

# Rediscovery of *Leptorhynchos scabrus* (Benth.) Haegi in Northern Victoria

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The beginning of European settlement on this continent 150 years ago initiated a period of great change for the landscape of the country and its indigenous flora and fauna. The indigenous vegetation was either entirely removed or the processes which defined the flora and fauna were altered with irreversible consequences.

Many of these plants and animals, adapted to the conditions of fire and drought with specialist reproductive and survival mechanisms, were uncompetitive under frequent mechanical disturbance, irrigation, domestic stock grazing and the exclusion of fire. These foreign regimes of disturbance all had the affect of altering the pre-settlement vegetation communities by selectively favouring some species, eliminating others and promoting exotics.

Whilst many refugia will exhibit features of the site's original structure or species composition, they have almost always been altered to a lesser or greater extent. Consequently, the present composition of a remnant is a function of both:

- (a) the pre-settlement composition of the site, and
- (b) the regime of disturbance, or exclusion of disturbance, experienced since settlement began.

On a local scale, often the later factor has the greatest impact on the vegetation and cannot be ignored when attempting to explain its current composition.

This principle is nowhere more apparent than in the so-called grassland or treeless plain vegetation of Victoria's Northern Riverine Plain. In this very intensively farmed area, each roadside, block of public land and freehold paddock may contain quite different vegetation depending on its particular management history. Even within paddocks, there may be considerable variation depending on factors such as cultivation history and dam location.

In February 1992, a property near Mitiamo (North of Bendigo) was brought to my attention by a DCNR consultant named Phil Maher who was searching for Plains-wanderers. This particular property is now thought to contain the largest single remaining population of this species in Victoria (Maher and Baker-Gabb, 1993).

Whilst inspecting the property with Phil in that month, I became particularly interested in a paddock that was at the time suffering obvious signs of overgrazing. But because of the apparent lack of a cultivation history and the presence of numerous summer flowering indig-

enous perennials such as *Ptilotus exaltatus*, the site seemed to exhibit some potential.

Upon returning in the spring of that year, the site turned out to be better than my initial expectations. The paddock contained large areas of species-rich grassland vegetation with an extraordinary number of rare and threatened species, some in exceptionally large numbers. One yellow annual daisy in particular interested me, as it was something I had not seen before. Upon keying the specimen I discovered its identity to be *Leptorhynchos scabrus* (syn. *L. medius*) or Annual Buttons, considered endangered in Victoria (Gullan et al., 1990).

Other species observed at the site included *Maireana excavata* (vulnerable), *Stipa gibbosa* (rare), *Swainsona plagiotropis* (endangered), *S. murrayana* (endangered) and *Ptilotus erubescens* (endangered), all of which were in good numbers. The profusion of *L. scabrus* and *S. murrayana* in particular, was outstanding, and it was estimated that well over 10,000 plants made up each population in that year (Foreman, 1993).

*L. scabrus* is easily characterised by its long tapered beaked achene, annual habit and dimorphic involucre bracts (Jessop and Toelken, 1986). Its large brightly colored yellow capitula makes this plant one of the most attractive and impressive of the Northern Plains flora.

From my observations at the site, this plant germinates annually in late autumn or winter soon after the autumn rainfall break, developing slowly through the winter months until the temperature rises towards the beginning of spring. At this point growth is relatively rapid and flowering soon follows in late September–early

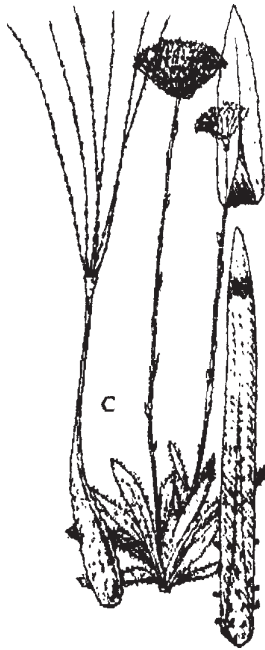


Fig. 1. Sketch of *Leptorhynchos scabrus* (Benth.) Haegi (Annual buttons) form (Jessop and Toelken, 1986) depicting the plant's beaked achene, dimorphic involucre and large solitary capitulum.

October. Enormous quantities of seed are set each year in the latter half of October, but what happens to it once it is teased free of the involucre by the wind remains unknown.

Previously this species was described in Victoria as *L. medius* (Cunn. ex DC) and *L. elongatus* DC. var. *peduncularis* Benth., however recent taxonomic revision has indicated that this entity is the same as that described as *L. scabrus* (Benth.) Haegi in Western Australia and South Australia, and *L. scaber* (Benth.) Haegi in New South Wales (Ross, 1993). *L. scabrus* has been retained in the latest Victorian vascular plant census and the others recognised as synonyms.

Despite the listing of *L. scabrus* as endangered (Gullan et al., 1991), this species was considered to be extinct in Victoria according to the Herbarium as the previous col-

lections (five) all date from prior to the 1900s (Ian Clarke, pers. comm.; Table 1). Furthermore, Willis (1972) notes the distribution of *L. scabrus* as 'far W., in Coleraine district and Wimmera'. Interestingly, no records of this species have been previously made east of the Wimmera on the Northern Plain in Victoria where this recent discovery was made.

Despite such a long period since the last collections, its conservation status in Victoria has remained "endangered" because of the paucity of floristic work in the areas in question. In such circumstances the retention of an "endangered" status is the normal practice (Neville Walsh, pers. comm.). Even quite recent studies in the Riverina of New South Wales and Victoria, produced no evidence of the continued existence of this species in South Eastern Australia (McDougall and Kirkpatrick, 1994; Moore, 1953; Beadle, 1948; Leigh and Mulham, 1977; Mulham and Jones, 1981).

In New South Wales, *L. scabrus* is both recorded in the State's census and mentioned in the recently published Flora of NSW (Harden, Vol. 3, 1992), although this is based on one record which is apparently unsubstantiated. In South Australia, this species is considered rare but not under threat, as it is recorded from a number of conservation reserves on the Eyre Peninsula (Jessop and Toelken, 1986; John Briggs, pers. comm.).

In Western Australia, it is reputed to be widespread along the south-west coast on the strength of many recent collections either from reserves or other areas unlikely to suffer disturbance (Paul Wilson, pers. comm.). Despite the fact that *L. scabrus* is considered to be rare or threatened in Victoria, New South Wales and South Australia, it will not be listed on the national list of rare and threatened plants because of its known abundance in Western Australia (John Briggs, pers. comm.).

One interesting aspect of its distribution is that in the west Annual Buttons are primarily found in lightly textured sandy soils on or near the coast, whereas in the east (now represented only by the Mitiamo population) it is found on heavily textured inland alluvium. This dichotomy is worthy of further investigation, especially considering the relative success of this taxon in sands compared with that in clays.

Table 1. Collection dates for *Leptorhynchos scabrus* (Benth.) Haegi (Annual buttons) in Victoria prior to 1992.

Location	Date	Source
Coleraine	November 1882	H.M.R. Rupp
Encounter Bay	1895	Miss Hussey 457
Stawell, Upper Wimmera R.	1893	W.E. Matthews
Shire of Lowan, Nhill	1899	St. Eloy. D'Atton
Wimmera	1885	D. Sullivan

The fact that *L. scabrus* is found only within the boundaries of this one paddock north of Mitiamo, indicates that the paddock's management history could hold the key to its extraordinary success at the site, and similarly, its apparent failure elsewhere. Investigations revealed that unlike all other paddocks on the property, for most of this century, this site has only been exposed to light cattle and horse grazing, with sheep being introduced only quite recently (Foreman, 1993). Further more, much of the paddock has never been mechanically disturbed by cultivation, and in the sections that have been disturbed in this manner, *L. scabrus* is no longer present. Overgrazing, cultivation and to a lesser extent weed invasion, seem to be the most critical threats.

Currently, trials are in place to assess the impact of various disturbance regimes (including cultivation and grazing) in an effort to establish the best techniques for broad acre conservation of this species and its habitat. Purchase of the property (some 1300 ha in total) in question is also being pursued by a collection of State and National organisations. If successful, this site would become one of the most important lowland grassland reserves in Victoria and probably south-eastern Australia, and a significant refuge for the continued conservation of many rare and threatened species.

According to my initial flora inventory, remnant grasslands on the Northern Plain can be broadly placed in two categories:

1. Grazed grasslands of paddocks and other large reserves containing a relatively high proportion of annual native forbs, and
2. Roadside and rail reserve grasslands where the original (sometimes woody) perennials have persisted in the absence of frequent grazing.

Despite each being effectively adjacent to one another, both types have their own characteristic combination of species because of management history.

Where grazing has been frequent and variously intense in the past, selection for some of the smaller annual species capable of rapid and prolific seed production, has been the major force in transforming what is thought to have originally been an open grassy saltbush shrubland. The summer growing annual, Woolly Mantle or *Eriochlamys behrii*, is an excellent example of this, as it is really only found in grazed paddocks.

Whilst some annuals tended to excel in these circumstances, others did not. I suggest *L. scabrus* is an example of the latter as illustrated by its scarcity today. I suspect it would have been quite widespread in the Wimmera and the western portion of the Northern Plain prior to European arrival, even though the only Victorian records are only from the Wimmera. Because of its relative size and palatability, *L. scabrus* quickly disappeared from much of its original range as a consequence of overgrazing and later, cultivation. Today it has only managed to persist where both these types disturbance have been absent within its former geographic range. The extraordinary density of *L. scabrus* at the Mitiamo site, suggests that management practices in the past may have encouraged the plant and transformed the population from a few scattered individuals per hectare into thousands. More research concerning the taxon's ecology will be needed to support this hypothesis.

Experimental work set up at the site in 1992 in order to look into the impact of various kinds of disturbance on a grazed species-rich annual grassland will hopefully produce the first batch of data later this year (1993). This information should help to explain the extraordinary presence of *L. scabrus* and perhaps more importantly, also provide clear guidance for future conservation management for this species and its habitat.

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