

Discussion

I believe that LWP's karo scrub is a natural development rather than a planting. Ring-counts of several of the larger trees indicate a trunk-diameter growth rate of somewhat less than a centimetre a year, with the oldest age obtained being 28 years for a tree with a trunk 20 cm in basal diameter. That is, the scrub seems to have developed through invasion of an area that, in 1974, was largely covered by pohuehue (and probably, given the trends noted by Esler, by Kikuyu grass a short time later).

The natural distribution of karo along the Whatipu-Piha cliffs is very sporadic, so it might just be possible that the scrub derives from hedges planted by local property-owners. It could be significant, then, that the earliest Piha specimen of karo in the Auckland Museum herbarium (*Moore & Melville*, coll.

1961, AK 155800) is noted as coming from "sand behind dunes at foot of cliffs".

The how and why of this karo invasion can only be speculated on. Perhaps a fire here produced the right conditions for it, but I note that although the LWP dunes have the largest area of karo scrub at Piha, a similar cover is developing locally on the dunes south from here, on what Esler (1974) called the "Central Dunes". (Some of these karo trees are as large as the LWP ones, but a number of them are dying back, perhaps because of the notably hot 2015–16 summer).

In New Zealand at large a sand-dune scrub that is dominated by karo is a novelty — such vegetation is not mentioned in the classic works, nor in a more recent nationwide inventory (Partridge 1992).

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Bird's-foot clover (*Trifolium ornithopodioides*) – rediscovered in Auckland

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While carrying out a vegetation survey of Motuhoropapa Island (8.12 ha), which is part of The Noises group in Auckland's inner Hauraki Gulf, I came across an exotic herb that was unfamiliar to me: bird's-foot clover or trigonel (*Trifolium ornithopodioides*) (Fig. 1).

Distribution

Bird's-foot clover is native to western and southern Europe and NW Africa (Webb et al. 1988). Checking with other New Zealand herbaria revealed that there were two earlier collections for Auckland, both with rather vague localities, one presumed to be collected in the 1930s and the other in 1954 (Table 1). Presumably these two collections are what the "Auckland City" record is based on in the *Flora of New Zealand* (Webb et al. 1988: p. 690). Looking at the general distribution of bird's-foot clover in New Zealand, based on 71 herbarium specimens, it appears to have its stronghold in the South Island (except the West Coast), extending to the southern North Island, and with only three records in the northern half of the North Island. It has also been

collected on the Chatham Islands. Excluding the two historical Auckland records the next most northern collection is from a roadside at Hawaii Beach near



Fig. 1. The first Auckland region collection of bird's-foot clover in 61 years, from Motuhoropapa, The Noises. Note the faded 2-flowered inflorescence with immature pods; corolla > pod (with scattered hairs); pod > calyx; and a single seed from a mature pod. Scale divisions 0.5 mm. Collected 15 Dec 2015 (AK 359828).

Table 1: Previous herbarium collections of bird's-foot clover from Auckland.

Location	Habitat	Collector	Coll. Date	Herbarium
Manakau [Manukau] Harbour [northern coast] *		[Michael] Hodgkins	[1930–35]**	CHR 4470
Auckland	lawns	Inst. Agric. [Institute of Agriculture]	13 Dec 1954	CHR 90151

* = Waikowhai, Wattle Bay, Blockhouse Bay and Huia are all Hodgkins' Manukau collecting localities based on AK and CHR herbarium specimens (= 318 specimens)

** = inferred date range from Hodgkins' Auckland collections in AK and CHR

Opotiki, collected by Mark Heginbotham in December 1975, CHR 365147, Lat. 37° 55' 35' S. This collection supports the literature record by Heginbotham & Esler (1985). Another Bay of Plenty record (based on Whitaker 1989) is Moutoki Island (Lat. 37° 49' 58' S), part of the Rurima Rocks.

Brief description

Bird's-foot clover is an annual or short-lived perennial. The leaves (Fig. 2) reminded me of *Medicago nigra*, although the petiolules were more-or-less of equal length which is a *Trifolium* character. Note that in *Medicago* the central petiolule is longer. Bird's-foot clover is distinguished from all other naturalised clovers by the few-flowered heads (white or pink), glabrous leaves and the many-seeded pod (4-9 seeds) which exceeds the calyx (Webb et al. 1988) – see Figs. 1, 2. The pods open at the distil end and the yellow-green seeds (1.0-1.5 mm across) with black flecks roll out.

Habitat

The habitat of bird's-foot clover from the *Flora of New Zealand* (Webb et al. 1988): "Dry waste places, depleted pastures, gardens, riverbeds, lawns." The Online Atlas of the British and Irish Flora gives a fuller habitat description: "A winter-annual of acidic sands, gravels and compacted shingle, occurring on bare ground in disturbed, often much trampled places like car parks, tracks and paths, and occasionally in lawns and on heavily grazed commons. It prefers sites that are moist in winter and parched in summer. Lowland ... This inconspicuous species has been under-recorded in the past." This compares favourably with the habitats from the label notes on the New Zealand herbarium specimens, except that it appears to be more coastal in New Zealand: coastal turf between cliffs and the coastal rocks, with *Plantago coronopus*, *Samolus repens* and *Isolepis basilaris* (E Wairarapa); shingle ballast, stock siding (Addington); saline coastal land (near Richmond); ryegrass-white clover pasture (N Canterbury); stony river terrace (near Ashburton); saltmarsh turf (Canterbury); gravel just above high tide level (Kapiti Island); gravelly soil pockets on ledges on steep rocky cliffs, in gaps

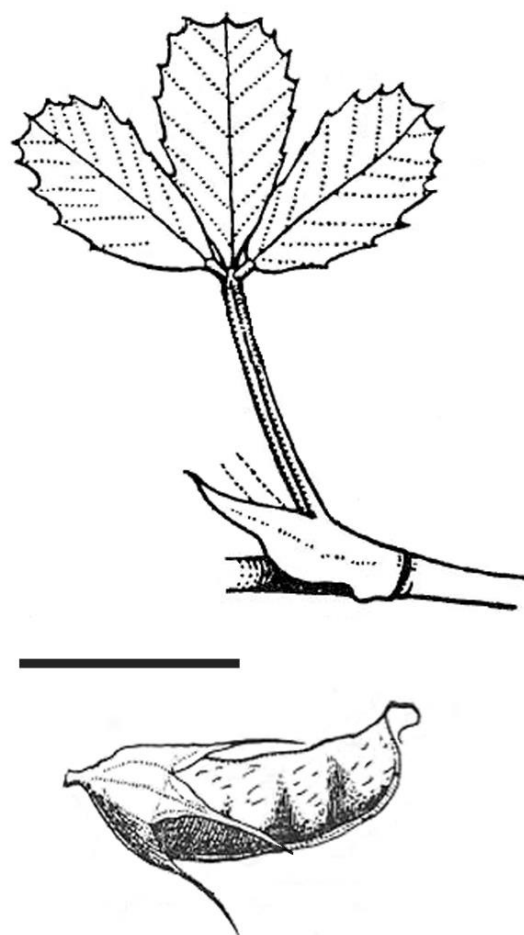


Fig. 2. Leaf and pod of bird's-foot clover. Image by Joshua Salter, adapted from Healy 1970, figs. 8a and 11k. Scale bar = 5 mm.

among *Poa cita* – *Rytidosperma racemosum* (Mana Id, Wellington); and beside saltmarsh, exotic grasses (Tahiti Bay, Wellington).

The habitat of the plants on Motuhoropapa was on the north-western coast in the extreme upper splash zone, an open rocky area, amongst other herbaceous species and scattered small woody shrubs (*Coprosma repens*, *Myoporum laetum*), just below the bush zone. This area has been, until recently, a nesting area for black-backed gulls and would well fit the

“moist in winter and parched in summer” habitat description from the Atlas of the British and Irish Flora.

How did it get to The Noises?

It may have survived in Auckland since those two early records, although I find it unlikely because the region and its islands (including The Noises) have been well botanised for native and naturalised species for well over a century. Perhaps the black-backed gulls carried it to the island for nesting material? Their extensive nesting sites on Rangitoto Island some 17 km away deserve a closer inspection. Another possibility is that it came off someone's boot. The site is on the route from the northern boat landing rocks up to a small hut used on the island by scientists since 1977-78 (Cameron 1998). Perhaps one of the visiting scientists came directly from

southern New Zealand with a bird's-foot clover seed stuck in his/her boot?

This article is to record that this rather cryptic bird's-foot clover is present in Auckland, and it would be good to keep an eye out for it.

Acknowledgements

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Waipu Beach “red tide” seaweed wash-up, January 2016

Mike Wilcox

There was a spectacular washup of seaweed at Waipu Beach, Northland, in early January 2016 (Fig. 1). This was reported on the TV3 News, and also in the NZ Herald. Summer washups of red algae at Waipu Beach and Langs Beach seem to be a regular event, and have been reported in local newsletters and newspapers (Whangarei Boys High School News 15 Apr 2014; Bream Bay News 28 Feb 2013, 3 Dec 2015, 14 Jan 2016; The Northern Advocate 11 Jan 2016).



Fig. 1. Waipu Beach “red tide”, 15 Jan 2016. Photo: Andre LaBonte.

I contacted Andre LaBonte of LaBonte Coastal Consultants, Waipu, asking for specimens to be sent to the Auckland Museum, to find out what species were present in this latest washup. Samples were received, and analysis completed on 14 January 2016.

The species identified in the samples were all red algae, as follows:

Plocamium angustum, making up about 60% of the volume bulk of the samples. Fresh whole plants. Bright red. AK 360003 (Fig. 2).

Acrosorium ciliolatum, making up about 35% of the volume bulk of the samples. Fresh whole plants. Reddish brown. AK 360001 (Fig. 3).

Spyridia filamentosa, mainly as small fragments. Pinkish. AK 360004 (Fig. 4).

Amalthea freemaniae (formerly *Halymenia latifolia*), large soft, fragile greenish-coloured blades, entangled with the other algae. AK 360005.