

Distribution, ecology and conservation status of the uncommon native buttercup *Ranunculus urvilleanus*

P.J. de Lange & R.O. Gardner

Introduction

Ranunculus urvilleanus was described by Cheeseman (1925), who distinguished it from *R. hirtus* (now *R. reflexus* (see Connor & Edgar 1987)) by its "much greater size, more slender habit, more compressed achenes, with more curved styles". It is found in northern New Zealand (Fig. 1a), typically in damp open habitats (Fig. 2). The species is of a lax weedy habit (Fig. 2 & 3) and easily confused with several other common adventive *Ranunculi*, as well as the more abundant endemic lowland species *R. reflexus*. Figure 3 & 4 depict the leaves, flowers and fruits of *R. urvilleanus*, as well as an achene of *R. reflexus* (Fig. 3) to aid in identification.

R. urvilleanus was initially treated as a Threatened Species by Wilson & Given (1989) who gave it the IUCN Red Data book classification of "vulnerable". In 1993 the species was deleted from the New Zealand Threatened and Local Plant lists (Cameron *et al.* 1993). Many of the reasons for that decision were the result of research carried out by one of us (PJdeL) during the late 1980's and presented both as an oral paper to the Auckland Botanical Society Threatened Plant Symposium held during August 1990, and later in 1993 as a submission to the New Zealand Threatened Plant Committee. This paper provides a review and update of that information.

Distribution

Figure 1a & 1b shows the distribution of *R. urvilleanus* as deduced from herbarium records (a total of 56 collections examined from 44 localities. Information obtained from a search of the following herbaria: AK, AKU, CANU, CHR, MPN, NZFRI, OTA, WAIK, WELT, and WELTU). *Ranunculus urvilleanus* has a range which extends from North Cape south to c. lat. 38°. This distribution is more extensive than that given by Cheeseman (1925) or Allan (1961). The reasons why are only partly because of increased botanical knowledge. Cheeseman and Allan both state that *R. urvilleanus* is "not uncommon" from the North Cape Peninsula to the Bay of Islands, with an outlying population on Little Barrier. What is of interest here is that collections of *R. urvilleanus* from South Auckland, made by Petrie and Carse, existed in Allan's time at both WELT and CANTY (now at CHR). His failure to examine them relates to restrictions imposed upon herbarium visits as part of security measures in place during World War II (B.H. Macmillan, N.M. Adams pers. comm., 1990). It seems that Allan, when faced with the difficulty of obtaining collections, examined only type material and a limited range of specimens. Under these circumstances his use of Cheeseman's distribution for such a well-defined species is understandable. Oddly, subsequent treatments of the species have by and large followed these earlier texts despite the better level of access to the same collections we examined e.g., Webb *et al.* (1988) and Johnson & Brooke (1989).

Of the 44 localities known to have had populations of *R. urvilleanus*, 25 are considered current, with the remaining 19 treated as historical. The historical sites have mostly been subsumed by residential development and farms, but several in the eastern North Island and Waikato are probably still worth revisiting.

The species has a predominantly eastern distribution (Fig. 1b) north of Auckland and the Waitakere Range, but south of here is seen to be scattered from near Pukekohe down to Taharoa. In this area the species is probably uncommon now, through loss of habitat.

On the eastern side of the North Island, south of Auckland, plants have been gathered only from Tauranga (*Hodgkins*, October 1942, WELT 8788), and Te Whaiti (*Petrie*, January 1920, WELT 27295), this being the most southerly natural occurrence known of the plant. Within this area the species may now be extinct as it is not recorded in the most recent treatment of the threatened plants of the Bay of Plenty area (Beadel 1988).

During 1990 *R. urvilleanus* appeared as a casual weed in Wellington (Fig. 1a), with local occurrences along the Hutt Motorway near Percy Reserve, Petone and by the Takapu Railway Station, in Tawa. These occurrences almost certainly stemmed from the escape of cultivated plants grown nearby, as was the situation in A.P. Druce's garden at Pinehaven, Upper Hutt, where *R. urvilleanus* became an aggressive garden escape (A.P.Druce pers. comm., 1990). Steps have since been taken to eradicate plants from all of these localities.

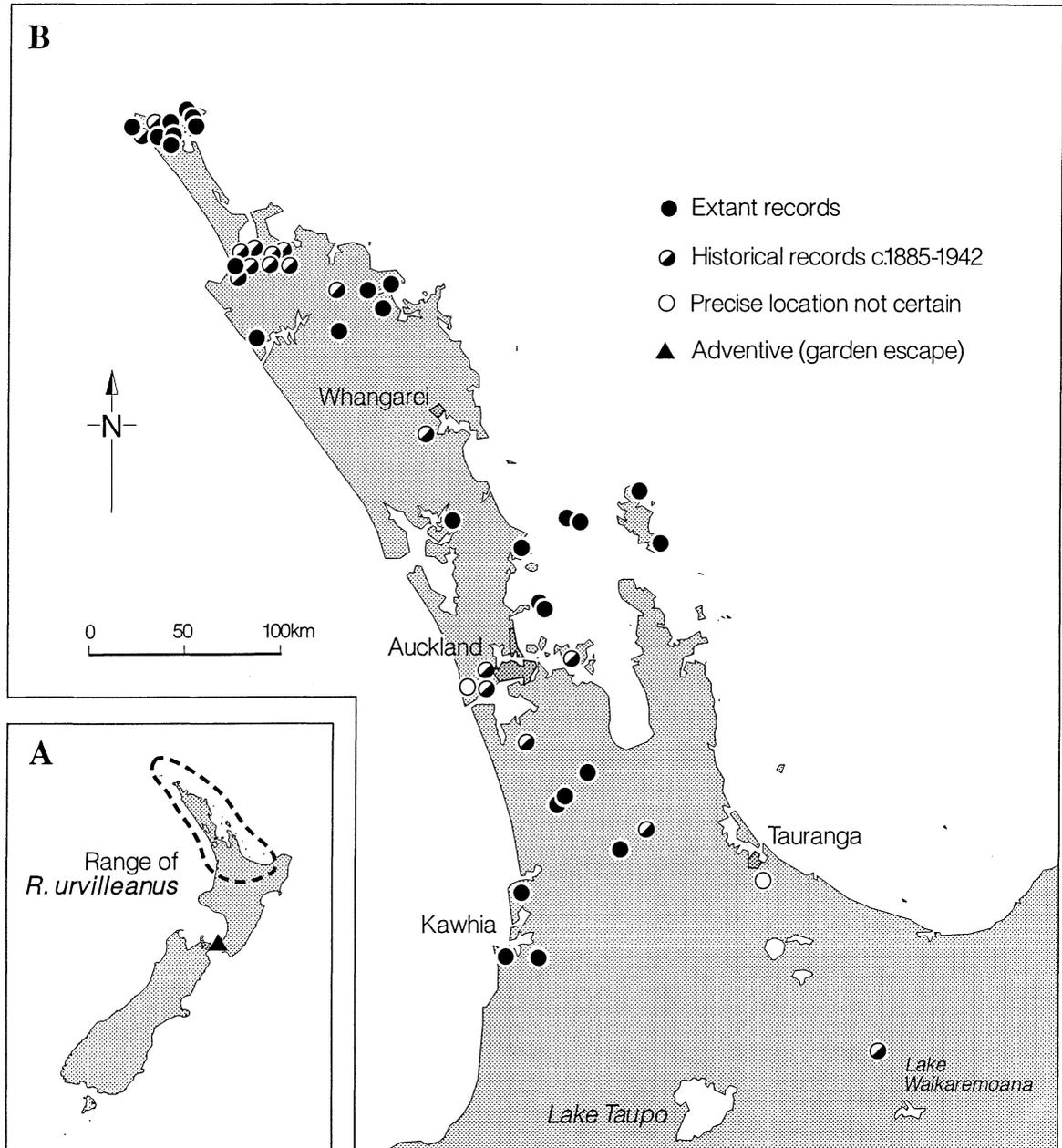


Figure 1. (A) Generalised distribution of *Ranunculus urvilleanus*, including adventive occurrence in Wellington, (B) Detailed distribution of *R. urvilleanus*; open circles depict historical sites, closed circles, extant.

Autecology

Ranunculus urvilleanus is most frequently found along the open, swampy margins of lowland forest and from the mineralised edges of coastal and lowland raupo (*Typha orientalis*) swamps (Johnson & Brooke 1989, authors pers. obs.). It has also been gathered from open ground on damp clay, within ephemeral stream beds, on banks above slow flowing creeks, and in rank grassland, scrub,

and from kahikatea (*Dacrycarpus dacrydioides*) forest. Occasional specimens have also been collected from dune slacks.

This is one indigenous species that has benefited from anthropogenic disturbance, and plants have several times been recorded from sites vegetated with exotics such as willow (*Salix* spp.), hawthorn (*Crataegus monogyna*) and blackberry (*Rubus fruticosus* agg.). Specimens have also been collected as weeds on gravel paths, on track margins (Fig. 2) and in poorly drained pasture. This species is unpalatable to stock, and may be suspected to be toxic, like many other members of this family, although poisoning involving the species has not been recorded (Connor 1977).



Figure 2. *Ranunculus urvilleanus* growing amongst *Schoenus tendo* and kanuka (*Kunzea ericoides*) on cattle pugged clay, Rosalie Bay Track, Great Barrier Island (November 1989).

In suitable conditions *R. urvilleanus* can reach impressive dimensions, plants at Rosalie Bay, Great Barrier Island (CHR 466094) being c.1.4 m in height (Fig. 2). At Tom Bowling Bay, North Cape, plants over 1.7 m tall were frequent in open scrubland. These massive specimens often produce several stems and may have numerous daughter rosettes. However, such plants are exceptional, and more usually plants are less than 80 cm in height and produce a single stem. In shaded conditions plants often sprawl through the associated herbage, producing adventitious roots from the stem nodes and spreading vegetatively.

In the wild, flowering occurs over the summer, commencing early September, peaking in January, and continuing through to late March. In cultivation, flowering continues throughout the year, although the plants peak during the summer months. Plants are self-fertile, with achenes typically ripening between three to five weeks after flowering (Fig. 4). The achenes are c. 2.7 mm long, quite distinctly larger than those of *R. reflexus*, and, unusually, the style does not persist as a stiff hook but curls and withers somewhat along its upper part (Fig. 3; ROG pers. obs. on plants from two sources). The species may be partially distributed by water as some achenes can float,

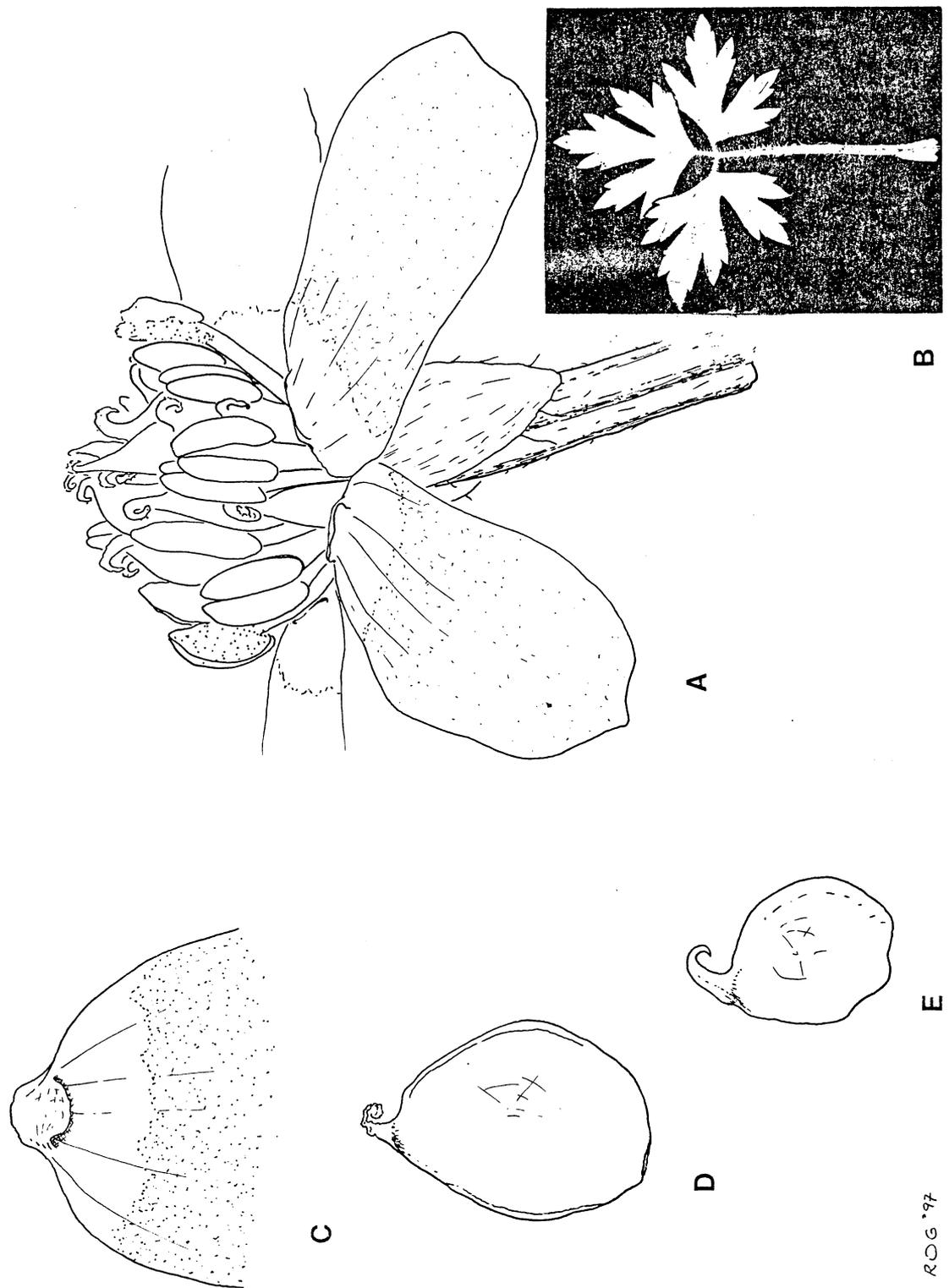


Figure 3. *Ranunculus urvilleanus* : (A) flower (x 15); (B) stem leaf (x 0.7); (C) petal base with nectary scale (x 15); (D) achene with shrunken style (x 15); (E) achene of *R. reflexus* with intact style, lower left.

although most sink within minutes of immersion. Germination can be slow (c. 4 -10 weeks) in over mature seed, but when sown fresh will usually germinate within 1 to 2 weeks, with a 79-84 % success rate.

A limited amount of asexual reproduction has been observed in both wild (see above) and cultivated material (WAIK 12535). Adventitious roots are initiated from the stem nodes in damp conditions. Following root development buds form at the stem root interface and these in time give rise to a series of daughter rosettes. Experimental cuttings taken from stem nodes produced roots within 10 - 12 days of planting in a moist sandy loam.

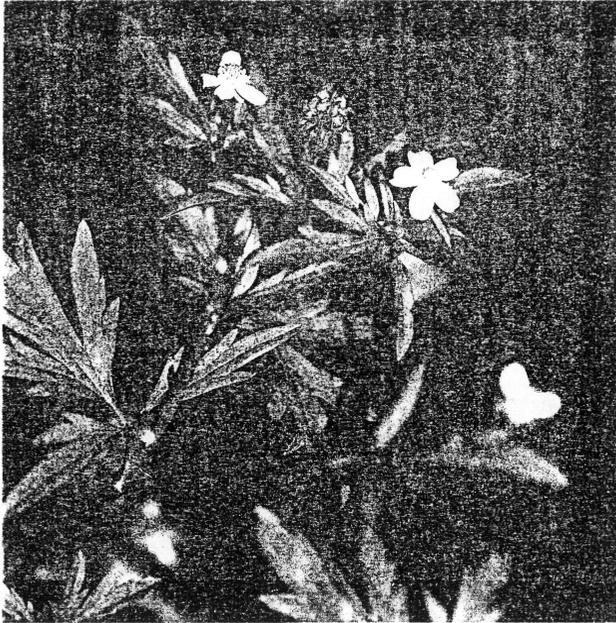


Figure 4. A flowering and fruiting branchlet of *Ranunculus urvilleanus*, Opuatia Wetlands, near Lake Whangape (September 1988).

Current population size and status

Ranunculus urvilleanus reaches its greatest abundance in the Te Paki - North Cape area (Fig. 1b). Here the species was first collected from Spirits Bay in December 1926 (CHR 334149) and since then the species has been collected from this area eleven times. The long-term prospects for these populations appears assured provided open conditions can be maintained in some places, such as the edges of swamps and in the cattle-pugged ground around Kohuranaki.

In the Mangonui area, which includes the type locality, *R. urvilleanus* has been collected eight times between 1896 and 1920. It has recently (October 1990) been collected from near Awanui. The Bay of Islands is another stronghold of the species, and at present the species is known from four sites. The only one to have been specifically surveyed, at Rangitane Scenic Reserve, had over 100 plants in the one survey plot (L.J. Forester pers. comm., 1990).

Further south, there is a Carse collection from Maungatapere, Whangarei, made in May 1898 (CHR 334199) and several from the Auckland area, collected between 1885 and 1924. All of these sites are treated as historical, although a collection from the Waitakere Ranges (Ball, April 1885, AKU 2937) is in an area where the species could still occur.

The Omaha sandspit and the islands of the Hauraki Gulf support five populations which appear to be in good condition. It is quite likely that further populations will be found as exploration of the gulf islands continues. One of the island populations, that on Little Barrier, was first collected from by Cheeseman in January 1901 (AK 6916), and has been gathered from there twice since, the most recent collection being made in May 1990. On Great Barrier Island the species was first reported by de Lange (1990), who found a large population at Rosalie Bay, and recently (1993) the species has been discovered further north at Whangapoua (E.K. Cameron pers. comm., 1993).

South of the Gulf the species is known from eleven localities, of which three are treated as historical. The surviving populations in this area are typically small (< 3 plants) and occupy mainly wasteland or the margins of forested remnants. The one exception is the Opuatia wetlands, near Lake Whangape, where a thriving colony of c. 120 plants was discovered under a canopy of hawthorn (*Crataegus monogyna*) in 1986 (WAIK 6887).

South of the Waikato in the eastern Bay of Plenty and Te Urewera, the species has not been collected since 1942; much suitable habitat still occurs in the Bay of Plenty and East Cape area so searches could be rewarding.

Of the 18 known present-day populations of *R. urvilleanus*, most appear stable in terms of the present condition of the habitat they occupy, population structure, and other factors influencing the species abundance. It is anticipated that some populations occupying seral communities will decline as succession proceeds, but that these losses will be minimal, and more importantly natural.

Conservation status

Ranunculus urvilleanus is not constrained by its reproductive biology, with individual plants producing large quantities of viable seed. Although it is primarily a wetland species, *R. urvilleanus* is more than capable of utilising a wider range of natural and induced seral habitats. Therefore, so long as low-level disturbance of *R. urvilleanus* habitats continues, the species will very likely be able to maintain itself. This paper also suggests that the species has been under-collected prior to the last decade, thereby giving past conservation biologists a false impression of its conservation status.

While it is true that some of the known populations are small and vulnerable, and several have been extirpated, it is evident that the species is, by and large, maintaining itself through most of its former range. Furthermore, based on randomly sampled plots from several populations in Te Pahi, the Bay of Islands and the Waikato we estimate a national population figure for the species in excess of 10 000 individuals, with the majority of these plants confined to reserved land administered by the Department of Conservation. We also believe it likely that further populations exist simply because until recently, the species has been frequently misidentified or confused with other adventive *Ranunculi*, or its presence has been overlooked altogether by regional botanists through past confusion over this species exact natural distribution (see above), or their failure to distinguish this weedy species as indigenous. Therefore the deletion from New Zealand Threatened and Local Plant list (Cameron *et al.* 1993) is in our view still appropriate.

Acknowledgements

We would like to thank the curators of the following herbaria: AK, AKU, CANU, CHR, MPN, NZFRI, OTA, WAIK, WELT, and WELTU for providing records of, and making available specimens of *Ranunculus urvilleanus* for study. We are grateful to Bryony Macmillan and Nancy Adams for comments relating to the preparation of the section on *Ranunculus* in the Flora of New Zealand series. We would also like to acknowledge the discussions held with Patrick Brownsey, Ewen Cameron, Paul Champion, Gillian Crowcroft, Tony Druce, Lisa Forester, and Phil Garnock-

and from kahikatea (*Dacrycarpus dacrydioides*) forest. Occasional specimens have also been collected from dune slacks.

This is one indigenous species that has benefited from anthropogenic disturbance, and plants have several times been recorded from sites vegetated with exotics such as willow (*Salix* spp.), hawthorn (*Crataegus monogyna*) and blackberry (*Rubus fruticosus* agg.). Specimens have also been collected as weeds on gravel paths, on track margins (Fig. 2) and in poorly drained pasture. This species is unpalatable to stock, and may be suspected to be toxic, like many other members of this family, although poisoning involving the species has not been recorded (Connor 1977).



Figure 2. *Ranunculus urvilleanus* growing amongst *Schoenus tendo* and kanuka (*Kunzea ericoides*) on cattle pugged clay, Rosalie Bay Track, Great Barrier Island (November 1989).

In suitable conditions *R. urvilleanus* can reach impressive dimensions, plants at Rosalie Bay, Great Barrier Island (CHR 466094) being c.1.4 m in height (Fig. 2). At Tom Bowling Bay, North Cape, plants over 1.7 m tall were frequent in open scrubland. These massive specimens often produce several stems and may have numerous daughter rosettes. However, such plants are exceptional, and more usually plants are less than 80 cm in height and produce a single stem. In shaded conditions plants often sprawl through the associated herbage, producing adventitious roots from the stem nodes and spreading vegetatively.

In the wild, flowering occurs over the summer, commencing early September, peaking in January, and continuing through to late March. In cultivation, flowering continues throughout the year, although the plants peak during the summer months. Plants are self-fertile, with achenes typically ripening between three to five weeks after flowering (Fig. 4). The achenes are c. 2.7 mm long, quite distinctly larger than those of *R. reflexus*, and, unusually, the style does not persist as a stiff hook but curls and withers somewhat along its upper part (Fig. 3; ROG pers. obs. on plants from two sources). The species may be partially distributed by water as some achenes can float,

Jones, over aspects of this species' distribution, taxonomy, and conservation status. Gillian Crowcroft provided the photographs used for Figures 2 & 4.

References

- Allan, H.H. 1961: Flora of New Zealand Vol. 1. Wellington, Government Printer.
- Beadel, S.M. 1988: A register of threatened plant and local plant taxa in the eastern region, department of conservation, their distribution and status. Technical Report Series 6. Rotorua, Department of Conservation.
- Cameron, E.K.; de Lange, P.J.; Given, D.R.; Johnson, P.N. & Ogle, C.C. 1993: New Zealand threatened and local plant lists (1993 Revision). *New Zealand Botanical Society Newsletter* 32: 14-28.
- Cheeseman, T.F. 1925: Manual of the New Zealand flora . Wellington, Government Printer.
- Connor, H.E. 1977: The poisonous plants in New Zealand . Wellington, Government Printer.
- Connor, H.E. & Edgar, E. 1987: Name changes in the indigenous New Zealand Flora, 1960-1986 and Nomina Nova IV, 1983-1986. *New Zealand Journal of Botany* 25: 115-170.
- de Lange, P.J. 1988: New records from the general Waikato. *New Zealand Botanical Society Newsletter* 12: 8 -9.
- de Lange, P.J. 1990: Additions and confirmations to the flora of Great Barrier Island. *Auckland Botanical Society Journal* 45: 22-23.
- Johnson, P. & Brooke, P. 1989: Wetland plants in New Zealand. Wellington, DSIR Publishing.
- Webb, C.J., Sykes, W.R. & Garnock-Jones, P.J. 1988: Flora of New Zealand, Vol. IV. Christchurch, Botany Division, DSIR.
- Wilson, C.M. & Given, D.R. 1989: Threatened plants of New Zealand. Wellington, DSIR Publishing.

Additional Notes on the Vascular Flora of North Cape

B.S. Parris

I visited the North Cape Scientific Reserve and environs during Labour Weekend 1969 and Easter 1970 in order to check Wheeler's (1963) species list for the area. Numerous additional species were collected or recorded and further habitat records were made, but only those based on herbarium specimens in AK have been included in the most recent survey of the area (Cameron & Jones 1996). The additional sight records made in 1969-70 are included here to augment our knowledge of the composition and distribution of the vascular flora of North Cape. They include 18 additional taxon records, four species validated from unconfirmed records by Buchanan & Kirk (1869), one species confirmed from Wheeler (1963) which was regarded as a possible mistake by Cameron & Jones (1996), and 138 additional habitat records. The new records bring the total number of taxa to 489, 70% of which are native. The community numbers cited are the same as those used in Wheeler (1963) and Cameron & Jones (1996). Numbers in square brackets indicate community records published in Cameron & Jones (1996) which were also noted by me in 1969-1970.

A. Additional taxa recorded

Ferns

Pteris comans x *P. saxatilis* 4 Parris 593, K

Dicotyledons

* *Callitriche stagnalis* 6

* *Carica pubescens* 4

* *Ciclospermum leptophyllum* 3, 5

* *Ficus carica* 4

* *Galium aparine* 3

* *Helenium puberulum* 3

Hydrocotyle elongata 4

* *Nicotiana tabacum* 5