

Christchurch District Plan Site of Ecological Significance

Site Significance Statement

Site name: Lathams

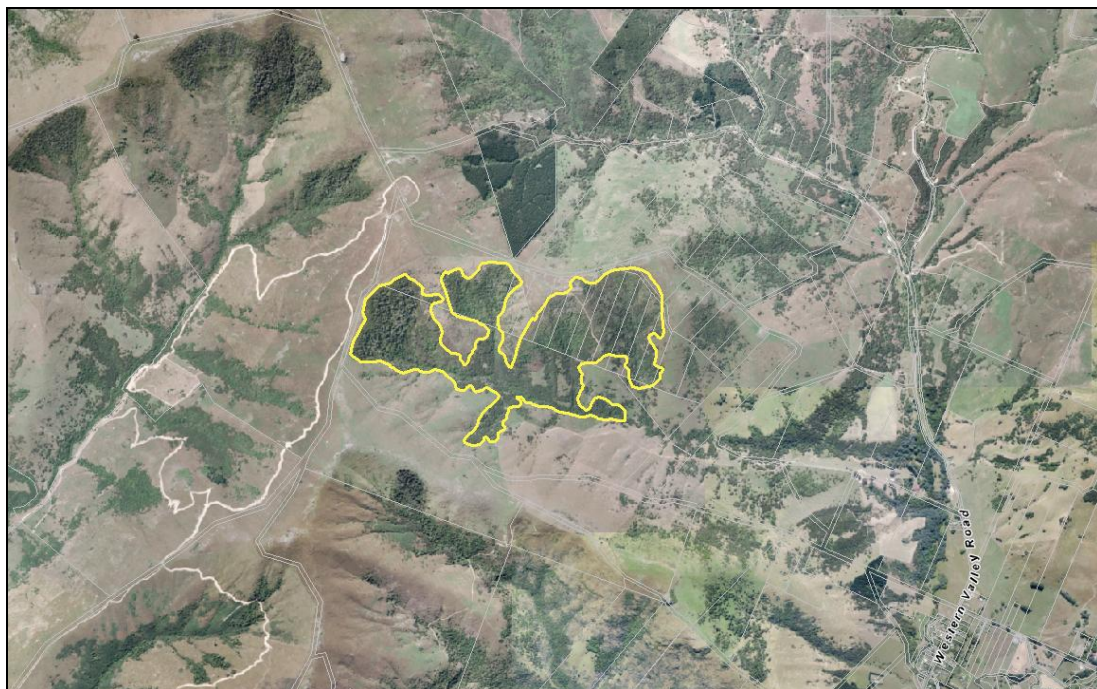
Site number: SES/H/19

Physical address of site: Western Valley Road, Little River

Summary of Significance:

The site is significant because it contains a large area of rare and representative indigenous forest including one of the best remnants of old-growth montane thin-barked totara/hardwood forest on Banks Peninsula. The site supports a high diversity of indigenous plant and invertebrate taxa including invertebrates that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district, a large number of plant species that are uncommon in the ecological district or region and a bird species that is uncommon in the ecological district. The site is well buffered, plays an important role in maintaining ecological processes in the wider landscape and is an important habitat for forest birds and invertebrates.

Site Map



Additional Site Information

Ecological District: Herbert

Area of SES (ha): 123.67

Central point (NZTM): E1581881, N5156424

Site Description

This site is located in a small unnamed valley on the western side of Western Valley, Little River. The valley drains into the Hukahuka Turoa Stream. It is largely on steep south and south-east facing slopes and in gullies in the upper part of the valley. The altitudinal range of the site is from approximately 200 to 660 m above sea level. The Department of Conservation identified the site as a Recommended Area for Protection (Herbert RAP 13 – Latham) (Wilson 1992).

The main vegetation communities identified at the site by (Wildland Consultants unpubl. data 2014a) are:

- Old-growth thin barked totara/mixed hardwood forest on montane slopes
- (Old-growth thin barked totara)/mixed hardwood forest on montane slopes
- Mixed broad-leaved second growth podocarp-hardwood forest on lowland and montane slopes
- Mixed secondary growth podocarp-hardwood forest/scrub
- Secondary growth kanuka forest.

The old-growth montane thin-barked totara/hardwood forest in the Wairewa BPCT covenant is one of the best remnants of its type left on Banks Peninsula (Walls 2010)

Extent of Site of Ecological Significance

The site includes the old-growth montane thin barked totara/ mixed hardwood forest, montane (thin-barked totara)/mixed hardwood forest and scrub and the mixed secondary growth podocarp-hardwood forest and scrub in the upper catchment. It includes both of the BPCT covenants as well as the regenerating forest and scrub east of the Wairewa Extension Covenant. Kanuka forest in the lower valley floor is included in the site because it provides an important link between the areas of higher value forest on the upper slopes.

Connected areas of riparian secondary broad-leaved hardwood forest and kanuka forest downstream of the site are also likely to be significant. However, these areas were not surveyed and there is no up-to-date information to assess their significance. An ecological survey of these areas is recommended.

Assessment Summary

The Lathams Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3 and 4), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

Assessment against Significance Criteria

Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The old-growth montane thin-barked totara/mixed hardwood forest in the Wairewa BPCT covenant is one of the best remnants of its type left on Banks Peninsula (Walls 2010). It has a dense canopy large emergent thin-barked totara trees and young thin-barked totara are abundant and regenerating vigorously around the margins. Occasional matai trees are present. The canopy and subcanopy contain a number of different hardwood species, and the understorey is relatively dense and contains a wide variety of small-leaved shrub species, ferns and native vines (Wildland Consultants unpubl. data 2014a).

The second growth forest and shrubland in the Wairewa Extension BPCT covenant and in the remainder of the site is typical of this vegetation community in the ecological district. The canopy is relatively intact and dense and contains a diverse range of regenerating broadleaved species; the most common species being lancewood, mountain totara, kohuhu, lemonwood/tarata, narrow-leaved lacebark, and mahoe. There are a small number of large emergent thin-barked totara trees within the BPCT covenant (Walls 2010, Wildland Consultants unpubl. data 2014a).

The secondary growth kanuka forest is not significant under this criterion. The canopy is dominated by kanuka and there are only occasional hardwood trees such as mahoe, lemonwood, and kowhai. The subcanopy and understorey vegetation is relatively sparse and consists mainly of unpalatable species (Wildland Consultants unpubl. data 2014a).

The site supports a representative assemblage of Banks Peninsula forest bird species (Walls 2010, Wildland Consultants unpubl. data 2014a). A reasonably high proportion of the species in the "Banks Peninsula native bush bird species assemblage" (Crossland unpubl. data 2014) have been recorded at the site

(Appendix 1) even though no formal bird monitoring has been undertaken. Walls (2010) noted that the covenanted areas are also likely to be used by morepork, kingfisher, shining cuckoo, welcome swallow and perhaps tui.

The site also supports a representative assemblage of indigenous invertebrates. The species composition is highly characteristic of the species assemblages expected in these habitat types on Banks Peninsula. Of the 127 species recorded only three were exotic (Wildland Consultants unpubl. data 2014b). A list of the invertebrate species recorded at the site is provided in Appendix 2.

2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

The site is significant under this criterion.

It is a moderately large example of indigenous forest in the context of the Herbert Ecological District.

Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

The site is significant under this criterion.

The indigenous forest within the site is significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all other indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Of particular significance is the presence of montane old growth thin-barked totara forest within the site. Old growth forest (of any type) has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009).

The old growth thin-barked totara at the head of the basin in the western-most gully (below Trig PP and Pt. 684) is also on a Chronically Threatened land environment (F3.3b) where <20% (17.6%) indigenous vegetation is left on this land environment nationally (Walker et al. 2007). The remainder of the site is on an At Risk land environment and is not significant at the level 4 land environment scale.

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

It supports invertebrates that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district, a large number of plant species that are

uncommon, either within the ecological district or region, and one bird species that is uncommon in the ecological district.

Plants

Wilson (unpubl. data. 1985) recorded *Tmesipteris horomaka* (Threatened - Nationally Critical and endemic to Banks Peninsula) at the site but it was not recorded by Wildland Consultants (unpubl. data 2014a) during a recent botanical survey of part of the site identified by Wilson (1992).

A number of plant species occur at the site (Wildland Consultants unpubl. data 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013):

- *Anisotome aromatica*
- *Blechnum colensoi*
- *Blechnum novae-zelandiae*
- *Epilobium brunnescens*
- *Epilobium pedunculare*
- *Histiopteris incisa*
- *Juncus novae-zelandiae*
- *Luzula picta*
- *Nematoceras trilobus*
- *Notogrammitis billardierei*
- *Olearia ilicifolia*
- *Schizeilema trifoliolatum*
- *Senecio wairauensis*

Walls (2010) also recorded the following plant species that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) with the BPCT covenants:

- *Blechnum colensoi* (Wairewa Covenant)
- *Blechnum novae-zelandiae* (Wairewa and Wairewa Extension Covenants)
- *Histiopteris incisa* (Wairewa Covenant)
- *Olearia ilicifolia* (Wairewa Extension Covenants)
- *Raukaua anomalus*
- *Tmesipteris tannensis* (Wairewa Covenant)
- *Wahlenbergia albomarginata* (Wairewa Covenant)

Birds

One bird species that is uncommon in the Herbert ED occurs at the site Wildland Consultants unpubl. data 2014a):

- South Island rifleman.

Invertebrates

Nationally At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014b) are:

- *Zelandobius wardi* (Ward's stonefly) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)

- *Cosmiotes helonoma* (grass runner) (At Risk – Relict)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014) that are endemic to Banks Peninsula are:

- *Celatoblatta peninsularis* (Banks cockroach)
- *Zelandobius wardi* (Ward's stonefly)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014) that are uncommon in the Herbert Ecological District are:

- *Argyrophenaga antipodum* (tussock butterfly) (uncommon in ecological district) – one of three known locations on Banks Peninsula

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

The site is not significant under this criterion. There are no species at their distributional limits within Canterbury Region or nationally

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

The site is not significant under this criterion. It does not contain vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

The site is significant under this criterion.

The diversity of vegetation communities and ecological sequences is moderate. There are several forest communities including old-growth montane totara-hardwood forest, montane (thin-barked totara)/mixed hardwood forest, secondary growth podocarp-hardwood forest and scrub and secondary growth kanuka forest. Despite the moderate number of vegetation communities the site contains a high diversity of indigenous plant taxa. Wildland Consultants (unpubl. data 2014a) recorded 95 indigenous plant species during a survey of part of the site. This included 20 ferns and 22 tree species (a list of the plant species recorded at the site is provided in Appendix 3). This diversity reflects the altitudinal sequence from 200 to 660 m above sea level, moist conditions on the upper slopes, the relatively intact understorey within those areas of the site that are fenced to exclude stock and the diversity of shrubs, grasses and sedges in forest edge ecotones and early successional vegetation communities.

The site also contains a diverse indigenous invertebrate fauna. A recent survey (Wildland Consultants unpubl. data 2014b) (which targeted moths and butterflies)

found 127 species, of which 106 were moths and butterflies. A list of the invertebrate species recorded at the site is provided in Appendix 2.

Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

It is a relatively large area that is well buffered by kanuka forest and secondary growth podocarp-hardwood forest and scrub.

Kanuka forest in the lower valley floor is significant under this criterion because it provides an important link between the areas of higher value forest on the upper slopes, and buffers and shades the stream that flows through the bottom of the valley.

The large size of the site and the relative intactness and diversity of the higher value forest within the site means it plays an important role in maintaining ecological processes in the wider landscape. It is also part of a network of ecologically important old-growth forest in the wider area including in the head of Prices Valley and the Kaituna Spur and Waipuna Saddle Scenic Reserves. These areas are important 'stepping stones' for the movement and dispersal of mobile indigenous fauna such as New Zealand pigeon.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

The site is not significant under this criterion. There are no wetlands within the site.

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

This large area of forest, which includes old-growth podocarp forest and other areas of relatively intact secondary forest, provides important permanent habitat for a large number of indigenous forest birds. Those species recorded at the site are rifleman (which are uncommon in the ecological district), South Island tomtit, brown creeper, bellbird, New Zealand wood pigeon, Australasian harrier, South Island fantail, grey warbler, silvereye and New Zealand pipit (At Risk – Declining) (Walls 2010, Wildland Consultants unpubl. data 2014a). It also provides important seasonal feeding habitat for New Zealand pigeon.

The site also provides important habitat for a diverse range of indigenous invertebrates including species that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district (Wildland Consultants unpubl. data 2014b).

Site Management

Existing Protection Status

There are Two Banks Peninsula Conservation Trust Covenants within the site; the Wairewa Covenant (9.3 ha) and Wairewa Extension Covenant (11.2 ha). Remaining areas are not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> • Pest animals. • Goats. There are feral goats within the site (Wildland Consultants unpubl. data 2014a). • Possums. Possums numbers appear to be high relative to other areas on Banks Peninsula (Walls 2010, Wildland Consultants unpubl. data 2014a). They have caused severe damage to tree fuchsia in the past and thin-barked totara and understory seedlings have also been damaged by possums (Walls 2010). 	<ul style="list-style-type: none"> • Consider removing goats. Goats are a serious threat to the ecological values of the site. They also have the potential to spread onto neighbouring properties and into other areas with high ecological values. Not removing goats poses a significant threat to the success of the multi-agency Banks Peninsula Feral Goat Eradication Programme. • Consider monitoring possum numbers within the site and maintaining possum numbers at low densities using one or a combination of spotlighting, bait stations or kill trapping. 	<ul style="list-style-type: none"> • Discussion with the landowner about the benefits to biodiversity of goat control. • Assistance for the landowner with goat control if agreed. • Advice and guidance for landowner about monitoring and control of possums, with assistance as appropriate.
<ul style="list-style-type: none"> • Biodiversity pest plants. There are very few weeds of concern within the covenants. Elderberry is rare and there is some gorse, including on the margins of the covenants (Walls 2010). • Other biodiversity pest plants recorded within the site are: burdock (several small plants near the stream in the kanuka forest), (Wildland Consultants unpubl. data 2014a). 	<ul style="list-style-type: none"> • Gorse is not a threat to the ecological values of the site and control is not necessary. • Consider removing burdock which is a Restricted Pest in the ECan Regional Pest Management Strategy. • Consider ongoing weed surveillance for biodiversity pest plants such as sycamore and Darwin's barberry. 	<ul style="list-style-type: none"> • Advice and guidance for landowner about pest plant monitoring and control. • Assistance where appropriate.
<ul style="list-style-type: none"> • Fencing. BPCT covenants that cover part of the site are well fenced and free of domestic stock (Walls 	<ul style="list-style-type: none"> • Consider fencing other areas of forest and scrub to promote natural regeneration and improve understory structure and 	<ul style="list-style-type: none"> • Discussion with landowner about the benefits of stock control for biodiversity and discussion about

<p>2010). Stock have access to other areas of forest within the site.</p>	<p>diversity.</p> <ul style="list-style-type: none">• Consider fencing the areas of exotic grass, regenerating scrub and treeland between the three large forest areas on the upper slopes (including the two BPCT covenants). Removing stock from these areas would promote natural regeneration and improve the shape of the site, increase its size, improve habitat connectivity and buffering and reduce threats associated with past habitat fragmentation including edge related effects.	<p>options available.</p> <ul style="list-style-type: none">• Assistance available as appropriate.
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References

- Crossland A.C. (2014). *Association of Indigenous Species*. Christchurch City Council Internal Report, Christchurch City Council.
- Environment Canterbury. (2011). *Canterbury Regional Pest Management Strategy 2011-2015*. Environment Canterbury, Christchurch. 148 pp.
- Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
- Harding, M. A. (2009). *Canterbury Land Protection Strategy: A Report to the Nature Heritage Fund Committee*. Wellington: Nature Heritage Fund.
- New Zealand Landcover Database (Version 4). <http://www.lcdb.scinfo.org.nz/>. Retrieved 24/11/2014.
- Walls, G. (2010). *Wairewa and Wairewa Extension. Banks Peninsula Conservation Trust Covenant Ecological Survey Report*. Unpublished Report prepared for the Banks Peninsula Conservation Trust Covenant, May 2010. 12 pp.
- Wildland Consultants. (2014a). *Botanical survey results - Lathams*. Unpublished data, collected for Christchurch City Council. (Trim: 14/317531).
- Wildland Consultants. (2014b). *Banks Peninsula Entomological Survey: Lathams*. Unpublished data collected by Brian Patrick for the Christchurch City Council. (TRIM: 14/313609).
- Wilson, H.D. (1985). *Banks Peninsula Botanical Survey Card Number 329. Herbert. Western Valley - from Trig PP down the bushy valley side towards Latham Homestead*. Unpublished data.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., Park, T., & Porteous, T. (2007). *Guide for users of the threatened environment classification (Ver 1.1.)*.
- Wilson, H.D. (1992). Banks Ecological Region: Port Hills, Herbert and Akaroa Ecological Districts. *Protected Natural Areas Programme Survey Report No. 21*. Department of Conservation, Canterbury. 342 pp.
- Wilson, H.D. 2009. *Natural History of Banks Peninsula*. Canterbury University Press, Christchurch. 144 pp.
- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

Assessment completed by: Scott Hooson
Date: 30 January 2015

Statement completed by: Scott Hooson
Date: 30 January 2015

Statement updated by: XXX
Date: XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.

Appendix 1: Indigenous Banks Peninsula Native Bush Bird Species Assemblage

Comparison of bird species recorded at Lathams (Walls 2010, Wildland Consultants unpubl. data 2014a) with the “Banks Peninsula Native Bush Bird Species Assemblage” (Crossland 2014).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
✓	Australasian harrier	<i>Circus approximans</i>
✓	Bellbird	<i>Anthornis melanura melanura</i>
✓	Brown creeper	<i>Mohua novaeseelandiae</i>
✓	Grey warbler	<i>Gerygone igata</i>
	Morepork	<i>Ninox novaeseelandiae novaeseelandiae</i>
	New Zealand falcon	<i>Falco novaeseelandiae</i>
	New Zealand kingfisher	<i>Halcyon sancta vagans</i>
✓	New Zealand pigeon	<i>Hemiphaga novaeseelandiae novaeseelandiae</i>
	Shining cuckoo	<i>Chrysococcyx lucidus lucidus</i>
✓	Silvereye	<i>Zosterops lateralis lateralis</i>
✓	South Island fantail	<i>Rhipidura fuliginosa fuliginosa</i>
✓	South Island rifleman	<i>Acanthisitta chloris chloris</i>
✓	South Island tomtit	<i>Petroica macrocephala macrocephala</i>
	Tui	<i>Prosthemadera novaeseelandiae novaeseelandiae</i>
	Welcome swallow	<i>Hirundo tahitica neoxena</i>

Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014b)

* = exotic species

ORDER/Family/genus/species	Common Name
MEGALOPTERA	dobsonfly
Corydalidae	
<i>Archichauliodes diversus</i>	
NEUROPTERA	lacewings
Hemerobiidae	
<i>Drepanacra binocula</i>	
* <i>Micromus tasmaniae</i>	
HEMIPTERA	
Tibicinidae	cicada
<i>Amphipsalta zelandica</i>	<i>clapping cicada</i>
Acanthosomatidae	
<i>Rhopalimorpha lineolaris</i>	
Lygaeidae	
<i>Nysius huttoni</i>	
Miridae	
<i>Bipuncticoris species</i>	
ORTHOPTERA	
Tettigoniidae	katydid
<i>Conocephalus bilineatus</i>	
Gryllidae	cricket
<i>Pteronemobius bigelowi</i>	
Anastostomatidae	
<i>Hemideina femorata</i>	
COLEOPTERA	
Carabidae	ground beetles
<i>Megadromus antarcticus</i>	
Cerambycidae	
<i>Prionoplus reticularis</i>	<i>huhu</i>
Coccinellidae	
<i>Coccinella leonina</i>	<i>ladybird</i>
Elateridae	click beetle
Species not identified?	large species found in forest
Scarabaeidae	chafers
<i>Costelytra zelandica</i>	
<i>Odontria striata</i>	<i>striped chafer</i>
<i>Odontria species</i>	
<i>Pyronota festiva</i>	
HYMENOPTERA	
Ichneumonidae	
<i>Netelia producta</i>	
LEPIDOPTERA	
Hepialidae	porina moths

<i>Wiseana copularis</i>	
Nepticulidae	
<i>Stigmella fulva</i>	
Tineidae	
<i>Erechthias charadrota</i>	
<i>Opogona comptella</i>	
Psychidae	
<i>Liothula omnivora</i>	
Glyphipterigidae	
<i>Glyphipterix alchoyossa</i>	
<i>Glyphipterix triselena</i>	
<i>Glyphipterix brachyacma</i>	
<i>Glyphipterix erastis</i>	
Elachistidae	
<i>Cosmiotes helonoma</i>	
<i>Cosmiotes ombrodoxa</i>	
Lyonetiidae	
<i>Bedellia psammitis</i>	
Gelechiidae	
<i>Anisoplaca achyrota</i>	
Oecophoridae	
<i>Barea exarcha</i>	
<i>Gymnobathra hamatella</i>	
<i>Gymnobathra parca</i>	
<i>Gymnobathra calaginosa</i>	
<i>Gymnobathra tholodella</i>	
<i>Izatha huttoni</i>	
<i>Izatha katadiktya</i>	
<i>Leptocroca scholaea</i>	
<i>Sthamopoda aposema</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena basella</i>	
<i>Tingena crotala</i>	
<i>Tingena melanamma</i>	
<i>Tingena marcida</i>	
<i>Tingena macarella</i>	
<i>Tingena siderodeta</i>	
<i>Trachypepla euryleucota</i>	
Tortricidae	leaf rollers
<i>Capua semiferana</i>	
<i>Cnephasia jactatana</i>	
<i>Ctenopseustis obliquana</i>	
<i>Epichorista siriana</i>	
<i>Harmologa amplexana</i>	
<i>Catamacta gavisana</i>	
<i>New genus and species</i>	
Crambidae	
<i>Antiscopa epicomia</i>	
<i>Deana hybreasalis</i>	
<i>Eudonia cymatias</i>	
<i>Eudonia dinodes</i>	
<i>Eudonia feredayi</i>	
<i>Eudonia luminatrix</i>	

<i>Eudonia minualis</i>	
<i>Eudonia philerga</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia manganeutis</i>	
<i>Eudonia microphthalma</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Eudonia aff. minualis</i>	
<i>Glaucocharis auriscriptella</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Scoparia halopis</i>	
<i>Scoparia minusculalis</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<i>Uresiphita maoralis</i>	
GEOMETRIDAE	
<i>Asaphodes beata</i>	
<i>Asaphodes chlamydota</i>	
<i>Austrocidaria anguligera</i>	
<i>Austrocidaria callichlora</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis inductata</i>	
<i>Declana egregia</i>	
<i>Declana junctilinea</i>	
<i>Elvia glaucata</i>	
<i>Epiphyrme undosata</i>	
<i>Epyaxa rosearia</i>	
<i>Gellonia dejectaria</i>	
<i>Gellonia pannularia</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Helastia corcularia</i>	
<i>Hydriomena deltoidata</i>	
<i>Ischalis fortinata</i>	
<i>Pasiphila muscosata</i>	
<i>Pasiphila malachita</i>	
<i>Pasiphila sandycias</i>	
<i>Pasiphila urticae</i>	
<i>Poecilasthena schistaria</i>	
<i>Pseudocoremia fasciculata</i>	
<i>Pseudocoremia pergrata</i>	
<i>Pseudocoremia productata</i>	
<i>Pseudocoremia suavis</i>	
<i>Pseudocoremia lactiflua</i>	
Noctuidae	
<i>Graphania morosa</i>	
<i>Graphania mollis</i>	
<i>Graphania mutans</i>	
<i>Graphania omoplaca</i>	
<i>Graphania plena</i>	

<i>Graphania ustistriga</i>	
<i>Meterana decorata</i>	
<i>Meterana new species</i>	
<i>Persectania aversa</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota sulcana</i>	
Erebidae	
<i>Celama parvitis</i>	
<i>Rhapsa scotoscialis</i>	
Lycaenidae	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Zizina oxleyi</i>	
Nymphalidae	admirals
<i>Argyrophenga antipodum</i>	<i>tussock</i>
<i>Vanessa gonerilla</i>	<i>red admiral</i>
<i>Vanessa itea</i>	<i>yellow admiral</i>
Pieridae	white butterfly
<i>*Pieris rapae</i>	
PLECOPTERA	stonefly
Gripopterygidae	
<i>Zelandobius wardi</i>	
PHASMIDA	stick insect
<i>Clitarchus hookeri</i>	
BLATTODEA	cockroach
Blattidae	
<i>Celatoblatta peninsularis</i>	

Appendix 3: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
Indigenous species	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	bush lily, kakaha
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex breviculmis</i>	grassland sedge
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Crassula colligata</i>	stonecrop
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dicksonia squarrosa</i>	wheki
<i>Epilobium brunnescens</i> subsp. <i>brunnescens</i>	willow herb
<i>Epilobium nummulariifolium</i>	creeping willow herb
<i>Epilobium pedunculare</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka

<i>Hebe salicifolia</i>	koromiko
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niñao
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Juncus edgariae</i>	leafless rush, wi
<i>Juncus novae-zelandiae</i>	dwarf rush
<i>Kunzea ericoides</i>	kanuka
<i>Lagenophora pinnatifida</i>	parani
<i>Lagenophora strangulata</i>	parani
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Luzula picta</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rata
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Nematoceras trilobum</i>	spider orchid
<i>Notogrammitis billardierei</i>	common strap fern
<i>Olearia ilicifolia</i>	NZ holly, hakeke
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Pittosporum eugeniioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain totara, thin-barked totara
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis sp.</i>	green-hooded orchid
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rytidosperma species</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Schizeilema trifoliolatum</i>	
<i>Senecio wairauensis</i>	native fireweed
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Uncinia rubra</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Urtica incisa</i>	bush nettle

Exotic Species	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arctium minus</i>	burdock
<i>Bellis perennis</i>	daisy
<i>Callitriche stagnalis</i>	starwort
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus bufonius</i>	toad rush
<i>Juncus effusus</i>	soft rush
<i>Leontodon taraxacoides</i>	hawkbit
<i>Lolium perenne</i>	ryegrass
<i>Luzula multiflora</i>	woodrush
<i>Mimulus guttatus</i>	monkey musk
<i>Mimulus moschatus</i>	musk
<i>Mycelis muralis</i>	wall lettuce
<i>Nasturtium officinale</i>	watercress
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Poa annua</i>	annual poa
<i>Prunella vulgaris</i>	selfheal
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Stellaria media</i>	chickweed
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Veronica arvensis</i>	field speedwell
<i>Vicia sativa</i>	vetch