WAIONE AND TAAHAU FROST FLATS, WHIRINAKI FOREST PARK

Craig Bishop

On Sunday 6 March 2005, following the Arahaki Lagoon field trip the day before, a merry band of some 10 keen young botanists set out from the Whirinaki Recreation Camp for Waione and Taahau frost flats on the western edge of Whirinaki Forest Park.

The frost flats are located on the boundary between two ecological districts with very different geology: the flat ignimbrite plateau of Kaingaroa Ecological District, and the much hillier and highly dissected Whirinaki Ecological District. Soil profiles are very similar at both Taahau and Waione; new soil over a 40-60cm layer of fine Taupo ash, which lies c.20cm below the soil surface. Below this is a 1 – 1.5m thick layer of water-sorted Taupo pumice breccia (Pullar 1980). The sites experience frequent severe temperature inversions which depress temperatures relative to those on the surrounding slopes, and at the Minginui climate station. Temperature data collected for a PhD thesis (Bishop 2005) shows that, on average, extreme minimum temperatures are almost 6°C lower at Taahau compared with Minginui (one of the coldest climate stations in the North Island) and that during more extreme frosts the difference is even larger.

Their location at the boundary between the fire-prone Kaingaroa Plateau, and Maori settlement(s) in the Whirinaki Valley means that human-lit fires have been very influential in shaping the present vegetation of Waione and Taahau. There have been Maori in the Whirinaki Valley for at least 600 years and probably much longer (Morton *et. al.* 1984). There was extensive destruction of forest in the area by fire c.700 years ago (McGlone 1983) and fires have been frequent since that time. The current irregular, winding boundary of tall forest along the western edge of Whirinaki Forest is probably '… the result of repeated natural or manmade fires that have swept across Kaingaroa Plain during centuries past' (Morton *et. al.* 1984). Both frost flat sites have been used for cattle-grazing in the past. Monoao is said to have increased in importance on the frost

flats since the cessation of grazing, and this is certainly the case at Waione, where it is (very) slowly invading the Yorkshire fog-browntop grassland. The frost flat vegetation at Waione and Taahau is one of the few unmodified examples remaining in the whole ecological region (McEwen 1987).

The objective of the morning was to do some general botanising on the frost flats, and search for *Dactylanthus taylorii* in the seral forest that surrounds these sites. Our first stop was Waione frost flat. After quickly botanising along the margins of roads and tracks cut through the monoao-dominated frost flat vegetation, we plunged into the scrub. Botanising was concentrated on an abrupt ecotone (vegetation transition) from frost flat heathland, to kanuka forest, to podocarp-tawa forest along the margin of Waione. You gain a real appreciation for the rapid nature of the vegetation transition, which occurs over just 40 – 60m here, when you can see new species appearing (and disappearing) every five paces or so.

The short section of ecotone we botanised along has almost certainly been stable for at least 100 years (Bishop 2005), *i.e.* extant frost flat vegetation is not being 'invaded' by the surrounding forest. The extreme frostiness of these sites means that even regular frosts are severe enough to exclude most forest species from Waione and Taahau. The few 'forest' trees which are able to establish in frost flat vegetation under a regular frost regime (mostly *Coprosma* sp. 't', horoeka, kohuhu and manuka) are killed by severe frosts, which occur every 10 – 30 years or so.

After traversing the ecotone for a while Chris Ecroyd introduced us to the wonderful world of dactylanthus. The known population of dactylanthus at Waione was increased by several after the inevitable 'hunt for new plants' which followed the talk. After a spot of lunch we pushed back into the scrub and headed down into the Waione frost flat again. Other botanical highlights included the discovery of three species of *Hypericum* – *H. japonicum*, *H. humifusum* and the threatened *H.* aff. *japonicum,* all growing predominantly along old vehicle tracks, as well as populations of *Botrychium australe* which

were scattered through the very open understorey beneath the dense monoao stands. Then it was off to Taahau for a quick look around.

At Taahau there was time for some quick botanising along the road edges where some interesting plants were seen before the journey home. Probably the most noteworthy was a good population of *Ophioglossum coriaceum* on both sides of the road growing on open pumice.

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Botanists enjoying a wet day at Waione frost flats. Photo: Paul Cashmore

A SEASON OF INTERESTING THREATENED PLANT DISCOVERIES IN WHIRINAKI FOREST PARK

Paul Cashmore

So far this year there has been a range of interesting new discoveries of nationally threatened plant species/populations in and around Whirinaki Forest Park. These have occurred thanks to the Botanical Society weekend visit in March (see article in this newsletter) and from some dedicated threatened plant survey work by the Department of Conservation (DOC).

The first discovery was made in January by DOC when a single *Alepis flavida* (Chronically Threatened – Gradual Decline (de Lange *et. al.* (2004)) mistletoe plant was discovered growing on red beech (*Nothofagus fusca*) high on a ridge behind Minginui village in the Tuwatawata Ecological Area. This is part of a much larger area where DOC is