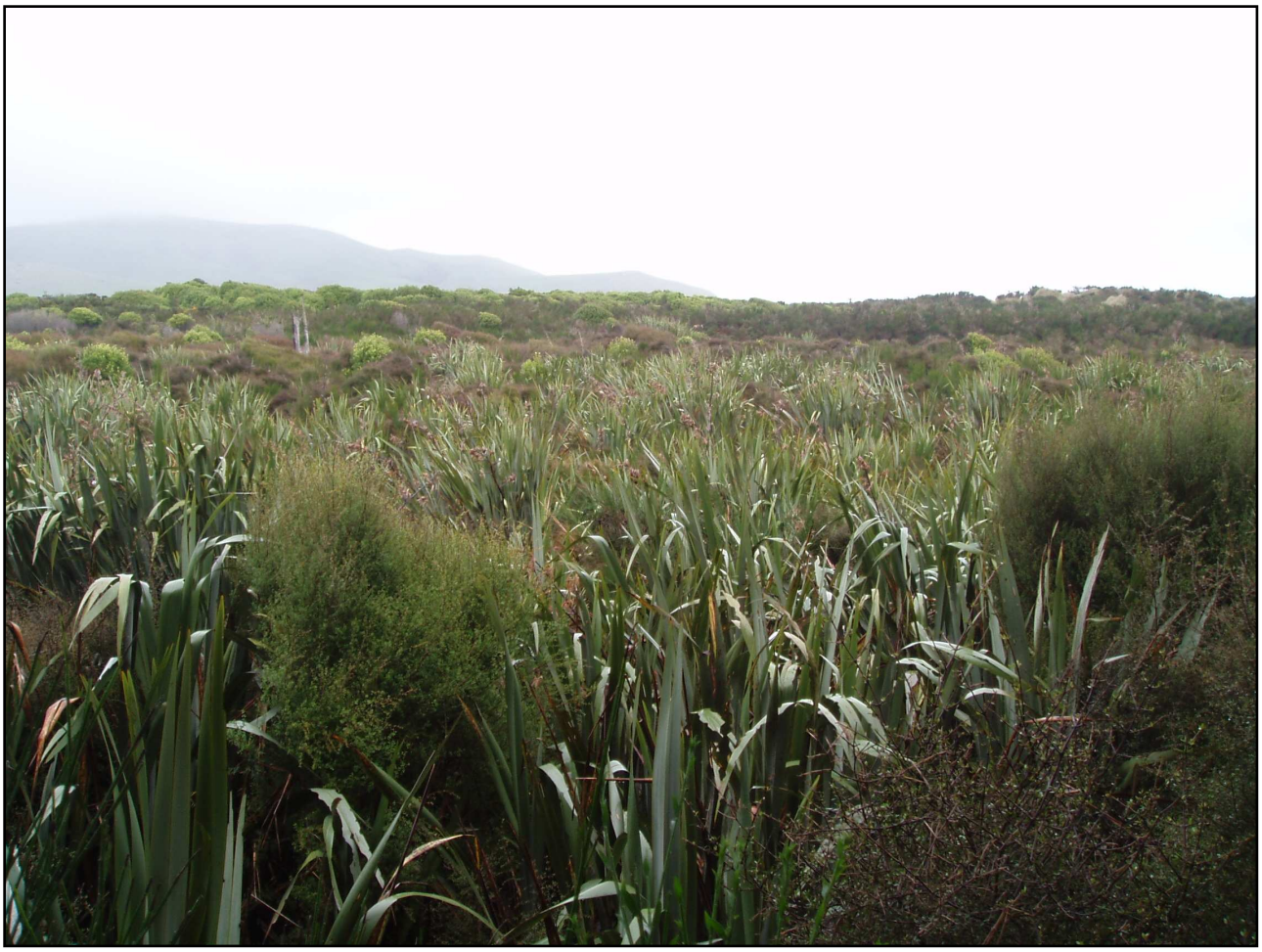
environment SOUTHLAND

Te Taiao Tonga

High Value Area Assessment Report



Site Name: Karyn Owen
Site ID: LGWD2

Survey Date: 16 May 2010

Survey Completed By: Chris Stowe & Kiri Pullen (Urtica Inc. Ecological Monitoring and Consultancy)

Purpose

The purpose of the High Value Areas (HVA) assessment programme is to identify, define, describe, rank and record sites on private land containing indigenous biodiversity values.

This report provides you, the landowner, with information about the presence, condition and relative value of indigenous biodiversity on your land. The information provided in this report aims to:

- promote the benefits of protecting and enhancing indigenous biodiversity values to private landowners and the community in general;
- assist landowners to make decisions about seeking legal protection for biodiversity values on their land through the use of covenants;
- help assess the state of the indigenous biodiversity at local, regional and national level.

It is important to note that your private property rights will not be challenged or threatened in any way by this assessment.

Background

Since the arrival of Polynesian settlers to New Zealand about 750 years ago and, later, by European settlers, there has been substantial pressure on the indigenous flora and fauna of our country. The main changes that have occurred include deforestation, draining of wetlands, and the modification of tussock grasslands. For example, the national extent of indigenous forest cover has been reduced from 85% in pre-Polynesian times to approximately 23% today and 90% of wetlands have been lost over the same time period. The introduction of pest plants and animals has become a threat to the biodiversity of natural ecosystems, and also threatens the productivity of pasture, crops and forestry[1]. Now, it is in the lowlands, where the land is most productive and valuable, where many of our rarest ecosystems and species are found. This makes the fragments of native ecosystems that have been kept by private landowners of a very high value.

Legal Description

- Section I SECT 10 Blk X1 Longwood SD.
- Section II Blk X1 Longwood SD

Location and Access

- 150 Dryden Rd., Colac Bay.
- Access down Dryden Road from Colac Bay.
- Grid reference: E2114126 N5414685.

[1] Ministry for the Environment, State of New Zealand's Environment. Report released 2007.

Figure 1: topographical map showing the HVA unit location

General Habitat Description

See appendix 1 for a map showing approximate boundaries of the unit/s identified within the HVA overlaid onto aerial imagery. Appendix three displays the photographs that illustrate the habitat type and condition of the unit.

Ecological District (ED)[2]

New Zealand is divided into 85 ecological regions and 268 ecological districts. An ecological district is a part of New Zealand where geological, topographical, and climatic factors, as well as biological features and processes all interrelate to produce a characteristic landscape and range of biological communities. The ecological district framework has been widely used by ecologists as the basis for ecological research and environmental management.

The HVA is situated in the Southland ED. Located west of the Southland Plains, the ED is made up of coastal, lowland and montane areas (with a small subalpine area up to 800 m asl. on the Longwood Range). Climatically the environment is cool, with low solar radiation, moderate vapour pressure deficits and low annual water deficits.

Original lowland ecosystems were made up of coastal shrubland-low forest, including minor areas of totara forest on dunes. Low altitude areas near the coast supported flaxland and sedgeland in wetlands and podocarp-hardwood forest on gentle hill country[3]. These original ecosystems have been substantially depleted by clearance for farming and timber. Wetland areas were once far more extensive locally all around Lake George, on flat lands behind Kawakapatu Bay, and behind much of Colac Bay. Of these, close to 50% are now lost to drainage and vegetation clearance.

Ecosystem type and physical description

Non-wetland and wetland ecosystems on coastal plains/flats.

Vegetation type/s

- **Unit 1**: Flax-manuka flaxland (swamp) (0.5 ha)
- **Unit 2**: Manuka forest (5.9 ha)
- **Unit 3**: Kohuhu-manuka scrub (2.8 ha)

Any variation in structure and composition within these units is detailed under ecological features and conditions, below.

Size and Shape

Fragmentation of habitats causes an increase in edge areas and effects. The nature and severity of edge effects are determined primarily by patch shape and size, with aspect, structure of adjoining vegetation, and influxes of animal or plant pests also important. The strength of the edge effect diminishes as one moves deeper inside patch. Therefore a very long, thin area may be all edge.

Edge effects can make the environmental conditions around the margins of any forest or wetland remnant unsuitable for many of its component species, and can have detrimental impacts on plant health, diversity, composition and structure.

The total area of the HVA is approximately 9.2 hectares. It has a compact shape without extensive exposed strips or fingers. As a result, combined with the sheltering effects of the adjacent pine trees

[2] McEwen, W. Mary (editor), 1987. *Ecological regions and districts of New Zealand*. Third revised edition in four 1:5000,000 maps with one booklet to accompany each map. New Zealand Biological Resources Centre Publication No. 5 (in four parts). Department of Conservation, Wellington.

[3] Southland Protection Strategy. A report to the Nature Heritage Fund Committee. M. A. Harding. 1999.

and the buffering effect of the Department of Conservation reserve to the north near Lake George, edge effects are limited.

Connectivity
The diversity and abundance of species able to be present and to persist in any fragment of native habitat is dependent on connectivity with other sites of similar environmental conditions. Connectivity does not have to mean continuous cover of native vegetation between patches since animals can travel to find suitable habitat. However, the more fragments are isolated within a landscape of exotic vegetation, the less connectivity they will have.

The HVA serves as an important corridor connecting the coastal dune system to the south with the forest, scrub and wetland vegetation surrounding Lake George to the north and west. In the wider landscape, the HVA provides a connection with larger areas of indigenous vegetation in the Longwood Range as well as other nearby smaller bush remnants.

Adjacent Land Use
Surrounding land uses include forestry, farming and grazing. Two small areas of forestry adjoin the area. One protrudes from the west side into the interior of the HVA, the other is a small area on the south-east side of the HVA. The paddocks adjoining the HVA to the west are not currently grazed. Paddocks to the east have recently been cleared of scrub (manuka-kohuhu-flax of similar age and composition to the HVA). This area is now being used to graze sheep. A Department of Conservation reserve surrounding Lake George forms most of the northern boundary. A combination of private owners and crown owned agencies own land to the south between the HVA and the coast. Some of this area is leasehold grazing land. Parts of this are not grazed and have a cover of dune vegetation and scrub.

River Catchment
The HVA is within the Ourawera Stream/Lake George catchment.

Ownership
The HVA is in private ownership.

Current Protection
The HVA has no legal protection.

Ecological Features and Condition

The HVA occupies flat, low-lying land with the water table below the surface in most places. However, much of the HVA shows evidence of a once wetter environment. This is indicated by old *Carex secta* (nigger head) stumps scattered throughout the area, as well as the present day species composition in the units. Only the flaxland was characterised as a wetland (swamp). The dominant vegetation types are the manuka forest and kohuhu scrub (Units 2 and 3). Both of these are likely to be seral types that will eventually revert to a podocarp-hardwood association.

Canopy edge condition is overall very good with no areas of dieback noted during the survey. Some portions of the units are protected from strong winds by the tall pines. The interior canopy foliage was mostly dense with only a few canopy holes due to natural tree fall and death. No possum browse was observed on palatable species. A healthy native understorey was present throughout the kohuhu-manuka scrub and in the manuka forest (Units 2 and 3), particularly where the canopy was less dense. In these areas regenerating seedlings and saplings of broadleaf species such as *Coprosma* spp., kohuhu, broadleaf, lancewood, wineberry, five-finger and pate were present. Palatable species such as bush flax (*Astelia fragrans*), hen and chicken fern, hounds tongue fern, soft tree fern, *Dicksonia squarrosa* and prickly shield fern were present in low numbers. The only browse noted was a small amount on

prickly shield fern, narrow-leaved mahoe and *Dicksonia squarrosa*. This could be attributable to deer which occasionally inhabit the area.

The flaxland swamp unit appears to be in the process of becoming a terrestrial environment. This is probably due to the diversion of the natural water inflow into drains running alongside the road, then down the eastern boundary to Lake George. This is allowing dryland species such as broom, gorse and pasture grasses to gain a foothold, as well as native species such as kohuhu, broadleaf, pate and wineberry. No sedimentation, erosion or evidence of increased nutrient levels was noted.

Vegetation associations are described below:

Vegetation Units

- **Unit 1**: Flax-manuka flaxland (swamp) (0.5 ha)

This is a good healthy stand of flax and manuka up to 2.5 m tall with patches of kohuhu, *Coprosma propinqua, Coprosma taylorii*, *Juncus gregiflorus*, *Carex secta* and broom. A fringe of *Coprosma propinqua* can be found on higher ground near the pines, and kohuhu is extensive on drier areas near the road. The overall area of this unit is probably considerably drier now than previously as the small seepage/drainage channel that once fed the basin now flows into a drain alongside the road, rather than through the flaxland. The drier environment is allowing the growth of dryland plants, including weeds such as broom and gorse.

- **Unit 2**: Manuka forest (5.9 hectares)

This vegetation type is dominated by manuka up to 5 m in height, with scattered kohuhu and lancewood also in the canopy. The sub-canopy consists of regenerating kohuhu, wineberry, tree ferns, pate and *Coprosma propinqua.* This is quite dense in places, particularly where the manuka canopy is more open. The groundcover is relatively sparse with scattered crown fern, bracken, water-fern and *Blechnum* spp. Much of this unit is probably a seral type which has the potential to develop into a climax podocarp-broadleaf forest. Approximately 25% of this unit is comprised of a sub-type (not mapped) consisting of manuka-kohuhu shrubland. This area is dominated by short (<1.5 m tall) manuka with scattered kohuhu. It is adjacent to the road between the flaxland and pines.

- **Unit 3**: Kohuhu-manuka scrub (2.8 ha)

This unit is similar to the manuka forest of Unit 2, but has advanced more towards a mixed hardwood association. The manuka canopy is thinning and dying and being replaced by hardwoods, particularly kohuhu, but also with scattered pate, broadleaf and wineberry. Approximately 50% of the canopy of this unit is kohuhu with 30% remaining in manuka. A sub-canopy of *Coprosma propinqua* and tree ferns exists along with a mixed ground-cover of ferns and hardwood seedlings.

Bird Presence

A number of bird species were recorded. Bellbird, blackbird, fantail, grey warbler, harrier, magpie, redpoll and silvereye were noted. In the past we have heard fernbirds in the vegetation along the roadside. The presence of fernbirds is notable. South Island fernbirds are listed as 'at risk – declining'[4].

Other Values

The HVA forms part of the indigenous vegetation that forms a continuous zone around Lake George. Therefore, it is important both in maintaining the naturalness of that area, and buffering the lake from surrounding land use changes. Several archaeological sites (middens) exist not far to the south of the HVA.

[4] Miskelly et al. 2008. Conservation status of New Zealand birds, Notornis 55: 117-135.

Significance of the Habitat in District and National Contexts

Representative Value within the Ecological District

Representativeness is often considered by ecologists to be an important criterion for an assessment of site importance. This is based on the notion that a reserve system should contain the full range of natural ecosystems historically characteristic of an area.

Representativeness alone does not take into account the condition of a site, or its level of modification. However, in an agricultural landscape where natural ecosystems are highly fragmented it is arguable that any site with a natural character that is representative of what formerly existed is vital to attaining an integrated sustainable presence of native biota. Furthermore, such sites form the basis for ecological restoration in heavily modified landscapes.

The flax-manuka flaxland (Unit 1) is representative of the vegetation that originally covered poorly drained, relatively fertile low-lying areas of the ED. This vegetation type once covered approximately 2% of the Longwood Ecological District[5]. The Southland Protection Strategy does not indicate how much manuka forest and kohuhu scrub (Units 2 and 3) naturally existed in pre-human times, but periodic natural fires and disturbance probably maintained at least some areas in this vegetation type. Examples of seral manuka-kohuhu (broadleaf) scrub or forest such as are found in the HVA are likely to be the product of similar, but human, disturbance including land clearance, drainage and fire followed by reversion to scrub/forest.

The remaining extent of regenerating, secondary manuka-broadleaf scrub or forest is difficult to determine but examples are quite extensive in the Lake George area (where it is protected in Department of Conservation reserves) and in various small patches in lowland coastal areas behind Colac and Kawakaputa Bay. Many of these are at risk of development as they are not adequately protected in the Southland District Plan and the perception of many landowners is that they are of limited ecological value. As a result, the HVA is considered to have moderate representative value.

Representative Value at the National Scale (Threatened Environments Classification)

The threatened environment classification (TEC) was developed by Landcare Research to identify where areas of much reduced and poorly protected terrestrial indigenous ecosystems are most likely to occur. It is important to note that the TEC is based on national data sets and has limitations at local and property scales. The classification incorporates background information on New Zealand's terrestrial environments including climate, soils and landforms as well as how much indigenous vegetation remains and how much of it is protected.

There are six different categories within the Threatened Environment Classification. Categories 1 – 3 contain the environments where the loss of habitats for native species has been greatest in the past. Categories 4 and 5 include environments that will have more than 30% of their land area remaining in indigenous cover, but have less than, or up to 20% legally protected, and category 6 environments have greater than 20% of their area protected and more than 30% indigenous cover[6].

Under the TEC, most of the HVA is classified as within a category 6 (i.e. less reduced and better protected), meaning that >30% of indigenous vegetation remains with >20% protected).

[5] Southland Protection Strategy. A report to the Nature Heritage Fund Committee. M. A. Harding. 1999.

[6] Threatened Environment Classification: Guide for Users (Ver 1.1, August 2007), Landcare Research New Zealand Ltd 2007.

Threats Identified

Weeds

Weeds are defined as troublesome or unattractive plants growing in an undesired area[7]. Weeds in New Zealand have major economic and ecological impacts and cost millions of dollars annually to control. In natural ecosystems they may cause irreversible damage to the habitats they invade by smothering or displacing indigenous vegetation[8].

A large number of exotic weed species, particularly grasses and herbs were identified during this survey - most of which are not a threat to the ecological integrity of the site. Other weeds do pose some threat to the HVA and should be managed if possible. These are listed below.

Table 1: Weed species identified that are a threat to the HVA

Common Name	Scientific Name	Comments
Crack willow	*Salix fragilis*	Two individuals seen. These are not in the HVA but are on DOC land around Lake George. These are significant weeds and the owner has permission from DOC to control them.
Chilean flame creeper	*Tropaeolum speciosum*	Seen in several places within Units 2 and 3, particularly where there are gaps in the canopy.
Tutsan	*Hypericum androsaemum*	Eradication plant in Pest Management Strategy. Two small plants seen side by side in NE corner of property.
Spanish heath	*Erica lusitanica*	Eradication plant in Pest Management Strategy. Scattered along stream and open ground of Unit 1 and along roadside of property
Gorse	*Ulex europeaus*	Scattered within the HVA but not abundant.
Broom	*Cytisus scoparius*	Scattered around margins and sometimes in open interior. Mostly in Unit 1 and areas of shorter vegetation in unit 2. A thick band also occurs parallel to the road.

Pest Animals

Pest animals can be defined as species that have been introduced to New Zealand and that have a negative impact on native plants and animals and/or production areas. The major threats to our terrestrial flora and fauna come from possums, rats, mustelids (stoats, ferrets, weasels) and ungulates (deer, goats, pigs). Possums impact on forest health, particularly on canopy foliage, fruits and flowers, and are predators of native bird species. Rats prey on seeds, seedlings, invertebrates, lizards and birds. Ungulates can have a major impact on the vegetation by browsing understorey plants. This can impede or prevent regeneration of canopy species.[9]

Deer and possums are known to be present. Cats, rats, rabbits, hares and stoats are assumed to be present. Deer are present only in low numbers and their impact appears to be minor with little understorey or canopy browse noted. Casual hunting of possums has occurred in the past.

Grazing/Fencing

The present owner is not grazing the property and has no desire to do so. Fences prohibit the entry of stock from neighbouring farms to the east and west, while Lake George and the road access buffer the rest.

Many natural areas in Southland are located on or near areas accessible to stock. When stock have access to an area their grazing damages the vegetation by removing understorey plants and preventing

[7] Weeds, www.dictionary.reference.com.
[8] Weeds, www.landcareresearch.co.nz.
[9] Pest animals, www.doc.govt.nz.

regeneration. Other side effects can include pugging of the soil, and changes in the water quality of wetland and riparian areas.

Other Habitat Modifications

Much of the management history of the HVA is unknown. However, aerial photos from c. 1950 show that the current extent and character of the HVA has not changed significantly since that time. The area was once part of a larger farm and is likely to have been accessible to stock in the past. We know that it has been drained and it is also probable that it was burnt at some stage (old dead spars present).

Most remaining natural areas in Southland are threatened by habitat modification such as drainage and clearance, including felling of trees. These modifications can lead to the loss of some habitats and ecosystems. They also have the potential to alter hydrology and nutrient cycles in the soil.

Management Recommendations

This site is already being very well managed. The owner has a high degree of ecological awareness and is keen to undertake restoration and enhancement of the area.

The main recommendations for the HVA are:

- control gorse and broom within the flax-manuka swamp of Unit 1. If a decision is made to leave the band of broom by the road, then constant vigilance should be maintained to keep young plants out of Unit 1;

- crack willow, Spanish heath, Chilean flame creeper and tutsan pose a potential threat to the ecological integrity of the HVA and should be eradicated or controlled. At this stage of the infestation, the eradication of these weeds is possible without major cost in time or resources;

- it would be interesting to see the effects of restoring some of the water inflow through the flax swamp. This may enhance the viability of the wetland, and mitigate against further spread of weeds such as gorse and broom;

- intensify possum control and establish other forms of pest control such as rat and stoat control;

- formal protection (i.e. QE II covenant) of the HVA would help to ensure its future viability and continued recovery.

Funding may be sought to carry out these recommendations through a number of trusts and organisations throughout the province and the rest of New Zealand.

Conclusion

The HVA contains a diversity of vegetation types, including wetland and non-wetland systems. Three main vegetation units were identified. These include flax-manuka flaxland, manuka forest and kohuhu-manuka scrub. The flaxland swamp is broadly representative of the vegetation that once covered poorly drained, fertile, lowland areas in the Longwood Ecological District. Such vegetation was previously far more extensive than today. The forest and scrub units are seral types that are in the process of developing into taller podocarp-hardwood forest.

The area provides important habitat for a large range of birds and invertebrates and also has scenic value. It is important as a corridor connecting the coastal dune system to the south with the forest, scrub and wetland vegetation surrounding Lake George as well as larger areas of indigenous vegetation

in the Longwood Range. It also forms a useful buffer to the wetland vegetation surrounding Lake George and is important in maintaining the naturalness of this area.

The HVAs condition overall is very good. The canopy is in excellent condition and a healthy native understorey is developing within the forest and shrubland units. Problem weeds are present but these could be controlled or eradicated with prompt action and not too great an investment of resources. The current owner should be congratulated and encouraged for actively addressing these issues.

For further details or assistance please contact:

Environment Southland
cnr North Road and Price Street
Invercargill 9810
Private Bag 90116
Invercargill 9840
Phone 03 211 5115

Appendix 1: Aerial photograph of the HVA with boundaries, vegetation units and waypoint/photopoint locations highlighted. Refer to appendix 2 for key to vegetation units and waypoint descriptions/co-ordinates. Photographs are presented in appendix 3.

Appendix 2: Key to vegetation units and waypoint/photopoint list

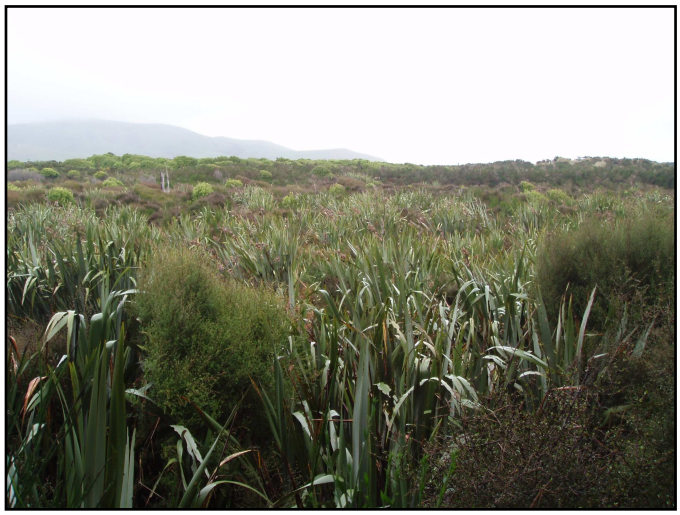
2.1 Key to vegetation units

- **Unit 1**: Flax-manuka flaxland (swamp) (0.5 ha)
- **Unit 2**: Manuka forest (5.9 ha)
- **Unit 3**: Kohuhu-manuka scrub (2.8 ha)

2.2 Waypoint/photopoint list

WPNT no.	Easting	Northing	Description
1	2114301	5414834	Location of two tutsan plants and one small willow.
2	2114182	5414840	Location of one big or several smaller willows, 3 m high.

Appendix 3: Photopoint images



Photopoint 1: View towards Unit 1 from pines (no waypoint)

Photopoint 2: View inside of Unit 2 (no waypoint).

Photopoint 3: View from house over Unit 1 (no waypoint)

Appendix 4: Site plant species list

Species Name	*Common Name*	*Life form*
Cematis paniculata	clematis	Climber/Scrambler
Muehlenbeckia australis	pohuehue	Climber/Scrambler
Parsonsia heterophylla	native jasmine	Climber/Scrambler
Tropaeolum speciosum	Chilean flame creeper	Climber/Scrambler
Rubus fruticosus	blackberry	Climber/Scrambler
Asplenium bulbiferum	hen and chicken fern	Fern
Blechnum chambersii		Fern
Blechnum discolor	piupiu, crown fern	Fern
Blechnum fluviatile	kiwakiwa, creek fern	Fern
Blechnum montanum		Fern
Blechnum novae-zelandia		Fern
Blechnum procerum	small kiokio	Fern
Cyathea smithii	katote, soft tree fern	Fern
Dicksonia fibrosa	wheki ponga	Fern
Dicksonia squarrosa	wheki	Fern
Histiopteris incisa	mata, water fern	Fern
Hymenophyllum multifidum	A filmy fern	Fern
Microsorum pustulatum	paraharaha, hound's tongue	Fern
Polystichum vestitum	puniu, prickly shield fern	Fern
Pteridium esculentum	aruhe, bracken	Fern
Lycopodium varium	hanging clubmoss	Fern ally
Astelia fragrans	bush flax	Herb
Centella uniflora		Herb
Cortaderia richardii	toetoe	Herb
Hydrocotyle novae-zelandiae	a penny-wort	Herb
Lotus pedunculatus	birdsfoot trefoil	Herb
Mycelis muralis	wall lettuce	Herb
Nertera depressa		Herb
Phormium tenax	NZ flax	Herb
Carex secta	niger head	Rush/Sedge/Grass
Holcus lanatus	Yorkshire fog	Rush/Sedge/Grass
Leptocarpus similis	oioi	Rush/Sedge/Grass
Juncus gregiflorus		Rush/Sedge/Grass
Uncina uncinata	a hooked sedge	Rush/Sedge/Grass
Aristotelia serrata	makomako, wineberry	Tree/Shrub
Carpodetus serratus	putaputaweta, marble leaf	Tree/Shrub
Coprosma propinqua		Tree/Shrub
Coprosma psuedociliata		Tree/Shrub

Species Name	*Common Name*	*Life form*
Coprosma rotundifolia		Tree/Shrub
Cordyline australis	cabbage tree, ti kouka	Tree/Shrub
Cytisus scoparius	broom	Tree/Shrub
Dacrydium cupressinum	rimu	Tree/Shrub
Erica lusitanica	spanish heath	Tree/Shrub
Fuchsia excorticata	kotukutuku, tree fuchsia	Tree/Shrub
Griselinia littoralis	kapuka, broadleaf	Tree/Shrub
Leptospermum scoparium	manuka	Tree/Shrub
Melicytus lanceolatus	narrow-leaved mahoe	Tree/Shrub
Myrsine australis	red mapou	Tree/Shrub
Myrsine divaricata	weeping mapou	Tree/Shrub
Pittosporum tenuifolium	kohuhu	Tree/Shrub
Podocarpus hallii	totara	Tree/Shrub
Pseudopanax colensoi	three finger	Tree/Shrub
Pseudopanax crassifolius	lancewood	Tree/Shrub
Salix fragilis	crack willow	Tree/Shrub
Schefflera digitata	pate, seven-finger	Tree/Shrub
Ulex europaeus	gorse	Tree/Shrub

Note: This species list has been compiled from plants observed during the HVA field survey. The survey focused on dominant and common species, as well as some rarer indicator species; therefore, it is not a complete list for the site. Many of the common non-invasive exotic plants, such as pasture grasses and herbs, are not listed.

** denotes introduced species.*