GUIDELINES FOR THE APPLICATION OF ECOLOGICAL SIGNIFICANCE CRITERIA FOR INDIGENOUS VEGETATION AND HABITATS OF INDIGENOUS FAUNA IN CANTERBURY REGION

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GUIDELINES FOR THE APPLICATION OF ECOLOGICAL SIGNIFICANCE CRITERIA FOR INDIGENOUS VEGETATION AND HABITATS OF INDIGENOUS FAUNA IN CANTERBURY REGION

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Reviewed and approved for release by:

![Signature]

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Director/Principal Ecologist  
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1. INTRODUCTION

The Canterbury Regional Policy Statement (RPS) is now operative, following a consultation process and hearing. Appendix 3 of the RPS contains ecological significance criteria with a twofold purpose:

- To enable local authorities and stakeholders to use consistent criteria for determination of areas of significant indigenous vegetation or significant habitats of indigenous fauna; and/or

- To enable evaluative assessments to be made where studies have not been undertaken, in situations where there is a new proposal for subdivision, use or development (triggering a requirement for either a resource consent or a plan change).

Wildland Consultants Ltd were previously commissioned to review the draft criteria and to provide a recommended criteria set tailored to Canterbury Region, in particular its patterns of land use and remaining natural areas, including wetlands. This criteria set was modified following stakeholder feedback. Submitters to the hearing requested further changes, and some of these were proposed in the criteria set recommended to the hearing panel, but the hearing panel did not agree with all of these proposals. As the significance criteria set is now operative, Environment Canterbury now requires written guidelines to assist interpretation and implementation of the criteria set.

This report firstly summarises the results of reviews of significance criteria and guidelines in other plans and policies. Secondly, this report provides overall guidelines to assist with assessments of significance, and detailed guidelines for each of Environment Canterbury’s operative significance criteria.

2. METHODS

Policies and guidelines were reviewed relating to the assessment of ecologically significant sites, primarily relevant policies within regional policy statements and district plans.

A summary of the documents referred to is provided in Table 1.

Table 1: Information reviewed during compilation of guidelines for the assessment of ecological significance in the Canterbury Region.

<table>
<thead>
<tr>
<th>Authority</th>
<th>Policy/Plan/Statement</th>
<th>Year Published</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater Wellington Regional Council</td>
<td>Proposed Wellington Regional Policy Statement</td>
<td>2013</td>
</tr>
<tr>
<td>West Coast Regional Council</td>
<td>West Coast Land and Riverbed Plan</td>
<td>2012</td>
</tr>
<tr>
<td>Caucus of Ecological Experts</td>
<td>West Coast Land and Riverbed Plan appeals</td>
<td>2010</td>
</tr>
<tr>
<td>Horizons Regional Council</td>
<td>End of Hearing Officer Report</td>
<td>2009</td>
</tr>
<tr>
<td>Bay of Plenty Regional Council</td>
<td>Bay of Plenty Regional Water and Land Plan</td>
<td>2008</td>
</tr>
<tr>
<td>Otago Regional Council</td>
<td>Regional Plan: Water for Otago</td>
<td>2004</td>
</tr>
</tbody>
</table>
The Southland RPS contains very brief definitions of ecological significance, and very little guidance with which to interpret these definitions, and is not referred to further. The Southland RPS is currently being reviewed and it is anticipated that provisions on biodiversity will be updated.

West Coast Regional Council has an operative Land and Riverbed Plan, aspects of which - including the significance of wetlands - were recently resolved by Environment Court and High Court processes. A caucus statement prepared by experts involved in the case set out the approach and criteria preferred by those ecologists.

Guidance provided by the above sources was supplemented by the outcomes of stakeholder consultation and feedback at a workshop held at Lincoln on 24 April 2013. Workshop participants had been supplied with draft guidelines and questions prior to the workshop, and discussion centred on key issues. Some stakeholders provided additional feedback after further consideration of workshop discussion, and this was also considered during revision of the guidelines.

### 3. SUMMARY OF REVIEW FINDINGS

#### 3.1 Process for assessment of significance

Most regional and territorial authorities assess the ecological significance of sites by defining a range of significance criteria against which site values are to be assessed. In general, a site is considered to be of significance if it meets one or more of the criteria in these criteria sets. Criteria sets vary between regions and districts, as does the extent of guidance given to those required to interpret the criteria. In many cases, no further guidance is given above and beyond the definition of each criterion provided in relevant plans. Poorly-worded or ambiguous criteria can lead to differences in interpretation.

Significance assessments almost always require site visits, because existing information is either lacking, was collected for a different purpose, or is out-of-date.

All criteria-based approaches carry risks that significant areas of indigenous vegetation and/or habitats may not meet criteria thresholds if they are not well-defined or if they are applied incorrectly. Explicit well-defined criteria and guidelines are important for reducing ambiguity that can hinder efficient and effective resource management decision-making. Whatever the approach used, it is important that those undertaking the assessment are well-qualified and experienced, and apply the criteria correctly.
Landholders need to know when resource consents are needed for activities that potentially affect significant areas of indigenous vegetation and habitats. This should be addressed by advocacy when new policies are established.

3.2 Significance criteria sets

Criteria sets are generally based on the same ecological principles, but are nuanced to serve the particular needs of a particular region or district. This is appropriate, and consistent with the criteria set developed for Canterbury Region, now operative in the Canterbury RPS. It is helpful to include guidance as to how significance criteria should be applied, to ensure that significance criteria are applied consistently. This is more important for some criteria than others. Section 4 below provides the framework within which guidelines for application of the specific criteria for Canterbury Region are developed in Section 5.

4. GUIDELINES FOR CANTERBURY

The ecological significance criteria set for Canterbury Region incorporates four matters - representativeness, rarity/distinctiveness, diversity and pattern, and ecological context - each of which is associated with one to several criteria tailored to the Canterbury Region.

The criteria and guidelines make specific reference to and are consistent with the four national priorities for the protection of indigenous biodiversity on private land (MfE/DOC 2007a; 2007b). The guidelines sit outside the Canterbury RPS and have no statutory weight, unlike the criteria. The usefulness of this is that the guidelines can be updated (for example if new biodiversity assessment tools become available) without going through a plan change process.

4.1 Who are the guidelines written for?

These guidelines are primarily written for the benefit of practicing ecologists, as the key people making site assessments under the ecological significance criteria in the operative CRPS. The guidelines contain technical information that ecologists will be familiar with.

4.2 Canterbury RPS Policy

Chapter 9 of the Canterbury RPS contains six policies relating to ecosystems and indigenous biodiversity in Canterbury Region. These policies are summarised below.

Policy 9.3.1 of the Canterbury RPS provides the basis for use of the ecological significance criteria.

Significance, with respect to ecosystems and indigenous biodiversity, is to be determined by assessment of areas and habitats against four matters:

a) Representativeness
b) Rarity or distinctive features
c) Diversity and pattern

d) Ecological context

Assessment of each matter is made according to the significance criteria in Appendix 3 of the RPS. Each matter has one or more criteria that describe the thresholds for significance. Areas are considered significant if they meet one or more of the ten criteria. Areas identified as significant will be protected to ensure no net loss of indigenous biodiversity or indigenous biodiversity values as a result of land use activities.

Policy 9.3.2 of the Canterbury RPS recognises the four national priorities for protection of indigenous biodiversity on private land. These are:

- Indigenous vegetation in land environments where less than 20% of the original indigenous vegetation cover remains.
- Areas of indigenous vegetation associated with sand dunes and wetlands.
- Areas of indigenous vegetation located in ‘originally rare’ terrestrial ecosystem types not covered under (1) and (2) above.
- Habitats of Threatened and At Risk indigenous species.

Policy 9.3.3 specifies an integrated and coordinated management approach to halting the decline in Canterbury’s indigenous biodiversity, including working across ecological boundaries, establishing best practice indigenous biodiversity management guidelines, and promoting collaboration between stakeholders.

Policy 9.3.4 promotes the enhancement and restoration of Canterbury’s ecosystems and indigenous biodiversity, where this will improve the functioning and long term sustainability of these ecosystems.

Policy 9.3.5 addresses wetland protection and enhancement, and specifies that the ecological significance of wetlands is to be assessed against both the matters in Policy 9.3.1 and the national priorities in Policy 9.3.2. Policy 9.3.5 generally promotes the protection, enhancement, and restoration of all of Canterbury’s remaining wetlands, and encourages formation of created wetlands that have the capacity to contribute to the restoration of indigenous biodiversity. Finally, Policy 9.3.5 aims to protect adjoining areas of indigenous and other vegetation that extend outside an ecologically significant wetland and are necessary for the ecological functioning of the wetland.

Policy 9.3.6 relates to biodiversity offsetting and establishes five criteria for the use of biodiversity offsets in Canterbury Region.

4.3 Definitions

Chapter 9 of the RPS contains several definitions of relevance to the guidelines. These include:

Ecosystem means a system of interacting terrestrial or aquatic living organisms within their natural and physical environment. In Section 2 of the Resource Management Act, ecosystems and their constituent parts are part of the environment and include people and communities. However, in Chapter 9, the focus for
“ecosystems” is their natural components and their contribution to the maintenance of indigenous biodiversity.

**Indigenous biodiversity** includes all plants and animals that occur naturally in New Zealand and have evolved or arrived without any assistance from humans. Indigenous species include migratory species visiting New Zealand on a regular or irregular basis.

The CRPS does not define ‘indigenous vegetation’ or ‘wetland’ but Territorial Local Authority (TLA) plans often contain definitions for these terms and the appropriate TLA definition should be used in each case.

### 4.4 Scope of guidelines

As described above, the scope of the guidelines is ecosystems and indigenous biodiversity within Canterbury Region. The guidelines need to reflect the ecosystem and indigenous biodiversity policy of the Canterbury RPS. The guidelines address ecological considerations only. Issues such as how indigenous biodiversity should be managed or protected are the responsibility of territorial local authorities.

### 4.5 Overview of Canterbury Region vegetation cover and key ecosystems

#### 4.5.1 Land cover

The Canterbury Plains and other lowland habitats have had almost all of their indigenous vegetation removed and are largely classified as Acutely Threatened land environments (Walker *et al.* 2007) in which less than 10% of the original indigenous vegetation cover remains. Inland basins such as the Hanmer Basin, Mackenzie Basin, Omarama Basin, Hakatamea Valley, Waihao Basin have also experienced considerable loss and depletion of indigenous vegetation cover, and are largely classified as Chronically Threatened land environments in which less than 20% of the original indigenous cover remains. Hill country on Banks Peninsula and in the coastal hills of North Canterbury also has a considerable proportion of Chronically Threatened land environments, as does the coastal plain at Kaikoura. Elsewhere, mid-elevation hill country varies in the extent of indigenous cover remaining, depending on the extent to which topography has made clearance of indigenous vegetation more difficult. A greater proportion of the original indigenous cover remains further west, on steeper, higher elevation landforms.

The pattern of remaining indigenous vegetation and habitats across Canterbury is therefore far from uniform. These geographical differences mean that significant examples of vegetation and habitat in a highly modified part of the Region will often be smaller and less intact than comparable vegetation/habitat types in those parts of Canterbury that retain most of their natural values. This regional variation in the pattern of remaining indigenous vegetation and habitats is reflected in the examples that have been chosen to illustrate the guidelines in Section 5.

Despite the overall loss of indigenous vegetation cover across lowland and montane Canterbury, the region still contains many significant biodiversity features. A selection of these is briefly described below.
4.5.2 Wetlands

Important Canterbury wetlands include wetlands on the margins of coastal lagoons, lakes, and estuaries, riparian wetlands associated with rivers, and ephemeral wetlands and swamps, fens, and bogs in inland basins and river valleys. Many of these wetlands provide habitat for Nationally Threatened or At Risk indigenous plants and animals, and some wetland complexes are considered to be outstanding at nationally level (e.g. Wildland Consultants 2012).

4.5.3 Braided rivers

Canterbury Region holds New Zealand’s most outstanding range of braided rivers, which have distinctive plant communities and important habitat for indigenous fauna, particularly populations of ‘braided river birds’ that breed on braided river beds in spring and summer.

4.5.4 Coastal ecosystems

Significant lagoons and estuaries are associated with several Canterbury river mouths and provide important wildlife habitat. Kaitorete Spit is a nationally significant coastal beach and dune system that holds the largest and most continuous population of pikao (*Ficinia spiralis*) in New Zealand (Johnson 1992) and is important for its plant, invertebrate, and lizard assemblages. Coastal cliffs, points, and reefs are abundant on Banks Peninsula and the Kaikoura coast, and contrast with the sand, gravel, and mudstone substrate along much of the Canterbury coast.

4.5.5 Glacial landforms

Canterbury Region contains an outstanding assemblage of glacial landforms reflecting several major ice advances over the last 65,000 years (Barrell *et al.* 2011). Moraine and outwash plain landforms are particularly well represented in the Waimakariri, Rakaia, Canterbury Plains, Lake Heron, Rangitata, and Mackenzie Basin areas. Glacial landforms are responsible for the creation of most of the ephemeral wetlands found in inland Canterbury, and dry outwash plains support a characteristic and distinctive flora of indigenous plant species, many of which are Nationally Threatened or At Risk. Eastern moraines and outwash plains are naturally uncommon ecosystem types that have been recently assessed as Endangered habitats (Holdaway *et al.* 2012). The extensive fine-scale patterning of Mackenzie Basin outwash plains is unparalleled elsewhere in New Zealand.

4.6 Scale of assessment

It is important to choose the correct scales for application of particular criteria and indicators. In some cases, the assessment can be made at more than one scale, typically the ecological district and Canterbury Region. In these cases, meeting the criterion at just one scale would be sufficient to trigger significance. In some cases the criterion itself defines the appropriate scale. Appropriate scales of reference are provided for each indicator.
4.7 What constitutes a significant site?

A significant site should include the significant features, and connecting habitat and key ecological processes that help to maintain the significant features. The significant site would normally include all vegetation/habitat units that contain or constitute significant features, and any intervening or buffering indigenous habitat that helps to connect these units and form a more cohesive or compact site. Mosaics of indigenous vegetation may be included in the significant area because an assemblage of small areas, overall, can comprise a significant area.

Seral vegetation is often included in significant sites, as it commonly forms a stage in the development of mature vegetation and habitat, or may have significant value as habitat of indigenous fauna in its own right, or as a site buffer. Significant sites can be entirely seral where seral vegetation may comprise the only representative examples of indigenous vegetation remaining in highly modified parts of Canterbury Region. Areas of exotic vegetation, for example pasture or gorse shrubland, are sometimes included in significant sites, as they may only detract from the significant values in a small way, and in many instances would succeed over time to indigenous vegetation.

4.8 1840 as a reference date

1840 is commonly selected as a baseline date for the assessment of representativeness and is the date selected for assessment of Representativeness in the guidelines. The utility of an 1840 baseline is that there is generally some documented information available on the extent, structure, and composition of indigenous vegetation and habitat at that time, but major European settlement and clearance of indigenous vegetation and habitat had not yet taken place. In the eastern South Island including Canterbury Region, seral vegetation types would have been widespread at the 1840 baseline, as many of these were promoted and maintained by fires lit by Polynesian settlers in earlier times.

4.9 Assessing fauna habitat

Significant habitats of indigenous fauna can include both areas of indigenous or exotic vegetation, or aquatic habitats such as streams, rivers, ponds, lakes, lagoons, and estuaries. The key requirement is that the habitat must be important habitat for indigenous fauna. The indigenous fauna do not need to be Threatened or At Risk species; significant habitats of common fauna are also included in the assessment of important indigenous fauna habitat.

4.10 Application of the guidelines

Criteria and indicators are listed in Table 2, with additional columns inserted for the guidelines and examples. The guidelines provide clarification as to how each criterion should be interpreted, and list information sources that will assist assessment. The examples illustrate how different types of indigenous vegetation in different parts of Canterbury Region would qualify against each criterion, using a “meets threshold/does not meet threshold” scale.
Where applicable, the examples have also been placed into a high/moderate/low scale to help illustrate the range of biodiversity composition and structure making a site significant or not. This means that the guidelines can be used for other processes than assessing significance, such as prioritising sites for management and undertaking State of the Environment (SOE) reporting.

It is important to note that the examples are NOT exhaustive, and do not constitute the only examples of significant or non-significant sites. Many other kinds of indigenous vegetation and habitats of indigenous fauna could be assessed as significant using the RPS criteria.
Table 2: Revised Canterbury significance criteria with associated guidelines and a limited selection of examples.

<table>
<thead>
<tr>
<th>Revised Criteria</th>
<th>Guidelines</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>This assessment is undertaken at the ecological district scale. Representative vegetation and habitats are those that are typical of those that would have been present at a baseline of 1840, i.e. prior to the bulk of European settlement. At this time, the Canterbury Plains and inland basins would already have been affected by fires lit by Polynesian settlers in earlier periods. This means that representative indigenous vegetation and habitats will include successional vegetation types such as low elevation shrubland, tussock grassland and herbfield. Indigenous vegetation types or indigenous fauna assemblages that are the most similar in composition and structure to those that would have been present in 1840 are ranked the highest. As most indigenous vegetation types and fauna assemblages have been modified to some extent, modified examples will often be the closest in composition and structure to the 1840 condition. For fauna assemblages, the highest ranked sites would include habitats where the assemblage of a specific fauna group (e.g. beetles) was close to the composition and structure that would be expected, where representatives of the natural range of indigenous vertebrate fauna groups are present (e.g. indigenous birds, lizards, frogs, bats, fish) or where the assemblage contains representatives of each of the feeding guilds of a single fauna group (e.g. among birds, nectarivorous, frugivorous, herbivorous, and insectivorous species).</td>
<td>High representative value (meets threshold): good quality examples of: broadleaved forest with emergent podocarps on Banks Peninsula; rock outcrops and rock faces on Banks Peninsula; any indigenous vegetation assemblages on the Canterbury Plains, especially those that contain indigenous woody species, e.g. kanuka and kowhai; Olearia odorata-Coprosma propinqua shrublands on toeslopes and snow totara shrublands on stable snares in the Mackenzie Basin; matagouri (Discaria toumatou) shrubland on alluvial fans, riparian flax-cabbage tree wetlands; indigenous vegetation on inland outwash plains; beech forest vegetation in the upper Hurunui catchment; bog pine/mountain toatara woodland in inter-montane basins; red tussock grasslands with indigenous inter-tussock species; pika-dominated sand dunes; estuaries and lagoons that support natural assemblages of shore and water birds; forest on Banks Peninsula providing habitat for tui (Prosthemadera novaeseelandiae), bellbird (Anthus melanura), kereru (Hemiphaga novaeseelandiae), tomtit (Petroica macrocephala), brown creeper (Mohoua novaeseelandiae), riflemen (Acanthissita chloris), or morepork (Ninox novaeseelandiae) in addition to more widely distributed indigenous forest bird species.</td>
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<tr>
<td>2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.</td>
<td>This assessment focuses on large examples of types of indigenous vegetation and habitats of indigenous fauna. Whether the vegetation is a large example of its type will depend on the pattern of vegetation remaining in the relevant ecological district. For example a 1 ha example of indigenous vegetation on the Canterbury Plains might be considered large, whereas 1 ha of beech forest near the Main Divide would be small.</td>
<td>Modified but meets threshold: broadleaved forest or kanuka forest with regenerating broadleaved trees on Banks Peninsula or on the coastal hills; moderately dense red tussock, hard tussock, and indigenous shrubs in inland basins; indigenous shrubland or herbfield on limestone landforms; shrubland or treelands with indigenous birds and lizards on Banks Peninsula, indigenous invertebrate assemblages on the Canterbury Plains.</td>
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<td>Low representative value (does not meet threshold): low stature monocultures of matagouri or bracken in hill country pasture; habitats where only one or two widely distributed indigenous bird species are present (e.g. grey warbler (Gerygone galea) and fantail (Rhipidura fuliginosa).</td>
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<td>High (meets threshold): &gt;30 ha indigenous forest in Akaroa Ecological District, indigenous forest and scrub on limestone landforms at Mt Cass; beech forest in the North Branch of the Hurunui River; a 40 ha broadleaved forest remnant in the Cheviot or Hunters Ecological Districts; beach ridge vegetation on Kaitorete Spit; 2.6 ha kanuka forest at Bankside Scientific Reserve, kanuka forest at Eyrewell on the Canterbury Plains; the Heathcote-Avon estuary; Lake Ellesmere/Te Wahtora.</td>
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| | | Low (does not meet threshold): a 0.05 ha dry kanuka forest remnant on the...
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<tr>
<th>Revised Criteria</th>
<th>Guidelines</th>
<th>Examples</th>
</tr>
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<tbody>
<tr>
<td><strong>Rarity/Distinctiveness</strong></td>
<td>This assessment is made at the scale of Canterbury Region, ecological district, and/or Level IV LENTZ environment. Any example of an indigenous vegetation type or fauna habitat that is reduced to less than 20% of its original extent at any one or more of these scales would meet the threshold of this indicator. The Canterbury Protection Strategy (Harding 2009) provides information on former vegetation and the extent of indigenous cover types remaining within each of Canterbury's ecological districts. The Threatened Environment Classification (Walker et al. 2007) provides information on land environments which retain less than 20% of their original indigenous cover.</td>
<td><strong>Meets threshold:</strong> any indigenous vegetation on the Canterbury Plains or Hanmer Plain; matai-totara forest; coastal broadleaved forest; forest with kahikatea and/or māta on Banks Peninsula; indigenous forest in the Waimate Ecological District; indigenous vegetation on limestone landforms (e.g. Mt Cass); indigenous vegetation on inland outwash plains; silver beech forest in the Mt Hutt Ecological District; black beech forest in the Motunau Ecological District; lowland wetlands; indigenous vegetation on coastal dunes. <strong>Does not meet threshold:</strong> beech forest in the high country immediately east of the Main Divide; matagouri shrubland in the Malvern Hills, Ashley, and Waiaru localities; snow tussock grassland above treeline in the Lake Summer area; <em>Hebe inaka</em> scrub in the Torlesse Ecological District;</td>
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<tr>
<td><strong>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.</strong></td>
<td></td>
<td><strong>High rarity value (meets threshold):</strong> Indigenous Plants and Fauna with Restricted Ranges: site contains one or more species that are Threatened or At Risk-Declining according to the threat system classification of Townsend et al. (2008); or are endemic to the Canterbury Region. For example, rock outcrops on Banks Peninsula that provide habitat for Canterbury mudfish (<em>Neochanna brunnea</em> ‘Canterbury’); the moth <em>Gadira petraula</em>, or forest remnants providing habitat for the jewelled gecko (<em>Nautilius gemmeus</em>); wetlands supporting Canterbury mudfish (<em>Neochanna burrowsseus</em>), indigenous and plantation forest at Eyrewell supporting the carabid beetle <em>Holcaspis brevicula</em>, sand dunes containing the red katipo (<em>Latrodictes kaitp</em>) spider; any site found to support Canterbury knobbed weevil (<em>Hadrampus tuberculatus</em>; likely to be restricted to <em>Aciphylia aurea</em> but may include other speargrass species) or robust grasshopper (<em>Brachaspis robustus</em>), Mackenzie Basin outwash plain habitats with <em>Lepidium solandri</em> or other Threatened and At Risk-Declining outwash plain plant species. Mackenzie Basin habitats of the grass moth <em>Orocrambus fugitivellus</em>. <em>Muehlenbeckia astonii</em> population on Kaitorete Spit. <strong>Mobile Indigenous Fauna:</strong> site contains one or more species that are Threatened according to the threat system classification of Townsend et al. 2008. For example, limestone formations or vegetation supporting breeding colonies of long-tailed bat (<em>Chalinolobus tuberculatus</em>), braided river systems with breeding populations of black-fronted tern (<em>Chlidonias albostriatus</em>), banded dotterel (<em>Charadrius bicinctus bicinctus</em>), wrybill (<em>Anarhynchus frontalis</em>), or black-billed gull (<em>Larus bulleri</em>); sites with significant populations of At Risk fauna (e.g. sites with substantial numbers of nesting pied stilt), or fauna that are not Threatened.</td>
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### Revised Criteria

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<th>Guidelines</th>
<th>Examples</th>
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<tbody>
<tr>
<td>5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.</td>
<td>This assessment is made at the national or Canterbury Region scale.</td>
<td>Meets threshold: a site containing one or more species or indigenous vegetation types at its distribution limits. For example, Banks Peninsula contains the northern limit of <em>Olearia fragrantissima</em> and the southern limit of at least 14 indigenous plant species (Wilson 2009), including titoki (<em>Alectryon excelsus</em>). Hinuia (<em>Elaeocarpus dentatus</em>) reaches its southern limit at Riccarton Bush, and narrow-leaved snow tussock (<em>Chionochloa rigida</em>) grassland reaches its northern limit on the north bank of the Rakaia River. The Canterbury gecko (<em>Woodworthia cf. brunnea</em>) and jewelled gecko reach their southern and northern distribution limits, respectively, in Canterbury. Low rarity value (does not meet threshold): site contains no Threatened, At Risk, or locally uncommon species and the vegetation type is commonly found both within the ecological district and elsewhere.</td>
</tr>
</tbody>
</table>
| 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 combination of factors. | This assessment refers to any unusual natural biotic or abiotic characteristics of a site which contribute to its value, for example vegetation associated with unusual landforms such as limestone outcrops, seasonally wet lake margins, or caves; or the presence of unusual associations of species. 'Originally rare' ecosystems should be assessed at the national scale, while other distinctive values should be assessed at the regional and/or ecological district scale. 'Originally rare' ecosystems at a national scale have been classified by Williams *et al.* (2007). Those known to occur in Canterbury Region include:  
- Dune deflation hollows  
- Stony beach ridges  
- Shingle beaches  
- Coastal cliffs on acidic rocks  
- Coastal cliffs on basic rocks  
- Calcareous screes  
- Frost hollows  
- Volcanic boulderfields  
- Boulderfields of calcareous rocks  
- Boulderfields of acidic rocks  
- Basic cliffs, scarps, and tors  
- Calcareous cliffs, scarps and tors  
- Inland outwash gravels | High distinctive value (meets threshold): vegetation or habitat that is one of few examples of its type within the region or ecological district (e.g. indigenous forest comprising beech (*Nothofagus* spp.), kawakawa (*Macropiper excelsum*), ngaio (*Myoporum laetum*), and pigeonwood (*Hedycarya arborea*) on Banks Peninsula, or bog pine (*Halocarpus bidwillii*)-red tussock (*Chionochloa rubra*) shrubland at Lagoon Saddle in the Craigieburn Ecological District); indigenous vegetation on originally rare ecosystems (e.g. indigenous herbfield on braided riverbeds, in ephemeral wetlands, on limestone cliffs or pavement, or on stony beach ridges); inland dune systems with *Zoysia minima*; Birdlings flat shrubland that provides habitat for a distinctive assemblage of indigenous lizard species; invertebrate assemblages in freshwater alluvial springs, other special features present at the Canterbury Region scale. Moderate distinctive value (meets threshold): vegetation or habitat that is predictably found on scattered sites within the region or ecological district with more than a few occurrences at each scale, or is commonly found in one part of the region or ecological district, but is absent from most of it (e.g. silver beech forest in the Mt Hutt Ecological District; red beech forest in Akaroa Ecological District; late snow lie vegetation in the Craigieburn Ecological District). Other special features are present at the ecological district scale. Low distinctive value (does not meet threshold): vegetation or habitat that is widespread within the region or ecological district, the site does not comprise an originally rare ecosystem, and there are no other special features associated with the site (e.g. mountain beech forest in the Craigieburn Ecological District). |
**Revised Criteria**

<table>
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<tr>
<th>Guidelines</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Braided riverbeds</td>
<td>matagouri shrublands in the Malvern Hills.</td>
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<td>Limestone erosion pavements</td>
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<td>Sinkholes</td>
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<td>Cave entrances</td>
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<td>Caves and cracks in karst</td>
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<td>Lake margins</td>
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<td>Cushion bogs</td>
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<td>Ephemeral wetlands</td>
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<td>Dune slacks</td>
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<td>Tarns</td>
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<td>Seepages and flushes</td>
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<td>Snowbanks</td>
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<td>Salt pans</td>
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**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.

This assessment is made at the scale of Canterbury Region and the relevant ecological district. Diversity is the number of indigenous habitats and species contained in an area. Like habitats should be compared with like because diversity differs markedly between different habitats. E.g. indigenous sand dune vegetation has relatively low species diversity compared with indigenous broadleaved forest vegetation. Pattern refers to changes in the distribution and abundance of species/habitats across the site, and is driven by underlying variation in the environment, e.g. aspect differences, natural disturbance, altitudinal change, soil characteristics. It can be represented by successional sequences, vegetation mosaics, and ecological gradients. High species diversity provides for greater interaction between species while habitat diversity allows ecological processes (e.g. dispersal, nutrient transfer) to operate and resources (e.g. nesting and feeding habitat) to be shared across different ecosystems.

High diversity and pattern value (meets threshold): intact sequences containing several different vegetation types (e.g. valley floor to alpine habitats, an intact gradient from wetland to forest); habitats with a high richness of indigenous species for their type (e.g. species-rich indigenous turf in ephemeral wetlands in the Coleridge Ecological District and Mackenzie Basin, dune and dry grassland vegetation on Kaitorete Spit; sites with high invertebrate diversity at order, family, or species level; rivers with five or more species of indigenous fish).

Moderate diversity and pattern value (meets threshold): truncated sequences with the remaining components intact (e.g. intact montane valley floor wetlands surrounded by short tussock grassland) or full sequences with less intact components (e.g. discontinuous sequence of indigenous scrub and forest from sea level to 800 m in Stony Bay valley, Akaroa Ecological District). Vegetation types or invertebrate assemblages with a moderate degree of species richness for their type. E.g. kanuka forest with diverse understorey composition and fauna.

Low (does not meet threshold): ecologically isolated vegetation types with low species richness for their type (e.g. patches of matagouri shrubland in pasture, isolated remnants of grazed kanuka forest, exotic-dominated sand dune vegetation backed by pasture); sites that support only limited indigenous fauna assemblages.

**Ecological Context**

8. Vegetation or habitat of indigenous fauna that provides or contributes

The degree to which an area of indigenous habitat or vegetation links to other such areas or contributes to local ecological processes. Such areas have a significant

High ecological context value (meets threshold): continuous riparian forest; wetlands with direct links to river systems; vegetation buffering wetlands from external influences such as sedimentation and excessive nutrient inputs; coastal
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<th>Revised Criteria</th>
<th>Guidelines</th>
<th>Examples</th>
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<td>to an important ecological linkage or network, or provides an important buffering function.</td>
<td>ecological function if they are within the flying distance for the majority of indigenous birds or if they provide a buffer from adverse effects such as predation, disturbance, or pollution.</td>
<td>shrublands providing nesting habitat for seabirds; whole catchments covered by indigenous vegetation; gully forest in South Canterbury that forms part of a network with other nearby patches; regenerating kanuka forest surrounding old growth podocarp/hardwood forest.</td>
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<td>The intention of this criterion is to ensure that the ecological functions of areas of indigenous vegetation are taken into consideration. The criterion places sites that are well-buffered and help to maintain ecological processes in the surrounding environment at a higher priority than sites which are poorly buffered and do not contribute to the functioning of surrounding ecosystems. The values of the site itself may be relatively low (e.g. a small area of indigenous scrub) but its context may give the site a higher value (e.g. the scrub links two large and high value forest remnants). Degraded vegetation and habitat can potentially have important ecological context value.</td>
<td>Moderate ecological context value (may meet threshold): stands of flax or kowhai in rough pasture that provide a seasonal food source for tui and bellbird, areas of scrub that form &quot;stepping stones&quot; for mobile bird and invertebrate species between larger forest tracts.</td>
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<td>The assessment is made at the scale of Canterbury region or the relevant ecological district. This criterion seeks to identify examples of wetlands that provide wider benefits to areas and ecosystems beyond their immediate boundaries.</td>
<td>Low ecological context value (unlikely to meet threshold): kanuka woodland surrounded by pasture and crops and distant from other areas of indigenous forest e.g. kanuka woodland in Bankside Scientific Reserve; grazed or degraded matai/gou shrubland and treeland; patches of bracken (Pteridium esculentum) fernland on road sides on the Canterbury Plains.</td>
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<td>9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.</td>
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<td>Important wetland functions (meets threshold): extensive wetlands on moraine landforms in the Mackenzie Basin and on the margins of Lake Ellesmere/Te Waihora; Avon-Heathcote Estuary (hutahi); wetlands on a river floodplain that are hydrologically connected to the river; riparian wetlands on streams that flow into a coastal lagoon; wetlands that provide an important seed source for other wetlands in the catchment; lake margin wetlands in high country basins; high country catchments with continuous or semi-continuous riparian wetlands.</td>
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<td>Low wetland functionality (unlikely to meet threshold): an isolated valley floor swamp in the catchment of a small second order stream; small ephemeral wetlands on terraces with no hydrological connections to streams or rivers; toe slope fens in intensively farmed catchments.</td>
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<td>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.</td>
<td>This criterion places importance on areas of indigenous vegetation or habitat that provide important habitat for indigenous fauna. This can apply to common fauna, so long as the habitat is an important one, for example, an area of forest that supports a large number of indigenous species of avifauna or large numbers of particular species. Many indigenous fauna congregate on a seasonal or daily basis and these congregation sites will often be important and rank as significant under this criterion.</td>
<td>High habitat value (meets threshold): any site that supports seabird colonies, e.g. sooty shearwater (Puffinus griseus) at Stony Bay; islands in braided river beds (e.g. Rakaia Island) that provide safe breeding habitat for braided river birds and refugia for a suite of indigenous plants and insects; rock faces that support rare and threatened moths and other fauna; marine mammal haulouts, spawning sites for indigenous fish, high tide bird roosts in estuaries, wetlands with habitat for Canterbury mudfish (Neochanna burrowsi); willows and other exotic trees that provide roosting habitat or shelter around feeding pools for long-tailed bats (Chalinolobus tuberculatus); coastal vegetation that provides breeding habitat for yellow-eyed penguin (Megadyptes antipodes) or the regionally endemic white-flippered penguin (Eudyptula minor albosignata); lakeside vegetation that provides nesting habitat for southern crested grebe (Podiceps...</td>
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<td>Revised Criteria</td>
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<td><em>cristatus australis</em>.</td>
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<td>Moderate habitat value (meets threshold): e.g. riparian crack willow forest on otherwise developed landscape that provides important local habitat for populations of native birds and invertebrates.</td>
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<td>Low habitat value (does not meet threshold): intensively grazed exotic pasture; ploughed fields providing temporary food sources for black-fronted tern (<em>Chlidonias albostriatus</em>), South Island pied oystercatcher (<em>Haematopus finschii</em>), and black-billed gulls.</td>
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Assessments of significance should assess site values against each of the criteria in Table 2. In doing so, the guidelines will help in the interpretation of each criterion, and ensure that the assessment is undertaken at the correct scale. For each assessment, the assessor should list the reasons why the site does or does not qualify against each criterion and indicator. This will help to reduce the subjectivity of the assessment, and allow a peer reviewer to assess its accuracy. Some of the criteria and indicators overlap to a degree, but each should be assessed independently.

5. CONCLUSIONS

Canterbury Region is large, diverse, and contains many features of considerable value for indigenous biodiversity. These features include very large tracts of indigenous forest and alpine environments, lake complexes, inland basins, large braided rivers cutting across highly-developed plains, coastal lagoons, and locally extensive limestone outcrops. On the other hand, indigenous vegetation and habitats have been almost eliminated from the plains and foothills, and often only tiny remnants of originally extensive ecosystems remain in these areas. Significance criteria therefore need to be associated with guidelines that ensure correct interpretation, and that appropriate thresholds are used in different parts of the Region.

A review of the guidance provided with significance criteria sets that are used elsewhere in New Zealand showed wide variation between different districts and regions, although common features were present in the guidance provided for the most recently-developed criteria sets. These included detailed interpretation of criteria using additional text and examples.

The guidelines and examples provided in this report should assist with appropriate application of the criteria set within Canterbury Region.

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REFERENCES/BIBLIOGRAPHY


Horizons Regional Council 2009: Officer Report - Response of Fleur Maseyk to Supplementary Evidence of Technical Experts for the Biodiversity Hearing


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