The case of the disappearing shore spurge: *Euphorbia glauca* (Euphorbiaceae) in the Auckland Region

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Introduction

Shore spurge (also known as waiuatua & waiokahukura) or *Euphorbia glauca* is one of Auckland's rarest plants. It is a native herb with upright un-branched stems up to 1m tall. The stem is usually bare (and sometimes tinged with pink) with visible leaf scars on the basal portion, above this, the stems are covered with distinctive blue grey lanceolate leaves. It has tiny dark reddish purple flowers and a distinctive 3 cornered capsule which hangs down when it is mature. All parts of the plant have milky juice. It flowers throughout summer and fruits from summer to early autumn. The commonly cultivated shore spurge available in nurseries has bright red stems in all stages of growth, however, the Brown's Island plant (Steve Benham *pers. comm.*) and the Little Barrier plant (Benham 2001) has mottled red stems.

Nationwide distribution

Shore spurge is still distributed throughout the country but is no longer as continuous in distribution as in the past. Cheeseman (1925) noted shore spurge was 'common along shores' from the north cape south. It has now disappeared from long stretches of coastline. The stronghold of the species is now in the south of the South Island. Nationally this species is regarded as in decline, formally assessed to be a 'Serious Decline' species by DOC (de Lange in Hitchmough 2002).

Distribution in the Auckland Region (as defined by de Lange and Cameron 1997)

Shore spurge has also suffered a dramatic decline in Auckland over the past 100 years, and I hope it will not join the already too long list of 19 plants we may have already lost in Auckland to date (see Appendix 1). Once found at nine out of the thirteen Ecological Districts which cover Auckland (and probably in others, such as Rodney, but I have come across no actual records) its range has contracted from at least eleven sites to two of our offshore islands – Motukorea (or Brown's Island) in the Inner Hauraki Gulf, and Hauturu (Little Barrier Island). Appendix 2 lists all the known (past and present) locations of this species in Auckland.

Ecology

Shore spurge is a coastal species growing on open sites such as dunes, cliffs, gravel, rocky places, and in seepages. It forms large colonies making it challenging to determine where one plants stops and another starts.

Why has it declined in Auckland?

Shore spurge is certainly palatable to rabbits (Paul Cashmore *pers. comm.*) and it may have declined in Auckland due to browsing by rabbits, other feral animals such as possums, or stock with access to dune areas[1]. Shore spurge may also be intolerant of trampling and use of dunes by people as recreational areas. Dune reclamation and coastal development may also have had a role. Competition by weeds is a likely factor implicated in decline with many exotic species aggressively invading our dunes. Our translocated population on Brown's Island seems to be suffering from introduced brown snail (*Cantareus aspersus* = *Helix aspersa*) damage. Its dwindling disappearance from the Auckland region is likely to be a combination of these factors.

Shore spurge may also occasionally be dioecious (male and female flowers on separate plants) which would render populations reproductively extinct if reduced to low population numbers (Peter de Lange *pers. comm.*). This needs further investigation.

Conservation measures in Auckland

The Hauturu/Little Barrier sites are safe from key threats and are monitored regularly. On Brown's Island/Motukorea, there is only one remaining natural shore spurge plant midway up a cliff in a rock crevice originally found by Alan Esler. The Botanical Society has visited this site (Gardner 1996). This individual plant has been known on the island since Alan Esler collected it in 1974 (AK 216254). Cuttings were taken from this individual in 1999 (as no flowers or seed were produced in the duration of monitoring from 1997-1999, nor since) and transferred to the Auckland Regional Botanic Gardens in Manurewa (Benham 2001). Seed has been collected from these cuttings and seedlings carefully raised producing 80 seedlings which were returned to the Brown's Island in June 2003 in a joint DOC/Auckland Regional Botanic Gardens operation. Our aim is to establish a self-sustaining population on the island to increase its security in the Inner Gulf. Further transfers to places where it grew in the past will be planned if this transfer is successful.

[1] Although it survived the farming period on Little Barrier where stock had access to the eastern landing site.

Acknowledgements
Thanks to Ewen Cameron, Peter de Lange and Steve Benham for comments on the draft of this article, and to Ewen for access to the specimens held in the Auckland Museum Herbarium (AK).

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Appendix 1. Plants presumed extinct in Auckland Region*

NE = Nationally Extinct
* = have not been collected or recorded for 50 years. Update from de Lange et al. (1999).

The date and location where this species was last recorded in Auckland is listed in brackets.

Species	Date last seen	Location	Reference
Asplenium pauperequitum	1880's- 1890's,	Mokohinau	AK 135800 see Cameron (1993)
Atriplex hollowayi	1872	Omaha Beach	AK 11285 (Kirk)
Clianthus maximus	1867-68	Great Barrier	WELT! (Kirk)
Discaria toumatou	1869	Waiuku	AK 5152 (Cheeseman)
Epilobium chionanthum	1901	Little Barrier	AK 15091(Adams)
E. komarovianum	1888	Rangitoto	AK 5759 (Cheeseman)
Gratiola nana	1900	Te Karaka flat	AK 107351 (Carse)
Hierochloe redolens	1950	Glendowie	AK 50866 (Trevarthen)
Lepidium flexicaule	1934	Bethells	AK 50866 (Cranwell)
L. obtusatum NE	1917	Manukau Heads	AK 4474, AK 206570
Leptinella rotundata	1880	Waitakere	AK 10445 (Cheeseman)
Linguella puberula	1920	Henderson	AK 108478 (Matthews)
Myosotis pygmaea var. *pygmaea*	1880	Anawhata	AK 7425 (Cheeseman)
Potentilla anserinoides	1901	Lower Waikato (Waiuku side)	Carse (1901)
Prasophyllum aff. *patens*	nd	Kaitoke swamp, Great Barrier Island	AK 11230 (Kirk)
Rubus schmidelioides var. *schmidelioides*	1900	Mauku	AK 4735 (Carse)
Trilepidea adamsii NE	1940	Waiheke	AK 103907 & more (Hall)
Viola lyallii	1901	Awhitu, lower Waikato river	Carse (1901)
Vittadinia australis	1868	Great Barrier Island	Kirk (1868)

Appendix 2. Shore spurge sites in Auckland region

Past Sites (> 60 years old)	Habitat	Collector	Herbarium sheet	Notes/ Reference	Date
Awhitu ED					
Karioitahi Beach	In sand			Carse, H. (1901). Common in sand.	1901
Waitakere ED					
North side of Lion Rock, Piha		Molesworth, B.E.G.	AK 102973	Two clumps found growing vigorously	1939
Tamaki ED					
Waitemata, near Mellsops	In shingle	Cranwell, L. M.	AK 102971		
Auckland Isthmus and the North Shore				Kirk (1870)	1870
Titirangi District				Cheeseman (1871)	1871
Onehunga, Manukau = Tamaki ED		Ball	AK 262585		1885
Orakei Basin, Waitemata		Hodgkins, M.	AK 102976, 102977	Also collected here on the same day by N. Mackie AK 102975	1933
Inner Gulf Islands ED					
Rangitoto Island				Kirk (1878)	1878
Motuihe Island				Kirk (1871)	1871
Kawau Island				Buchanan (1875)	1875
Great Barrier Island ED					
Port Fitzroy, Great Barrier Island		Kirk (1869)		Cited in Bartlett & Gardner 1983 and Bartlett 1984. Bartlett also mentioned he had seen this species near Port Fitzroy (n.d.)	1868
Present Sites	**Habitat**	**Collector**	**Herbarium sheet**	**Notes**	**Date**
Little Barrier ED					
Little Barrier Island, Hauturu – various sites	Boulders at beach and growing amongst Muehlenbeckia	Various	AK 155987		1962 - 2003
Inner Gulf Islands ED					
Motukorea (Browns) Island		Esler, A.E.	AK 216254	Esler (1980)	1974 - 2003

Two new native plants found in the Auckland Region

Ewen K. Cameron

Calochilus paludosus

A single plant of the ground orchid Calochilus paludosus was discovered by Jeremy Warden in October 2003 at Whangaparapara, Great Barrier Island. Vouchers: AK 284479 (photo); AK 284480 (single pickled flower). Ian St George et al. (2001) show three separate areas for its New Zealand distribution centred on: NW Nelson, Rotorua-Coromandel, and Northland. To my knowledge this is the first record of this species in the Auckland region. Native to Australia and New Zealand.