

# Christchurch District Plan Site of Ecological Significance

## Site Significance Statement

**Site name:** Wainui/Carews Peak

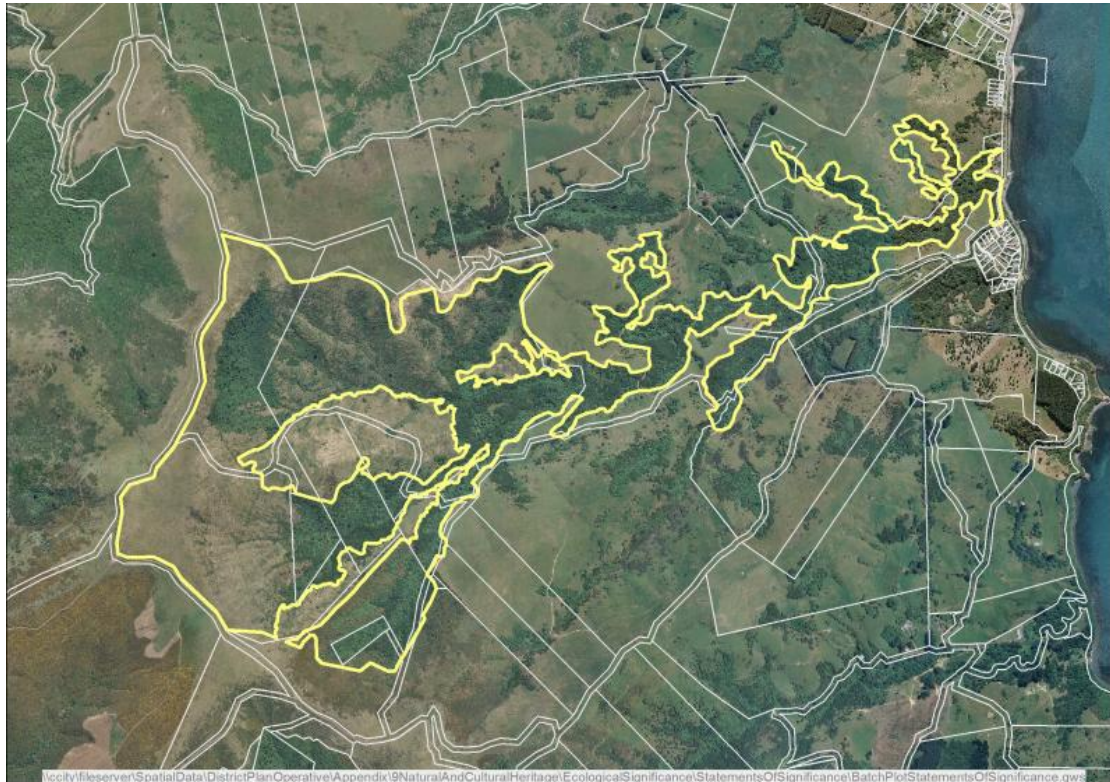
**Site number:** SES/A/20

**Physical address of site:** Bossu Road, Wainui

### Summary of Significance:

The site is significant because it contains a range of representative, rare and distinctive indigenous vegetation communities including originally rare ecosystems. It supports a diverse range of vegetation communities and habitats and has a continuous altitudinal sequence from near sea level to almost 800m. It supports a nationally Threatened plant species, six nationally At Risk plant species, an outstanding number of plant species that are uncommon within the ecological region or ecological district, three nationally At Risk fish species, four nationally Threatened or At Risk aquatic invertebrates (most of which are endemic to Banks Peninsula) and seven species at their distributional limits on Banks Peninsula. The site is an important ecological linkage from the coast at Akaroa Harbour over the summit of Carews Peak into the upper Peraki Valley catchment. It also provides important habitat for indigenous forest birds, fish and aquatic invertebrates.

### Site Map



## **Additional Site Information**

**Ecological District:** Akaroa

**Area of SES (ha):** 195.16

**Central point (NZTM):** E1590059, N5147114

## **Site Description**

The site is located on the southern side of Akaroa Harbour above Wainui Township. It includes the area around the summit of Carews Peak, the headwaters of the Carews Stream catchment and the steep gullies extending down to sea level at Akaroa Harbour at Wainui. The valley faces in a generally north-east direction and its altitudinal range is from sea level to 794 m at the summit of Carews Peak. The site was identified by the Department of Conservation as a Recommended Area for Protection (Akaroa RAP 11 – Carews Peak) (Wilson 1992). It is understood that the upper half of the site has been purchased by the Nature Heritage Fund and will be administered by the Department of Conservation.

The main vegetation communities within the site (Wilson 1992, Shanks and turney 2013, Wildland Consultants unpubl. data 2012) are:

- Matai - lowland totara - kahikatea/mixed hardwood forest on lowland hill slopes
- Thin-bark totara/mixed hardwood forest on montane hill slopes
- Mixed broadleaved second-growth hardwood forest on lowland and montane hill slopes
- Kanuka-dominant second-growth hardwood forest on lowland hill slopes
- Broadleaved hardwood treeland on lowland hill slopes
- Short tussockland on lowland and montane hill slopes
- Fernland on lowland and montane hill slopes
- Snow tussock tussockland on montane hill slopes
- Small leaved indigenous shrublands on lowland and montane hill slopes
- Freshwater lowland and montane marsh, swamp, flush and emergent aquatic vegetation
- Scattered plants on montane rock

## **Extent of Site of Ecological Significance**

The upper (western) boundary of the site is Bossu Road. The site includes Carews Peak and its surrounding tussocklands, grasslands, rock bluff communities and shrublands. It includes the indigenous montane and lowland forest and shrublands on the hill slopes and in the gullies in the upper catchment and the wetland communities in the small basin between 240 and 280 m above sea level. A large area of exotic grassland on a prominent north-facing slope in the middle of the upper catchment is excluded from the site. The site includes the matai - lowland totara - kahikatea/mixed hardwood forest and mixed broadleaved second-growth hardwood forest in the gullies in the lower part of the site. Large exotic trees on the margins of

the forested gullies and curtilage areas associated with residential dwellings in the lower part of the site are excluded.

## Assessment Summary

The Wainui/Carews Peak Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), 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 contains a range of indigenous vegetation communities that are representative of those that would have occurred in the ecological district at a baseline of 1840. These include small areas of old-growth podocarp forest (montane thin-barked totara (*Podocarpus cunninghamii*) forest and remnant lowland matai (*Prumnopitys taxifolia*) - lowland totara (*Podocarpus totara*) – kahikatea (*Dacrycarpus dacrydioides*)/mixed hardwood forest), rock bluff communities, snow tussock (*Chionachloa rigida*) grasslands, wetlands and streams. Indigenous vegetation communities that have been protected from stock, either in the Scenic Reserves or areas protected by the steep terrain are particularly intact. Generally natural ecological processes are functioning well and indigenous vegetation communities are regenerating and expanding, particularly in the upper part of the site (Shanks and Turney 2013).

The snow tussock tussocklands that occur on the upper slopes of Carews Peak are representative of the sub-alpine vegetation that occupied exposed, higher altitude sites in the ecological district. It also contains small areas of montane herbfield (Shanks and Turney 2013).

Igneous bluffs and scarps on the upper slopes of the site support highly specialised montane and sub-alpine rock bluff communities that have a number of nationally Threatened and At Risk uncommon and endemic plant species. These communities are representative of the communities that would have occurred on these sites at a baseline of 1840.

Secondary hardwood forest and shrubland (mixed broadleaved hardwood forest, kanuka (*Kunzea robusta*) forest and small-leaved indigenous shrublands) are the dominant cover within the site. Although secondary, and modified by past (and in the lower part of the site current grazing (Wildland Consultants 2012) their composition is diverse and there are few exotic species. These communities are

representative of the range of serial vegetation communities that would have present in the ecological district.

The peat wetland within the site is one of the best examples of a palustrine and riverine marsh in the ecological region (Shanks and Turney 2013) and the only example of a peat wetland (Wilson 1992). Although the structure and composition of the vegetation has been modified by stock grazing and trampling, the vegetation cover is predominantly indigenous (wi (*Juncus edgarie*) rushland and bog rush (*Schoenus pauciflorus*)) (Parker 2013, Grove and Parker 2013).

Carews Peak Stream supports a representative assemblage of aquatic invertebrates including a high proportion of sensitive mayfly, stonefly and caddisfly (EPT: Ephemeroptera, Plecoptera, Trichoptera) species, with an average of 53% of taxa being EPT and the abundance of EPT individuals an average of 42% (EOS unpubl. data 2014).

**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 large example of a diverse mosaic of indigenous dominated vegetation communities.

#### **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 in the lower half of the site is significant at the Level 4 land environment scale. The forest below Jubilee Road is on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007.) The remainder of the forest in the lower half of the site, and a small area of tussockland between Bossu Road and Carews Peak are on Chronically Threatened land environments (F3.1b and F3.3b respectively) where 12.2 and 17.6% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

The old growth montane thin-barked totara forest, matai - lowland totara - kahikatea/mixed hardwood forest and regenerating secondary forest ecosystems are significant under this criterion because they have been reduced to less than 20% of their former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Following human arrival the extent of forest in the ecological district (and region) was greatly reduced. The present extent of all indigenous forest in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)). The present extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009).

Wetlands within the site are also significant under this criterion. There is a complex of three small mesotrophic marsh and shallow water wetlands in a small basin at approximately 260 – 280 m above sea level. Wetland ecosystems have been reduced to less than 20% of their former extent at the regional and freshwater biogeographic unit scales. Ausseil *et al.* (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit.

**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 has one nationally Threatened plant species, six nationally At Risk plant species, an outstanding number of plant species that are uncommon within the ecological region or ecological district, three nationally At Risk fish species and four nationally Threatened or At Risk aquatic invertebrates (most of which are endemic to Banks Peninsula).

**Plants**

Nationally Threatened and At Risk plant species (de Lange *et al.* 2013) recorded from the site are:

- Banks Peninsula fork fern (*Tmesipteris horomaka*) (Threatened - Nationally Critical and endemic to Banks Peninsula) – on 7 host tree ferns (Shanks and Turney 2013)
- White mistletoe (*Tupeia antarctica*) (At Risk – Declining) - common on tree lucerne near Wainui Main Road. Likely to be one of the largest populations of this mistletoe on the Peninsula (Wildland Consultants unpubl. data 2012)
- Sand coprosma (*Coprosma acerosa*) (At Risk – Declining) (Wilson unpubl. data n.d.) (rare in the ecological region (Wilson 1992))
- Banks Peninsula sun hebe (*Heliohebe lavaudiana*) (At Risk - Declining, endemic to Banks Peninsula) (Shanks and Turney 2013)
- Climbing groundsel (*Brachyglottis scaidophila*) (At Risk – Declining) (Wilson unpubl. data n.d.) (rare in Canterbury (Wilson 1992))
- Grassland speargrass (*Aciphylla subflabellata*) (At Risk – Declining) (Shanks and Turney 2013)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Shanks and Turney 2013)

A large number (over 45) of plant species have been recorded from within the site<sup>1</sup> that are ‘uncommon to rare or very local’ on Banks Peninsula (Wilson 2013). They are:

- Spleenwort (*Asplenium trichomanes*) (Shanks and Turney 2013)
- Water fern (*Azolla rubra*) (Wilson unpubl. data n.d.)
- Common maidenhair (*Adiantum cunninghamii*) – in the forested areas below Jubilee Road (Wildland Consultants unpubl. data 2012)
- Bidibidi (*Acaena caesiiglauca*) (Shanks and Turney 2013)

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<sup>1</sup> The reference for the most recent record is provided, rather than the references for all records.

- Golden Spaniard (*Aciphylla aurea*) (and *Aciphylla aurea x subflabellata*) (Shanks and Turney 2013)
- Colenso's hard fern (*Blechnum colensoi*) (Shanks and Turney 2013)
- Kiokio (*Blechnum novae-zelandiae*) (Shanks and Turney 2013)
- Triangular hard fern (*Blechnum vulcanicum*) (Shanks and Turney 2013)
- *Carex secta* – in the forested areas below Jubilee Road (Wildland Consultants unpubl. data 2012)
- Swamp sedge (*Carex virgata*) (Shanks and Turney 2013)
- *Carex sinclairii* (Shanks and Turney 2013)
- Slender mountain daisy (*Celmisia gracilentia*) (Wilson unpubl. data n.d.)
- *Colobanthus strictus* (Shanks and Turney 2013)
- Mountain cabbage tree (*Cordyline indivisa*) (Kelly 1972)
- Tutu (*Coriaria sarmentosa*) (Wilson unpubl. data n.d.)
- Willow herb (*Epilobium brunnescens*) (Shanks and Turney 2013)
- Mountain aniseed (*Gingidia montana*) (Wilson unpubl. data n.d.)
- Filmy fern (*Hymenophyllum demissum*) (Shanks and Turney 2013)
- Filmy fern (*Hymenophyllum flabellatum*) (Shanks and Turney 2013)
- Filmy fern (*Hymenophyllum sanguinolentum*) 'Canterbury' (Kelly 1972)
- Filmy fern (*Hymenophyllum minimum*) (Shanks and Turney 2013)
- Filmy fern (*Hymenophyllum multifidum*) (Shanks and Turney 2013)
- Pennywort (*Hydrocotyle novae-zeelandiae*) (Shanks and Turney 2013)
- Flat-leaved rush (*Juncus planifolius*) (Shanks and Turney 2013)
- Dwarf rush (*Juncus novae-zelandiae*) (Shanks and Turney 2013)
- *Kelleria dieffenbachii* (Shanks and Turney 2013)
- Pratia (*Lobelia angulata*) (Shanks and Turney 2013)
- Alpine clubmoss (*Lycopodium fastigiatum*) (Kelly 1972)
- Porcupine shrub (*Melicytus* sp. aff *alpinus*<sup>2</sup>)
- Bush rice grass (*Microlaena avenacea*) (Kelly 1972)
- Common water milfoil (*Myriophyllum propinquum*) (Wilson unpubl. data n.d.)
- Nertera (*Nertera depressa*) (Shanks and Turney 2013)
- Comb fern (*Notogrammitis heterophylla*) (Shanks and Turney 2013)
- Shrub daisy (*Olearia bullata*) (Wilson unpubl. data n.d.)
- Mountain foxglove (*Ourisia macrophylla* subsp. *lactea*) (Shanks and Turney 2013)
- Ring fern (*Paesia scaberula*) (Shanks and Turney 2013)
- Dwarf mountain heath (*Pentachondra pumila*) (Wilson unpubl. data n.d.)
- Blue tussock (*Poa colensoi*) (Wilson unpubl. data n.d.)
- Shield fern (*Polystichum neozelandicum* subsp. *zerophyllum*) (Shanks and Turney 2013)
- Trembling brake (*Pteris tremula*) – in the forested areas below Jubilee Road (Wildland Consultants unpubl. data 2012)
- Green-hooded orchid (*Pterostylis banksii*) (Wilson unpubl. data n.d.)
- Swamp buttercup (*Ranunculus macropus*) (At Risk - Data Deficient (de Lange et al. 2013)) (Shanks and Turney 2013, Grove and Parker 2013)
- *Schizeilema trifoliolatum* (Wilson unpubl. data n.d.)
- *Scleranthus brockiei* (Wilson unpubl. data n.d.)
- *Scleranthus uniflorus* (Wilson unpubl. data n.d.)
- Sphagnum (*Sphagnum cristatum*<sup>3</sup>) - the only known locality on Banks Peninsula (Grove and Parker 2013, Shanks and Turney 2013)

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<sup>2</sup> *Melicytus* "Banks Peninsula" in Shanks and Turney (2013).

- Fork fern (*Tmesipteris elongata*) (Wilson unpubl. data n.d.) (rare in Canterbury (Wilson 1992)).
- Forest violet (*Viola filicaulis*) (Kelly 1972)

## Fish

Three nationally At Risk-Declining fish species (Goodman et al. 2014) have been recorded from the lower and mid reaches of Carews Peak Stream (EOS unpubl. data 2014):

- Longfin eel (*Anguilla dieffenbachia*)
- Kaoro (*Galaxias brevipinnis*)
- Blue gilled bully (*Gobiomorphus hubbsi*)

## Aquatic invertebrates

Nationally Threatened and/or endemic aquatic invertebrates (Grainger et al. 2014), most of which are endemic to Banks Peninsula, that have been recorded from the lower and mid reaches of Carews Peak Stream (EOS unpubl. data 2014) are:

- *Nesameletus vulcanus* (mayfly) (Threatened - Nationally Vulnerable, endemic to Banks Peninsula)
- *Costachorema peninsulae* (caddisfly) (Threatened - Nationally Vulnerable, endemic to Banks Peninsula)
- *Hydrobiosis styx* (caddisfly) (Threatened - Nationally Vulnerable)
- *Neocurupira chiltoni* (net-winged midge) (endemic to Banks Peninsula)

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

The site is significant under this criterion.

There are five species at their southern national distributional limits on Banks Peninsula, one species at its southern regional limit on Banks Peninsula and one species at its northern national limit on Banks Peninsula:

- Titoki (*Alectryon excelsus*) (southern regional limit) (Wildland Consultants unpubl. data 2012)
- Shining spleenwort (*Asplenium oblongifolium*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Narrow-leaved snow tussock (*Chionochloa rigida*) (northern national limit) (Shanks and Turney 2013)
- Kawakawa (*Piper excelsum*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Native passion vine (*Passiflora tetrandra*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Trembling brake (*Pteris tremula*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Turpentine scrub (*Dracophyllum acerosum*) (southern national limit) (Wildland Consultants unpubl. data 2012)

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<sup>3</sup> Referred to as *Sphagnum falcatulum* by Wilson unpubl. data (no date) and Shanks and Turney (2013).

**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 significant under this criterion.

It contains several vegetation communities that are either distinctive, of restricted occurrence, or occur within an originally rare ecosystem.

The steep upper slopes of the site, particularly the bluffs support tall snow tussock grassland. Snow tussock grassland is of restricted occurrence on Banks Peninsula and only occurs on the tops of the highest peaks. It is also at its northern national distributional limit on Banks Peninsula.

There are igneous bluffs and scarps on the upper slopes of the site, particularly on the steep eastern side of Carews Peak above Carews Peak Scenic Reserve. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

The site also contains a very distinctive peat wetland that is the only example of its type in the Banks Ecological Region (Wilson 1992). It is of scientific interest (Shanks and Turney 2013) and contains an unusual assemblage of wetland plants including a number of uncommon species such as *Sphagnum* (not known to occur elsewhere on Banks Peninsula), swamp buttercup, and water fern. Palustrine wetlands are also of restricted occurrence in the Akaroa ED (Grove and Parker 2013).

## **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.

It is of particular importance because it has a continuous altitudinal sequence from near sea level to the summit of Carews Peak at 794 m above sea level. It incorporates coastal, lowland, montane and sub-alpine ecosystems. The diversity and pattern of the vegetation communities and plant taxa across the site reflects this gradient. For example lowland matai - lowland totara - kahikatea/mixed hardwood forest contains warm temperate species such as ngaio (*Myoporum laetum*), native passion vine, shining spleenwort, titoki and kawakawa (Wildland Consultants unpubl. data) while remnant old-growth montane thin-barked totara grows in Peraki Saddle Scenic Reserve and montane/sub-alpine communities such as snow tussock grassland surrounding Carews Peak contain narrow-leaved snow tussock, dwarf mountain heath, turpentine scrub, bush snowberry (*Gaultheria antipoda*), snowberry (*G. depressa*) and golden Spaniard (Shanks and Turney 2013, Wilson unpubl. data n.d.). The site also incorporates a high degree of topographical and climatic variation which adds to the diversity of the vegetation and habitats (Shanks and Turney 2013). A list of the plant taxa

recorded downstream of where Jubilee Road crosses Carews Peak Stream is provided in Appendix 1. A list of species recorded in the upper part of the catchment purchased by the Nature Heritage Fund (including the Scenic Reserves) is provided in Shanks and Turney (2013).

## 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.

The continuous altitudinal sequence from the coast at Akaroa Harbour to the summit of Carews Peak means the site is an important ecological linkage for the movement and dispersal of plant taxa and fauna. Within the site this sequence links forest, shrublands, snow tussock grasslands, wetland, stream and rock bluff communities. The site also provides an important linkage from Carews Peak over the saddle to the Peraki Saddle Scenic Reserve and into the extensive high value indigenous dominated vegetation communities in the upper Peraki Valley catchment.

Because of the size, relative intactness and diversity of indigenous vegetation communities and habitats the site is very important in maintaining ecological processes in the surrounding environment. The forests and shrublands are well buffered and are expanding and plant/pollinator/disperser relationships are operating and regeneration is occurring (Shanks and Turney 2013). The site also provides seasonal habitat and food sources for a range of indigenous bird species. For example extensive areas of tree fuchsia forest provide an important seasonal food source for tui and bellbirds and mature podocarp trees provide a seasonal food source for New Zealand pigeon (Shanks and Turney 2013).

Carews Peak Stream supports at least six species of migratory freshwater fish (longfin eel, shortfin eel (*Anguilla australis*), koaro, common bully (*Gobiomorphus cotidianus*), bluegill bully, and banded kokopu (*Galaxias fasciatus*)) (EOS unpubl. data 2014). The ecological linkage between the coast and the catchment is essential for these fish.

### **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. Although they are of ecological importance, within the context of the wider landscape the relatively small, modified wetlands within the site are unlikely to play an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

### **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.

The size and relative intactness of the indigenous habitats within the site means it provides important permanent and seasonal habitat for indigenous forest birds. Shanks and Turney (2013) recorded New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*), bellbird (*Anthornis melanura melanura*), grey warbler (*Gerygone igata*), brown creeper (*Mohua novaeseelandiae*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), South Island tomtit (*Petroica macrocephala macrocephala*) and silvereye (*Zosterops lateralis lateralis*) at the site in June and July 2013. Extensive areas of tree fuchsia forest provide an important seasonal food source for tui and bellbirds (Shanks and Turney 2013) and mature podocarp trees provide a seasonal food source for New Zealand pigeon.

Carews Peak Stream is listed as a key habitat for nationally threatened freshwater fish within the Canterbury Region including inanga, longfin eel, torrentfish (*Cheimarrichthys fosteri*), bluegill bully, redfin bully (*Gobiomorphus huttoni*), and koaro (Department of Conservation 2012).

The site also provides important habitat for indigenous aquatic invertebrates including several nationally Threatened and/or endemic aquatic invertebrates (EOS unpubl. data 2014). Maintaining continuous riparian cover within the catchment is important for the ongoing survival of indigenous aquatic invertebrates (Fraser 2006).

## Site Management

### Existing Protection Status

It is understood that the upper half of the site has been purchased by the Nature Heritage Fund and will be administered by the Department of Conservation. The remaining lower part of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Domestic stock, particularly cattle. Damage to indigenous vegetation communities, wetlands and stream banks.</li> </ul>	<ul style="list-style-type: none"> <li>• It is understood that the Department of Conservation has, or will, maintain existing fences to a stock proof standard and fence-off the upper half of the site purchased for conservation purposes (Shanks and Turney 2013).</li> <li>• Consider fencing forested areas in the remaining unprotected parts of the site to promote understorey development.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowner about benefits to biodiversity of stock management options to protect understorey development.</li> <li>• Assistance available where appropriate and with landowner's agreement.</li> </ul>
<ul style="list-style-type: none"> <li>• Biodiversity pest plants:</li> <li>• Yellow passionfruit (<i>Passiflora pinnatistipula</i>) (many plants on edges at lower end of valley), sycamore (many trees at lower end of valley near houses), English ivy (<i>Hedera helix</i>) and German ivy (<i>Delairea odorata</i>), periwinkle (<i>Vinca major</i>) (near buildings and along drive at lower end of valley), hawthorn (<i>Crataegus monogyna</i>) (Wildland Consultants unpubl. data 2012).</li> <li>• Crack willow (<i>Salix fragilis</i>) and grey willow (<i>S. cinerea</i>) are present in the wetland (Parker unpubl. data 2013, Shanks and Turney 2013).</li> <li>• There are few weeds in the upper part of the</li> </ul>	<ul style="list-style-type: none"> <li>• Consider controlling existing biodiversity weeds in the indigenous forest in the lower part of the site. Priorities for control are: sycamore, banana passionfruit, ivy, and periwinkle.</li> <li>• Remove the single pine from the upper part of the catchment to prevent further spread.</li> <li>• Consider controlling willows. Control of grey willows is the highest priority for management.</li> <li>• Consider regular, ongoing surveillance for biodiversity pest plants throughout the site.</li> <li>• Retain gorse as a nurse crop and buffer to forested areas but consider ongoing control on rock-outcrops and tussock grasslands (Shanks and Turney 2013).</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about pest plant monitoring and control.</li> <li>• Assistance available where possible.</li> <li>• Advice and guidance as required for landowner about protection and enhancement of biodiversity.</li> </ul>

<p>catchment (Shanks and Turney 2013).</p> <ul style="list-style-type: none"> <li>There is a single pine in forest below the western boundary in the upper part of the catchment (Shanks and Turney 2013).</li> <li>Gorse (<i>Ulex europaeus</i>) is present in the upper part of the catchment including in grassland and tussockland communities around Carews Peak (Shanks and Turney 2013).</li> </ul>		
<ul style="list-style-type: none"> <li>Animal pests. Possums.</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring possum densities throughout the site (in conjunction with the Department of Conservation) and undertake control as required.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of possums, in collaboration with DOC and ECan.</li> <li>Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Damage to white mistletoe (<i>Tupeia antarctica</i>) near the junction of Jubilee Road with Wainui Main Road by possums, stock and road maintenance activities (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring possum densities throughout the site (in conjunction with the Department of Conservation) and undertake control as required.</li> <li>Consider fencing areas where domestic stock have access to this species.</li> <li>Council to ensure that damage to indigenous roadside vegetation beyond the road envelope is minimised during Council roadside trimming/mowing and maintenance.</li> </ul>	
<ul style="list-style-type: none"> <li>Decline or loss of Banks Peninsula fork fern (<i>Tmesipteris horomaka</i>) (Threatened - Nationally Critical) population.</li> </ul>	<ul style="list-style-type: none"> <li>Department of Conservation are proposing to monitor of this population once every three years in conjunction with their monitoring of the species in other reserves (Shanks and Turney 2013).</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

## References

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**Date:** 10 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 10 March 2015

**Statement updated by:** Debbie Hogan  
**Date:** 6 June 2017  
**Update purpose:** Site map updated to show boundary as amended through Decision 50 (Natural and Cultural Heritage (Part) – 9.1 Indigenous Biodiversity) of the Independent Hearings Panel on the Christchurch Replacement District Plan

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: Plant Species List for Forest Downstream of Jubilee Road

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Adiantum cunninghamii</i>	maidenhair
<i>Alectryon excelsus</i>	titoki
<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>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex species</i>	
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Haloragis erecta</i>	toatoa
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Juncus edgariae</i>	leafless rush, wi

<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rata
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken
<i>Pteris tremula</i>	trembling brake
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Tupeia antarctica</i>	white mistletoe, pirita, tupia
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Chamaecytisus palmensis</i>	tree lucerne
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Coprosma repens</i>	taupata
<i>Crataegus monogyna</i>	hawthorn
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Eucalyptus species</i>	eucalypt, gum tree
<i>Hedera helix</i>	ivy, english ivy
<i>Holcus lanatus</i>	Yorkshire fog
<i>Juglans regia</i>	walnut

<i>Mimulus guttatus</i>	monkey musk
<i>Passiflora pinnatistipula</i>	yellow passionfruit
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rubus fruticosus</i>	blackberry
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Senecio mikanioides</i>	German ivy
<i>Vinca major</i>	periwinkle