

ASSESSMENT OF ECOLOGICAL SITE SIGNIFICANCE IN KAPITI DISTRICT - METHODOLOGY



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DRAFT

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EXECUTIVE SUMMARY

A workshop was convened on 9 September 2015 that included qualified ecologists from Wildland Consultants, Kessels Ecology and Boffa Miskell to discuss ecological significance criteria and to ensure the Kapiti Coast District assessment criteria were consistent with those contained within RPS Policy 23 and suitable for determining the ecological importance of Ecological Sites. This workshop was facilitated by Stephen Daysh (Environmental Management Services), and Jamie Steer (Greater Wellington Regional Council, developing Method 21 Guidelines) attended as observer. The workshop provided a platform for free and open, discussion on the matters outlined in this report, on a without prejudice basis.

Workshop attendees agreed that significance of an ecosystem or habitat is a S.6(c) matter under the Resource Management Act 1991 and will be assessed in a binary manner (yes or no) for each of the Regional Policy Statement Policy 23 criteria. A site need only be significant for one of the RPS Policy 23 criteria to be considered significant, and all criteria are equally weighted. Attaining significance in more than one criteria does not imply that the site is more significant. The scale at which the significance assessment is undertaken, and the relevant data sources, have been agreed and are set out in Table 2. The agreed ecological significance assessment criteria rely in part on other Environment Court cases and are consistent with the Draft RPS Method 21 report on how to interpret Policy 23 criteria, although there remain interpretation and use issues with parts of some criteria.

Sites that have been determined to be ecologically significant may also need to be ranked or prioritised for management, including differentiating those sites with fundamentally more conservation value (i.e. pristine condition, numerous special species etc.). A site ranking framework provides a mechanism to assign management priorities to ecological sites, and a potential framework is included as Appendix 6.

Lowland ecosystems are those that occur below the altitudinal location where forest transitions to beech dominated systems; in Kāpiti District this is about 600 m above sea-level. The boundary of the Manawatu Plains Ecological District has been refined to exclude the Tararua foothills, which are geologically and climatically different. Methodology has been agreed to review Ecological Site boundaries and exclude non-indigenous and non-local vegetation types, and where practical align with existing boundary fences provided these adjustments will not affect the overall viability of the Ecological Site, this includes particular provisions for Ecological Site K017 'Tararua Ranges and foothills'.

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1. INTRODUCTION

Kāpiti Coast District Council (KCDC) notified a Proposed District Plan (PDP) in November 2012. This plan contains policies and rules pertaining to the protection of ecologically significant sites and the identification of these sites (Policy 3.11). The Ecological Sites listed in Schedule 3.1 of the PDP were identified through previous survey work, using the most up to date significance criteria available at that time.

Since the notification of the PDP, the Regional Policy Statement (RPS) for Wellington region was made operative in April 2013 (Greater Wellington Regional Council 2013). The RPS includes identification criteria for Ecological Sites (Policy 23) and a requirement to protect significant ecosystems (Policy 24). As required by the Resource Management Act 1991 (the 'RMA'), the PDP must 'give effect to' the RPS. The wording of Policy 3.11 in the 2012 PDP is broadly similar to the RPS Policy 23, however it is proposed to replace the wording related to Ecological Site identification in the PDP (Policy 3.11) with the exact wording of RPS Policy 23 to ensure that KCDC's obligations in giving effect to the RPS are met (Submitter Engagement Version June 2015).

This means that the significance of all Ecological Sites in Schedule 3.1 needs to be checked to ensure that all sites meet PDP Policy 3.11/RPS Policy 23 (hereafter referred to as RPS Policy 23). In addition, KCDC would like to ensure that the interpretation of RPS Policy 23 is in line with the intended direction of the RPS and with the draft RPS Method 21: 'Information to assist with the identification of indigenous ecosystems and habitats with significant biodiversity values' (Greater Wellington 2015).

The information compiled during the methodology workshop (see Section 1.2) and outlined in this report will be included in a wider ecology report that KCDC has commissioned Wildlands to complete, associated with a review of submissions, and PDP definitions as part of the engagement process prior to formal reporting and hearings in 2016.

1.1 Submissions on the KCDC PDP

A large number of submissions were made on the PDP, including on the significance and location of Ecological Sites. Following an independent review of the PDP the Council resolved in July 2014 to continue with the review process and to hold-off formal hearings until 2016 to enable further engagement with submitters on key issues.

A number of rural submitters who had lodged submissions relating to Chapter 3 (Natural Environment) and Chapter 7 (Rural Environment) have formed a Rural Issues Group (RIG). This group has hosted a series of meetings with Council staff and key consultants since the inaugural meeting held in November 2014.

A key focus for the group relates to PDP provisions (objectives, policies, rules and mapping) associated with identified outstanding and significant landscapes and Ecological Sites, in particular in the Tararua Foothills area and how these impact on the operation of rural properties.

At the 17 December 2014 RIG meeting it was decided that to progress technical review work and associated discussions on the Tararua Foothills issues, a small number of submitter properties would be identified for “Pilot Studies”. This would involve Council’s respective landscape and ecology consultants (Isthmus and Wildlands) visiting the properties to review the current PDP mapping and to discuss the particular issues associated with those properties with the landowners.

As part of the engagement process in March 2015, KCDC appointed independent Working Reviewers to work with Isthmus and Wildlands respectively (Landscape Architect Frank Boffa, and Ecologist Gerry Kessels). Working Reviewers have a brief, in which they have been asked to liaise directly with the rural submitters on an as-required basis through the Pilot Study process.

Also as part of the engagement process a decision was made to run a workshop with other ecologists to review the interpretation of the RPS Policy 23 significance criteria and other matters that could affect Ecological Site significance assessments. The findings from that workshop are written up in this report and peer reviewed by an external reviewer (as indicated on the title page). The agreed methodology will be used to assess the significance of all Ecological Sites contained in Schedule 3.1 of the PDP.

1.2 Methodology Workshop

A workshop was convened on 9 September 2015 that included qualified ecologists from Wildland Consultants (Kelvin Lloyd and Astrid van Meeuwen-Dijkgraaf), Kessels Ecology (Gerry Kessels) and Boffa Miskell (Vaughan Keesing). This workshop was facilitated by Stephen Daysh (Environmental Management Services), and Jamie Steer (Greater Wellington Regional Council, responsible for developing Method 21 Guidelines) attended as observer. The workshop provided a platform for free and open discussion, on a without prejudice basis, on the matters outlined in this report.

The purpose of the workshop was to discuss how the RPS Policy 23 criteria should be interpreted and to define a suitable methodology for determining the ecological significance of the PDP Ecological Sites.

2. PREVIOUS ASSESSMENTS OF ECOLOGICAL SITES IN KĀPITI COAST DISTRICT

The 1995 Proposed Kāpiti Coast District Plan contained a Heritage Register and list of 138 Ecological Sites. These were mainly forest remnants or wetlands identified by the Department of Conservation. This Plan became operative in 1999 with 133 these sites identified.

Wildlands undertook field inspections of Ecological Sites from November 2002 to March 2003 to confirm or identify boundaries and collect ecological information (Wildland Consultants 2003a, report 662). In addition to the 133 Ecological Sites in the Operative District Plan (“ODP”), an additional 36 sites were proposed.

In addition to the ODP sites, 24 additional wetland sites were identified by Greater Wellington Regional Council (GWRC); some differed only in the location of the site boundaries. In total, 69 wetland sites were reported on and three additional wetland sites recommended as Ecological Sites (Wildland Consultants 2003b, report 669).

The two 2003 reports formed the basis of 'Plan Change 55(A) - Ecological Sites Update' - where the accurate site data was formally identified in the Heritage Register of the Kāpiti Coast District Plan. For the sake of ease, this process was split in two parts, (A) which dealt with the lowland sites, and (B) which involved the Tararua Sites and other lowland sites missed in the initial survey.

In 2007, Wildlands was commissioned to review 47 additional terrestrial and wetlands sites (excluding K017) as part of 'Plan Change 55(B) Ecological Sites Update'. The same method and field sheets were used as with the earlier reports. This resulted in an additional 29 sites being recommended as Ecological Sites (Wildland Consultants 2007, report 1684). This information resulted in the inclusion of these additional sites in the 2012 Proposed District Plan.

Field assessment of Ecological Site K017 Tararua Ranges was not included in the Wildlands 2007 assessment because the boundaries were to be ground-truthed at a future date. Therefore, the boundaries for this site, in the 2012 Proposed District Plan, were delineated using 2007 aerial photography.

A further four sites were surveyed in 2012 (Wildland Consultants 2012a), of which three were considered to be ecologically significant, and one was included by KCDC on the basis of tangata whenua values. Another site (Marycrest) was surveyed and included by KCDC.

In 2013 Greater Wellington Regional Council, Boffa Miskell and Wildlands worked together to develop a ranking system to identify wetlands of regional importance according to the criteria proposed in the Regional Policy Statement for Wellington region (Wildland Consultants 2013, based on Boffa Miskell 2011). This involved assessing each criterion and giving it a score from '1' to '5' with '5' being the highest value (most important). Certain criteria were given more weight but if a site scored a '2' in any of the criteria described then it was considered to be significant under Section 6(c) of the RMA. This scoring system, after review by Gerry Kessels, was used to assess Ecological Sites on the "Pilot Studies" properties. During this process several additional changes to the methodology were proposed and have also been reviewed as part of the methodology review process in this report.

3. PLANNING OBLIGATIONS

Objective 16 of Regional Policy Statement outlines an objective of maintaining and enhancing biodiversity values, which includes a role for district councils to protect areas of significant indigenous biodiversity.

Indigenous ecosystems and habitats with significant biodiversity values are maintained and restored to a healthy functioning state.

Associated with this objective are the following ‘Anticipated Environmental Results’:

1. *District and regional plans have identified indigenous ecosystems and habitats with significant biodiversity values.*
2. *District and regional plans contain policies, rules and/or methods to protect indigenous ecosystems and habitats with significant biodiversity values from inappropriate subdivision, use and development.*
3. *There is no loss of indigenous ecosystems and habitats with significant biodiversity values identified in a district or regional plan.*
4. *There is at least a 20 per cent increase in the area of indigenous ecosystems and habitats that are legally protected.*

The Regional Policy Statement also notes in section 3.6 ‘Indigenous Ecosystems’:

The regionally significant issues and the issues of significance to the Wellington region’s iwi authorities for indigenous ecosystems are:

1. *The region’s indigenous ecosystems are reduced in extent*

The region’s indigenous ecosystems have been significantly reduced in extent, specifically:

- (a) *wetlands*
- (b) *lowland forests*
- (c) *lowland streams*
- (d) *coastal dunes and escarpments*
- (e) *estuaries*
- (f) *eastern ‘dry land’ forests.*

2. *The region’s remaining indigenous ecosystems are under threat*

The region’s remaining indigenous ecosystems continue to be degraded or lost.

The obligations of the Kāpiti Coast District Council to identify indigenous ecosystems and habitats are set out in Policy 23 of the Regional Policy Statement for the Wellington region. Ecosystems and habitats will be considered significant if they meet one or more of the criteria outlined below.

Policy 23: Identifying indigenous ecosystems and habitats with significant indigenous biodiversity values - district and regional plans

District and regional plans shall identify and evaluate indigenous ecosystems and habitats with significant indigenous biodiversity values; these ecosystems and habitats will be considered significant if they meet one or more of the following criteria:

- (a) Representativeness: the ecosystems or habitats that are typical and characteristic examples of the full range of the original or current natural diversity of ecosystem and habitat types in a district or in the region, and:
 - (i) are no longer commonplace (less than about 30% remaining); or

- (ii) are poorly represented in existing protected areas (less than about 20% legally protected).
- (b) **Rarity:** the ecosystem or habitat has biological or physical features that are scarce or threatened in a local, regional or national context. This can include individual species, rare and distinctive biological communities and physical features that are unusual or rare.
- (c) **Diversity:** the ecosystem or habitat has a natural diversity of ecological units, ecosystems, species and physical features within an area.
- (d) **Ecological context of an area:** the ecosystem or habitat:
 - (i) enhances connectivity or otherwise buffers representative, rare or diverse indigenous ecosystems and habitats; or
 - (ii) provides seasonal or core habitat for protected or threatened indigenous species.
- (e) **Tangata whenua values:** the ecosystem or habitat contains characteristics of special spiritual, historical or cultural significance to tangata whenua, identified in accordance with tikanga Māori.

When assessing ecological significance of indigenous ecosystems in New Zealand, Whaley et al (1995), and others (for example Norton & Roper-Lindsay 2004), recognise the need to assess ecological sustainability, viability, buffering, threat and management matters as part of the assessment process. Importantly, however, these matters are secondary to the core criteria to be considered in the significance assessment process (Maseyk and Gerbeaux 2015). That is the sustainability or viability of a site is not a prerequisite of significance. *Assessment of significance and site viability are two different processes, and the latter does not determine the former and is a secondary consideration* (Maseyk and Gerbeaux 2015).

4. ECOLOGICAL SIGNIFICANCE

Significance has a specific statutory meaning derived from S6(c) of the RMA, that is the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. How sites should be protected is another matter, and draws on information on the relative value of areas, habitats, species or ecosystems and their priorities for protection and management.

4.1 Significance

Section 6(c) of the RMA applies to private and public conservation land, as significant sites on either land type can be modified or destroyed by a variety of threats. Significant areas on private land can be more vulnerable to development as there can be fewer legal mechanisms protecting these areas. Public conservation land is legally protected by the Conservation Act and other relevant Acts administered by DOC. However, the significant values on both private and public land can be modified directly by developments and they can also be modified or destroyed by

activities on or adjacent to the significant site, such as drainage, fire, vegetation clearance, and a lack of animal pest and weed control.

The RMA does not define 'significant', though the term has been the subject of much discussion among ecologists and its meaning has been broadly clarified through RMA hearings, including in the Environment Court. The Government's Proposed National Policy Statement (NPS) on Indigenous Biodiversity defines the scope of s6(c) of the RMA as follows:

An area of significant indigenous vegetation or a significant habitat of indigenous fauna is an area or habitat whose protection is important for the maintenance of indigenous biological diversity.

(MfE 2011)

This definition makes the important link between s6(c) and ss30 & 31 of the RMA, which state that one of the functions of local authorities is the maintenance of indigenous biological diversity.

4.1.1 Workshop outcome - significance

The ecologists agreed that significance is a binary decision. A site either is, or isn't, significant for a particular aspect or criteria. To be significant a site needs to meet one or more of the criteria in RPS Policy 23. Thus even meeting one of the criteria would make a site significant. Meeting several criteria does not make a site more significant, but could indicate that a site is more important. All significance criteria are equivalent; that is no significance criterion should be seen as more important than other criteria.

4.1.2 Workshop outcome - site ranking

The ecologists agreed that ranking sites for management is different from significance. Management actions are often prioritised on a scale which could be numeric (e.g. 5 is best, 1 is least) or descriptive (e.g. high, moderate, least). Such rankings can be useful, amongst other information, to inform management decisions, allocation of resources, focus efforts on particular geographic regions, or to evaluate one or more aspects across multiple sites.

Site rankings may be determined on the basis of several factors, such as inherent ecological values, proximity to other sites, degree of modification, vulnerability to threats, or the extent to which similar ecosystems are formally protected. For example, a particular district may contain 200 ecologically significant sites, but some sites are considered to be more important than others (Davis *et al.* 2015).

It was decided that it would be useful to provide a ranking for each KCDC Ecological Site, and the ranking should be un-weighted. Weighting can be applied as required when management decisions are being made; for instance higher rankings for sites that are already fenced, or for sites that are within 500 m of another Ecological Site, or where a community group or private landowner is already undertaking management of the site. Weighting is a management decision and will vary according to the question posed.

The ecologists reviewed, adapted, and revised a proposed site ranking framework for ecological values (provided in Appendix 6). This ranking process is broadly aligned with that developed by the Greater Wellington Regional Council for the identification of regionally significant wetlands (Boffa Miskell 2011, Wildland Consultants 2013).

5. ASSESSMENT OF SIGNIFICANCE

5.1 Representativeness

RPS Policy 23:

- (a) Representativeness: the ecosystems or habitats that are typical and characteristic examples of the full range of the original or current natural diversity of ecosystem and habitat types in a district or in the region, and:
- (i) are no longer commonplace (less than about 30% remaining); or
 - (ii) are poorly represented in existing protected areas (less than about 20% legally protected).

Representative is always with reference to a biodiversity type, and is usually referenced to a baseline condition of that type (often chosen as at 1840). RPS Policy 23 refers to the full range of the original or current natural diversity, indicating both a time element and a species and habitat diversity element, but does not specify a baseline or other standard against which representativeness should be assessed.

5.1.1 Ecosystems or Habitats that are Typical and Characteristic Examples

An Environment Court decision in the case of West Coast Regional Council vs Friends of Shearer Swamp and other parties contains an agreed definition (Appendix 8 of the decision, reproduced in Appendix 1 of this report) of what constitutes typical and characteristic examples of the full range of the original or current natural diversity of ecosystem and habitat types. This definition was based on several rounds of expert conferencing contributed to by a large number of ecologists, and is therefore robust. The key points are summarised below.

Essentially a representative ecosystem or habitat type is one that contains indigenous vegetation types or indigenous fauna assemblages that were typical for, and has the attributes of, the relevant class of ecosystem or habitat type as it would have existed in pre-human times¹. This criterion was considered to be satisfied if:

- (a) the ecosystem or habitat type comprised indigenous vegetation types that are
- (i) typical in plant species composition and structure; and
 - (ii) the condition is typical of what would have existed in that
 - indigenous species dominate; and

¹ Jamie Steer from Greater Wellington Regional Council confirmed that this should be pre-human times, but for West Coast the reference point was circa 1840.

- most of the expected species and tiers of the vegetation type(s) are present for the relevant class of ecosystem or habitat type; or
- (b) the ecosystem or habitat type contains indigenous fauna assemblages that
- (i) are typical of the ecosystem or habitat type class; and
 - (ii) indigenous species are present in most of the guilds expected for the habitat type.

The representative criterion was to be applied to the whole or part of the ecosystem or habitat type irrespective of land tenure, and was to be assessed at the ecological district and other relevant bio- geographic unit scale¹.

Singers and Rogers (2014) have developed a national classification framework for terrestrial ecosystems for the Department of Conservation. GWRC commissioned Nicholas Singers to produce a geo-spatial map of **potential** historic ecosystems in the Wellington region (Singers 2014) based on the national ecosystem classification. This classification system can be used to provide the standard against which representativeness can be assessed at a regional (Greater Wellington) and district (Kāpiti Coast) scale.

5.1.2 District or Region

The spatial scale of the assessment is important also. Representativeness requires a spatial scale, and can be assessed globally, at a national or regional scale, right down to within a local catchment. RPS Policy 23 provides some guidance in that ‘region’ is assumed to be Wellington region, and ‘district’ is interpreted as Territorial Local Authority (TLA) district (e.g. Kāpiti Coast District)². However, ecological representativeness significance can be assessed at the national, ecological region (e.g. Sounds-Wellington) or ecological district (e.g. Foxton Ecological District) scale, with the ecological district scale being routinely used.

5.1.3 Original or Current Natural Diversity

Jamie Steer (GWRC) clarified that ‘original’ referred to the pre-human condition and current natural diversity refers to the remaining habitats that exist currently including habitats that are no longer pristine or may be degraded but still remain some of the best characteristic examples of that type.

Two classification systems exist that map the vegetation types that are likely to have existed prior to modification by humans. It should be noted that both are broad ecosystem classifications which can amalgamate several vegetation and habitat types in to one category, also the scale of the mapping (national and regional) may not align perfectly with vegetation gradients observed in the field.

¹ For West Coast this read as freshwater bio- geographic unit scale.

² As per email from Jamie Steer Greater Wellington Regional Council 22 September 2015.

Singers and Rogers (2014) can be used to estimate the **potential** historic biodiversity patterns at a regional and district scale, but not at the national or ecological district scale (all ecological districts extend beyond the boundaries of Kāpiti Coast District).

Leathwick *et al.* (2012) have produced a geo-referenced national layer that predicts the **potential** historic biodiversity patterns based on the Land Environments of New Zealand (LENZ) classification (Leathwick *et al.* 2003). This layer can be used to estimate the original indigenous vegetation cover at a national and ecological district scale.

5.1.4 Less than 30% Remaining or 20% Protected

The Land Cover Database 4.1 (LCDB 4.1, Landcare Research 2015) is a national multi-temporal, thematic classification of New Zealand's land cover. It contains 33 mainland classes, including 18 classes that are generally dominated by indigenous species, or are indigenous habitats with minimal or no vegetation cover (e.g. Gravel & Rock or River). The classes are too broad to be of much use for assessing representativeness and the database suffers from resolution issues and thematic errors when used at a fine scale.

However LCDB is the only national mapping layer showing current vegetation cover that can be used to assess reduction from the original extent of indigenous vegetation types. By mapping the indigenous cover classes within LCDB in conjunction with the Singers (2014) and Leathwick *et al.* (2012) classifications, the qualifiers (less than about 30% remaining) at national, Wellington regional, Kāpiti Coast district, and ecological district level can be calculated. Information from other sources (DOC, Queen Elizabeth II Trust, Nga Whenua Rahui, TLA protected land) can be used to calculate the proportion of remaining indigenous vegetation that is protected.

5.1.5 Workshop outcome - Representativeness:

Some of the ecologists noted that the requirements for 30% of extent or 20% of legal protection are pernicious qualifiers that are not related to the meaning of representativeness; *the ecosystems or habitats that are typical and characteristic examples of the full range of the original or current natural diversity of ecosystem and habitat types in a district or in the region.*

Other ecologists felt that the RPS criteria were entirely appropriate; firstly assessing if a site is actually representative of its type, and then, if so, assessing its ‘representativeness’ in terms of its current coverage or extent.

Given that these qualifiers are an operative part of the RPS, they must be ‘given effect to’ in the Kāpiti Coast District PDP.

The ecologists agreed that the Singers (2014) vegetation layer provided the only reasonable spatial data (in terms of sufficient resolution of vegetation classes) that could be used to identify whether part, or all, of an Ecological Site is representative habitat at the regional or Kāpiti Coast District scale.

Typical and Characteristic

The Singers (2014) mapping would be used to make an assessment as to whether the vegetation types described are typical and characteristic - that is:

- indigenous species dominate; and
- most of the expected species and tiers of the vegetation type(s) are present for the relevant class of ecosystem or habitat type.

The current habitat descriptions for each ecological site have been reviewed and assessment made as to whether they match the Singers and Rogers (2014) classification (as mapped by Singers 2014). This information is provided in Appendix 2. There are a few small areas of coastal habitat that are not mapped in Singers (2014) namely an area including taupata (*Coprosma repens*) shrubland, coastal forest, rocky shore, and sandy shore - this is considered to be representative habitat for that location.

It was also agreed that the minimum area of forest or scrub to be considered a representative ecological site was 0.5 ha. Wetlands should not have an area limit but be dominated (i.e. comprise 50% or more) by indigenous vegetation and/or water.

Qualifiers - Less than 30% remaining or 20% protected

It is proposed to use the Land Cover Database 4.1 (Landcare Research 2015) in conjunction with the Singers (2014) classification to calculate the vegetation remaining at a Wellington regional and a Kāpiti Coast district scale, and in combination with Leathwick *et al.* (2012) to calculate these at a national and ecological district level. The various protection layers will be used to calculate the proportion protected at various scales.

5.2 Rarity

- (b) **Rarity:** the ecosystem or habitat has biological or physical features that are scarce or threatened in a local, regional or national context. This can include individual species, rare and distinctive biological communities and physical features that are unusual or rare.

In New Zealand 'threat classification systems' have been developed for a range of biotic and non-biotic features, including plants and animals, naturally uncommon ecosystems, threatened land environments, and geological features (Table 1).

Preventing the extinction of New Zealand's unique plant and animal species is a critical element in the Government's New Zealand Biodiversity Strategy (Ministry for the Environment 2000) and a vital step in doing this is to identify those species that are at risk of extinction, and to measure the level and nature of that risk. The Department of Conservation (DOC) published a classification system according to threat of extinction using criteria that had specifically been developed for New Zealand conditions (Molloy *et al.* 2002) and this classification has since been updated (Hitchmough *et al.* 2007). All taxonomic groups are reassessed about every five

years and all species within that group are classified in to one of the threat categories (Table 1) according to the most current knowledge at the time (Appendix 3).

Terrestrial ecosystems that were rare before human colonisation of New Zealand often have highly specialised and diverse flora and fauna characterised by endemic and nationally rare species and many of these ecosystems are under threat from anthropogenic modification and their biodiversity values are declining. A list of 72 rare ecosystems, defined as having a total extent less than 0.5% (i.e. <134,000 ha) of New Zealand's total area (268,680 km²), has been compiled (Williams *et al.* 2007) and these have subsequently been ranked using the IUCN's red list criteria for ecosystems (Wiser *et al.* 2014, Holdaway *et al.* 2012.).

The Threatened Land Environment Classification (TEC, Walker *et al.* 2008) is used to assess remaining indigenous vegetation and the proportion of that legally protected at a national scale. Any indigenous ecosystems or habitat types that occur in two of the most-reduced (<20% indigenous cover remaining) categories would be considered rare (Table 1), regardless of whether they meet other criteria.

Physical features are specifically mentioned in the criterion. Ecologists may not have sufficient expertise to identify and rank the importance of physical features, therefore it is proposed to use the New Zealand Geopreservation Inventory. The objective for the identification of the geological features in the Geopreservation Inventory was to ensure the survival of the best representative, unique and important examples of the broad diversity of geological features, land forms, soil sites and active physical processes to enable the understanding and on-going research of these geological features (Kenny and Hayward 1996). The importance ranking includes consideration of whether the geological feature is a rare or threatened feature.

Table 1: Threat classification systems for biota, ecosystems and geological features and which classifications would trigger the rarity criteria.

Classification System and Classification	Rare
Biota (plants and animals) - Hitchmough <i>et al.</i> 2007	
Threatened-Nationally Critical	Yes
Threatened-Nationally Endangered	Yes
Threatened-Nationally Vulnerable	Yes
At Risk-Declining	Yes
At Risk-Naturally Uncommon	Yes
At Risk-Relict	Yes
At Risk-Recovering	Yes
Data Deficient	Species dependent
Non-resident Native-Coloniser	No
Non-resident Native-Migrant	No
Non-resident Native-Vagrant	No
Not Threatened	No
Introduced and Naturalised	No
Extinct	No
Naturally Uncommon Ecosystems - Williams <i>et al.</i> 2007, Holdaway <i>et al.</i> 2012	
Critically endangered	Yes
Endangered	Yes
Vulnerable	Yes
Naturally uncommon - Not Threatened	Yes
Originally common	No

Classification System and Classification	Rare
Threatened Land Environment Classification categories - Walker <i>et al.</i> 2008	
< 10% indigenous cover left	Yes
10-20% indigenous cover left	Yes
20-30% indigenous cover left	No
> 30 % left and < 10% protected	No
> 30 % left and 10-20% protected	No
> 30 % left and > 20% protected	No
Geological sites and landforms - Kenny and Hayward 1996	
International importance	Yes
National importance	Yes
Regional importance	Yes
Highly vulnerable	Yes
Moderately vulnerable	No
Unlikely to be damaged by humans	No
Could be improved by human activity	No
Site already destroyed (not necessarily by human activity)	No
Not listed	No

5.2.1 Workshop outcome - Rarity

The ecologists agreed that threatened includes any Threatened or At Risk level under a national classification system.

Fauna

Use the relevant DOC threat classification system.

In terms of mobile species, if a site includes threatened species that occurs only as vagrants or only as single individuals (not a population) then that site should not be considered to be significant for rarity. A site has to comprise important habitat for it to be significant. For example, kākā (*Nestor meridionalis septentrionalis*, Threatened-Nationally Vulnerable) visiting a grove of walnut trees when walnuts are ripe would not make this a significant site, although if they were breeding in the grove then it could potentially be a significant habitat for kākā, but only if the walnut trees were part of a larger area of indigenous vegetation. North Island long-tailed bats (*Chalinolobus tuberculatus*, Threatened-Nationally Vulnerable) are known to use hollows and loose bark of pine trees and willows as roosting sites, so if bats occur in such an area, then these non-indigenous tree species may be part of the habitat regularly used by bats, and could therefore potentially be significant. This would also require further consideration of the wider habitat context.

For habitat where species information is lacking or for which a species has not been recorded, to meet the rarity criterion a site must provide suitable habitat for a threatened species, and

- The species has been recorded previously as occupying that Ecological Site; or
- The species is known to occur locally (e.g. recorded in eBird or literature) and the site provides good quality habitat.

This assessment will be a professional judgement and also depends on an understanding of the habitat utilisation and home range behaviour of the taxon of interest. The question that must be answered is “*Are we confident that this species would be located within this site if the appropriate fauna survey was undertaken?*” If there is any doubt about this, then the site will be ranked as not significant for this particular rare or threatened species.

Some fauna species that are not nationally Threatened or At Risk, are however known to be scarce in the Wellington region. These species and the locations where they are known to be scarce are listed in Appendix 4. Regionally scarce species may also include fauna species at their distribution limit or beyond known limits.

Flora

Use the relevant DOC threat classification system.

For regionally scarce species, DOC has produced a listing of plant species that are regionally threatened, including which district they are known to be scarce in (Sawyer 2004). Regionally scarce species may also include plant species at their distribution limit or beyond known limits.

Ecosystems and Habitats

Use the descriptions for originally rare ecosystems for defining rare and distinctive biological communities (Williams *et al.* 2007, Holdaway *et al.* 2012, Wiser *et al.* 2014).

Threatened and Rare Environments

Use the national Threatened Environment Classification (Walker *et al.* 2008) to identify areas that comprise 20% or less indigenous cover remaining. These areas may be significant if they are dominated by indigenous species, or in a relatively natural state. However, if the habitats are similar to those described in Table F2(b) of ‘Schedule F - Indigenous Biological Diversity’ of the Horizons One Plan (2014) then they will not be considered to be significant. This table has been reproduced in Appendix 4 of this report.

Physical Features

Refer to the relevant geological inventory (Kenny and Hayward 1996), otherwise only consider the existing indigenous habitat values as they relate to the distinctive physical features which may support unusual combinations of indigenous species or threatened or at risk species. Examples could include frost hollows, ephemeral wetlands, limestone, rock and boulder scree which still retain or support indigenous habitat values particular to that physical feature.

5.3 Diversity

- (c) Diversity: the ecosystem or habitat has a natural diversity of ecological units, ecosystems, species and physical features within an area.

Diversity in biological sense measures, or accounts, for the variety of organisms in a particular ecosystem¹. The number of organisms is dependent on the type of ecosystem; for instance a foredune system may naturally only comprise of one layer of plant species comprising half a dozen species, whereas a wetland system may include several different ‘types’ of wetland, with multiple vegetation layers from submerged plants to emergent tall trees. The diversity of an ecosystem therefore needs to be assessed relative to that particular ecosystem or habitat type.

An area will also be more diverse if it contains:

- Multiple ecosystem and habitat ‘types’; or
- Multiple tiers of vegetation; or
- Intact ecological sequences such as estuarine wetland systems adjoining tall, forest, or lowland to upland forest sequences; or
- Unusual characteristics, for example an unusual combination of species, vegetation classes, vegetation structural tiers, or landforms; or

The assessment of diversity of indigenous fauna assemblages should consider:

- the ecosystem or habitat type contains, or is likely to contain, indigenous fauna assemblages that are relatively diverse for that ecosystem or habitat type class; OR
- indigenous species guilds are relatively full, for example all naturally occurring insectivorous birds are present within a site; OR
- at least three vertebrate fauna groups are present (e.g. bats, birds, and lizards).

5.3.1 Workshop outcome - Diversity

The ecologists agreed that diversity has to be evaluated relative to the particular ecosystem or habitat type; some may be naturally more diverse than other types. It should also be evaluated relative to the pre-human base-line condition and the other remaining similar ecosystems and habitats.

The amount of diversity, and whether this is considered to be significant, is a professional judgement call.

5.4 Ecological Context

- (d) Ecological context of an area: the ecosystem or habitat:
- (i) enhances connectivity or otherwise buffers representative, rare or diverse indigenous ecosystems and habitats; or

¹ <http://www.biology-online.org/dictionary/Diversity>

- (ii) provides seasonal or core habitat for protected or threatened indigenous species.

Ecological context assess the value of the site in a landscape context. It includes, but is not limited to, such aspects as:

- Does the area provide a connection between other sites for mobile species (and thus for seeds and propagules moved by those species);
- Does the area protect another (potentially more important) site, for instance from invasion from weeds, the effects of wind, or reduces mammal movements (e.g. gorse hedge, river);
- Do mobile species congregate at this site because there is an important resource (e.g. seasonal or year round food, nesting or breeding habitat, lack of predators make for a safe roosting site, etc);
- Is this the only, or one of a few, or an important, site remaining in the wider landscape where mobile fauna can rest on a journey;
- Does this site contribute ecosystem services in the wider landscape (e.g. slowing water flow, preventing soil erosion, filtering water, etc).

5.4.1 Workshop outcome - Ecological Context

The ecologists agreed that the criteria for ecological context in the West Coast Regional Council vs Friends of Shearer Swamp and other parties (Appendix 8 of the decision, reproduced in Appendix 1 of this report) seemed appropriate. Thus a site will be considered significant for ecological context if it has one or more of the following functions or attributes:

- (a) It plays an important role in protecting adjacent ecological values, including adjacent and downstream ecological and hydrological processes, indigenous vegetation, habitats or species populations; or
- (b) Is an important habitat for critical life history stages of indigenous fauna including breeding/spawning, roosting, nesting, resting, feeding, moulting, refugia, or migration staging points (as used seasonally, temporarily or permanently); or
- (c) It makes an important contribution to ecological networks (such as connectivity and corridors for movement of indigenous fauna); or
- (d) It makes an important contribution to the ecological functions and processes within the ecological site, and potentially within the landscape.

A site will be deemed significant for ecological context if there is evidence or justification for supporting one or more of the above functions or attributes, and especially where the ecological context supports populations of protected terrestrial indigenous species as defined in the Wildlife Act 1953 S.3 'Wildlife to be protected', or indigenous fish species and their migratory pathways.

GWRC Policy 23 criteria refers to the relationship of a site to “*representative, rare or diverse ecosystems*”, thus it would generally make sense and be appropriate for these buffers or connections to be included with the ‘representative, rare or diverse ecosystem’ site. It would not seem appropriate to identify a site as significant solely on its role as a buffer or corridor. It is in fact difficult to think of an example where this would be the case since the buffer or corridor is required to have a functional role protecting something of ecological value; i.e. protecting ecologically valuable habitat or providing connectivity for significant fauna or between significant habitat for fauna.

5.5 Tangata Whenua Values

- (e) Tangata whenua values: the ecosystem or habitat contains characteristics of special spiritual, historical or cultural significance to tangata whenua, identified in accordance with tikanga Māori.

5.5.1 Workshop outcome - Tangata Whenua Values

The ecologists agreed that an assessment of tangata whenua values is generally outside the expertise of ecological specialists and should be evaluated by a specialist in that field. Where research into the values of a potential ecological site identifies potential tangata whenua values then these can be noted for that site, but should not be further assessed by ecological specialists.

5.6 Agreed attributes and data sources for each RPS Policy 23 criterion

Table 2 summarises the agreed attributes and data sources to be used to assess the RPS Policy 23 criteria. Note that the data sources are not an exhaustive listing and other sources may be available, or may be used, to undertake the analysis.

5.7 Draft RPS Method 21; interpretation of Policy 23 criteria

The attributes and data sources listed in Table 2 are in agreement with those listed in the Draft RPS Method 21 report (Greater Wellington Regional Council 2015).

Table 2: Agreed attributes and data sources for each RPS Policy 23 criterion.

Criterion	Response	Attribute	Scale	Data Source	Justification
Representativeness	Yes/No	Vegetation types are typical and characteristic	Wellington region, Ecological District, Kāpiti Coast District	PNAP reports, Singers and Rogers 2014.	As per Appendix 2 of this report.
		Fauna assemblages are typical and characteristic	Wellington region, Ecological District, Kāpiti Coast District	PNAP reports, Singers and Rogers 2014, eBird, NatureWatch, NIWA freshwater fish database, DOC Bioweb, other literature.	List species guild. Identify whether confirmed or likely.
		Exceeds minimum area	Site	GIS size for site.	Site size.
		AND: Less than 30% indigenous remaining	National	Leathwick <i>et al.</i> 2012 vs Indigenous in LCDB4.1, and protection status.	% indigenous remaining and/or protected.
		OR: Less than 20% indigenous protected	Greater Wellington region	Singers and Rogers 2014 vs Indigenous in LCDB4.1 and protection status.	% indigenous remaining and/or protected.
			Relevant ecological district(s) Kāpiti Coast District	Leathwick <i>et al.</i> 2012 vs Indigenous in LCDB4.1, and protection status. Singers and Rogers 2014 vs Indigenous in LCDB4.1, and protection status.	% indigenous remaining and/or protected. % indigenous remaining and/or protected.
Rarity	Yes/No	Fauna	National & Regional	PNAP reports, eBird, NatureWatch, falcon database, NIWA freshwater fish database, DOC Bioweb, Appendix 3 of this report, other literature.	List nationally Threatened or At Risk, or regionally scarce species. Identify whether confirmed or likely.
		Flora	National & Regional	PNAP reports, NatureWatch, NZPCN network database, DOC report on regionally threatened plants, DOC Bioweb, other literature.	List Nationally Threatened or at Risk, or regionally scarce species. Identify whether confirmed or likely.
		Ecosystems and habitats	National	Williams <i>et al.</i> 2007, Holdaway <i>et al.</i> 2012, Wiser <i>et al.</i> 2014.	List habitats.
		Threatened and rare environments	National	TEC.	List TEC category (area within site).
		Physical features	National, Regional or Kāpiti Coast District	Kenny and Hayward 1996, other literature.	List physical feature.
Diversity	Yes/No	Expected habitat types	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons.
		Expected habitat tiers	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons.
		Ecological sequences	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons.
		Distributional limits	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons.

Criterion	Response	Attribute	Scale	Data Source	Justification
		Unusual characteristics	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons.
Ecological Context	Yes/No	Important buffering role	Site (Ecological District, Kāpiti Coast District)	Aerial photography, GIS, literature, judgement call.	List reasons.
		Important fauna habitat	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons, indicate if confirmed or likely.
		Ecological networks	Site (Ecological District, Kāpiti Coast District)	Aerial photography, GIS, literature, judgement call.	List reasons.
		Important ecosystem functions	Site (Ecological District, Kāpiti Coast District)	Literature, judgement call.	List reasons.

DRAFT

6. LOWLAND BIOCLIMATIC ZONE

Section 3.6 of the RPS notes that loss of lowland ecosystems is of particular concern to Wellington iwi. Through the pre-hearing process it became apparent that there was some misconception with regards to what constitutes lowland environments. Some landowners understood lowland to comprise the flat coastal plains and to not include the Tararua foothills. However, from a technical ecological perspective lowland comprises the ecosystems and habitats below the altitude where broadleaved podocarp forest transitions to mainly beech dominated systems.

The exact altitudinal position where this occurs varies throughout the country and relates to the cold-tolerance of the key canopy species (Wardle 2002). In the Kāpiti Coast District key lowland canopy species include tawa (*Beilschmiedia tawa*), kohekohe (*Dysoxylum spectabile*), northern rata (*Metrosideros robusta*), kamahi (*Weinmannia racemosa*), titoki (*Alectryon excelsus*), and mahoe (*Melicytus ramiflorus*). The lowland altitudinal boundary in the Kāpiti Coast District occurs roughly at 600 m above sea-level.

7. REFINEMENT OF ECOLOGICAL DISTRICT BOUNDARIES

The delineation of an ecological district is undertaken on the basis of the topographical, geological, climatic, soil and biological features, including the broad cultural pattern, which results in characteristic landscapes and a range of biological communities. Ecological district boundaries were drawn on existing knowledge and relatively low resolution maps in the 1980's (McEwen *et al.* 1987a, 1987b). These boundaries are occasionally refined as new information comes to hand, or when higher resolution maps illustrate that the ecological boundary doesn't quite capture the intended ecological aspects.

The Foxton Ecological District contains the most extensive sand-dune system in New Zealand. The sand-belt runs from Patea to Paekakariki and includes several estuaries, and many wetlands and dune lagoons or lakes (McEwen 1987a).

The Manawatu Plains Ecological District comprises low lying uplifted marine terraces or alluvial terraces created by rivers (McEwen 1987a).

Steep, high, dissected hills and mountains characterise the Tararua and Rimutaka Ranges within the Tararua Ecological District. The rock is heavily faulted and broken by major rivers with steep hill slopes dropping to small river flats (McEwen 1987b).

During site visits to some of the Ecological Sites along the foothills of the Tararua Ranges it became apparent that the Manawatu Plains Ecological District boundary included part of the foothills, which should more correctly be part of the Tararua Ecological District. This was confirmed by referring to the underlying geology and soils information Figure 1 (soils information from Begg and Johnston 2000). The division between relatively young Quaternary alluvial type soils and older fractured grey stone and mudstone sequences occurs at about the 80 m contour line at the base of the slope. Thus the Manawatu Plains Ecological District boundary is better defined by

more or less following the 80 m contour and this refined ecological district boundary is shown in Figure 2.

The location of the Foxton Ecological District boundary was also reviewed, but found to be largely correct, except where changes to the Manawatu Plains boundary necessitated some adjustments.

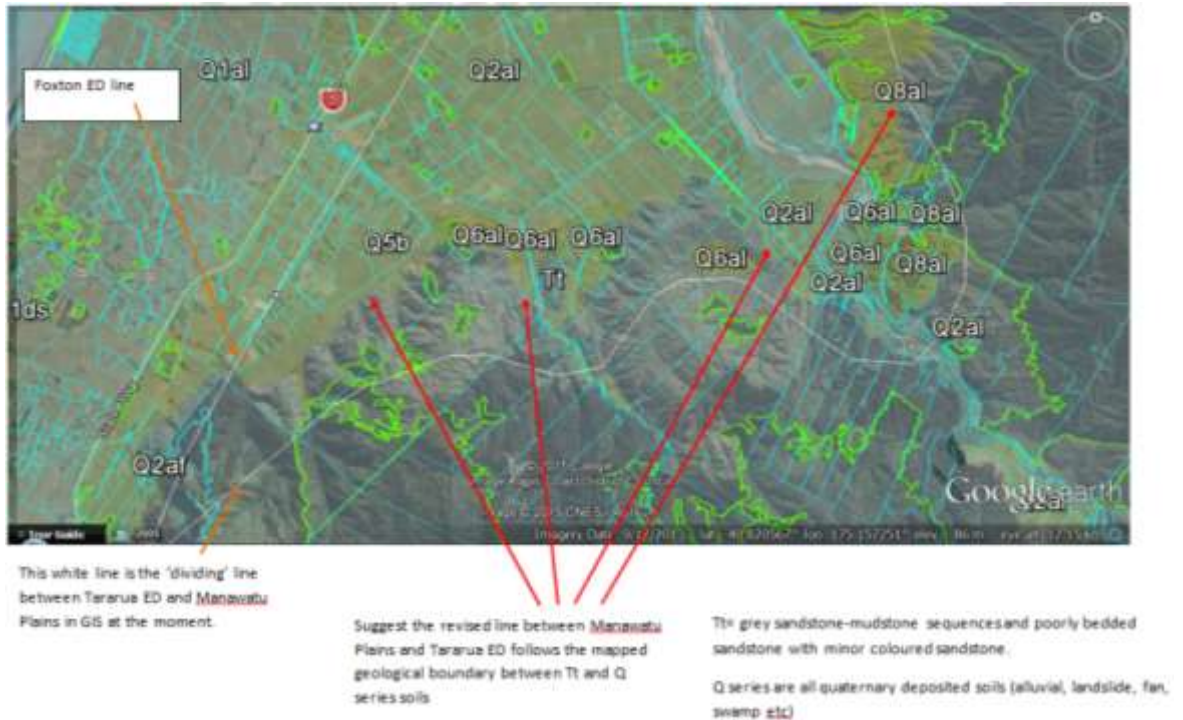
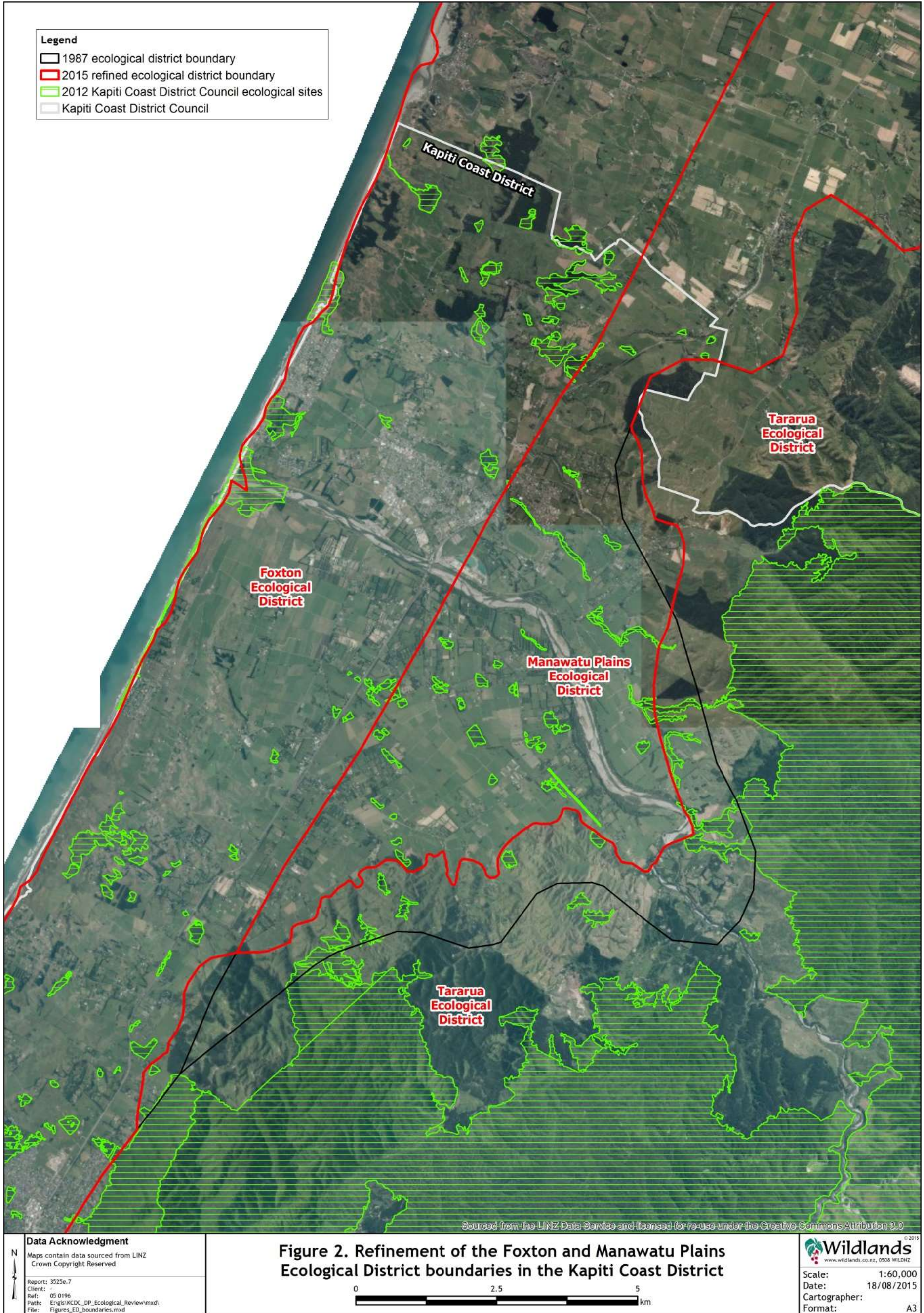


Figure 1: Location of Manawatu Plains and Taranui Ecological District boundaries in relation to underlying soil types.

Workshop outcome

The ecologists agreed that changing the boundaries of the Manawatu Plains Ecological District at the location shown in Figures 1 and 2 was a valid approach and supported by underlying geology.



8. ECOLOGICAL SITE BOUNDARIES

The delineation of sites (mapped boundaries as shown in the 2012 KCDC PDP) will be checked for all Ecological Sites against the most recent aerial photography available. Where there are discrepancies between the mapped site boundary and the vegetation types apparent on an aerial photograph then these will be appropriately corrected. A variation to the District Plan would be needed if a substantial increase in the extent of the ecological site resulted, but discrepancies of this nature are unlikely to occur.

Site delineation on aerial photographs generally follows the outer edge of the vegetation, often a tree canopy. In some instances this includes trees overhanging boundary fences, with little, if any, understorey vegetation, and little ecological value. In these instances it may be appropriate for the Ecological Site boundary to follow the fence-line, provided that this does not compromise the ecological values of the site as a whole.

Some Ecological Sites may include non-indigenous, or non-local indigenous vegetation species. Where these occur on the edge of an Ecological Site they will be excluded where possible, provided that the vegetation does not provide important habitat for threatened or at risk species, or an important buffering role (e.g. gorse growing on the ephemerally wet edge of a wetland), or another important ecological role (e.g. a known fauna migration corridor or regular roosting habitat for a nationally threatened bird species). Exclusion of non-indigenous, or non-local indigenous plant species in the core of an Ecological Site may not be possible as it could compromise the ecological values and cohesiveness of the site as a whole. These situations will need to be specifically assessed by the assessing ecologist and a professional judgement call made on a case by case basis.

Where additional or new information, including site visits, illustrate that part or all of an ecological site comprises less than 50% locally indigenous species, and the site does not provide important indigenous fauna habitat, then that part of the ecological site will be removed as far as practicable, provided it does not compromise the core values of the Ecological Site.

8.1 Ecological Site K017 boundaries

For small sites it is usual to include early succession indigenous vegetation (more than 50% indigenous) as this helps buffer and protect the site, and increases longer-term resilience. Ecological Site K017 ‘Taranua Ranges and foothills’ is a very large site, in excess of 40,000 ha. Thus the approach taken for K017 is to exclude any terrestrial indigenous vegetation on the margins of K017 that is of relatively recent origin (largely induced) and not indigenous forest, even though these areas all occur in the lowland bio-climatic zone. This includes exotic, indigenous or mixed vegetation types that comprise more recent or highly modified structural classes, such as shrublands, lowland scrub, lowland fernlands and lowland treeland, unless this includes threatened vegetation species or types.

- K017 - Protocol 1

Ecological Site K017, along its western margins within Kāpiti Coast District, incorporates a variety of indigenous forest, scrub, shrubland and treeland types. Areas of indigenous scrub, indigenous treeland, shrubland or fernland, as well as areas dominated by non-indigenous plant species, will not be included in K017 where they can be accurately mapped, as supported by site specific field assessments and/or recent aerial photography.

For a large site, such as K017, it may also be appropriate to consider opportunities to align Ecological Site boundaries with existing, practical and sustainable boundaries, such as fences where this could lead to better potential long-term conservation management outcomes (e.g. stock exclusion maintained). Given the large size of K017 these boundary adjustments may be greater than merely overhanging tree canopies. These more substantial boundary adjustment will be assessed on a case by case basis and only implemented where such adjustments will have a negligible effect on the viability of the core values of the significance site, and where it could result in better long-term conservation management outcomes.

- K017 Protocol 2

Where the fenced property boundary is close to the 2012 KCDC PDP Ecological Site boundary, the property boundary will be followed where practical, provided that area to be excluded from the Ecological Site:

- (i) Comprises less than 1 ha in total within the property boundaries of indigenous forest dominated by lowland species such as tawa, kamahi, kohekohe, northern rata, beech or podocarp species; or
- (ii) Comprises less than 5 ha of forest within the property boundaries, taller than 4 m, dominated mostly by early successional forest species, such as mahoe, mapou (*Mysine australis*), Coprosma species and *Pseudopanax* species.

9. SUMMARY OF METHODOLOGY

A workshop was convened on 9 September 2015 that included qualified ecologists from Wildland Consultants (Kelvin Lloyd and Astrid van Meeuwen-Dijkgraaf), Kessels Ecology (Gerry Kessels), and Boffa Miskell (Vaughan Keesing) to discuss ecological significance criteria and to ensure the Kapiti Coast District assessment criteria were consistent with those contained within RPS Policy 23 and suitable for determining the ecological importance of Ecological Sites. This workshop was facilitated by Stephen Daysh (Environmental Management Services), and Jamie Steer (Greater Wellington Regional Council, developing Method 21 Guidelines) attended as an observer. The workshop provided a platform for free and open discussion on the matters outlined in this report, on a without prejudice basis.

Workshop attendees agreed that significance of an ecosystem or habitat is a S.6(c) matter under the Resource Management Act 1991 and will be assessed in a binary manner (yes or no) for each of the Regional Policy Statement Policy 23 criteria. A site need only be significant for one of the RPS Policy 23 criteria to be considered significant, and all criteria are equally weighted. Attaining significance in more than one criteria does not imply that the site is more significant (but it may be more important for management purposes). The scale at which the significance assessment is undertaken, and the relevant data sources, have been agreed and are set out in Table 2 above.

Significance assessment methodology for some criteria includes reference to outcomes of other Environment Court cases; in particular the West Coast wetland and the Horizons One Plan. The attributes and data sources listed in Table 2 are in agreement with those listed in the Draft RPS Method 21 report (Greater Wellington Regional Council 2015), although there remain interpretation and use issues with parts of some criteria.

Where a site has been determined to be ecologically significant it will also be ranked for management. *This is a separate assessment from significance*, and can also include ranking for criteria that are not strictly ecological, such as prior management and community priorities, as well as differentiating those sites with fundamentally more conservation value. Site ranking provides a mechanism to assign management priorities to ecological sites. Site ranking will be undertaken as per the agreed criteria (Appendix 6) on a five-point score, and provided as an un-weighted summed score. This site ranking matrix was also reviewed and revised by workshop attendees.

Lowland ecosystems are those that occur below the altitudinal location where forest transitions to beech dominated systems; in Kāpiti District this is about 600 m above sea-level. The boundary of the Manawatu Plains Ecological District has been refined to exclude the Tararua foothills, which are geologically and climatically different. Methodology has been agreed to review Ecological Site boundaries and exclude non-indigenous and non-local vegetation types, and where practical align with existing boundary fences provided these adjustments will not affect the overall viability of the Ecological Site, this includes particular provisions for Ecological Site K017 'Tararua Ranges and foothills'.

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DRAFT

WEST COAST VS SHEARER SWAMP ENVIRONMENT COURT DECISION APPENDIX 8

APPENDIX 8

The criteria in this Appendix will be used to ascertain whether a wetland is ecologically significant. A wetland is significant if it triggers one or more of the following criteria.

1. Ecological context

[1] The **ecological context** of the wetland has one or more of the following functions ~~and~~ or attributes:

- (a) it plays an important role in protecting adjacent ecological values, including adjacent and downstream ecological and hydrological processes, indigenous vegetation, habitats or species populations; or
- (b) is an important habitat for critical life history stages of indigenous fauna including breeding/spawning, roosting, nesting, resting, feeding, moulting, refugia, or migration staging points (as used seasonally, temporarily or permanently); or
- (c) it makes an important contribution to ecological networks (such as connectivity and corridors for movement of indigenous fauna); or
- (d) it makes an important contribution to the ecological functions and processes within the wetland.

2. Representative wetlands

[2] A **representative wetland** is one that contains indigenous wetland vegetation types or indigenous fauna assemblages that were typical for, and has the attributes of, the relevant class of wetland as it would have existed circa 1840.

[3] This criterion will be satisfied if the wetland (not including pakihi wetlands) contains either:

- (a) **indigenous wetland vegetation types** that have the following attributes:
 - (i) the indigenous wetland vegetation types that are typical in plant species composition and structure; and
 - (ii) the condition of the wetland is typical of what would have existed circa 1840 in that:
 - indigenous species dominate; and
 - most of the expected species and tiers of the wetland vegetation type(s) are present
 - for the relevant class of wetland; or

- (b) (i) the wetland contains **indigenous fauna assemblages** that:
- are typical of the wetland class; and
 - indigenous species are present in most of the guilds expected for the wetland habitat type.

[4] A pakihi wetland is a representative wetland where:

- (a) it is greater than 40 hectares in area; and
- (b) it is dominated by a mixture of sedges, ferns, restiads, rushes, mosses and manuka (*Leptospermum scoparium*) of which *Baumea* spp, *Sphagnum* spp, *Gleichenia dicarpa*, and *Empodisma minus* are the main species.

[5] The representative wetland criterion applies to the whole or part of the wetland irrespective of land tenure.

[6] Each wetland is to be assessed at the ecological district and freshwater biogeographic unit scale.

3. Rarity

[7] The wetland satisfies this criterion if:

- (a) nationally threatened species¹ are present²; or
- (b) nationally at risk species or uncommon communities or habitats are present and either:
- the population at this site provides an important contribution to the national population and its distribution, or
 - there are a number of at risk species present, or
 - the wetland provides an important contribution to the national distribution and extent of uncommon communities or habitats; or
- (c) regionally uncommon species are present; or
- (d) is a member of a wetland class that is now less than 30% of its original extent as assessed at the ecological district and the freshwater biogeographic unit scales; or
- (e) excluding pakihi, it contains lake margins, cushion bogs, ephemeral wetlands, damp sand plains, dune slacks, string mires, tarns, seepages and flushes or snow banks which are wetland classes or forms identified as historically rare by Williams *et al* (2007) .

¹ The Threatened and At Risk categories are defined in the current version of the New Zealand threat classification system (Townsend et al 2008). Species are reassessed according to these categories approximately every three years.

² For mobile species such as kotuku this requires some assessment of the importance of the site for the species, i.e. the intention is not to include areas such as wet pasture where these birds may be foraging.

4. Distinctiveness

- [8] The wetland satisfies the **distinctiveness criterion** if it has special ecological features of importance at the international, national, freshwater biogeographic unit or ecological district scale including:
- (a) intact ecological sequences such as estuarine wetland systems adjoining tall forest; or
 - (b) an unusual characteristic (for example an unusual combination of species, wetland classes, wetland structural forms, or wetland landforms); or
 - (c) it contains species dependent on the presence of that wetland and at their distribution limit or beyond known limits.

Explanation

- [9] The **wetland classes** may be determined in a number of ways including the classification index of Johnson and Gerbeaux (2004).
- [10] **Wetland indigenous vegetation types** are identified with reference to the dominant plants species that are present, the structural class, wetland class and hydrosystem (see for example Johnson and Gerbeaux (2004) or similar method).
- [11] The three **freshwater biogeographic units** in the West Coast region are the Northwest Nelson-Paparoa, Grey-Buller, and Westland units (Leathwick *et al.* 2000).
- [12] **Ecological districts** are described and mapped in McEwen (1987). The maps of the ecological districts on the West Coast region have been refined by David Norton and Fred Overmars for use at the 1:50,000 scale and are available from the Department of Conservation (West Coast Conservancy).

ASSESSMENT OF WHETHER ECOSYSTEMS OR HABITATS ARE TYPICAL AND CHARACTERISTIC FOR EACH KCDC ECOLOGICAL SITE

This assessment was undertaken on the brief dominant habitat type description for each Ecological Site in the 2012 Proposed District Plan, prior to further modifications and vegetation descriptions undertaken as part of the review of submissions.

The assessment compares the “Ecological Site Dominant Habitat Description” from the PDP with that mapped by Singers (2014) the “Singers and Rogers Ecosystem Classification”. Indigenous vegetation types are assessed to be typical for, or have the attributes of, the relevant pre-human class of ecosystem or habitat type if the same class (e.g. forest, swamp) and key species occurred in both descriptions.

Where the Ecological Site description is considered to only include some of the attributes of the Singers and Rogers (2014) postulated vegetation type, this is indicated by being ‘Partially’ in the “Typical and characteristic” column. This includes where the ecosystem type is described as the same class (e.g. forest) but comprised different species (e.g. totara forest vs Kohekohe, tawa forest), or early successional vegetation types that contain some of the elements. Differences in vegetation type may be due to more fine-scale mapping at an ecological site scale, compared to a region-wide scale.

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
E092	WF8, Kahikatea, pukatea forest	0.42	Dune lake	Yes
K001	DN2, Spinifex, pingao grassland/sedgeland	0.59	Dune lake	Yes
	DN2/5 Coastal Sand Dunes Mosaic	0.09		
	DN5, Oioi, knobby clubrush sedgeland	0.11		
	Open Water	6.36		
	Strand	0.01		
	Swamp mosaic	5.26		
	WF8, Kahikatea, pukatea forest	2.71		
K002	Swamp mosaic	4.08	Dune lake, wetland	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.03		
	(blank)	0.00		
K004	Swamp mosaic	4.61	Manuka scrub wetland	Yes
K005	Swamp mosaic	1.71	Ephemeral dune wetland	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.00		
	WF8, Kahikatea, pukatea forest	0.09		
K007	MF6, Kohekohe, tawa forest	1.27	Dune lake, wetland, kahikatea swamp forest, tawa forest	Yes
	Open Water	0.18		
	Swamp mosaic	0.89		
	(blank)	0.01		
K008	MF6, Kohekohe, tawa forest	2.94	Tawa-kohekohe forest	Yes
K009	MF6, Kohekohe, tawa forest	3.93	Dune lake, wetland, swamp forest	Yes
	Open Water	16.76		

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
	Swamp mosaic	7.62		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.17		
K010	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.02	Wetland, lagoon	Yes
	WF8, Kahikatea, pukatea forest	1.18		
K011	MF6, Kohekohe, tawa forest	2.33	Tawa forest, dune lake	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.05		
K012	Open Water	1.77	Dune lake, wetland	Yes
	Swamp mosaic	2.87		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.58		
	WF8, Kahikatea, pukatea forest	0.13		
K013	MF6, Kohekohe, tawa forest	2.64	Wetland, swamp forest, secondary indigenous forest	Yes
	Swamp mosaic	21.81		
K014	BR1, Hard tussock, scabweed gravel/stonefield	10.85	Estuarine wetland, river mouth	Yes
	DN2, Spinifex, pingao grassland/sedgeland	1.45		
	DN2/5 Coastal Sand Dunes Mosaic	8.74		
	DN5, Oioi, knobby clubrush sedgeland	2.58		
	Strand	5.88		
	Swamp mosaic	2.22		
	(blank)	1.32		
K015	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.00	Pukatea-kahikatea swamp forest, wetland	Yes
	WF8, Kahikatea, pukatea forest	5.79		
K016	MF6, Kohekohe, tawa forest	1.28	Kohekohe-mahoe forest	Partially
K017	AL4, Mid-ribbed and broad-leaved snow tussock tussockland/shrubland	555.79	Tawa forest, kamahi forest, mahoe forest, mamaku forest, sub-alpine shrubland, with areas of alpine grasslands, river valleys	Yes
	BR1, Hard tussock, scabweed gravel/stonefield	0.04		
	CDF4, Hall/Es totara, pahautea, kamahi forest	873.76		
	CDF6, Olearia, Pseudopanax, Dracophyllum scrub [Subalpine scrub]	774.60		
	CLF10, Red beech, silver beech forest	14,501.13		
	CLF11-2, Silver beech	2,047.92		
	CLF9, Red beech, podocarp forest	8,765.02		
	MF6, Kohekohe, tawa forest	201.04		
	MF7, Tawa, kamahi, podocarp forest	8,612.02		
	MF8, Kamahi, broadleaved, podocarp forest	5,078.53		
	(blank)	0.10		
K018	MF6, Kohekohe, tawa forest	2.64	Kohekohe-tawa forest	Yes
	WF2, Totara, matai, ribbonwood forest	3.45		
K019	MF6, Kohekohe, tawa forest	1.77	Tawa-kohekohe forest	Yes
	WF2, Totara, matai, ribbonwood forest	0.86		
K020	MF6, Kohekohe, tawa forest	2.05	Kamahi forest	Partially
	WF2, Totara, matai, ribbonwood forest	0.06		

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
K021	MF6, Kohekohe, tawa forest	1.39	Tōtara-tawa-kamaha forest	Yes
	WF2, Totara, matai, ribbonwood forest	1.18		
	WF8, Kahikatea, pukatea forest	1.16		
K022	MF6, Kohekohe, tawa forest	5.95	Kamaha forest, tawa-tōtara forest	Yes
	WF8, Kahikatea, pukatea forest	0.75		
K023	MF6, Kohekohe, tawa forest	18.30	Kamaha forest, tawa forest, tawa-kohekohe forest	Yes
	MF7, Tawa, kamaha, podocarp forest	0.01		
	WF2, Totara, matai, ribbonwood forest	1.07		
	WF8, Kahikatea, pukatea forest	0.23		
K024	WF2, Totara, matai, ribbonwood forest	3.34	Pukatea-tawa-kohekohe forest	Partially
	WF8, Kahikatea, pukatea forest	0.02		
K025	MF6, Kohekohe, tawa forest	10.43	Kamaha forest, tawa forest	Partially
	WF2, Totara, matai, ribbonwood forest	0.00		
K026	BR1, Hard tussock, scabweed gravelfield/stonefield	0.25	Tōtara-kohekohe-kamaha forest, tawa-kohekohe forest	Yes
	MF6, Kohekohe, tawa forest	3.84		
K027	BR1, Hard tussock, scabweed gravelfield/stonefield	26.04	Estuarine wetland, river mouth	Yes
	DN2, Spinifex, pingao grassland/sedgeland	0.63		
	DN2/5 Coastal Sand Dunes Mosaic	15.28		
	Strand	2.94		
	Swamp mosaic	5.29		
	WF2, Totara, matai, ribbonwood forest	18.97		
	WF8, Kahikatea, pukatea forest	0.17		
	(blank)	0.05		
K028	WF2, Totara, matai, ribbonwood forest	2.41	Matai-tōtara-kohekohe forest	Yes
K029	WF2, Totara, matai, ribbonwood forest	1.86	Kohekohe-tawa forest	Partially
K030	WF2, Totara, matai, ribbonwood forest	1.45	Tōtara-kohekohe forest	Yes
K031	MF6, Kohekohe, tawa forest	5.49	Tōtara forest	Yes
	WF2, Totara, matai, ribbonwood forest	0.53		
K032	MF6, Kohekohe, tawa forest	1.57	Tōtara-mahoe forest	Yes
K033	MF6, Kohekohe, tawa forest	0.16	Tōtara forest	Yes
	WF2, Totara, matai, ribbonwood forest	1.54		
K034	MF6, Kohekohe, tawa forest	4.19	Kohekohe-tawa-nīkau forest	Yes
K035	WF2, Totara, matai, ribbonwood forest	0.82	Tītoki-tōtara forest	Yes
K036	WF2, Totara, matai, ribbonwood forest	1.61	Tōtara-kohekohe forest	Yes
K037	WF2, Totara, matai, ribbonwood forest	1.47	Tōtara-mataī forest	Yes
K038	WF2, Totara, matai, ribbonwood forest	3.51	Tōtara-tītoki-mataī forest	Yes
K039	WF2, Totara, matai, ribbonwood forest	3.25	Tōtara-mataī-tītoki forest	Yes
K040	MF6, Kohekohe, tawa forest	0.11	Tōtara-matai-titoki forest	Yes
	WF2, Totara, matai, ribbonwood forest	1.63		
K041	WF2, Totara, matai, ribbonwood forest	1.04	Tōtara-matai-titoki forest	Yes

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
K042	WF2, Totara, matai, ribbonwood forest	3.61	Tōtara-titoki-matai forest	Yes
K043	WF2, Totara, matai, ribbonwood forest	3.41	Tōtara forest	Yes
K044	MF6, Kohekohe, tawa forest	0.99	Tōtara-matai forest, tōtara-titoki forest	Yes
	WF2, Totara, matai, ribbonwood forest	0.45		
K045	WF2, Totara, matai, ribbonwood forest	1.92	Tōtara-titoki-kohekohe forest	Yes
K046	MF6, Kohekohe, tawa forest	6.88	Tōtara forest	Partially
K047	MF6, Kohekohe, tawa forest	3.65	Tōtara forest	Partially
K048	WF2, Totara, matai, ribbonwood forest	2.75	Tōtara-matai-titoki forest	Yes
K049	MF6, Kohekohe, tawa forest	2.89	Kohekohe-titoki forest	Yes
	WF2, Totara, matai, ribbonwood forest	0.23		
K050	MF6, Kohekohe, tawa forest	1.32	Kohekohe-tawa forest with kawakawa and nīkau	Yes
K051	MF6, Kohekohe, tawa forest	0.82	Tawa-kohekohe forest	Yes
K052	MF6, Kohekohe, tawa forest	1.49	Tawa-kohekohe-tītoki forest	Yes
K053	MF6, Kohekohe, tawa forest	4.92	Tawa-kohekohe forest	Yes
K054	MF6, Kohekohe, tawa forest	0.38	Tawa-karaka-kohekohe forest	Yes
	WF8, Kahikatea, pukatea forest	1.60		
K055	DN2/5 Coastal Sand Dunes Mosaic	0.14	Dune wetland	Yes
	Swamp mosaic	46.10		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.85		
	WF8, Kahikatea, pukatea forest	1.32		
K056	Swamp mosaic	0.26	Dune wetland	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	1.15		
	Swamp mosaic	6.69		
K057	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.69	Dune wetland	Yes
	Swamp mosaic	6.69		
K058	MF6, Kohekohe, tawa forest	7.17	Kohekohe-tawa-tītoki forest	Yes
K059	MF6, Kohekohe, tawa forest	1.88	Kohekohe-tawa forest, induced wetland	Yes
	WF8, Kahikatea, pukatea forest	0.14		
K060	Swamp mosaic	4.35	Harakeke wetland	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.01		
	WF8, Kahikatea, pukatea forest	0.04		
K061	MF6, Kohekohe, tawa forest	7.43	Kohekohe forest, kohekohe-tawa forest, titoki-mahoe treeland	Yes
K062	MF6, Kohekohe, tawa forest	163.66	Kohekohe-tawa-tītoki forest	Yes
	MF7, Tawa, kamahi, podocarp forest	133.83		
	MF8, Kamahi, broadleaved, podocarp forest	37.00		
K063	MF6, Kohekohe, tawa forest	1.51	Kohekohe-tawa-tītoki forest	Yes
K064	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.41	Kohekohe, tītoki, tawa forest	Partially
	WF8, Kahikatea, pukatea forest	1.19		
K065	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.00	Kānuka-mānuka scrub	Partially
	WF8, Kahikatea, pukatea forest	6.85		
K066	DN2/5 Coastal Sand Dunes Mosaic	0.44	Dune wetland	Yes
	Open Water	0.22		
	Swamp mosaic	55.26		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	1.84		

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
	WF8, Kahikatea, pukatea forest	7.68		
K067	MF6, Kohekohe, tawa forest	2.96	Kohekohe forest	Yes
K068	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.95	Raupo-harakeke wetland and remnant dune forest	Yes
K069	MF6, Kohekohe, tawa forest	0.51	Kohekohe forest	Yes
K070	MF6, Kohekohe, tawa forest	2.13	Kohekohe tītoki Forest	Yes
K071	MF6, Kohekohe, tawa forest	6.69	Kohekohe-tītoki-tawa forest, kamahi forest, kānuka scrub	Yes
K072	MF6, Kohekohe, tawa forest	6.60	Tawa-tītoki forest, kohekohe-tītoki-tawa forest	Yes
K073	MF6, Kohekohe, tawa forest	4.92	Kohekohe-tawa forest	Yes
K074	MF6, Kohekohe, tawa forest	3.31	Kohekohe-tawa forest, māhoe forest	Yes
K075	MF6, Kohekohe, tawa forest	3.09	Tītoki-tawa-rewarewa forest	Yes
K076	MF6, Kohekohe, tawa forest	7.67	Tawa-tītoki-kohekohe forest	Yes
K077	MF6, Kohekohe, tawa forest	22.80	Tawa-kohekohe forest	Yes
	MF7, Tawa, kamahi, podocarp forest	3.03		
K078	MF6, Kohekohe, tawa forest	7.75	Tawa-kohekohe forest	Yes
	MF7, Tawa, kamahi, podocarp forest	5.06		
K079	MF7, Tawa, kamahi, podocarp forest	23.21	Tawa forest, kamahi forest	Yes
K081	DN2/5 Coastal Sand Dunes Mosaic	20.00	Estuarine wetland, river mouth	Yes
	River	15.53		
	Strand	12.18		
	Swamp mosaic	12.79		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.98		
	WF8, Kahikatea, pukatea forest (blank)	6.69		
		0.06		
K082	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.35	Kahikatea-pukatea swamp forest	Yes
	WF8, Kahikatea, pukatea forest	1.33		
K083	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.67	Kohekohe-tītoki-māhoe forest	Partially
	WF8, Kahikatea, pukatea forest	0.44		
K084	MF6, Kohekohe, tawa forest	0.34	Kahikatea swamp forest, mānuka scrub	Partially
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.58		
K085	MF6, Kohekohe, tawa forest	1.33	Kohekohe-pukatea forest, kohekohe forest, kohekohe-tītoki forest, semi-swamp forest	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.71		
	WF8, Kahikatea, pukatea forest	4.24		
K086	MF6, Kohekohe, tawa forest	11.18	Kohekohe-tawa forest	Yes
K087	MF6, Kohekohe, tawa forest	99.43	Kohekohe-tawa forest, tawa forest, kohekohe forest, kānuka forest, small area of wetland and swamp forest	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.09		
	WF8, Kahikatea, pukatea forest	0.76		
K088	MF6, Kohekohe, tawa forest	0.76	Kohekohe-nīkau forest	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.41		
	WF8, Kahikatea, pukatea forest	0.15		
K089	WF6, Totara, matai, broadleaved forest [Dune Forest]	2.32	Kohekohe forest, māhoe forest, pukatea-maire tawake swamp forest, wetland	Yes
	WF8, Kahikatea, pukatea forest	5.17		
K091	MF6, Kohekohe, tawa forest	13.64	Kohekohe-nīkau forest	Yes
K093	WF8, Kahikatea, pukatea forest	1.27	Mānuka scrub wetland	Partially
K094	MF6, Kohekohe, tawa forest	1.95	Kohekohe forest	Yes
K095	MF6, Kohekohe, tawa forest	51.19	Kānuka-māhoe-gorse scrub, kohekohe-tītoki forest	Yes
	WF8, Kahikatea, pukatea forest	1.75		

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
K096	MF6, Kohekohe, tawa forest	4.93	Tawa-kohekohe forest	Yes
K097	MF6, Kohekohe, tawa forest	3.29	Kohekohe-tawa forest	Yes
K098	MF6, Kohekohe, tawa forest	61.97	Kohekohe forest, kānuka scrub	Yes
K099	MF6, Kohekohe, tawa forest	39.22	Kohekohe-māhoe forest, māhoe-mamaku forest, tawa forest	Yes
K100	MF6, Kohekohe, tawa forest	5.65	Māhoe forest	Partially
K101	MF6, Kohekohe, tawa forest	1.36	Kohekohe forest	Yes
K102	MF6, Kohekohe, tawa forest	1.01	Kohekohe forest	Yes
K103	MF6, Kohekohe, tawa forest	1.24	Tawa forest, raupo wetland	Yes
K104	MF6, Kohekohe, tawa forest	3.47	Kohekohe-tawa-tītoki forest	Yes
K105	MF6, Kohekohe, tawa forest	3.22	Kohekohe-tawa-tītoki forest	Yes
K106	MF6, Kohekohe, tawa forest	0.01	Raupo reedland wetland	Yes
	Swamp mosaic	9.40		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.28		
K108	MF6, Kohekohe, tawa forest	0.03	Kahikatea swamp forest, kanuka scrub, ephemeral wetland	Yes
	Swamp mosaic	8.12		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	6.31		
	WF8, Kahikatea, pukatea forest	2.38		
K109	DN2/5 Coastal Sand Dunes Mosaic	105.39	Sand dune	Yes
	Strand	0.02		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	3.75		
	WF8, Kahikatea, pukatea forest	0.34		
K110	DN2/5 Coastal Sand Dunes Mosaic	2.33	Sand dune, māhoe forest	Yes
	MF6, Kohekohe, tawa forest	2.79		
	(blank)	0.16		
K111	MF6, Kohekohe, tawa forest	15.15	Kohekohe forest	Yes
K112	DN2/5 Coastal Sand Dunes Mosaic	0.00	Dune wetland	Yes
	Swamp mosaic	5.22		
	WF8, Kahikatea, pukatea forest	0.11		
K113	(blank)	1.47	Taupata shrubland, forest, rocky shore, sandy shore?	Yes
K114	(blank)	1.15	Shrubland, rocky shore, sandy shore?	Yes
K115	(blank)	0.98	Shrubland, forest, rocky shore, sandy shore?	Yes
K116	MF6, Kohekohe, tawa forest	0.04	Ephemeral wetland on coastal gravel	Yes
	Open Water	6.92		
	SA4, Shore bindweed, knobby clubrush gravel/stonefield	1.09		
K117	CL3, Coprosma, Muehlenbeckia shrubland/herbfield/rockland	306.20	Tawa forest, rata/kamaha forest, kohekohe forest, kanuka forest, manuka scrub, coastal shrublands, cliff tussocklands, and small wetlands	Yes
	MF6, Kohekohe, tawa forest	1,536.46		
	Open Water	8.09		
	Rocky beach	6.26		
	SA4, Shore bindweed, knobby clubrush gravel/stonefield	46.51		
(blank)	15.15			
K123	MF6, Kohekohe, tawa forest	3.07	Tōtara forest	Partially
K124	MF6, Kohekohe, tawa forest	0.70	Kohekohe-karaka forest	Yes
K125	MF6, Kohekohe, tawa forest	1.20	Kohekohe forest	Yes
K131	WF6, Totara, matai, broadleaved forest [Dune Forest]	5.21	Kānuka-gorse scrub, mānuka scrub wetland	Yes
	WF8, Kahikatea, pukatea forest	5.85		
K133	MF6, Kohekohe, tawa forest	2.50	Wetland, swamp forest,	Yes

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
K134	WF6, Totara, matai, broadleaved forest [Dune Forest]	6.11	kohekohe forest, tawa forest	
	WF8, Kahikatea, pukatea forest	35.02		
K135	WF8, Kahikatea, pukatea forest	0.43	Raupo wetland	Partially
K136	CL3, Coprosma, Muehlenbeckia shrubland/herbfield/rockland	20.38	Kohekohe coastal forest, secondary scrub	Partially
	MF6, Kohekohe, tawa forest	19.09		
K139	MF7, Tawa, kamahi, podocarp forest	3.44	Kamahi forest, makomako forest, scrub	Yes
K140	MF6, Kohekohe, tawa forest	2.47	Kohekohe-tītoki forest	Yes
K141	MF6, Kohekohe, tawa forest	2.02	Kohekohe forest	Yes
K145	MF6, Kohekohe, tawa forest	0.39	Riparian vegetation	Field Check Required
K150	MF6, Kohekohe, tawa forest	1.35	Kānuka scrub	Partially
K151	MF6, Kohekohe, tawa forest	7.30	Pukatea-maire tawake swamp forest, māhoe forest, kohekohe-kānuka forest	Yes
K153	MF6, Kohekohe, tawa forest	2.14	Kohekohe-mahoe forest	Yes
K154	MF6, Kohekohe, tawa forest	1.74	Kohekohe coastal forest	Yes
	WF2, Totara, matai, ribbonwood forest	1.11		
K164	MF6, Kohekohe, tawa forest	0.63	Kohekohe-tītoki forest	Yes
K165	MF6, Kohekohe, tawa forest	1.29	Kohekohe-tawa forest	Yes
	WF2, Totara, matai, ribbonwood forest	0.27		
K166	MF6, Kohekohe, tawa forest	2.49	Tōtara forest	Yes
	WF2, Totara, matai, ribbonwood forest	1.31		
K168	MF6, Kohekohe, tawa forest	0.62	Kohekohe forest	Yes
K170	MF6, Kohekohe, tawa forest	4.06	Kānuka scrub	Partially
K171	WF6, Totara, matai, broadleaved forest [Dune Forest]	7.62	Manuka wetland	Partially
K175	WF8, Kahikatea, pukatea forest	0.06	Ephemeral sedge-herb-grassland wetland	No
K175	DN2/5 Coastal Sand Dunes Mosaic	2.28	Dune lake	Yes
	River	0.12		
	Swamp mosaic	0.01		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.23		
	WF8, Kahikatea, pukatea forest	5.39		
	WF8, Kahikatea, pukatea forest	0.06		
K176	DN2/5 Coastal Sand Dunes Mosaic	25.11	Wetland, dune system	Yes
	WF8, Kahikatea, pukatea forest	0.27		
K178	WF2, Totara, matai, ribbonwood forest	1.98	Tōtara-matai-tītoki forest	Yes
K183	WF8, Kahikatea, pukatea forest	0.56	Mānuka scrub wetland	Partially
K184	MF6, Kohekohe, tawa forest	1.14	Mānuka scrub and rushland wetland	Partially
	Swamp mosaic	2.34		
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.79		
K185	DN5, Oioi, knobby clubrush sedgeland	0.12	Dune lake and reedland. Wildlife Refuge.	Yes
	MF6, Kohekohe, tawa forest	2.68		
	Swamp mosaic	0.69		
	WF8, Kahikatea, pukatea forest	0.33		
K186	Swamp mosaic	4.18	Mānuka scrub wetland	Partially
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.15		
K188	Swamp mosaic	1.13	Mānuka-kānuka scrub	Partially
K189	WF6, Totara, matai, broadleaved forest [Dune Forest]	4.27	Kānuka treeland, wetland	Partially

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
K191	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.40	Tawa-pukatea- kohekohe forest, constructed pond	Yes
	WF8, Kahikatea, pukatea forest	0.15		
K193	Swamp mosaic	0.22	Cabbage tree/ harakeke-toetoe wetland	Yes
	WF8, Kahikatea, pukatea forest	0.00		
K194	Swamp mosaic	1.16	Raupo wetland	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.01		
K195	MF6, Kohekohe, tawa forest	2.01	Kohekohe-tawa forest	Yes
K196	MF6, Kohekohe, tawa forest	1.04	Wetland, pukatea-swamp, maire swamp forest	Yes
K197	DN2/5 Coastal Sand Dunes Mosaic	0.40	Kānuka scrub and shrubland, Kānuka-garden	Partially
K198	MF6, Kohekohe, tawa forest	3.65	Tawa-kohekohe forest, Kohekohe-mapou-karamu-pigeonwood forest	Yes
K199	MF6, Kohekohe, tawa forest	3.07	Tawa-kohekohe forest, Kohekohe-mapou-karamu-pigeonwood forest	Yes
K200	MF6, Kohekohe, tawa forest	4.67	Tawa-kohekohe forest and treeland	Yes
	MF7, Tawa, kamahi, podocarp forest	0.05		
K202	MF6, Kohekohe, tawa forest	4.37	Tawa-kohekohe forest and treeland	Yes
	MF7, Tawa, kamahi, podocarp forest	1.71		
K203	MF6, Kohekohe, tawa forest	2.24	Tawa-kohekohe-pigeonwood-rewarewa forest, tītoki-kohekohe-tawa-rewarewa forest	Yes
	MF7, Tawa, kamahi, podocarp forest	3.09		
K204	MF6, Kohekohe, tawa forest	5.31	Tawa-kohekohe-pigeonwood-rewarewa forest, tītoki-kohekohe-tawa-rewarewa forest	Yes
	MF7, Tawa, kamahi, podocarp forest	1.10		
K205	MF6, Kohekohe, tawa forest	16.04	Tawa-kohekohe-pigeonwood-rewarewa forest, tītoki-kohekohe-tawa-rewarewa forest	Yes
	MF7, Tawa, kamahi, podocarp forest	12.99		
	MF8, Kamahi, broadleaved, podocarp forest	3.68		
K206	MF7, Tawa, kamahi, podocarp forest	4.74	Probably tawa-kohekohe forest	Yes
K207	MF7, Tawa, kamahi, podocarp forest	7.82	Probably tawa-kohekohe forest	Yes
K209	MF6, Kohekohe, tawa forest	0.88	Tawa-karaka-kohekohe forest	Yes
K210	Swamp mosaic	1.94	<i>Juncus</i> spp. wetland	Partially
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.11		
	WF8, Kahikatea, pukatea forest	0.03		
K211	Swamp mosaic	2.08	<i>Isolepis prolifer</i> sedgeland, pukatea-swamp maire forest	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.12		
	WF8, Kahikatea, pukatea forest	0.43		
K212	MF6, Kohekohe, tawa forest	1.36	Tawa-tītoki-kohekohe forest, Pukatea-kohekohe forest and Tōtara forest	Yes
	WF2, Totara, matai, ribbonwood forest	0.83		
K214	Swamp mosaic	1.34	<i>Carex virgata</i> - <i>Juncus</i> spp./ pasture, Excavated pond	Partially
K215	Swamp mosaic	6.70	Mānuka-swamp coprosma	Yes

Ecological Sites ID	Singers and Rogers Ecosystem Classification	Area (ha)	Ecological Site Dominant Habitat Description	Typical and Characteristic
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.64	wetland, <i>Isolepis prolifer-Baumea rubiginosa</i> / sphagnum sedgeland, <i>Juncus</i> spp.- <i>Carex virgata</i> -gorse/pasture rushland, excavated pond, dune slack	
K218	MF6, Kohekohe, tawa forest	1.33	Tawa-karaka-titoki forest,	Yes
	Swamp mosaic	0.06	Tawa-kahikatea-mamaku forest, Tawa-exotic tree species forest	
K219	MF6, Kohekohe, tawa forest	0.61	Raupo reedland	Yes
	Swamp mosaic	1.60		
K220	Swamp mosaic	2.01	Cabbage tree/ swamp coprosma/sedges wetland,	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	0.35	Cabbage tree/old man's beard vineland, Cabbage tree/pohuehue vineland	
K221	CL3, <i>Coprosma, Muehlenbeckia</i> shrubland/herbfield/rockland	15.44	Tauhinu-(<i>Coprosma propinqua</i>)/pasture shrubland, Karaka-titoki-mahoe treeland, Pohuehue scrub, Cabbage tree/tauhinu treeland, Kohekohe-titoki-karaka forest, Manuka/tauhinu shrubland	Yes
	MF6, Kohekohe, tawa forest	3.38		
K231	DN2, Spinifex, pingao grassland/sedgeland	7.80	Gravel beach and dune c.4.5 km long × 100 m wide, turf and mat plants, wind shorn shrubs and trees, exotic species.	Yes
	DN2/5 Coastal Sand Dunes Mosaic	1.28		
	Strand	3.71		
	(blank)	0.56		
K233	MF6, Kohekohe, tawa forest	0.06	Old drainage canal for Lake Waitawa, and surrounding wetlands	Partially
	Open Water	0.04		
	Swamp mosaic	4.74		
K234	MF6, Kohekohe, tawa forest	0.52	Coastal karaka-rewarewa forest	Partially
K235	MF6, Kohekohe, tawa forest	0.15	Pukatea-kahikatea swamp forest	Yes
	WF6, Totara, matai, broadleaved forest [Dune Forest]	1.87		

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REGIONALLY SCARCE FAUNA

List of fauna that is not nationally threatened or at risk but is scarce or uncommon in part or all of the Greater Wellington Region. The majority of this information is sourced from literature cited below, but some expert judgement will be required when assessing the ecological significance of a site.

Common Name	Scientific Name	Location Where Scarce
Bellbird	<i>Anthornis melanura melanura</i>	All of GWRC, localised distribution, increasing in abundance. Wairarapa Plains, Eastern Wairarapa
North Island tomtit	<i>Petroica macrocephala toitoi</i>	Uncommon in urban areas or around urban fringe of extensive forests, Wairarapa Plains, Eastern Wairarapa
North Island robin	<i>Petroica longipes</i>	Uncommon in urban areas or around urban fringe of extensive forests, Wairarapa Plains, Eastern Wairarapa
Whitehead	<i>Mohoua albicilla</i>	Uncommon in urban areas or around urban fringe of extensive forests, Wairarapa Plains, Eastern Wairarapa
Grey warbler	<i>Gerygone igata</i>	Wairarapa Plains, Eastern Wairarapa
Kereru	<i>Hemiphaga novaeseelandiae</i>	Wairarapa Plains, Eastern Wairarapa
Sacred kingfisher	<i>Todiramphus sanctus</i>	Wairarapa Plains
Tui	<i>Prothemadera novaeseelandiae</i>	Wairarapa Plains, Eastern Wairarapa

INFORMATION FROM

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RARE AND THREATENED HABITAT EXCLUSIONS - HORIZONS ONE PLAN

If an area is classified as less than 20% remaining under the Threatened Environment Classification (PRS Policy 23 Rarity criterion) but the habitat type predominantly (more than 50%) meets any of the following criteria it will not be considered to be rare habitat, threatened habitat or at-risk habitat.

Horizon Operative One Plan

Table F.2(b):

Forest*, Treeland*, Scrub*, or Shrubland* Habitat Types Classified as Threatened or At-Risk

- i. Areas of indigenous* tree* species planted for the purposes of timber harvest.
- Or
- ii. Indigenous* vegetation planted for landscaping, horticultural, shelter belts, gardening or amenity purposes.

Or

Wetland^ Habitat Types Classified as Rare or Threatened

- iii. Damp gully heads, or paddocks subject to regular ponding, dominated* by pasture or exotic species in association* with wetland^ sedge and rush species.
- Or
- iv. Ditches or drains supporting raupo, flax or other wetland species (eg., *Carex* sp., *Isolepis* sp.), or populations of these species in drains or slumps associated with road reserves or rail corridors.
- Or
- v. Areas of wetland^ habitat specifically designed, installed and maintained for any of the following purposes:
 - (a) stock watering (including stock ponds), or
 - (b) water^ storage for the purposes of fire fighting or irrigation (including old gravel pits), or
 - (c) treatment of animal effluent (including pond or barrier ditch systems), or
 - (d) wastewater treatment, or
 - (e) sediment control, or
 - (f) any hydroelectric power generation scheme, or
 - (g) water^ storage for the purposes of public water supplies*.
- Or
- vi. Areas of wetland^ habitat maintained in relation to the implementation of any resource consent^ conditions^ or agreements relating to the operation* of any hydroelectric power scheme currently lawfully established.
- Or
- vii. Open water^ and associated vegetation created for landscaping purposes or amenity values where the planted vegetation is predominately exotic, or includes assemblages of species not naturally found in association* with each other, on the particular landform, or at the geographical location of the created site*.

Tussockland* Habitat Type Classified as At-risk

- viii. Red tussock regenerating through pasture dominated by exotic grass species.

**MANAGEMENT
RANKING CRITERIA**

ECOLOGICAL VALUES TO BE ASSESSED FOR MANAGEMENT RANKING

	1 Representative	2 TEC¹	3 Rare Habitats	4 Rare Plants	5 Rare Fauna	6 Communities	7 Ecological context	8 Habitat for indigenous fauna
5	Ecosystems ² that are typical and characteristic of those originally present prior to human occupation; or an ecosystem that are some of the better remaining examples of its type in the region.	At least 0.5 ha of indigenous vegetation or habitat on Acutely Threatened (<10% indigenous cover remaining) land environments.	Nationally rare or uncommon indigenous vegetation or habitat	Nationally Threatened indigenous plant, lichen, or fungus species present	Nationally Threatened indigenous animal species regularly present	At least 5 indigenous vegetation/habitat types or landforms covered by indigenous vegetation OR at least 80% of the expected indigenous plant species, OR at least one indigenous fauna group with close to expected species richness	Extensive or uninterrupted habitat greater than 100 ha in size or at least 5 km long, OR buffers more than 70% of the margin of an important or vulnerable ecosystem (e.g. stream wetland, dune systems, nationally rare ecosystem type).	Important site or habitat for more than 10 or assemblage of indigenous fauna species
4	Ecosystems that are mostly typical and characteristic of those originally present prior to human occupation, but where parts of the ecosystem are not in original condition; or ecosystems that are some of the better remaining examples of its type in the ecological district.	At least 1 ha of indigenous vegetation or habitat on Chronically Threatened (10-20% indigenous cover remaining) land environments.	Regionally rare or uncommon indigenous vegetation or habitat	Nationally At Risk-Declining indigenous plant, lichen, or fungus species present OR regionally uncommon indigenous plant species present.	Nationally At Risk-Declining indigenous animal species regularly present OR regionally uncommon indigenous animal species present.	At least 4 indigenous vegetation/habitat types or landforms covered by indigenous vegetation OR at least 70% of the expected indigenous plant species, OR at least one indigenous fauna group with 70% expected species richness	Extensive or uninterrupted habitat 10-100 ha in size or 3-5 km long, OR buffers 50-70% of the margin of an important or vulnerable ecosystem.	Important site or habitat for 5-9 assemblage of indigenous fauna species
3	Ecosystems that are typical and characteristic examples of the current natural diversity of ecosystem types in the ecological district (but not the best examples remaining).	At least 5 ha of indigenous vegetation or habitat on At Risk (20-30% indigenous cover remaining) land environments.	Rare or uncommon indigenous vegetation or habitat at ecological district scale.	Nationally At Risk-Naturally Uncommon, At Risk--Relict or At Risk-Recovering plant, lichen, or fungus species present, OR indigenous plant, lichen, or fungus species present that is rare at ecological district scale	Nationally At Risk-Naturally Uncommon, At Risk--Relict or At Risk-Recovering indigenous animal species regularly present	At least 3 indigenous vegetation/habitat types or landforms covered by indigenous vegetation OR at least 50-70% of the expected indigenous plant species, OR at least one indigenous fauna group with 50-70% expected species richness.	Habitats of 5-9 ha in size or 1-2 km long OR buffers 20-49% of the margin of an important or vulnerable ecosystem	Important site or habitat for 2-4 assemblage of indigenous fauna species
2	Ecosystems that retain only limited elements that are typical of the natural diversity of an ecological district.	At least 5 ha of indigenous vegetation or habitat on Critically Under protected (>30% protection) land environments.	No rare / uncommon habitat / community recorded.	Data Deficient plant, lichen, or fungus species present and recently recorded.	Data Deficient indigenous animal species regularly present	Only 2 indigenous vegetation/habitat types or landforms covered by indigenous vegetation OR at least 25-50% of the expected indigenous plant species, OR at least one indigenous fauna group with 25-50% expected species richness	Habitats of 1-4 ha in size or 0.1-0.9- km long OR buffers 1-19% of the margin of an important or vulnerable ecosystem	Important site or habitat for 1 assemblage of indigenous fauna species
1	Ecosystems that contain few or no elements that are representative of the natural diversity of an ecological district.	Under protected land environments or No Threat Category.	No rare / uncommon habitat / community recorded.	No nationally or regionally or locally rare or uncommon plant, lichen, or fungus species recorded.	No rare or uncommon animal species regularly present.	Only 1 indigenous vegetation/habitat type or landform covered by indigenous vegetation OR less than 25% of the expected indigenous plant species, OR less than 25% expected species richness for fauna groups.	Small (<1 ha) areas of habitat that do not buffer important or vulnerable ecosystems.	Unimportant site or habitat for assemblage of indigenous fauna species

¹ Threatened Environment Classification. Only potentially relevant if indigenous vegetation or habitats are present.

² For brevity, ecosystems include habitats in this table.

**BOFFA MISKELL
PEER REVIEW**

14 October 2015

Stephen Daysh (CC: Astrid van Meeuwen-Dijkgraaf)
Environment management services
First Floor, Bowman Building, Market Street, PO Box 149,
Napier



4140

By Email: stephen.daysh@emslimited.co.nz

Dear Stephen and Astrid

RE: [NAME OF OFFER OF SERVICE AND CLIENT REFERENCE IF RELEVANT]
Independent Ecological Review

The following letter has been prepared to fulfil your request for an independent review of the documents provided.

INTRODUCTION

Scope

This letter provides an independent review of assessment of the draft report: Ecological Site Significance in Kapiti District - methodology. It focuses specifically on the method for determining significance to be used in identifying significant natural areas (SNA) in the Kapiti Coastal District for inclusion in the KCDC plan. It follows a one day workshop to review and provide input to the method by the authors and a small peer review group. GWRC were represented in that group but in an advisory capacity in terms of the relatively new RPS significance criteria.

This peer review is intended to provide structured feedback on aspects of the method which require interpretation of the RPS criteria and the "internal" workings of the method. It is not an edit of the report. It highlights areas of differing opinion where these persist, provides explanation of the reviewer's opinion and seeks clarification or further justification that may resolve those matters.

Qualifications

My name is Vaughan Francis Keesing. I hold a PhD in Ecology (Massey University 1994). I've been a practicing ecologist since 1995. I have been a consulting ecologist with Boffa Miskell since 1998. I'm a member of the EIANZ.

Throughout my career I have specialised in the assessment of landscape level significance identification (SNA, and PNAP, e.g. Rangitikei PNAP, Ashburton SNA, Northshore PNAP, West Coast Regional Wetlands of Significance) and in the assessment of smaller scale values relating to a wide range of ecological impact assessments. Some of these assessments have been for major infrastructure projects including large subdivisions (Omaha, Pegasus), industrial scale windfarms (Westwind, HMR), hydropower projects (Wairau, Arnolds), irrigation storage (Hurunui water, Ruataniwha) and major roading projects including Transmission Gully and Mackays to Peka Peka. In undertaking this work I have had the opportunity to use and test many Regions and districts significance criteria.

I have appeared at numerous council hearings, Environment Court hearings, and boards of Enquiry. I have been involved in expert conferencing for many of these projects and have been involved in the development of consent conditions for most of these projects, and in their implementation including construction monitoring and carrying out of agreed ecological management and mitigation.

I have been involved in a number of Council and Court processes (ECAN, Auckland Unity plan, Thames District) to review or modify significance criteria (most relevant to this process being the Shearer Swamp vs West Coast Regional Council).

I therefore believe I have a good understanding of the current Kapiti local and national discussions on significance assessment, and specifically how these debates on the use of individual criteria.

Overall, I believe I am suitably qualified to carry out this review.

Approach to Review

Two iterations of a documents (as a draft) have been provided to me as part of this review following a one day workshop discussing the documents approach. That workshop was used by the principal author to reflect and remove initial and obvious areas of question and debate and resolve all “early” ecological opinion issues regarding the method. The initial review I responded with email commentary and no other formal response to assist the author in producing the second “final” draft report. It is this last report which I now provide formal written review.

Other Matters

In addition to the review documents I have considered the draft RPS use guidance document supplied by GWRC as well as other reference material relating to significance criteria, particular my and Dr Lloyds evidence and material relating to the West Coast Regional Councils new set of wetland significance criteria established for the Court and similar evidence for the Auckland Unitary plan.

REVIEW

Introduction

I understand that the information to be tested (site details) has been collected over a number of years since the early 2000's and that information has been added to through the years. The test for significance has changed through that time but not substantially. That same material now has to be re-tested using the method developed in this review material.

A workshop to discuss and pre-empt potential issues with interpretation, and use, of the RPS policy 23 method was conducted and this was a very constructive, informative and useful part of this review.

Previous assessment section

This was a useful, critical, back ground to the collection of the data to be used in the current assessment. A critical question I had at the workshop was the extent and detail of the information gathered at each site. The RPS criteria require a reasonable level of taxa specific information. The principal author assured me the data was sufficiently detailed and consistent between sites and over time. The report outlines the historic extent of information collection, by I assume a variety of field investigators, as well as the array of additional sites added over time.

A key to the method to follow is the reliability and current validity of the site specific data. I have not viewed the data itself, as that is not a component of my brief, but I am assured by the author that the data is sufficient and fit for purpose.

Planning obligations

A small section on planning has been enclosed for which I have no comment

Ecological significance

The report reflects the workshop discussion on significance and the difference between “importance”, or ranking for management priority and “significance” as per the RMA. It rightly records the outcome of the workshop which was that RMA significance is a binary decision – yes or no, where as “ranking” can be on a graduated scale. Both assessments would be included in the final report which in terms of an SNA report is an appropriate set of approach.

Assessment of Significance

The report works its way through the RPS policy 23 criteria.

Representativeness: I agree with the general discussion, the reporting of the workshop conclusions and the proposed method to operate the policy 23 representativeness criteria. This criteria is currently problematic and requires the interpretive approach and additional detail proposed in the report. The approach proposed, to a degree is based on the Courts decision in the West Coast Regional Council vs Friends of Shearer Swamp and other parties case in regard to representativeness and which I agree is appropriate.

One small issue is that the authors state that “*Some of the ecologists noted that the requirements for 30% of extent or 20% of legal protection are pernicious qualifiers*”. Pernicious means “having a very harmful effect” and I question if the criteria’s use of representativeness in the form it has is “very harmful” to the concept of representativeness.

Rarity: I agree by and large with the approach proposed in the report, with two exceptions: where habitat is considered significant on the grounds of fauna without faunal data; and where geological features are considered significant in the absence of biotic data. I note when considering Geological sites and landforms that from the ecological assessment perspective rare geology is not part of the test of ecological significance, unless it contains taxa special to that geology. It is the presence of flora and fauna specific or special to that special (rare) geology that is of moment and to be assessed, not the presence of the geological feature alone.

If “checking” this component (geology) of the criteria for rarity in the report is about the **potential** value for special flora and fauna such a site might provide (either through an absence of survey or into the future under different management) then, in my opinion, it should not receive a “check”. Potential value has no place in an assessment of current

ecological significance. The role of the assessor is to determine the current existing value at the time of the survey, or to conduct a survey to determine the values/condition currently present. Potential value can be part of the discussion in identification of opportunities but, in my opinion, has no place in an objective assessment of ecological significance under the RMA

My discussion on this point is re-emphasised under the “fauna” heading under rarity, below.

In regard to faunal presence the report proposes the following:

“For habitat where species information is lacking or for which a species has not been recorded, to meet the rarity criteria a site must be suitable habitat for a threatened species, and

- *The species has been recorded as occupying that Ecological Site previously; or*
- *The species is known to occur locally (e.g. recorded in eBird or literature) and it is suitable habitat for that species.”*

In my opinion these criteria are too open ended. While I acknowledge that few, if any, SNA surveys have the time and resources to fully assess invertebrate, bird and lizard fauna present, evidence of the presence of a population should be required.

I accept single observations at site survey coupled with professional (suitably qualified) judgement calls by the assessor, is the only compromise to full faunal studies. And as such is a solution to this method which I endorse. I do not consider using over old records or estimations based on wider local presence as good practice when determining significance unless actual evidence of habitat use or the presence of the species in consideration can be brought to bear.

The determination of significance is an important assessment that affects landowners in substantial ways through recognition of the area in a plan, and (in terms of management and protection) where resources might be spent. A historic record coupled with suitable habitat should not typically be sufficient where the record is older than the life span of the species involved. After all most unmanaged ecological areas (especially on private land) are, small and trending down in condition and biodiversity and a historic record is unlikely reliable.

In terms of “Physical Features”, as noted above, I do not consider the use of the geological formation as a sufficient criteria in and of its own, but require there to be the presence of the flora and /or fauna special to that geological feature (e.g. limestone escarpment) to be present. The statement in the report that this sub criterion can be triggered by a “feature which **may** support unusual combinations of indigenous species...” Is not acceptable to me. Survey should determine if those species are actually present before they contribute to the significance determination of the site.

Diversity: I agree with the use and interpretation and record of the workshop out come in terms of diversity.

Ecological Context

I have considerable issue with the use of buffering areas and corridors as being significant areas in the absence of any other value, and in the absence of evidence of use (as a

corridor) or function as a buffer. Too often these criteria are checked without reference to the specifics of the function and, in the case of buffering value to the actual SNA, too often very large areas of otherwise non-significant feature are called significant when the “buffering” function is achieved by the first 20m of the feature adjacent to the actual valued area.

These concerns have been moderated by the proposed method following the West Coast Regional Council vs Friends of Shearer Swamp and other parties’ treatment. Whereby “important” allows emphasis to be placed.

Some consideration, as to defining (a) “*It plays an important role in protecting adjacent ecological values, including adjacent and downstream ecological and hydrological processes, indigenous vegetation, habitats or species populations*” still needs to be articulated to make clear the intention of the extent of a feature to be significant where its only function (“value) is to buffer a better site against wind or weeds (for example) and is a site much larger than required to achieve that function. In those instances the method, I believe, should include the buffer in the “better value” SNA rather than designate another SNA.

Tangata Whenua values: I agree with the approach.

Refinement of the Ecological District Boundaries

I agree with the rationale and approach taken and the resultant outcomes. Boundaries are largely fluid constructs devised for specific purposes, and should be considered as gradients rather than fixed lines, and their application flexible to recognise this.

Review Conclusions

In conclusion I am in agreement with the majority of the proposed interpretations and proposed use of the GWRC RPS policy 23 significance criteria for the KCDC SNA current process.

I however, disagree with the approach proposed where judgement alone is used to include special geological sites without knowledge of the presence of the special associated flora and fauna. I do not accept that “**may have**” is sufficient. In a similar vein I hold reservations about checking the rarity criterion for threatened and at risk fauna based only on presence of suitable habitat where there are no recent records of the use or presence of those taxa.

I suggest a slight modification to the use of the Ecological Context in regard to assigning buffering value, in that consideration should be given to include the buffer area in the primary SNA and to not make large areas of otherwise not significant feature significant because of a small area of buffer value supplied to the primary valued area.

Yours sincerely

Dr Vaughan Keesing
BOFFA MISKELL LTD
14.10.2015

**REPLY TO
BOFFA MISKELL
PEER REVIEW**



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Reply to peer review of report 3525p

ASSESSMENT OF ECOLOGICAL SITE SIGNIFICANCE IN KAPITI DISTRICT - METHODOLOGY

Dear Vaughan Keesing

Thank you for your comprehensive peer review of the methodology report. It is pleasing that you concur with most of the report contents. This short reply sets out our response to the remaining peer review points raised and where in the methodology document changes have been made.

With regards to the following points raised in your peer review:

2.5 Assessment of Significance

Representativeness

You indicate discomfort with the word pernicious as used in the report (5.1.5 - Workshop outcome – Representativeness).

This section merely highlights that there was a difference of opinion between ecologists with regards to the qualifiers of “30% or less of the extent or 20% or less legally protected”.

This is a genuinely held belief by some of the workshop attendees that using, often, relatively broad scale classification systems or predictors of ecosystem types (e.g. Leathwick 2012, Singers 2014) are too simplistic and will not express the full range of ecosystem types in an area. These classification systems group ecosystem and habitat types and can thus lead to under-representation of these particular ecosystem or habitat types. For instance Matai-tōtara-kohekohe forest is a specific forest type on the alluvial flats surrounding the Ōtaki River with very little of the original extent remaining. However, this area of the Ōtaki River is classified as Tōtara, matai, ribbonwood forest (Singers 2014); a forest ecosystem type that covers a much wider area, thus the representativeness of the Matai-tōtara-kohekohe forest type is reduced.

This can potentially result in failing to identify or include ecosystem ‘sub’-types as ecologically significant sites. This could in turn result in these areas not being protected by Regional Plan and District Plan mechanisms, which could result in these systems being harmed.

The paragraph following the section that mentions ‘pernicious’ in the report notes that other ecologists at the workshop were comfortable with the approach of applying these qualifiers. Furthermore, these qualifiers are part of the GWRC Policy 23 criteria and are therefore required to be assessed using the transparent methodology outlined in Table 2 of the report.

Rarity- Physical features

Regional Policy Statement for the Wellington region Policy 23 specifically includes “*physical features that are unusual or rare*”.

We agree with you that some ecologists may lack the expertise to assess physical geological features for significance; hence the recommendation to rely on the New Zealand Geopreservation Inventory which is compiled by qualified geologists (Kenny and Hayward 1996). This inventory lists the exact location of the feature and includes consideration of whether the geological feature is a rare or threatened feature.

We also agree that it is the presence of flora and fauna specific or special to that geology that needs to be assessed by ecologist. This is reflected by the following in the statement in the report:

“Examples could include frost hollows, ephemeral wetlands, limestone, rock and boulder scree which still retain or support indigenous habitat values particular to that physical feature”

Emphasis added to the report on page 13.

Rarity- fauna presence

The significance of a site will be assessed on the information that is available. It is not the intention to assume that any site contains rare fauna unless there is robust information to support this, and site contains good quality habitat that could support a population, either permanently or seasonally. For many sites there is no information on the presence of rare or threatened fauna, and these sites will be ranked as not significant for fauna rarity.

For cryptic fauna (lizards, invertebrates, bats, and fish) older and nearby records may be all that is available. If there is evidence of a mobile rare species from an adjacent (within the foraging range) habitat that comprises the same or very similar ecosystem then it will require professional judgement to determine whether that particular species is likely to utilize that habitat and whether that habitat is important to that species.

One example is an At Risk-Declining fish species recorded from a river immediately adjacent to and connected to the streams within an ecological site; where these streams comprise suitable habitat for that species and have no known fish barriers. It would, in this case, be illogical to assume that this particular fish species would be absent from the ecological site, and that a fauna survey would fail to find this species.

To reinforce the requirement for a high degree of confidence for the presumptive presence of fauna the wording has changed as follows;

Fauna

Use the relevant DOC threat classification system.

In terms of mobile species, if a site includes threatened species that occurs only as vagrants or only as single individuals (not a population) then that site should not be considered **to be significant for rarity. A site has to comprise important habitat for it to be significant.** For ~~instance~~ **example**, kākā (*Nestor meridionalis septentrionalis*, Threatened-Nationally Vulnerable) visiting a grove of walnut trees when walnuts are ripe would not ~~necessarily~~ **make this a significant site, although if they were breeding in the grove then it could potentially be a considered significant habitat for kākā, but only if the walnut trees were part of a larger area of indigenous vegetation.** North Island long-tailed bats (*Chalinolobus tuberculatus*, Threatened-Nationally Vulnerable) are known to use hollows and loose bark of pine **trees** and willows as roosting sites, so if bats occur in such an area, then these non-indigenous tree species may be part of the habitat regularly used by bats, and could therefore potentially be significant. **This would also require further consideration of the wider habitat context.**

For habitat where species information is lacking or for which a species has not been recorded, to meet the rarity criterion a site must **provide be** suitable habitat for a threatened species, and

- The species has been recorded previously as occupying that Ecological Site; or
- The species is known to occur locally (e.g. recorded in eBird or literature) and **the site provides good quality habitat it is suitable habitat for that species.**

This assessment will be a professional judgement ~~call~~ and also depends on an understanding of the habitat utilisation and home range behaviour of the taxon of interest. **The question that must be answered is “Are we confident that this species would be located within this site if the appropriate fauna survey was undertaken?”** If there is any doubt about this, then the site will be ranked as not significant for this particular species.

Some fauna species that are not nationally Threatened or At Risk, are however known to be scarce in the Wellington region. These species and the locations where they are known to be scarce are listed in Appendix 4. ~~Information is derived mainly from available literature and online information sources, but some professional judgement will be required when assessing sites for the presence of these species.~~ Regionally scarce species may also include fauna species at their distribution limit or beyond known limits.

Ecological context

We agree with you and have added the following to p.15 of the report.

GWRC Policy 23 criteria refers to the relationship of a site to “*representative, rare or diverse ecosystems*”, thus it would generally make sense and be appropriate for these buffers or connections to be included with the ‘representative, rare or diverse ecosystem’ site. It would not seem appropriate to identify a site as significant solely on its role as a buffer or corridor. It is in fact difficult to think of an example where this would be the case since the buffer or corridor is required to have a functional role protecting something of ecological value; i.e. protecting ecologically valuable habitat or providing connectivity for significant fauna or between significant habitat for fauna.

Once again, thank you for your contribution to the workshop and the peer review of the methodology report.

Yours sincerely

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