# *Lepidium oleraceum* – a threatened herb of coastal Wellington

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*Suddenly, as rare things will, it vanished...*
Robert Browning ('One word more', 1855)

## INTRODUCTION

*Lepidium oleraceum* Sparrm ex G.Forst (Brassicaceae) is a rare thing indeed. Cook's scurvy grass or nau as it is more commonly known is one of New Zealand's most famous plants having been harvested by Captain Cook, along with other herbaceous coastal plants, to feed to his crew to protect them from catching scurvy. It may be for that reason the species came top in a 2005 national poll to find New Zealand's favourite plant. Irrespective, scurvy grass has always been high on New Zealand's conservation agenda as one of the most endangered elements of the endemic flora, and botanists have long acknowledged that to see it in the wild is one of those special botanical moments shared by only a small handful—in the North Island anyway. As we recognise it here, the species is endemic to New Zealand where it is found from the Kermadec and Three Kings Island groups, south through the North, South, and Stewart Islands, with a recently discovered (2004) outlier on the Bounty Islands group. With one notable exception (Mangere Island) we regard plants from the Chatham, Antipodes, Snares and Auckland Islands as representing other allied but as yet unnamed potentially distinct species. Through this range the species is now virtually confined to offshore islands, islets and rock stacks. In the Wellington region, as with much of the North Island it has all but vanished (Fig. 1).

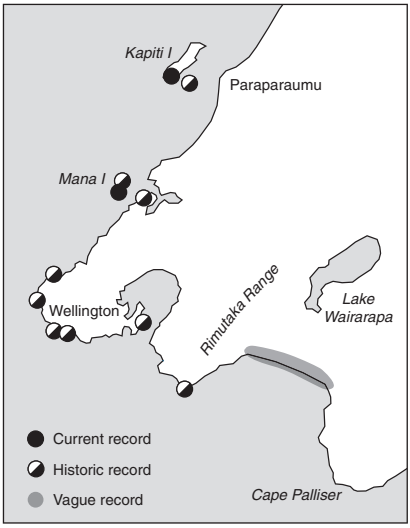


Figure 1. Map showing the current and

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historic distribution of *Lepidium oleraceum* in the Wellington district.

## WHAT DOES THE PLANT LOOK LIKE?

Figure 2. *Lepidium oleraceum*, Cook's scurvy grass. Photo: John Barkla.

The plant is well described in several Flora treatments (Kirk 1899; Cheeseman 1906, 1925; Allan 1961 and Webb *et al.* 1988) and popular field guides (Wilson 1982; Wilson and Given 1989). It is a pretty plant which, in its typical form, forms a small bush up to 1 × 1 m (in exceptional circumstances) with rhomboid, serrated leaves and numerous sprays of white, pleasantly scented flowers (Fig. 2). All parts of the plant are strongly pungent when bruised, smelling somewhat like cress or rocket (*Eruca vesciaria* subsp. *sativa*). BotSoc members will know it from the cover photograph of the 1988 *Bulletin*—that from a plant growing in a garden on Mana Island. It flowers from late spring to early autumn (or all year round in milder climes) and the abundant fruit are freely produced throughout the year but generally peaking production from October till February. The sexually perfect flowers are small (2–5 mm across) and white. The plant produces copious seed (Norton *et al.* 1997), longevity is more a matter of circumstance; in cultivation plants can live up to 6 years, but in the wild some populations have an almost annual growth habit. As alluded to above, *L. oleraceum* is a highly variable taxon throughout its range (Crisp *et al.* 2000; Walls *et al.* 2003; de Lange *et al.* 2004) and further studies to describe that taxonomic variation are underway (P. J. de Lange and P. B. Heenan unpubl. data). From the other 28 or so Lepidia recorded from New Zealand *L. oleraceum* can be distinguished by the glabrous stems, long-persistent, broad, dark-green toothed, stem leaves, and by the glabrous pedicels, flowers with four stamens and acute silicles which lack a marginal wing.

## SCURVY GRASS IN WELLINGTON

In Wellington *L. oleraceum* is currently known from only two places in the wild both occurring on lands administered by the Department of Conservation. John Buchanan made the first record of the species from the region when he found it at the south end of Kapiti Island during his rambles there sometime during 1874 (Buchanan 1874). W.R.B. Oliver also recorded *L. oleraceum* from Kapiti in 1935 (WELT 9656) as did Wilkinson and Wilkinson (1952).

Cockayne recorded it from Tokomapuna (Cockayne 1907). A.S. Wilkinson noted that it was planted 'near the boat house' on Kapiti in October 1934 by the New Zealand Alpine and Rock Garden Society (Wilkinson no date). But it was not until 1996 when members of the Society visited Kapiti Island that *L. oleraceum* was relocated at Wharekohu Bay (Wellington Botanical Society 1996). This find roughly equates with buchanan's earlier observation.

The second site in the region is Mana Island, where it was found growing on a rock stack used by gulls and shags as a roosting site (Ogle 1987, see also WELT 77995, WELT 27653 and CHR 424). It was previously recorded on northern cliffs below the trig (Atkinson *et* al 1975) but has not been seen there since. Several records of *L. oleraceum* have been made at other sites in Wellington (see Table 1). These historic records are evidence that *L. oleraceum* was once far more widely distributed (Fig. 1) and suggests that as with elsewhere in the country the plant has undergone a major range contraction in the Wellington region.

Table 1. Wild records of *Lepidium oleraceum* at which the plant has not been seen for ten years or more.

| SITE | SOURCE |
|---|---|
| Cape Turakirae | Beddie (see Zotov *et al.* 1938). |
| Mana Island, northern cliffs below trig | Atkinson *et al.* (1975) |
| Near Cape Terawhiti, and sparingly around the coast | Aston (1911: WELTU* 2288). |
| North of Karori Stream | Oliver (1931: WELT* 27656). |
| Ocean Beach, Wairarapa Plains | Buchanan, J. (no date) |
| Ohau Bay, by Terawhiti | Aston (1910: WELT 27657, WELT 27660, WELT 27637). |
| Seatoun, Miramar Peninsula | Oliver, W.B. (1937: WELT 9711). |
| Titahi Bay | Aston (1910: WELT 27652). |
| Tokomapuna Island | Cockayne (1907) |
| Tongue Point and rock stack, near Thomas Rock | Healy (1937: CHR* 426, CHR 89894, CHR 19028) and Anonymous (1930: WELT 27658, WELT 27659, WELT 9712). |

* Herbarium acronyms follow Holmgrem *et al.* 1990.

## CURRENT STATUS OF SCURVY GRASS IN WELLINGTON

Scurvy grass is not the most abundant of plants but its apparent rarity is not a new phenomenon. Cheeseman earlier last century noted that "*...it can hardly be said to be a plentiful species at the present time...*" (Cheeseman 1914) and Thomas Kirk stated that "*...the plant has become so rare that some New Zealand botanists have never seen it in the recent state...*" (Kirk 1892).

*Lepidium oleraceum* was recently classified by the New Zealand Threatened plants committee as "Acutely Threatened – Nationally Endangered" (de Lange *et al.* 2004) and justifiably so. The Department of Conservation's response has been to develop a plan to ensure the survival and protection and recovery, not only of *L. oleraceum* but of all threatened coastal cress species (Norton and de Lange 1999). In Wellington *Lepidium oleraceum* is now believed to be extinct on the mainland, while on Mana and Kapiti Islands it is known from fewer than 40 wild plants.

## WHAT ARE THE HABITAT PREFERENCES OF *LEPIDIUM OLERACEUM*?

Based on current species associations and apparent habitat preferences, *Lepidium oleraceum* would appear to favour coastal cliffs and rocky places. The plant has also been associated with guano enriched seabird nesting sites and in particular the nesting sites of red billed gulls, shags, penguins, and various burrowing petrels. On occasion shags have been seen to use it as nesting material—thereby facilitating its spread to new habitats. It would seem that sea birds such as these help provide a fertile environment and an open habitat in which *L. oleraceum* can thrive. Nevertheless, questions still remain about the habitat preferences of *L. oleraceum*. For example, what factors shape its distribution? What limits the species ability to thrive?

## WHY IS *LEPIDIUM OLERACEUM* SO UNCOMMON?

*Lepidium oleraceum* is now a threatened plant, and while it is conceivable that it was always an uncommon species, there is clear evidence to suggest that over riding this natural scarcity there has been a serious range contraction. Determining the factors causing that decline may aid the species survival. It would be easy to attribute the species decline to the often quoted myth of Captain Cook harvesting boat loads of the plant in the Marlborough Sounds (de Lange & Norton 1996). Analysis of the actual journals and records from that time show that this was hardly the case, except—possibly—at one place (Long Island) in the Marlborough Sounds. In short, Cook and his crew harvested anything edible; over time these edibles (some 10 taxa in total) came to be personified as *Lepidium oleraceum* 'scurvy grass' and ulimately Cook's scurvy grass (de Lange and Norton 1996; de Lange 1998).

In fact Cook's impact was probably minimal. Today there are many other sound reasons for its decline. For

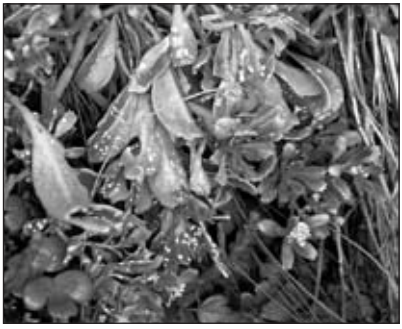

Figure 3. *Albugo candida*, shepherd's purse fungus (white spots), on *Lepidium* aff. *oleraceum* (b), South Moriori Creek, Chatham Island. Photo: Peter de Lange.

example, *L. oleraceum* is often infected by shepherd's purse fungus (*Albugo candida*) (Fig. 3) both in the wild and in cultivation. It is not yet known for certain if the fungus has an effect on plant survivorship but this seems very likely. The fact is, showing whether the fungus is a 'threat' to survival of individual plants or populations has not proved easy, partly because the "fungus" is actually an oomycete, and one which is notoriously difficult to isolate, grow and inoculate plants with. Recent studies suggest that for most of its life it occurs as asymptomatic infections, and that it may even be transferred in seed tissue.

Other threats are less ambigious. For example, loss through herbivory from the larvae of cabbage white butterflies (*Pieris rapae*) and diamond-backed moths (*Plutella maculipennis*) is undisputed—as anyone who has tried growing it will attest. The ongoing decline in abundance of seabirds that help disperse *Lepidium* seed, and disturb and enrich the plants' preferred habitats with nutrients through deposition of guano, may have also contributed to the species' decline.

Coastal development is likely to have caused the demise of some populations of *L. oleraceum*. Many plant species known to have occurred in coastal Wellington, including *Muehlenbeckia ephedroides* and *Pimelea arenaria,* have disappeared during the last fifty years. A population of *L. oleraceum* recorded at Seatoun (on the Miramar peninsula) by Oliver in 1937 (Table 1) may well have been destroyed by coastal development and the removal of rock and gravel to build houses, sea walls or tracks. This record may in fact have largely referred to *L. obtusatum* for, although there are a few collections of *L. oleraceum* from that area, most are *L. obtusatum*.

Browsing animals such as possums (*Trichosurus vulpecula*) and sheep (*Ovis aries*) and cattle (*Bos taurus*) are also believed to have impacted on populations of *L. oleraceum*. Cheeseman attributed the decline of *Lepidium oleraceum* to cattle and sheep… which greedily eat it down in any locality they can reach… (Cheeseman 1914). Competition from naturalised plants such as veldt grass (*Ehrharta erecta*) can also lead to loss of habitat for scurvy grass. Cockayne in his Botanical Survey of Kapiti Island (1907) suggested that on Kapiti Island scurvy grass had been 'exterminated by goats'.

*L. oleraceum* may be a rare plant in Wellington but at least it still survives. Other *Lepidium* species, such as *Lepidium tenuicaule*, *L. flexicaule* and *L. obtusatum*, previously recorded from the Wellington region, have not been seen here in the wild for more than 50 years, and the latter is now believed to have gone extinct (de Lange 2005).

## CONSERVATION OF *LEPIDIUM OLERACEUM*

In Wellington the conservation of *Lepidium oleraceum* has several objectives. Firstly the protection of the two extant wild populations from threats (such

as weeds or disturbances) is essential. Secondly, establishing self-sustaining wild populations of *L. oleraceum* at other sites on Mana, Kapiti and on Matiu / Somes Island will be beneficial. Finally, research is necessary to determine the survivorship of *L. oleraceum* seedlings introduced to new wild sites, to investigate the use of seeds in establishing wild populations and to determine the impact of albugo on wild plants.

The establishment of new populations of all coastal *Lepidium* species on predator-free islands and at selected mainland sites will be valuable for their long-term conservation. *L. oleraceum* may be introduced to other sites on the mainland, particularly those places where the plant was formerly known to occur such as Titahi Bay, Tongue Rock and Turakirae Head. Surveys of historic sites (Table 1) are also required to determine whether *L. oleraceum* is there. Those historic sites may be suitable places to plant *L. oleraceum* and its associated plant species provided the original causes of species decline are not still operating.

## CONCLUSIONS

A realistic conservation goal for *Lepidium oleraceum* is to give the plant a competitive advantage in the coastal landscape of New Zealand and to ensure that it continues to exist in the wild without need of conservation management. The simple tasks described above may enable us to achieve that goal. Apathy and negligence should not lead to the continued demise of New Zealand's unique flora. Cook's scurvy grass is a good example of a threatened element of outdoor New Zealand for which conservation management is essential to ensure its survival. Those of us who have been privileged to meet it in the wild must make known our desire to see it survive and thrive in the wild forever.

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