## Updated guidelines for determining areas of significant indigenous vegetation and habitats of indigenous fauna in the Waikato region.

Walkato X/X/



www.waikatoregion.govt.nz ISSN 2230-4363 (Online)

Prepared by: Wildland Consultants Ltd PO Box 7137 Te Ngae Rotorua 3042

For: Waikato Regional Council Private Bag 3038 Waikato Mail Centre HAMILTON 3240

October 2022

Peer reviewed	by:
---------------	-----

Karen Denyer and Gerry Kessels Date 17 June 2019

Approved for release by:

Mike Scarsbrook Date 26 June 2023

#### Disclaimer

This technical report has been prepared for the use of Waikato Regional Council as a reference document and as such does not constitute Council's policy.

Council requests that if excerpts or inferences are drawn from this document for further use by individuals or organisations, due care should be taken to ensure that the appropriate context has been preserved, and is accurately reflected and referenced in any subsequent spoken or written communication.

While Waikato Regional Council has exercised all reasonable skill and care in controlling the contents of this report, Council accepts no liability in contract, tort or otherwise, for any loss, damage, injury or expense (whether direct, indirect or consequential) arising out of the provision of this information or its use by you or any other party

## UPDATED GUIDELINES FOR DETERMINING AREAS OF SIGNIFICANT INDIGENOUS VEGETATION AND HABITATS OF INDIGENOUS FAUNA IN THE WAIKATO REGION





## UPDATED GUIDELINES FOR DETERMINING AREAS OF SIGNIFICANT INDIGENOUS VEGETATION AND HABITATS OF INDIGENOUS FAUNA IN THE WAIKATO REGION

**Contract Report No. 4981** 

March 2023

Reviewed and approved for release by:

Sarah Beadel Director Wildland Consultants Ltd

## Acknowledgement

It is acknowledged that the revised version of this document builds upon ongoing discussions and professional expertise of a wide range of ecologists both within the Waikato Regional Council as well as from independent agencies and/or companies. The following people have provided helpful comments and edits on draft versions of this revised report: Karen Denyer, Gerry Kessels, Chris Staite, and Michael Townsend. Helpful comments from Waikato Regional Council staff in the Natural Heritage, Science and Policy, and Coastal Policy teams have also improved these guidelines.

## **Table of Contents**

1	Introduction					
2	Determine what you need to do	4				
3	Application of significance criteria					
	3.1 Step 1: Is a site significant?	5				
	3.3 Step 2: Optional: Why is a site significant?	6				
	3.4 Step 3: Optional: How significant is a site?	6				
4	Relative importance of an area of significant indigenous vegetation or significant					
	habitat of indigenous fauna	18				
Refer	References and selected bibliography 30					
5	Other useful information sources 3					
6	Definitions 3					
Арреі	Appendix 1. Potential current and historical vegetation types of the Waikato Region split byEcological District based on Singers and Rogers 2014 vegetation classifications.41					
Арреі	Appendix 2. Guidelines for interpretation of key terms which underpin assessment of significant natural areas from the draft National Policy Statement for Indigenous					
	Biodiversity.	51				
Арреі	ndix 3. Significance assessment guidelines from Whaley et al. 1995.	55				
Арреі	Appendix 4. Confidence rating for site evaluations and significance rankings         58					

## Tables

1.	Criteria for the assessment of significance and reasons for why a site is significant	6
2.	Relative importance of an area of significant indigenous vegetation or significant habitat of indigenous fauna	19
3.	Checklist for assessing the relative importance of an area of significant indigenous vegetation or significant habitat of indigenous fauna	27

## Abstract

Waikato Regional Council has a strategic objective to identify important areas of indigenous vegetation and habitats of indigenous fauna within the Waikato Region for biodiversity management to meet the requirements of Section 6c of the Resource Management Act 1991 (RMA) (New Zealand Government 1991). Identification of Significant Natural Areas (SNAs)<sup>1</sup> is the logical first step. This report provides guidelines for ecologists, planning agencies, and community groups to interpret the revised significance criteria present in the 2016 Waikato Regional Policy Statement. This report also aligns the interpretation of the significance criteria with the exposure draft of the National Policy Statement for Indigenous Biodiversity (Ministry for the Environment, 2022) where possible<sup>2</sup>. Guidance is also provided on assessing the relative significance of sites (International, National, Regional, or Local) to prioritise management once an area has been identified as being significant. Useful definitions and references are provided.

<sup>&</sup>lt;sup>1</sup> SNA is the acronym for Significant Natural Areas. Significant Natural Areas is a short term for areas of significant indigenous vegetation and significant habitats of indigenous fauna as defined in Section 6c of the Resource Management Act.

<sup>&</sup>lt;sup>2</sup> As a draft, the National Policy Statement on indigenous biodiversity is likely to change in the future. To ensure national guidelines on significant indigenous biodiversity are followed, users should refer to the most recent publications available at the time of an assessment.

## 1 Introduction

Section 6c of the Resource Management Act 1991 ('the Act') requires those enacting it to provide for, as a matter of national importance, the protection of areas of significant indigenous vegetation and significant habitats for indigenous fauna (New Zealand Government 1991). Regional Councils are also required, under Section 30(1)(ga) of the Act, to establish, implement, and review objectives, policies, and methods for maintaining indigenous biological diversity in their region. However, the Act does not prescribe how to assess significance, nor does the Act require differential protection of sites based on the degree of relative significance; however assigning a level of significance can help prioritise resource allocation. Chapter 11 of the Waikato Regional Policy Statement provides policy direction for maintaining, enhancing, and avoiding adverse effects on indigenous biodiversity, and provides policy relating to the identification and protection of areas of significant indigenous biodiversity. Territorial authorities and the Waikato Regional Plan must give effect to the Waikato Regional Policy statement.

As part of the policy for identifying and protecting significant indigenous biodiversity, criteria to assess the significance of vegetation and habitats within the Waikato Region were developed by Waikato Regional Council in 2002 and were added to the Waikato Regional Policy Statement operative at that time (Environment Waikato 2002). At that time, a guidelines document for interpretation of the significance criteria was also developed (Environment Waikato and Wildland Consultants 2002). Since 2002, the significance criteria within the Regional Policy Statement have been updated, but this was not reflected in any updated guidelines for interpretation of those criteria. This report provides updated guidelines for interpretation of the significance criteria present in the 2016 Waikato Regional Policy Statement and aligns the interpretation of the significance criteria with the exposure draft National Policy Statement for Indigenous Biodiversity (Ministry for the Environment, 2022)<sup>3</sup>, where possible. The draft National Policy Statement for Indigenous Biodiversity gives guidance on relevant ecological principles and definitions which can be contentious in relation to the assessment of significant natural areas; this guidance has been reproduced in Appendix 2 to provide clarity for users of this guide. Input from an experienced and suitably qualified ecologist(s) is recommended to ensure the evaluation of significance and relative importance of an area follows sound ecological practice.

This report provides a process for three potential options relating to an area of indigenous vegetation or habitat for indigenous fauna:

- Assessment of WHETHER an area of indigenous vegetation or indigenous fauna habitat (a site) is significant (the basic requirement of the Act).
- Outlining WHY a site is significant.
- Determining HOW significant a site is.

Each successive option requires completion of the previous steps.

Unless a site has been surveyed recently (within 5-10 years of the assessment), a field visit is recommended to accurately apply assessment criteria and to determine whether it contains significant indigenous vegetation or significant habitat for indigenous fauna. There are 11 criteria (see Table 1 below) that were developed for the Waikato Regional Policy Statement, many of which have been tested by appeals to the Environment Court or through negotiation at a District Plan appeals level. A site is considered to be significant if one or more criterion is triggered in Table 1, unless the only criterion met is Criterion 1, in which case one of the other

<sup>&</sup>lt;sup>3</sup> As a draft, the National Policy Statement on indigenous biodiversity is likely to change in the future. To ensure national guidelines on significant indigenous biodiversity are followed, users should refer to the most recent publications available at the time of an assessment.

criteria must also be met for a protected site to be significant. If none of the criteria in Table 1 are assessed as being met at the time of the assessment, the site should be labelled as 'Not Presently Significant'. Areas of vegetation and habitats of indigenous fauna are not static in the environment; they will change with natural processes, climatic changes, and as a result of active management. Consequently, the ecological values of a site can change over time and a site which may previously have been assessed as Not Presently Significant may be assessed as Significant or of Indeterminate Significance at a later date.

## Note: to classify a site as "Not Presently Significant" each criterion must have been tested and shown to be not applicable.

If you wish to develop a list or schedule of significant sites within a wider area, you can apply the criteria to all sites for which adequate information is available. Developing comprehensive schedules or lists of significant sites can require significant resources and it is difficult to ensure that the coverage is comprehensive. However, such lists can be very valuable because they also provide detailed information that can be used to underpin the allocation of resources for active management and associated plan provisions. Lists of terrestrial and wetland habitats which meet, or are likely to meet the Waikato Regional Policy Statement criteria have been compiled for nine of the ten Districts within the Waikato Region (see Section 5 for the titles of publications for districts where schedules have been compiled). Lists of geothermal, lake, and stream habitats which meet, or are likely to meet the Waikato Regional Policy Statement criteria have also been compiled (also see Section 5), and an assessment of significant areas within the Coastal Marine Area (CMA) is currently being prepared. These lists provide a good starting point for finding information on a site, but should not be used as the final determination of whether a site is significant or not presently significant. The reports of the desktop assessments undertaken for the Waikato Regional Council are available on the Waikato Regional Council website, however some local body authorities have undertaken additional work since the initial desktop assessments, so District Plans for the relevant district should also be consulted. All eleven of the criteria presented below can be used to assess sites located within the Coastal Marine Area (CMA), however a CMA site should also be assessed against the criteria within Policy 11 of the New Zealand Coastal Policy Statement (2010) before determining whether a coastal site is significant or not presently significant.

Sites for which adequate information is not available should be considered to be potentially significant until proven otherwise. Alternatively, sites can be assessed on an "as required" basis. Where adequate information is not available, and resources for undertaking surveys to bolster existing information are lacking, it can be useful to provide a confidence rating (Low, Medium, High) for future users of the information. A guideline for determining level of confidence in the assessment is provided in Appendix 4.

Note: This is a guidelines document, not Council policy. We welcome feedback and suggestions. Please phone 0800 800 401 and ask to speak to one of the biodiversity team.

## 2 Limitations of data

Significant changes in national and regional policy have occurred since the first guidelines for significant natural area assessments for the Waikato Region were published in 2002. There are now national level policy statements for a wide range of ecosystem and land management types, most of which have only become operative since 2019 at the earliest. Consequently, regional councils throughout the country are required to align their regional policies and objectives with the new national level policy documents. However, due to the large volume of new national policy documents that were published within a short timeframe, there has not yet been sufficient time for all regional level policies and guidelines to be updated accordingly. Additionally, some national policy documents are still in draft form and are not yet operative.

The guidelines given below therefore reflect the current national policy guidelines as at February 2023 and align with draft policy documents where possible. Both the National Policy Statement for Indigenous Biodiversity (NPS-IB) and the updated Waikato Coastal Policy are expected to be published in 2023. To ensure national and regional guidelines on significant indigenous biodiversity and significant coastal areas are followed, users should refer to the most recent publications available at the time of an assessment.

## **3** Determine what you need to do

It is important to consider the type and level of information needed and for what purposes the assessment is required.

What type and level of information do you require?	What is the information required for?
Determine if a site is <b>ecologically significant, for</b> any reason.	You <i>might want to do this</i> if you are attempting to create a map or schedule of sites that are considered to be significant and worthy of protection.
	It is advised that you start with the easiest criteria first, as it may not be necessary to apply all criteria once one is found to be applicable.
Assess <b>all of the ecological values</b> for which a site may be significant.	You <i>will need to do</i> this if an activity is planned that may adversely affect a site to ensure that the characteristics which make a site significant are protected from adverse effects. For example, a resource consent application to clear vegetation or divert water. The Waikato Regional policy statement requires that the characteristics that make a site significant are protected from adverse effects rather than the geographic site only. You <i>might want to do this</i> if you have responsibility for active management of a site. Knowing all the values for which a site is
	significant will enable you to determine the management needs, likely costs, and to establish priorities.
Find out <b>how significant</b> a site is. That is, of international, national, regional, or local significance.	You <i>might want to do this</i> if you are allocating resources between a number of sites.
	Sites that are assigned a lower level of significance (e.g. local) are still considered to be significant for the purposes of Policy 11.2 of the operative Waikato Regional Policy Statement (RPS), and in relevant sections of any other policy documents that cannot be inconsistent with the RPS such as district plans.

## 4 Application of significance criteria

Assessment of the 11 criteria set out in Table 1 below will enable the assessment of whether a site is significant, the reasons why a site is significant, and a relative level of significance (note that Table 2 would also need to be completed to assign a measure of relative significance).

#### 4.1 Step 1: Is a site significant?

- 1. First complete the top of Table 1. Identify the site by providing a site name, land tenure/owner, location, area (hectares), ecological district name, and a brief general description.
- 2. To assist you in determining whether a site is 'Significant' or 'Not Presently Significant', assess each of the criterion listed in **Column A**. **Column B** contains further information and relevant definitions, while **Column C** provides likely sources of information.
- 3. Provide responses ("Yes", "No", "Not Sure") in Column D.
- 4. If you answer yes to **one or more** of the criteria, then a site <u>is</u> significant<sup>4</sup> in terms of the Waikato Regional Policy Statement criteria. (Unless the only criterion met is Criterion 1, in which case one of the other criteria must also be met for a protected site to be significant.)
- 5. If you only wish to know whether a site is significant, apply Table 1 only until a "Yes" response is triggered in **Column D**. This will help save cost and effort.
- 6. Complete **Column E** to justify your decision.
- 7. The criteria have been grouped, but are listed roughly in order of ease of access to information. They are not presented in any order of importance.
- 8. The assistance of a suitably qualified and experienced ecologist/biologist should be sought when undertaking assessment of the criteria. The opinion of an ecologist is not necessarily the final answer, but may be used, with appropriate evidence, to argue for or against a site being classified as significant.
- 9. If you answer "No" for all of the criteria in Table 1 then a site is deemed "Not presently significant". To be confident of this assessment you must seek further information to eliminate all "Not sure" responses. Note that any interest in the use or development of a site should not rely on an old assessment that determined that a site was not presently significant. Significance status can change, even over a few years, on the basis of change in the environment or new information. A site should be resurveyed (a site inspection) and reassessed if it is still an area of indigenous vegetation or habitat for indigenous fauna.
- 10. If you think that a site is likely to meet one or more of the criteria in Table 1 but there is insufficient evidence to respond Yes or No with certainty, then the site is deemed to be "Likely to be significant" and will require field survey to gather further information, unless one of the other criteria has been assessed as being met.
- 11. If you are unsure about all criteria for a site, the site should be assessed as being of Indeterminate significance. Field survey will be required to gather further information to assess whether the site meets, or does not meet, any of the criteria.

<sup>&</sup>lt;sup>4</sup> Note however, that a site's significance may be determined ultimately by a decision-making body based on technical evidence from relevant specialists (usually qualified and experienced ecologists).

### 4.3 Step 2: Optional: Why is a site significant?

- 1. Complete **Column D** in **Table 1**. If you wish to know why your site is significant **assess all of the criteria**, rather than stopping the assessment at the first "Yes" response in Column D.
- Note that the number of "Yes" responses in Column D is not necessarily an indication of a greater or lesser degree of significance, as one feature may carry particular weight (e.g. an extremely rare or unusual feature).

#### 4.4 Step 3: Optional: How significant is a site?

- 1. If you wish to know how significant a site is, complete **Column E** in Table 1 for all criteria assigned a "Yes" response.
- 2. Use the responses in **Column E** of Table 1 to help assess the additional questions in Table 2. Complete Table 2 if you want to determine the level of significance (international, national, regional, local).
- 3. Table 2 contains detailed information to assist in your assessment. Table 3 is a summarised version of Table 2. You can use it to double-check your results in Table 2, or once familiar with the process, as an alternative to Table 2.

#### Table 1: Criteria for the assessment of significance and reasons for why a site is significant

#### Site Name:

Area (ha):

**Ecological District:** 

Land Tenure:

Location (grid reference and general location):

**General Description:** 

	A. Criteria⁵	B. Definitions and Further Information <sup>5</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
PREV	IOUSLY ASSESSED SITE		-	-	
1	It is indigenous vegetation or habitat that is currently, or is recommended to be, set aside by statute or covenant or by the Nature Heritage Fund, Ngā Whenua Rāhui committees, or the Queen Elizabeth the Second National Trust Board of Directors specifically for the protection of biodiversity, and meets at least one of Criteria 2-11.	This may include sites protected under the Conservation Act, Resource Management Act, or with QEII National Trust, Ngā Whenua Rāhui, or Nature Heritage Fund. Some areas may be protected for reasons other than biodiversity protection. If unsure, check the reasoning for protection with the authority responsible for the gazetting of the site.	Department of Conservation Waikato Regional Council Ngā Whenua Rāhui QEII National Trust Nature Heritage Fund Territorial Authority (District or City council).	Y / N / NS	What type of legally protected area is it? e.g. Scenic Reserve, National Park, QEII Covenant.

<sup>&</sup>lt;sup>5</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

	A. Criteria <sup>6</sup>	B. Definitions and Further Information <sup>6</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
ECOL	OGICAL VALUES				
2	In the <b>Coastal Marine Area</b> , it is indigenous vegetation or habitat for indigenous fauna that has been reduced in extent or degraded due to historic or present anthropogenic activity to a level where the <b>ecological sustainability</b> of the ecosystem is threatened. <sup>7,8</sup>	See footnote 8.	Waikato Regional Council Coastal Plan (in preparation) <sup>8</sup>	Y / N / NS	

<sup>&</sup>lt;sup>6</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

<sup>&</sup>lt;sup>7</sup> In addition to this criterion, any potential SNA identified within the Coastal Marine Area should be assessed against all eleven criteria within this guidance document **AND** Policy **11** of the New Zealand Coastal Policy Statement.

<sup>&</sup>lt;sup>8</sup> Mapping of significant indigenous biodiversity areas within the Coastal Marine Area (CMA) will be identified by the proposed Waikato Regional Coastal Plan. Notification of the revised Coastal Plan is anticipated in 2023, following which guidance and information within the plan should also be consulted when assessing areas in the CMA.

A. Criteria <sup>9</sup>	B. Definitions and Further Information <sup>9</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
<ul> <li>3 It is vegetation or habitat that is currently habitat for indigenous species or associations of indigenous species that are:</li> <li>Classified as threatened or at risk, or</li> <li>Endemic to the Waikato Region, or</li> <li>At the limit of their natural range.</li> </ul>	Species that are threatened with extinction are indigenous species that have been evaluated and placed within any of the 'Threatened' or 'At Risk' categories within the New Zealand Threat Classification System <sup>10</sup> . Care should be taken when assessing this criterion for species which are otherwise common in the wider landscape/ecological region/district but which are listed as Threatened or At Risk as a precautionary measure due to potential risk factors e.g. common Myrtaceae species which are now classified as Threatened or At Risk due to the threat posed by Myrtle rust. In these instances, professional ecological judgment should be used. With respect to fauna habitat, professional ecological judgement should be used when assessing significance, particularly when evaluating relative significance of occasional site use by highly mobile fauna. Where there is doubt, refer to the guidelines on rarity and distinctiveness given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council University of Waikato Published reports or maps	Y / N / NS	List the subject species and their threat category, e.g. Threatened-Nationally Critical, At Risk-Declining, At Risk-Naturally Uncommon, regionally uncommon. List source of information.

<sup>9</sup> 

Terms highlighted in **bold** type are defined in the glossary on Pages 39-40. When listing Threatened, At Risk, or Data deficient species for this criterion, please ensure the most up-to-date threat classification publications are used for the relevant organism grouping. 10

A. Criteria <sup>11</sup>	B. Definitions and Further Information <sup>11</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
4 It is indigenous vegetation, habitat, or an ecosystem type that is under- represented (20% or less of its known or likely original extent remaining) in an Ecological District, Ecological Region, or nationally.	Maps of ecological regions and districts are available from Department of Conservation or Waikato Regional Council. A type of indigenous vegetation or habitat could refer to a broad unit such as podocarp/tawa forest, or a more detailed classification and mapping unit such as harakeke ( <i>Phormium tenax</i> ) flaxland. Definitions and examples of vegetation/habitat structural classes and vegetation types are provided in Atkinson (1985). See Section 5 for other publications which provide examples of vegetation types for various habitats. Comparison with known or likely original extent may require analysis (e.g. using a Geographic Information System) of current extent and previous extent. As a starting point, use the vegetation/habitat type analysis provided in Appendix 1 of this document which is based on the potential historic ecosystems of New Zealand by Singers and Rogers (2014) <sup>12</sup> . If protected natural area programme reports (PNAP survey reports) are available for your area, these will provide a more detailed, comprehensive analysis of vegetation types.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	List under-represented vegetation/habitat type(s) and state whether they are under-represented at a national, regional, or ecological district scale?

<sup>&</sup>lt;sup>11</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

<sup>&</sup>lt;sup>12</sup> Care should be taken when using this data set as some vegetation and habitat types within some parts of the Waikato Region (coastal and northern Waikato) are not well delineated or accurately described by the methodology used for this data set. To avoid doubt, multiple publications or data sets should be utilised to ensure an accurate assessment of this criterion for any given site.

A. Criteria <sup>13</sup>	B. Definitions and Further Information <sup>13</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
5 It is indigenous vegetation or habitat that is, and prior to human settlement was, nationally uncommon, such as geothermal, Chenier plain, or karst ecosystems, hydrothermal vents or cold seeps.	Geothermal habitats can include geysers, springs, sinter terraces, and hydro-thermally altered soils. They provide habitat for geothermally- influenced vegetation, and heat- tolerant bacteria. A Chenier plain is a plain comprising shell ridges with infilled muds and other sediment between the ridges. An extensive area at Miranda provides habitat for international wader migrants. Karst ecosystems are limestone systems, providing habitat for specialist limestone plants (e.g. <i>Asplenium</i> <i>cimmeriorum, Gymnostomum</i> <i>calcereum</i> ) and fauna (e.g. cave wētā). Note that these three examples are not a comprehensive list of nationally uncommon vegetation or habitat types. Other nationally uncommon and/or historically rare ecosystems are defined in Williams <i>et al.</i> (2007) and Holdaway <i>et al.</i> (2012). Where there is doubt, refer to the guidelines on rarity and distinctiveness given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council	Y / N / NS	Type of feature:

<sup>&</sup>lt;sup>13</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

A. Criteria <sup>13</sup>	B. Definitions and Further Information <sup>14</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
<ul> <li>6 It is wetland habitat for indigenous plant communities and/or indigenous fauna communities (excluding exotic rush/pasture communities) that has not been created and subsequently maintained for or in connection with: <ul> <li>(a) waste treatment; or</li> <li>(b) wastewater renovation; or</li> <li>(c) hydroelectric power lakes (excluding Lake Taupō); or</li> <li>(d) water storage for irrigation; or</li> <li>(e) water supply storage; unless in those instances they meet the criteria in Whaley <i>et al.</i> (1995).</li> </ul> </li> </ul>	<ul> <li>Wetlands have been severely depleted nationwide, and are recognised as a nationally rare habitat type.</li> <li>Wetlands may have fluctuating water levels and the edge of a wetland may be difficult to define but will generally be where wetland plant species (e.g. raupō) are replaced with dryland species (e.g. kānuka); soil analysis may be required to accurately delineate wetland boundaries in some instances (see Fraser <i>et al.</i> 2018). Note that mānuka can occur in wetland and dryland habitats.</li> <li>The definition of wetlands also includes coastal wetlands, e.g. ephemeral wetlands associated with sand dunes, mangroves, and estuaries.</li> <li>See Section 5 for publications which provide good information on wetland delineation.</li> <li>All artificially-created wetlands listed in Criterion 6a-e should <u>also</u> be evaluated using the criteria in Whaley <i>et al.</i> (1995), as well as criteria 1-5 and 7-11 in Table 1. The significance criteria from Whaley <i>et al.</i> (1995) are reproduced in Appendix 3.</li> </ul>	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps Copies of Whaley <i>et al.</i> (1995) can be obtained from Waikato Regional Council	Y / N / NS	Type of wetland habitats/indigenous communities present:

<sup>&</sup>lt;sup>14</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

A. Criteria <sup>15</sup>	B. Definitions and Further Information <sup>15</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
<ul> <li>7. It is an area of indigenous vegetation or naturally occurring habitat that is large relative to other examples in the Waikato Region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type.</li> <li>Note that this criterion is not intended to select the largest example only in the Waikato Region of any habitat type.</li> </ul>	This criterion is not intended to select the largest single example of a habitat type in the Waikato Region. Refer to vegetation maps (e.g. Leathwick <i>et al.</i> 1995, Singers and Rogers 2014), natural area inventories, DOC compilations of Sites of Special Wildlife Importance (SSWI), DOC Conservation Management Strategies for Waikato, Bay of Plenty, Wanganui, Auckland, and Tongariro/ Taupō Conservancies, Protected Natural Area Programme survey reports to help determine the species that are typical of each habitat type and to determine which other parts of the Waikato Region have similar habitat, and the size of those examples. Where there is doubt, refer to the representativeness, and diversity and pattern guidelines given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	Broad habitat types present:

<sup>&</sup>lt;sup>15</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

A. Criteria <sup>16</sup>	B. Definitions and Further Information <sup>16</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
<ul> <li>8 It is aquatic habitat (excluding artificial water bodies, except for those created for the maintenance and enhancement of biodiversity or as mitigation as part of a consented activity) that is within a stream, river, lake, groundwater system, wetland, intertidal mudflat or estuary, or any other part of the coastal marine area and their margins, that is critical to the self-sustainability of an indigenous species within a catchment of the Waikato Region, or within the coastal marine area. In this context 'critical' means essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species. This includes areas that maintain connectivity between habitats.</li> </ul>	Excludes artificial water bodies, except those created for the maintenance and enhancement of biodiversity or as mitigation for a consented activity. Groundwater systems in this context relate to spring-fed streams and wetlands, other wetlands that are primarily fed by ground water (e.g. fens and seepages), and underground water systems. Therefore, a groundwater system in this context is potentially significant in its role of maintaining such spring or ground-fed streams and wetlands. It is likely that sound technical advice will need to be obtained from an appropriately qualified and experienced aquatic ecologist and/or hydrologist. For areas below mean high water springs (MHWS), consult guidance on aquatic habitat within the Waikato Regional Council Coastal Plan (in preparation) <sup>17</sup> .	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council University of Waikato	Y / N / NS	Catchment:

<sup>&</sup>lt;sup>16</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

<sup>&</sup>lt;sup>17</sup> Mapping of significant indigenous biodiversity areas within the Coastal Marine Area (CMA) will be identified by the proposed Waikato Regional Coastal Plan. Notification of the revised Coastal Plan is anticipated in 2023, following which guidance and information within the plan should also be consulted when assessing areas in the CMA.

A. Criteria <sup>18</sup>	B. Definitions and Further Information <sup>18</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
9 It is an area of indigenous vegetation or habitat that is a healthy, representative example of its type because:	Fencing and pest control would be required for most mainland sites in the Waikato Region (irrespective of habitat type).	Consultant Ecologist Department of Conservation Waikato Regional Council	Y / N / NS	<ul> <li>Rank the following factors High (H), Medium (M) or Low (L):</li> <li>Structural intactness</li> <li>Ratio of indigenous:exotic species</li> </ul>
<ul> <li>its structure, composition, and ecological processes are largely intact; and,</li> <li>if protected from the adverse effects of plant and animal pests and of adjacent land and water use (e.g. stock, discharges, erosion, sediment disturbance), can maintain its ecological sustainability over time.</li> </ul>	Ecologists assessing this criterion should take into account the site's size, shape, buffering from external effects, and connection to other natural areas. Other factors to be considered include indigenous regeneration and recruitment (e.g. the presence of fruit, seedlings, nests, juveniles, fauna), structural tiers, hydrological processes in wetlands, invasive weeds, pest animals, domestic stock, threat management, management history. Where there is doubt, refer to the representativeness, and diversity and pattern guidelines given in Appendix 2.	Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Published reports or maps This criterion will require the input of an experienced and qualified ecologist. Good information will be required, and, in most instances, a field visit will be necessary.		<ul> <li>Connectivity to other natural areas</li> <li>Size of the area in the context of the relevant ecological district</li> <li>Degree of protection from likely threats (e.g., fenced, buffered)</li> <li>Species diversity</li> <li>List no. of responses to the above questions:</li> <li>H M L</li> <li>Indicate overall ecological quality of the site:</li> <li></li> <li>Would you consider this to be among the best examples of its type nationally (Y/N), in the Waikato Region (Y/N), or in a particular ecological region/district (Y/N)? Provide justification:</li> </ul>

<sup>&</sup>lt;sup>18</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

A. Criteria <sup>19</sup>	B. Definitions and Further Information <sup>19</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
10 It is an area of indigenous vegetation or habitat that forms part of an <b>ecological</b> <b>sequence</b> that is either not common in the Waikato Region or an ecological district, or is an exceptional, <b>representative</b> example of its type.	Ecological sequences that are not common in the Waikato Region include, but are not restricted to, indigenous dune vegetation through to coastal scrub or forest, lake margins or geothermal systems to indigenous forest, coastal to montane or alpine vegetation. Such sequences should be largely intact (e.g. perhaps bisected by roads but not by large tracts of non-indigenous land cover), such that they can be traversed by most indigenous species that are reliant on such sequences for the completion of part or all of their life- cycles (e.g. by movement of key fauna or dispersal of propagules such as seeds). It will probably be necessary to provide or obtain a map(s) of the sequence and the main vegetation types and habitats that it comprises. GIS analysis using a vegetation map and an appropriate evaluation framework, e.g. ecological district boundaries, may demonstrate whether a sequence is uncommon or one of the better examples. An exceptional, representative sequence will be one of the best examples of its type in the Waikato Region, taking into account its intactness, composition, and ecological processes. Where there is doubt, refer to the diversity and pattern guidelines given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	Does the site include or is it part of one of the best or only examples of this type of ecological sequence nationally (Y/N), regionally (Y/N), or in the relevant ecological district (Y/N)?  Location:  Key elements of sequence:  Justification:  Justification:

<sup>&</sup>lt;sup>19</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

A. Criteria <sup>18</sup>	B. Definitions and Further Information <sup>20</sup>	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
ROLE IN PROTECTION OF ECOLOGICALLY	SIGNIFICANT AREA			
11 It is an area of indigenous vegetation or habitat for indigenous species (which habitat is either naturally occurring or has been established as a mitigation measure) that forms, either on its own or in combination with other similar areas, an ecological buffer, linkage or corridor, and which is necessary to protect any site identified as significant under Criteria 1-10 from external adverse effects.	This criterion also includes riparian vegetation that protects a significant aquatic habitat e.g. a freshwater fishery, lake, river, or stream that is important for the sustainability of an indigenous species, or a coastal or marine system. This criterion can also include sites which act as 'stepping stone' habitat between otherwise geographically isolated, significant sites. Determination of how far stepping stone habitat can be from other significant sites will depend on which species is used as an example. Therefore, care should be taken to consult a suitably qualified ecologist when determining whether a site meets this criterion. Where there is doubt, refer to the ecological context guidelines given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	Key ecological function(s) of the site (buffer, ecological linkage, other):

<sup>&</sup>lt;sup>20</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

## 5 Relative importance of an area of significant indigenous vegetation or significant habitat of indigenous fauna

Whilst the Waikato Regional Policy statement does not require determination of relative significance for a site which has been identified as significant, these guidelines provide an additional table to determine four levels of importance or relative significance: international, national, regional, and local. Determining the relative significance of significant sites will help decision makers and land managers prioritise management and resource allocation for SNAs within their jurisdiction.

Factors to be assessed when assigning a level of significance to a site are provided below in Table 2. These are elements of the primary criteria 1-11 in Table 1 and they provide additional detail to enable recognition of features that are significant within an international, national, regional, or local context.

Sites assessed using Table 2 must first have been assigned a "Yes" response to at least one of the criteria in Table 1, unless the only criterion met is Criterion 1, in which case one of the other criteria must also be met for a protected site to be significant. A site cannot be assigned to a level of significance unless it has first been shown to be ecologically significant.

A site will be assigned to the highest level at which it meets any one of the factors in Table 2. IF a site is assigned a "Yes" response at the International level, for instance, there is no need to progress further down the table, although the site is also likely to comply with elements lower in the hierarchy.

Sites can be assigned a level of significance based on the following factors:

- Legal status and previous assessment (Criterion 1) as an ecologically significant site, and/or;
- Rarity/Threat status (species, habitats, ecosystems) (Criteria 2, 3, 4, 5, 6, 8), and/or;
- Relative quality (Criteria 7, 9, 10), and/or;
- Ecological function as a buffer, linkage, or corridor (Criterion 11).

NB: A site is ecologically significant in terms of Section 6c of the Resource Management Act if it has been determined as significant using Table 1 above. A relative importance ranking of Local or Regional does not diminish the legislative requirements for sites identified as significant just because their relative level is lower than those of International and National significance.

Table 3 is a checklist that summarises the features a site must hold to be considered of international, national, or regional significance. Use it to double-check significance level assessments. After becoming familiar with the detail in Table 2 you may find it more convenient to use Table 3 directly to apply a level of significance.

## Table 2: Relative importance of an area of significant indigenous vegetation or significant habitat of indigenous

#### fauna.

In Column A, circle the criteria numbers for which you scored a 'Yes' in Table 1. Then consider the factors to be assessed, and complete Column D, using your answers in Table 1, Column E to justify your response.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
	INTERNATIONALLY SIGNIFICANT		
	A site is Internationally Significant if you respond 'YES' to any of the questions in this section.	Internationally significant natural areas have usually been identified in previous assessments. These sites are so important that some of them are already protected by international conventions. For example, the Tongariro National Park is a World Heritage Area, and there are three wetlands in the Waikato listed as Wetlands of International Importance under the international Ramsar Convention (Whangamarino Swamp, Kopuatai Peat Dome, and the Firth of Thames estuary). Other natural areas may be internationally significant if they contain high quality vegetation or habitat that is unique in the world - for example, geothermal systems at Waiotapu and Orakeikorako.	

<sup>&</sup>lt;sup>21</sup> Terms highlighted in **bold** type are defined in the glossary on Pages 39-40.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
1	Has it been recognised under international legislation or convention, or recommended for protection by a suitably qualified body, as an internationally significant area (e.g. as a World Heritage Site or a Ramsar site)?	A suitably qualified body able to recommend a site for international recognition includes Department of Conservation, QEII National Trust, Ngā Whenua Rāhui, and Nature Heritage Fund <sup>22</sup> .	Y / N / NS
2	Is it a coastal habitat or ecosystem type within the <b>Coastal</b> <b>Marine Area</b> , which has been depleted or degraded on an international scale <i>and</i> is it degraded to the extent where <b>ecological sustainability</b> is threatened internationally?	For example, shell barrier beaches at Miranda, seagrass beds, or some shellfish beds.	Y / N / NS
3	Is it currently habitat for an indigenous species (or genetically distinct population) which is threatened with extinction (in the categories Nationally Critical, Nationally Endangered, or Nationally Vulnerable) <u>and</u> is endemic to the Waikato Region?	For a site to meet the criterion for international significance it must comprise <b>significant habitat</b> for a species (or genetically distinct population) on an international basis. It must also provide habitat for the species (or genetically distinct population), and/or the genetic entity must be indigenous to the site. Nationally threatened Waikato endemics include Northern striped gecko, Moehau stag beetle, <i>Corybas carsei</i> .	Y / N / NS
3	Is it a key habitat for the completion of the life cycle of a species (or genetically distinct population) that migrates internationally, the populations of which would be threatened if these habitats were not sustained?	An example of key habitat for international migrants is the Firth of Thames.	Y / N / NS
3	Is it significant habitat for a threatened international migrant at the limit of its natural range?		Y / N / NS

<sup>&</sup>lt;sup>22</sup> DOC = Department of Conservation, WRC = Waikato Regional Council, NHF = Nature Heritage Fund, NWR = Ngā Whenua Rāhui, QEII = QEII National Trust.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
5	Is it one of the best international examples of an ecosystem type which is nationally uncommon?	For example, shell barrier beaches at Miranda.	Y / N / NS
If the site meets several of: 2 & 9, or 4 & 9, or 5 & 9, or 5 & 9, or 6 & 9, or 7 & 9, or 8 & 9, or 9 & 10	Is the site the best or only remaining large <b>representative</b> example in New Zealand of a <b>suite</b> of relatively intact indigenous ecosystems and <b>ecological sequences</b> e.g. a <b>wetland</b> /forest complex with altitudinal sequences?	This would need to be justified by several well-qualified and experienced ecologists.	Y / N / NS
	NATIONALLY SIGNIFICANT		
	The site is <b>at least</b> Nationally Significant if you can answer 'YES' to any of the questions in this section.	<b>Nationally Significant</b> natural areas include sites that contain healthy populations of threatened species (such as kōkako and kākā habitat at Pureora), or are very good examples of nationally rare habitat or vegetation (such as the large wetlands in the northern Waikato). They also include sites that are the only location where certain species occur, such as the Mahoenui giant wētā. Nationally significant sites tend to attract the interest of scientists, technical specialists, and/or tourists from other parts of New Zealand	
1	Is it protected, or recommended for protection, under the Conservation Act 1987 (as an Ecological Area, or Forest Sanctuary), National Parks Act 1980, Marine Reserves Act 1971, or Reserves Act 1977 (as a Nature Reserve or Scientific Reserve)?	In the Waikato Region these include, but are not limited to, Tongariro National Park, Waihaha Ecological Area, Waipapa Ecological Area, Mangatutu Ecological Area, Rapurapu Ecological Area, Ecological Areas on the Coromandel Peninsula.	Y / N / NS

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
2	Is it a coastal habitat or ecosystem type within the <b>Coastal</b> <b>Marine Area<sup>23</sup></b> which has been depleted or degraded on a national scale <i>and</i> is it degraded to the extent where <b>ecological sustainability</b> is threatened nationally <sup>24</sup> ?	Examples in the Waikato Region include rhodolith beds.	Y / N / NS
3	Is it habitat used on a <b>regular basis</b> by, or is key habitat for, an indigenous species (or genetically distinct population) in the threat categories 'Nationally Critical', 'Nationally Endangered', or 'Nationally Vulnerable'?	Sites where low numbers are present on only a few occasions (and are unlikely to be important for the long-term viability of the species) do not meet this criterion. For a site to meet this criterion for national significance, it will be of importance for the viability of the species (or genetically distinct population) on a national basis. The site will provide habitat for the species (or genetically distinct population), and it will either be used on an <b>ongoing basis</b> , or be important for sustaining a population on a seasonal basis for key components of its life cycle (e.g. feeding site), or be an important migratory site, breeding site, or over-wintering site.	Y / N / NS
3	Is it one of the best quality examples nationally of habitats used on an <b>ongoing basis</b> by a species (or a genetically distinct population) in the At Risk categories 'Declining', 'Recovering', 'Relict', or 'Naturally Uncommon'?	For example, Archey's frog habitat at Whareorino.	Y / N / NS
3	Is it a key habitat for the completion of the life cycle of a nationally Threatened or At Risk species (or genetically distinct population) that migrate nationally and that would be threatened if these habitats were not sustained?	For example, over-wintering habitat for black stilt at Kawhia Harbour, or over- wintering habitat for banded dotterel at Kawhia Harbour and Aotea Harbour.	Y / N / NS

<sup>&</sup>lt;sup>23</sup> In addition to this criterion, any potential SNA identified within the Coastal Marine Area should be assessed against all eleven criteria within this guidance document AND Policy 11 of the New Zealand Coastal Policy Statement.

<sup>&</sup>lt;sup>24</sup> Mapping of significant indigenous biodiversity areas within the Coastal Marine Area (CMA) will be identified by the proposed Waikato Regional Coastal Plan. Notification of the revised Coastal Plan is anticipated in 2023, following which guidance and information within the plan should also be consulted when assessing areas in the CMA.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
2 & 9, or 4 & 9 or 5 & 9 or 6 & 9	Is it indigenous vegetation or habitat for indigenous species that is <b>under-represented</b> nationally (20% or less remains), or nationally uncommon (including <b>wetland</b> ) that is a good quality example that is <b>representative</b> of its type?	Good quality examples would receive mostly high or medium ratings for Criterion 9 in Table 1, taking into account size, presence of plant and animal pests, stock damage, and other damaging effects. For the definition of vegetation types refer to Criterion 4 in Table 1 above: Column B, Definitions and Further Information.	List no. of responses to criterion 9 in Table 1: H M L Y / N / NS
	<b>REGIONALLY SIGNIFICANT</b> The site is <b>at least</b> Regionally Significant if you can respond 'YES' to any of the questions in this section.	<b>Regionally significant</b> natural areas include the best examples in the Waikato Region of habitats that may be common elsewhere in New Zealand - for example, our best dune systems or largest mangrove-filled estuaries, or large examples of more common vegetation types. They may also include degraded examples of nationally rare features.	
1	Is it protected, or has been recommended to be protected, under the Reserves Act 1977, as a Wildlife Management Reserve, Wildlife Refuge, Scenic Reserve, Ngā Whenua Rāhui Kawenata, or for any conservation purpose under the Conservation Act such as a Conservation Area or Conservation Park, specifically for the protection of biodiversity?		Y / N / NS Status: Recommended Status:
1	Is it protected, or has it been recommended to be protected, as a QEII Open Space Covenant, Ngā Whenua Rāhui Kawenata, or Nature Heritage Fund reserve for biodiversity protection purposes other than those outlined for sites of international or national significance?		Y / N / NS

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
2	Is it a coastal habitat or ecosystem type within the <b>Coastal</b> <b>Marine Area<sup>25</sup></b> which has been depleted or degraded on a regional scale <i>and</i> is it degraded to the extent where <b>ecological sustainability</b> is threatened regionally <sup>26</sup> ?	For example, green-lipped mussel ( <i>Perna canaliculus</i> ) beds, subtidal seagrass beds, estuarine habitat.	Y / N / NS
3	Is it habitat of considerable importance for the conservation of an indigenous species (or genetically distinct population) in the 'At Risk' category ('Declining', 'Becovering' 'Belict' and 'Naturally Uncommon') or is	Assessment of whether a species is regionally uncommon in the Waikato Region would have to be justified by a well-qualified and experienced ecologist(s) very familiar with the species and ecology of the Waikato Region.	Y / N / NS Species:
i	important habitat for a non-threatened species that is endemic to the Waikato Region, or at the limits of its natural range.	Sites where low numbers are present on only a few occasions and sites that are unlikely to be important for long-term viability of the species, or genetically distinct population, do not meet this criterion.	Threat Status:
3	Is it habitat of importance for the conservation of a regionally uncommon species (or genetically distinct population) within the Waikato Region, although the species is secure elsewhere?	For a site to meet this criterion for regional significance, the site will be of importance for the viability of a particular species (or genetically distinct population) on a regional basis. The site will provide habitat for the species (or genetically distinct population), and it will either be used on an <b>ongoing basis</b> , or be important for	Y / N / NS Species:
		sustaining a population on a seasonal basis for key components of its life cycle (e.g. feeding site), or be an important migratory site, breeding site, or over-wintering site.	Threat Status:
3	Is it habitat considered (by several qualified and	but in the Threatened categories Nationally Critical, Nationally Endangered, or	Y / N / NS
	sustainability of a 'data-deficient' species on a regional basis.	Nationally vulnerable, may be placed in this category.	Species:
			Threat Status:

<sup>&</sup>lt;sup>25</sup> In addition to this criterion, any potential SNA identified within the Coastal Marine Area should be assessed against all eleven criteria within this guidance document AND Policy 11 of the New Zealand Coastal Policy Statement.

<sup>&</sup>lt;sup>26</sup> Mapping of significant indigenous biodiversity areas within the Coastal Marine Area (CMA) will be identified by the proposed Waikato Regional Coastal Plan. Notification of the revised Coastal Plan is anticipated in 2023, following which guidance and information within the plan should also be consulted when assessing areas in the CMA.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
2 & 9 or, 4 & 9	Is it indigenous vegetation or habitat for indigenous species that is <b>under-represented</b> regionally (i.e. within relevant ecological regions and districts) and which is a good quality example that is <b>representative</b> of its type (taking into account size, plant and animal pests, stock damage, and other damaging effects)?	Good quality examples would receive high or medium ratings for Criterion 9 in Table 1. Assessment must be justified by a suitably qualified and experienced ecologist.	Y / N / NS List no. of responses to question 9 in Table 1: H M L
4, 5 <i>,</i> or 6	Is it a relatively large example of indigenous vegetation or habitat for indigenous species that is <b>under-represented</b> nationally, or nationally uncommon (including <b>wetlands</b> ), but which is degraded in quality (taking into account presence of plant and animal pests, stock damage, and other damaging effects)?	Assessment must be justified by a well-qualified and experienced ecologist. Use the results from Criterion 9 in Table 1 to determine the relative quality of the site.	Y / N / NS
4	Is it the Region's only remaining <b>representative</b> example (irrespective of its size) of a particular indigenous vegetation type or indigenous species habitat that is degraded in quality?	<b>Representative</b> examples are vegetation/habitat types that are typical or characteristic of the indigenous biodiversity of an ecological district and which include all the expected species/assemblages for a particular ecological district and/or landform. The reality for many landscapes, particularly throughout much of the Waikato, is that a 'representative example' will be the largest and most diverse remaining example of indigenous vegetation and habitats. Degraded sites would receive mostly Low scores for the factors listed in Criterion 9.	Y / N / NS List no. of responses to question 9 in Table 1: H M L

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
9 or 8 <b>&amp;</b> 9 or 10 <b>&amp;</b> 9	Is it one of the best <b>representative</b> examples in the Waikato Region of indigenous vegetation, or habitat for indigenous fauna, or an <b>ecological sequence</b> ?	Assessment must be justified by a well-qualified and experienced ecologist.	Y / N / NS
7 <b>&amp;</b> 9	Is it a large, good quality example of indigenous vegetation or habitat for indigenous species <b>representative</b> of the ecological character typical of the Waikato Region?	This may include examples of indigenous vegetation that are large or moderately large relative to other similar habitats in the Region or within the relevant ecological district. They should be relatively intact and retain the main elements of their original composition structure. Examples would include relatively large tracts of indigenous forest and habitats on the Hakarimata Range and Kaimai Range.	Y / N / NS
11	Is it a buffer (or a key part of a buffer) to a site that is of international or national significance?	The site buffered must have first been shown to be of national or international significance using relevant sections in Table 2 above.	Y / N / NS
All	LOCALLY SIGNIFICANT The site is at least of Local Significance if you answered "Yes" to at least one of criteria 2-11 in Table 1 but did not answer "Yes" to any of the questions above in Table 2.	Locally significant natural areas are healthy examples of relatively common vegetation and habitat types. They are often small areas, but large enough to enable key ecological processes to occur, such as regeneration of seedlings or reproduction and recruitment of indigenous fauna. These sites may not be particularly significant in their own right, but nevertheless play an important part in a network of natural areas. For example, a locally significant site might be important as a seasonal feeding or breeding area. It might also act as a 'stepping stone' between other natural areas, allowing indigenous fauna to move in search of food or mates. Such sites are likely to provide <b>representative</b> examples of common or typical vegetation types or habitat for common indigenous species. They will not be among the best examples in the Region but will meet Criterion 9 as healthy, functioning, and ecologically viable sites.	Y / N

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed <sup>21</sup>	C. Notes	D. Response (Yes / No / Not Sure)
HOW SIGN	IIFICANT IS THE SITE?	Circle the highest level for which you allocated at least one "Yes" response in Table 2. This indicates the relative importance of the site.	International, National, Regional, Local

# Table 3: Checklist for assessing the relative importance of an<br/>area of significant indigenous vegetation or significant<br/>habitat of indigenous fauna.

#### Notes for Table 3

If a site is not of international, national, or regional significance, but meets one of the 11 criteria, it is locally significant.

- 1 Sites that are the 'best' example of their type will also meet Criterion 9. For international significance, such sites will also be likely to meet a number of other criteria and must comprise an ecosystem complex.
- 2 Levels of significance are applicable to any site that is part of a larger area that qualifies under any criterion.
- 3 A site that is significant as a large area of wildlife habitat, aquatic habitat, or a representative example of its type, will only be of greater than regional significance if it also meets one of the other criteria for which national or international levels apply. For instance, if the site was also habitat for acutely threatened species, it would be assessed using Criterion 3 as well as Criteria 7, 8, or 9.

Cuitouio	Reason for		Significance Levels	
Criteria	Significance	International	National	Regional
1	Legally protected or	RAMSAR or World	Ecological Area,	Other areas
	recommended for	Heritage Site.	Forest Sanctuary,	recognised under the
	protection.		National Park,	Reserves Act, or
			Marine Reserve,	Conservation Act, or
			Nature Reserve,	QEII National Trust,
			Scientific Reserve.	Ngā Whenua Rāhui,
				or Nature Heritage
				Fund.
2	Coastal vegetation	Internationally	Nationally depleted	Regionally depleted
	or habitat for	depleted or	or degraded coastal	or degraded coastal
	indigenous fauna	degraded coastal	vegetation or habitat	vegetation or habitat
	that has been	vegetation or	type.	type.
	reduced in extent	habitat type.		
	by human impacts.			
3	Threatened or At	Nationally	Nationally	Nationally At Risk
	Risk species.	Threatened Waikato endemic species.	Threatened species.	species.
	Waikato Endemic.		Best example habitat	Non-threatened
		Threatened species	for a species at its	Waikato endemic
	Species at the limits	at their international	natural range limit.	species.
	of their natural	range limit.		
	range.		Nationally At Risk	Non-threatened
		International	Waikato endemic	species at the limit of
	Regionally	migrants that would	species.	their natural range.
	uncommon species.	be threatened if this		
		habitat were lost.		Regionally
				uncommon species.

Critoria	Reason for		Significance Levels	
Criteria	Significance	International	National	Regional
4	Under-represented vegetation or ecosystem type.	Best or only remaining large example of a suite or sequence of ecosystems. For criteria 4, 5, 6, and 10, sites in this category would also be likely to meet a number of other criteria and form an ecosystem complex.	Good quality example of nationally under- represented vegetation or ecosystem type (must also meet Criterion 9).	Good quality example of regionally under- represented vegetation or ecosystem type. <b>OR</b> Relatively large but degraded example of a nationally under- represented habitat type. <b>OR</b> Degraded example but the Region's only remaining example (of any size).
5	Nationally/naturally uncommon ecosystem.	Best or only remaining large example in NZ of a suite of naturally uncommon ecosystems.	Good quality example of a nationally rare type (must also meet Criterion 9).	Relatively large but degraded example.
6	Wetland habitat.	Best or only remaining large example in NZ of a wetland type with gradients between other ecosystem types.	Good quality example (must also meet Criterion 9).	Relatively large but degraded example.
7	Large, diverse, intact habitat.	See note 2 above.	See note 2 above.	Good quality representative example (must also meet Criterion 9).
8	Aquatic habitat.	See note 2 above.	See note 2 above.	The Region's best or only example of a good quality example (must also meet Criterion 9).
9	Representative example.	See note 2 above.	See note 2 above.	One of the Region's best examples.
10	Uncommon or exceptional ecological sequence. Buffer	Best or only remaining large example of a suite or sequence of ecosystems.	Good quality example of a nationally rare ecological sequence (must also meet Criterion 9).	One of the Region's best examples (must also meet Criterion 9). Buffers a site that is
				of national or international significance.

## **References and selected bibliography**

- Atkinson IAE 1985. Derivation of vegetation mapping units for an ecological survey of Tongariro National Park, North Island, New Zealand. New Zealand Journal of Botany, 23: 361-378.
- Biodiversity Collaborative Group 2018: Report of the Biodiversity Collaborative Group. Wellington, Biodiversity (Land and Freshwater) Stakeholder Trust.
- Bouma S. 2016: Marine biodiversity stocktake of the Waikato region 2015. Waikato Regional Council Technical Report 2015/48. Prepared for Waikato Regional Council.
- Clarkson BR, Sorrell BK, Reeves PN, Champion PD, Partridge TR, Clarkson BD 2003. Handbook for monitoring wetland condition. Wellington, Ministry for the Environment.
- Collier KJ, Clarkson BD, Chadderton L 2002. Draft criteria and framework for assessing natural heritage value of nationally important freshwater and estuarine ecosystems. Draft report. Prepared for the Department of Conservation, Wellington.
- Cromarty P, Scott DA (eds) 1995. A Directory of Wetlands in New Zealand. Department of Conservation, Wellington, New Zealand.
- de Lange PJ, Heenan PB, Given DR, Norton DA, Ogle CC, Johnson PN, Cameron EK 1999. Threatened and uncommon plants of New Zealand. New Zealand Journal of Botany 37: 603-628.
- Environment Waikato and Wildland Consultants 2002: Areas of significant indigenous vegetation and habitats of indigenous fauna in the Waikato Region. Guidelines to apply regional criteria and determine level of significance. Environment Waikato Technical Report TR2002/15.
- Holdaway RJ, Wiser SK, Williams PA 2012. Status assessment of New Zealand's naturally uncommon ecosystems. Conservation Biology 26: 619–629.
- Leathwick JR, Clarkson BD, Whaley PT 1995. Vegetation of the Waikato Region: current and historical perspectives. Landcare Research Contract Report LC9596/002. Manaaki Whenua-Landcare Research Ltd. Prepared for Environment Waikato.
- MacDiarmid A, McKenzie A, Sturman J, Beaumont J, Mikaloff-Fletcher S, Dunne J 2012. Assessment of anthropogenic threats to New Zealand marine habitats. New Zealand Aquatic Environment and Biodiversity Report No. 93.
- McEwen WM 1987. Ecological Regions and Districts of New Zealand. 3rd revised edition and 4 1:500,000 maps. Biological Resources Centre Publication No. 5. Wellington, Department of Conservation.
- Ministry for the Environment 2022: National Policy Statement for Indigenous Biodiversity Exposure draft. <u>https://environment.govt.nz/assets/publications/NPSIB-exposure-draft.pdf</u>
- New Zealand Government 1991: Resource Management Act. Wellington, New Zealand Government.
- New Zealand Government 2010: New Zealand Coastal Policy Statement 2010. Wellington, New Zealand Government.

- Shaw WB 1994. Botanical Ranking for Nature Conservation. Science and Research Series No. 72. Wellington, Department of Conservation.
- Singers NJD, Rogers GM 2014. A classification of New Zealand's terrestrial ecosystems. Science for Conservation publication No. 325. Wellington, Department of Conservation.
- Waikato Regional Council 2018. Waikato Regional Policy Statement. Hamilton, Waikato Regional Council.
- Whaley KJ, Clarkson BD, Leathwick JR 1995. Assessment of criteria used to determine 'significance' of natural areas in relation to section 6(c) of the Resource Management Act (1991). Landcare Research Contract Report LC9596/021. Hamilton, Environment Waikato.
- Wildland Consultants 2000. Identification of significant natural areas in the Waikato Region using remote sensing and existing databases. Wildland Consultants Ltd Contract Report No. 340. Prepared for Environment Waikato.
- Wildland Consultants and EPRO 1999. Key ecological sites for pest control in private tenure in Waikato Region - Waikato District and part Franklin District. Wildland Consultants Ltd Contract Report No. 236. Prepared for Environment Waikato.
- Williams PA, Wiser S, Clarkson B, Stanley MC 2007. New Zealand's historically rare terrestrial ecosystems set in a physical and physiognomic framework. New Zealand Journal of Ecology 31: 119–128.

## 6 Other useful information sources

#### Locally/Regionally Threatened Species

- Beadel SM 1992. Threatened and local plants of Bay of Plenty Conservancy. Technical Report Series No. 13. Rotorua, Department of Conservation.
- Brandon A, de Lange P, Townsend A 2004. Threatened plants of Waikato Conservancy. Wellington, DOC Science Publishing.
- Overdyck L 2019. Nationally Threatened and Regionally Uncommon species of the Waikato Region. Unpublished Waikato Regional Council Technical Report #10607924.
- Wildland Consultants 2016. Nationally threatened and regionally uncommon plant species in the Bay of Plenty. Wildland Consultants Contract Report No. 3953c. Prepared for Bay of Plenty Regional Council.

#### Protected Natural Area, Natural Heritage, and Significant Natural Area Reports

- Abrahamson L 1990. Coastal resource inventory first order survey. Waikato Conservancy. Wellington, Department of Conservation.
- Ausseil A, Gerbeaux P, Chadderton WL, Stephens T, Brown D, Leathwick J 2008. Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands. Discussion document. Landcare Research Contract Report LC0707/158. Prepared for the Department of Conservation.

- Bayfield MA, Courtney SP, Wiessing MI 1991. North Taranaki Ecological District Survey Report for the Protected Natural Areas Programme. Wanganui, Department of Conservation.
- Beadel SM 1995. Vegetation and flora of lands administered by Bay of Plenty Conservancy.Department of Conservation. Rotorua. Wildland Consultants Ltd Contract Report No. 130. 556 pp.
- Beadel SM 2006. Ōtānewainuku Ecological District. Survey report for the Protected Natural Areas Programme. Rotorua, Department of Conservation.
- Bibby CJ, Beadel SM, Ryan CP, Nicholls JL, Hosking MA 2000. Taumarunui Ecological District. Survey report for the Protected Natural Areas Programme. Wanganui, Department of Conservation.
- Clark R, Floyd C, Clarkson B 2017: Significant natural areas of the Waikato Region: karst ecosystems. ERI Contract Report 51. Prepared for Waikato Regional Council.
- Collier K, Clements B, David B, Lake M, Leathwick J 2010. Significant natural areas of the Waikato region: streams and rivers: Methodology and draft list of priority sites. Environment Waikato Technical Report 2010/19. Hamilton, Waikato Regional Council (Environment Waikato).
- Cornes TS, Thomson RE, Clarkson BD 2012. Key ecological sites of Hamilton City. Volumes 1 and 2. CBER Contract Report 121. Prepared for Hamilton City Council.
- Emmett DK, Smale MC, Clarkson BD, Leathwick JR, Jessen MR, Whaley PT 1998. Indigenous vegetation of the Āwhitu and Manukau Ecological Districts. Landcare Research Contract Report LC9798/101. Hamilton, Manaaki Whenua-Landcare Research.
- Fromont M 1991. Kaimanawa Ecological Region Protected Natural Areas Reconnaissance Survey. Hawkes Bay, Department of Conservation Tongariro/Taupō Conservancy.
- Harding M 1997. Waikato Protection Strategy A Report to the Heritage Fund Committee. Wellington, Forest Heritage Fund.
- Humphries EA, Tyler AM 1990. Coromandel Ecological Region. New Zealand Protected Natural Areas Programme. Hamilton, Department of Conservation, Waikato Conservancy.
- Kessels and Associates 2010. Significant Natural Areas of the Thames-Coromandel District: Terrestrial and wetland ecosystems. Environment Waikato Technical Report 2010/36. Hamilton, Waikato Regional Council (Environment Waikato).
- Kessels and Associates 2013. Significant natural areas of the Waipā district: terrestrial and wetland ecosystems. Environment Waikato Technical Report 2013/16. Hamilton, Waikato Regional Council (Environment Waikato).
- Kessels GHA, Porter S, Deichmann B, Riddell D, Clark R, Phyn D 2009. Natural Heritage of the Hauraki District. Terrestrial and wetland ecosystems. Environment Waikato Technical Report 2010/08. Hamilton, Waikato Regional Council (Environment Waikato).
- Kessels GHA, Stanway EA 1993. An outline of the unprotected conservation values within the Hauraki District Council. Hamilton, Department of Conservation, Waikato Conservancy.
- Leathwick J, Julian K 2009. Identification of high value rivers and streams in the Waikato Region: Final report. Environment Waikato Technical Report 2009/05. Hamilton, Waikato Regional Council (Environment Waikato).

- Regnier CE 1987. Coromandel Ecological Region. Protected Natural Areas Programme. Phase 1. Wellington, Biological Resources Centre, Department of Conservation.
- Regnier C, Clarkson BR 1988. Tainui Ecological Region Protected Natural Areas Programme: Phase 1. Compilation of information on protected natural areas and proposed reserves. Hamilton, Department of Conservation.
- Regnier CE, Clarkson BD, Stanway E, Collins LS 2003. Herangi Ecological District: Survey report for the protected natural areas (PNA) programme. Hamilton, Department of Conservation.
- Shaw WB, Beadel SM 1998. Natural heritage of the Rotorua District. Wildland Consultants Ltd Contract Report No. 176. Prepared for Rotorua District Council.
- Spring-Rice BN 1996. Ātiamuri Ecological District survey report for the New Zealand Protected Natural Areas Programme. Unpublished draft report. Tūrangi, Department of Conservation.
- Tyrell M, Cutting M, Green C, Murdoch G, Denyer K, Jamieson A 1998. Hunua Ecological District. New Zealand Protected Natural Areas Programme Survey Report No. 17. Auckland, Auckland Regional Council.
- van der Zwan W, Kessels G 2017. Significant natural areas of the Waikato District: terrestrial and wetland ecosystems. Environment Waikato Technical Report 2017/36. Hamilton, Waikato Regional Council (Environment Waikato).
- Wildland Consultants 1999. Taumarunui Ecological District survey report for the Protected Natural Areas Programme. Wildland Consultants Ltd Contract Report No. 272. Prepared for the Department of Conservation.
- Wildland Consultants 2009. Significant natural heritage of the South Waikato District. Volumes 1 and 2. Wildland Consultants Ltd Contract Report No. 2109. Prepared for Environment Waikato.
- Wildland Consultants 2010: State of the environment assessment for the catchments of the Kaimai Range and Northern Mamaku Plateau. Wildland Consultants Ltd Contract Report No. 2075. Prepared for Department of Conservation, Environment Bay of Plenty, Environment Waikato.
- Wildland Consultants 2011. Significant Natural Areas of the Waikato Region Lake Ecosystems. Environment Waikato Technical Report 2011/05. Hamilton, Waikato Regional Council (Environment Waikato).
- Wildland Consultants 2014. Significant Natural Areas of the Waitomo District Terrestrial, wetland, and karst ecosystems Volumes 1 and 2. Wildland Consultants Ltd Contract Report No. 1080b. Prepared for Environment Waikato.
- Wildland Consultants 2014. Field inventory and assessment of geothermal vegetation in the Waikato Region based on 2012 aerial photographs. Wildland Consultants Ltd Contract Report No. 3330. Prepared for Waikato Regional Council, Hamilton.
- Wildland Consultants 2014. Taupō District Significant Natural Area site information sheets, 2014. Wildland Consultants Ltd Contract Report No. 3455. Prepared for Taupō District Council.
- Wildland Consultants 2016. Significant natural areas of the Ōtorohanga District: terrestrial and wetland ecosystems. Environment Waikato Technical Report 2016/36. Hamilton, Waikato Regional Council (Environment Waikato).

#### **Threat Classification Publications**

- Andrew IG, Macfarlane RP, Johns PM, Hitchmough RA, Stringer IAN 2012. The conservation status of New Zealand Diptera. New Zealand Entomologist 35: 99-102.
- Baker CS, Boren L, Childerhouse S, Constantine R, van Helden A, Lundquist D, Rayment W, Rolfe JR 2019. Conservation status of New Zealand marine mammals, 2019. New Zealand Threat Classification Series 29. Wellington, Department of Conservation
- Barker GM, Brook FJ, Mahlfeld K, Walker K, Roscoe DJ, Hitchmough RA, Edwards E, Rolfe JR, Michel P. 2021: Conservation status of New Zealand indigenous terrestrial Gastropoda (slugs and snails), 2020. Part 1. Athoracophoridae (leaf-veined slugs) and Succineidae (amber snails). New Zealand Threat Classification Series 32. Wellington, Department of Conservation.
- Buckley TR, Boyer S, Bartlam R, Hitchmough R, Rolfe J, Stringer I 2015. Conservation status of New Zealand earthworms, 2014. New Zealand Threat Classification Series 10. Wellington, Department of Conservation.
- Buckley TR, Hitchmough R, Rolfe J, Stringer I 2016. Conservation status of New Zealand stick insects, 2014. New Zealand Threat Classification Series 15. Wellington, Department of Conservation.
- Buckley TR, Palma RL, Johns PM, Gleeson DM, Heath ACG, Hitchmough RA, Stringer IAN 2012. The conservation status of small or less well-known groups of New Zealand terrestrial invertebrates. New Zealand Entomologist 35: 137-143.
- Burns RJ, Bell BD, Haigh A, Bishop P, Easton L, Wren S, Germano J, Hitchmough RA, Rolfe JR, Makan T 2018. Conservation status of New Zealand amphibians, 2017. New Zealand Threat Classification Series 25. Wellington, Department of Conservation.
- Cooper JA, Buchanan PK, Leonard P, Allison-Cooper L, Johnston P, Padamsee M, McKenzie E, Michel P. Conservation status of selected species of non-lichenised agarics, boletes and russuloid fungi in Aotearoa New Zealand, 2021. New Zealand Threat Classification Series 38. Wellington, Department of Conservation.
- de Lange PJ, Blanchon D, Knight A, Elix J, Lucking R, Frogley K, Harris A, Cooper J, Rolfe J 2018. Conservation status of New Zealand indigenous lichens and lichenicolous fungi 2018. New Zealand Threat Classification Series 27. Wellington, Department of Conservation.
- de Lange PJ, Glenny D, Frogle K, Renner MAM, von Konrat M, Engel JJ, Reeb C, Rolfe JR 2020. Conservation status of New Zealand hornworts and liverworts, 2020. New Zealand Threat Classification Series 31. Wellington, Department of Conservation.
- de Lange PJ, Rolfe JR, Barkla JW, Courtney SP, Champion PD, Perrie LR, Beadel SM, Ford KA, Breitwieser I, Schönberger I, Hindmarsh-Walls R, Heenan PB, Ladley K 2018. Conservation status of New Zealand indigenous vascular plants, 2017. New Zealand Threat Classification Series 22. Wellington, Department of Conservation.
- Duffy C, Francis M, Dunn, Finucci B, Ford R, Hitchmough R, Rolfe J 2018. Conservation status of New Zealand chondrichthyans (chimaeras, sharks and rays), 2016. New Zealand Threat Classification Series 2. Wellington, Department of Conservation.
- Dunn NR, Allibone RM, Closs GP, Crow SK, David BO, Goodman JM, Griffiths M, Jack DC, Ling N, Waters JM, Rolfe JR 2018. Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Wellington, Department of Conservation.

- Funnell G, Gordon D, Leduc D, Makan T, Marshall BA, Mills S, Michel P, Read G, Schnabel K, Tracey D, Wing S. 2021. Conservation status of indigenous marine invertebrates in Aotearoa New Zealand. New Zealand Threat Classification Series 40. Department of Conservation.
- Grainger N, Harding J, Drinan T, Collier K, Smith B, Death R, Makan T, Rolfe J 2018. Conservation status of New Zealand freshwater invertebrates, 2018. New Zealand Threat Classification Series 28. Wellington, Department of Conservation.
- Heath ACG, Stringer I, Hitchmough R, Rolfe J 2015. Conservation status of New Zealand fleas, 2014. New Zealand Threat Classification Series 12. Wellington, Department of Conservation.
- Hitchmough R 2013. Summary of changes to the conservation status of taxa in the 2008–11 New Zealand Threat Classification System listing cycle. New Zealand Threat Classification Series 1. Wellington, Department of Conservation.
- Hitchmough R, Barr B, Knox C, Lettink M, Monks JM, Patterson GB, Reardon JT, van Winkel D, Rolfe J, Michel P. 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Wellington, Department of Conservation.
- Hitchmough R, Bull L, Cromarty P (comp.) 2007. New Zealand Threat Classification System lists 2005. Wellington, Science & Technical Publishing, Department of Conservation.
- Hoare RJB, Dugdale JS, Edwards ED, Gibbs GW, Patrick BH, Hitchmough RA, Rolfe JR 2017. Conservation status of New Zealand butterflies and moths (Lepidoptera), 2015. New Zealand Threat Classification Series 20. Wellington, Department of Conservation.
- Leschen RAB, Marris JWM, Emberson RM, Nunn J, Hitchmough RA, Stringer IAN 2012. The conservation status of New Zealand Coleoptera. New Zealand Entomologist 35: 91-98.
- Mahlfeld K, Brook FJ, Roscoe DJ, Hitchmough RA, Stringer IAN 2012. The conservation status of New Zealand terrestrial Gastropoda excluding Powelliphanta. New Zealand Entomologist 35: 103-109.
- Nelson WA, Neill K, D'Archino R, Rolfe JR 2019. Conservation status of New Zealand macroalgae, 2019. New Zealand Threat Classification Series 30. Wellington, Department of Conservation.
- O'Donnell CFJ, Borkin KM, Christie JE, Davidson-Watts I, Dennis G, Pryde M, Pascale M2023. Conservation status of bats in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 41. Department of Conservation, Wellington. 18 pp.
- Robertson HA, Baird KA, Elliott GP, Hitchmough RA, McArthur N, Makan TD, Miskelly CM, O'Donnell CFJ, Sagar PM, Scofield RP, Taylor GA, Michel P 2021. Conservation status of birds in Aotearoa New Zealand, 2021. New Zealand Threat Classification Series 36. Wellington, Department of Conservation.
- Rolfe JR, Fife AJ, Beever JE, Brownsey PJ, Hitchmough RA 2016. Conservation status of New Zealand mosses, 2014. New Zealand Threat Classification Series 13. Wellington, Department of Conservation.
- Sirvid PJ, Vink CJ, Fitzgerald BM, Wakelin MD, Rolfe J, Michel P. 2021: Conservation status of New Zealand Araneae (spiders), 2020. New Zealand Threat Classification Series 34. Wellington, Department of Conservation.
- Stringer IAN, Hitchmough RA 2012. Assessing the conservation status of New Zealand's native terrestrial invertebrates. New Zealand Entomologist 35: 77-84.

- Stringer IAN, Hitchmough RA, Larivière MC, Eyles AC, Teulon DAJ, Dale PJ, Henderson RC 2012. The conservation status of New Zealand Hemiptera. New Zealand Entomologist 35: 110-115.
- Townsend AJ, de Lange PJ, Duffy CAJ, Miskelly CM, Molloy JM, Norton DA 2008. New Zealand Threat Classification System manual. Wellington, Department of Conservation.
- Trewick S, Hitchmough R, Rolfe J, Stringer I 2018. Conservation status of New Zealand Onychophora ('peripatus' or velvet worm), 2018. New Zealand Threat Classification Series 26. Wellington, Department of Conservation.
- Trewick S, Hegg D, Morgan-Richards M, Murray T, Watts C, Johns P, Michel P 2022. Conservation status of Orthoptera (wētā, crickets and grasshoppers) in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 39. Wellington, Department of Conservation.
- Walker K, Brook FJ, Barker GM, Roscoe DJ, Edwards E, Hitchmough RA, Rolfe JR, Michel P. 2021. Conservation status of New Zealand indigenous terrestrial Gastropoda (slugs and snails), 2020. Part 2. Achatinellidae, Bothriembryontidae (pūpūharakeke), Euconulidae, Helicarionidae, Pupinidae and Vertiginidae. New Zealand Threat Classification Series 33. Wellington, Department of Conservation.
- Ward D, Early J, Schnitzler FR, Hitchmough R, Rolfe J, Stringer I 2017. Conservation status of New Zealand Hymenoptera, 2014. New Zealand Threat Classification Series 18. Wellington, Department of Conservation.
- Yeates GW, Zhao ZQ, Hitchmough RA, Stringer IAN 2012. The conservation status of New Zealand Nematoda. New Zealand Entomologist 35: 128-130.

#### Vegetation/habitat type publications

- Clarkson BD, Clarkson BR, Downs TM 2007. Indigenous vegetation types of Hamilton Ecological District. CBER Contract Report 58. Hamilton, University of Waikato.
- Clarkson BR 2013. A vegetation tool for wetland delineation in New Zealand. Landcare Research Contract Report No. LC1793. Prepared for Meridian Energy.
- Clarkson BR 2018. Wetland delineation protocols. Landcare Research Contract Report no. LC3354. Prepared for Tasman District Council.
- Cody A 1994. Inventory of landforms, cold springs, geothermal fields and geothermal features. Unpublished report and maps. Rotorua, Department of Conservation.
- Denyer K, Clarkson BR, Clarkson BD 1999. Waikato Freshwater Wetland Monitoring Strategy: Scoping Exercise for State of the Environment Monitoring.
- Fenwick G, Greenwood M, Williams E, Milne J, Watene-Rawiri E 2018. Groundwater Ecosystems: Functions, Values, Impacts and Management. NIWA Client Report 2018184CH. Prepared for Horizons Regional Council.
- Fitzgerald N, Smale M 2010. An updated assessment of the geothermal vegetation in the Bay of Plenty Region based on 2007 aerial photography. Landcare Research Contract Report LC0016. Prepared for Environment Bay of Plenty.
- Fraser S, Singleton P, Clarkson B 2018. Hydric soils-field identification guide. Landcare Research Contract Report LC3233. Prepared for Tasman District Council.

- Horstman EM, Lundquist CJ, Bryan KR, Bulmer RH, Mullarney JC, Stokes DJ 2018. The dynamics of expanding mangroves in New Zealand. In Makowski C, Finkl CW eds. Threats to Mangrove Forests, Springer, Cham. 23-51.
- Johnson P, Gerbeaux P 2004. Wetland types in New Zealand. Wellington, Department of Conservation.
- Kenny JA, Hayward BW 1996. Inventory and maps of important geological sites and landforms in the Waikato Region. First edition. Geological Society of New Zealand Miscellaneous Publication No. 85.
- MacDiarmid AB, Law CS, Pinkerton M, Zeldis J 2013. New Zealand marine ecosystem services. In Dymond JR ed. Ecosystem services in New Zealand–Conditions and trends, Lincoln, Manaaki Whenua Press. 238-253.
- McCullough CD 1998. Habitat requirements of key palustrine wetland species in the Waikato Region. A technical report prepared for Environment Waikato. Hamilton, McCullough Freshwater Consultancy.
- Morrison MA, Lowe ML, Parsons DM, Usmar NR, McLeod IM 2009. A review of land-based effects on coastal fisheries and supporting biodiversity in New Zealand. New Zealand Aquatic Environment and Biodiversity Report 37. Wellington, Ministry of Fisheries.
- Nicholls JL 1979. Waikato Forest Class Map. Forest Service Mapping Series 6, Sheet No. 4. Rotorua, Forest Research Institute.
- Merrett MF, Clarkson BR 1999. Definition, description and illustrations of geothermally influenced terrestrial and emergent wetland vegetation. Landcare Research Contract Report: LC9900/022.
- Payton I, Andreasend S, Fastier M, Burrows L, Hall G 1991. National Indigenous Vegetation Survey Database. Auckland Dataset Directory. Forest Research Institute Contract Report: FEW 91/36. Prepared for the Department of Conservation.
- Smale MC, Fitzgerald NB 2015. Geothermal vegetation types of the Taupō Volcanic Zone. Environment Waikato Technical Report 2015/11. Hamilton, Waikato Regional Council (Environment Waikato).
- Smale MC, Fitzgerald NB 2015. A field guide to the vegetation associations of the Taupō Volcanic Zone. Environment Waikato Technical Report 2015/32. Hamilton, Waikato Regional Council (Environment Waikato).
- Wildland Consultants 2000. Geothermal areas in the Waikato Region. Wildland Consultants Ltd Contract Report No. 297. Prepared for Environment Waikato.

#### Wildlife publications

- Moynihan KT 1986. Wildlife and sites of special wildlife interest in the Western Waikato Region. Fauna Survey Unit Report No. 41. Wellington, New Zealand Wildlife Service, Department of Internal Affairs.
- Rasch G 1989. Wildlife and wildlife habitats in the Bay of Plenty Region. Regional Report Series No. 11. Rotorua, Department of Conservation.
- Roberston CJR, Hyvönen P, Fraser MJ, Pickard CR 2007. Atlas of Bird Distribution in New Zealand. 1999-2004. Wellington, The Ornithological Society of New Zealand, Inc.

Saunders AJ 1983. Wildlife and wildlife habitat values of the Mamaku Plateau - an overview. Fauna Survey Unit Report No. 37. Wellington, New Zealand Wildlife Service.

#### Other publications/information sources

- Biodiversity Collaborative Group 2018. Report of the biodiversity collaborative group. Wellington, Biodiversity (Land and Freshwater) Stakeholder Trust.
- Department of Conservation 2014. Waikato Conservation Management Strategy 2014–2024. Wellington, Department of Conservation.
- Department of Conservation 1996. Waikato Conservation Management Strategy 1996-2000. Wellington, Department of Conservation.
- Ecofx and Kessels and Associates 2000. Key Ecological Sites in the Coromandel Ecological Region for pest control. Report prepared for Environment Waikato.
- NIWA freshwater fish database. Accessed from: <u>https://www.niwa.co.nz/information-</u> <u>services/nz-freshwater-fish-database</u>
- MacDiarmid A, Taylor P, Carbines M, Hewitt J, Bolton-Ritchie L, Maharadz-Smith A, Townsend M, Thrush S, Walker J. Marine habitat assessment decision support (MarHADS) Tool: Background and Operating Instructions. NIWA Project ELF09240.
- McLeod M, Leathwick JR, Stephens RTT 1997. Landforms of the Waikato Region. Landcare Research Contract Report: LC9697/130. Hamilton, Manaaki Whenua-Landcare Research NZ Ltd.
- Molloy J, Davis A 1994. Setting priorities for the conservation of New Zealand's threatened plants and animals. 2nd edition; collated by C. Tisdall. Wellington, Department of Conservation.

## 7 Definitions

- \* Denotes definitions taken directly from the 2016 Waikato Policy Statement
- **Coastal Marine Area\*:** means the foreshore, seabed, and coastal water, and the air space above the water of which a) the seaward boundary is the outer limits of the territorial sea, or b) the landward boundary is the line of mean high water springs, except that where that line crosses a river, the landward boundary at that point shall be whichever is the lesser of i) one kilometre upstream from the mouth of the river; or ii) the point upstream that is calculated by multiplying the width of the river mouth by five.
- *Critical:* Essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species.
- **Ecological sustainability\*:** A site's ability to continue to exist as an area of indigenous vegetation or habitat for indigenous fauna when taking into account its size, shape, buffering from external effects, connection to other natural areas, and likely threats. It may change naturally into a different habitat but will continue to contain mainly indigenous species and remain of natural character.
- **Ecological sequence\*:** A series of two or more connected ecosystem or vegetation types that retain natural transition zones along an environmental gradient.
- Endemic to the Waikato Region: Only occurs naturally within the Waikato Region.
- **Forest:** Woody vegetation in which the cover of trees and shrubs in the canopy is >80% and in which tree cover exceeds that of shrubs. Trees are woody plants >10 cm diameter at breast height (1.4 metres above ground level). Treeferns >10 cm are treated as trees.
- **Natural Habitat**: Indigenous vegetation or habitats similar to the pre-human environment(s) where the species (or genetically distinct population) was found for key components of its life cycle. In most instances the site will have undergone adverse changes (e.g. as a result of invasive species, logging, reduction in size or loss of connectivity) but key elements of natural character will remain (site condition may also have improved as a result of intensive control of pest plants and animals). Natural habitat can, in some situations, move across a landscape over time due to natural changes (e.g. volcanism, active dunes, landslides, and geothermal manifestations).
- **Natural range:** The geographic and abiotic range within which a plant or animal species would be naturally be found without human intervention.
- **Ongoing Basis**: A species (or genetically distinct population) utilises a site for key components of its life cycle. For fauna, this includes habitats that comprise a key component for its survival, as a food source, breeding ground, roosting site, hibernating site, aestivating site, or site for other key natural behaviours for the species. For plants this would include a site where a species is well-established (i.e. a population is maintained over several years), but it would not include a site where there is only one record of a species which is unlikely to have established permanently at a site. Old records may be important for some biota as many species may only be conspicuous during a particular season or not in every year.
- **Representative example:** Representative examples are vegetation/habitat types that are typical or characteristic of the indigenous biodiversity of an ecological district and which include all the expected species/assemblages for an ecological district and/or landform. This includes healthy examples of commonplace vegetation/habitats where most of the

expected species/assemblages are present and also includes secondary or regenerating vegetation that is recovering following natural or induced disturbance provided species composition is typical of that vegetation/habitat.

- **Scrub:** Woody vegetation in which the cover of shrubs and trees in the canopy is >80% and in which shrub cover exceeds that of trees (c.f. forest). Shrubs are woody plants <10cm diameter at breast height (1.4 metres above the ground).
- **Shrubland:** Vegetation in which the cover of shrubs in the canopy is 20-80% and in which the shrub cover exceeds that of any other growth form or bare ground. Shrubs are woody plants <10cm diameter at breast height (1.4 metres above the ground).
- Under-represented: 20% or less of known or likely original extent remaining.
- **Wetland:** A wetland, as defined by Section 2 of the Resource Management Act (1991), is permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.

# Appendix 1. Potential current and historical vegetation types of the Waikato Region split by Ecological District based on Singers and Rogers 2014 vegetation classifications<sup>1</sup>.

#### Note on the use of the vegetation classification data

The ecosystem classification data used to map potential ecosystems of the Waikato Region was a desktop exercise only which was developed by the Department of Conservation as a tool for prioritising ecosystem management at a national scale (Singers & Rogers 2014). This classification is a desktop modelling exercise which amalgamates previous ecosystem and vegetation type classifications, ecological studies aligned to an abiotic framework, and other GIS layers which could inform potential ecosystem and vegetation type patterns (e.g. soil maps). The data set describes a full range of ecosystem types at a variety of scales in a natural or potential state as they potentially existed if people arrived today in New Zealand. Consequently, the mapped vegetation type may not match the current vegetation type in any given polygon, landscape unit, or District.

In total, the classification led to 152 ecosystems being recognised. However, this is just one possible scale of classification, with coarser or finer levels possible depending on purpose. Some manual digitising of the data set has been undertaken using Waikato Regional Council aerial photographs and validation of the mapped types is currently underway. Consequently, the values contained within the following table may be subject to change in the future<sup>2</sup>.

For more information on the methodology and limitations of the dataset please refer to Singers and Rogers 2014: A classification of New Zealand's terrestrial ecosystems. Science for Conservation publication No. 325. Department of Conservation, Wellington.

<sup>&</sup>lt;sup>1</sup> DISCLAIMER: The areas and percentages of vegetation types given in this table represent predicted values for the areas of vegetation located within the portion of each Ecological District located within the Waikato Region only. In particular, the following ecological districts only have a small part of their area located within the Waikato Region therefore the representativeness of the values given in this table should not be extrapolated for the remainder of the Ecological District outside the Waikato Region: Āwhitu, Manukau, Hunua, Te Aroha, Ōtānewainuku, Rotorua, Pureora, Kaingaroa, Tongariro, Taumarunui, North Taranaki, Moawhango, and Kaimanawa.

<sup>&</sup>lt;sup>2</sup> It is expected that the data set will be reviewed at regular intervals depending on Council resource availability. Please apply to the Waikato Regional Council for the most up to date information if required.

	<b>Ecological Districts</b>														
		Atiamuri			Āwhitu			Colville			Hamilton		ŀ	lapuakohe	
Vegetation/Habitat Type	Potential	Current	9/	Potential	Current	0/	Potential	Current	9/	Potential	Current	9/	Potential	Current	9/
	Historical Extent	Extent	Remaining	Historical Extent	Extent	Remaining	Historical Extent	Extent	Remaining	Historical Extent	Extent	Remaining	Historical Extent	Extent	Remaining
CDF4-1, Hall's tōtara, pāhautea, kāmahi forest	438.4	367.8	83.9												
CL1, Pohutukawa treeland/flaxland/rockland				35.5	0.0	0.0	256.5	100.8	39.3						
DN2, Spinifex, pīngao grassland/sedgeland				73.5	0.0	0.0	0.6	13.6	2,177.2						
DN2/5, Coastal sand dunes mosaic				0.0	8.5	N/A	0.0	51.3	N/A						
GT, Geothermal	687.0	725.9	105.7												
MF10, Tōtara, mataī, kahikatea forest	113,844.9	309.3	0.3												
MF11, Rimu forest	126.4	42.2	33.4												
MF11-3, Rimu, mataī forest	2,633.9	282.5	10.7												
MF20, Hard beech forest	7.5	7.5	100.0												
MF22, Tawa, rimu, northern rātā, beech forest	16.4	16.4	100.0												
MF24, Rimu, tōwai forest							981.9	660.7	67.3						
MF25, Kauri, tōwai, rātā, montane podocarp forest							839.2	703.9	83.9						
MF4, Kahikatea forest	3,579.4	0.0	0.0												
MF4, Kahikatea forest and WL, Swamp mosaic	2,074.6	142.3	6.9												
MF7.1, Tawa, mangeao forest	20,329.2	2,789.2	13.7							45,267.5	101.3	0.2			
MF7.2, Rātā, tawa, kāmahi, podocarp forest	4,479.6	2,047.5	45.7												
MF8.1, Kāmahi, broadleaved, podocarp forest	66,797.0	2,455.8	3.7												
Open Water	2,751.1	74.7	2.7	16.4	0.0	0.0	47.9	0.3	0.6	1,099.6	45.1	4.1	22.1	0.4	1.8
Reclaimed							0.4	0.0	0.0						
SA1.1, Seagrass herbfield							214.0	0.0	0.0						
SA1.2, Mangrove forest and scrub							147.5	90.3	61.2						
SA1.3, Searush, oioi, rushland [Saltmarsh]							408.9	95.5	23.4						
Strand							7.7	9.2	119.3						
TI3, Monoao scrub/lichenfield	1,129.9	0.0	0.0												
VS2, Kānuka scrub/forest	328.8	52.5	16.0	0.0	31.4	N/A	0.0	2,494.0	0.0	0.0	218.1	N/A	0.0	1,170.4	N/A
WF11.1, Kauri, podocarp, taraire forest				2,422.2	0.0	0.0	0.0	1.6	N/A						
WF11.2, Kauri, podocarp, tawa forest							58,646.3	10,820.1	18.4	68.6	26.0	37.9	328.9	241.0	73.3
WF12, Kauri, podocarp, broadleaved beech forest							110.0	58.0	52.7	1,084.3	81.8	7.5	38,620.4	3,540.0	9.2
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest							4,597.9	1,947.6	42.4	24,271.9	761.8	3.1	25,982.5	3,469.4	13.4
WF2, Tōtara, mataī, ribbonwood forest	189.5	0.0	0.0							15,607.4	85.7	0.5	1,575.7	23.8	1.5
WF4, Pōhutukawa, pūriri, broadleaved forest							5,720.1	947.9	16.6						
WF5, Tōtara, kānuka, broadleaved forest [Dune forest]				1,972.0	2.6	0.1	287.7	8.0	2.8						
WF7.1, Pūriri forest				258.3	0.0	0.0									
WF7.2, Pūriri, taraire forest				0.0	80.2	0.0									
WF7.3, Kahikatea, pūriri forest							2,207.0	8.5	0.4						
WF8, Kahikatea, pukatea forest				0.0	2.6	0.0	1,274.0	1.1	0.1	23,521.1	273.0	1.2	5,856.1	100.8	1.7
WF8/WL, Kahikatea, pukatea forest and Swamp mosaic				896.7	0.0	0.0									
WF9, Taraire, tawa, podocarp forest				785.9	50.4	6.4	0.0	41.2	N/A				0.0	2.0	N/A
WL, Fen mosaic	118.5	7.1	6.0				31.0	0.0	0.0				208.7	78.0	37.4
WL, Swamp mosaic	2,003.2	775.1	38.7	0.5	0.0	0.0	85.8	43.9	51.2	333.8	216.0	64.7	203.8	99.4	48.8
WL, Swamp/fen mosaic	709.4	20.4	2.9				39.5	9.3	23.5	2,347.1	13.2	0.6	85.7	0.0	0.0
WL18, Flaxland	17.6	27.9	158.3				0.0	24.3	N/A	,			0.0	0.3	N/A
WL2, Mānuka, greater wire rush restiad rushland									·······				32.5	8.4	25.9
WL2/3, Bog Mosaic										45,742.9	304.5	0.7	786.5	14.6	1.9

	Ecological Districts           Hauraki         Herangi         Hinuera         Hunua         Kaimai														
		Hauraki			Herangi	-		Hinuera	-		Hunua			Kaimai	
Vegetation/Habitat Type	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining
AH1. Gravelfield/stonefield [Fellfield]													373.7	358.2	95.8
AH4 Woolly moss bristle tussock blue tussock mossfield/													0.0	0.6	N/A
tussockland/stonefield													0.0	0.0	,,,
AL3. Red tussock tussockland/shrubland													1.617.0	1.605.2	99.3
AL4. Mid-ribbed and broad-leaved snow tussock													3.594.8	3.916.4	108.9
tussockland/shrubland													,	,	
BR1, Hard tussock, scabweed gravelfield/stonefield													202.2	49.2	24.3
CDF3, Mountain beech forest													8,642.2	8,052.1	93.2
CDF4-1, Hall's tōtara, pāhautea, kāmahi forest				1,352.7	783.2	57.9							74.6	74.6	100.0
CDF6, Olearia, Pseudopanax, Dracophyllum scrub [Subalpine scrub]													1.7	591.4	35,415.9
CL2, Ngaio, taupata treeland/herbfield/rockland				227.4	7.2	3.2									
CLF10, Red beech, silver beech forest													10,446.0	2,288.5	21.9
CLF11, Silver beech forest													1,912.8	1,690.7	88.4
CLF12, Silver beech, mountain beech forest													2,482.9	2,408.6	97.0
CLF9, Red beech, podocarp forest													5,999.6	5,626.2	93.8
CLF9-3, Red beech, mountain beech forest													2,850.8	2,827.0	99.2
DN2, Spinifex, pīngao grassland/sedgeland				15.8	15.4	97.6									
DN2/5, Coastal sand dunes mosaic				0.0	33.5	N/A									
MF10, Tōtara, mataī, kahikatea forest							5.5	0.0	0.0						
MF11-3, Rimu, mataī forest													74.0	74.0	100.0
MF20, Hard beech forest				0.0	78.3	N/A									
MF24, Rimu, tōwai forest										438.9	438.9	100.0			
MF7.1, Tawa, mangeao forest							7,313.3	52.7	0.7						
MF7.2, Rātā, tawa, kāmahi, podocarp forest				5,940.8	4,855.6	81.7									
MF7.3, Tawa, pukatea, podocarp forest				8,339.0	5,073.0	60.8									
MF8.1, Kāmahi, broadleaved, podocarp forest				······									1,082.0	1,081.8	100.0
Open Water	395.3	1.5	0.4	46.6	0.7	1.4	214.6	9.4	4.4	314.5	5.0	1.6	27.4	0.3	1.3
SA1.1, Seagrass herbfield	18.2	0.0	0.0	21.4	0.0	0.0				29.0	0.0	0.0			
SA1.2, Mangrove forest and scrub	188.5	54.2	28.8												
SA1.3, Searush, oioi, rushland [Saltmarsh]	88.4	2.6	3.0	52.7	0.0	0.0									
SA1.5, Shellfield (Chenier Plain)	9.4	3.2	33.4												
SA1.6, Saltmarsh, ribbonwood, ngaio, akeake scrub	50.5	3.8	7.5												
SC1, Gravelfield													2.9	0.0	0.0
Strand				0.0	37.5	N/A									
TI3/TI5, Frostflat mosaic													0.0	0.1	N/A
TI3/TI5/TI6, Frostflat mosaic													108.6	8,208.7	7,558.1
VS2, Kānuka scrub/forest	0.0	213.1	N/A	0.0	7.9	N/A	0.0	52.1	0.0	0.0	1,347.9	N/A	0.0	31.2	N/A
WF11.2, Kauri, podocarp, tawa forest	1,709.2	255.8	15.0				63.0	59.6	94.6						
WF12, Kauri, podocarp, broadleaved, beech forest	1,794.8	19.1	1.1				66.5	4.6	7.0	8,757.0	3,486.8	39.8			
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest	8,344.7	90.4	1.1	33,672.6	17,595.8	52.3	24,407.8	470.5	1.9	11,772.9	6,938.4	58.9			
WF14, Kāmahi, tawa, podocarp, hard beech forest				864.4	238.1	27.5									
WF2, Tōtara, mataī, ribbonwood forest	1,331.9	19.4	1.5	59.9	0.0	0.0	24,545.2	50.7	0.2	500.8	0.0	0.0			
WF4, Põhutukawa, pūriri, broadleaved forest	674.7	0.8	0.1	2,038.2	0.0	0.0				1,190.6	2.3	0.2			
WF5, Tōtara, kānuka, broadleaved forest [Dune forest]	455.3	0.0	0.0	25.0	0.0	0.0				24.0	0.0	0.0			
WF7.2, Pūriri, taraire forest										160.6	0.0	0.0			
WF8, Kahikatea, pukatea forest	37,402.6	100.7	0.3	1,675.2	37.0	2.2	49,616.4	248.1	0.5	1,061.3	18.3	1.7			
WF8/WL, Kahikatea, pukatea forest and Swamp mosaic				0.0	4.1	N/A									
WF9, Taraire, tawa podocarp forest										91.6	83.9	91.6			
WL, Bog/fen mosaic	485.4	0.6	0.1												
WL, Fen mosaic				0.6	0.0	0.0				42.6	0.0	0.0			
WL, Swamp mosaic	1,727.0	1,667.6	96.6	175.8	42.6	24.2	22.3	31.1	139.3	4.5	2.1	46.0			
WL, Swamp/fen mosaic							235.5	2.6	1.1						
WL18, Flaxland	0.0	0.5	N/A												
WL2, Mānuka, greater wire rush restiad rushland	8,351.8	303.7	3.6				298.2	1.1	0.4						
WL2/3, Bog Mosaic	805.5	0.3	0.0												
WL3, Bamboo rush, greater wire rush restiad rushland	13,500.1	9,291.7	68.8												

							Ecolog	gical District	s						
		Kāingaroa			Kawhia	-		Manukau	_	7	Maungatauta	ri	Me	ercury Islands	•
Vegetation/Habitat Type	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining
CDF4-1, Hall's tõtara, pāhautea, kāmahi forest				2,738.0	2,651.1	96.8				344.2	344.2	100.0			
CL1, Pōhutukawa treeland/flaxland/rockland				121.7	9.8	8.0							96.2	42.8	44.5
CL2, Ngaio, taupata treeland/herbfield/rockland				26.5	30.1	113.3									
CLF10, Red beech, silver beech forest	2,557.2	0.0	0.0												
CLF5, Mataī, hall's tōtara, kāmahi forest	14,315.8	17.4	0.1												
CLF9, Red beech, podocarp forest	560.6	0.0	0.0												
DN2, Spinifex, pīngao grassland/sedgeland				285.9	130.0	45.5							3.3	0.0	0.0
DN2/5, Coastal sand dunes mosaic				0.0	200.0	N/A									
DN5, Oioi, knobby clubrush sedgeland				1.4	0.0	0.0									
MF10, Tōtara, mataī, kahikatea forest	78,110.3	2.6	0.0							73.4	0.0	0.0			
MF11-3, Rimu, mataī forest	2,435.3	0.0	0.0												
MF22, Tawa, rimu, northern rātā, beech forest	9.7	0.0	0.0												
MF4, Kahikatea forest	121.8	0.0	0.0												
MF7.1, Tawa, mangeao forest	34,443.3	0.0	0.0							20,464.5	2,260.5	11.0			
MF7.2, Rātā, tawa, kāmahi, podocarp forest	5,323.8	0.0	0.0	7,425.0	4,985.8	67.1				1,139.4	1,112.4	97.6			
MF7.3, Tawa, pukatea, podocarp forest										60.3	0.0	0.0			
MF8.1, Kāmahi, broadleaved, podocarp forest	5,397.3	69.9	1.3							1.1	0.0	0.0			
Open Water	480.5	0.0	0.0	393.3	0.0	0.0	30.2	0.0	0.0	883.5	10.9	1.2			
SA1.1, Seagrass herbfield				558.1	6.9	1.2									
SA1.3, Searush, oioi, rushland [Saltmarsh]				151.7	86.9	57.3									
SA1.6, Saltmarsh, ribbonwood, ngaio, akeake scrub				0.0	1.4	N/A									
Strand				0.0	71.9	N/A							0.0	1.2	N/A
TI3, Monoao scrub/lichenfield	91,219.2	2.3	0.0												
TI4, Coprosma, Olearia scrub [Grey scrub]	1,802.0	0.0	0.0												
VS2, Kānuka scrub/forest	290.8	43.2	14.9	0.0	2,451.6	N/A	0.0	73.1	N/A	0.0	331.5	N/A	0.0	102.4	N/A
VS2, Kānuka scrub/forest and VS5, Broadleaved species scrub/forest	121.2	0.0	0.0												
mosaic															
VS8, Monoao scrub	7.4	0.0	0.0												
WF11.2, Kauri, podocarp, tawa forest							0.0	13.0	N/A	0.0	1.6	N/A	1,128.9	8.6	0.8
WF12, Kauri, podocarp, broadleaved, beech forest							974.4	7.6	0.8						
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest	14,342.7	0.0	0.0	108,205.0	30,943.7	28.6	12.8	0.3	2.6	57,520.4	4,591.6	8.0			
WF2, Tōtara, mataī, ribbonwood forest	4,794.7	0.0	0.0	327.7	16.3	5.0				1,288.7	28.6	2.2			
WF4, Pōhutukawa, pūriri, broadleaved forest				2,148.7	13.9	0.6							506.3	81.9	16.2
WF5, Tōtara, kānuka, broadleaved forest [Dune forest]				3,749.7	285.2	7.6									
WF7.1, Pūriri forest							38.0	0.0	0.0						
WF7.2, Pūriri, taraire forest							5,995.5	535.9	8.9						
WF7.3, Kahikatea, pūriri forest							0.0	3.6	N/A						
WF8, Kahikatea, pukatea forest	213.7	0.0	0.0	1,974.2	132.1	6.7	279.7	10.5	3.7	5,295.7	23.6	0.4			
WF8/WL, Kahikatea, pukatea forest and Swamp mosaic	81.5	0.0	0.0				4,082.1	0.0	0.0						
WF9, Taraire, tawa podocarp forest							2,816.0	98.2	3.5						
WL, Bog/fen mosaic							3.0	0.0	0.0						
WL, Fen mosaic	793.0	5.3	0.7	69.5	49.5	71.1							3.9	0.0	0.0
WL, Swamp mosaic	350.1	8.8	2.5	370.5	217.7	58.8	3.0	1.9	64.0	25.7	4.8	18.8	10.2	8.3	81.9
WL, Swamp/fen mosaic	180.3	0.8	0.5	137.3	70.2	51.1									
WL14, Ephemeral wetland	1.5	0.0	0.0												
WL18, Flaxland				0.0	1.3	N/A									
WL2, Mānuka, greater wire rush restiad rushland							85.6	1.2	1.4						
WL22, Carex, Schoenus pauciflorus sedgeland	2.6	0.0	0.0												

	Ecological Districts														
		Meremere			Moawhango		N	lorth Taranak	ci		Ōtānewainuk	(U		Pureora	
Vegetation/Habitat Type	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining
AH1, Gravelfield/stonefield [Fellfield]				3.6	3.2	88.6									
AL3, Red tussock tussockland/shrubland				109.0	91.6	84.0									
AL4, Mid-ribbed and broad-leaved snow tussock tussockland/				0.0	279.3	N/A									
shrubland															
CDF3, Mountain beech forest				747.9	347.4	46.4									
CDF4-1, Hall's tōtara, pāhautea, kāmahi forest							654.7	553.1	84.5	45.3	309.7	683.2	6,514.8	1,036.8	15.9
CDF4-4, Pink pine, pāhautea forest										1,396.2	939.0	67.3			
CDF6, Olearia, Pseudopanax, Dracophyllum scrub [Subalpine scrub]				1.3	141.2	10,736.6							80.3	0.0	0.0
CL1, Pohutukawa treeland/flaxland/rockland							0.0	1.1	N/A						
CL2, Ngaio, taupata treeland/herbfield/rockland							68.1	6.6	9.7						
CLF11, Silver beech forest				1.1	0.0	0.0				16.7	16.7	100.0			
DN2, Spinifex, pīngao grassland/sedgeland							6.6	0.2	2.6						
DN2/5, Coastal sand dunes mosaic	222.1	87.8	39.5				0.0	16.8	N/A						
MF10, Tōtara, mataī, kahikatea forest	0.0	6.6	N/A							25.4	0.7	2.7	22,410.3	864.9	3.9
MF11, Rimu forest										5.9	0.2	3.3			
MF11-3, Rimu, mataī forest													7,633.8	770.9	10.1
MF20, Hard beech forest							0.0	1,140.7	N/A				·		
MF21. Tawa, kāmahi, rimu, northern rātā, black beech forest							4.451.3	3.557.2	, 79.9						
MF22, Tawa, rimu, northern rātā, beech forest							.,			59.7	19.4	32.5			
MF7.1. Tawa, mangeao forest										4.624.5	3.735.8	80.8			
MF7.2. Rātā. Tawa, kāmahi, podocarp forest										5.574.7	5.060.9	90.8	57.052.8	9.727.2	17.0
MF7.3. Tawa, pukatea, podocarp forest							16.836.6	11.883.7	70.6	-,			0.0	4.4	N/A
MF8.1. Kāmahi, broadleaved, podocarp forest							52.3	0.0	0.0	2.7	2.7	99.9	17.894.7	3.791.0	21.2
Open Water	6,195,3	41.8	0.7				79.4	2.0	2.5	2.9	0.0	0.0	207.9	0.0	0.0
SA1 1 Seagrass herbfield	31.8	1.2	3.8				19 3	0.0	0.0		0.0		207.0	0.0	
SA1 3 Searush oioi rushland [Saltmarsh]	01.0		0.0				12.6	9.2	73.2						
Strand							0.8	6.8	865.0						
TI3 Monoao scrub/lichenfield							0.0	0.0	000.0				377 0	345 3	91.6
TI5 Bog nine mountain celery nine silver nine scrub/forest													379 5	425.8	112.2
VS2 Kānuka scruh/forest	0.0	1 300 9	N/A				0.0	117.8	N/A				0.0	58.0	N/A
WE11.1 Kauri podocarp taraire forest	714 1	0.0	0.0				0.0	11/10					0.0	30.0	
WF112 Kauri podocarp tawa forest	5 422 0	127.2	2.3							20.4	20.3	99.8			
WF12 Kauri nodocarp broadleaved beech forest	6 884 9	244.8	3.6							10.3	10.3	100.0			
WF13 Tawa kohekohe rewarewa hīnau podocarp forest	35 313 9	910.8	2.6				8 331 2	4 080 2	49 0	5 250 8	927.6	17.7			
WF14 Kāmahi tawa nodocarn hard beech forest	55,515.5	510.0					3 204 3	631.0	19.0	3,230.0	527.0				
WF2 Tōtara matai ribbonwood forest	3 181 3	46.6	1.5				5,201.5	001.0		94	0.6	6.2			
WF4 Põhutukawa nüriri broadleaved forest	2.8	0.0	0.0				1 781 4	29	0.2	5.1	0.0	0.2			
WF5_Tōtara_kānuka_broadleaved forest [Dune forest]	337 3	0.0	0.0				1,701.4	2.5	0.2						
WF7.2 Pūriri taraire forest	522.0	10.9	2 1												
WF8 Kahikatea nukatea forest	8 648 6	523.0	6.0				1 063 1	74.7	7.0	165.0	2.2	1 4			
WF8/WL Kabikatea nukatea forest and Swamn mosaic	3 8// 1	58.2	1.5				1,003.1	, ,	7.0	105.0	2.2	1.7			
WF9 Taraire tawa podocarn forest	10 012 1	521.9	5.2												
Will Fen mosaic	5 1/2 0	2 227.2	<b>ס.ב</b> אב ז				27.1	0.0					115 5	10.0	16 /
WL Swamn mosaic	5,145.9 0 101 2	2,324.3	45.2				52.1	0.0	A7 1	21 2	27.2	272	c DD	17.0	15.4
WL Swamp/fen mosaic	3,131.2 2 606 7	3,031.0	33.0 16 1				7.5	3.3	47.1	51.5	27.5	67.5	5.55	14.9	15.0
W112 Elayland	2,090.7	433.1	10.1 A 611 A												
WL2, Hakidiu WL2, Mānuka, greater wire rush restind rushland	0.0	29.3	4,011.4												
wez, wanuka, greater wire rusiniestidu rusilidilu	5,100.4	5,170.4	99.4				1	1	1					1	

							Ecolo	gical District							
		Raglan			Ranginui			Rotorua			Tairua		Т	aumarunui	
Vegetation/Habitat Type	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining	Potential Historical Extent	Current Extent	% Remaining
CDF4-1, Hall's tōtara, pāhautea, kāmahi forest				729.5	655.9	89.9							263.9	263.9	100.0
CL1, Pohutukawa treeland/flaxland/rockland	116.7	0.0	0.0							112.4	39.1	34.8			
CL2, Ngaio, taupata treeland/herbfield/rockland	0.0	28.2	N/A												
CLF5, Mataī, hall's tōtara, kāmahi forest													8.3	0.0	0.0
DN2, Spinifex, pīngao grassland/sedgeland	152.4	47.1	30.9							142.2	27.5	19.3			
DN2/5, Coastal sand dunes mosaic	0.0	254.5	N/A							0.0	38.2	N/A			
MF10, Tōtara, mataī, kahikatea forest				1,277.0	60.4	4.7	616.3	4.3	0.7						
MF11-3, Rimu, mataī forest													152.3	2.6	1.7
MF24, Rimu, tōwai forest										393.2	391.3	99.5			
MF25, Kauri, tōwai, rātā, montane podocarp forest										227.4	297.2	130.7			
MF4, Kahikatea forest				0.0	9.3	N/A							0.0	53.2	N/A
MF7.1, Tawa, mangeao forest				964.9	5.2	0.5	428.0	156.3	36.5						
MF7.2, Rātā, Tawa, kāmahi, podocarp forest				34,822.0	14,592.4	41.9	1,941.8	604.8	31.1				24,653.5	4,126.4	16.7
MF7.3, Tawa, pukatea, podocarp forest				70,913.7	10,419.8	14.7							869.4	70.6	8.1
MF8.1, Kāmahi, broadleaved, podocarp forest				3.4	0.0	0.0	157.1	0.0	0.0				500.3	109.8	21.9
Open Water	69.1	0.1	0.2	748.7	2.6	0.3				190.0	4.3	2.3	1.1	0.2	14.4
SA1.1, Seagrass herbfield	359.2	9.3	2.6							133.9	0.0	0.0			
SA1.2, Mangrove forest and scrub	16.5	8.8	53.7							173.0	186.9	108.1			
SA1.3, Searush, oioi, rushland [Saltmarsh]	48.9	13.7	28.0							194.4	86.3	44.4			
Strand	11.2	60.4	537.6							21.4	3.8	17.8			
TI3, Monoao scrub/lichenfield							13.0	0.0	0.0						
VS2, Kānuka scrub/forest	0.0	2,660.1	N/A	0.0	72.2	N/A	124.8	0.0	0.0	0.0	2,514.0	N/A			
WF11.1, Kauri, podocarp, taraire forest	4,847.8	74.5	1.5												
WF11.2, Kauri, podocarp, tawa forest	4,463.7	283.7	6.4							72,192.7	10,534.3	14.6			
WF12, Kauri, podocarp, broadleaved, beech forest	0.0	4.0	N/A							1,051.4	1,110.8	105.6			
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest	96,780.7	11,498.4	11.9	500.1	0.0	0.0				4,366.9	2,889.3	66.2			
WF2, Tōtara, mataī, ribbonwood forest	77.4	14.0	18.1	69.1	0.1	0.2									
WF4, Pōhutukawa, pūriri, broadleaved forest	2,953.3	8.0	0.3							2,597.1	282.7	10.9			
WF5, Tōtara, kānuka, broadleaved forest [Dune forest]	268.7	0.0	0.0							994.5	17.6	1.8			
WF7.3, Kahikatea, pūriri forest	0.0	11.7	N/A							3,989.2	27.8	0.7			
WF8, Kahikatea, pukatea forest	2,849.6	511.4	17.9	2,442.4	13.1	0.5				2,510.9	5.8	0.2	89.8	0.0	0.0
WF8/WL, Kahikatea, pukatea forest and Swamp mosaic	0.0	0.4	0.0												
WF9, Taraire, tawa podocarp forest	18,579.1	1,848.4	9.9												
WL, Fen mosaic							2.7	2.0	73.4	29.6	16.9	57.0	2.8	0.0	0.0
WL, Swamp mosaic	513.4	75.7	14.8	271.2	38.1	14.0	10.1	0.2	1.8	49.3	9.6	19.4	44.4	4.2	9.5
WL, Swamp/fen mosaic	0.0	4.1	N/A							456.5	112.4	24.6			
WL18, Flaxland	0.0	9.7	N/A							0.0	3.8	N/A			

Ecological Districts															
		Taupō			Tauranga			Te Aroha			Thames			Tokoroa	
Vegetation/Habitat Type	Potential Historical Extent	Current Extent	% Remaining												
CDF4-1, Hall's tõtara, pähautea, kāmahi forest	3,314.8	2,501.8	75.5												
CDF4-4. Pink pine, pāhautea forest							496.6	490.0	98.7						
CDF6. <i>Olegria</i> . <i>Pseudopanax</i> . <i>Dracophyllum</i> scrub [Subalpine scrub]	0.0	5.8	N/A												
CDF7. Mountain beech, silver beech, montane podocarp forest							242.0	242.8	100.3						
CL1. Pohutukawa treeland/flaxland/rockland										3.4	0.0	0.0			
CLF10. Red beech, silver beech forest	16.248.6	491.1	3.0												
CLF11. Silver beech forest	79.6	79.5	99,9				898.8	311.1	34.6						
CLF11-3. Silver beech, kāmahi forest							102.6	0.0	0.0						
CLF5. Mataī, hall's tōtara, kāmahi forest	2.733.2	344.3	12.6												
CLF9. Red beech, podocarp forest	11.002.7	3.613.6	32.8												
GT. Geothermal	92.0	51.9	56.4												
MF10 Tōtara mataī kahikatea forest	75 238 0	1 011 2	1.3										45 797 6	321.1	0.7
MF11 Rimu forest	, 3,230.0	1,011.2											25 5	23.8	93.3
MF11-3 Rimu mataī forest	19 767 5	6 936 5	35.1										23.5	23.0	55.5
MF20 Hard beech forest	13,707.5	0,000.0	55.1										501.6	141.6	28.2
MF20, Tawa rimu northern rātā heech forest													/89.9	390.0	79.6
MF24 Rimu towai forest										5 238 7	1 639 1	88.6	405.5	330.0	75.0
MF25, Kauri tōwai rātā montane nodocarn forest										5,238.7	4,039.4	163.0			
MF2. Kabikatoa forost	014.6	10.9	2.2							550.0	911.0	105.7			
MES Plack booch forest	2 254 2	17.0	<u> </u>											1	
ME3, 1 Tawa mangoao forost	2,334.3	144.0	0.1				2 174 0	2 752 4	96.7				21 10E 0	2 500 8	12.2
ME7.2. Pātā tawa kāmahi podecarp forest	600 3	601 7	00.1				5,174.0	2,752.4	26.0				21,103.0	2,590.8	12.2
ME7.2, Rata, tawa, kamam, pouocarp forest	000.5	001.7	99.1				1,001.7	505.0	20.9				30,070.9	0,970.9	10.0
MEV.3, Tawa, pukatea, podocarp Torest	CE 002 0	21 002 2	22.4										2,082.8	589.0	28.3
MF8.1, Kamani, broadleaved, podocarp forest	65,883.8	21,982.3	33.4							F70	1.0	2.0	12.4	0.0	0.0
Dealeinead	61,616.3	3.8	0.0				2.2	0.0	0.0	57.8	1.8	3.0	414.2	3.0	0.7
										24.1	0.0	0.0		r	
SA1.1, Seagrass herbfield										8.9	0.0	0.0			
SA1.2, Mangrove forest and scrub										22.3	0.0	0.0		r	
SA1.3, Searush, oloi, rushland [Saltmarsh]										2.0	0.0	0.0			
Strand	0									3.7	0.0	0.0			
113, Monoao scrub/lichenfield	2,/51.6	227.1	8.3												
TI3/TI5, Frostflat mosaic	39.8	66.7	167.6												
TI3/TI5/TI6, Frostflat mosaic	232.2	12,850.4	5,534.3												
TI5, Bog pine, mountain celery pine, silver pine scrub/forest	18.7	16.5	88.2											ł	
VS2, Kānuka scrub/forest	0.0	2,753.1	N/A				0.0	31.6	N/A	0.0	483.6	N/A	0.0	194.1	N/A
WF11.2, Kauri, podocarp, tawa forest				3.2	0.0	0.4	3,164.0	4,217.0	133.3	30,942.5	1,156.2	3.7		ł	
WF12, Kauri, podocarp, broadleaved, beech forest							970.2	833.1	85.9	136.0	142.3	104.6		l	
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest							4,441.4	1,800.3	40.5	1,820.2	887.8	48.8	208.3	0.0	0.0
WF4, Pōhutukawa, pūriri, broadleaved forest										870.0	198.3	22.8		l	
WF7.3, Kahikatea, pūriri forest										491.1	48.4	9.9			
WF8, Kahikatea, pukatea forest							0.0	3.4	N/A	563.2	0.0	0.0	466.4	21.3	4.6
WL, Fen mosaic	414.8	327.4	78.9												
WL, Swamp mosaic	1,565.4	873.6	55.8							0.0	9.8	N/A	277.8	180.3	64.9
WL, Swamp/fen mosaic	1,571.9	1,384.5	88.1											L	
WL11, Machaerina sedgeland	16.1	4.3	26.6												
WL14, Ephemeral wetland	0.4	0.4	100.0												
WL18, Flaxland	42.3	38.5	90.9										0.0	7.8	N/A
WL20, Coprosma, twiggy tree daisy scrub	95.9	119.2	124.2												

	Ecological Districts											
		Tongariro			Waihī			Waipā			Waitomo	
Vegetation/Habitat Types	Potential Historical Extent	Current Extent	% Remaining									
AH1, Gravelfield/stonefield [Fellfield]	14.9	800.0	5,356.7									
AH4, Woolly moss, bristle tussock, blue tussock mossfield/ tussockland/stonefield	11,649.4	4,373.5	37.5									
AL3, Red tussock tussockland/shrubland	1,077.3	5,213.7	484.0									
AL4, Mid-ribbed and broad-leaved snow tussock	0.0	5,138.9	N/A									
RR1 Hard tussock scabweed gravelfield/stonefield	10.8	1 0	17 7									
PP2 Pristle tusseck, Regulia, Muchlanhackia gravelfield/sandfield	260.0	1.9 60 7	22.6									
CDE3 Mountain beach forest	12 112 0	1 571 7	12.0									
CDEA-1 Hall's tõtara nähautea kämahi forest	4 702 3	2 447 6	52.1									
CDF6 Olegria Pseudonanay Draconhyllum scrub [Subalnine scrub]	3 9/18 1	2,447.0	92.1									
CI 1 Pohutukawa treeland/flaxland/rockland	3,340.1	3,321.3	55.5	64.6	7 1	10.9						
CI2 Ngaio taupata treeland/herbfield/rockland				0.0	7.9	N/A						
CLE10. Red beech, silver beech forest	1.434.5	713.5	49.7	0.0	,							
CLF11, Silver beech forest	68.9	67.8	98.3									
CLF12. Silver beech, mountain beech forest	35.7	3.2	9.0									
CLF5. Mataī, Hall's tōtara, kāmahi forest	3.098.3	182.3	5.9									
CLF9. Red beech, podocarp forest	3.637.2	995.5	27.4									
CLF9-3. Red beech, mountain beech forest	218.6	197.1	90.2									
DN2/5. Coastal sand dunes mosaic				0.0	7.0	N/A						
GT. Geothermal	47.6	30.1	63.2			· · · ·						
lce	277.8	0.0	0.0									
MF10, Tōtara, mataī, kahikatea forest	6,959.5	95.0	1.4									
MF11-3, Rimu, mataī forest	2,766.4	1,176.6	42.5									
MF21, Tawa, kāmahi, rimu, northern rātā, black beech forest										298.4	262.5	88.0
MF24, Rimu, tōwai forest				1,840.0	1,803.6	98.0						
MF25, Kauri, tōwai, rātā, montane podocarp forest				226.7	193.6	85.4						
MF4, Kahikatea forest	34.2	22.2	64.8				0.0	0.3	N/A	0.0	54.7	N/A
MF7.1, Tawa mangeao forest							7,451.0	26.5	0.4			
MF7.2, Rātā, Tawa, kāmahi, podocarp forest				166.1	0.0	0.0				12,664.6	3,204.7	25.3
MF7.3, Tawa, pukatea, podocarp forest							30,785.5	380.5	1.2	98,262.1	9,504.1	9.7
MF8.1, Kāmahi, broadleaved, podocarp forest	7,863.0	2,284.5	29.1									
Open Water	1,826.2	7.9	0.4	17.1	0.3	1.6	126.4	20.3	16.0	50.2	1.0	1.9
SA1.2, Mangrove forest and scrub				9.1	3.6	40.0						
SA1.3, Searush, oioi, rushland [Saltmarsh]				8.1	0.5	6.3						
Strand				7.6	1.1	14.4						
TI3, Monoao scrub/lichenfield	0.0	9.1	N/A									
TI6, Red tussock tussockland	26.2	25.8	98.7									
VS2, Kānuka scrub/forest	0.0	557.0	0.0	0.0	113.8	N/A	0.0	10.2	N/A	0.0	55.7	N/A
WF11.2, Kauri, podocarp, tawa forest				31,824.2	6,962.7	21.9						
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest				11,301.9	6,942.6	61.4	8,406.2	177.4	2.1	39,111.0	12,576.1	32.2
WF2, Tōtara, mataī, ribbonwood forest				0.0	19.7	0.0	942.6	0.8	0.1	863.6	22.5	2.6
WF4, Pōhutukawa, pūriri, broadleaved forest				741.7	152.1	20.5						
WF5, Tōtara, kānuka, broadleaved forest [Dune forest]				32.3	0.0	N/A						
WF7.3, Kahikatea, pūriri forest				268.2	0.0	0.0						
WF8, Kahikatea, pukatea forest				112.3	6.2	5.5	20,037.0	115.7	0.6	10,278.1	356.2	3.5
WL, Fen mosaic	165.7	150.1	90.6							2.5	0.0	0.0
WL, Swamp mosaic	234.7	191.6	81.6	213.4	0.5	0.2	161.4	20.3	12.6	1,116.5	169.1	15.1
WL, Swamp/fen mosaic	617.2	653.2	105.8	141.2	61.0	43.2	1,762.9	0.1	0.0			
WL11, Machaerina sedgeland	66.3	53.4	80.5									
WL16, Red tussock, Schoenus pauciflorus tussockland	21.1	21.1	100.0									
WL18, Flaxland				0.0	0.2	N/A						

Vogetation /Habitat Type		Entire Waikato Region	
	Potential Historical Extent	Current Extent	% Remaining
AH1, Gravelfield/stonefield [Fellfield]	392.3	1,161.4	296.1
AH4, Woolly moss, bristle tussock, blue tussock mossfield/tussockland/stonefield	11,649.4	4,374.1	37.5
AL3, Red tussock tussockland/shrubland	2,803.4	6,910.5	246.5
AL4, Mid-ribbed and broad-leaved snow tussock tussockland/shrubland	3,594.8	9,334.6	259.7
BR1, Hard tussock, scabweed gravelfield/stonefield	212.9	51.1	24.0
BR3, Bristle tussock, Raoulia, Muehlenbeckia gravelfield/sandfield	269.0	60.7	22.6
CDF3, Mountain beech forest	21,504.0	9,971.1	46.4
CDF4-1, Hall's tõtara, pāhautea, kāmahi forest	21,173.3	11,989.7	56.6
CDF4-4, Pink pine, pāhautea forest	1,892.8	1,429.0	75.5
CDF6, Olearia, Pseudopanax, Dracophyllum scrub [Subalpine scrub]	4,031.4	4,659.9	115.6
CDF7, Mountain beech, silver beech, montane podocarp forest	242.0	242.8	100.3
CL1. Pōhutukawa treeland/flaxland/rockland	807.0	200.7	24.9
CL2. Ngajo, taupata treeland/herbfield/rockland	322.1	79.9	24.8
CLF10. Red beech, silver beech forest	30.686.3	3.493.0	11.4
CLE11 Silver beech forest	2 977 8	2 165 8	72 7
CLF11-3 Silver beech kāmahi forest	102.6	0.0	0.0
CLE12 Sjoner beech, kunnin blest	2 518 6	2 411 8	95.8
CLE 12, silver beech, mountain beech lorest CLE5 Mataī hall's tātara kāmahi forest	20 155 7	544 0	27
CLE9, Match, Hall 5 total 8, Kallah Horest	21,200,1	10 235 3	/8.3
CLEO 2. Red beech, podocarp Torest	21,200.1	2 024 1	48.5
DN2 Spinifey, ningap, grassland (sodgeland	5,009.5	3,024.1	30.5
DN2/ Spinitex, pingao grassianu/seugelatiu	080.2	233.7	214.2
	222.1	097.0	314.2
DNS, Oloi, knobby clubrush sedgeland	1.4 020 F	0.0	0.0
	826.5	807.9	97.7
	277.8	0.0	0.0
MF10, Totara, matai, kanikatea forest	344,358.1	2,676.1	0.8
MF11, Rimu forest	157.9	66.2	42.0
MF11-3, Rimu, matai forest	35,463.3	9,243.2	26.1
MF20, Hard beech forest	509.2	1,368.1	268.7
MF21, Tawa, kāmahi, rimu, northern rātā, black beech forest	4,749.8	3,819.7	80.4
MF22, Tawa, rimu, northern rātā, beech forest	575.7	425.8	74.0
MF24, Rimu, tōwai forest	8,892.8	7,933.8	89.2
MF25, Kauri, tōwai, rātā, montane podocarp forest	1,849.9	2,105.8	113.8
MF4, Kahikatea forest	4,650.0	159.5	3.4
MF4, Kahikatea forest and WL, Swamp mosaic	2,074.6	142.3	6.9
MF5, Black beech forest	2,354.3	144.8	6.1
MF7.1, Tawa, mangeao forest	165,646.0	14,470.7	8.7
MF7.2, Rātā, Tawa, kāmahi, podocarp forest	202,430.8	58,475.9	28.9
MF7.3, Tawa, pukatea, podocarp forest	228,149.4	37,925.7	16.6
MF8.1, Kāmahi, broadleaved, podocarp forest	165,647.3	31,777.7	19.2
Open Water	78,328.0	237.3	0.3
Reclaimed	24.5	0.0	0.0
SA1.1, Seagrass herbfield	1,393.7	17.5	1.3
SA1.2, Mangrove forest and scrub	556.9	344.0	61.8
SA1.3, Searush, oioi, rushland [Saltmarsh]	967.7	294.7	30.5
SA1.5, Shellfield (Chenier Plain)	9.4	3.2	33.4
SA1.6, Saltmarsh, ribbonwood, ngaio, akeake scrub	50.5	5.2	10.2
SC1, Gravelfield	2.9	0.0	0.0
Strand	52.4	191.8	366.0
TI3, Monoao scrub/lichenfield	95,490.7	583.8	0.6
TI3/TI5. Frostflat mosaic	39.8	66.8	167.9
TI3/TI5/TI6. Frostflat mosaic	340.8	21.059.2	6.179.3
TI4. Coprosma. Olegria scrub [Grev scrub]	1.802.0	0.0	0.0
TI5. Bog nine, mountain celery nine, silver nine scrub/forest	398.2	442.3	111.1
TI6. Red tussock tussockland	26.2	25.8	98.7
VS2 Kānuka scrub/forest	7ΛΛ Λ	19 542 5	2 625 3
VS2 Kānuka scrub/forest and VS5 Broadleaved species scrub/forest mosaic	121.2	<u>1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	0.0
VS2, Nanaka serub/forest and vos, broadicaved species serub/forest mosaic	<u>тст.с</u> 7 Л	0.0	0.0
WE11 1 Kauri podocarn taraire forest	7.4	0.0 76 1	1.0
WE11.2, Kauri, podocarp, taran e lorest	200 077 4		1.0
WE12 Kauri podocarp broadlaavad baach farast			10.5
WE12 Tawa kabakaba rawarawa binau nadagar farast		<u> </u>	<b>15.8</b>
WE14 Kāmphi taug padagam bard bagak farat	528,964.0	109,499.7	20.7
WF2 Tatara matai ribbanwaad farast		220.0	21.4
wrz, iotara, matal, ribbonwood forest	55,365.0	328.9	U.6

	Entire Waikato Region							
vegetation/Habitat Type	Potential Historical Extent	Current Extent	% Remaining					
WF4, Pōhutukawa, pūriri, broadleaved forest	21,225.0	1,690.7	8.0					
WF5, Tōtara, kānuka, broadleaved forest [Dune forest]	8,146.7	313.4	3.8					
WF7.1, Pūriri forest	296.3	0.0	0.0					
WF7.2, Pūriri, taraire forest	6,678.2	627.1	9.4					
WF7.3, Kahikatea, pūriri forest	6,955.4	100.0	1.4					
WF8, Kahikatea, pukatea forest	177,396.3	2,580.9	1.5					
WF8/WL, Kahikatea, pukatea forest and Swamp mosaic	8,904.3	62.7	0.7					
WF9, Taraire, tawa podocarp forest	32,284.7	2,646.0	8.2					
WL, Bog/fen mosaic	488.5	0.6	0.1					
WL, Fen mosaic	7,177.4	2,979.6	41.5					
WL, Swamp mosaic	19,103.1	7,769.7	40.7					
WL, Swamp/fen mosaic	10,981.1	2,765.1	25.2					
WL11, Machaerina sedgeland	82.4	57.7	70.0					
WL14, Ephemeral Wetland	1.9	0.4	22.3					
WL16, Red tussock, Schoenus pauciflorus tussockland	21.1	21.1	100.0					
WL18, Flaxland	60.6	143.7	237.2					
WL2, Mānuka, greater wire rush restiad rushland	11,956.5	3,484.8	29.1					
WL2/3, Bog Mosaic	47,335.0	319.4	0.7					
WL20, Coprosma, twiggy tree daisy scrub	95.9	119.2	124.2					
WL22, Carex, Schoenus pauciflorus sedgeland	2.6	0.0	0.0					
WL3, Bamboo rush, greater wire rush restiad rushland	13,500.1	9,291.7	68.8					

## Appendix 2. Guidelines for interpretation of key terms which underpin assessment of significant natural areas (excerpt from the exposure draft National Policy Statement for Indigenous Biodiversity 2022).

Four key concepts underpin the nationally accepted approach for assessing areas of significant indigenous vegetation and significant habitats of indigenous fauna:

- Representativeness
- Diversity and Pattern
- Rarity and Distinctiveness
- Ecological Context

A site is considered to be a Significant Natural Area if it meets any one of the attributes of the four criteria listed above. Guidance for determining whether a site meets an appropriate ecological threshold for each of these concepts is given below.

#### Representativeness

The extent to which the vegetation or habitat of indigenous fauna is typical or characteristic of the indigenous biodiversity of the ecological district or marine biogeographic area.

#### Guidance

Indigenous vegetation or habitat of indigenous fauna that would be expected to occur at undeveloped sites in the ecological district or marine biogeographic area in the present-day environment (e.g., landform, soils, substrate, climate), including seral (regenerating) indigenous vegetation. Representativeness includes commonplace vegetation/habitats, which is where most indigenous biodiversity is present, and may also include degraded indigenous vegetation, ecosystems, or habitats that are typical of what remains in depleted ecological districts. It is not restricted to the best or most representative examples. And, it is not a measure of how well that vegetation or habitat is protected elsewhere in the ecological district.

#### Assessment

Significant vegetation has structure and composition (biodiversity and integrity) typical of the indigenous vegetation of the ecological district or marine biogeographic area in the present-day environment. This includes seral or regenerating vegetation that is recovering following natural or induced disturbance, provided species composition is typical of that type of vegetation. Significant fauna habitat is that which supports the typical suite of indigenous animals that would occur in the present-day environment. The application of this criterion should result in identification of indigenous vegetation and habitats that are representative of the full range and extent of ecological diversity across all environmental gradients in an ecological district, such as climate, altitude, landform, and soil sequences. The ecological character and pattern of the indigenous vegetation in the ecological district should be described by reference to the types of indigenous vegetation and the landforms on which it occurs.

#### Site attributes

Sites that qualify under this criterion will have at least one of the following attributes:

- Vegetation which has structure and composition (biodiversity and integrity) that is typical of the indigenous vegetation of the ecological district or marine biogeographic area;
- Habitat that supports a typical suite of indigenous fauna that is characteristic of the habitat type in the relevant ecological district, and retains at least a moderate range of species expected for that habitat type in the ecological district;

- Vegetation which has modified structure and/or composition (biodiversity) but is still typical of the indigenous vegetation of the ecological district or marine biogeographic area;

For the avoidance of doubt, indigenous vegetation or habitat that is not typical of the indigenous vegetation or habitat of the ecological district or marine biogeographic area will not qualify as a significant natural area under this criterion.

#### **Diversity and Pattern**

Diversity and pattern is the extent to which the expected range of diversity and pattern of biological and physical components within the relevant ecological district is present in an area.

#### Guidance

Diversity has biological components, such as species/taxa, communities, and ecological variation. It also has physical components, such as geology, soils/substrate, aspect/exposure, altitude/depth, temperature, salinity, turbidity, and waves/currents. Pattern includes changes along environmental gradients, such as ecotones and ecological sequences. Some communities or habitats are uniform, with naturally low species diversity; that attribute is assessed under the representativeness criterion.

#### Assessment

Significance is the extent to which the biological range and environmental variation at a site reflects that present in the ecological district. Sites that have a wider range of species, habitats, or communities, or wider environmental variation due to ecotones, gradients, and sequences, rate more highly under this criterion.

#### Site attributes

Sites that qualify under this criterion will have at least one of the following attributes:

- A high diversity of indigenous species, habitats or communities, and/or presence of important ecotones, or complete ecological gradients or sequences.
- A moderate diversity of indigenous species, habitats or communities, and/or presence of ecotones, or partial ecological gradients or sequences.

For the avoidance of doubt, a site with low diversity of indigenous species, habitats or communities, and lack of ecotones, gradients or sequences will not qualify as a significant natural area under this criterion.

#### **Rarity and Distinctiveness**

The presence of rare or distinctive indigenous taxa, habitats of indigenous fauna, indigenous vegetation or ecosystems.

#### Guidance

Rarity is the scarcity (natural or induced) of indigenous species, habitats, vegetation, or ecosystems. Rarity includes things that are uncommon, and things that are threatened. 'Threatened' and 'At Risk' (including 'Naturally Uncommon') species at a national scale are listed in publications prepared and regularly updated by the Department of Conservation. Rarity at a regional or local scale is defined by local lists or determined by expert ecological advice. Further effort is needed to prepare regional and local lists, especially for fauna. The significance of nationally-listed Threatened or At Risk species should not be downgraded if they are common within a region or ecological district.

Historically rare (or naturally uncommon) terrestrial ecosystems are defined and listed by Williams *et al.* (2007). These ecosystems, along with wetlands and sand dunes, are proposed as a priority for protection on private land by the Ministry for the Environment (2007).

Two national frameworks that are available for the assessment of depletion of terrestrial indigenous vegetation or ecosystems are in common use: Ecological Districts, as defined by McEwen (1987); and Land Environments, as defined by Leathwick *et al.* (2003). Rarity of indigenous vegetation in each Land Environment has been assessed by Walker *et al.* (2006) and Cieraad *et al.* (2015). Land Environment data should be interpreted with caution. These are based on physical attributes which may not accurately reflect vegetation (or habitat) patterns at a local scale.

Distinctiveness includes distribution limits, type localities, local endemism, relict distributions, and special ecological or scientific features.

#### Assessment

An area that qualifies as an SNA under this criterion has at least one of the following attributes:

- Provides habitat for an indigenous species that is listed as 'Threatened', 'At Risk' (as defined by national threat classification system lists);
- Regionally or locally uncommon indigenous species, habitats, vegetation or ecosystems;
- Indigenous vegetation depleted to less than 20 per cent of its pre-human extent in the ecological district, region, or land environment;
- Indigenous vegetation or habitat of indigenous fauna occurring on naturally uncommon ecosystems;
- An indigenous species or plant community at, or near, its natural distributional limit;
- The type locality of an indigenous species;
- The presence of a distinctive assemblage or community of indigenous species;
- The presence of a special ecological or scientific feature.

Application of most recent published lists of the threat status for any growth form or life form should be guided by expert ecological advice. Species within the Myrtaceae family that are relatively common in many areas (kānuka, mānuka, and rātā species) are listed as 'Threatened' or 'At Risk', due to the threat posed by myrtle rust. These species are listed with the qualifiers DP (data poor) and De (taxa) that do not fit the criteria so are designated to the most appropriate listing.

With respect to fauna habitat, professional ecological judgement should be used when assessing significance. For example:

- Comparing a golf course that has the occasional presence of a mobile 'Threatened' species (e.g., black stilt), with a shrubland that has the presence of a relatively sedentary 'At Risk' species (e.g., southern grass skink). The golf course should not be rated as significant habitat; whereas the shrubland should.
- Comparing the significance of fauna habitat in non-indigenous vegetation. The sighting of a single North Island kākā in a stand of pines does not make the stand of pines significant. However, a proven bat roost within a pine tree may confer significance for this criterion.

#### Site attributes

Sites that qualify under this criterion will have any of the following attributes:

- Provides habitat for a nationally 'Threatened', or several 'At Risk', indigenous plant or animal species;
- An indigenous species or plant community at its distributional limit;
- Indigenous vegetation or habitat of indigenous fauna, or ecosystem, that has been reduced to less than 10 per cent of its former extent in the ecological district or land environment;
- Indigenous vegetation/habitat occurring on sand dunes, wetlands, or estuaries;
- Biogenic habitats in the marine environment;
- Indigenous vegetation/habitat occurring on 'originally rare' ecosystem types;
- Provides habitat for an 'At Risk', 'Data Deficient', regionally uncommon, or locally uncommon indigenous plant or animal species;
- An indigenous species or plant community near its distributional limit;
- Indigenous vegetation or habitat of indigenous fauna, or ecosystem, that has been reduced to between 10 and 20 per cent of its former extent in the ecological district or land environment;
- The presence of a distinctive assemblage or community of indigenous species, or special ecological or scientific feature.

For the avoidance of doubt, sites with the following attributes <u>do not</u> qualify as significant natural areas under this criterion:

- Supports no 'Threatened', 'At Risk', 'Data Deficient', regionally or locally uncommon indigenous species, and no indigenous species near distribution limits;

- Is not indigenous vegetation/habitat on sand dunes, wetlands, estuaries or 'originally rare' ecosystems;
- Is not indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20 per cent of its former extent in the ecological district or land environment;
- Has no distinctive assemblage or community of indigenous species, or special ecological or scientific features.

#### **Ecological context**

The extent to which the size, shape, and position of an area within the wider landscape (land, fresh water or marine) contributes to its ability to maintain indigenous biodiversity or affects the ability of the surrounding landscape to maintain its indigenous biodiversity.

#### Guidance

Ecological context has two main attributes: the characteristics that help maintain indigenous biodiversity at the site (such as size, shape, and configuration); and the contribution the site makes to protection of indigenous biodiversity in the wider landscape (such as by linking or buffering other sites, providing 'stepping stones' of habitat, or maintaining ecological and hydrological processes and integrity).

#### Assessment

Higher value is placed on sites that: have features that help maintain indigenous biodiversity at the site (such as size, shape, configuration or buffering); support large numbers of, or provide important habitat for, indigenous fauna; provide a buffer to, or link between, other significant areas; or play an important role in the biological/natural functioning of a freshwater or coastal/marine system.

#### Attributes

Sites that qualify under this criterion will have at least one of the following attributes:

- At least moderate size with a compact shape, in the context of the relevant ecological district;
- Is well-buffered relative to remaining habitats in the relevant ecological district;
- A site that provides an important full or partial buffer to, or link between, one or more important habitat of indigenous fauna or significant natural areas and/or is important for the natural functioning of a freshwater or coastal/marine system;
- Is important for the natural functioning of an ecosystem relative to remaining habitats in the ecological district;

For the avoidance of doubt, sites with the following attributes do not qualify as significant natural areas under this criterion:

- A small and/or poorly-buffered site;
- A site that does not buffer or link other sites, and is unimportant for the natural functioning of a freshwater or coastal/marine system.

## Appendix 3. Significance assessment guidelines from Whaley *et al.* 1995.

The concept of dividing New Zealand into Ecological Districts was first introduced by Nicholls (1979) and later detailed by Simpson (1982), as a framework for organising, recording and retrieving ecological information. The Districts were delineated subjectively using forums and workshops to reach consensus among New Zealand's ecologists, with the aim of defining units of consistent internal ecological character.

New Zealand was initially divided into 235 provisional Ecological Districts (Simpson 1982), which has since been revised to 268 (McEwen 1987). Defined on the basis of geology, landform, climate, soil and flora, with boundaries located according to topographical, biological, and geological discontinuities, rivers, and catchment boundaries, they are "ecologically homogeneous or possess a simple or repeating system of ecosystems" (Simpson 1982). The 85 (originally 82) Ecological Regions (McEwen 1987) are "aggregations of adjacent related districts, or are highly distinctive for some specific reason. Ecological Districts that could not be aggregated with another became Ecological Regions in their own right, e.g., Rangitikei Ecological Region (Simpson 1982)".

*Criteria*. A set of seven criteria was designed, to fulfill the goals outlined above. They have been used to evaluate the 'significance' of natural areas, and to select RAP's (Recommended Areas for Protection) within the PNAP (Myers *et al.* 1987). The criteria are applied within the boundaries of each of the 268 Ecological Districts (McEwen 1987). That is, every natural area surveyed within each ecological district is assessed in the context of the existing Protected Natural Areas system of that district, and those other unprotected natural areas remaining. The PNAP criteria are a synthesis of criteria used in other ranking systems, before its conception. They are:

(1.) Representativeness

(2.) Diversity and pattern

(3.) Rarity and special features

(4.) Naturalness

(5.) Long-term viability

(6.) Size and shape

(7.) Buffering

1. Representativeness is a central concept of modern nature conservation programmes worldwide (O'Connor *et al.* 1990), and is the "conceptual backbone" and primary criterion of the PNAP (Kelly & Park 1986), arising directly from the Reserves Act (1977). It recognises the importance of natural areas with features typical of the Ecological District in which they lie, e.g., characteristic species and communities of the original natural landscape of the area.

There are several different layers to this criterion. Natural areas are given a representativeness value on the basis of a) the extent of the original/typical vegetation

Manaaki Whenua - Landcare Research

9

Doc # 15603780

and landscape of the District, and b) the extent and quality of the remaining natural areas. The degree of representation within the reserves network of the Ecological District is also considered.

The point of reference for the 'original' natural landscape is important and should be established. Because of modification by Polynesian settlers and in the absence of a reliable written record, the pre-European (i.e., 1840) datum is commonly used (Smale 1994).

Although representativeness is not a readily quantifiable parameter (O'Connor *et al.* 1990), comparisons can be made between sites (Myers *et al.* 1987) using a grading system, e.g., low-high.

2. Diversity is commonly the major criterion upon which environmental impact statements and ecological assessments are based (O'Connor *et al.* 1990). In the context of the PNAP, diversity refers to the natural diversity of ecological units, ecosystems, and physical features within a natural area (Myers *et al.* 1987). Diversity of floristic associations within each ecological unit and species richness are also taken into account. Pattern relates to the gradients – biological, successional, drainage, altitudinal, salinity, etc. that exist within a natural area.

3. Rarity is more difficult to define. Often rarity refers to individual species, but it can apply equally to a community, ecological unit, or landform. In the context of the PNAP, rarity refers to paucity of numbers or occurrences of elements of natural diversity (e.g., species, communities). This is particularly pertinent when considering the high level of endemism in the New Zealand biota. The presence of rare species tends to impart high value to natural areas. Special features include elements of high endemism, species limits of distribution, ecotones, mosaics, and sequences, etc. (Myers *et al.* 1987). Rare and special features are assessed, in increasing order of importance, at the district, regional or national level (Regnier *et al.* 1988).

4. Naturalness is valued because natural systems are complexes that when modified tend to lose their integrity and, in particular, their vulnerable species (Peterken 1974). Reduced naturalness may be evidenced by physical modifications to community structure and species composition, invasion of exotic species, loss of sensitive or intolerant species, and increases of 'aggressive' native plants (O'Connor *et al.* 1990). To define an area's naturalness, a point of reference must first be defined, i.e., pre-Maori or pre-European (1840s). In most Ecological Districts even the most pristine ecosystems have had some sort of modifying influences. The measure of naturalness is therefore relative to both what remains within each Ecological District, and the point of reference being used.

5. Long-term viability refers to an area's inherent ability to maintain itself in the long term, in the absence of any active management (Myers *et al.* 1987), and resist direct and to indirect human effects (Humphreys & Tyler 1990). Many valuable New Zealand

ecosystems have low resilience to external perturbation and, therefore, the long-term viability criterion has much relevance to nature conservation in New Zealand (O'Connor *et al.* 1990).

The last two criteria are not in themselves ecological, but have important effects on the others. They involve well established principles of reserve design, which have been discussed in depth elsewhere (e.g., McIntyre *et al.* 1984).

6. Size and shape effect the long-term viability of species, communities, and ecosystems as well as the amount of diversity (Smale 1994). This criterion gives natural areas a rank based on their ability to maintain themselves, given internal disturbance dynamics and processes (Myers *et al.* 1987). Large, compactly shaped natural areas tend to be better buffered against human disturbance, natural disaster, and pressures from the surrounding landscape, and have a smaller proportion of 'edge' habitats (Whitcomb *et al.* 1976).

7. Buffering is the degree of protection an area has from outside modifying influences, given by natural features or, in some instances, fences or other artificial structures (Myers *et al.* 1987). The extent to which an area is buffered has important consequences for its long-term effective functioning. This criterion also includes an assessment of the relationship an area has with its surrounding landscape.

Other management-oriented criteria are applied to each natural area, during the final evaluation process, including fragility and threat. Fragility measures the inherent vulnerability of the natural area to environmental change, and threat assesses those factors which could "disturb existing equilibrium" (Humphreys & Tyler 1990).

The original PNA survey guidebook outlined additional criteria that might be used, but these were not initially evaluated in RAP selection (Myers *et al.* 1987). Additional evaluation criteria have been added by subsequent survey teams. For example, in the Pukeamaru Ecological District and Coromandel Region survey reports management input was included (Regnier *et al.* 1988, Humphreys & Tyler 1990). Management input considers the human cost of maintaining the inherent viability of a natural area in perpetuity; e.g.fencing, exotic animal and plant control, restoration, and replanting.

In the evaluation process, some of the criteria are integrated to give measures like representative quality (naturalness, size and buffering). Within each evaluated criterion, values are assigned, enabling the natural areas in each district to be ranked (refer to Appendix 2). The evaluation procedures have also evolved and been modified since the programme's conception. The weighting of some criteria has varied from Ecological District to Ecological District, depending on factors like the amount of indigenous vegetation remaining, the extent of modification of the district, and the number of areas in the District already under formal protection.

Manaaki Whenua - Landcare Research

Doc # 15603780

# Appendix 4. Confidence rating for site evaluations and significance rankings

Confidence Rating	Definition
High	High level of confidence in assessment.
	Ecological information about the site is:
	Comprehensive
	Reliable     Applicable and (or recent
	Applicable and/or recent     Site specific
	• Site specific
	Sites with a high confidence rating include:
	Relatively large, well-studied, protected areas, e.g. Whareorino Forest
	• Protected areas that are well-known as habitats for threatened species, e.g. Māhoenui Giant Wētā Scientific
	Reserve, Mapara Scenic Reserve (a habitat for kōkako).
	Unprotected sites that have been identified as recommended areas for protection in a protected natural area
	survey.
	Other sites that have been the subject of fauna and/or flora surveys and the information is comprehensive,
	reliable, recent and site-specific.
	Sites with a high confidence ranking have a low requirement for field survey.
Medium	Moderate level of confidence in assessment.
	Ecological information about the site is:
	Relatively comprehensive
	Reliable
	Not entirely applicable/recent
	<ul> <li>More likely to be general than site-specific, e.g. the information applies to a larger tract of indigenous vegetation, of which the site is a relatively small part.</li> </ul>
	vegetation, of which the site is a relatively small part.
	Sites with a moderate confidence rating include:
	• Sites where the assessment is based on ecological information that does not meet all of the criteria for a high
	confidence ranking.
	• Sites that are contiguous with a site that has a high confidence ranking, and information about the contiguous
	site is assumed to be applicable to the site that is being assessed.
	• Sites that have been assessed as nationally or regionally significant on the basis of a record of a single species (such as whitehead as follow) without mosting other exiteria for national exceptional significance.
	<ul> <li>Sites for which incomplete ecological information exists, and for which targeted surveys may result in records.</li> </ul>
	of threatened species.
	Sites with a medium confidence ranking have a requirement for field survey.
Low	Low level of confidence in the assessment.
	Ecological information about the site is not available or is:
	Not comprehensive
	General
	Sites with a low confidence rating include:
	Very small protected sites e.g. marginal strips.
	• Unprotected sites within ecological districts where a protected natural area survey has not been undertaken.
	• Sites that have met criteria for national significance, solely on the basis of a record of a species (e.g. kiwi,
	kōkako) that is probably extinct at the site.
	Sites with a low confidence ranking have a high requirement for field survey.