

# Botanical Values and effects associated ORC water plan change for the Manuherikia River

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## Critical issues

- A change in flow regime within the Manuherikia River could have direct impacts upon terrestrial ecosystems values.
- A rise in Falls Dam would result in the flooding of habitat and result in a loss of ecological values.
- New water storage reservoirs and dams could result in a loss of ecological values.
- Water takes and associated infrastructure could result in a loss of ecological values.
- Increased irrigation has potential to impact upon ecological values.

## Summary of values and effects

- There is a limited amount of indigenous vegetation associated with the bed of the river that would be directly impacted by a change of flow in the catchment. The most vulnerable ecosystems are likely to be wetlands which could occur either along the riverbed or in close proximity to the river. While these are likely to be small scale and localised. They are also likely to be modified. However, as a consequence of paucity of remaining wetlands within the dry Central Otago climate and along the valley floor, any impacted wetlands would have ecological significance.
- While there are many threatened plant species within the catchment, few if any are likely to occur within the bed of the river and be directly impacted by a change of flow in the catchment. Therefore, limited impact is likely from a change flow regime in the Manuherikia River.
- A likely impact upon indigenous vegetation will be from a rising of the level of Falls Dam or the creation of other dams. An increase in the level of Falls Dam would impact upon populations of threatened plant species, fauna species and also result in the flooding of indigenous vegetation. The effect of this will be dependent upon the change in height and the area of land that is flooded.
- It is anticipated that the creation of other reservoirs could also result in the loss of indigenous vegetation and potentially threatened plant species. Further it is anticipated that any new dam or rise in Falls Dam would require a separate RMA consent process including an appropriate ecological impact assessment.
- Any water take or other infrastructure could also result in impacts upon indigenous vegetation and threatened plant species. Adequate detail on the location would be required to assess the effects.
- Any expansion in irrigation has potential to impact upon indigenous vegetation, including rare dryland vegetation, as well any associated threatened plant species. Adequate detail on the location of irrigation and associated infrastructure would be required in order to assess the effects.

## Ecosystem values

- The catchment of the Manuherikia River contains a rich diversity of ecosystems.
- The catchment of the Manuherikia River contains several naturally rare ecosystems.
- The valley floors are generally classified as Threatened LENZ units.
- The catchment of the Manuherikia River contains several EMU and SMU's.

## Overview of the Catchment

The northern headwaters of the Manuherikia River arises near Omarama Saddle between the northern St Bathans Range and northern Hawkdun Range. The confluence of the Manuherikia River with the Clutha River is at Alexandra. The major tributaries of the Manuherikia River are Dunstan Creek, Manor Burn, Pool Burn and Ida Burn, other tributaries include the Lauder Stream, Dunstan Creek, Chatto Creek and many others. The western boundary of the catchment is formed by the Dunstan Mtns, Chain Hills and Dunstan Range. The eastern boundary of the catchment is formed by the Hawkdun Mtns, Rough Ridge and the extensive plateau country to the east and south-east of Alexandra (including the Manorburn/Greenland and Poolburn Reservoirs).

## Ecosystems present

There is extensive indigenous vegetation that occurs within the Manuherikia River. It is likely that up to 14 naturally occurring and an additional 5 secondary (i.e. successional) ecosystems are present within the Manuherikia River catchment (see Attachment 1). In addition, it is thought that up to 9 naturally rare ecosystems could be present (see Attachment 2). Naturally rare ecosystems have been identified as National Biodiversity Priority 3 (MfE, 2007). Further, six of these naturally rare ecosystems have been assessed as threatened (see Attachment 2).

In general, the valley floor and terraces are much modified generally having been cultivated. The LENZ maps show the pattern of land use and extent of remaining indigenous vegetation cover. The major area of indigenous cover remaining on the valley floor terraces now remaining is in the upper catchment above Falls Dam, but also including Fiddlers Flat (below Falls Dam). Elsewhere indigenous vegetation remains as fragment remnants. The most common indigenous vegetation remnants are shrublands and generally dominated by matagouri (*Discaria toumatau*). These shrubland remnants are also likely to contain native broom (most commonly *Carmichaelia petriei*), *Coprosma* species (most commonly mingimingi (*Coprosma propinqua*)), porcupine shrub (*Melicytus alpinus*), *Olearia odorata*, koromiko (*Hebe salicifolia*), the vine - *Muehlenbeckia complexa* and the lawyer vine – *Rubus schmidelioides*. The shrublands may locally contain rare species including *Coprosma intertexta*, *Olearia lineata*, coral broom (*Carmichaelia crassicaule* ssp. *crassicaule*), climbing broom (*C. kirkii*) or other species. The shrublands remnants are most likely to occur on steep scarp slopes, hillslopes and in gullies. Locally, there are the naturally rare salt pan areas.

With increasing altitude, the proportion of indigenous vegetation and naturalness increases. The upper slopes of mountain ranges are dominated by snow tussockland including both narrow-leaved snow tussock (*Chionochloa rigida* ssp. *rigida*) and slim snow tussock (*C. macra*). In parts of the catchment there are extensive fellfields occur on the more exposed summits and sparsely vegetated scree slopes.

## **Ecological Management Units**

There are 9 Ecological Management Units found in the Manuherikia catchment (see Attachment 3). The Falls Dam lakeshore turf and Fiddlers Flat – Home Hills EMU will both be impacted by the raising of Falls Dam.

## **Threatened LENZ Environments**

Most of the valley floor of the Manuherikia Valley (below Falls Dam) and the Pool Burn/Ida Burn Valley floor is classified as Acutely Threatened (i.e. ,10% remaining in indigenous vegetation cover). The remainder of the valley floors is either Chronically Threatened (i.e. 10-20% remaining in indigenous vegetation cover) or At Risk (i.e. 20-30% remaining in indigenous vegetation cover). Much of the lower and mid slope mountain slopes are either Chronically Threatened or At Risk. Generally, only the upper mountain slopes and summit areas have a lower LENZ threat classification. Ecosystems with less than 20% indigenous vegetation cover remaining have been identified as National Biodiversity Priority 1 (MfE, 2007).

## **Impacts upon ecosystem values**

There are several different threats to the terrestrial ecosystem and flora values within the Manuherikia River catchment that are associated with water takes, changes flow regimes, damming/inundation and irrigation. These impacts are discussed below.

### **Water take effects within the catchment**

#### **A) Impact from changed flow regime**

The effects of a change in flow regime is likely to be largely restricted to the riverbed. There are limited areas of indigenous vegetation that will be directly impacted by changes in flow regime. Terrestrial Ecosystems that are potentially impacted could include areas of braided river bed, wetlands and riparian shrublands. The braided riverbed is naturally sparsely vegetated and for much of the main branch of Manuherikia River, Pool Burn and Ida Burn there is now very little native vegetation. The primary ecological value of the braided riverbed is the habitat it provides for native fauna (particularly birds).

There are likely to be wetlands associated with the riverbed. These wetlands are likely to be small scale and scattered. They are also likely to be modified containing a mixture of native and exotic species. Despite the small size and modification any wetlands affected are likely to have ecological significance. These wetlands have not been mapped. Therefore, the importance of these wetlands remains to be determined.

#### **B) Increased weediness to riverbeds.**

- Lowering flows will expose more riverbed.
- Exposed riverbed is likely to be invaded by exotic plants that benefit from disturbed areas. Further the impact of exotic plants could be exacerbated if combined with the creation of storage dams as these may reduce flood impacts.
- Increased weed abundance will reduce nesting habitat for braided river birds.
- Increased weed abundance provides additional cover for introduced predators and so may result in reduced breeding success for braided river birds.

### **Infrastructure associated with water takes**

Water takes will involve a range of structures and infrastructure (including impacts in the bed of watercourse, on the riparian margins and extending from the river margins). The current and potential future impacts have not been assessed individually. Riparian vegetation will be locally impacted by clearance and or disturbance and can result in fragmentation impacts and weed invasion. The most common riparian vegetation is likely to be grey shrubland, however short tussockland or other vegetation could be present locally. The importance of the riparian vegetation will vary dependent upon the site.

### **Water storage reservoirs**

There are 4 existing major water storage reservoirs in the catchment these are Falls Dam, Greenland, Manorburn and Poolburn reservoirs. However other smaller reservoirs exist and more may be created in the future. There are active plans for raising the level of Falls Dam. A rise in the level of Falls Dam will have ecological impacts.

#### **a) Raising of Falls dam**

- Lake shore turf vegetation occurs around the margin of Falls Dam. This is a naturally rare ecosystem (Williams *et al.* 2006) and has the threatened status of Critically Endangered (Holdaway *et al.* 2012).
- Raising the dam will permanently flood the lake shore turf vegetation. Therefore, potentially the full extent of this naturally rare ecosystem will be lost. This is the only occurrence of this ecosystem within the Manuherikia catchment.
- Other ecosystems will also be impacted. The extent of impact will be dependent upon the level of lake level increase. These ecosystems likely to be impacted include shrublands, short tussockland, wetland and braided riverbed.
- There are 2 EMU's associated with Falls Dam. These are the Falls Dam lakeshore turf and Fiddlers Flat/Home Hills EMU's. Both are likely to be impacted by any rise in lake levels.
- There are threatened species that will be impacted by the raising of the lake level. These are discussed in the threatened plant section below.

#### **b) Other storage dams**

The other major existing reservoirs are the Manorburn, Greenland and Poolburn Reservoirs. There are additional existing small reservoirs present. There is likely to be other storage dams created in the future. The values impacted will only be able to be quantified once the location is finalised. However, storage dams are likely to be located in gullies where they are feed by existing waterways. Gully locations potentially contain native shrublands and potentially wetlands. The establishment of a reservoir will result in a change in flow regime in the catchment.

### **Impacts from additional irrigation**

There is likely to be increases in the extent of irrigated land in the future. The potential expansion of irrigation is likely to be the major impact upon terrestrial ecological values within the Manuherikia catchment. There is likely to be a range of effects on native vegetation from irrigation and associated land use change including cultivation and intensification of land use. There will be both direct impacts and secondary impacts. The direct impact of irrigation (and associated land use intensification) is the loss of habitat. There are also a number of indirect effects from irrigation, these include:

- Irrigation can increase the humidity in the surrounding area. This is detrimental to dryland plants that have evolved to survive in arid environments.

- Addition of water directly onto dryland ecosystems is detrimental to these places. Increased water can facilitate the spread and survival of weed species that then outcompete native plants. Without this additional water, the weedy species may struggle to survive in the dry environments, whereas native plants have evolved to cope.
- Development of intensively irrigated brassica crops is detrimental to native brassica plants:
  - The inland cress species *Lepidium* species are all susceptible to white rust (*Albugo*) and brassica viruses.
  - Brassica crops and brassica weeds (like shepherd's purse) can be a large reservoir of both white rust and brassica viruses.
  - Increased humidity also benefits the white rust fungi, which does not do as well in dry environments.
  - Likewise, white cabbage butterflies also pose a threat to inland cress species.

### Impacts upon threatened plant species

There are many threatened plant species that have been recorded from the Manuherikia catchment. Attachment 4 provides a list of 37 threatened and 41 At Risk species recorded from the catchment. However, these species are only likely to be impacted if:

- 1) They occur in the bed of the Manuherikia River and are directly impacted by a change in flow regime.
- 2) They are impacted by water take infrastructure including pipelines.
- 3) They are impacted by future increased irrigation and associated land use intensification (both direct and indirect impact).
- 4) They have potential to be impacted by changes in the storage of Falls Dam (including being impacted by associated infrastructure).
- 5) They are affected by the creation of additional water storage reservoirs.

Of these four impacts it is only possible to determine the impact relating to 1 and 3 (as the locations that could be impacted by 2, 4 and 5 have not been defined).

Threatened plant species impacted by a change in flow regime within the Manuherikia River (or its tributaries):

- There are several rare plant species that occur as riparian species including *Carmichaelia curta*, *C. kirkii*, *C. petrieii*, *C. compacta*, *Coprosma intertexta*, *Olearia lineata* and matagouri (*Discaria toumatau*). There are no clear impacts to these species from a change in flow regime.
- There are also some rare plant species that occur in wetlands which could be impacted by a change in flow regime. These rare wetland plants include *Triglochin palustre*, *Ranunculus ternatifolius*, *R. maculatus*, *Deschampsia caespitosa*, *Carex tenuicaulis*, *C. berggrenii*, *Tetrachondra hamiltonii* and *Mentha cunninghamii*.
- There are few if any species whose preferred habitat is the bed of rivers. However, examples include *Muehlenbeckia ephedrioides*.

Plant species potentially impacted by the raising of Falls Dam: The number of species would depend upon the extent of lake level increase. Detailed survey would be required to be certain of which species would be impacted. Threatened species that are thought likely to

occur include *Lepidium sisymbrioides*, *L. solandri*, *Carmichaelia crassicaule* ssp. *crassicaule*, *C. curta*, *C. vexillata*, *C. petriei*, *Coprosma intertexta* and other species.

Notable threatened plant values:

The Manuherikia catchment contains several notable threatened plant values.

- A high diversity of threatened and At Risk species
- The Salt pan ecosystems contain some notable threatened plant species. These include *Lepidium kirkii*, *Puccinellia raroflorens* and *Atriplex buehneri*.
- Summer annual plant species – *Ceratocephala pungens*, *Myosotis brevis* and *Myosurus minimus* ssp. *novae-zelandiae*.
- A national stronghold for some species.

### **What are the critical times of year for the values?**

Spring:

- Appearance of spring annual plants. These species may occur in seasonally damp areas or depressions. They complete their lifecycles before the area dries out. Others germinate in tarn and lake margins as the water table drops and the soil becomes exposed. It is essential that these systems keep their regular system of water as weeds can invade the exposed soil if the water is removed for long periods of time.
- Beginning of flowering season for most species, which is essential for sustaining populations of threatened plants.

Summer:

- Continuation of flowering and exposing of tarn edges as water evaporates.
- Beginning of fruiting season, which is essential for sustaining populations of threatened plants.

Autumn:

- Continuation of fruiting season.

Winter:

- Replenishment of water into tarn and lake systems. Important for ensuring weeds do not take hold in the soils exposed during summer months.

### **Additional information requirements**

Other terrestrial ecological values that will also be impacted include fauna values in particular, braided riverbed birds, lizards and invertebrates.

To determine the specific site impacts the location information will be needed.

There is limited information that I had available regarding the impacts raising Falls Dam. I understand that there have been ecological assessments undertaken. These reports if available would provide greater detail on the potential effects.



## Attachment 1 Ecosystems found in the Manuherikia catchment

### Code Ecosystem name

CLF1	Hall's totara, mountain celery pine, broadleaf forest
CDF2?	<i>Dracophyllum</i> , mountain celery pine, <i>Olearia</i> , <i>Hebe</i> shrub [Sub-alpine scrub]
AL1	Narrow-leaved and slim snow tussock
AH2	<i>Dracophyllum muscoides</i> cushionfield
TI4	Coprosma, <i>Olearia</i> scrub [Grey scrub]
WL8?	Herbfield/mossfield/sedgeland (thought likely to be present)
WL9	Cushionfield
WL16?	Red tussock, <i>Schoenus pauciflorus</i> tussockland (thought likely to be present)
WL17	<i>Schoenus pauciflorus</i> sedgeland [Alpine seepages/flushes]
WL22?	<i>Carex</i> , <i>Schoenus pauciflorus</i> sedgeland
CL8	<i>Helichrysum</i> , <i>Melicytus</i> shrubland/tussockland/rockland
SC1	Gravelfield [Scree and boulderfields]
BR1	Hard tussock, scabweed gravelfield/stonefield
SA11	Kirk's scurvey grass herbfield/loamfield
VS6	Matagouri, <i>Coprosma propinqua</i> , kowhai scrub
VS7	Mountain tauhinu, <i>Dracophyllum rosmarinifolium</i> scrub
VS 10	Bracken fernland
VS11	Short tussockland
VS14	Tall snow tussock tussockland

## Attachment 2 Naturally Rare ecosystems present

Ecosystem name	Threat status
Inland outwash gravels	Critically Endangered
Braided riverbeds	Endangered
Inland Saline (salt pans)	Critically Endangered
Lake margins	Vulnerable
Cushionbogs	Not Threatened
Ephemeral wetlands?	Critically Endangered
Tarns?	Not Threatened
Seepages and flushes	Endangered
Snowbanks	Not Threatened

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### Attachment 3 Ecological Management Unit's within the Manuherikia catchment

#### 300494 – Hawkdun Range

- Prescription is not started.
- Rank = 612.
- Fire induced tussock grasslands/subalpine tussock grasslands and screes on greywacke.
- Contains a range of threatened plants, fish and reptiles.

#### 300987 – Northern Dunstons

- Rank = 300.
- Most is on private land.
- Tussock/shrubland with cushion fields at higher altitudes.
- Contains the threatened plant *Ranunculus brevis* (Threatened – Nationally Endangered).

#### 300851 – Fiddlers Flat – Home Hills

- Rank = 256.
- One third of the management unit is PCL, the rest is private land with conservation covenants.
- Kānuka/*Olearia* shrublands.
- Contains threatened plants including *Lepidium sisymbrioides*.

#### 300852 – Unnamed Lake, Rough Ridge

- Rank = unranked.
- Private land site.
- Prescription not developed.
- No species listed.

#### 300986 – Shepherds Creek

- Rank = 555.
- Prescription not started.
- Tōtara forest with mountain toatoa.
- No Species listed.

#### 300984 – Dunstan Creek Gorge

- Rank = unranked.
- Management unit is on s9(2)(a), currently in tenure review.
- Kānuka/*Olearia* scrub.
- No species listed.

#### 401015 – Manuherikia

- Rank = not ranked.
- Prescription active.
- Multiple covenants and conservation areas.
- Fish species are listed.

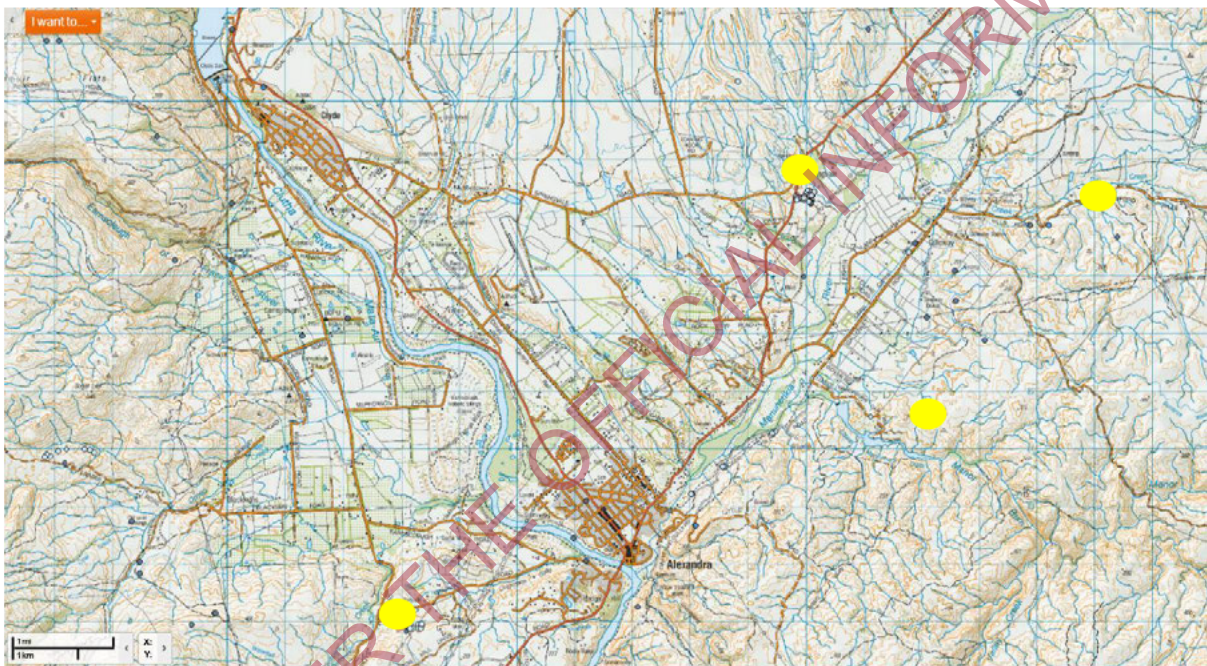
#### 300495 – Falls Dam lakeshore turf

- Rank = unranked.
- Prescription not started.
- Private ownership.

- Rising the dam would be a threat to the management unit.
- No work done, because the long-term viability of the management unit is uncertain.
- Various lakeshore turf species (not listed) and skinks.

#### 300843 – Manuherikia saline sites

- Rank = 167.
- Prescription active.
- Mix of private land (without covenants) and PCL.
- Inland saline herbfields and ephemeral tarns/lakes.
- Contains many threatened plant species, including *Ceratocephala pungens*, *Isolepis basilaris*, *Lepidium kirkii*, *Myosotis brevis*, *Myosurus minimus* subsp. *novae-zelandiae*, *Puccinellia raroflorens*.
- Contains threatened invertebrate species.



Location of the Manuherikia saline sites.

Attachment 4 Threatened and At Risk plant species.

The table below provides a list of threatened plants within the entire Manuherikia catchment. Many of these species are found in the ranges surrounding the Manuherikia River rather than directly alongside the River or on the highly developed alluvial outwashes and terraces.

The species listed here have been identified from the DOC bioweb database (as viewed from the DOC GIS platform), plant lists from Graeme Jane's Plant Database, and by searching observations uploaded onto iNaturalistNZ.


Threat Status	Species	Directly affected by plan change (y/n)
Threatened	Nationally Critical	<i>Carmichaelia curta</i>
	Nationally Critical	<i>Ceratocephala pungens</i>
	Nationally Critical	<i>Chenopodium detestans</i>
	Nationally Critical	<i>Crassula peduncularis</i>
	Nationally critical	<i>Lepidium kirkii</i>
	Nationally critical	<i>Lepidium sisymbrioides</i>
	Nationally critical	<i>Lepidium solandri</i>
	Nationally critical	<i>Leptinella conjuncta</i>
	Nationally Critical	<i>Myosotis albosericea</i>
	Nationally Critical	<i>Myosotis cheesemanii</i>
	Nationally Critical	<i>Myosotis oreophila</i>
	Nationally Critical	<i>Pachycladon exile</i>
	Nationally Critical	<i>Puccinellia raroflorens</i>
	Nationally Critical	<i>Simplicia laxa</i>
	Nationally Critical	<i>Triglochin palustris</i>
	Nationally	<i>Crassula multicaulis</i>
	Endangered	
	Nationally	<i>Pachycladon cheesemanii</i>
	Endangered	
	Nationally	<i>Ranunculus brevis</i>
	Endangered	
	Nationally	<i>Senecio dunedinensis</i>
	Endangered	
	Nationally	<i>Veronica cupressoides</i>
	Endangered	
	Nationally Vulnerable	<i>Atriplex buechananii</i>
	Nationally Vulnerable	<i>Carex albula</i>
	Nationally Vulnerable	<i>Carex inopinata</i>
	Nationally Vulnerable	<i>Carmichaelia crassicaulis</i> subsp. <i>racemosa</i>
	Nationally Vulnerable	<i>Carmichaelia kirkii</i>
	Nationally Vulnerable	<i>Kunzea robusta</i>
	Nationally Vulnerable	<i>Kunzea serotina</i>
	Nationally Vulnerable	<i>Leptospermum scoparium</i>
	Nationally Vulnerable	<i>Muehlenbeckia ephendrioides</i>
	Nationally Vulnerable	<i>Myosotis brevis</i>
	Nationally Vulnerable	<i>Myosotis glauca</i>
	Nationally Vulnerable	<i>Myosurus minimus</i> subsp. <i>novaezelandiae</i>
	Nationally Vulnerable	<i>Olearia frimbriata</i>
	Nationally Vulnerable	<i>Ranunculus ternatifolius</i>
	Nationally Vulnerable	<i>Raoulia monroi</i>
	Nationally Vulnerable	<i>Sonchus novae-zelandiae</i>
	Nationally Vulnerable	<i>Tetrachondra hamiltonii</i>
At Risk	Declining	<i>Acaena buechananii</i>
	Declining	<i>Aciphylla subflabellata</i>
	Declining	<i>Achnatherum petriei</i>
	Declining	<i>Carex berggrenii</i>
	Declining	<i>Carex tenuiculmis</i>
	Declining	<i>Carmichaelia petriei</i>
	Declining	<i>Carmichaelia vexillata</i>

Declining	<i>Colobanthus brevisepalus</i>
Declining	<i>Coprosma intertexta</i>
Declining	<i>Deschampsia caespitosa</i>
Declining	<i>Discaria toumatou</i>
Declining	<i>Isolepis basilaris</i>
Declining	<i>Leptinella serrulata</i>
Declining	<i>Luzula ulophylla</i>
Declining	<i>Mentha cunninghamii</i>
Declining	<i>Montigena novae-zelandiae</i>
Declining	<i>Olearia lineata</i>
Declining	<i>Polygonum plebeium</i>
Declining	<i>Pterostylis tanypoda</i>
Declining	<i>Raoulia australis</i>
Declining	<i>Raoulia beauverdii</i>
Declining	<i>Raoulia parkii</i>
Naturally Uncommon	<i>Agrostis subulata</i>
Naturally Uncommon	<i>Anthosachne aprica</i>
Naturally Uncommon	<i>Asplenium subglandulosum</i>
Naturally Uncommon	<i>Cardamine reptans</i>
Naturally Uncommon	<i>Carex purpurata</i>
Naturally Uncommon	<i>Carex subtilis</i>
Naturally Uncommon	<i>Carmichaelia compacta</i>
Naturally Uncommon	<i>Gentianella lilliputiana</i>
Naturally Uncommon	<i>Lageophora barkeri</i>
Naturally Uncommon	<i>Leptinella albida</i>
Naturally Uncommon	<i>Montia angustifolia</i>
Naturally Uncommon	<i>Pimelea pseudolyallii</i>
Naturally Uncommon	<i>Poa senex</i>
Naturally Uncommon	<i>Ranunculus maculatus</i>
Naturally Uncommon	<i>Raoulia petriensis</i>
Naturally Uncommon	<i>Rytidosperma merum</i>
Naturally Uncommon	<i>Urtica aspera</i>
Naturally Uncommon	<i>Veronica chionohebe</i>
Naturally Uncommon	<i>Veronica pimeleoides subsp. faucicola</i>
Relict	<i>Leptinella maniototo</i>

**The Manuherikia catchment has many Ngāi Tahu Taonga Plants.**

<b>Ingoa Māori</b>	<b>Species</b>
Aruhe	<i>Pteridium esculentum</i>
Harakeke	<i>Phormium tenax</i>
Horoeka	<i>Pseudopanax crassifolius</i>
Houhi	<i>Hoheria</i> species
Kānuka	<i>Kunzea</i> species
Kāpuka	<i>Griselinia littoralis</i>
Koromiko	<i>Hebe salicifolia</i>
Kōwhai	<i>Sophora</i> species
Mānīa	<i>Carex flagillifera</i>
Mānuka	<i>Leptospermum scoparium</i>
Pātōtara	<i>Leucopogon fraseri</i>
Raupō	<i>Typha angustifolia</i>
Taramea	<i>Aciphylla</i> species
Tī kouka	<i>Cordyline australis</i>
Toatoa	<i>Phyllocladus alpinus</i>
Toetoe	<i>Cortaderia richardii</i>
Tutu	<i>Coriaria</i> species
Wharariki	<i>Phormium cookianum</i>
Wī	<i>Poa cita</i>
Wīwī	<i>Juncus</i> species

Out of scope



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