

# Moawhango Ecology

Native plants at risk

JULY 1997



Department of Conservation  
*Te Papa Atawhai*

## INTRODUCTION

The Moawhango Ecological District is a distinctive, upland plateau and basin floor landscape of the North Island, comprising 139,500 ha. It includes land to the east of Waiouru, off State Highway One, which is managed by the New Zealand Army. The district is a place of special natural beauty, with an unusually large range of approximately 750 species of native plants.



*River meanders and red tussocks.*

The land is cut, in deep gorges in places, by the Moawhango River. It is a billowing landscape of tussocks, with patches of beech forest. The Moawhango red tussock are the largest remnant of tussockland which once stretched from the Ruahine Range northwards to Taupo and Rotorua. But it is also a special place of mixed shrublands, wetlands and subalpine herb fields.

*Cover Photograph: Upper Moawhango River landscape. Tussocklands and shrubs on infilled valley floors.*

*Rivers carve through layers of young sandstone rock and older underlying greywacke.*



Much of this is open country. Nowhere else in the North Island are there such large, undulating plateaus at high altitudes.

It is a wilderness flanked by the still active volcanic plateau whose dynamics have contributed to the character of this landscape and nature of its plants.



*Low fertility tarn perched on a plateau surface.*

This landscape has a South Island 'feel' to it, with at least 14 species of plants that are found in the South Island and only in this part of the North Island. These are survivors in an area which remained stable over long periods, while sea invasions and mountain building obliterated their potential habitats over most of the central and southern North Island.

Special plants survive here below the treeline because cold air inversion and poor drainage have created sites that have been without trees for thousands of years. Some of these plants are nationally threatened.



*Rugged ridges and river gorges flank the soft relief of the valley floors.*

*The rare *Kaimanawa forget-me-not*, *Myosotis glauca* (NT, RD)*



Some of the variety of the Moawhango's natural landscapes can be seen in these introductory photographs.



*River floor plains have high fertility wetlands.*

At another level, there is beauty in the indigenous inhabitants. Many of the special plants are dainty minatures. They are self pollinating and do not require large display to attract insects. They form part of the district's ecology, as distinctive as it is vulnerable.

## LAND-USE HISTORY

The survival of the special plants is, in part, because the Moawhango area has never been intensively farmed. However, it is a landscape where wild horses have roamed.



*Photograph: Geoff Osborne and New Zealand Geographic*

The size of the herd dropped to less than 200 in 1979, which led to formal protection in 1981. Horse numbers increased so swiftly that by the 1990s there was concern both for the fragile ecology of the region and the welfare of the horses. Despite three small musters from 1993, numbers in early 1997 still exceeded 1700. The protection order was lifted in 1996.

This pair of photographs shows the loss of native tussock resulting from horse grazing in the Argo Valley, the first picture taken in 1989, the second in 1997.



Research indicates that none of these horses are genetically distinctive, nor are they a particular breed.

Note:  
NT - Nationally Threatened  
RD - Rare Distribution

## THE PLANTS AT RISK

As with all landscapes it is important to understand the plants in the context of their ecosystems. Rivers have carved hard greywacke and redeposited it as rounded gravels. Water and frost have worn away softer rocks, forming sand and silt and mixed these with gritty volcanic tephra ("ash") and Taupo pumice. The resulting landscape is a mosaic of rocky gorges, stepped river terraces and broad flats between the rivers. Wetlands form where there is poor drainage. Some wetlands are always wet and become peaty, while others are ephemeral (temporary). Each type is home to special plants. Wetlands and their inhabitants are extremely vulnerable to damage by horses.

## EPHEMERAL WETLANDS



*Lake with fluctuating water levels,  
Awapatu Valley*

These are tender places where the water comes and goes, usually in seasonal cycles. The plants have evolved to cope with periodic phases of drought and wetness. The soils of ephemeral wetlands are puggy when wet and flaky when dry. They are, therefore, easily impacted by horse hooves.



*Two small daisies growing together: Gnaphalium ensifer (RD) (white-green leaves) and G. traversii (white leaves) in their undamaged state.*



*Seedheads of the critically endangered wetland grass Amphibromus fluitans (NT).*

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*Undamaged seedheads of the sedge, Carex capillacea (RD) found in 1996 in the upper Moawhango, its sole North Island location.*



*Horse hoof-prints in native turf dominated by a native plantain, Plantago triandra and Selliera microphylla, a succulent herb.*

*Distinctive horse skid marks and droppings show in native turf which is the habitat of the small daisy Gnaphalium ensifer (RD) and Carex capillacea (RD). Horse droppings change the nutrient status of the turf and encourage weeds.*



*The red-brown sedge, Carex rubicunda is one of the highly specialised plants which grow under water but flower and seed as their pool habitats dry out each year.*

## FLUSH ZONES

“Flush zones” are a distinct type of high fertility wetland, created by seepage from higher ground. The species confined to flush zones have doubtful viability because horse activity has been so concentrated here.



*A flush zone, in the Upper Moawhango catchment. In it are found a small tufted sedge Carex berggrenii (RD), a native carrot (Orcomyrrhis “delicatula”) (NT, RD) and the buttercup (Ranunculus recens) (NT, RD).*



*Horse pugging in a flush in the same area has not only damaged the special native buttercup but enabled the intrusion of an exotic rush, Juncus articulatus.*



*The Moawhango buttercup, Ranunculus recens (NT) is confined in the North Island to the Moawhango Ecological District.*

*The star-shaped native carrot Orcomyrrhis “delicatula” (NT, RD).*



*Note how, in their hunt for food, the horses actually tear the Carex berggrenii (RD) out at the roots.*



*Hoof pugging in boggy turf of flush zone beside Awapapu River.*

## SHINGLE AND CHANNELS



*Typical shingle terraces,  
Upper Moawhango River.*

Somewhere between the wet and the dry are a number of different micro-habitats created by meandering streams of the Upper Moawhango basin. By the rivers there are beaches of coarse or fine shingle, silt or sand, some wet and others seasonally dry. River flats behind the beaches have wet or dry channels where streams once flowed. Some flats are submerged only when the main streams flood, others are always wet and become peaty. Each kind of place is home to different plants.



*The threatened forget-me-not,  
Myosotis "Volcanic Plateau"  
(NT) grows in peat channels  
under tussock in the Upper  
Moawhango River.*



*The rare Kāiwharua forget-me-not,  
Myosotis "lanca", (NT, RD) which  
horses have often trampled out of its  
shingle habitat.*

*Opportunistic weeds such as  
hawkweed (Hieracium pilosella)  
invade the habitat of Acaena  
inermis, a grey biennial (RD).*

*Other 'intruders' in the area include  
cassear, hair fescue, Yorkshire fog,  
sweet vernal and browntop.*



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*Myosotis tenericaulis, a forget-me-not (RD),  
which had one other North Island record before  
being found in 1996 in silty channels near the  
Moawhango West Stream.*

## THE DRYLANDS

Some previous courses of rivers are now high above the flood plains, with surfaces of shingle, sand or pumice. These drought-prone sites have their own natural character and distinctive species.



*Hard tussock and red tussock on a dry terrace where the horses choose to defecate; the nutrients from horse dung enhance the growth of exotic weeds.*



*Drought resistant shrubs on a pumice surface.*

*A common dryland plant is the cushion of shaggy moss (Racomitrium), shown here trampled by horses.*



## BIODIVERSITY

Since New Zealand ratified the Rio Biodiversity Convention in 1993 the Department of Conservation has developed its strategy on biodiversity. This is designed to protect and enhance the nation's indigenous plants and animals wherever they occur, on public and private land. It takes an ecosystem, rather than a single-species approach.

Because New Zealand has been isolated from its supercontinent 'parent' for some 100 million years, much of its flora and fauna is unique. However, human impacts have so dramatically modified much of the New Zealand landscape over the past 800 years that there are few places in the world where so much distinctiveness is at such risk. Parts of the Moawhango ecological district, including much of the Waiouru army lands, are still relatively unspoilt. The area boasts landscapes, vegetation and plants that are disappearing elsewhere. Even before human intervention, the district was unique. Studies of natural features such as landforms and plants allow us to look back through time and manage better for the future, to keep what is uniquely New Zealand. Detailed studies are already showing just how rich and special the native flowering plants are in the district, and it is certain that future studies of other plants, such as lichens, mosses and liverworts, and small animals, including lizards and insects, will reveal equally important information.

*An enclosure on a flush zone below a red tussock terrace in the Awapatu Valley, set up by scientists seven years before this photograph. Regenerating Schoenus inside plot, browsed Schoenus in front.*



*Photographs by Colin Ogle and John Barkla of the Department of Conservation unless otherwise credited.*

Published by:  
Wanganui Conservancy,  
Private Bag 3016,  
Wanganui.

*Printed on recycled paper  
by H&A Print, Wanganui*