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# **Ecological Evaluation of Manganui River Government Purpose (Wildlife Management) Reserve, Northland**

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Manganui River marsh, shrub and forest wetlands.

**NIWA Client Report: HAM2008-196  
October 2008**

**NIWA Project: ELF09202**

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*Prepared for*

Northland Regional Council

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*Reviewed by:*



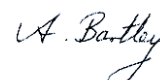
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John Clayton

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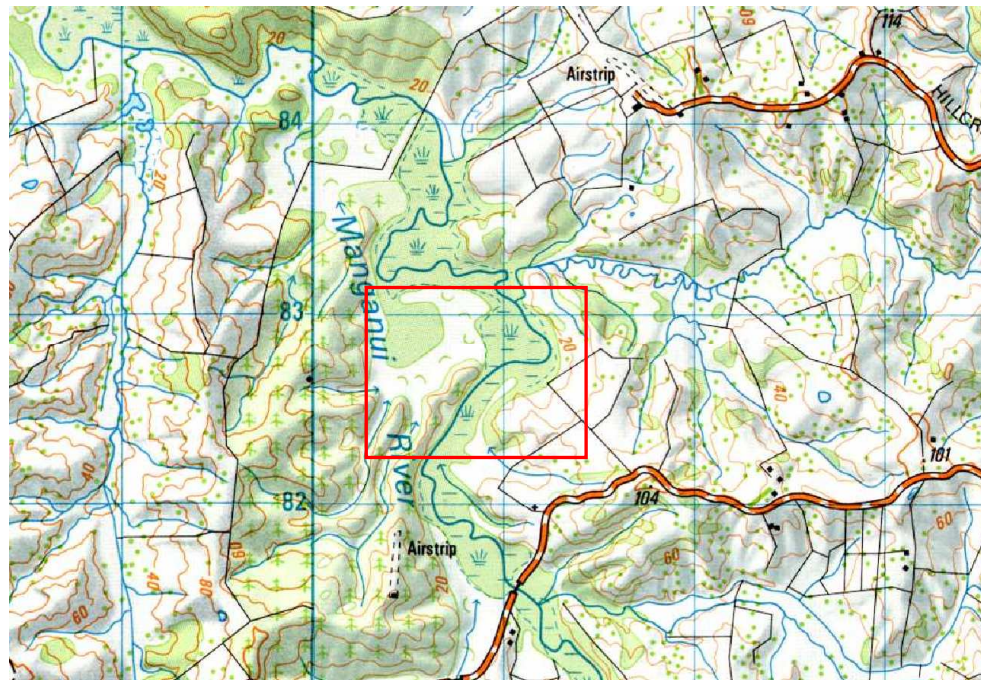
## 1. Introduction

Northland Regional Council successfully sought Envirolink funding (Advice No. NLRC86) to engage NIWA to advise on the ecological values of the Manganui River Government Purpose (Wildlife Management) Reserve and the status and management of pest plants within the reserve.

The Manganui River is a tributary of the Northern Wairoa River, with the mid-reaches of the river (including the Manganui River Government Purpose (Wildlife Management) Reserve) flowing through significant areas of indigenous forested hills (as well as plantation pine forestry and farmed pasture) with large areas of wetland vegetation developed within its unmodified floodplain. Such unmodified floodplains are now rare in New Zealand, especially in the North Island.

## 2. Field evaluation

The Manganui River Government Purpose (Wildlife Management) Reserve was visited on 15 October 2008. Access was through pine forestry off the Mititai Road and the wetland was walked between the co-ordinates 2610675E; 6582725N and 2611125E; 6582765N compiling an inventory of the flora and discerning different vegetation types. Plate 1 shows a map of the area.



**Plate 1:** Map of Manganui River Reserve (red rectangle shows the area investigated).

### 3. Results

Two main vegetation types were discerned; marsh and swamp forest/scrub. A species list of plants (also combining records made by Andrew Townsend and Nigel Miller on 17 June 2008) is appended to this report.

#### 3.1 Marsh

The wettest parts of the wetland were dominated by predominantly herbaceous vegetation with scattered stunted kahikatea (*Dacrycarpus dacrydioides*), manuka (*Leptospermum scoparium*) and mingimingi (*Coprosma propinqua*) (Plate 1).



**Plate 2:** Manganui River Reserve: Marsh of predominantly introduced herbs with scattered stunted trees and shrubs.

Vegetation closest to an old river channel (and often smothering it) was a mosaic of predominantly naturalised species including alligator weed (*Alternanthera philoxeroides*), parrot's feather (*Myriophyllum aquaticum*), primrose willow (*Ludwigia peploides*) and the willow weed *Persicaria strigosa*. The native willow weed *P. decipiens* was also a dominant component of this vegetation. Patches of taller indigenous lake clubrush (*Schoenoplectus tabernaemontani*) and spike sedges (*Eleocharis* spp.) are local within this area. The shallower margins (~ 10 to 30 cm

deep surface water at the time of visit) were dominated by swards of the indigenous sedge *Carex gaudichaudiana* (Plate 2).



**Plate 3:** Manganui River Reserve: Swards of the indigenous sedge *Carex gaudichaudiana*.

This intergraded into scrub on the margin of the pine plantation, with mingimingi and lesser amounts of *C. rhamnoides* and a range of native and introduced sedges, rushes and grasses.

### 3.2 Swamp forest/scrub

The vegetation dominated by woody vegetation was situated on the inner edge of a large river meander, with both levee and backwater swamp vegetation present. In both vegetation types kahikatea dominated, with lesser amounts of kowhai (*Sophora microphylla*), swamp ribbonwood (*Plagianthus regius*) and occasional podocarps such as matai (*Prumnopitys taxifolia*), totara (*Podocarpus totara*) and rimu (*Dacrydium cupressinum*) especially near the river. The shrub layer was dominated by a vast array (19 species) of small-leaved divaricating shrubs (Plate 3).



**Plate 4:** Manganui River Reserve: Divaricating shrubs under kahikatea (*Dacrycarpus dacrydioides*) swamp forest.

Larger leaved shrubs including a *Hebe* (possibly *H. stricta*) (Plate 4) and a large number of ferns were found in the levee forest.





**Plate 5:** Manganui River Reserve: *Hebe stricta*? in the levee forest adjacent to the Manganui River.

Swamp kiokio (*Blechnum novae-zelandiae*) was the only fern common in backwater areas. Other ground cover species in this wetter forest were the sedges *Carex virgata*, *C. ochrosaccus* and *Eleocharis acuta* and dicotyledon herbs including *Hydrocotyle pterocarpa*, *Callitriche petriei* and the rare *Crassula ruamahanga* (Plate 5).

Unfortunately the dominant ground cover species was the introduced weed wandering Jew (*Tradescantia fluminensis*) which carpets the majority of the backwater swamp forest area.



**Plate 6:** Manganui River Reserve: Herbaceous ground cover under kahikatea (*Dacrycarpus dacrydioides*) swamp forest including *Hydrocotyle pterocarpa* (blue arrow), *Callitriche petriei* (yellow arrow) and the endangered *Crassula ruamahanga* (red arrow).

## 4. Discussion

The reserve is recognised as perhaps the best example of a floodplain marsh and associated riverine swamp forest of its type in the North Island. The values stem largely from its unmodified hydrology and native dominant vegetation. A total of 104 indigenous species were recorded in two half-day visits to the site (July and October 2008). The rarity of this type of wetland complex with an unmodified hydrology should be recognised with better protection than the current General Purpose Reserve affords. Further investigations are recommended during summer to both increase area accessible and allow identification of some groups (especially sedges and rushes) that were not fertile.

A number of nationally and regionally rare species of plants are present at the site including possibly the northernmost occurrence of *Crassula ruamahanga*, narrow-leaved houhere (*Hoheria angustifolia*) weeping mapou (*Myrsine divaricata*) and *Carex gaudichaudiana*. A wetland of this size and isolation is likely to provide breeding habitat for a number of endangered birds including Australasian bittern (*Botaurus poiciloptilus*) and crakes (*Porzana* spp.). A Department of Conservation survey for the rare black mudfish (*Neochanna diversus*) was undertaken on the same date as this survey. A single mudfish was located in this survey, with more specimens collected 900 m north of the study site in June 2008 (Amy Macdonald, DOC, pers. comm.).

The marsh area appears to be a low lying basin with an old river cut-off that floods during high rainfall events. The current Manganui River channel encloses this area. A range of introduced species have established here including a few species dispersed by waterfowl, such as *Persicaria strigosa*, but predominantly water spread asexually reproducing species such as alligator weed and parrot's feather. Their impact on the wetland hydrology appears to be limited as they do not obstruct the main river channel, although these species are conspicuous in the marsh area and are dominant floating mat (sudd) formers in this area, occupying some areas that would have supported sedge and raupo beds or open water habitat. Although these species are highly invasive, especially in fertile wetlands, control of these species would not achieve significant conservation gains, especially in the long-term. It is likely that there are infestations of these plants further up the catchment and re-infestation would occur after each flood event. These species would be more problematic in permanent ponded areas and are likely to completely smother them.

Fortunately willows (*Salix* spp.) especially grey willow (*S. cinerea*) were not located in the areas investigated. This species is likely to have the greatest impact of any weed species on all but the densest forest stands and should be part of any weed surveillance programme considered for the wetland.

The swamp forest is remarkably free of pest plants with the notable exception of wandering jew, which like alligator weed is asexual in New Zealand and would be dispersed from upstream sites by flood events. It is having considerable impact on native seedling establishment and displacement of other ground cover species. Current work by Landcare Research Ltd. investigating the potential for biocontrol agents for wandering Jew show good promise (Nick Waipara, Auckland Regional Council, pers. comm.) and this site would be an ideal place to trial effectiveness of control. Other environmental weeds typical of such swamp forests such as Japanese honeysuckle (*Lonicera japonica*), royal fern (*Osmunda regalis*) and privets (*Ligustrum* spp.) were not recorded, and efforts should be made to prevent establishment of these and other weeds.

## 5. Recommendations

- The rarity of this type of wetland complex with an unmodified hydrology should be recognised with better protection than the current General Purpose Reserve affords.
- A full survey of the Reserve should be undertaken during December-March should be carried out to identify any further endangered plants or vegetation types.
- Assessment of other biota especially birds should be undertaken.
- Control of alligator weed, parrot's feather, primrose willow, wandering jew and other introduced species are not advocated, but introduction of wandering Jew biocontrol agents should be pursued at this site.
- The threat from a range of weeds not known from the site is such that a surveillance programme should be initiated. A survey for the nearest sources of bird dispersed species, such as Japanese honeysuckle and privet and wind dispersed species, such as grey willow should be included in this programme.

## 6. Appendix: Species list of plants found in the Manganui River Government Purpose (Wildlife Management) Reserve

Species name	Common name
<b>Indigenous Species - Ferns</b>	
<i>Adiantum aethiopicum</i>	maidenhair fern
<i>Adiantum hispidulum</i>	maidenhair fern
<i>Adiantum viridescens</i>	maidenhair fern
<i>Arthropteris tenella</i>	
<i>Asplenium bulbiferum</i>	hen and chicken fern
<i>Asplenium flaccidum</i>	hanging spleenwort
<i>Asplenium polyodon</i>	
<i>Blechnum chambersii</i>	
<i>Blechnum membranaceum</i>	
<i>Blechnum novae-zelandiae</i>	swamp kiokio
<i>Cyathea dealbata</i>	ponga, silver fern
<i>Deparia petersenii</i>	
<i>Dicksonia squarrosa</i>	wheki
<i>Diplazium australe</i>	
<i>Doodia australis</i>	
<i>Histiopteris incisa</i>	water fern
<i>Hymenophyllum demissum</i>	filmy fern
<i>Hymenophyllum frankliniae (ferrugineum)</i>	filmy fern
<i>Hypolepis ambigua</i>	
<i>Lastreopsis glabella</i>	
<i>Lastreopsis velutina</i>	
<i>Microsorium pustulatum</i>	hound's tongue
<i>Paesia scaberula</i>	ring fern
<i>Pellaea rotundifolia</i>	
<i>Pneumatopteris pennigera</i>	

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<i>Pteris tremula</i>	
<i>Pyrrhosia eleagnifolia</i>	leather leaf fern
<b>- Trees, shrubs and lianes</b>	
<i>Alectryon excelsa</i>	titoki
<i>Beilschmiedia tarairi</i>	taraire
<i>Beilschmiedia tawa</i>	tawa
<i>Carmichaelia australis</i>	New Zealand broom
<i>Coprosma arborea</i>	
<i>Coprosma areolata</i>	
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma rhamnoides</i>	
<i>Coprosma rigida</i>	
<i>Coprosma rotundifolia</i>	
<i>Coprosma spathulata</i>	
<i>Cordyline australis</i>	te kouka, cabbage tree
<i>Corynocarpus laevigata</i>	karaka
<i>Dacrydium cupressinum</i>	rimu
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Geniostema rupestre</i>	hangehange
<i>Hebe stricta?</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood
<i>Hoheria angustifolia</i>	narrow-leafed houhere
<i>Knightia excelsa</i>	rewarewa
<i>Kunzea ericoides</i>	kanuka
<i>Laurelia novae-zelandiae</i>	pukatea
<i>Leptospermum scoparium</i>	manuka
<i>Lophomyrtus bullata</i>	ramarama
<i>Melicope simplex</i>	poataniwha
<i>Melicytus micranthus</i>	small-leaved mahoe

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<i>Melicytus ramiflorus</i>	mahoe
<i>Metrosideros diffusa</i>	white rata
<i>Metrosideros perfoliatus</i>	white rata
<i>Muehlenbeckia australis</i>	pohuehue
<i>Muehlenbeckia complexa</i>	pohuehue
<i>Myrsine australis</i>	mapou
<i>Myrsine divaricata</i>	weeping mapou
<i>Nestegis cunninghamii</i>	black maire
<i>Nestegis lanceolata</i>	white maire
<i>Parsonsia heterophylla</i>	New Zealand jasmine
<i>Passiflora tetraptera</i>	kohia, New Zealand passionfruit
<i>Pennantia corymbosa</i>	kaikomako
<i>Pittosporum cornifolium</i>	tawhirikaro
<i>Plagianthus regius</i>	manatu, lowland ribbonwood
<i>Podocarpus totara</i>	totara
<i>Prumnopitys taxifolia</i>	matai
<i>Rhopalostylis sapida</i>	nikau
<i>Ripogonum scandens</i>	supplejack
<i>Rubus schmidelioides</i>	bush lawyer
<i>Sophora microphylla</i>	kowhai
<i>Streblus heterophyllus</i>	small leaved milkwood
<b>- Dicot herbs</b>	
<i>Callitriche petriei</i>	
<i>Calystegia tuguriorum</i>	
<i>Centella unifolia</i>	
<i>Crassula ruamahanga</i>	
<i>Geranium solandri</i>	
<i>Haloragis erecta</i>	toatoa
<i>Hydrocotyle moschata</i>	

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*Hydrocotyle novae-zelandiae*

*Hydrocotyle pterocarpa*

*Oxalis exilis?*

*Persicaria decipiens* swamp willow weed

*Viola cunninghamii*

**- Monocots**

*Carex gaudichaudiana*

*Carex maorica?*

*Carex ochrosaccus*

*Carex secta* purei

*Carex virgata* swamp sedge

*Collospermum hastatum*

*Earina mucronata* bamboo orchid

*Eleocharis acuta* spike sedge

*Eleocharis sphacelata* tall spike sedge

*Freycinettia baueriana* kiekie

*Isolepis reticularis*

*Juncus australis*

*Juncus edgariae*

*Juncus pallidus*

*Juncus usitatus*

*Oplismenus hirtellus*

*Schoenoplectus tabernaemontani* lake club rush

*Typha orientalis* raupo

**Introduced Species**

*Agrostis stolonifera* creeping bent

*Alisma plantago-aquatica* water plantain

*Alternanthera philoxeroides* alligator weed

*Anthoxanthum odoratum* sweet vernal

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<i>Azolla pinnata</i>	ferny azolla
<i>Bidens frondosa</i>	beggar's ticks
<i>Carex longus?</i>	
<i>Cortaderia selloana</i>	pampas
<i>Cyperus eragrostis</i>	umbrella sedge
<i>Galium palustre</i>	marsh bedstraw
<i>Juncus acuminatus?</i>	
<i>Juncus effusus</i>	soft rush
<i>Landoltia punctata</i>	purple-backed duckweed
<i>Lotus pedunculatus</i>	lotus major
<i>Ludwigia peploides</i>	primrose willow
<i>Mentha spicata</i>	spearmint
<i>Myriophyllum aquaticum</i>	parrot's feather
<i>Oenanthe pimpinelloides</i>	parsley dropwort
<i>Persicaria hydropiper</i>	water pepper
<i>Persicaria strigosa</i>	
<i>Ranunculus repens</i>	creeping buttercup
<i>Rumex conglomeratus</i>	clustered dock
<i>Tradescantia fluminensis</i>	wandering Jew

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