Botanical Society trip - Kaukapakapa Scientific Reserve

Fran Hintz

Kaukapakapa Scientific Reserve ("Whakatiwai") is a 200 ha block of regenerating kauri dominant forest on the northern side of the Kaukapakapa River, two kilometres upstream from its junction with the Kaipara River at Mt Rex. It is administered by DOC and has been a reserve since 1968, at which time it was subdivided from a much larger block owned by a local timber-milling family, the Wests. Unfortunately the only easy access to the reserve is via the remainder of the original block and the new owners do not encourage visitors.

The alternative access is by river, at high tide. For its trip on 17 September 1994, the Botanical Society, with West Auckland Forest and Bird Protection Society (a party of about thirty) chose this route travelling on Terry Somers' charter boat "Kewpie Too". We left at 8.30 am from Parakai, to catch the tide, and enjoyed the trip down the Kaipara past the extensive mangrove covered mud flats, and up the Kaukapakapa River past masses of flowering kowhai. We literally had to jump ashore and clamber up to a plateau dotted with a dozen pits, evidence of Maori occupation. From here it was uncharted territory, over to the verge of a small tidal creek, then back up to the ridge. We found a rich variety of flora (*Alseuosmia* sp. and *Cyrtostylis oblonga* in flower being my special delights). The growth on this part of the ridge is so prolific that the track is now non-existent, but we persevered and reached the almost impregnable pa site. Only the presence of trees (and their roots) on the steep slopes made climbing up possible. We stopped here for lunch. From this point the track is well worn. The vegetation changes to almost pure kauri stands, the conditions being much drier.

At the top of the hill the track leaves the reserve and the vegetation becomes scrubby with introduced weeds becoming common. We climbed the boundary fence to reach the (private) road. It was depressing to find here that a patch of manuka which had sheltered many *Pterostylis graminea* in flower had been felled and seedling pines planted in their place. We followed the road out to the gate and met the waiting bus at 2 pm.

This reserve is worthy of Bot. Soc.'s future attention, because of the great variety of vegetation and the areas within it which have been unexplored in the last thirty years. An exciting prospect for the adventurous botanist.

Additions and comments on the flora and fauna of Motukahakaha Island, Hauraki Gulf, Auckland

P. J. de Lange and I. McFadden

Introduction

The flora, fauna and vegetation of Motukahakaha, a small (0.6 ha) island (grid reference: S11 072835) situated between Ponui and Rotoroa Islands, Hauraki Gulf, was described and illustrated in detail by Cameron and Taylor (1992) [1]. On 19 October 1994 we visited Motukahakaha for thirty minutes while on transit from a reconnaissance visit to nearby Tarahiki Island. We were interested to determine the identity of a *Clematis* cited by Cameron and Taylor (1992) as one which could not be "*matched with any known wild species in New Zealand*". We also took the opportunity to examine the grey-faced petrel (*Pterodroma macroptera gouldi*) burrows to determine if they were still actively being used by petrels as was previously inferred by Cameron and Taylor (1992). Several additions to the island's flora were made.

[1]. Cameron and Taylor (1992) refer to this island as "Unnamed Islet". Recently, Mike Lee (*pers. comm.*, 1994) has drawn to our attention the fact that this island is known as Motukahakaha.

The *Clematis*

The specimen of Clematis gathered by G. Taylor (AKU 22036) [2], is rather poor, comprising a piece of stem with attached shrivelled leaves. The stem and midribs of the specimen are covered with white hairs (visible to the naked eye). The leaflet bases are cuneate and the lamina lightly toothed.

On our visit we specifically searched for the vine. This was soon located, and being in flower, was identified as a male *C. paniculata* (AK). No other specimens of *Clematis* were located on the islet, which is consistent with the situation as reported by Cameron and Taylor (1992).

While the large white flowers of our collection clearly distinguish this species from other *Clematis*, the foliage is reminiscent of *C. foetida* (R.O. Gardner *pers. comm.*, 1994). Following further comparison with AKU 22036 there are other differences as well. Notably, our specimen is only slightly pubescent, the leaflets are smaller, and the narrow cuneate, toothed leaves of AKU 22036 are scarcely evident. To understand these differences we subjected AKU 22036 to critical comparison with other collections of NZ *Clematis* in AK, resulting in the following explanation of these vegetative differences.

It would seem that AKU 22036 is a young "water shoot" of *C. paniculata*; an observation supported by the following evidence. Firstly, the shrivelled condition of the AKU 22036 suggests it was collected while in active growth and, lacking the coriaceous texture of mature growth, it wilted prior to pressing.

Second, the marked **white** pubescence of AKU 22036 is typical of the young shoots of *C. paniculata*. The foliage of other similar indigenous and adventive *Clematis* have either brown or golden hairs (R.O Gardner *pers. comm.*, 1994). Thirdly, the cuneate leaflet base and marginal teeth so evident in AKU 22036 are present in the few collections of *C. paniculata* showing young active growth. It would seem that while *C. paniculata* leaflets usually have cordate to truncate bases (Allan, 1961), cuneate bases seem to be developed in shaded conditions, or on young growth which has not yet fully expanded prior to collection. In specimens such as these, marginal teeth are often present.

Grey-Faced Petrels

Cameron and Taylor (1992) noted the presence of grey-faced petrel burrows and inferred that breeding may have taken place recently. The timing of our visit was such that any chicks, if present, would be evident. We located several burrows of a size consistent with those of grey-faced petrels, but no chicks were detected. Most burrows looked disused and the impression given was that no breeding had occurred this season. There was evidence that little blue penguins (*Eudyptula minor*) were using some burrows, as indicated by streaks of white droppings outside entrances.

As part of the rodent eradication programme carried out in 1992 on nearby Rotoroa Island, three bait stations were set out on the islet (M. Lee *pers. comm.*, 1994). Norway rats (*Rattus norviegicus*) were subsequently eradicated from Rotoroa and Motukahakaha, the latter taking eight days (Cameron, 1992). Unfortunately, maintenance of bait stations on Motukahakaha appeared to have lapsed. On our visit we found only two bait stations containing rotted bait. This is unfortunate as Motukahakaha is an important "stepping stone" for rodents to reach nearby Rotoroa. Therefore, continual maintenance of the bait stations on Motukahakaha is necessary to prevent their re-establishment. Although the presence of rats was not confirmed for Motukahakaha, our visit was brief, and it is quite likely that they were present. This could account for the apparent failure of the grey-faced petrel colony to breed.

An alternative explanation was offered by Graeme Taylor (*pers. comm.*, 1994). Graeme has observed that grey-faced petrel chicks often die during protracted spells of wet weather. Between August and October 1994, Auckland experienced unusually wet conditions, and this may have caused any nesting attempts on Motukahakaha to fail. However, if this were the case, we should have seen evidence of attempted nesting. Furthermore this suggestion is not supported by our observation of successful breeding of grey-faced petrels on nearby Tarahiki (see introduction).

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[2] Herbarium acronyms follow those recommended by Holmgren *et al.* (1990).

We conclude therefore, that grey-faced petrels probably bred on Motukahakaha sometime in the last two decades. During this time rats probably caused sufficient nesting failures to have prompted the birds to try elsewhere. Insufficient time has elapsed since the 1992 eradication of the island's rodents to determine whether grey-faced petrels will recolonise Motukahakaha.

Species Additions

Nine new additions were made to the published flora of the island (*loc. cit.*) and several vouchers of the more interesting records were lodged in AK. The unusually wet conditions prior to our visit resulted in a luxuriance of herbaceous species. This contrasts with the dry and shrivelled state of the island's vegetation when it was visited by Ewen Cameron (*pers. comm.*, 1994), and highlights the need to visit islands' over several growing seasons when detailing their flora.

Acianthus sinclairii AK
Locally common within short grassland along the south western end of the islet.

Bromus fonkii AK
Locally common within the black-backed gull (*Larus dominicanus*) colonies where it forms dense swards.

Drosera auriculata AK
Locally common on the bare ground separating the two vegetated areas of the islet.

Geranium retrorsum AK
Numerous plants of *Geranium retrorsum* were noted along the south western margin of the island, where they were growing in a low grassland dominated by *Rytidosperma racemosum*, *Vulpia bromoides*, and the moss *Thuidium furfurosum*. *Geranium retrorsum* is an uncommon species in the North Island (Gardner, 1984) and it is now particularly scarce within the Auckland isthmus, where the only sizeable populations known occur on Watchman Island in the Waitemata Harbour (Cameron, 1988) and within small lava islands near the outlet of Ann's Creek, Onehunga (PdL *pers. obs.*). The decline of this species on the Auckland isthmus has been attributed to rabbits (*Oryctolagus cuniculus*) which seriously damage and/or dig up plants (R.O. Gardner *pers. comm.*, 1994). This conjecture is supported by the distribution of *G. retrorsum* within the Inner Gulf Islands Ecological District (see McEwen, 1987). Current records (i.e., the last ten years) for *G. retrorsum* from this district includes Motutara, Saddle (G.A. Taylor *pers. comm.*, 1994), Motuihe (de Lange and Crowcroft unpubl., 1994) and Tarahiki Islands (de Lange and McFadden unpubl., 1994). It is only on Motuihe, which has rabbits, that *G. retrorsum* is uncommon.

Hebe
Cameron and Taylor (1992) suggested that two *Hebe* taxa may be present: *H. stricta* var. *stricta* (AK 200601), and another species (AK 200602) which they placed within the former taxon, although noting that the collection was vegetatively similar to *Hebe sp.* "m" of Eagle (1982). On our visit we noted two species, *Hebe stricta* var. *stricta*, and *H. macrocarpa* subsp. *macrocarpa*, as well as occasional hybrids between both species (*H.* x *affinis*). Suspecting that AK 200602 was this hybrid, one of us (P.dL) examined this collection and AK 200601.

Both collections represent *H.* x *affinis*, distinguished from *H. macrocarpa* by the generally smaller corolla, more or less acute corolla lobes, and overall shorter, obviously pubescent racemes. The specimens differ from *H. stricta* var. *stricta* by the thicker coriaceous leaves, generally shorter broader corolla with wider corolla lobes, and the capsules which, while variable, are generally broader than they are long. This last character varies between collections, with the capsules of AK 200601 more acute and recurved (features of *H. stricta* var. *stricta*) than those of AK 200602 which are broader and lack the acute tips (features of *H. macrocarpa*). A final feature of this hybrid, seen in both collections, is the large number of aborted flowers.

Therefore, although recorded by Cameron and Taylor (1992), *H. stricta* var. *stricta* is not represented by their collections. On our visit we found this *Hebe* abundant on the eastern end of the islet, while *H.*

macrocarpa was locally present within the scrub on both eastern and western extremities. The hybrid is locally distributed between these areas.

Oxalis pes-caprae
Present within a disused planter bucket in scrub at the western extremity of the islet. The bucket and its contents (*Oxalis* included) were removed from the islet.

Tetragonia trigyna
Abundant along the south eastern margin of the islet.

Thelymitra pauciflora
Common over a small area on the narrow eroded ridge connecting the west and eastern forested areas. Flowers dark blue.

Additional Comments

During our visit we noted an unusual abundance of sand brome (*Bromus arenarius*) which had been reported as rare on the island by Cameron and Taylor (1992). Formerly considered indigenous (Cheeseman 1906, 1925), sand brome is now generally accepted as adventive to New Zealand (Connor, 1988). It is, however, rarely seen these days (c.f. Buchanan, 1880; Cheeseman, 1925), and most recent records suggest it has retreated to coastal locations, especially within offshore islands of the Hauraki Gulf.

The perceived scarcity of this annual species was commented on by Given (1981) who, while doubting its nativity, suggested it may be under threat. Reasons for its scarcity were not entertained, although later Connor (1988) noted that its breeding system was not in itself a threat. From our observations of the species we suspect that *B. arenarius* populations are naturally unstable, fluctuating in response to availability of water in their naturally drought prone habitats. This suggestion is supported by the AK collections of sand brome and by the recollections of those familiar with the grass (e.g., G. A. Taylor *pers. comm.*, 1994). These suggest that sand brome is a strictly short-lived spring to early summer annual, which has often dried off by early November. Furthermore the majority of sand brome records come from sites which experience chronic water shortages by late spring.

In the drought prone climate of the Hauraki Gulf islands, sand brome is usually found flowering by September, with occasional specimens persisting until mid October. Following the wet spring of 1994, sand brome was located on several gulf islands where it had previously not been recorded following visits in late October and mid November. On others such as Motukahakaha, its abundance was in stark contrast to that noted by Cameron and Taylor (1992).

Appreciating this then makes sense of the observation by Buchanan (1880) that sand brome flowers between December and February, as well as his comments about its abundance. We suspect his observations were based on a more southerly station, or on collections gathered following a wetter than usual spring.

Discussion

As noted by Cameron and Taylor (1992), Motukahakaha has an extremely diverse flora for its size and contains a number of species uncommon within the Inner Gulf Islands Ecological District. It is also remarkably free of serious weeds (see also Cameron and Taylor, 1992: 26).

It is unfortunate that prior rodent control measures lapsed [3]. Removal of rodents and regular bait station maintenance on Motukahakaha is vital both for the island flora and fauna, and as a safeguard to prevent rodents reinfesting Rotoroa Island.

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3. Since this article was written Mike Lee (*pers. comm.*, 1994) has increased the number of bait stations on Motukahakaha to six. Furthermore, he has assured us that regular visits to maintain these stations will be conducted by the residents of Rotoroa Island.

We were also dismayed to note the presence of several marijuana (*Cannabis sativa*) plots. These were not reported by Cameron and Taylor (1992), suggesting they were emplaced sometime after their last visit in 1990. The extent of the plots and the condition of the surrounding vegetation suggests that they have been used over several seasons at least. The plots included a number of planter buckets filled with potting mix. One of these buckets supported a dense growth of bermuda buttercup (*Oxalis pers-caprae*) which, although subsequently eradicated, highlights the way in which such plantations spread weeds and pests throughout the gulf (see also de Lange, 1994).

Our short visit added nine taxa to the list of Cameron and Taylor (1992). The total flora now stands at 114 taxa, including three hybrids, while 34 % of the flora is adventive.

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