

Autumn is a time for fruiting of the shrubs, and many colourful red or orange fruits were evident, especially on *Berberis*, *Cotoneaster*, *Rosa*, and *Lonicera*. Many Gentianaceae were in flower, and two species of great beauty were *Swertia dichotoma* and *Gentiana lawrencei* var. *farreri*. Gentianaceae is an important family here (*Comastoma*, *Gentiana*, *Gentianopsis*, *Halenia*, *Lomatogonium*, *Swertia*), and I met Dr Chen Shilong of the Northwest Plateau Institute of Biology, who with his colleagues is "doing" the Gentianaceae for the new Flora of China series in English (Missouri

Botanical Gardens).

Other particularly prominent families are Asteraceae, Rosaceae and Fabaceae. *Artemisia* is exceptionally common on the Loess Plateau, and in ruderal vegetation. There are dozens of species, all of which are highly aromatic (wormwood or sagebush). *Potentilla* abounds, with shrubby as well as creeping herbaceous species (e.g. *P. anserina*) in the steppe and meadow vegetation. Of the legumes, *Astragalus*, *Caragana*, *Hedysarum*, *Oxytropis*, and *Thermopsis* widely occur.

#### Acknowledgements

Plants were identified with the help of three local experts – Wei Zhengduo, retired Qinghai Forestry Bureau engineer; Lu Xuefeng, Northwest Plateau Institute of Biology; and Zhang Zhihe, retired Grassland Institute scientist. I sincerely thank Marta Treskonova for her ecological observations in the field.

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## Clear felling atop Auckland's highest peak: the destruction of submontane shrubland on Kohukohunui, Hunua Range

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Kohukohunui is the highest point on the Hunua Range at 688 m altitude. The summit supports a diverse community of submontane shrubland not found elsewhere on the Auckland mainland. Above 600 m altitude, lowland forest gives way to low vegetation dominated by species such as *Quintinia serrata*, *Cyathea smithii*, *Olearia rani*, *Melicytus ramiflorus*, and *Dicksonia squarrosa*. The submontane shrubland at the summit is characterised by the presence of species either scarce or absent at lower altitudes, for example *Griselinia littoralis* (herbarium voucher: AK 208604), *Pseudowintera colorata* (AK 208822), and the abundant *Ascarina lucida* (AK 158503). Kohukohunui is the only confirmed site for *Ascarina lucida* on the Auckland mainland, and is listed as being naturally uncommon and sparse in the Auckland ecological region (de Lange et al. 1999). Bellbird are frequently observed feeding in the summit area, and kokako, kaka, North Island robin and Hochstetter's frog are found in the surrounding forest (pers. obs.)

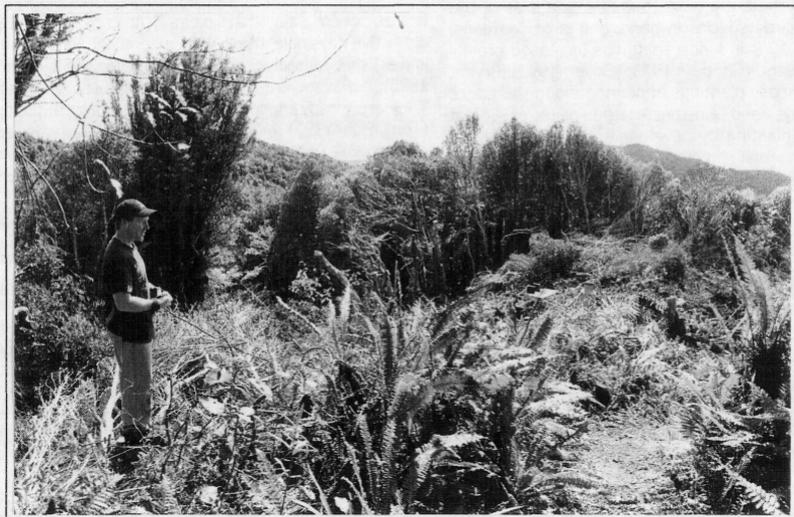
A rainfall gauge is sited a short distance to the north of Kohukohunui trig, and until recently this was situated in a small clearing c. 10 m in diameter. On visiting the summit in September 2002 it was discovered that an area c. 25 m x 35 m had been clear-felled around the rain gauge (Fig. 1). The species felled included *Quintinia serrata*, *Hebe macrocarpa* var. *latisejala*, *Melicytus ramiflorus*, *Olearia rani*, *Pseudopanax crassifolius*, *Beilschmiedia tawa*, *Pseudowintera axillaris*, *Myrsine salicina*, *Cyathea*

*smithii*, *Dicksonia squarrosa*, *Hedycarya arborea*, and at least seven *Ascarina lucida*. The tallest trees felled were c. 5 m in height, including a *Quintinia serrata* with a stem diameter of c. 20 cm (at ground level), an *Ascarina lucida* at c. 21 cm diameter, and a *Pseudowintera axillaris* at c. 10 cm diameter. Age estimates for *Ascarina lucida* of this size at Kohukohunui are in the vicinity of 130 years (Martin 2001). The vegetation cleared had been chain sawed close to the ground level from the rainfall gauge to the outer edge of the cleared area, an action not necessary to gain the required line of sight from the gauge to the nearest clear sky. This included the felling of groundcover species such as mature stands of *Blechnum discolor*. Possible wind-throw, due to the strong edge effects at this exposed site, is likely to increase the size of the clearing.

Enquires were made to the Auckland Regional Council regarding this forest clearance. Permission had been granted to clear fell around the gauge, the damage being regarded as a "necessary evil". It was also claimed that the area clear-felled had been previously cleared c. 20 years ago. This failed to explain the seemingly excessive size of the area cleared, and the nature of the clearing, which involved the removal of groundcover species. The size and estimated age of the largest trees felled, would also indicate that the latest clear felling involved a much greater area than the previous clearance.

Permission has been granted to take stem cross sections from the felled trees. This is a rare opportunity to investigate age – diameter relationships for submontane tree species, including the regionally

scarce *Ascarina lucida*, and also to observe which of the species involved are able to recover by resprouting from cut stumps.



**Fig. 1. Kohukohunui**  
View looking north across clearing. Steve McCraith front left, rainfall gauge centre right.  
October 2002.

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