in the Tasmanian Museum” from this locality. Three syntype specimens from Mt Nelson exist in the Australian Museum collections and the Tasmanian Museum specimen is lost (a vial with a matching label exists, but the vial is empty). Apart from these four nineteenth-century specimens, the species has not been found again on Mt Nelson despite very persistent efforts.

“Domain, Hobart Town (a single specimen)” (Petterd, 1879). There have been no further records from the Queens Domain and no specimen is known.

“Hillgrove”. (Petterd, Queen Victoria Museum collection specimens, undated but probably between 1880 and 1900.) The most likely correct location of Hillgrove was only very recently determined – it is a large property established in the 1820s on the Channel Highway south of Tarooma (GR 5273 2436). Petterd collected two specimens there. On 5 Aug 2004, the author found one freshly dead shell under a stone during a two-hour search in a gully very close to Hillgrove (GR 5275 2438). Considering the amount and condition of habitat available, it is likely that a population persists in the area, but this remains to be confirmed.

Grass Tree Hill, GR 5275 2621 (approx.) (author’s records.) Three dead shells found on 26 May 1990, and one further dead shell on 26 May 2002. No specimens found during searches of Grass Tree Hill on 1 Nov 1995, 21 Dec 2000, or 5 Oct 2002. The four specimens found were within about 50 m of each other. All were under stones and all were in very poor condition. Total search time for these five samples was about ten hours, of which about six hours were spent searching within 200 m of the area where specimens have been found.

Pipeline Track near Romilly Street, South Hobart, GR 5247 2498 (author’s records.) A dead specimen was found in soil in a track cutting on 2 Nov 2002, followed by another dead specimen nearby on 3 Nov 2002, two live specimens under the same rock on 5 Nov 2002, and a further dead specimen on 5 July 2003. The specimens found have been within about a one hectare section of a four hectare bush block and the total search effort in the area has been about five hours.

Poimena Reserve, Austins Ferry, GR 5199 2632 (author’s records.) A single dead shell was found on 12 Dec 2003, after the species had not been seen on 13 June 1990 or 25 Jan 1991. The dead shell was bleached white and in poor condition, and had a small empty spider web inside it. A further search on 15 Dec 2003 was unsuccessful. Total search effort has been about six hours.

Figure 2 shows the locations of recent and historical records and unsuccessful searches for this species in the Greater Hobart region. Because the species is seldom found at all, and scarce where present, it may have been overlooked in areas outside Greater Hobart, for instance parts of the southern midlands.

### ECOLOGY

Nothing is known of the habitat for the “Mount Wellington” record. Although Petterd (1879) comments that the species occurred “under stones in moist places” on Mt Nelson, he contradicts this elsewhere. Discussing *D. vicens*

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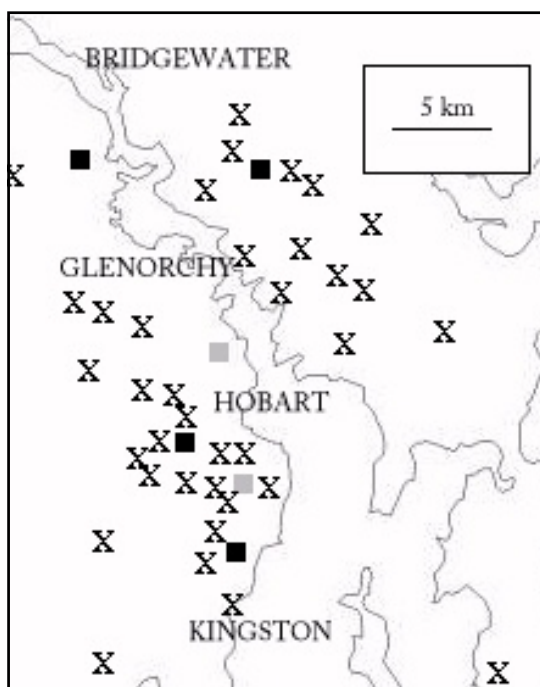
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and two other species, he writes:

“All three are of the same habit, found on the under surface of boulders, generally in rather dry situations, and all are extremely rare.” (p. 37)

There have not been any subsequent records on Mt Nelson despite a total of at least 30 hours' searching on Mt Nelson and gullies on its slopes (author's records).



**Figure 2.** Greater Hobart area showing recent records (dark squares), nineteenth-century records (light squares) and post-1985 unsuccessful lowland searches in suitable habitat (X). The nineteenth century record from “Mt Wellington” is not shown as it is impossible to accurately determine where the observation would have been made.

The Queens Domain population is probably extinct. The Queens Domain is an enclosed area of mostly open dry woodland, some of which has been cleared for recreation, quarries, houses and the Hobart Botanical Gardens. It experiences high fire frequencies and its land snail fauna is now dominated by introduced species. *D. vigens* has not been recorded despite a total of seven hours' searching (author's records). Three other species recorded there by Petterd have not been recorded there since, but three species of *Paralaoma* persist.

The Grass Tree Hill specimens were found on a grassy rocky knoll in open dry *Eucalyptus globulus* woodland with an understorey of sparse *Olearia vis-*

*cosa* and other shrubs. There is a large proportion of bare soil on this knoll, and the undersides of the rocks there are usually very dry. The site was severely burnt in about 1993 and it is unclear whether a living population is still present.

The Poimena Reserve specimen was found in damp *Allocasuarina* / *Beyeria* scrub on dolerite very close to an area of wet *Pomaderris* scrub. This site has been burnt frequently, the last time being in about 1994, and there is no evidence of a living population. The fire frequency at Poimena Reserve has been reduced in response to the reserve's conservation values, increasing the survival chances of any population that remains.

Both the Romilly Street and Hillgrove finds were made in areas of short wet forest, again on dolerite. At Romilly Street this is dominated by *Eucalyptus globulus* but at Hillgrove no eucalypts were seen in the immediate area. The Romilly Street site was last burnt in 1967, and the gully at Hillgrove was only partially burnt in the most recent severe fire (1998).

It is not unusual for a Tasmanian native land snail to be found in a range of forest types. It is surprising that *D. vicens* occurs in both open dry and closed wet forest but is apparently absent from the great majority of well-searched suitable sites within its geographic range.

### CONSERVATION

Prior to the confirmation of Petterd's Hillgrove record, the prognosis for this species was bleak, as the only known living population (Romilly Street) occupies a very small area of bush and is not necessarily secure even in the absence of any specific human impacts. The Hillgrove find occurred in one of several small gullies running from Albion Heights and Mount Nelson to Tarooma. With the exception of Truganini Reserve (which has been extensively searched without any records of *D. vicens*) the remaining gullies have not been sampled for land snails.

Because of the small number of records and the large number of possible threats to the species, it is not possible to say what particular processes will eliminate the species. Bushfires are the most noticeable potential threat, but if bushfires have caused the demise of the Poimena and Grass Tree Hill populations, then dead shells have persisted for almost a decade. It is not known whether this is plausible in the conditions present at these sites. Other potential threats include habitat loss, habitat fragmentation (an especially serious potential issue for a species that occurs in small and localised populations) and competition or predation by exotic invertebrates, including snails (if such interactions occur). Control of the latter is impractical, but further fragmentation in areas of known habitat and overburning can both be avoided by appropriate planning by

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councils and other landholders and planners.

The *Tasmanian Native Land Snails Recovery Plan* (in preparation) is likely to recommend a major survey for this species, with all or most populations identified by such a survey to then be protected. The efficiency of such single-species surveys in gathering invertebrate distribution data was questioned by Mesibov *et al.* (2002), but the unreliability with which this species occurs in apparently suitable habitats leaves no alternative to very comprehensive surveying. Protection measures for populations found on private land could include purchasing land for reservation, but would be more likely to include voluntary management agreements with landholders and/or agreements to place covenants on properties to prevent future clearing. Reservation alone may not be sufficient to secure the species, and impacts capable of crossing reserve boundaries will still require attention.

There is still not enough information to reassess the species' status of Vulnerable under the *Tasmanian Threatened Species Act 1995*. The species' unreliability of occurrence, scarcity where present and possible disappearance from former sites, all suggest that the species is not secure even if there are further records outside the species' currently known range. More research will be needed to establish whether Endangered status is warranted.

### ACKNOWLEDGEMENTS

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