

## REDISCOVERY OF COOKS SCURVY GRASS (*LEPIDIUM OLERACEUM*) ON BANKS PENINSULA

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### INTRODUCTION

Cook's scurvy grass (*Lepidium oleraceum*) is one of eight indigenous *Lepidium* species found in New Zealand. Six of these are coastal species and two are found inland, usually associated with saline and/or rich dry soils. The genus belongs to the Brassicaceae family for which palatability tends to be a feature – *L. oleraceum* is no exception to this. Many of our common vegetables belong to this family, for example the cabbage. All New Zealand *Lepidium* species are considered to be under some degree of threat. One species, *L. obtusatum*, has not been seen since 1939 and is now presumed to be extinct (de Lange *et al.* 1999).

Cook's scurvy grass is classified as an endangered species (de Lange *et al.* 1999). Contrary to its common name, it is not a grass at all, but a rather fleshy herb that occupies coastal sites usually associated with seabird and seal colonies. Its common name comes from the early voyages of Captain Cook, who in need of fresh vegetables to ward off scurvy, collected it and other coastal plants in great quantity to feed the crew (see de Lange and Norton (1996) for a good historical account). In fact, so abundant was Cook's scurvy grass and other coastal plants (e.g. *Apium prostratum*), that they were collected by the boatload as James Cook records in his diary on his visit to Tolaga Bay on 27 October 1769:

*"the other place I landed at was at the north point of the Bay where I got as much Sellery and Scurvy Grass as loaded the boat."* (Beaglehole 1968; p. 184).

Although abundant during early European visits to New Zealand, its decline in mainland populations was rapid. By the late 19<sup>th</sup> century its demise had become a concern for botanists. Kirk writes on the decline of *L. oleraceum*:

*"L. oleraceum is stated by Captain Cook to have occurred in such abundance that he was able to obtain boat-loads of it, which proved of good service to his crews when troubled with scurvy; but the plant has become so rare that some New Zealand botanists have never seen it in the recent state."* (Kirk 1891, p. 424).

Cheeseman also comments on the loss of *L. oleraceum*:

*"It is now quite extinct in several of the localities he (Cook) visited, and is fast becoming rare in others. Its disappearance is due to cattle, which greedily eat it down in any locality they can reach."* (Cheeseman 1925 p. 471).

Today very few mainland populations exist and those that do are often small and lack vigour (Norton and de Lange, 1999).

Reasons for the decline in Cook's scurvy grass are attributed to a number of factors. Browsing by introduced herbivores, including some invertebrates such as the white cabbage butterfly (*Pieris rapanda*), has had an impact (Esler 1975; Given 1981), as has the shepherd's purse fungus (*Albugo candida*) which is known to infect and kill plants (Given 1981; de Lange 1986; Ogle 1987). Over collecting by botanists may also have contributed to the decline in some populations (Norton *et al.* 1994). However, its decline occurred well before many of these threats were present. Recent evidence highlights the importance of seabird and seal colonies for providing suitable habitat for Cook's scurvy grass (Norton *et al.* 1997). This evidence suggests that the loss of mainland seal and sea bird colonies from sealing and predation by rats (inadvertently introduced by sealing and whaling crews), was a significant factor in the decline of the species.

### ***Lepidium oleraceum* on Banks Peninsula**

Cook's scurvy grass has not been seen on the Canterbury mainland since 1921, when Laing recorded it in Paua Bay, Banks Peninsula. Here it was described as growing on a sea cliff. Despite thorough surveys of Banks Peninsula, Cook's scurvy grass has not been found since this record. What remained to be surveyed, however, were a number of small rock stacks separated from the mainland by the sea. These stacks typically have sheer sides and a shallow loess mantle on their 'plateau like' (albeit sloping) tops that supports vegetation. Kerry-Jane Wilson (Lincoln University) and myself visited four of the largest islands on 18 December 2000. Access was by helicopter, requiring precise flying, and the precarious exercise of disembarking on to small platforms.

Cook's scurvy grass was found growing on the southern most island just off the eastern headland of Island Bay (grid reference NZMS 260 N37 994 012). This site consists of a rock stack that rises to about 50 m above the sea. It is approximately 70 m long and 30 m wide, with a loess covered top sloping steeply toward the south west. Cook's scurvy grass occupies a patch of about 20 m<sup>2</sup> on the western corner of the island – approximately a couple of hundred plants in total. All plants appeared healthy and were flowering profusely with no sign of the shepherd's purse fungus or other threats such as herbivory.

The vegetation of the island is dominated by the native ice plant (*Disphyma australe*) which forms an extensive cover. *Einadia triandra* is also locally abundant. Other common native species, although sporadic, include blue wheat grass (*Elymus solandri*), spurry (*Spergularia media*) and *Crassula sieberiana*. Exotic species including barley grass (*Critesion murinum*), downy brome (*Bromus tectorum*), and sow thistle (*Sonchus oleraceus*) are also present. The most striking feature of this island is extensive bird burrowing by fairy prions (*Pachyptila turtur*). Consequently the topsoil contains little structure, and is often bare and loose. Great care is needed to avoid collapsing the maze of burrows.

Searches of the other three islands did not reveal any further populations of Cook's scurvy grass despite their similar vegetation. Brief descriptions of these other islands are attached as an appendix

## Conservation Implications

The rediscovery of Cook's scurvy grass on Banks Peninsula fills a key distributional gap for this species. Previously Cook's scurvy grass was considered to be extinct on the east coast between the Marlborough Sounds and Otago. In addition, this find provides a good opportunity to manage for the recovery of the species. Although this population appears healthy and self-sustaining, it is confined to one small area and is therefore at risk in its entirety to potential threats. Conservation initiatives need to insure against potential extinction. One strategy is to create *ex-situ* populations, in effect creating insurance populations in case of local extinction. The availability of similar islands around Banks Peninsula provides a good opportunity for this, although one would have to wonder why it is absent in the first place given the similarity of these islands to where Cook's scurvy grass is currently found! The establishment of mainland populations is, however, more desirable, primarily due to easier access. Further survey is also important. Discoveries of additional populations may occur in areas that have been overlooked in the past due to access difficulties. Further recovery actions are outlined in the national recovery plan prepared for all coastal *Lepidium* species (Norton and de Lange 1999).

In addition to providing a refuge for flora and fauna, these islands also provide an interesting insight into coastal communities of Banks Peninsula prior to large-scale changes brought about from the introduction of animal pests and pastoralism. Apart from Crown Island (Appendix 1), all are significantly free from weed species (although some weeds are present, they are relatively uncommon). This seems remarkable given that all seem to be within easy dispersal distance of the exotic species that dominate similar mainland coastal cliffs. This indicates an element of ecosystem robustness – another remarkable feature given the small size and insufficient isolation of these islands to ensure adequate buffering from invasions.

Norton et al. (1997) emphasise the dependency of coastal *Lepidium* species on seabird/seal colonies. Seabirds would seem to be an important element in the maintenance and ecology of these island plant communities, with bird activity having a major influence on the local habitat. On mainland Banks Peninsula, predation by pest species has all but eliminated sea bird colonies. Consequent changes in soil structure, stability and nutrient status have occurred and the vegetation is almost entirely dominated by exotic species. The opportunities for coastal communities, such as those that remain on these islands, have been eliminated due to these changes.

## CONCLUSION

The rediscovery of Cook's scurvy grass on a small island off Banks Peninsula highlights the conservation importance of these small islands. Not only are they some of the last remaining refuges for fauna and flora, but they allow for the continuation of an interesting ecological interaction between birds and plants to occur. This ensures the maintenance of a unique ecosystem all but eliminated from the Canterbury mainland.

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## Appendix 1: Descriptions of islands visited.

### Island Nook (NZMS 260 N37 125 035).

Rock stack rising 40-50 m above sea level with prominent north to south ridge and narrow face steeply sloping west. Shallow loess covering extensively burrowed by birds. Large patches of fine, loose soil. Dominated by ice plant with spurry and *Einadia triandra* common. A patch of blue wheat grass occupies the western end. One plant of pohuehue (*Muehlenbeckia australis*) and 2 plants of ngaio (*Myoporum laetum*) are confined to the cliff edge, all prostrate. Occasional *Crassula sieberiana*. Scattered but never abundant exotic species include cats ear (*Hypochoeris radicata*), barley grass, ryegrass (*Lolium perenne*), sow thistle, and downy brome.

### Red Cliffe Nook. (NZMS 260 N36 131 040)

Wedge shaped rock outcrop and talus rising to 15 m above sea level and sloping south east. Approximately 30 m by 10 m in area. Bare compacted soil between rocks. Large clumps of ice plant and *Muehlenbeckia complexa* occupy the top of ridge. The shore groundsel (*Senecio lautus*), blue wheat grass, *Einadia triandra* and *Wahlenbergia gracilis* are present throughout, but never abundant. Confined to the south western cliff face is plume grass (*Dichelachne crinita*), prostrate mingimingi (*Coprosma propinqua*), Banks Peninsula fescue (*Festuca actua*) and the fern *Asplenium appendiculatum* subsp. *maritimum*. Few opportunities for bird burrows exist although some nesting activity was evident. Geckos and a colourful skink were also observed.

### Crown Island. (NZMS 260 N36 192 125)

Circular shaped island approximately 900 m<sup>2</sup> in area, consisting of a gently sloping plateau of coarse rock close to sea level and a central rock pillar covered in spotted shags (*Stictocarbo punctatus*). Contains a small remnant of coastal scrub on the southern faces including ngaio, mingimingi and mahoe (*Melicytus ramiflorus*). The ferns *Asplenium oblongifolium* and *A. appendiculatum* subsp. *maritimum* are also found growing on steep rock faces. Ice plant is the dominant native plant species but silver tussock (*Poa cita*) and the Banks Peninsula fescue are also common, especially on the southern plateau area. Other native species present include the shore groundsel, *Einadia triandra*, sea primrose (*Samolus repens*), native celery (*Apium prostratum*), plume grass, *Lachnagrostis pilosa*, an unreachable *Rytidosperma* sp., and blue wheat grass. Weed species are also prevalent on this island, especially tree mallow (*Lavatera arborea*) which dominates large areas. cocksfoot (*Dactylis glomerata*), elderberry (*Sambucus nigra*), downy brome, Yorkshire fog (*Holcus lanatus*) are also present. White flippered penguins (*Eudyptula albosignata*), fairy prions, black backed gulls (*Larus dominicanus*), and spotted shags inhabit this island.