Appendix 12: Significant Natural Areas

- **12-1 Significant Natural Areas of Hamilton City District Terrestrial and Wetland Ecosystems - June 2022**
- **12-2 Hamilton City District Plan Significant Natural Area Review – Issues and Options - May 2022**
- **12-3 HCC City Waters – SNA Technical Memo – June 2022**

Metadata for the "Significant Natural Areas – Hamilton City" Data set is available through Council website:
Plan Change 9 - Historic Heritage and Natural Environment - Hamilton City Council

Hamilton City Council
Te kaunihera o Kirikiriroa

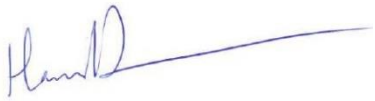
Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems

For Hamilton City Council

June 2022

REPORT INFORMATION AND QUALITY CONTROL

Prepared for:	Jamie Sirl Team Leader City Planning | City Growth Hamilton City Council

Author:	Wiea Montemezzani Ecology Consultant	
Reviewers:	Hamish Dean Principal Ecologist	
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1 EXECUTIVE SUMMARY

On behalf of Hamilton City Council, 4Sight Consulting has undertaken an assessment of Significant Natural Areas (SNA) within Hamilton City (Kirikiriroa). This report provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context.

The SNA database will assist Hamilton City Council (HCC) in their development of policies, incentives, and rules in relation to their obligations under the Resource Management Act (1991), primarily under section 6c, to protect significant habitats of indigenous fauna and flora.

The primary objective of this project was to review and update the existing Key Ecological Sites of Hamilton City (Cornes et al. 2012) and identify new areas that are considered significant under the Waikato Regional Policy Statement (WRPS) Chapter 11A – Table 11-1 (WRC 2016) criteria for determining significance for indigenous biodiversity with respect to section 6(c) of the Resource Management Act 1991 (RMA).

As part of this SNA project, two sets of spatial data were created:

- '**Floristic SNA**' (fSNA): *Distinct areas of wetland or terrestrial vegetation communities dominated by naturally occurring indigenous plant communities or where naturally occurring indigenous vegetation define the primary aspects of the natural area which makes it significant in terms of Section 6c of the RMA (for example, the area meets criteria 4, 5, 6 or 10).*
- '**Corridor/indigenous fauna habitat SNA**' (cSNA): *Areas that are able to be delineated by topographical or vegetation features (such as a gully systems, which can be dominated by exotic vegetation or restoration planting), which:*
    - *Provides significant fauna habitats (including stepping stone or corridor habitats), including regularly used habitats by nationally At Risk or Threatened indigenous fauna species (for example, the area meets criterion 3); or*
    - *Provides ecological buffering to a regionally or nationally important SNA, (for example, the area meets criteria 7, 8, 9,11).*

The first part of the SNA site identification and significance assessments was carried out through a 'desktop' exercise, during which no fieldwork or ground-truthing was undertaken. The assessments were conducted using high resolution orthorectified aerial imagery, oblique imagery (provided by LINZ), and by reviewing the original SNA dataset (Cornes et al. 2012), existing spatial databases available in GIS software, existing ecological information available from reports, and local knowledge of 4Sight ecologists and the external reviewers Professor Bruce Clarkson and Gerry Kessels.

Part two of this project included an extensive consultation period during which feedback was sought from affected landowners, and other stakeholders including Waikato Regional Council and Department of Conservation. Iwi consultation was undertaken by HCC staff and not included in this report.

The Peacocke Structure Plan (PSP) area was not in the scope of this assessment and potential SNA within this area were not assessed as part of this work. Spatial data of this area was used to delineate the area, merely as an indication as to where the SNA in this area are located (Kessels & Baber 2021). The ecological significance of this area has been assessed as part of the Peacock plan change (PC5) by Kessels & Baber (2021).

The cSNA spatial dataset was created, basing the polygons in the first instance on the Biodiversity Inventory spatial dataset (WRC 2021). The Biodiversity Inventory dataset was mapped at a 1:1,500 scale and provides a detailed review of both exotic and indigenous vegetation types, classifying these based on the Singers and Rogers (2014) classification. Following landowner feedback responses, further changes were made to refine the linework of cSNA where we had inadvertently captured man-made structures, orchards, ornamental gardens, and other features considered not part of the proposed cSNA features. From a total of 384 feedback responses, a total of 39 landowners were visited and all remaining ones were reviewed in GIS and updated where needed.

The fSNA spatial dataset was taken from the SNA spatial dataset as created by Cornes et al. (2012) and no spatial changes were made during the first part of this project. A review of the linework was undertaken in the second part of this project. An initial review of the linework was undertaken based on recent aerial imagery, and further changes were made following site visits of fSNA on private land. A total of 13 sites were visited on private land and where possible, fSNA were assessed from adjoining public land. Following a review of fSNA on private land few fSNA were

removed from the dataset as they were considered not currently significant under the fSNA framework. These sites remain significant under the cSNA framework. Eight fSNA on public land were visited and ground-truthed in May 2022 and minor changes were made to the extent of a few sites.

Each potential SNA was assessed against the 11 WRPS significance criteria to determine if the site was significant or not. Each site was assessed as either 'Significant', 'Not Significant', or 'Indeterminate'. The assessment of each criterion followed Table 1 of the assessment guidelines (WRC & Wildland Consultants, 2019 – in prep.).

If a site was found to tick at least one significance criterion (following Tables 1-3 of the Framework guidelines), it was further assessed to determine a level of significance, i.e., 'International', 'National', 'Regional', or 'Local', in a Waikato Region context following Table 2.1 of the guidelines (WRC & Wildland Consultants, 2019 – in prep.).

Each SNA was also assigned a 'level of confidence', dependant on how much information was available and the level of detail that could be provided.

An assessment of nationally threatened environments within Hamilton City was undertaken, using the Threatened Environment Classification developed by Manaaki Whenua - Landcare Research. 99.9% of land environments within Hamilton City were referred to as 'Threatened', while 0.1% were considered 'Not Threatened'.

A review of available databases was undertaken to assess the presence of 'Threatened' and 'At Risk' flora and fauna species. A total of 34 Threatened, At Risk, Regionally Uncommon, Extinct, or Data deficient taxa (16 flora species and 18 fauna species) have been recorded within Hamilton City SNA. While the threat classification of species is important to determine the level of significance of a site, care was taken to not over- or under rank a site. Highly mobile species such as NZ kākā and NZ falcon that visit a site occasionally may not be considered sufficient to trigger WRPS criterion 3 and hence to assign an area as ecologically significant. Long-tailed bats on the other hand have been recorded throughout Hamilton City but may not use all areas regularly. Professional judgement by a suitably qualified ecologist was used to determine the threshold for habitat usage on a case-by-case basis.

A total of 70 potential cSNA were identified, of which 52 sites were assessed as 'Significant'. These 52 sites equate to approximately 6.1% of Hamilton City's area. This area includes the Waikato River and waterbodies of the City's peat lakes.

63.5% of the significant sites were assessed as 'Nationally' or 'Regionally' significant, primarily as a result of 'Threatened - Nationally Critical' bat species utilising the site. The level of significance was often dependant on whether bats are known to utilise the area on a regular basis or sporadically.

57% of the potential cSNA were assessed with a high level of confidence, 33% with medium confidence, and 10% with low confidence.

The fSNA dataset followed the original SNA dataset prepared in 2010 by Cornes et al. (2012). All fSNA sit within or overlap with the 'newly' created cSNA in their entirety. A complete overlap of fSNA and cSNA is most common where a site comprises a standalone forest remnant (i.e., Te Papanui – Claudelands Bush).

A total of 65 fSNA were assessed as significant, comprising an area of 121.86 ha of high-quality vegetation situated within or overlapping with the cSNA layer. Of the significant fSNA, 60% (16 sites totalling 72.53 ha) were assessed as 'Nationally' significant, 16% as 'Regionally' significant (17 sites accounting for 19.74 ha), and 24% as 'Locally' significant (32 sites totalling 29.49 ha).

A high level of confidence was assigned to 14 'Nationally', 10 'Regionally', and 9 'Locally' significant fSNA, and a medium level of confidence was assigned to 2 'Nationally', 7 'Regionally' and 23 'Locally' significant sites.

Recommendations were made following the first stage desktop assessments on:

- Ground-truthing approach (which have been largely completed at the writing of this second draft of the report);
- Opportunities for protection, restoration, and recreation; and
- Ongoing monitoring.

While the majority of ground-truthing has been undertaken as part of this second draft of the report, it is expected that additional sites on private land will require to be ground-truthed prior to notification of the District Plan. Additionally, fSNA on public land are yet to be visited and any updates on those need to be reflected in the spatial dataset and associated Master dataset.

Ground-truthing site visits of cSNA and fSNA are an important part of the SNA assessment process, as it provides a chance to verify the vegetation and other ecological features on site. These visits are following a rapid assessment methodology and collect information on floristic characteristics, sign of pest animals and plants and potential boundary/linework issues.

The identification, protection and enhancement of SNA within Hamilton are important both to fulfil the City's obligations under the RMA and RPS and because these ecologically significant areas are important in their own right. They contribute to ecosystem functions, natural local heritage and the liveability of the city. They enhance indigenous biodiversity and provide services such as enhancement of amenity features and form part of the stormwater system. Full indigenous vegetation improves stream and riverbank stability and improves water quality. The work done to increase the quality and quantity of key sites across the city has already had positive results. Future work will reinforce those gains and contribute a healthy, sustainable environment for generations to come.

Ecological management aspects identified during this project that will require consideration at the policy and regulatory level for HCC in the preparation of the District Plan change are:

- A wide range and diverse set of potential SNA dispersed throughout Hamilton City were identified, including many gully habitats that in the past would all have been linked and interconnected. Through urban development many of these gully systems are now reduced and some connectivity between natural areas lost. Reconnecting these habitats through revegetation and restoration efforts would benefit these areas and protect the functional values for indigenous flora and fauna.
- Planning mechanisms need to acknowledge and account for incomplete scientific knowledge and incorporation of new information which may affect the ecological significance analysis presented in this report.

Essential components of the on-going protection and ecological restoration of biodiversity values of SNA require enhancing indigenous populations of species through ongoing weed and animal pest management, stock exclusion, and carrying out enhancement planting. By applying these restoration objectives over a wide area, in particular when involving wetland and riparian margins, ongoing biodiversity management will enhance and restore ecological processes at a landscape scale.

Ten years have passed since the previous SNA assessment was undertaken by Cornes et al. (2012), during which key sites were identified, focusing on indigenous flora sites (now fSNA). It was recommended in that report that rapid reconnaissance checks of fSNA were to be undertaken on a 5-yearly basis to monitor changes in vegetation structure, species richness, and management effects. It is recommended that this monitoring schedule be adopted.

2 INTRODUCTION

On behalf of Hamilton City Council, 4Sight Consulting has undertaken an assessment of significant natural areas (SNA) within Hamilton City (Kirikiriroa). This report provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context.

The SNA database will assist Hamilton City Council (HCC) in their development of policies, incentives, and rules in relation to their obligations under the Resource Management Act (1991), primarily under section 6c, to protect significant habitats of indigenous fauna and flora.

Based on the findings, recommendations were made on methods to maintain and protect existing SNA and indigenous biodiversity. Those recommendations were given to HCC, who are currently in the process of a District Plan review process, in which they will take this assessment into consideration.

The data resulting from this project will be held and maintained in an SNA database by HCC. It is important to recognise that the inventory produced for this study is an indicative and provisional data set of SNA in Hamilton City and it is expected to be updated periodically as new information becomes available. In particular, feedback from iwi, Department of Conservation (DOC), Manaaki Whenua – Landcare Research, other key stakeholders, and data obtained from consenting assessments will provide valuable information which will be used to validate the data.

Indigenous terrestrial and freshwater wetland natural areas were assessed as part of this inventory. Lake, and riverine ecosystems were also included in this assessment, as they form an intrinsic part of the ecosystems within the landscape.

3 OBJECTIVES

The primary objective of this project was to review and update the existing Key Ecological Sites of Hamilton City (Cornes et al. 2012) and identify new areas that are considered significant under the Waikato Regional Policy Statement (WRPS) Chapter 11A – Table 11-1 (WRC 2016) criteria for determining significance for indigenous biodiversity[1] (Appendix A:).

As part of this SNA project, two sets of spatial data were created:

- '**Floristic SNA**' (fSNA), focusing on high-quality floristic content of the site. These sites are based on those key sites identified by Cornes et al. (2012).
- **'Corridor/indigenous fauna habitat SNA**' (cSNA), SNA assessed for their full indigenous biodiversity characteristics, including their function as habitat for highly mobile or migratory fauna and their connectivity function in the wider landscape.

The methodology for the desktop review process (the first part of this project) consisted of five stages: development of the methodology, a literature review, GIS mapping and analysis, an assessment of the significance of sites, and quality control and review by 4Sight ecologists, and two external reviewers (Prof Bruce Clarkson and Gerry Kessels).

The second part of this project included an extensive consultation process during which Waikato Regional Council, Department of Conservation, private landowners, and other stakeholders were consulted. During the consultation process, information was collected on the accuracy of the draft proposed SNA linework, presence of indigenous species, and potential threats and issues existing within proposed SNA.

The key outputs of this project are this report and a spatial dataset with associated excel spreadsheet (Master Dataset) of all sites assessed, which include the following attributes:

- Spatial information, protection status of each site;
- Description of key vegetation, ecosystem, and habitat types. As well as significant flora and fauna species; and
- Assessment of the 11 WRPS criteria, level of significance, threats and opportunities for management (a complete list of attributes is provided in Appendix G: of this report).

[1] The RPS criteria were developed to determine significance under Section 6(c) of the Resource management Act 1991.

4 METHODOLOGY

4.1 Introduction

The SNA site identification and significance assessments were carried out through a 'desktop' exercise, during which no fieldwork or ground-truthing was undertaken. The assessments were conducted using high resolution orthorectified aerial imagery, oblique imagery (provided by LINZ), reviewing the original SNA dataset (Cornes et al. 2012), recent vegetation inventory mapping undertaken by WRC, existing spatial databases available in GIS software, literature review, and existing in-house knowledge of Hamilton City's biodiversity. During the entire project, valuable input was provided on the methodology, deliverables, and individual potential SNA sites by external reviewers Prof Bruce Clarkson (University of Waikato) and Gerry Kessels (Bluewattle Ecology Ltd.).

The original SNA dataset dating back to 2010 comprised 75 sites, covering an area of 163.8 hectares, which equated to approximately 1.5% of Hamilton City (Cornes et al. 2012). All sites identified and ranked by Cornes et al. (2012) were ground-truthed. However, the dataset was assessed using an older version of the WRPS significance determination criteria and focused mainly on floristic characteristics of the site. As these sites provide a relatively high level of detail on the floristic content of the site, they have been kept separate from the newly identified SNA. The SNA sites identified in 2010 and reassessed through this project are hereafter referred to as '**floristic SNA**' (fSNA).

> ***fSNA**: Distinct areas of wetland or terrestrial vegetation communities dominated by naturally occurring indigenous plant communities or where naturally occurring indigenous vegetation define the primary aspects of the natural area which makes it significant in terms of Section 6c of the RMA (for example, the area meets criteria 4, 5, 6 or 10).*

Where this fSNA dataset mainly focused on indigenous flora values, the current approach focuses on the fuller extent of biodiversity values of an area, including habitats of both indigenous fauna and flora using the WRPS criteria to determine ecological significance with respect to section 6(c) of the RMA (Appendix A:).

New potential SNA were identified, and their ecological significance was assessed using the WRPS criteria. New sites were identified using the geospatial linework of the recently completed Biodiversity Inventory (WRC 2021) as a reference point. This desktop dataset maps and categorises both exotic and indigenous vegetation throughout Hamilton City over recent aerial photography. These new (2021) potential SNA were assessed for their full indigenous biodiversity characteristics, including their function as habitat for highly mobile and migratory fauna and their connectivity function in the wider landscape. Hereafter, these SNA are referred to as '**corridor/indigenous fauna habitat SNA**' (cSNA).

> ***cSNA**: Areas that are able to be delineated by topographical or vegetation features (such as a gully systems, which can be dominated by exotic vegetation or restoration planting), which:*
>
> - *Provide significant fauna habitats (including stepping stone or corridor habitats), including habitats regularly used by nationally At Risk or Threatened indigenous fauna species (for example, the area meets criterion 3); or*
> - *Provide ecological buffering to a regionally or nationally important SNA, (for example, the area meets criteria 7, 8, 9,11).*

~~A~~ total of 70 potential cSNA were identified.

A number of cSNA overlap in their entirety with fSNA as they were identified in 2010 (for example Te Papanui – Claudelands Bush). Where cSNA completely overlapped with fSNA the potential cSNA were removed in favour of the fSNA. Other fSNA sit within a larger cSNA such as an extensive gully system. These fSNA sites have been assessed individually and highlight pockets of high-quality indigenous vegetation.

4.2 Literature review

A thorough review of available existing information was undertaken to determine the ecological characteristics of Hamilton City. All key documents, spatial and online databases were reviewed. This included researching both electronic and paper sources together with the personal observations of project staff and employees of other ecological organisations. Furthermore, information was gathered from DOC and Manaaki Whenua – Landcare

Research and included. A list of primary sources of information used for the literature review is provided in Appendix C.

4.3 GIS mapping and analysis

The original SNA dataset (Cornes et al. 2012) together with the Biodiversity Inventory spatial dataset (provided by WRC in September 2021) provided the basis for two SNA datasets: fSNA and cSNA.

The fSNA spatial dataset was taken from the SNA spatial dataset as created by Cornes et al. (2012) and a review of the linework was undertaken as part of part two of this project.

The cSNA spatial dataset was created, basing the polygons in the first instance on the Biodiversity Inventory spatial dataset (WRC 2021). The Biodiversity Inventory dataset was mapped at a 1:1,500 scale and provides a detailed review of both exotic and indigenous vegetation types, classifying these based on the Singers and Rogers (2014) classification. Attributes include indigenous and exotic vegetation communities, wetlands (known or species associated), references to associated reports or datasets, associated aerial oblique photography used to identify ecosystem type (in accordance with Singers and Rogers 2014, plus WRC specific additions – including exotic community types), and provide comments on the structure of vegetation as well as extent of observable invasive plants from the oblique photography. Orthorectified[2] high resolution aerial imagery and oblique imagery (LINZ) were used as primary tools to determine the vegetation types present within each polygon.

To the best of our ability, using the most recent aerial imagery available for Hamilton City (dated 2021), the boundaries of cSNA polygons were drawn through the centre of the canopy of individual trees so that the tree is included but whatever they are overhanging (for example gardens and lawns) is excluded from the SNA. For example, where large trees exist next to a road or dwelling, the canopy will overlap the man-made structures, but the road or dwelling under this canopy are not considered significant and should not be captured by this assessment. An example is provided in Appendix H. Footpaths and small structures underneath the canopy of mature trees may still have been captured, but it is considered that this will not have an impact on the significance or function of the proposed SNA.

Additional datasets were overlayed to provide ecological context and a basis for individual site assessments. Key datasets used to delineate potential SNA included:

- Original SNA dataset (Cornes et al. 2012)
- Biodiversity Inventory (WRC 2021)
- HCC alluvial sites
- HCC gully sites
- HCC riverbank islands
- HCC SNA peat lakes
- HCC District Plan Waikato Riverbank and Gully Hazard Area

Spatial datasets used to assist in individual assessment of sites included:

- Protection
  - HCC reserves
  - QEII National Trust Open Space covenants
  - DOC administered protected land
- Flora and fauna
  - Bat database (DOC 2021a)
  - Herpetofauna database (DOC 2020)
  - New Zealand Freshwater Fish Database (NZFFDB) (NIWA 2021)

[2] Orthorectification is the process of removing the effects of image perspective (tilt) and relief (terrain) effects for the purpose of creating a planimetrically correct image.

- eBird (2021)
- iNaturalist (2021)
- Bioweb bird and plant observations (DOC 2021b)
- 5MBC data (Manaaki Whenua – Landcare Research 2019)

An Excel spreadsheet was prepared and completed, collating site description and significance assessment information. Information for each potential SNA on potential threats and management opportunities were also included.

4.4 Design scale and minimum mapping unit (MMU)

The minimum design scale of the SNA database was 1:1,500, and where high-resolution imagery was available, more accurate mapping was undertaken.

For the purposes of this project the MMU was 0.05 ha per individual polygon, rounded to the nearest 0.01 ha. Areas of indigenous vegetation smaller than 0.05 ha were not mapped or assessed unless such areas were determined to have a significance level of at least 'Regional' (Section 0.1).

4.5 Grouping polygons

An objective approach was applied for grouping polygons. Considerations for grouping polygons included:

- each of the individual (or isolated) polygons to be grouped should be 0.05 ha in area or greater, unless there is a clear and justifiable reason for including an individual polygon that was less than 0.05 ha (see MMU description in section 4.4 above);
- the grouped polygons should have a clear biogeographical and/or ecological relationship, e.g. the polygons to be grouped could all be in the same valley or watershed, or all be closely associated with a reserve or other protected SNA of the same primary ecosystem type;
- the grouped polygons should not be very different in size or shape, unless they are within a reasonable distance of each other (e.g. less than 1 km);
- the grouped polygons should not have a different individual significance level (e.g. one of the polygons has a record for a threatened species but the others do not).

4.6 Significance assessment and level of significance

The assessment of the significance of sites was undertaken, with relevant attributes completed in the Master Dataset spreadsheet. The site assessment also included a review of the polygon boundaries and linework, and changes were made where appropriate.

Analysis of the indigenous vegetation and fauna characteristics of Hamilton City was undertaken with respect to the relevant provisions of the RMA and, in particular, the ecological significance assessment criteria of the WRPS (Appendix A:).

The framework for the significance assessment was based on quantitative and qualitative parameters, described below.

4.6.1 Descriptive attributes

Attribute data for each potential SNA were presented in the form of an excel spreadsheet (Master Dataset), collating site description and significance assessment information for the two sets of SNA.

A number of descriptive fields providing background information relevant to each site include: a site name, a brief site description, the broad ecosystem type, and details of any significant flora/fauna species recorded from the site or considered likely to be present.

4.6.2 Significance assessments

Each potential SNA was assessed against the 11 WRPS significance criteria (Appendix A:) to determine if the site was significant or not. Each site was assessed as either:

- 'Significant', at least one of the 11 WRPS significance assessment criteria (Table 11-1 – WRPS) was met;
- 'Likely' to be significant where the information available indicates the site has a high likelihood of meeting one or more of the 11 criteria, but needs further verification with more information, such as from ground-truthing;
- 'Not significant' where, based on the information available, it is certain that the site did not meet any of the 11 criteria; or
- 'Indeterminate' where there was insufficient information to determine if the site meets any of the 11 criteria, or be classified in the 'Likely' or 'Not significant' categories. More information is needed for these sites, such as ground-truthing.

The assessment of each criterion followed Table 1 of the criteria assessment guidelines (WRC & Wildland Consultants, 2019 – in prep.) (Appendix B:). Extra attention was given to criterion 3 for threatened and/or endemic species (see below).

Relevant species for assessment of criterion 3 are those that are 'Threatened' or 'At Risk' within the New Zealand Threat Classification System (Townsend et al. 2008) or those that are regionally rare in the Waikato (Overdyck 2020). Within this assessment, determination of the significance of a habitat for 'Threatened' or 'At Risk' species was dependent on ecological context (i.e. all else being equal, similar habitat types may differ markedly in their significance for 'Threatened' or 'At-Risk' species based on matters such as use throughout the seasons, surrounding landuse dynamics and ecological connectivity). As part of the ecological significance assessment process, records of threatened indigenous fauna species were reviewed. However, many species, such as NZ kākā and NZ falcon are only occasional users of parts of Hamilton City as part of their vast home ranges. Records of occasional presence of such species may therefore not be considered sufficient to trigger WRPS criterion 3 and hence to assign an area as ecologically significant. Professional judgement by a suitably qualified ecologist was used to determine the threshold for habitat usage on a site-by-site basis.

Other fauna species, such as the long-tailed bat, regularly use or are dependent on river, park, and gully habitats within Hamilton City throughout the year. Professional knowledge of bat habitat utilisation throughout Hamilton City was used to determine which areas or habitats were significant and which were not. This knowledge was backed up by scientific studies (particularly the annual city-wide bat monitoring reports, which report on bat presence throughout the city (Mueller et al. 2017; van der Zwan 2018; van der Zwan & Mueller 2019; Dumbleton & Montemezzani 2020).

Some indigenous plant species which are common in the wider landscape or ecological region/district are currently listed as nationally 'Threatened' or 'At Risk' due to the threat posed by myrtle rust, which can infect species in the Myrtaceae family. Where these species were recorded, their presence alone wouldn't necessarily trigger criterion 3 in this assessment. However, given the rarity of kānuka forest (and in fact any indigenous forest remnant) in the Hamilton ED, kānuka forest will likely trigger criterion 4 because it is considered significant as an under-represented vegetation community type (rather than because of its 'At-Risk' status due to myrtle rust).

4.6.2.1 Determination of Relative Significance

If a site is found to tick at least one significance criterion (following Tables 1-3 of the Framework guidelines in Appendix B:), it was further assessed to determine a level of significance, i.e. 'International', 'National', 'Regional', or 'Local', in a Waikato Region context following Table 2.1 of the guidelines (Framework guidelines in Appendix B:) (WRC & Wildland Consultants, 2019 – in prep.). Figure 1 below outlines this process.

Each SNA was also assigned a 'level of confidence' (Appendix E:), dependant on how much information was available and the level of detail that could be provided.

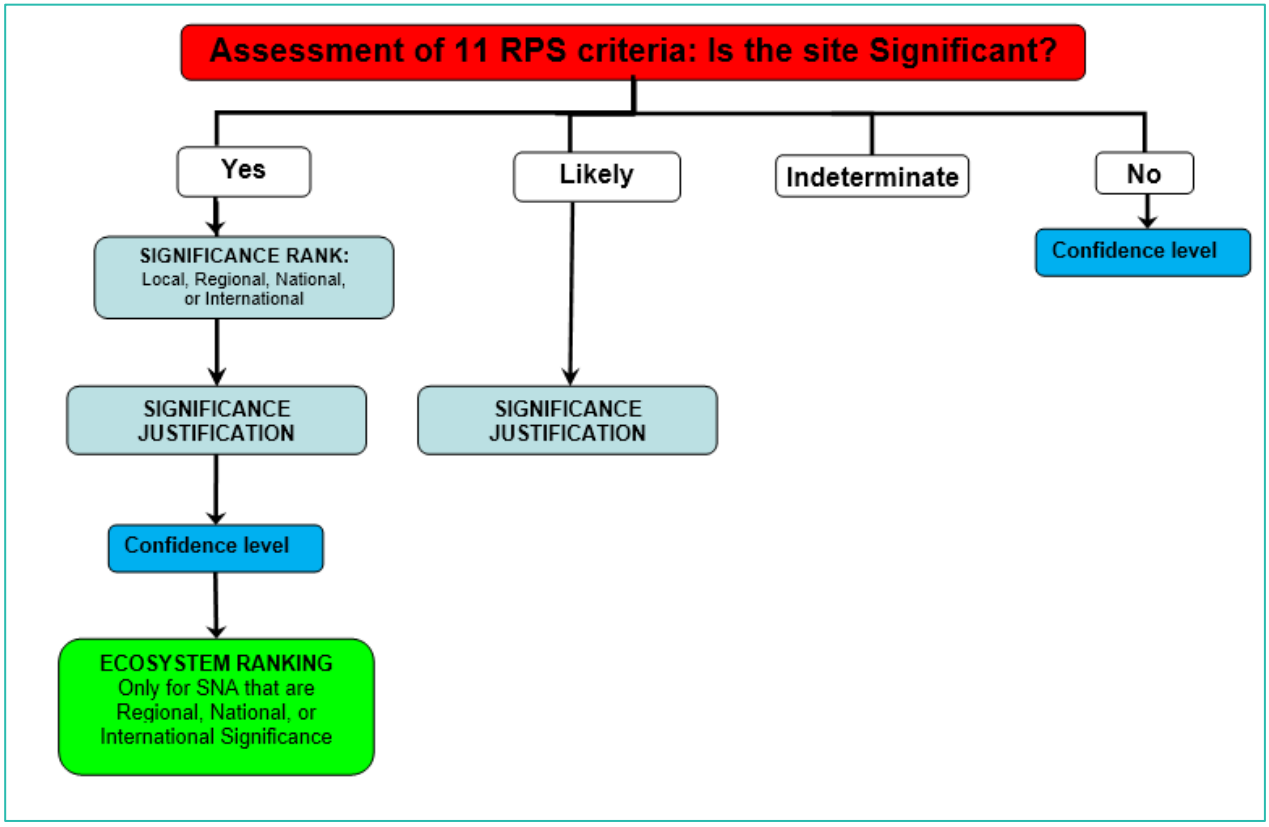


Figure 1. Significance assessment process

4.7 Consultation process

4.7.1 Landowners

During Part 2 of this project, HCC sent letters to all affected landowners notifying them of the proposed SNA that had been identified on their property. Over 1700 letters were sent, and a total of 384 electronic feedback forms were returned. Information from these responses was sent through and collated in a spreadsheet.

Feedback was provided on the accuracy of the proposed SNA and included information on where the proposed SNA captured man-made structures, orchards, and ornamental gardens, species present (both pest species and indigenous species), and other issues including dumping of rubbish, erosion, and flooding.

Any relevant information provided on flora and fauna (Threatened and At Risk indigenous species and pest species) and 'issues' such as erosion, rubbish dumping and flooding were captured in the Master Dataset and then linked to the spatial dataset. A total of 188 additions were made to the Master Dataset.

Where comments were made on the inaccuracy of the linework of the proposed SNA (cSNA), an initial review of aerial imagery was undertaken and where possible, the linework was amended based on the desktop review. Where not enough information was provided to make an informed decision on any potential linework changes, a ground truthing site visit was undertaken.

4.7.2 Other stakeholders

Waikato Regional Council and Department of Conservation have reviewed V1.0 of this report and provided valuable inputs to inform this version (V2.0) of the report.

Iwi consultation was not undertaken by 4Sight, but has been done by HCC staff, therefore no comments relating to this are included in this report.

4.7.3 Ground truthing site assessments

4.7.3.1 cSNA

Where comprehensive feedback was provided, a review of aerial imagery was undertaken, zooming in closer to the affected property. Where possible and warranted, changes were made in the spatial dataset directly. Where this was not possible, and permission for a site visit was granted, landowners were contacted, and a site visit was undertaken. A total of 39 properties were visited.

Where no detail was provided on the proposed SNA, a review of the property was undertaken using GIS, but due to time constraints, these landowners were not contacted.

Examples of how feedback from landowners was used to update the spatial dataset are included in Appendix H. These included:

- Exclusion of an orchard;
- Exclusion of a driveway hidden under dense canopy;
- Exclusion of a corner of a deck and ornamental garden;
- Exclusion of a grassed verge along a driveway; and
- Exclusion of a corner of flat land where canopy cover extended past the actual gully landform.

4.7.3.2 fSNA

All fSNA sites located on private land, and where access was granted, were ground-truthed and linework updated, although not every individual property was visited. A total of 13 site visits were undertaken to assess the accuracy of fSNA on private land. Following review on site, linework was further updated and refined to represent the 'true' extent of the fSNA where needed. Some fSNA were considered no longer significant based on flora values alone and were removed from the current dataset (dated 22 May 2022). Where fSNA were removed from the dataset, these areas will remain significant under the cSNA framework.

Eight fSNA on public land were visited and ground-truthed in May 2022 and minor changes were made to the extent of a few sites.

5 ECOLOGICAL CHARACTERISTICS OF KIRIKIRIROA (HAMILTON CITY)

5.1 General Overview

Hamilton City is New Zealand's largest inland city (c. 11,000 hectares), with a population of about 160,000 people. A major landscape feature of the city is the Waikato River, NZ's longest river that bisects the city area for a length of 16 km. The city has more than 1,000 hectares of open space, spread over 145 parks (Hamilton City Council 2021) (Figure 2).

The Mangakotukutuku and Mangaonua gullies situated along the southern urban-rural interface of Hamilton City are the largest of the four gullies and, together with the Waikato River, form the single largest and most continuous ecotone in Hamilton. Conversely, the Kirikiriroa and Waitawhiriwhiri gullies are situated within the urban matrix in highly developed areas in the northern part of the city.

5.2 Bioclimatic zones, Ecological District, Land Environments

Hamilton is located within the Waikato basin within the Hamilton Ecological District (ED). The Hamilton ED has been classified as lowland bioclimatic zone. Due to the sheltered inland location of the Waikato basin seasons consist of mild winters, warm, humid summers, and frequent fog.

The climate in Hamilton is characterised by light winds (averaging 11 km/hr per annum); rainfall averaging 1072 millimetres per annum (~90 mm/month) with an average of 169 rain days (<0.1mm) per annum; annual mean temperature is ~15°C (ranging averages between 6.1°C and 23.1°C throughout the year) with frosts common in the month of July. Sunshine hours average ~1950 hours in Hamilton (Chappell 2013).

Land environments that are threatened within Hamilton City were mapped using the Threatened Environment Classification developed by Landcare Research. The threat classification for the remaining indigenous biodiversity in New Zealand's environments is based on three components: how much indigenous cover remains within land environments, how much land is legally protected, and how past loss of indigenous cover and natural heritage protection are distributed across New Zealand's landscape (Walker et al. 2015)[3]. From a national level, Manaaki Whenua - Landcare Research have mapped New Zealand's most rare and threatened ecosystems. This national level information provides part of the biodiversity picture that is needed to inform resource management decisions at the regional and local level (MfE 2015).

Within Hamilton City, 99.9% of land environments are referred to as 'Threatened Environments', with the majority (84.7%) identified as 'Less than 10% of indigenous cover remaining with no legal protection'. A very small portion (0.1%) of Hamilton City has been categorised as 'Over 30% indigenous cover remaining and more than 20% has legal protection' (Table 1). This comprises predominantly an area in the south-west of the city (Figure 3).

Table 1. Summary of total land area for Threatened Environment Categories within Hamilton City

Category	Threat Classification Category	Area (ha)	%
1	< 10% indigenous cover left	9,204	84.7%
2	10-20% indigenous cover left	1,631	15.0%
6	> 30% left and > 20% protected	9	0.1%
	Total	**10,867**	**100%**

[3] The Threatened Environment Classification 2012 combines Land Environments of New Zealand (LENZ; Leathwick et al., 2002), the land cover classes of the fourth Land Cover Database (LCDBv4.0) and the protected areas network, identifying legally protected areas for the purpose of natural heritage protection.

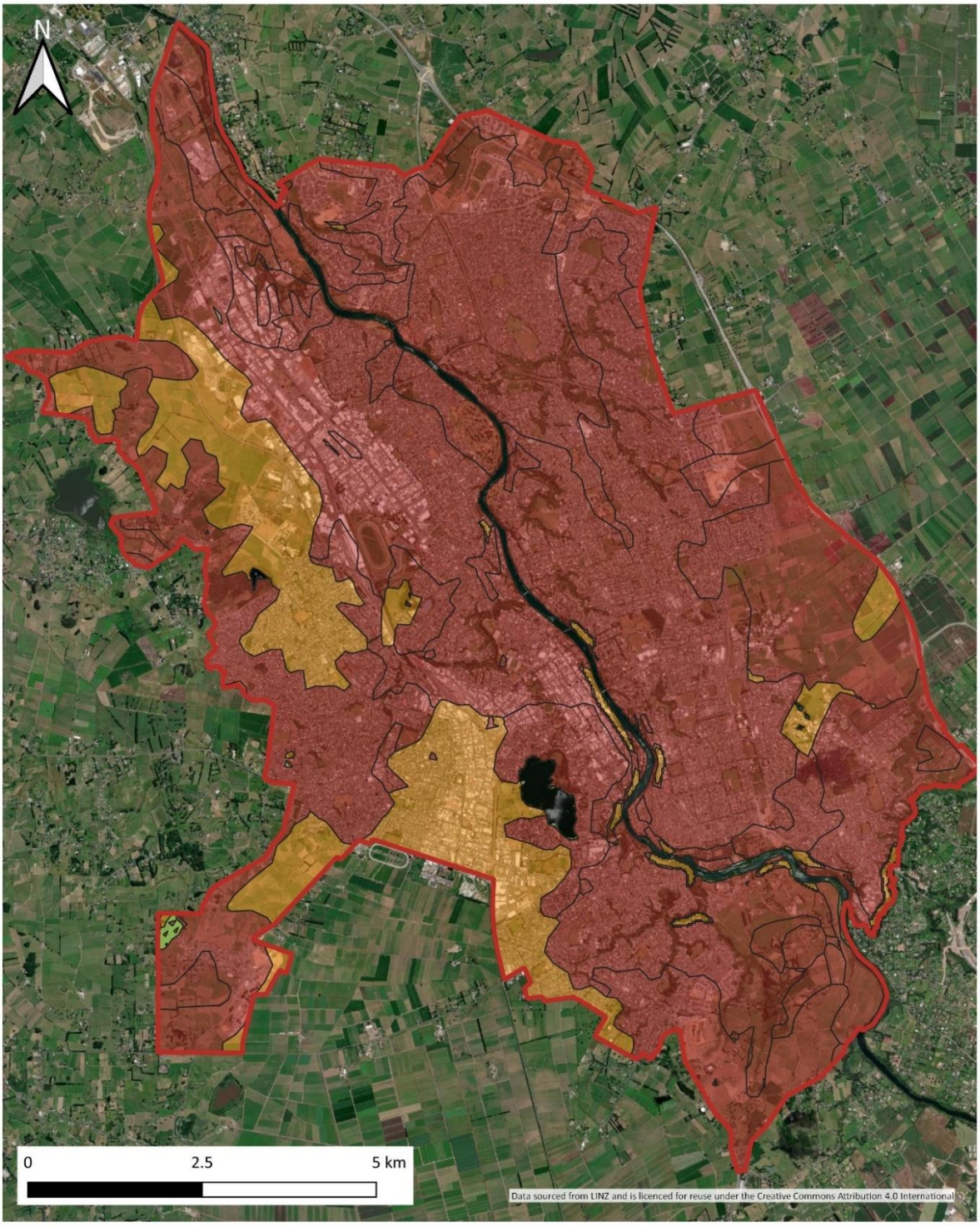
Hamilton City

Legend

Hamilton City Boundaries

Client: Hamilton City Council
Project Code: 10252
Date: 15/12/2021
Version: 1.1
Author: MK
Approved: WM

Figure 2. Hamilton City



Threatened Environment Classification within Hamilton City

Legend

Threatened Environment Classification
- < 10% indigenous cover left
- 10-20% indigenous cover left
- > 30 % left and > 20% protected

Hamilton City Boundaries

Client: Hamilton City Council
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Figure 3. Threatened Environment Classification over Hamilton City

5.3 Landform, geology, and soils

Hamilton City is comprised of four main landform units: gullies, hills, alluvial plains, and peatlands. In the past most of these areas were dominated by indigenous forest.

The Hamilton Basin, within which Hamilton City is situated, is a major inland basin comprising alluvial plains with extensive Holocene peatlands and minor lakes. Quaternary sedimentary rocks include pumiceous sand, silt, and gravel with interbedded peat. Old alluviums, part of the Hinuera surface soils were carried down by ancestral Waikato River from the central volcanic plateau (McEwen 1987).

The bedrock of the Hamilton basin is comprised of greywacke basement rock that was eroded to a plain about 100 million years ago (mya). Peat swamps began to form as the surface warped and created depressions about 50 mya. By 30 mya the area that is now the Hamilton basin was submerged under the advancing sea, depositing sandstones and limestones on the seafloor. Differential uplift created the basins and uplands that now form the Waikato Region. Volcanic activity distributed ignimbrite and volcanic material across the Hamilton Basin, which was then shaped by the action of the Waikato River and its associated streams to create the hilly landscape that characterises the current Hamilton Basin (McCraw *in* Clarkson et al. 2002) (Figure 4).

5.3.1 Low rolling hills

Low rolling hills and the foothills of ranges at the edge of Hamilton represent the remnants of a landscape dating back around more than a million years. The hilly morphology pre-dates c. 340 ka[4] (Lowe 2021). On the foot slopes of the low rolling hills the parent material is represented by poorly drained colluvium from Hamilton Ash and other deposits (Clarkson et al. 2007).

5.3.2 Alluvial plains and river terraces

Low mounds or ridges of alluvial plains represents alluvium derived ultimately from the mainly volcanic catchments of the central North Island and deposited by the ancestral Waipa River and then the ancestral Waikato River system in a series of depositional episodes over the past c. 100 ka[4] (Lowe 2021). The alluvial surface comprises a series of low ridges/bars and swales or depressions from the Hinuera formation. The slightly raised channel/bar deposits (Horotiu soils comprise tephra fallout cover on coarse alluvium) are well drained soils while lower-lying 'swales' (shallow depressions) containing volcanogenic overbank flood deposits are poorly drained soils (Lowe 2021), creating boggy areas (Clarkson et al. 2007) (Figure 4).

The lowermost terrace adjacent to the modern Waikato River mark deposition from a break-out flood event about 250 AD ago following the latest eruption of Taupo Volcano (in 232 ± 10 AD). Large quantities of pumiceous deposits (Taupo Pumice Alluvium) were deposited as terrace deposits adjacent to the main river channel and up tributary valleys or gullies that drained into it (Lowe 2021). This lower terrace is well drained as it contains more sand and gravel (Clarkson et al. 2007).

5.3.3 Gullies

Gullies are occasionally cut into the Hinuera Surface, usually draining towards the modern Waikato River. Soils of the gully sides, and terrace scarps, are Kirkiriroa series and soils on the recent alluvium in gully bottoms are Tamahana series (Lowe 2021) (Figure 4). Gullies were formed about 15,000 years ago through a process called 'spring sapping'. As the Waikato River cut down creating steep banks, aquifers were exposed. These eroded steep-sided troughs back from the riverbank, which eventually became Hamilton's gully system. Gullies have two main land units: the steep gully sides, and the gully floor. On the sides, soil material is well-drained, generally from the Hinuera formation. The gully floors are more poorly drained (Clarkson et al. 2007).

5.3.4 Peatlands

While peatlands are not generally recognised as a geological feature, they do form an important landscape unit within the Hamilton basin. On the Hinuera surface, large, raised bogs developed, initially as low-lying wet areas near lakes.

[4] ka = thousands of years ago; Ma = millions of years ago; cal =calibrated or calendar

Over time, the peats spread and thickened and merged into raised bogs when net precipitation in the region increased at c. 13,000 cal[4] years ago (Lowe 2021) (Figure 4).

Peatlands include peat lakes and peat bogs, all of which are generally very wet and poorly drained areas. Peat lakes are often shallow and have peat-stained water that is naturally acidic; conditions that support unique and ecologically significant species assemblages.

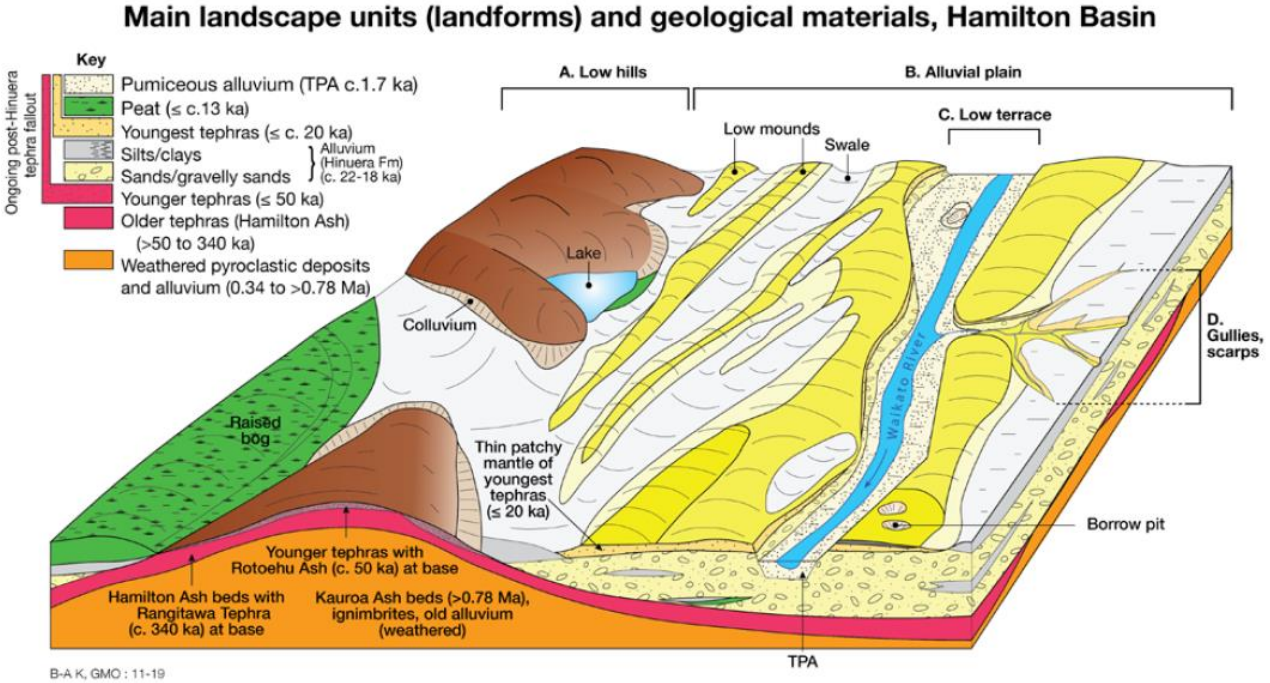


Figure 4. Main landscape units A-D and geological materials and ages in the Hamilton Basin (Lowe 2021)

5.4 Vegetation types

Very little vegetation remains within Hamilton City following extensive clearance since the area was settled c. 1,000 years ago (Newnham et al. 1989). Hamilton City was progressively converted to farmed pasture and in more recent times to dense residential properties with only a handful of original forest and wetland habitats remaining.

Leathwick et al. (1995) calculated the decline in indigenous vegetation since 1840 and current percentage cover. While Hamilton City makes up only 7% of the Hamilton ED, it is estimated that since 1840, the Hamilton ED has had a 97.8% reduction in indigenous vegetation. Percentage cover of indigenous vegetation in 1995 was about 1% forest and less than 1% scrub and wetland for the entire Hamilton ED. Wetlands and conifer forests were the dominant ecosystems of Hamilton ED before human settlement (Harding 1997). These two ecosystems also suffered the highest percentage reduction through anthropogenic activities (Cornes et al. 2012).

Following a more recent study of vegetation/habitat types within Waikato Region, a total of 152 ecosystems were identified across the Waikato Region, with ten terrestrial vegetation types within Hamilton ED (Table 2). Of these ten terrestrial vegetation types, seven are currently under-represented with less than 10% of their original extent remaining. Kauri, podocarp, tawa forest (WF11.2) and swamp mosaic wetland (WL) are considered not under-represented, as more than 20% of their pre-European extent remains.

Of note is that kanuka scrub/forest (VS2) has been identified as a recent vegetation type and did not exist in pre-European times.

Table 2. Remaining vegetation/habitat types within the Hamilton Ecological District (WRC 2021, Based on Singers & Rogers 2014 classification)

Vegetation/Habitat Type	Hamilton Ecological District		
	Potential Historical Extent	Current Extent	% Remaining
MF7.1, Tawa, mangeao forest	45,267.50	101.3	**0.2**
Open Water	1,099.60	45.1	**4.1**
VS2, Kānuka scrub/forest	0	218.1	N/A
WF11.2, Kauri, podocarp, tawa forest	68.6	26	37.9
WF12, Kauri, podocarp, broadleaved beech forest	1,084.30	81.8	**7.5**
WF13, Tawa, kohekohe, rewarewa, hīnau, podocarp forest	24,271.90	761.8	**3.1**
WF2, Tōtara, matai, ribbonwood forest	15,607.40	85.7	**0.5**
WF8, Kahikatea, pukatea forest	23,521.10	273	**1.2**
WL, Swamp mosaic	333.8	216	64.7
WL, Swamp/fen mosaic	2,347.10	13.2	**0.6**
WL2/3, Bog Mosaic	45,742.90	304.5	**0.7**

5.4.1 Low rolling hills

Low rolling hills and the foothills of ranges at the edge of Hamilton were historically dominated by rimu-tawa forest and kauri-hard beech forest (Clarkson et al. 2007). Where poorly drained soils are present at the foot-slopes of the hills, kahikatea-pukatea forests were common (Clarkson et al. 2007).

Currently, very small remnants of native forests remain within Hamilton City. Remnants include the Temple view kahikatea stands, the kahikatea stands at Waikato University, and native forest remnants at Lake Rotoroa.

5.4.2 Alluvial plains and river terraces

The moderately to well-drained low mounds or ridges of alluvial plains were predominantly supported mixed conifer-broadleaf forest. In the shallow depressions or swales which drain less readily kahikatea semi-swamp forests were common. On the lower well-drained terraces along the Waikato River, totara-matai-kowhai forest were historically present (Clarkson et al. 2007).

Currently, the lower river terrace along the Waikato River comprises predominantly exotic forest types such as alder and willow, but also areas with treefern species, kānuka, and occasional pockets of wetland habitat. Occasional remnants of pukatea-swamp maire forest remain along the Waikato River. Restoration efforts are being undertaken in various parts along the Waikato River, connecting the river to the mouths of adjoining gullies.

Alluvial plains have largely been built upon, but small forest remnants remain including kahikatea-broadleaf forest remnants such as found in Te Papanui - Claudelands Bush, Southwell forest remnant, as well as smaller kahikatea forest scattered throughout the city.

5.4.3 Gullies

On the well-drained gully sides, totara-matai-kowhai forest were historically common, whereas the more poorly drained gully floors were dominated by kahikatea-pukatea-swamp maire forest (Clarkson et al. 2007).

Currently, many of the gullies have seen extensive clearing and infilling. Gullies in the northern parts of the city in particular have been disconnected and partially filled in to make way for roads and housing. The gullies in the southern parts of the city have seen less pressures from development in the past but are currently under pressure from extensive roading and planned developments.

Most gullies currently comprise a mixture of indigenous and exotic vegetation cover. Many steep gully sides have been planted in pines, gums, and have become infested with weed species such as privet and vines. However, some gullies still present good examples of indigenous cover with mahoe and whekī ferns dominant.

Gully floors may however still present an indigenous cover, often presenting willow and cabbage trees as dominant species.

Many restoration efforts are being undertaken in many of the gullies within the city both by Council and community groups. While many of the plantings are still young, these areas may become important indigenous vegetation areas in the future.

5.4.4 Peatlands

Poorly drained peatlands historically hosted a range of vegetation types including submerged vegetation, swamp forest, sedgelands, shrublands and restiad bogs (Clarkson et al. 2007).

Marginal wetlands exist on the margins of Hamilton's peat lakes, many receiving extensive restoration inputs to enhance the native component of plantings and eradicate invasive weeds. Lake margins include wetland vegetation such as raupō, sedges, and rushes. Regionally uncommon plant species have been recorded within these riparian margins including *Hiya distans*, *Dianella haematica*, and *Sparganium subglobosum* along Minogue Park – Lake Rotokaeo – Forest Lake.

Extensive restoration work has been undertaken for almost two decades at Waiwhakareke Natural Heritage Park, expanding the area of indigenous vegetation from 3 ha to 35 ha between 2004 and 2019. This area covers not only peatland, but also alluvial plains and low rolling hills. Plantings include species such as kahikatea, pukatea, and numerous shrubs and wetland species such as *Sporadanthus ferrugineus* and other species that would have naturally occurred in the area.

5.5 Fauna habitat

New Zealand's longest river, the Waikato River, is a key feature of Hamilton City. This wide single-path river cuts Hamilton City in two with its deep channel and provides an ecological corridor for the movement of both indigenous and exotic wildlife. The forest remnants scattered throughout the city form steppingstones for flying species to move around the densely urbanised landscape, the large area of Waiwhakareke Natural Heritage Park is in the process of becoming an important refuge for indigenous fauna.

5.5.1 Long-tailed bats

Hamilton is one of only a few cities in New Zealand where long-tailed bats (*Chalinolobus tuberculatus*; Threatened – Nationally Critical, O'Donnell et al. 2018) are known to persist in an urban landscape. The first study on bats in Hamilton City was undertaken in 2011/12 (Le Roux and Le Roux 2012), which led to annual city-wide surveys of bats since the summer of 2016/17 till 2020/21 (Mueller et al. 2017; van der Zwan 2018; van der Zwan & Mueller 2019; Dumbleton & Montemezzani 2020). Each year, bats are detected in a greater number of locations, with the highest levels of bat activity consistently in the southern parts of the city. However, bat detections are being recorded more frequently also in the western, eastern, and northern parts of the city (Mueller et al. 2017; van der Zwan 2018; van der Zwan & Mueller 2019; Dumbleton & Montemezzani 2020).

While roosting habitat has been confirmed only in a few places in the southern parts of the city, various levels of activity have been detected throughout the city (Figure 5).

Habitat where bats continue to be detected are primarily the large gullies in the southern parts of the city which are largely still connected (Mangaonua, Mangaone, and Mangaharakeke gully systems). However, bats continue to be detected sporadically and in low number of detections in some of the gullies in the north of the city, including Mangaiti Gully and Te Awa O Katapaki gully. Bats are known to be roosting within some of these gullies, near the Waikato River, and within shelterbelts set within an open pastureland landscape in the southern parts of the city (Davidson-Watts 2019).

Riparian margins along the Waikato River, particularly in the southern parts within Hammond Bush also see regular and consistent activity throughout the survey seasons.

Forest remnants such as Te Papanui - Claudelands Bush and Southwell Park in the east and Farnborough and Dinsdale Park in the west of the city see irregular activity and often only a small number of detections per survey season.

Bats have also regularly been detected in the various peatland habitats present in the city. Regular, yet low numbers of bat detections, have been recorded at Waiwhakareke Natural Heritage Park, Lake Rotoroa, and Minogue Park - Lake Rotokaeo – Forest Lake.

5.5.2 Avifauna

The diverse landscape of Hamilton City provides habitat for a great number of indigenous avifauna species. New Zealand falcon (*Falco novaeseelandiae ferox*; At Risk – Recovering, Robertson et al. 2021) and kākā (*Nestor meridionalis septentrionalis*; At Risk – Recovering, Robertson et al. 2021) have been recorded at various locations within forest or gully habitats. While these birds have been reported on various occasions, they are only sporadic visitors of the city, and it is unlikely that nesting habitat currently exists within the city. A great number of common forest birds are present within gully habitats and forest remnants. Bellbird (*Anthornis melanura melanura*) and Australasian shoveler (*Anas rhynchotis*) have been recorded in the city, and while these species are common in other parts of the country, these are Regionally Uncommon within the Waikato Region.

Peatlands including their associated wetlands and lakes provide habitat for a number of wetland birds and waterfowl.

A number of shag species have been reported along riparian river margins. While these species may not be nesting within Hamilton City, the river provides great feeding grounds for these species.

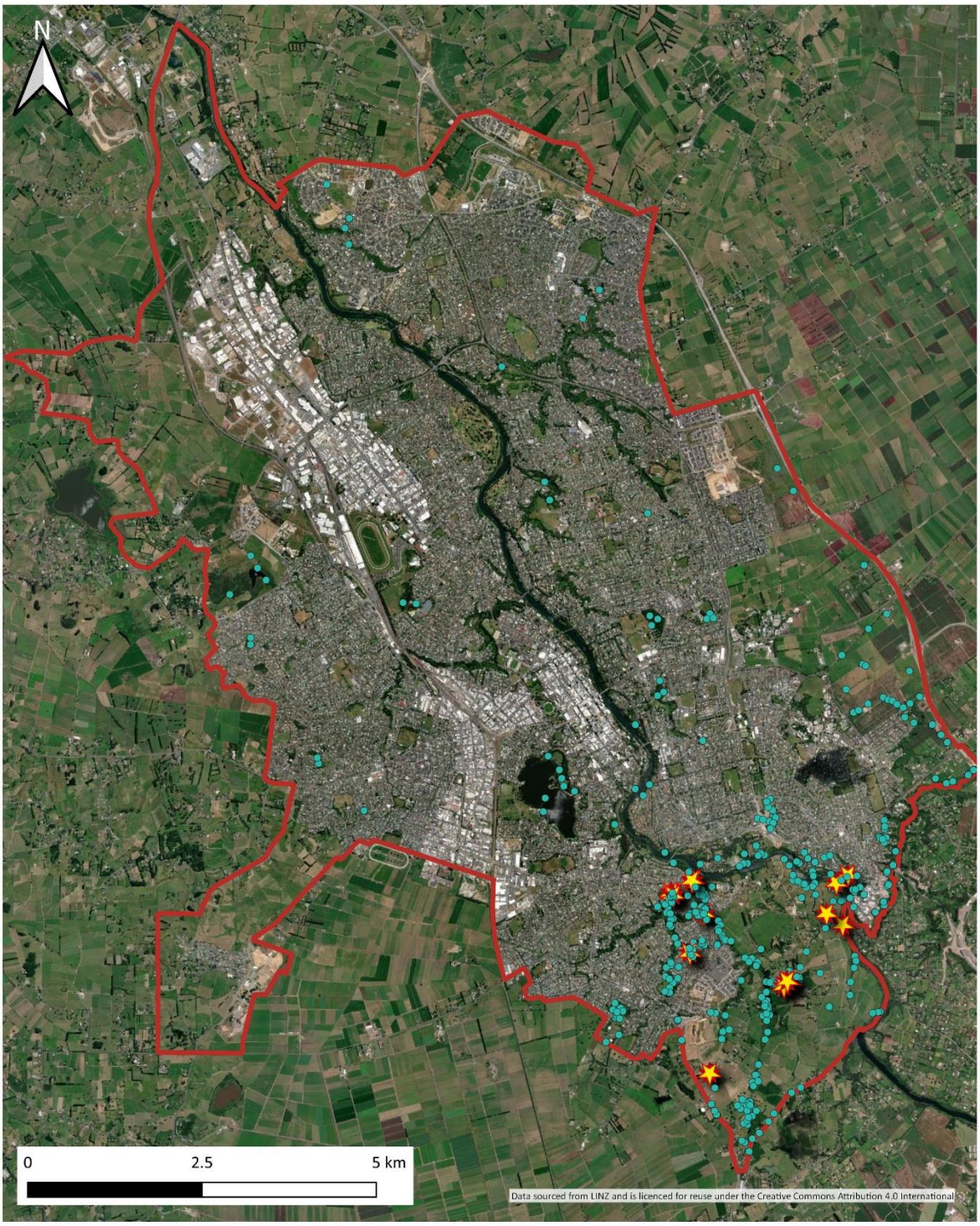
5.5.3 Herpetofauna

Few herpetofauna species are known to be present within the urbanised landscape of Hamilton City. Besides the exotic plague skink (*Lampropholis delicata*), copper skink (*Oligosoma aeneum*; At Risk – Declining, Hitchmough et al. 2021) have been recorded. Copper skink reside in forest or open areas that are shaded and have adequate groundcover such as logs, rocks, long grass, or deep leaf litter. While their natural habitat exists within gullies and forest remnants, copper skink now also inhabit urban areas and are regularly found in compost heaps.

5.5.4 Fish

Throughout Hamilton City, branching off the Waikato River are a series of gully systems, including the four major gully systems of Kirikiriroa, Mangakotukutuku, Mangaonua and Waitawhiriwhiri, and numerous minor systems. Waterways in the bottom of those gullies, as well as the Waikato River itself provide an extensive network for indigenous fish species. Besides indigenous fish species, a wide range of exotic/pest fish species are present.

Moreover, while most fish species are found to be present within well-defined stream channels, black mudfish (*Neochanna diversus*, At Risk – Declining, Dunn et al. 2018) are known to be present in heavily degraded and isolated drains or wetlands within the city. Known locations are present in the north, north-east, and the south-east of the city, where specific surveys were done as part of consent requirements.



Bat Detections within Hamilton City

Legend

DOC Bat Database (June 2021)

Roost

Bat presence

Hamilton City Boundaries

Client: Hamilton City Council
Project Code: 10252
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Version: 1.1
Author: MK
Approved: WM

Figure 5. Bat detections across Hamilton City

6 THREATENED AND NOTABLE SPECIES

6.1 Threatened and regionally uncommon species

A total of 31 Threatened, At Risk, and Data Deficient taxa have been recorded within Hamilton City (Overdyck 2020). A total of 34 Threatened, At Risk, Data Deficient, Regionally uncommon, and a presumably Extinct taxa have been recorded within Hamilton City SNA. The discrepancy of these numbers is a result of a recently updated Threat classification of a lizard species, and two plant species that have been identified as Regionally Uncommon by Prof Bruce Clarkson which did not exist within Overdyck (2020).

Threat classifications were determined using the New Zealand Threat Classification System (NZTCS) manual (Townsend et al. 2008) depicted in Table 3 below. Native taxa are placed in one of four main categories in descending order of severity of risk: Extinct, Threatened, At Risk or Not Threatened. Threatened taxa are considered to be facing imminent extinction, while At Risk taxa are in trouble but are not considered at imminent risk of extinction. Taxa are further classified into the conservation statuses listed below (Table 3) including Data Deficient taxa, which are yet to be formally assessed due to a lack of information, and the categories of Native Non-resident (Migrant, Vagrant and Coloniser) and Not Threatened taxa (Overdyck 2020).

Information on species listed below was derived from available databases and reports available from DOC, WRC, and Manaaki Whenua – Landcare Research[5]. Only those (Threatened, At Risk or Regionally uncommon) species recorded within Hamilton City SNA have been recorded in the tables below.

The most recent threat classification documents published by the Department of Conservation were used to determine the threat status of species (e.g. de Lange et al. 2018; Grainger et al. 2018; Hoare et al. 2017; Trewick et al. 2016; Dunn et al. 2018; Hitchmough et al. 2021; Robertson et al. 2021; O'Donnell et al. 2018).

Regionally uncommon species are those species which are not nationally threatened and may have secure populations elsewhere but have been identified through the various SNA or similar processes as uncommon or a genetically distinct population within the Waikato Region. These species are important at the regional level and may also have potential to be elevated to nationally threatened status if their populations are placed under stress and so are useful to include in a regional database (Overdyck 2020).

No current formal assessments are known to exist for Waikato's regionally uncommon or regionally threatened species; thus, a precautionary approach has been taken during the SNA process to capture data relating to species that could reasonably be considered as 'regionally uncommon' and the regional rarity of species has been supported with literature references or personal communications where available.

No Threatened or At Risk bryophytes, fungi, or macroalgae species are known to be present in Hamilton City.

[5] iNaturalist (2021); eBird (2021); NZFFDB (2021); BioWeb herpetofauna database (2021); DOC bat database (2021); 5MBC data from Manaaki Whenua – Landcare Research (2019)

Table 3. NZTCS categories used in this report for native biota following Townsend et al. (2008)

Category	Conservation status
Extinct	-
Threatened	Nationally Critical
	Nationally Endangered
	Nationally Vulnerable
At Risk	Declining
	Recovering
	Relict
	Naturally Uncommon
Data Deficient	Data Deficient
Non-resident	Migrant
	Vagrant
	Coloniser
Not Threatened	Not Threatened

6.1.1 Threatened, At Risk, and regionally uncommon flora species

6.1.1.1 Vascular plants

Within Hamilton City SNA, 11 vascular plants have been recorded as being Threatened (7) or At Risk (4) and a further four as regionally uncommon (Table 4). One vascular plant species (*Juncus holoschoenus var. holoschoenus*) has been classified as Extinct from the Waikato Region (Overdyck 2020) but a record exists within Minogue Park – Lake Rotokaeo – Forest Lake SNA within Hamilton City. This record may be verified during the ground-truthing stage of this project. It must be noted that a further eight Threatened or At Risk flora species have been recorded within Hamilton City (Overdyck 2020), but these do not fall within the identified SNA and therefore have not been captured in this dataset.

The conservation status of vascular plants were reassessed by de Lange et al. (2018) resulting in considerable changes for the Waikato Region. The conservation status of all native Myrtaceae has been reassessed following the detection of myrtle rust (*Austropuccinia psidii*) in New Zealand in May 2017 and concern over the potential devastation that could be caused to native *Metrosideros* species if the *Ceratocystis fimbriata* strain responsible for 'Rapid 'Ōhi'a Death' in Hawai'I (recently identified as two species *C. lukuohia* and *C. huliohia* by Barnes et al. (2018)) became established in New Zealand. To date, kauri dieback (*Phytophthora agathidicida*) has not been detected in Hamilton City.

Currently, there are no known effective treatments for myrtle rust or kauri dieback. Within Hamilton City six vascular plant species have received this elevated level of threat status as a precautionary measure for Myrtaceae species that were previously considered to be either Not Threatened or At Risk, to At Risk or Threatened status. (Table 4; de Lange et al. 2018; Overdyck 2020).

Table 4. Threat status of vascular plant species that have been recorded in Hamilton City (Names and threat status obtained from de Lange et al. 2018)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Astelia grandis	Swamp astelia	Swamps and bogs	Regionally uncommon
Dianella haematica	Swamp blueberry/turutu	Swamps and bogs	Regionally uncommon
Fimbristylis velata	Fimbristylis	Shoreline, receding shallow lakes and river margins	At Risk – Naturally Uncommon
Hiya distans	-	Swamps and bogs	Regionally uncommon
Juncus holoschoenus var. holoschoenus	-	Swamps and bogs	Extinct**
Kunzea robusta	Kanuka	Forests and scrublands	Threatened – Nationally Vulnerable*
Leptospermum scoparium var. scoparium	Mānuka	Forests and scrublands	At Risk – Declining*
Metrosideros diffusa	White climbing rātā	Forests and scrublands	Threatened – Nationally Vulnerable*
Metrosideros fulgens	Rātā vine	Forests and scrublands	Threatened – Nationally Vulnerable*
Metrosideros perforata	Small white rātā/akatea	Forests and scrublands	Threatened – Nationally Vulnerable*
Mida salicifolia	Maire-taiki	Forests and scrublands	At Risk – Declining
Ptisana salicina	King fern/ para	Forests and scrublands	At Risk – Declining
Rorippa divaricata	New Zealand watercress/matangaoa	Forests and scrubland, lake and river margins	Threatened – Nationally Vulnerable
Sparganium subglobosum	Bur-reed/maru	Swamps and bogs	Regionally uncommon
Solanum aviculare var. aviculare	Poroporo	Forests and scrublands	Threatened – Nationally Vulnerable
Syzygium maire	Tawake/swamp maire	Forests and scrublands	Threatened – Nationally Critical

*Threat status as a result of Myrtle rust concerns.
** While listed as extinct in Overdyck (2020), a record exists for this species. This may be verified during the ground-truthing stage of this project.

6.1.2 Threatened, At Risk, and regionally uncommon fauna species

A total of 18 Threatened (2), At Risk (12), Data deficient (1), and regionally uncommon (3) fauna species have been recorded within Hamilton City SNA. However, many species, such as NZ kākā and NZ falcon, are highly mobile and have large territories and vast home ranges. It is therefore difficult to predict where these species may utilise suitable habitats throughout a year, making habitat utilisation probably much broader than specific points in time as shown on a static database.

Other species, such as the long-tailed bat, are regularly being discovered in new sites and habitats where, in conjunction with improved survey methods and technology, ecological investigations for resource consents and/or scientific research are conducted.

Additionally, cryptic species such as black mudfish are known to inhabit highly modified drainage systems and are not easily detected, unless specific surveys are undertaken, often as part of ecological investigations for resource consents and/or scientific research.

The following tables list the Nationally Threatened and At Risk fauna species recorded in Hamilton City SNA.

6.1.2.1 Mammals

New Zealand's only true land mammal, the long-tailed bat is present throughout Hamilton City. While the presence of the Threatened – Nationally Critical bat species is regular and known roosting sites are present in the southern parts of the city, bats are being detected more frequently in the northern parts of the city (Table 5; Figure 5).

Table 5. Threat status of terrestrial mammal species that have been recorded in Hamilton City (Names and threat status obtained from O'Donnell et al. 2018)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Chalinolobus tuberculatus	Long-tailed bat/pekapeka-tou-roa	Forests and scrublands	Threatened – Nationally Critical

6.1.2.2 Avifauna

One Threatened, four At Risk, and two regionally uncommon avifauna species have been reported within Hamilton City SNA (Table 6). As mentioned above, many of these species are seasonally mobile and/or have vast home ranges, it makes it hard to predict how much of Hamilton City's habitats they regularly utilise.

Table 6. Threat status of avifauna species that have been recorded in Hamilton City (Names and threat status obtained from Robertson et al. 2021)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Anas rhynchotis	Australasian shoveler/ kuruwhengi	Swamps and bogs	Regionally uncommon
Anthornis melanura melanura	Bellbird/korimako	Forests and scrublands	Regionally uncommon
Falco novaeseelandiae ferox	New Zealand falcon	Forests and scrublands	At Risk – Nationally Vulnerable
Hydroprogne caspia	Caspian tern/taranui	Beaches and dunes	Threatened – Nationally Vulnerable
Nestor meridionalis septentrionalis	North Island kākā	Forests and scrublands	At Risk – Recovering
Phalacrocorax carbo novaehollandiae	Black shag/kawau	Streams, rivers, and lakes	At Risk – Naturally Uncommon
Phalacrocorax sulcirostris	Little black shag/kawau tūi	Streams, rivers, and lakes	At Risk – Naturally Uncommon

6.1.2.3 Herpetofauna

One skink species, recently been reclassified as At Risk – Declining, has been recorded within Hamilton City SNA (Table 7).

Table 7. Threat status of herpetofauna species that have been recorded in Hamilton City (Names and threat status obtained from Hitchmough et al. 2021)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Oligosoma aeneum	Copper skink	Forests and scrublands	At Risk - Declining

6.1.2.4 Freshwater fish

Six At Risk freshwater fish species have been recorded within Hamilton City SNA (Table 8).

Table 8. Threat status of freshwater fish species that have been recorded in Hamilton City (Names and threat status obtained from Dunn et al. 2018)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Anguilla dieffenbachii	Longfin eel/tuna	Streams, rivers, and lakes	At Risk - Declining

Cheimarrichthys fosteri	Torrent fish/panoko	Streams, rivers, and lakes	At Risk - Declining
Galaxias argenteus	Giant kōkopu	Streams, rivers, and lakes	At Risk - Declining
Galaxias maculatus	Inanga	Streams, rivers, and lakes	At Risk - Declining
Gobiomorphus gobioides	Giant bully	Streams, rivers, and lakes	At Risk – Naturally Uncommon
Neochanna diversus	Black mudfish	Streams, rivers, and lakes	At Risk - Declining

6.1.2.5 Freshwater invertebrates

One freshwater invertebrate species have been recorded in Hamilton City SNA as At Risk - Declining, and one as Data Deficient (Table 9).

Table 9. Threat status of freshwater invertebrate species that have been recorded in Hamilton City (Names and threat status obtained from Grainger et al. 2018)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Echyridella menziesii	Freshwater mussel	Streams, rivers, and lakes	At Risk - Declining
Paranephrops sp.	Freshwater crayfish	Streams, rivers, and lakes	Data deficient

6.1.2.6 Terrestrial invertebrates

One regionally uncommon terrestrial invertebrate species has been recorded within Hamilton City SNA (Table 10).

Table 10. Threat status of terrestrial invertebrate species that have been recorded in Hamilton City (Names and threat status obtained from Hoare et al. 2017 and Trewick et al. 2016)

Scientific name	Common/Māori name	Primary ecosystem	Threat status
Hemideina thoracica	Auckland tree wētā	Forests and scrublands	Regionally uncommon

7 RESULTS OF THE SIGNIFICANT NATURAL AREAS INVENTORY AND ASSESSMENT

7.1 Significant Natural Areas Results

7.1.1 cSNA

A total of 70 potential cSNA sites were assessed, of which 52 sites were identified as SNA, comprising an area of 671.81 ha [6]. The 52 cSNA sites account for 6.1% of Hamilton city's total area. (Figure 6; Table 11).

As outlined above, the Peacocke Structure Plan area was excluded from this exercise as the assessment of SNA within this area has been undertaken previously and is currently being notified to respective landowners. Approximately 9% of the cSNA within Hamilton City sit within the Peacocke Structure Plan area, covering an area of ~75 ha.

Of the significant cSNA, 63% (33 sites) were assessed as either 'Regionally' or 'Nationally' significant, accounting for 593.9 ha. The Waikato River, accounting for a large portion of Hamilton City's SNA area (137 ha) was rated 'Nationally' significant (Table 13). This accounts for 48.4% of the cSNA assessed as 'Nationally' significant.

Sites assessed as 'Nationally' significant were mostly gully habitats (7 sites) accounting for 127.9 ha, mostly because long-tailed bats are known to regularly utilise these specific sites (Table 13).

Sixteen cSNA were identified as 'Locally' significant, covering an area of 75.7 ha, accounting for 11% of sites assessed (Table 11). While 18 potential cSNA sites were assessed as currently 'Not Significant', and 3 sites were assessed as 'Indeterminate' due to the lack of available information to make a confident assessment of the sites (Table 11).

A confidence level was assigned to each assessed site following the guidelines in Appendix E:. A high level of confidence was assigned to 57% of the sites, with 33% at medium confidence, and 10% at low confidence (Table 12).

Only one QEII covenant is present within Hamilton City on private property (~0.12 ha), along with three small areas of DOC conservation land (totalling ~0.5 ha of marginal strips along the Waikato River), whereas most public land covering natural features are protected by Council Reserves. Large portions of gully habitat are also present on private land.

[6] This does not include the Peacocke Structure Plan area which accounts for a further ~75ha

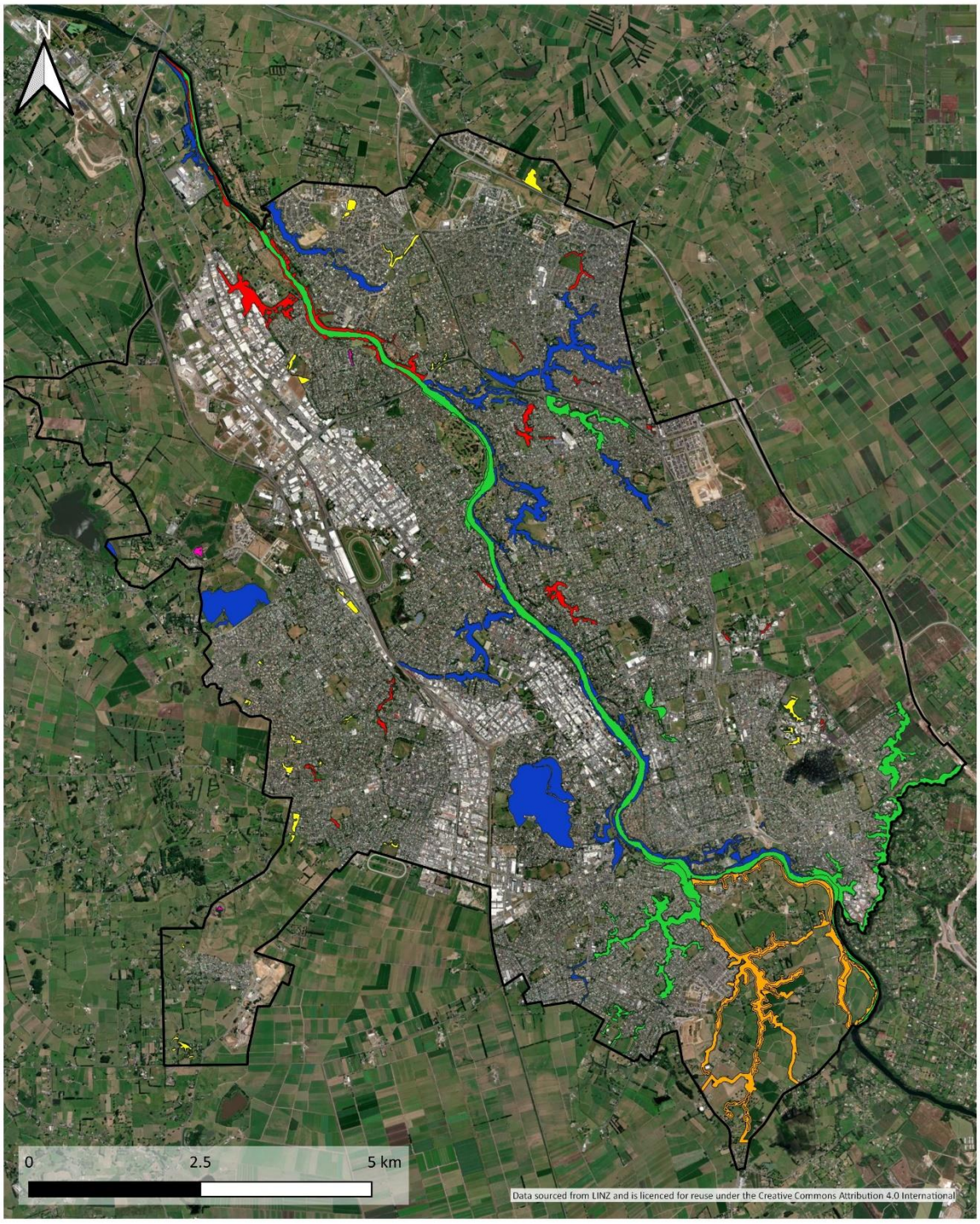

Figure 6. cSNA level of significance within Hamilton City (showing SNA within notified PSP area)

Table 11. Summary of total number and area (ha) of sites assessed for significance in Hamilton City (cSNA)

Level of significance	# of sites assessed	Area (ha)	% of total area assessed	% of Hamilton City area**
National	11	282.69	40%	2.55%
Regional	22	311.18	44%	2.81%
Local	16	75.66	11%	0.68%
Indeterminate	3	2.29	0%	0.02%
Not Significant	18	28.04	4%	0.25%
Total of significant* areas	**52**	**671.81**	**96%**	**6.06%**
Grand Total	**70**	**699.86**	**100%**	**6.31%**

*Sum of National, Regional and Local levels of significance.

**Hamilton city area 11090 ha[7]

[7] Territorial Authority 2020 spatial dataset. Derived from: https://datafinder.stats.govt.nz/layer/104267-territorial-authority-2020-generalised/

Table 12. Summary of confidence levels and relative significance of cSNA, shown in number of sites and area (ha)

Level of significance	High confidence				Medium confidence				Low confidence			
	Area (ha)	# of sites	% of total area assessed	% of total sites assessed	Area (ha)	# of sites	% of total area assessed	% of total sites assessed	Area (ha)	# of sites	% of total area assessed	% of total sites assessed
National	272.02	9	39%	13%	10.67	2	2%	3%	-	-	-	-
Regional	246.56	14	35%	20%	64.62	8	9%	11%	-	-	-	-
Local	40.93	9	6%	13%	34.72	7	5%	10%	-	-	-	-
Indeterminate	-	-	-	-	0.44	1	0%	1%	1.84	2	0%	3%
Not Significant	7.43	8	1%	11%	11.78	5	2%	7%	8.83	5	1%	7%
Grand Total* **	**566.95**	**40**	**81%**	**57%**	**122.24**	**23**	**17%**	**33%**	**10.67**	**7**	**2%**	**10%**

***Excludes Peacocke Structure Plan area.

Table 13. Summary of ecosystem types and relative significance levels of cSNA, shown in number of sites and area (ha)

Level of significance	Forest		Gully		River		River margin		Wetland	
	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites
National	5.47	1	127.87	7	136.85	1	12.51	2	-	-
Regional	60.00	5	90.53	6	115.88	3	44.78	8	-	-
Local	31.61	8	14.07	5	-	-	29.98	3	-	-
Indeterminate	-	-	0.63	1	-	-	-	-	1.65	2
Not Significant	15.46	11	4.04	2	-	-	-	-	8.54	5
Grand Total* **	**112.53**	**25**	**237.14**	**21**	**252.73**	**4**	**87.26**	**13**	**10.20**	**7**

***Excludes Peacocke Structure Plan area, which includes gully, river margin, and wetland habitat.

7.1.2 fSNA

As outlined above, the fSNA dataset was created from the original SNA dataset prepared in 2010 by Cornes et al. (2012). Many fSNA sit within or overlap the 'newly' created cSNA in their entirety. Initially, some fSNA completely overlapped cSNA sites where sites comprised a standalone forest remnant (i.e. Te Papanui – Claudelands Bush). In the latest iteration of the dataset (22 May 2022) the complete overlaps were removed by removing the cSNA and leaving the fSNA in place. However, many fSNA sit within a larger cSNA site and this should be kept in mind when reviewing the tables and figures below with the tables and figures in section 7.1.1 above.

A total of 65 fSNA sites were assessed, comprising an area of 121.8 ha [8] and all 65 sites were significant (Figure 7; Table 14).

Following the review of SNA identified in 2010, five have been removed from the fSNA dataset as they were considered no longer significant based on flora values alone. A comparison between SNA identified in 2010 and fSNA in 2021 is presented in Table 15.

Of the fSNA, 60% (16 sites totalling 72.5 ha) were assessed as 'Nationally' significant, 16% as 'Regionally' significant (17 sites accounting for 19.7 ha), and 24% as 'Locally' significant (32 sites totalling 29.5 ha) (Table 14).

A high level of confidence was assigned to 14 'Nationally' and 10 'Regionally' significant fSNA, where a medium level of confidence was assigned mostly to 'Locally' significant sites (23 sites) (Table 16).

The ecosystem type with the most fSNA sites was gully habitats (29 sites covering 37.9 ha), whereas the largest area of fSNA was within lake habitats (44.2 ha spread over 2 sites including lakes and peat lakes; Table 17).

Table 14. Summary of total number and area (ha) of fSNA assessed for significance in Hamilton City

Level of Significance	Number of fSNA	Area (ha)	% of total fSNA area within HCC
National	16	72.53	60%
Regional	17	19.74	16%
Local	32	29.49	24%
Grand Total	**65**	**121.75**	**100%**

Table 15. Comparison between 2010 SNA and fSNA evaluation

SNA year	Number of sites	SNA area mean (ha)	SNA area (ha)
2010	77	2.17	167.3
2021 (fSNA)	65	1.87	121.75

[8] To date, the linework has not been completed as part of this project. Therefore, minor changes to the area calculations of fSNA are likely.

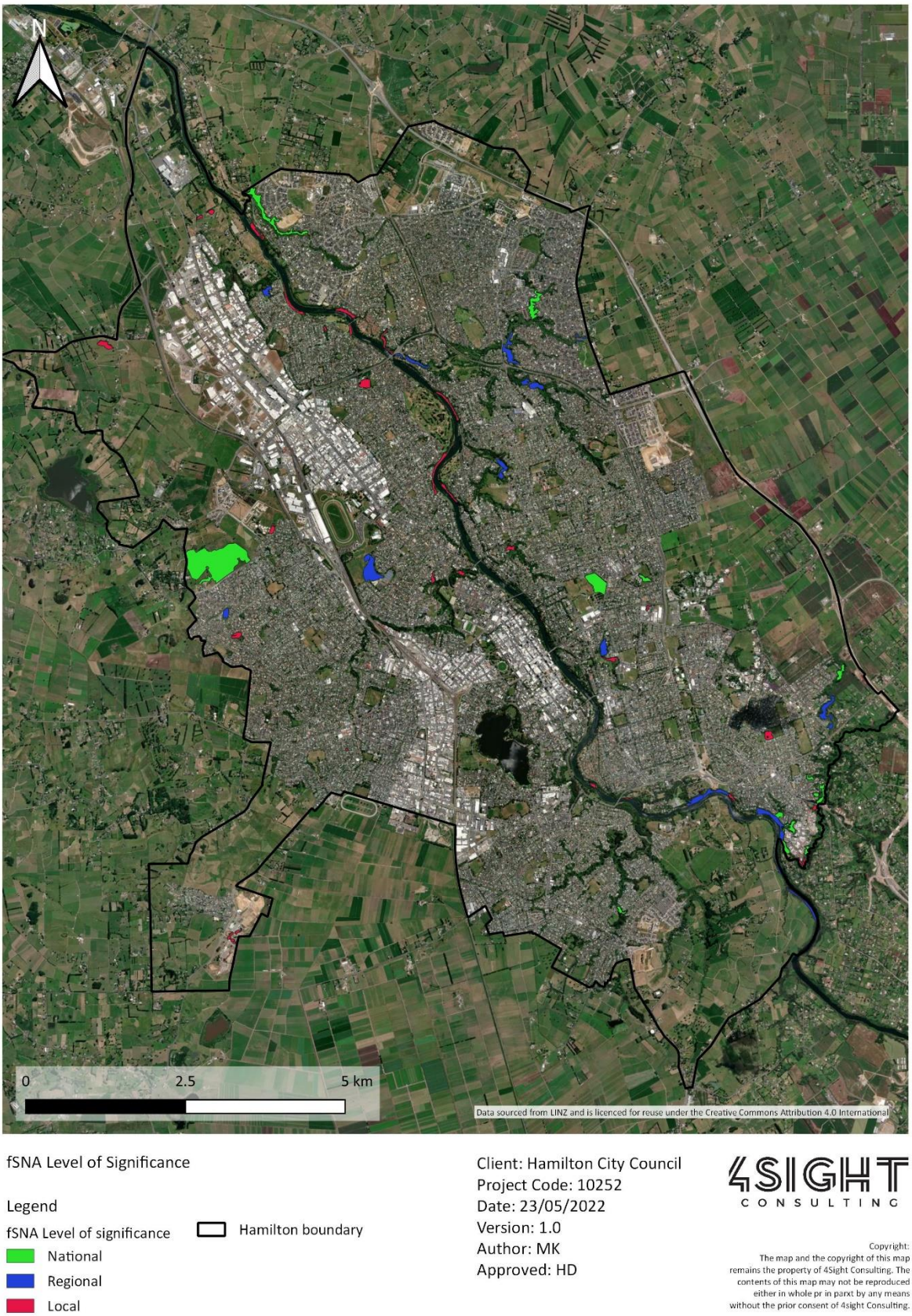

Figure 7. fSNA level of significance within Hamilton City (excludes SNA within notified PSP area)

Table 16. Summary of confidence levels and relative significance, shown in number of fSNA sites and area (ha)

Level of Significance	High			Medium			Low		
	Area (ha)	# sites	% of total fSNA area	Area (ha)	# sites	% of total fSNA area	Area (ha)	# sites	% of total fSNA area
National	15.60	14	13%	1.47	2	1%	-	-	-
Regional	10.24	10	8%	11.48	7	9%	-	-	-
Local	7.18	9	6%	75.79	23	62%	-	-	-
							-	-	-
Grand Total	**33.02**	**33**	**27%**	**88.74**	**32**	**73%**	**-**	**-**	**-**

Table 17. Summary of ecosystem types and relative significance levels, shown in number of fSNA sites and area (ha)

Level of significance	Alluvial Plain		Forest		Gully		Peat Lake incl. waterbody		River Island		Riverbank	
	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites	Area (ha)	# sites
National	0.93	1	6.38	1	18.14	13	37.35	1	-	-	-	-
Regional	-	-	1.12	1	16.85	9	6.87	1	-	-	10.03	6
Local	6.25	8	5.17	5	2.93	7	-	-	0.39	2	9.35	10
Grand Total	**7.18**	**9**	**12.67**	**7**	**37.92**	**29**	**44.22**	**2**	**0.39**	**2**	**19.37**	**16**

7.2 Limitations of the assessment

7.2.1 cSNA overlapping fSNA

Care must be taken when reviewing this work in places where both cSNA and fSNA have been identified. fSNA overlap cSNA in places where high-quality floristic vegetation is present. Site descriptions, level of significance, and justification of significance may differ for those overlapping sites. Where overlap exists, the SNA with the highest level of significance prevails.

7.2.2 Peacocke Structure Plan

The Peacocke Structure Plan (PSP) area was not in the scope of this assessment and potential SNA within this area were not assessed as part of this work. As the ecological significance of this area has been assessed as part of the Peacock plan change (PC5) (Kessels & Baber 2021), this area was not reassessed. However, as SNA do exist within this area, the notified SNA within the PSP area are depicted in Figure 6. One site (C36) adjoined SNA in the adjacent PSP and in this case these fragments were assessed as if they were part of the larger site, rather than just on their own merits.

7.2.3 Waikato River/Water bodies

As part of this assessment, it was decided that waterbodies of peat lakes within Hamilton City were to be included within this assessment. Additionally, it was decided that the Waikato River itself should be included as well as this is a major feature within Hamilton City, providing invaluable habitat for numerous indigenous freshwater fish species. The result of including those waterbodies in this assessment is that a large area of SNA is covered by aquatic habitat rather than by terrestrial and wetland habitat.

7.2.4 Mudfish habitat

A number of drains in Hamilton City have records of At Risk – Declining black mudfish. Those records are most likely the result of fish surveys undertaken as part of consenting requirements for development projects. While some of those records may still be correct, there is a chance that some of these drains have since been cleared and mudfish relocated to suitable habitats nearby. Where fish have been relocated, those locations are not recorded within the NZFFDB and it is unsure if the fish are still present at the new location. Because of the uncertainty around the presence of black mudfish, those sites have been excluded from this assessment.

8 CONCLUSIONS

This assessment identified SNA within a range of habitat types, including gullies, peat lakes, forest remnants, and wetlands within Hamilton City. This assessment will assist Hamilton City Council in their development of policies, incentives, and rules in relation to their obligations of the RMA (1991), primarily under Section 6c, to protect significant habitats of indigenous fauna and flora.

Two sets of spatial data were created:

- '**Floristic SNA**' (fSNA), focusing on high-quality floristic content of the site. These sites follow the identified key sites by Cornes et al. (2012).
- '**Corridor/indigenous fauna habitat SNA**' (cSNA), SNA assessed for their full indigenous biodiversity characteristics, including their function as habitat for migratory fauna and their connectivity function in the wider landscape.

To determine whether a site was significant it was assessed against the 11 criteria defined in chapter 11 of the previous Waikato RPS. Generally, if a site met one or more of these criteria, it was considered an SNA, and was then assessed to determine a level of significance, i.e. 'International', 'National', 'Regional', or 'Local', as per guidelines developed by WRC & Wildland Consultants (2019 in prep.). Sites that were not found to be significant were classified into one of the following categories: 'Indeterminate' or 'Not Significant'.

Given this first part of the project was a desktop study, an attribute called 'Confidence Level' was used to indicate the amount of confidence in the accuracy of the significance assessment of a site. This report and associated spatial datasets will form the basis for further, more detailed, investigations during the ground-truthing stage of this project.

Nationally threatened environments within Hamilton City were identified using the Threatened Environment Classification developed by Manaaki Whenua - Landcare Research. 99.9% of land environments within Hamilton City were referred to as 'Threatened', while 0.1% is considered 'Not Threatened'.

A total of 33 Threatened, At Risk, Regionally Uncommon, Extinct, or Data deficient taxa (15 flora species and 18 fauna species) have been recorded within Hamilton City SNA. While the threat classification of species is important to determine the level of significance of a site, care was taken to not over- or under rank a site. Where species such as NZ kākā and NZ falcon may not be considered sufficient to trigger WRPS criterion 3 and hence to assign an area as ecologically significant. Long-tailed bats on the other hand have been recorded throughout Hamilton City, but may not use all areas regularly. Professional judgement by a suitably qualified ecologist was used to determine the threshold for habitat usage on a case-by-case basis.

As a result of this assessment, a total of 70 potential cSNA were identified, of which 52 sites were assessed as 'Significant'. These 52 sites equate to approximately 6.1% of Hamilton City's area. This area includes the Waikato River and waterbodies of the City's peat lakes.

63.5% of the sites assessed were deemed as 'Nationally' or 'Regionally' significant, primarily as a result of the presence of long-tailed bats. The level of significance often dependant on whether bats are known to utilise the area on a regular basis or sporadically.

A high level of confidence was assigned to 57% of the identified cSNA, 33% with medium confidence, and 10% with low confidence.

The fSNA dataset followed the original SNA dataset prepared in 2010 by Cornes et al. (2012). All fSNA sit within or overlap with the 'newly' created cSNA in their entirety. A complete overlap of fSNA and cSNA is most common where a site comprises a standalone forest remnant.

A total of 65 fSNA were assessed as significant, comprising an area of 121.8 ha high-quality vegetation situated within the cSNA layer. Of the significant fSNA, 60% (16 sites totalling 72.53 ha) were assessed as 'Nationally' significant, 16% as 'Regionally' significant (17 sites accounting for 19.7 ha), and 24% as 'Locally' significant (32 sites totalling 29.5).

A high level of confidence was assigned to 14 'Nationally' and 10 "Regionally' significant fSNA, where a medium level of confidence was assigned mostly to 'Locally' significant sites (23 sites).

9 RECOMMENDATIONS

9.1 Opportunities for protection, restoration, and recreation

The SNA identified In Hamilton City comprise a mixture of indigenous and exotic vegetation. These areas contain remnant wetlands, forest fragments, and provide important habitat for many indigenous bird and fish species, as well as for long-tailed bats. The ecological significance criteria of the WRPS do not differentiate between indigenous and exotic ecosystems as significant habitat for these 'At Risk' and 'Threatened' plants and animals.

Currently there is a distinct lack of SNA on alluvial terraces, Hamilton City's most dominant landform. Although gullies and riverbanks around the city are a significant source of biodiversity and connectivity, most of the other key sites are very isolated within the city landscape. Increasing the connectivity of sites around Hamilton City and with the surrounding peri-urban areas will increase the flow of native plant and animal species through the city and across all landforms.

The identification, protection and enhancement of SNA within Hamilton are important both to fulfil the City's obligations under the RMA and RPS and because these ecologically significant areas are important in their own right. They contribute to ecosystem functions, natural local heritage and the liveability of the city. They enhance indigenous biodiversity and provide services such as enhancement of amenity features, or form part of the stormwater system. Full indigenous vegetation improves river and stream bank stability and increases water quality. The work done to increase the quality and quantity of key sites across the city has already had positive results. Future work will reinforce those gains and contribute a healthy, sustainable environment for generations to come.

Several ecological management aspects were identified during this project which likely will require consideration at the policy and regulatory level for HCC in the preparation of the District Plan change. These are:

- This SNA assessment has identified a wide range and diverse set of potential SNA dispersed throughout Hamilton City. This area includes many gully habitats that in the past would all have been linked and interconnected. Through urban development many of these gully systems are now reduced and some connectivity between natural areas lost. Besides reconnecting these habitats through revegetation and restoration efforts, buffer zones around these areas would benefit these areas and protect the functional values for indigenous flora and fauna. Many of these habitats are dominated by exotic vegetation or are situated within private ownership.
- Planning mechanisms need to acknowledge and account for incomplete scientific knowledge and incorporation of new information which may affect the ecological significance analysis presented in this report.
- Planning mechanisms need to take into account the values of the two categories of SNAs (flora and corridor) and aim to protect those values. For example, the rules protecting a gully primarily valued as a bat corridor may be different from those protecting a high value stand of remnant vegetation.

9.2 Ongoing monitoring

Essential components of the on-going protection and ecological restoration of biodiversity values of SNA require enhancing populations of indigenous species through ongoing weed and animal pest management, stock exclusion, stop of habitat fragmentation, illegal dumping, and carrying out enhancement planting. By applying these restoration objectives over a wide area, in particular when involving wetland and riparian margins, ongoing biodiversity management will enhance and restore ecological processes at a landscape scale.

Ten years have passed since the previous SNA assessment was undertaken by Cornes et al. (2012), during which key sites were identified, focusing on indigenous flora sites (now fSNA). It was recommended in that report that rapid reconnaissance checks of fSNA were to be undertaken to monitor changes in vegetation structure, species richness, and management effects. Permanent vegetation plots exist in a number of fSNA and following the ground-truthing exercise as part of this project, should be re-measured again in 2027.

10 ACKNOWLEDGEMENTS

This SNA project relied heavily on the personal experience and knowledge of a number of key people, as well as institutional knowledge. As a consequence, a large number of people assisted with this project, including staff from Hamilton City Council, University of Waikato, Bluewattle Ecology, Waikato Regional Council. Many thanks for your help and for sharing your knowledge.

Kind thanks to Jamie Sirl from Hamilton City Council, for leading this project.

From the University of Waikato, Prof Bruce Clarkson for his in-depth knowledge in Hamilton City's botanical characteristics and for almost single-handedly populating the iNaturalist online database with botanical records found in every green patch in Hamilton City. This work was invaluable when populating the Master Dataset. Your inputs during the refinement of the methodology and review of the draft datasets are gratefully acknowledged.

Kind thanks to Gerry Kessels from Bluewattle Ecology for your continuous inputs in refinement of the methodology, reviewing of the draft dataset, and for picking up the phone whenever I had a question. Your inputs are greatly appreciated.

From 4Sight Consulting, thank you Hannah Mueller for managing this project, Cat Davis for helping populate the Master dataset, Marie Knue for populating the Master dataset and undertaking cSNA site visits, Sophie Brocklesby and Oliver Doherty-Ramsay for going through the landowner feedback forms, Charlotte Yates, Logan Bradley for your invaluable inputs to the Master dataset during the consultation phase, and Hamish Dean for your help undertaking fSNA site visits, the internal review processes, and all your other invaluable inputs.

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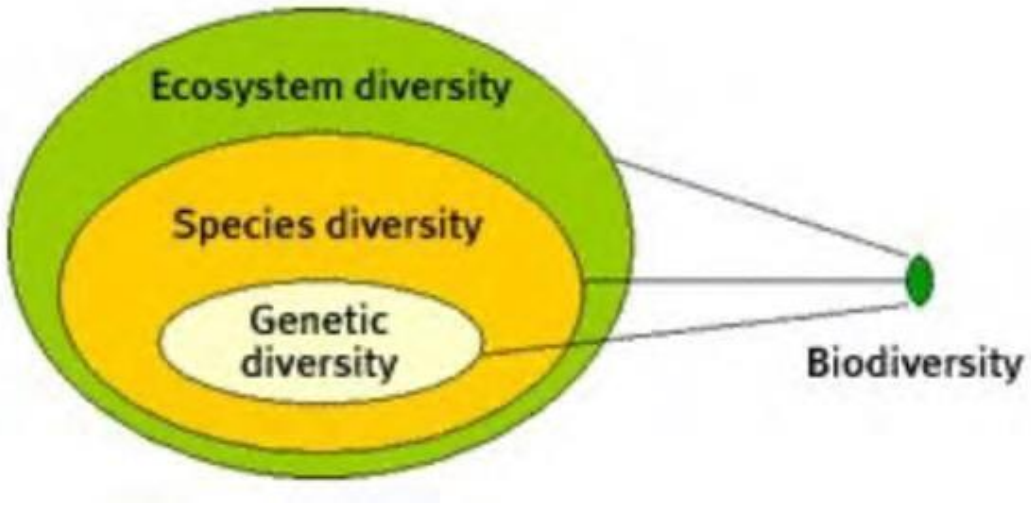
11 GLOSSARY

At risk: This means a species facing a longer-term risk of extinction in the wild (either because of severely reduced or naturally small population size or because the population is declining but buffered by either a large total population or a slow rate of decline) as identified in the New Zealand Threat Classification System lists.

Biodiversity (or biological diversity): Section 2 of the Resource Management Act 1991 (RMA) provides a definition for biodiversity: "the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems"; and/or is simply a way of defining the variety of life on Earth. This includes the different:

- types of animals, birds, fish, insects, plants, bacteria and other species;
- characteristics within a species, for example, how one giant skink differs from another;
- ways species live together, for example, how wood pigeons help to sow seeds;
- types of places species live together, for example, kauri forest or streams;
- ways in which species interact with their environment, for example, kahikatea forest likes to be seasonally flooded. The composition and abundance of species and communities in an ecosystem; and
- 'engines' that makes ecosystems work; e.g. the energy links which drive the interactions between trees, insects, birds and fish.

Biodiversity can be represented at three different levels as shown below:



(from MfE website, 2003)

Biodiversity is also about New Zealand's biological wealth. Much of our economy is based on the use of biological resources and we benefit from the "services" provided by healthy ecosystems. These include providing raw materials, purifying water, decomposing waste, cycling nutrients, creating and maintaining soils, and regulating climate.

Bioveg: The short name for a Waikato Regional Council data set called "Biodiversity Vegetation".

Ecology: (from Greek: οἶκος, oikos, "house, household, housekeeping, or living relations"; -λογία, -logia, "study of") Ecology is the interdisciplinary scientific study of the interactions between organisms and the interactions of these organisms with their environment.

Ecological District: A local part of New Zealand where the features of geology, topography, climate and biology, plus the broad cultural pattern, inter-relate to produce a characteristic landscape and range of biological communities unique to that area. In New Zealand, 268 ecological districts have been identified and mapped (at 1:500,000 scale; McEwen, 1987).

Ecosystems: Are communities of living things (animals, plants, fungi, bacteria and other microorganisms) that interact with each other and their physical environment (soil, rock, minerals, air, water, temperature, salinity). The roles of the animals and plants, and their abundance, are inseparably bound up with the numbers of other organisms and the amounts of materials available, and with the kinds of physical forces acting at any time. There are ceaseless exchanges of materials, and of energy between living things and their environment, following cyclic pathways which are perpetually repeated, for example the carbon and nitrogen cycles. These cycling systems are characteristic of ecological systems, or ecosystems for short; and/or an interacting system of living and non-living parts such as sunlight, air, water, minerals and nutrients. Ecosystems can be small and short-lived, for example, water-filled tree holes or rotting logs on a forest floor, or large and long-lived such as forests or lakes.

Endemic species: An endemic species is one that exists naturally in a particular environment or location (e.g. New Zealand), and does not exist naturally anywhere else.

Exotic species/Introduced species: A plant or animal species that has been brought to New Zealand by humans, either by accident or design. A synonym is 'Introduced species'.

Ground truthing: Undertaking a site visit of a natural feature to assess its ecological values, as well as to verify if what was found in literature and relevant databases is reflected on the ground.

Habitat: A habitat (which is Latin for "it inhabits") is an ecological or environmental area that is inhabited by a particular animal and plant species. It is the natural environment in which an organism lives, or the physical environment that surrounds (influences and is utilized by) a species population.

Indeterminate: Not able to be determined, defined or described accurately due to a lack of information.

Indigenous species: A plant or animal species that occurs naturally without the assistance of humans in New Zealand. A synonym is 'native'.

Indigenous vegetation: Any local indigenous plant community containing throughout its growth the complement of native species and habitats normally associated with that vegetation type or having the potential to develop these characteristics. It includes vegetation with these characteristics that has been regenerated with human assistance following disturbance, but excludes plantations and vegetation that have been established for commercial purposes.

Protected: This means the site is on private and/or public land and/or water that is legally protected by statute or covenant (e.g. under the Conservation Act 1987, Reserves Act 1977, etc.) and/or other type of legal protection. A list and categorisation of protection types that were applied for Hamilton City SNA is included in Appendix D.

SNA: The short term for Significant Natural Areas. SNA means "areas of significant indigenous vegetation and significant habitats of indigenous fauna" as defined in (Section 6(c) of RMA). Waikato Regional Council is identifying at the regional scale areas that meet one or more of the criteria in the operative Waikato Regional Policy Statement Appendix A as Significant Natural Areas.

Terrestrial ecosystems: Terrestrial ecosystems can be defined in the most general of terms as the various communities of organisms that inhabit the land in interaction with their environment. In the context of this project, terrestrial ecosystem types are permanently or intermittently dry areas with emergent vegetation dominated by forest, scrub and/or shrubland, or tussock land.

Threatened Species: A species faces a very high risk of extinction in the wild and includes nationally critical, nationally endangered and nationally vulnerable species as identified in the New Zealand Threat Classification System lists.

Threat Status: National Threat classification systems for ranking threatened species.

Unprotected: This means the site is on private and/or public land and/or water where there is no legal protection status. If it is unknown whether they are protected or not, then it "s "indeterminate"

Wetland: Permanently or intermittently wet areas, shallow water and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions (Resource Management Act 1991). The vegetation may be exotic and/or native woody plants such as willows or manuka, and/or herbaceous plants such as sedges, rushes, raupō (Typha), or mosses such as Sphagnum. "Willow wetlands" are wetland areas with a canopy dominated by exotic willows, but often contain native vegetation beneath the willows.

Definitions are primarily sourced from:

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- Resource Management Act 1991

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Appendix A:

Regional Policy Statement - Chapter 11A

Criteria for Determining Significance of Indigenous biodiversity & Guidelines for interpretation (WRC 2019)

Previously assessed site	
1	It is indigenous vegetation or habitat for indigenous fauna that is currently, or is recommended to be, set aside by statute or covenant or by the Nature Heritage Fund, or Ngā Whenua Rāhui committees, or the Queen Elizabeth the Second National Trust Board of Directors, specifically for the protection of biodiversity, and meets at least one of criteria 3-11.
Ecological values	
2	In the Coastal Marine Area, it is indigenous vegetation or habitat for indigenous fauna that has reduced in extent or degraded due to historic or present anthropogenic activity to a level where the ecological sustainability of the ecosystem is threatened.
3	It is vegetation or habitat that is currently habitat for indigenous species or associations of indigenous species that are: · classed as threatened or at risk, or · **endemic** to the Waikato region, or · at the limit of their natural range.
4	It is indigenous vegetation, habitat or ecosystem type that is under-represented (20% or less of its known or likely original extent remaining) in an Ecological District, or Ecological Region, or nationally.
5	It is indigenous vegetation or habitat that is, and prior to human settlement was, nationally uncommon such as geothermal, chenier plain, or karst ecosystems, hydrothermal vents or cold seeps.
6	It is wetland habitat for indigenous plant communities and/or indigenous fauna communities (excluding exotic rush/pasture communities) that has not been created and subsequently maintained for or in connection with: · waste treatment; · wastewater renovation; · hydro electric power lakes (excluding Lake Taupō); · water storage for irrigation; or · water supply storage; unless in those instances they meet the criteria in Whaley *et al*.. (1995).
7	It is an area of indigenous vegetation or naturally occurring habitat that is large relative to other examples in the Waikato region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type. Note this criterion is not intended to select the largest example only in the Waikato region of any habitat type.
8	It is aquatic habitat (excluding artificial water bodies, except for those created for the maintenance and enhancement of biodiversity or as mitigation as part of a consented activity) that is within a stream, river, lake, groundwater system, wetland, intertidal mudflat or estuary, or any other part of the coastal marine area and their margins, that is critical to the self sustainability of an indigenous species within a catchment of the Waikato region, or within the coastal marine area. In this context "critical" means essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species. This includes areas that maintain connectivity between habitats.
9	It is an area of indigenous vegetation or habitat that is a healthy and representative example of its type because: · its structure, composition, and ecological processes are largely intact; and · if protected from the adverse effects of plant and animal pests and of adjacent land and water use (e.g. stock, discharges, erosion, sediment disturbance), can maintain its **ecological sustainability** over time.
10	It is an area of indigenous vegetation or habitat that forms part of an **ecological sequence**, that is either not common in the Waikato region or an ecological district, or is an exceptional, representative example of its type.
Role in protecting ecologically significant area	
11	It is an area of indigenous vegetation or habitat for indigenous species (which habitat is either naturally occurring or has been established as a mitigation measure) that forms, either on its own or in combination with other similar areas, an ecological buffer, linkage or corridor and which is necessary to protect any site identified as significant under criteria 1-10 from external adverse effects.

Appendix B:

Guidelines for assessing significance and relative level of significance

From WRC GUIDELINES 2019 – in preparation

Step 1: Is a site significant?

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

Step 2: Why is a site significant?

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

Step 3: Optional: How significant is a site?

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

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

Site Name: **Area (ha):** **Ecological District:**

Land Tenure:

Location (grid reference and general location):

General Description:

A. Criteria[5]	B. Definitions and Further Information[9]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
PREVIOUSLY ASSESSED SITE				
1 It is indigenous vegetation or habitat that is currently, or is recommended to be, set aside by statute or covenant or by the Nature Heritage Fund, Ngā Whenua Rāhui committees, or the Queen Elizabeth the Second National Trust Board of Directors specifically for the protection of biodiversity, and meets at least one of Criteria 2-11.	This may include sites protected under the Conservation Act, Resource Management Act, or with QEII National Trust, Ngā Whenua Rāhui, or Nature Heritage Fund. Some areas may be protected for reasons other than biodiversity protection. If unsure, check the reasoning for protection with the authority responsible for the gazetting of the site.	Department of Conservation Waikato Regional Council Ngā Whenua Rāhui QEII National Trust Nature Heritage Fund Territorial Authority (District or City council).	Y / N / NS	What type of legally protected area is it? e.g. Scenic Reserve, National Park, QEII Covenant. _____ _____

9 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[6]	B. Definitions and Further Information[10]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
ECOLOGICAL VALUES				
2 In the **Coastal Marine Area**, it is indigenous vegetation or habitat for indigenous fauna that has been reduced in extent or degraded due to historic or present anthropogenic activity to a level where the **ecological sustainability** of the ecosystem is threatened.	Sound technical advice will need to be obtained from an appropriately qualified and experienced coastal or marine ecologist to accurately determine whether this criterion is met. A 'type' of vegetation or habitat could refer to a unit such as intertidal **wetland**, or a more detailed classification such as seagrass beds. See Section 5 for publications which provide examples of coastal vegetation types. Examples of indigenous vegetation or habitat for indigenous fauna in the **coastal marine area** may include mangroves, seagrass beds, kelp forests, tidal saltmarsh, subtidal or intertidal reefs, and estuaries (which often encompass a range of other habitats). Comparison of historical extent and present-day extent of a vegetation type will be required to accurately determine whether this criterion is met. Alternatively, intimate knowledge of coastal vegetation and habitats and patterns of loss within the region and nationally will be required. Knowledge of historic, current, and ongoing pressures on the vegetation/habitat type will also be required.	Waikato Regional Council Territorial Authority (district or city council) Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation	Y / N / NS	Is there evidence that the ecosystem type(s) in this site have become nationally or regionally depleted or degraded? (Please reference evidence below) _____ _____ Relevant habitat type(s): _____ _____ Area (ha) _____ Current vs historical extent: _____ Drivers of degradation (anthropogenic? Natural?): _____ Is ecological sustainability threatened e.g. does the site still retain natural character? Will the site continue to exist as indigenous habitats or vegetation without intervention?

10 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[6]	B. Definitions and Further Information[10]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
	Examples of where this criterion could be met include: • Kelp forests which have been degraded and reduced in extent through urchin (kina) grazing. This can occur through anthropogenic pressures such as overfishing of key kina predators like snapper and crayfish. • Seagrass beds can be degraded and reduced in extent through sedimentation and smothering resulting from land use clearance in surrounding catchments. • Intertidal sand and mud flats which form important feeding habitat for wader birds can be degraded and reduced in extent through elevated sedimentation loads exacerbated by land use clearance in catchments.			

A. Criteria[8]		B. Definitions and Further Information[11]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
3	It is vegetation or habitat that is currently habitat for indigenous species or associations of indigenous species that are: • Classified as threatened or at risk, or • **Endemic to the Waikato Region**, or • At the limit of their **natural range**.	Species that are threatened with extinction are indigenous species that have been evaluated and placed within any of the 'Threatened' or 'At Risk' categories within the New Zealand Threat Classification System[12]. Care should be taken when assessing this criteria for species which are otherwise common in the wider landscape/ecological region/district but which are listed as Threatened or At Risk as a precautionary measure due to potential risk factors e.g. common Myrtaceae species which are now classified as Threatened or At Risk due to the threat posed by Myrtle rust. In these instances, professional ecological judgment should be used. With respect to fauna habitat, professional ecological judgement should be used when assessing significance particularly when evaluating relative significance of occasional use by highly mobile fauna. Where there is doubt, refer to the guidelines on rarity and distinctiveness given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council University of Waikato Published reports or maps	Y / N / NS	List the subject species and their threat category, e.g. Threatened-Nationally Critical, At Risk-Declining, At Risk-Naturally Uncommon, regionally uncommon. List source of information. _____ _____ _____ _____ List any Threatened or At Risk species that use the site which are international migrants. _____ _____ List any regionally endemic species present. _____ _____ List any species at the limits of their natural range. _____ _____

11 Terms highlighted in **bold** type are defined in the glossary on Page 37.

12 When listing Threatened, At Risk, or Data deficient species for this criterion, please ensure the most up-to-date threat classification publications are used for the relevant organism grouping.

A. Criteria[10]	B. Definitions and Further Information[13]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
4 It is indigenous vegetation, habitat, or an ecosystem type that is **under-represented** (20% or less of its known or likely original extent remaining) in an Ecological District, Ecological Region, or nationally.	Maps of ecological regions and districts are available from Department of Conservation or Waikato Regional Council. A type of indigenous vegetation or habitat could refer to a broad unit such as podocarp/tawa forest, or a more detailed classification and mapping unit such as harakeke (*Phormium tenax*) flaxland. Definitions and examples of vegetation/habitat structural classes and vegetation types are provided in Atkinson (1985). See Section 5 for other publications which provide examples of vegetation types for various habitats. Comparison with known or likely original extent may require analysis (e.g. using a Geographic Information System) of current extent and previous extent. As a starting point, use the vegetation/habitat type analysis provided in Appendix 1 of this document which is based on the potential historic ecosystems of New Zealand by Singers and Rogers (2014)[14].	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	List under-represented vegetation/habitat type(s) and state whether they are under-represented at a national, regional, or ecological district scale? _____ _____ _____ _____ _____ List sources of information for determining whether an ecosystem/vegetation type is under-represented. _____ _____ _____ _____ _____

13 Terms highlighted in **bold** type are defined in the glossary on Page 37.

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

A. Criteria[10]	B. Definitions and Further Information[13]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
	If protected natural area programme reports (PNAP survey reports) are available for your area, these will provide a more detailed, comprehensive analysis of vegetation types.			

A. Criteria[12]		B. Definitions and Further Information[15]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
5	It is indigenous vegetation or habitat that is, and prior to human settlement was, nationally uncommon, such as geothermal, Chenier plain, or karst ecosystems, hydrothermal vents or cold seeps.	Geothermal habitats can include geysers, springs, sinter terraces, and hydro-thermally altered soils. They provide habitat for geothermally-influenced vegetation, and heat-tolerant bacteria. A Chenier plain is a plain comprising shell ridges with infilled muds and other sediment between the ridges. An extensive area at Miranda provides habitat for international wader migrants. Karst ecosystems are limestone systems, providing habitat for specialist limestone plants (e.g. *Asplenium cimmeriorum, Gymnostomum calcereum*) and fauna (e.g. cave wētā). Note that these three examples are not a comprehensive list of nationally uncommon vegetation or habitat	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council	Y / N / NS	Type of feature: _____ _____ _____ Area: _____ Condition: _____ _____ _____

15 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[12]	B. Definitions and Further Information[15]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
	types. Other nationally uncommon and/or historically rare ecosystems are defined in Williams *et al.* (2007) and Holdaway *et al*. (2012). Where there is doubt, refer to the guidelines on rarity and distinctiveness given in Appendix 2.			

A. Criteria[13]	B. Definitions and Further Information[16]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
6 It is **wetland** habitat for indigenous plant communities and/or indigenous fauna communities (excluding exotic rush/pasture communities) that has not been created and subsequently maintained for or in connection with: (a) waste treatment; or (b) wastewater renovation; or (c) hydroelectric power lakes (excluding Lake Taupō); or (d) water storage for irrigation; or (e) water supply storage; unless in those instances they meet the criteria in Whaley *et al*. (1995).	Wetlands have been severely depleted nationwide, and are recognised as a nationally rare habitat type. Wetlands may have fluctuating water levels and the edge of a wetland may be difficult to define but will generally be where wetland plant species (e.g. raupō) are replaced with dryland species (e.g. kānuka); soil analysis may be required to accurately delineate wetland boundaries in some instances (see Fraser *et al.* 2018). Note that mānuka can occur in wetland and dryland habitats. The definition of wetlands also includes coastal wetlands, e.g. ephemeral wetlands associated with sand dunes, mangroves, and estuaries. See Section 5 for publications which provide good information on wetland delineation. All artificially-created wetlands listed in Criterion 6a-e should <u>also</u> be evaluated using the criteria in Whaley *et al*. (1995), as well as criteria 1-5 and 7-11 in Table 1. The significance criteria from Whaley *et al.* (1995) are reproduced in Appendix 3.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps Copies of Whaley *et al*. (1995) can be obtained from Waikato Regional Council	Y / N / NS	Type of wetland habitats/indigenous communities present: _____ _____ _____ _____ Origins of wetland (natural, artificial): _____ _____ If the wetland was constructed, or created artificially (e.g. ponding following road construction) what was the purpose for which it was created (if known): _____ _____ Area (ha): _____

16 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[14]	B. Definitions and Further Information[17]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
7. It is an area of indigenous vegetation or naturally occurring habitat that is large relative to other examples in the Waikato Region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type. Note that this criterion is not intended to select the largest example only in the Waikato Region of any habitat type.	This criterion is not intended to select the largest single example of a habitat type in the Waikato Region. Refer to vegetation maps (e.g. Leathwick *et al*. 1995, Singers and Rogers 2014), natural area inventories, DOC compilations of Sites of Special Wildlife Importance (SSWI), DOC Conservation Management Strategies for Waikato, Bay of Plenty, Wanganui, Auckland, and Tongariro/ Taupō Conservancies, Protected Natural Area Programme survey reports to help determine the species that are typical of each habitat type and to determine which other parts of the Waikato Region have similar habitat, and the size of those examples. Where there is doubt, refer to the representativeness and diversity and pattern guidelines given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	Broad habitat types present: _____ _____ Area (ha) Notable flora or fauna: _____ _____ How does the size compare with other similar habitat types in the Region? _____ _____ Would you consider this to be among the best examples of its type nationally (Y/N), in the Waikato Region (Y/N), or in a particular ecological region/ district (Y/N)? Provide justification. _____ _____

A. Criteria[15]	B. Definitions and Further Information[18]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
8 It is aquatic habitat (excluding artificial water bodies, except for those created for the maintenance and enhancement of	Excludes artificial water bodies, except those created for the maintenance and enhancement of biodiversity or as mitigation for a consented activity.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water	Y / N / NS	Catchment: _____ _____

17 Terms highlighted in **bold** type are defined in the glossary on Page 37.

18 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[15]	B. Definitions and Further Information[18]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
biodiversity or as mitigation as part of a consented activity) that is within a stream, river, lake, groundwater system, **wetland**, intertidal mudflat or estuary, or any other part of the **coastal marine area** and their margins, that is **critical** to the self-sustainability of an indigenous species within a catchment of the Waikato Region, or within the **coastal marine area**. In this context '**critical**' means essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species. This includes areas that maintain connectivity between habitats.	Groundwater systems in this context relate to spring-fed streams and wetlands, other wetlands that are primarily fed by ground water (e.g. fens and seepages), and underground water systems. Therefore, a ground water system in this context is potentially significant in its role of maintaining such spring or ground-fed streams and wetlands. It is likely that sound technical advice will need to be obtained from an appropriately qualified and experienced aquatic ecologist.	and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council University of Waikato		Area (ha) or length of habitat: _____ Species dependent on the system: _____ _____ _____

	A. Criteria[16]	B. Definitions and Further Information[19]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
9	It is an area of indigenous vegetation or habitat that is a healthy, **representative** example of its type because: • its structure, composition, and ecological processes are largely intact; and, • if protected from the adverse effects of plant and animal pests and of adjacent land and water use (e.g. stock, discharges, erosion, sediment disturbance), can maintain its **ecological sustainability** over time.	Fencing and pest control would be required for most mainland sites in the Waikato Region (irrespective of habitat type). Ecologists assessing this criterion should take into account the site's size, shape, buffering from external effects, and connection to other natural areas. Other factors to be considered include indigenous regeneration and recruitment (e.g. the presence of fruit, seedlings, nests, juveniles, fauna), structural tiers, hydrological processes in wetlands, invasive weeds, pest animals, domestic stock, threat management, management history. Where there is doubt, refer to the representativeness and diversity and pattern guidelines given in Appendix 2.	Consultant Ecologist Department of Conservation Waikato Regional Council Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Published reports or maps This criterion will require the input of an experienced and qualified ecologist. Good information will be required, and, in most instances, a field visit will be necessary.	Y / N / NS	Rank the following factors High (H), Medium (M) or Low (L): • Structural intactness ____ • Ratio of indigenous:exotic species ____ • Connectivity to other natural areas ____ • Size of the area in the context of the relevant ecological district ____ • Degree of protection from likely threats (e.g., fenced, buffered) ____ • Species diversity ____ List no. of responses to the above questions: H _____ M _____ L _____ Indicate overall ecological quality of the site: _____ Would you consider this to be among the best examples of its type nationally (Y/N), in the Waikato Region (Y/N), or in a particular ecological region/district (Y/N)? Provide justification: _____ _____ _____ _____

19 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[17]		B. Definitions and Further Information[20]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
10	*It is an area of indigenous vegetation or habitat that forms part of an **ecological sequence** that is either not common in the Waikato Region or an ecological district, or is an exceptional, **representative** example of its type.*	Ecological sequences that are not common in the Waikato Region include, but are not restricted to, indigenous dune vegetation through to coastal scrub or forest, lake margins or geothermal systems to indigenous forest, coastal to montane or alpine vegetation. Such sequences should be largely intact (e.g. perhaps bisected by roads but not by large tracts of non-indigenous land cover), such that they can be traversed by most indigenous species that are reliant on such sequences for the completion of part or all of their life-cycles (e.g. by movement of key fauna or dispersal of propagules such as seeds). It will probably be necessary to provide or obtain a map(s) of the sequence and the main vegetation types and habitats that it comprises. GIS analysis using a vegetation map and an appropriate evaluation framework, e.g. ecological district boundaries, may demonstrate whether a sequence is uncommon or one of the better examples. An exceptional, representative sequence will be one of the best examples of its type in the Waikato Region, taking into account its intactness, composition, and ecological processes.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	Does the site include or is it part of one of the best or only examples of this type of ecological sequence nationally (Y/N), regionally (Y/N), or in the relevant ecological district (Y/N)? Location: _____ Key elements of sequence: _____ _____ _____ _____ _____ Justification: _____ _____ _____ _____ _____ _____ _____ _____

20 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. Criteria[17]	B. Definitions and Further Information[20]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
	Where there is doubt, refer to the diversity and pattern guidelines given in Appendix 2.			

A. Criteria[18]		B. Definitions and Further Information[21]	C. Likely Information Sources	D. Response (Yes? No? Not sure?)	E. If Yes, provide the information requested below to justify your decision and to assist with determining level of significance.
ROLE IN PROTECTION OF ECOLOGICALLY SIGNIFICANT AREA					
11	It is an area of indigenous vegetation or habitat for indigenous species (which habitat is either naturally occurring or has been established as a mitigation measure) that forms, either on its own or in combination with other similar areas, an ecological buffer, linkage or corridor, and which is necessary to protect any site identified as significant under Criteria 1-10 from external adverse effects.	This also includes riparian vegetation that protects a significant aquatic habitat e.g. a freshwater fishery, a lake, river, or stream that is important for the sustainability of an indigenous species, or a coastal or marine system. This criterion can also include sites which act as 'stepping stone' habitat between otherwise geographically isolated, significant sites. Determination of how far stepping stone habitat can be from other significant sites will depend on which species is used as an example. Therefore, care should be taken to consult a suitably qualified ecologist when determining whether a site meets this criterion. Where there is doubt, refer to the ecological context guidelines given in Appendix 2.	Consultant Ecologist Crown Research Institute, e.g. Landcare Research or National Institute of Water and Atmospheric Research (NIWA) Department of Conservation Waikato Regional Council Published reports or maps	Y / N / NS	Key ecological function(s) of the site (buffer, ecological linkage, other): _____ _____ Which site(s) does this area provide a buffer or linkage for? _____ _____ Which of criteria 1-10 does the buffered or linked site comply with? _____ _____ Justification: _____ _____ _____

21 Terms highlighted in **bold** type are defined in the glossary on Page 37.

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

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

A. RPS Criteria met (see Table 1, Section 3 above)	**B. Factors to be assessed**[22]	**C. Notes**	**D. Response (Yes / No / Not Sure)**
	INTERNATIONALLY SIGNIFICANT A site is Internationally Significant if you respond 'YES' to any of the questions in this section.	**Internationally significant** natural areas have usually been identified in previous assessments. These sites are so important that some of them are already protected by international conventions. For example, the Tongariro National Park is a World Heritage Area, and there are three wetlands in the Waikato listed as Wetlands of International Importance under the international Ramsar Convention (Whangamarino Swamp, Kopuatai Peat Dome, and the Firth of Thames estuary). Other natural areas may be internationally significant if they contain high quality vegetation or habitat that is unique in the world - for example, geothermal systems at Waiotapu and Orakeikorako.	

22 Terms highlighted in **bold** type are defined in the glossary on Page 37.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
		Internationally significant sites are likely to attract the interest of overseas and NZ scientists, and be a primary attraction for international and national tourists, e.g. Miranda bird sanctuary, Tongariro National Park.	
1	Has it been recognised under international legislation or convention, or recommended for protection by a suitably qualified body, as an internationally significant area (e.g. as a World Heritage Site or a Ramsar site)?	A suitably qualified body able to recommend a site for international recognition includes Department of Conservation, QEII National Trust, Ngā Whenua Rāhui, and Nature Heritage Fund[23].	Y / N / NS
2	Is it a coastal habitat or ecosystem type within the Coastal Marine Area, which has been depleted or degraded on an international scale *and* is it degraded to the extent where **ecological sustainability** is threatened internationally?	For example shell barrier beaches at Miranda, seagrass beds, or some shellfish beds.	Y / N / NS
3	Is it currently habitat for an indigenous species (or genetically distinct population) which is threatened with extinction (in the categories Nationally Critical, Nationally Endangered, or Nationally Vulnerable) **and endemic to the Waikato Region**?	For a site to meet the criterion for international significance it must comprise **significant habitat** for a species (or genetically distinct population) on an international basis. It must also provide habitat for the species (or genetically distinct population), and/or the genetic entity must be indigenous to the site.	Y / N / NS

23 DOC = Department of Conservation, WRC = Waikato Regional Council, NHF = Nature Heritage Fund, NWR = Ngā Whenua Rāhui, QEII = QEII National Trust.

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
		Nationally threatened Waikato endemics include Northern striped gecko, Moehau stag beetle, *Corybas carsei*.	
3	Is it a key habitat for the completion of the life cycle of a species (or genetically distinct population) that migrates internationally, the populations of which would be threatened if these habitats were not sustained?	An example of key habitat for international migrants is the Firth of Thames.	Y / N / NS
3	Is it significant habitat for a threatened international migrant at the limit of its natural range?		Y / N / NS
5	Is it one of the best international examples of an ecosystem type which is nationally uncommon?	For example shell barrier beaches at Miranda.	Y / N / NS
If the site meets several of: 2 **&** 9, or 4 **&** 9, or 5 **&** 9, or 6 **&** 9, or 7 **&** 9, or 8 **&** 9, or 9 **&** 10	Is the site the best or only remaining large **representative** example in New Zealand of a **suite** of relatively intact indigenous ecosystems and **ecological sequences** e.g. a **wetland**/forest complex with altitudinal sequences?	This would need to be justified by several well-qualified and experienced ecologists.	Y / N / NS

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
	NATIONALLY SIGNIFICANT The site is **at least** Nationally Significant if you can answer 'YES' to any of the questions in this section.	**Nationally Significant** natural areas include sites that contain healthy populations of threatened species (such as kōkako and kākā habitat at Pureora), or are very good examples of nationally rare habitat or vegetation (such as the large wetlands in the northern Waikato). They also include sites that are the only location where certain species occur, such as the Mahoenui giant wētā. Nationally significant sites tend to attract the interest of scientists, technical specialists, and/or tourists from other parts of New Zealand.	
1	Is it protected, or recommended for protection, under the Conservation Act 1987 (as an Ecological Area, or Forest Sanctuary), National Parks Act 1980, Marine Reserves Act 1971, or Reserves Act 1977 (as a Nature Reserve or Scientific Reserve)?	In the Waikato Region these include, but are not limited to, Tongariro National Park, Waihaha Ecological Area, Waipapa Ecological Area, Mangatutu Ecological Area, Rapurapu Ecological Area, Ecological Areas on the Coromandel Peninsula.	Y / N / NS
2	Is it a coastal habitat or ecosystem type within the Coastal Marine Area which has been depleted or degraded on a national scale *and* is it degraded to the extent where **ecological sustainability** is threatened nationally?	Examples in the Waikato Region include rhodolith beds.	Y / N / NS
3	Is it habitat used on a **regular basis** by, or is key habitat for, an indigenous species (or genetically distinct population) in the threat categories 'Nationally Critical', 'Nationally Endangered', or 'Nationally Vulnerable'?	Sites where low numbers are present on only a few occasions (and are unlikely to be important for the long-term viability of the species) do not meet this criterion. For a site to meet this criterion for national significance, it will be of importance for the viability of the species (or genetically distinct population) on a national basis. The site will provide habitat for the species (or genetically distinct population), and it will either be used on an **ongoing basis**, or be important for sustaining a population on a	Y / N / NS

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
		seasonal basis for key components of its life cycle (e.g. feeding site), or be an important migratory site, breeding site, or over-wintering site.	
3	Is it one of the best quality examples nationally of habitats used on an **ongoing basis** by a species (or a genetically distinct population) in the At Risk categories 'Declining', 'Recovering', 'Relict', or 'Naturally Uncommon'?	For example, Archey's frog habitat at Whareorino.	Y / N / NS
3	Is it a key habitat for the completion of the life cycle of a nationally Threatened or At Risk species (or genetically distinct population) that migrate nationally and that would be threatened if these habitats were not sustained?	For example, over-wintering habitat for black stilt at Kawhia Harbour, or over-wintering habitat for banded dotterel at Kawhia Harbour and Aotea Harbour.	Y / N / NS
2 **&** 9, or 4 **&** 9 or 5 **&** 9 or 6 **&** 9	Is it indigenous vegetation or habitat for indigenous species that is **under-represented** nationally (20% or less remains), or nationally uncommon (including **wetland**) that is a good quality example that is **representative** of its type?	Good quality examples would receive mostly high or medium ratings for Criterion 9 in Table 1, taking into account size, presence of plant and animal pests, stock damage, and other damaging effects. For the definition of vegetation types refer to Criterion 4 in Table 1 above: Column B, Definitions and Further Information.	List no. of responses to criterion 9 in Table 1: H _____ M _____ L _____ Y / N / NS
	<u>REGIONALLY SIGNIFICANT</u> The site is **at least** Regionally Significant if you can respond 'YES' to any of the questions in this section.	**Regionally significant** natural areas include the best examples in the Waikato Region of habitats that may be common elsewhere in New Zealand - for example, our best	

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
		dune systems or largest mangrove-filled estuaries, or large examples of more common vegetation types. They may also include degraded examples of nationally rare features.	
1	Is it protected, or has been recommended to be protected, under the Reserves Act 1977, as a Wildlife Management Reserve, Wildlife Refuge, Scenic Reserve, Ngā Whenua Rāhui Kawenata, or for any conservation purpose under the Conservation Act such as a Conservation Area or Conservation Park, specifically for the protection of biodiversity?		Y / N / NS Status: _____ Recommended Status: _____
1	Is it protected, or has it been recommended to be protected, as a QEII Open Space Covenant, Ngā Whenua Rāhui Kawenata, or Nature Heritage Fund reserve for biodiversity protection purposes other than those outlined for sites of international or national significance?		Y / N / NS
2	Is it a coastal habitat or ecosystem type within the Coastal Marine Area which has been depleted or degraded on a regional scale *and* is it degraded to the extent where **ecological sustainability** is threatened regionally?	For example green-lipped mussel (*Perna canaliculus*) beds, subtidal seagrass beds, estuarine habitat.	Y / N / NS
3	Is it habitat of considerable importance for the conservation of an indigenous species (or genetically distinct population) in the 'At Risk' category ('Declining', 'Recovering', 'Relict', and 'Naturally Uncommon'), or is important habitat for a non-threatened species that is	Assessment of whether a species is regionally uncommon in the Waikato Region would have to be justified by a well-qualified and experienced ecologist(s) very familiar with the species and ecology of the Waikato Region.	Y / N / NS Species: _____

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
	endemic to the Waikato Region, or at the limits of its **natural range**.	Sites where low numbers are present on only a few occasions and it is unlikely to be important for long-term viability of the species - or genetically distinct population - do not meet this criterion. For a site to meet this criterion for regional significance, the site will be of importance for the viability of a particular species (or genetically distinct population) on a regional basis. The site will provide habitat for the species (or genetically distinct population), and it will either be used on an **ongoing basis**, or be important for sustaining a population on a seasonal basis for key components of its life cycle (e.g. feeding site), or be an important migratory site, breeding site, or over-wintering site. Small populations of threatened plants, which are not significant on a national basis, but in the Threatened categories Nationally Critical, Nationally Endangered, or Nationally Vulnerable, may be placed in this category.	Threat Status: _____
3	Is it habitat of importance for the conservation of a regionally uncommon species (or genetically distinct population) within the Waikato Region, although the species is secure elsewhere?		Y / N / NS Species: _____ Threat Status: _____
3	Is it habitat considered (by several qualified and experienced ecologists) to be of importance for the sustainability of a 'data-deficient' species on a regional basis.		Y / N / NS Species: _____ Threat Status: _____

A. RPS Criteria met (see Table 1, Section 3 above)	**B. Factors to be assessed**[22]	**C. Notes**	**D. Response (Yes / No / Not Sure)**
2 **&** 9 or, 4 **&** 9	Is it indigenous vegetation or habitat for indigenous species that is **under-represented** regionally (i.e. within relevant ecological regions and districts) and which is a good quality example that is **representative** of its type (taking into account size, plant and animal pests, stock damage, and other damaging effects)?	Good quality examples would receive high or medium ratings for Criterion 9 in Table 1. Assessment must be justified by a suitably qualified and experienced ecologist.	List no. of responses to question 9 in Table 1: H _____ M _____ L _____ Y / N / NS
4, 5, or 6	Is it a relatively large example of indigenous vegetation or habitat for indigenous species that is **under-represented** nationally, or nationally uncommon (including **wetlands**), but which is degraded in quality (taking into account presence of plant and animal pests, stock damage, and other damaging effects)?	Assessment must be justified by a well-qualified and experienced ecologist. Use the results from Criterion 9 in Table 1 to determine the relative quality of the site.	Y / N / NS
4	Is it the Region's only remaining **representative** example (irrespective of its size) of a particular indigenous vegetation type or indigenous species habitat that is degraded in quality?	**Representative** examples are vegetation/habitat types that are typical or characteristic of the indigenous biodiversity of an ecological district and which include all the expected species/assemblages for a particular ecological district and/or landform. The reality for many landscapes, particularly throughout much of the Waikato, is that a '**representative** example' will be the largest and most diverse remaining example of indigenous vegetation and habitats.	List no. of responses to question 9 in Table 1: H _____ M _____

A. RPS Criteria met (see Table 1, Section 3 above)	**B. Factors to be assessed**[22]	**C. Notes**	**D. Response (Yes / No / Not Sure)**
		Degraded sites would receive mostly Low scores for the factors listed in Criterion 9.	L _____ Y / N / NS
9 or 8 **&** 9 or 10 **&** 9	Is it one of the best **representative** examples in the Waikato Region of indigenous vegetation, or habitat for indigenous fauna, or an **ecological sequence**?	Assessment must be justified by a well-qualified and experienced ecologist.	Y / N / NS
7 **&** 9	Is it a large, good quality example of indigenous vegetation or habitat for indigenous species **representative** of the ecological character typical of the Waikato Region?	This may include examples of indigenous vegetation that are large or moderately large relative to other similar habitats in the Region or within the relevant ecological district. They should be relatively intact and retain the main elements of their original composition structure. Examples would include relatively large tracts of indigenous forest and habitats on the Hakarimata Range and Kaimai Range.	Y / N / NS
11	Is it a buffer (or a key part of a buffer) to a site that is of international or national significance?	The site buffered must have first been shown to be of national or international significance using relevant sections in Table 2 above.	Y / N / NS

A. RPS Criteria met (see Table 1, Section 3 above)	B. Factors to be assessed[22]	C. Notes	D. Response (Yes / No / Not Sure)
All	**LOCALLY SIGNIFICANT** The site is **at least** of Local Significance if you answered "Yes" to at least one of criteria 2-11 in Table 1 but did not answer "Yes" to any of the questions above in Table 2.	**Locally significant** natural areas are healthy examples of relatively common vegetation and habitat types. They are often small areas, but large enough to enable key ecological processes to occur, such as regeneration of seedlings or reproduction and recruitment of indigenous fauna. These sites may not be particularly significant in their own right, but nevertheless play an important part in a network of natural areas. For example, a locally significant site might be important as a seasonal feeding or breeding area. It might also act as a 'stepping stone' between other natural areas, allowing indigenous fauna to move in search of food or mates. Such sites are likely to provide **representative** examples of common or typical vegetation types or habitat for common indigenous species. They will not be among the best examples in the Region but will meet Criterion 9 as healthy, functioning, and ecologically viable sites.	Y / N
HOW SIGNIFICANT IS THE SITE?		Circle the highest level for which you allocated at least one "Yes" response in Table 2. This indicates the relative importance of the site.	International, National, Regional, Local

Table 3: Checklist for assessing the relative importance of an area of significant indigenous vegetation or significant habitat of indigenous fauna.

Notes for Table 3

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

1 Sites that are the 'best' example of their type will also meet Criterion 9. For international significance such sites will also be likely to meet a number of other criteria and must comprise an ecosystem complex.

2 Levels of significance are applicable to any site that is part of a larger area that qualifies under any criterion.

3 A site that is significant as a large area of wildlife habitat, aquatic habitat or a representative example of its type, will only be of greater than regional significance if it also meets one of the other criteria for which national or international levels apply. For instance, if the site was also habitat for acutely threatened species, it would be assessed using Criterion 3 as well as Criteria 7, 8, or 9.

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

Criteria	Reason for Significance	Significance Levels		
		International	National	Regional
				Regionally uncommon species
4	Under-represented vegetation or ecosystem type	Best[1] or only remaining large example of a suite or sequence of ecosystems. For criteria 4, 5, 6, and 10, sites in this category would also be likely to meet a number of other criteria and form an ecosystem complex.	Good quality example of nationally under-represented vegetation or ecosystem type (must also meet Criterion 9).	Good quality example of regionally under-represented vegetation or ecosystem type. **OR** Relatively large but degraded example of a nationally under-represented habitat type. **OR** Degraded example but the Region's only remaining example (of any size).
5	Nationally/naturally uncommon ecosystem	Best[1] or only remaining large example in NZ of a suite of naturally uncommon ecosystems.	Good quality example of a nationally rare type (must also meet Criterion 9).	Relatively large but degraded example.
6	Wetland habitat	Best[1] or only remaining large example in NZ of a wetland type with gradients between other ecosystem types.	Good quality example (must also meet Criterion 9).	Relatively large but degraded example.
7	Large, diverse, intact habitat[2]	See notes above[2]	See notes above[2]	Good quality representative example (must also meet Criterion 9).
8	Aquatic habitat	See notes above[2]	See notes above[2]	The Region's best or only example of a good quality example (must also meet Criterion 9).
9	Representative example	See notes above[2]	See notes above[2]	One of the Region's best examples.
10	Uncommon or exceptional	Best[1] or only remaining large example of a suite or	Good quality example of a nationally rare	One of the Region's best examples (must

Criteria	Reason for Significance	Significance Levels		
		International	**National**	**Regional**
	ecological sequence.	sequence of ecosystems.	ecological sequence (must also meet Criterion 9).	also meet Criterion 9).
11	Buffer	-	-	Buffers a site that is of national or international significance.

Appendix C:

Key literature and datasets supporting the Hamilton City SNA assessment

Dataset	Source
Cornes, T.S., Thomson, R.E., Clarkson, B.D. 2012. Key Ecological Sites of Hamilton City Volume I & II. CBER Contract Report 121 prepared for Hamilton City Council. University of Waikato, Hamilton	Hamilton City Council
Hamilton District Plan SNA - GIS layer	Hamilton City Council
Biodiversity Vegetation (BIOVEG) - GIS Layer The dataset currently contains mapped polygons representing terrestrial vegetation, palustrine wetlands, mangroves, and saline wetlands within Waikato Regional Council boundary. The data set was digitised off the WRAPS imagery using a simplified version of the Land cover database (LCDB) classifications. This work is licensed under a Creative Commons Attribution 4.0 International License International	Waikato Regional Council
Aerial Photography – WRAPS 2017 – or later Colour digital orthophotography for the Waikato region. This work is licensed under a Creative Commons Attribution 4.0 International License	Waikato Regional Council
Aerial photography 2021 – Hamilton City	Hamilton City Council
Aerial Photography - Oblique Imagery 2021. Provided by LINZ This work is licensed under a Creative Commons Attribution 4.0 International License	Land Information New Zealand
Manaaki Whenua - Landcare Research New Zealand Limited. 2012. *Threatened Environment Classification.* Available at: https://www.landcareresearch.co.nz/tools-and-resources/mapping/threatened-environment-classification/#:~:text=The%20Threatened%20Environment%20Classification%20is,purpose%20of%20natural%20heritage%20protection The maps and information are licensed under a Creative Commons Attribution 3.0 New Zealand License	Manaaki Whenua - Landcare Research New Zealand Limited
WRC Biodiversity Inventory spatial dataset (draft – based on Singers & Rogers 2014). Provided by WRC on 3 September 2021	Waikato Regional Council
Protected areas	Land Information New Zealand
NIWA. 2021. *NZ Freshwater Fish Database.* Available at: https://niwa.co.nz/information-services/nz-freshwater-fish-database	NIWA
Biodiversity Information Management System (BIMS) spatial data and reports available for the HCC area (none available for Hamilton City)	Department of Conservation
Department of Conservation. 2021a. Bat database, spatial dataset. Provided by Department of Conservation. Dated June 2021	Department of Conservation
Department of Conservation. 2021. BioWeb Plants database, spatial dataset. Provided by Department of Conservation. Dated 2021	Department of Conservation
Department of Conservation. 2020. BioWeb herpetofauna database, spatial dataset. Provided by Department of Conservation. Dated 2020	Department of Conservation BioWeb (2021)
Fitzgerald, N. & Innes, J. 2019. *Hamilton biennial bird counts: 2004 - 2018.* Contract Report: LC3489 by Manaaki Whenua – Landcare Research. Prepared for Hamilton City Council and Ministry of Business, Innovation and Employment	Fitzgerald and Innes, (2019)
New Zealand Plant Conservation Network plant distribution database information drawn from National Vegetation Survey Database (NVS) (none present within Hamilton City)	New Zealand Plant Conservation Network and

	Manaaki Whenua - Landcare Research New Zealand Limited
Waikato Regional Council. 2016. Waikato Regional Policy Statement: Te Tauākī Kaupapahere Te-Rohe O Waikato. Hamilton, New Zealand.	Waikato Regional Council
Waikato Regional Council. 2002. Areas of Significant Indigenous Vegetation and Habitats of Indigenous Fauna in the Waikato Region. Guidelines to apply Regional Criteria and Determine Level of Significance. Waikato Regional Council Technical Report TR2002/15. 32 p. (DOCS# 791472)	Waikato Regional Council
Leathwick, J.R., Clarkson, B.D., Whaley, P.T. 1995. Vegetation of the Waikato Region: Current and Historical perspectives. Manaaki Whenua - Landcare Research contract report LC9596/022 prepared for Environment Waikato (Waikato Regional Council)	Manaaki Whenua - Landcare Research
Overdyck, E. 2019. Nationally threatened and regionally uncommon species of the Waikato Region TR 2019/28	Waikato Regional Council
Whaley, P.T., Clarkson, B.D & Leathwick, J.R. 1995. Assessment of criteria used to determine 'significance' of natural areas in relation to Section 6(c) of the Resource Management Act (1991). Hamilton, Manaaki Whenua – Landcare Research	Manaaki Whenua - Landcare Research
Clarkson B., Downs, T., Merrett, M. (eds.) 2002. Botany of the Waikato	Waikato Botanical Society Inc.
Harding, M. 1997. Waikato Protection Strategy. A report to the Forest Heritage Fund Committee	Forest Heritage Fund
Beadel, S.M., Shaw, W.B. 2000. Identification of significant natural areas in the Waikato Region using remote sensing and existing databases. Wildland Consultants Ltd Contract Report No. 340. Prepared for Waikato Regional Council. 103 pp	Waikato Regional Council
Waikato Regional Council & Wildland Consultants. 2019 - In Prep. Updated guidelines for determining areas of significant indigenous vegetation and habitats of indigenous fauna in the Waikato Region. Waikato Regional Council Technical Report	Waikato Regional Council & Wildlands
Department of Conservation. 2014. Waikato Conservation Management Strategy.	Department of Conservation
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Appendix D:

Types of legal protection in Hamilton City

This appendix lists the possible legal mechanisms, or types of legal protection that have been applied to protect natural areas within Hamilton City. The list includes those types that are reasonably expected to have been originally applied for protecting biodiversity values, as well as those considered indeterminate as to whether they were originally applied for protecting biodiversity values. This is based on the interpretation of RPS criterion 1, which assumes that the biodiversity values of a protected site have been previously assessed and deemed worthy of protection.

Legal protected types are:

- Nature Reserve
- Scientific Reserve
- National Reserve / National Park
- Scenic Reserve
- Conservation Park
- Wilderness Area
- Ecological Area
- Sanctuary Area
- Watercourse Area
- Wildlife Management Reserve / Government Purpose Reserve (Wildlife Management)
- Wildlife Refuge / Government Purpose Reserve (Wildlife Refuge)
- Wildlife Reserve / Government Purpose Reserve (Wildlife Reserve)
- Wildlife Sanctuary / Government Purpose Reserve (Wildlife Sanctuary)
- QEII Open Space Covenant
- Council Conservation Covenants
- Stewardship Area / Conservation Area
- Recreation Reserve
- Sanctuary Area
- Watercourse Area
- Historic Reserve
- Marginal Strip
- Local Purpose Reserve (Esplanade)

Appendix E:

Confidence levels for significant natural areas

Definitions and factors to consider when applying a Confidence Level to the significance assessment of a site. Adapted from Wildland Consultants Contract Report No. 1080 (DOC# 1396563)

Confidence level	Definition
High	High level of confidence in assessment. Ecological information about the site is: • Comprehensive • Reliable • Applicable and/or recent • Site specific Sites with a high confidence rating include: • Relatively large, well-studied, protected areas e.g. Waiwhakareke Natural Heritage Park. • Protected areas that are well known as habitats for threatened species • Unprotected sites that have been identified as recommended areas for protection in a protected natural areas survey. • Other sites that have been the subject of fauna and/or flora surveys and the information is comprehensive, reliable, recent and site-specific. Sites with a high confidence level have a low requirement for field survey
Medium	Moderate level of confidence in assessment. Ecological information about the site is: • Relatively comprehensive • Reliable • Not entirely applicable/ recent • More likely to be general than site-specific, e.g. the information applies to a larger tract of indigenous vegetation, of which the site is a relatively small part. Sites with a moderate confidence rating include: • Sites where the assessment is based on ecological information that does not meet all of the criteria for a high confidence level. • Sites that are contiguous with a site that has a high confidence level, and information about the contiguous site is assumed to be applicable to the site that is being assessed. • Sites that have been assessed as nationally or regionally significant on the basis of a record of a single species (such as kākā) without meeting other criteria for national or regional significance. • Sites for which incomplete ecological information exists, and for which targeted surveys may result in records of threatened species. Sites with a medium confidence level have a requirement for field survey.

Confidence level	Definition
Low	Low level of confidence in the assessment. Ecological information about the site is not available or is: • Not comprehensive • Unreliable • Out-dated • General Sites with a low confidence rating include: • Very small protected sites e.g. marginal strips. • Unprotected sites within ecological districts where a protected natural areas survey has not been undertaken. • Sites that have met criteria for national significance, solely on the basis of a record of a species (e.g. *Juncus holoschoenus var. holoschoenus*) that is probably extinct at the site. Sites with a low confidence level have a high requirement for field survey.

Appendix F:

Metadata for the "Significant Natural Areas – Hamilton City" Data set

Floristic Significant Natural Areas (fSNA) - Hamilton City 2022

Type File Geodatabase Feature Class

Tags Hamilton City Council, fSNA, floristic Significant Natural Areas

Summary

On behalf of Hamilton City Council, 4Sight Consulting has undertaken an assessment of floristic Significant Natural Areas (fSNA) within Hamilton City (Kirikiriroa). Floristic SNA are based on the historic SNA identified by Cornes et al. (2012). This dataset provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context.

Refer to the report: Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems (Montemezzani 2022).

Description

On behalf of Hamilton City Council, 4Sight Consulting has undertaken an assessment of significant natural areas (SNA) within Hamilton City (Kirikiriroa). Floristic SNA are based on the historic SNA identified by Cornes et al. (2012). This dataset provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context.

The SNA database will assist Hamilton City Council (HCC) in their development of policies, incentives, and rules in relation to their obligations under the Resource Management Act (1991), primarily under section 6c, to protect significant habitats of indigenous fauna and flora.

Based on the findings, recommendations were made on methods to maintain and protect existing SNA and indigenous biodiversity. Those recommendations were given to HCC, to be included as part of the District Plan review process, in which they will take this assessment into consideration.

The data resulting from this project will be held and maintained in an SNA database by HCC. It is important to recognise that the inventory produced for this study is an indicative and provisional data set of SNA in Hamilton City and it is expected to be updated periodically as new information becomes available. In particular, feedback from iwi, Department of Conservation (DOC), Manaaki Whenua and Landcare Research, other key stakeholders, and data obtained from consenting assessments will provide valuable information which will be used to validate the data.

Indigenous terrestrial and freshwater wetland natural areas were assessed as part of this inventory. Lake, stream, and riverine ecosystems were also included in this assessment, as they form an intrinsic part of the ecosystems within the landscape.

Refer to the report: Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems (Montemezzani 2022).

Credits

Wiea Montemezzani 4Sight Consulting

Use limitations

The first stage of the SNA site identification and significance assessments were carried out through a desktop exercise, during which no fieldwork or ground-truthing was undertaken. The desktop assessments were conducted using high resolution orthorectified aerial imagery, oblique imagery (provided by LINZ), and by reviewing the original SNA dataset (Cornes et al. 2012), existing spatial databases available in GIS software, existing ecological information available from reports, and local knowledge of 4Sight ecologists and the external reviewers Professor Bruce Clarkson and Gerry Kessels. Stage two of this assessment involved an extensive landowner consultation process during which 384 responses were received, and 58 properties were visited.

Extent

There is no extent for this item.

Scale Range

Maximum (zoomed in) 1:5,000

Minimum (zoomed out) 1:50,000

Corridor Significant Natural Area (cSNA) - Hamilton City 2022

Type File Geodatabase Feature Class

Tags Hamilton City Council, cSNA, corridor Significant Natural Areas

Summary

On behalf of Hamilton City Council, 4Sight Consulting has undertaken an assessment of corridor Significant Natural Areas (cSNA) within Hamilton City (Kirikiriroa). This dataset provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context.

Refer to the report: Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems (Montemezzani 2022).

Description

On behalf of Hamilton City Council, 4Sight Consulting has undertaken an assessment of significant natural areas (SNA) within Hamilton City (Kirikiriroa). This report provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context.

The SNA database will assist Hamilton City Council (HCC) in their development of policies, incentives, and rules in relation to their obligations under the Resource Management Act (1991), primarily under section 6c, to protect significant habitats of indigenous fauna and flora.

Based on the findings, recommendations were made on methods to maintain and protect existing SNA and indigenous biodiversity. Those recommendations were provided to HCC, who are currently in the process of a District Plan review process, in which they will take this assessment into consideration.

The data resulting from this project will be held and maintained in an SNA database by HCC. It is important to recognise that the inventory produced for this study is an indicative and provisional data set of SNA in Hamilton City and it is expected to be updated periodically as new information becomes available. In particular, feedback from iwi, Department of Conservation (DOC), Manaaki Whenua – Landcare Research, other key stakeholders, and data obtained from consenting assessments will provide valuable information which will be used to validate the data.

Indigenous terrestrial and freshwater wetland natural areas were assessed as part of this inventory. Lake, stream, and riverine ecosystems were also included in this assessment, as they form an intrinsic part of the ecosystems within the landscape.

Refer to the report: Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems (Montemezzani 2022)

Credits

Wiea Montemezzani. 4Sight Consulting

Use limitations

The first stage of the SNA site identification and significance assessments were carried out through a desktop exercise, during which no fieldwork or ground-truthing was undertaken. The desktop assessments were conducted using high resolution orthorectified aerial imagery, oblique imagery (provided by LINZ), and by reviewing the original SNA dataset (Cornes et al. 2012), existing spatial databases available in GIS software, existing ecological information available from reports, and local knowledge of 4Sight ecologists and the external reviewers Professor Bruce Clarkson and Gerry Kessels. Stage two of this assessment involved an extensive landowner consultation process during which 384 responses were received, and 58 properties were visited.

Extent

There is no extent for this item.

Scale Range

Maximum (zoomed in) 1:5,000

Minimum (zoomed out) 1:50,000

Appendix G:

Summary of attributes in Excel Master Dataset

The following is a list of all the attributes filled in in the Master Dataset. The complete Master Dataset will be provided as a separate document upon finalization of the spatial dataset.

SITE_ID
SITE_NAME
SNA Type
HIST_ID (2010)
SITE DESCRIPTION
ECOSYSTEM_TYPE
CRIT_1
CRIT_2
CRIT_3
CRIT_4
CRIT_5
CRIT_6
CRIT_7
CRIT_8
CRIT_9
CRIT_10
CRIT_11
RPS_CRITERIA_KNOWN_MET
RPS_CRITERIA_LIKELY_MET
RPS_CRITERIA_INDETERMINATE_MET
SIGNIFICANCE_2021
FULL_SIG_JUSTIFICATION
CONF_LEVEL
PEST_ANIMAL_ISSUE
PEST_PLANT_ISSUE
STOCK_ISSUE
DEV_ISSUE
OTHER_ISSUE
ISSUE_JUSTIFICATION
FAUNA
FAUNA & STATUS (2021)
FLORA
FLORA & STATUS (2021)
Reference_literature
BOUNDARY_SOURCE
AREA_HA
Latitude
Longitude

Appendix H:

Examples of linework review updates

Example 1. cSNA linework taken back to exclude the canopy dripline where this clearly overlaps man-made structures.

Example 2. Exclusion of an orchard along the eastern boundary of a gully slope.

Example 3. Exclusion of a driveway hidden under dense canopy.

Example 4. Exclusion of a deck and ornamental garden features.

Example 5. Exclusion of a narrow grass strip along a driveway.

Example 6. Exclusion of an area of flat garden adjacent to the gully slope.

Hamilton City District Plan Significant Natural Area Review – Issues and Options

Hamilton City Council

City Planning

Final Report

May 2022

REPORT INFORMATION AND QUALITY CONTROL

Prepared for:	Jamie Sirl Team Leader City Planning City Growth Hamilton City Council

Authors:	Melissa Pearson Senior Planning and Policy Consultant	
	Jerome Wyeth Principal Planning and Policy Consultant	
Approved for Release:	Jerome Wyeth Principal Planning and Policy Consultant	

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	V3 – Final Draft for Review	2 May 2022
	V4 – Final Report	31 May 2022

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1 INTRODUCTION

1.1 Purpose of report

4Sight has been engaged by Hamilton City Council to review and refine the provisions in the Hamilton City District Plan (**District Plan**) relating to Significant Natural Areas (**SNAs**). The purpose of this report is to outline issues and options to inform recommended amendments to the District Plan provisions relating to SNAs taking into account updated mapping of SNAs in the district recently completed by the 4Sight ecology team, relevant statutory requirements and policy direction, and current management practices for SNA protection and management. The recommendations in this report incorporate feedback from Hamilton City Council (**HCC**) and other external stakeholders and have resulted in recommended amendments to the SNA provisions in Chapter 20 in the District Plan and other consequential changes relating to the management of SNA to other chapters where required. These amendments to the District Plan will form part of a future plan change (Plan Change 9) and section 32 evaluation report.

1.2 Context for SNA review

The SNA provisions of the District Plan were last reviewed in 2017, when the final appeal point by the Waikato Regional Council was resolved by consent order. Although the provisions themselves were reviewed fairly recently, the underlying SNA mapping was based on work completed in 2010. It is also based only on areas of indigenous flora and does not include areas of significant indigenous fauna habitat. This is a significant gap as the Hamilton City district includes other vegetated areas (predominantly in gullies and along the Waikato River) that are the habitat for several threatened and/or regionally uncommon species, notably the long-tailed bat. Hamilton is one of only a few cities in New Zealand where long-tailed bats are known to persist in an urban landscape[1].The 4Sight ecology team has recently completed a desktop analysis (supported by targeted ground truthing), identifying areas of ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City. This work has identified an additional 695.47ha[2] of land (including 137ha of the Waikato River) that should be mapped as SNA in addition to the current 166ha already mapped as SNA in the District Plan[3]. The updated SNA mapping work is discussed in more detail in **Section 3.2** of this report.

As well as the review of the SNA mapping currently underway, there is also the need to review the operative SNA provisions in light of relevant statutory requirements. In particular, the Waikato Regional Policy Statement contains very clear direction on how to manage and protect areas of SNA. The review has also been informed by the policy direction and expected requirements in the proposed National Policy Statement for Indigenous Biodiversity (**proposed NPSIB**). While the proposed NPSIB is not yet in effect and has no legal weight, it provides clear national direction on how SNAs should be managed and is expected to be gazetted while Plan Change 9 is in the formal Schedule 1 submission and hearing process. Plan Change 9 is also intended to precede and align with a HCC plan change to give effect to the intensification policies in the National Policy Statement on Urban Development 2020 and the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 as the protection of SNA is one of the 'qualifying matters' that will be considered.

Finally, feedback has been received from the consenting team at HCC that the Operative District Plan provisions for SNA have some issues and are not always able to deliver the best environmental outcomes for indigenous biodiversity, particularly along the Waikato River and in the gully systems. This is resulting in a slow, cumulative loss of indigenous vegetation and habitat in these areas as pressure to develop private land increases. As such, this review provides an opportunity to review these provisions to respond to and address the implementation issues raised.

1.3 Structure of report

The report is structured as follows:

- **Section 2** – Statutory planning context
- **Section 3** – Strategic and local context
- **Section 4** – Review of other district plans
- **Section 5** – Review of existing Hamilton City District Plan provisions

[1] O'Donnell, C.F.J., Borkin, K.M., Christie, J.E., Lloyd, B., Parsons, S., Hitchmough, R.A. 2018: Conservation status of New Zealand bats, 2017. New Zealand Threat Classification Series 21. Department of Conservation, Wellington. 4 p.

[2] Excluding the Peacocke Structure Plan area, which includes an additional 75ha of SNA.

[3] 4Sight (2022) '*Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems',* prepared for Hamilton City Council.

- **Section 6** – Key issues identified with existing District Plan provisions
- **Section 7** – Options
- **Section 8** – Recommended SNA policy and rule framework.

2 STATUTORY PLANNING CONTEXT

2.1 Resource Management Act 1991

2.1.1 Purpose and principles

Section 5 of the RMA outlines the purpose of the Act which is as follows (**emphasis added**):

> *(1) The purpose of this Act is to promote the sustainable management of natural and physical resources. (2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—*
>
> > *(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
> >
> > ***(b) safeguarding the life-supporting capacity** of air, water, soil, and **ecosystems**; and*
> >
> > *(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Section 6 of the RMA outlines matters of national importance that must be recognised and provided for in achieving the purpose of the RMA. The section 6 matters of most relevance to indigenous biodiversity are (**emphasis added**):

> *(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development; ...*
>
> ***(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna; ….***
>
> *(e) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga;*

Section 6(c) is a key consideration for indigenous biodiversity and requires all persons exercising functions under the RMA to provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (significant natural areas). The word "protection" is not defined in the RMA, but the Environment Court has stated it has the ordinary meaning "to keep safe from harm, injury or damage"[4] and that it has a similar meaning as safeguard in section 5(2)(b) of the RMA. Section 6(c) is not subject to any qualifiers and the direction to protect significant natural areas is more absolute than section 6(a) and 6(b) of the RMA.

Section 7 sets out other matters to have particular regard to in achieving the purpose of the RMA. The relevant matters of most relevance to indigenous biodiversity are (emphasis added):

> *(a) kaitiakitanga:*
>
> *(aa) the ethic of stewardship:*
>
> *(b) the efficient use and development of natural and physical resources: …*
>
> *(c) the maintenance and enhancement of amenity values:*
>
> ***(d) intrinsic values[5] of ecosystems:***
>
> *f) maintenance and enhancement of the quality of the environment:*
>
> *(g) any finite characteristics of natural and physical resources: …*
>
> *(i) the effects of climate change: (j) the benefits to be derived from the use and development of renewable energy.*

[4] *Royal Forest and Bird Protection Society of New Zealand Inc v New Plymouth District Council* [2015] NZEnvC (2015) 19 ELRNZ 122 [63]

[5] Defined in the RMA as: *intrinsic values, in relation to ecosystems, means those aspects of ecosystems and their constituent parts which have value in their own right, including— (a) their biological and genetic diversity; and (b) the essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience*

The Environment Court has attempted to explain (in summary) the scheme of Part 2 of the RMA with respect to indigenous biodiversity in *Director General of Conservation v Invercargill City Council*[6]. Some key extracts from that decision are provided below (emphasis added).

> [44] In part 2 of the RMA there are three provisions that are particularly important and relevant to biodiversity issues. They are the obligations: "*safeguard ... the life-supporting capacity of ... ecosystems" (section5(2)(b) RMA); " ... protect ... areas of significant indigenous vegetation and significant habitats of indigenous fauna*" (section 6(c)); and …to have particular regard to the "*intrinsic values of ecosystems"* (section 7(d) recalling that is a defined term).
>
> [45] Five points should be made here about the scheme of the RMA in relation to indigenous biodiversity. First, the primary responsibility of local authorities when exercising their functions in respect of indigenous biodiversity is part of the very definition of "sustainable management": to safeguard the life-supporting capacity of ecosystems.
>
> [46] Second, **the recognition and protection of areas of significant indigenous vegetation, nationally important as it is, is an extension of that primary obligation. If an ecosystem or part of an ecosystem (being in either case an area of indigenous vegetation or a habitat of indigenous fauna) is found to be significant then that ecosystem is to be protected in itself, not merely to have its life-supporting capacity protected**.
>
> [47] Third, safeguarding (or protecting) the life-supporting capacity of ecosystems includes in each case having particular regard to each of its components including – as the definition of 'intrinsic values" 6 implies.

2.1.2 Functions of regional councils and territorial authorities

Regional council functions

Section 30 of the RMA sets out the functions of regional councils and this includes:

> *"(1) Every regional council shall have the following functions for the purpose of giving effect to this Act in its region*
>
> *(c) the control of the use of land for the purpose of –*
>
> *(iiia) the maintenance and enhancement of ecosystems in water bodies and coastal water;*
>
> *(ga) the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity;*

Regional councils are required to prepare regional policy statements and section 62 of the RMA sets out what regional policy statements must contain. This includes:

(1) A regional policy statement must state—

> *(i) the local authority responsible in the whole or any part of the region for specifying the objectives, policies, and methods for the control of the use of land—*
>
> *(iii) to maintain indigenous biological diversity; and…*

This requirement is intended to ensure there are clear allocation of roles and responsibilities for the control of land to maintain indigenous biodiversity between regional councils and territorial authorities.

Territorial authority functions

Section 31 sets out the functions of territorial authorities and this includes:

> *(1) Every territorial authority shall have the following functions for the purpose of giving effect to this Act in its district:*
>
> *(b) the control of any actual or potential effects of the use, development, or protection of land, including for the purpose of—*
>
> *(iii) the maintenance of indigenous biological diversity.*

Territorial authorities must prepare district plans to carry out its functions. District plans must give effect to national and regional policy statements.

[6] *Director General of Conservation v Invercargill City Council* [2018] NZEnvC 84.

2.2 National planning standards 2019

The National Planning Standards were introduced in April 2019 to provide nationally consistent direction on the structure and format of district plans, as well as providing some consistent content (definitions, noise and vibration metrics and mapping information). Standard 4 of the National Planning Standards set out the required format for district plans and this requires all district plans to include a chapter on 'ecosystems and indigenous biodiversity' in Part 2 – District Wide matters. Standard 7 of the National Planning Standards further states:

> *19. If the following matters are addressed, they must be located in the Ecosystems and indigenous biodiversity chapter:*
>
> *a. identification and management of significant natural areas, including under s6(c) of the RMA*
>
> *b. maintenance of biological diversity*
>
> *c. intrinsic values of ecosystems and indigenous biodiversity.*

The intent of these requirements is that provisions relating to significant natural areas and indigenous biodiversity are comprehensively included in one district plan chapter for ease of reference.

It is understood that the Hamilton City District Plan will be updated to give effect to the National Planning Standards as part of a future process (required to be implemented by April 2024). As such, updating the SNA and indigenous biodiversity provisions to align with the National Planning Standards is outside the scope of this project.

2.3 National Policy Statement for Urban Development 2020

The National Policy Statement for Urban Development 2020 (NPS-UD) was gazetted in July 2020 and came into force on 20 August 2020. The NPS-UD aims to recognise the national significance of:

- Having well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future; and
- Providing sufficient development capacity to meet the different needs of people and communities.

The NPS-UD includes a mix of directive and more generic objectives, policies and implementation requirements and territorial authorities must give effect to these provisions either within the specified timeframes in the NPS-UD or "as soon as practicable". The NPS-UD applies more directive provisions to 'Tier 1' urban environments, which includes Hamilton City, including specific provisions for intensification plan changes which must be notified by August 2022. The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 expanded on these requirements and introduced requirements to incorporate the 'medium density residential standards' (**MDRS**) into the intensification plan changes and a new ''Intensification Streamlined Planning Process' to enable these plan changes to be implemented by 2023. HCC are currently working on a plan change to give effect to these requirements.

Of particular relevance to the intensification plan change is the list of 'qualifying matters' in Clause 3.32 of the NPS-UD whereby local authorities can modify the building height and densities required in the intensification policies. The list of qualifying matters includes "*a matter of national importance that decision-makers are required to recognise and provide for under section 6 of the Act*" and "*open space provided for public use, but only in relation to the land that is open space".*

The work to update the SNA mapping and provisions needs to precede and align with the timing of the NPS-UD intensification plan change so that urban growth planning can consider the locations of new SNA areas and potentially introduce restrictions on housing within or in close proximity to these areas as a 'qualifying matter' under Clause 3.32(a).

2.4 National Policy Statement for Freshwater Management 2020

The National Policy Statement for Freshwater Management 2020 (**NPS-FM**) was gazetted on 3 August 2020. The objectives, policies and implementation requirements in the NPS-FM are primarily directed at regional councils and their statutory functions under section 30 of the RMA to manage freshwater quality and quantity. Nonetheless, district plans must give effect to the NPS-FM to the extent relevant. The NPS-FM includes an overarching objective to

> '*ensure that natural and physical resources are managed in a way that prioritises:*
>
> *(a) first, the health and well-being of water bodies and freshwater ecosystems*
>
> *(b) second, the health needs of people (such as drinking water)*

(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The policies in the NPS-FM most relevant to Significant Natural Areas are:

> ***Policy 3:*** *Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments*
>
> ***Policy 6:*** *There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.*
>
> ***Policy 7:*** *The loss of river extent and values is avoided to the extent practicable.*
>
> ***Policy 9:*** *The habitats of indigenous freshwater species are protected.*

Improved protection of Significant Natural Areas through the Hamilton Cit District Plan, particularly through the Waikato River Corridor and Gully network, is consistent with these policies and will help to protect the values of Waikato River and its function as a habitat for freshwater species.

There is some overlap between SNAs identified in the 4Sight report *"Significant Natural Areas of Hamilton City District: Territorial and Wetland Ecosystems*" and wetlands in Hamilton City. However, the SNA mapping and updated provisions through this work does not extend to mapping and protection of 'natural inland wetlands' as that is a regional council function under the NPS-FM, in particular Clause 3.22 and 3.23, and under the National Environmental Standards for Freshwater 2020 (discussed below).

2.5 National Environmental Standards for Freshwater 2020

The National Environment Standards for Freshwater 2020 (**NES-F**) set out regulations and standards aimed at protecting freshwater and freshwater ecosystems. Regulation 5 of the NES-F clarifies that the regulations are the functions of regional councils and do not deal with the functions of territorial authorities.

The regulations in the NES-F of most relevance to the review of SNA provisions are those the relate to the protection of 'natural inland wetlands' (Part 3, subpart 1 of the NES-PF). These regulations require strict measures for activities that can result in the loss of extent and values of natural wetlands. The NES-F prescribes activity statuses and detailed conditions for various potentially damaging activities in and around wetlands. Only minor activities (e.g. wetland restoration, maintenance of existing structures) are enabled within or near wetlands under the NES-F and it includes stringent consent requirements for vegetation clearance, earthworks, taking water etc. not specifically provided for (generally a non-complying or prohibited activity). This is supported by the strong policy direction in the NPS-FM to avoid the loss of extent of natural inland wetlands and protect their values.

2.6 Proposed National Policy Statement for Indigenous Biodiversity

Public consultation on the proposed National Policy Statement for Indigenous Biodiversity (**proposed NPS-IB**) took place between November 2019 and January 2020. Officials are continuing to work on issues raised through public consultation and the intention is to release an exposure draft of the NPSIB in the first half of 2022. The exposure draft responds to feedback from submissions and hui and will help test the workability of updated provisions, but the general intent and scope of the NPSIB remains broadly consistent with that consulted on. This timing will also enable further work on incentives/support measures to ensure that iwi/Māori, landowners, local authorities and other stakeholders are assisted in the implementation of the NPSIB.

The proposed NPSIB has no legal effect and is subject to potential future change. However, it is highly relevant to the review of SNAs and associated provisions in Hamilton City and is expected to come into effect during the Plan Change 9 submission and hearing process. Therefore, it is considered effective and efficient to align the review of SNA provisions with the policy direction and requirements anticipated under the proposed NPSIB.

The proposed NPSIB will require district-wide SNA mapping using nationally consistent criteria and principles. The proposed NPSIB will then require that certain adverse effects are to be avoided on SNAs with limited exceptions with activities recognised as being important to New Zealand's economic, social and cultural well-being. The adverse effects to be avoided from subdivision, use and development are:

i. loss of ecosystem representation and extent:

ii. disruption to sequences, mosaics, or ecosystem function:

iii. fragmentation of SNAs or the or loss of buffers or connections within an SNA and between other indigenous habitats and ecosystems:

iv. a reduction in population size or occupancy of threatened species using the SNA for any part of their life cycle;[7]

These adverse effects to be avoided are based on ongoing ecological advice on what is needed to maintain biodiversity in New Zealand. However, the proposed NPSIB also recognises the important of providing a more flexible regime to these strong "avoidance policies" for activities that are important to economic, social and cultural well-being and activities that seek to restore and enhance SNAs. These activities are generally to be managed in accordance with the 'effects management hierarchy' which is a well-established approach to manage effects biodiversity internationally and within New Zealand. Activities that have a different consent pathway in the proposed NPSIB relevant to this review include:

- 'Specified infrastructure' that provides a range of network utilities and infrastructure public benefit
- Maintaining and restoring a SNA
- Use and development required to address a risk to public health and safety
- Sustainable customary use.

While the proposed NPSIB has yet to be finalised and is subject to potential future change, these requirements have been considered in reviewing the District Plan SNA provisions particularly in terms of reviewing the current "avoidance policies" for SNA in the District Plan and pathways for certain activities that are important to economic, social and cultural well-being.

2.7 Waikato Regional Policy Statement 2016

The Waikato Regional Policy Statement (**Waikato RPS**) was made operative in 2016. The District Plan is required to give effect to the Waikato RPS and the provisions of most relevance to this review are the objectives in section 3, section 11 which outlines policies and methods for indigenous biodiversity and SNAs, and section 11A which is the criteria for determining significance of indigenous biodiversity. The key Waikato RPS provisions are provided in full in **Appendix A**.

The Waikato RPS objectives of most relevance to this review are outlined below.

> ***3.8 Ecosystem services***
>
> *The range of ecosystem services associated with natural resources are recognised and maintained or enhanced to enable their ongoing contribution to regional wellbeing.*
>
> ***3.19 Ecological integrity and indigenous biodiversity***
>
> *The full range of ecosystem types, their extent and the indigenous biodiversity that those ecosystems can support exist in a healthy and functional state.*

Section 11 of the Waikato RPS sets out a range of policies and methods to achieve these objectives. Key policies and methods are outlined below.

2.7.1 Policy 11.1 to maintain or enhance indigenous biodiversity

The intent of this policy is to maintain the full range of ecosystem types and maintain or enhance their spatial extent as necessary. The policy seeks to achieve this by (not exhaustive list, see **Appendix A** for full text):

- Working towards no net loss of indigenous biodiversity at a regional scale
- Recreating and restoring habitats and connectivity between habitats
- Supporting ecosystem habitats and SNAs through buffering and/or linking
- Considering and applying biodiversity offsets

Policy 11.1 also includes implementing methods, which provide district councils with clear direction as to how they should manage indigenous biodiversity in district plans. Key direction in Methods 11.1.1-11.1.11 include:

- The need to **provide for positive biodiversity outcomes when managing activities**, including subdivision and land-use change, i.e. requiring and enabling restoration and enhancement of indigenous biodiversity through both plan rules and consent processes.
- Clear **direction on the range of adverse effects on indigenous biodiversity** that district plans are required to manage. The full list is in Method 11.1.2, but it includes effects such as fragmentation of ecosystems and habitats,

[7] Clause 3.9(1)(a) of the propsoed NPSIB consulted on.

loss of corridors, connections, linkages and buffers, loss, damage or disruption to ecological processes, functions and ecological integrity and cumulative effects.

- The **use of a effects management hierarchy** (set out in Method 11.1.3), based on avoidance, remediation, mitigation and offsetting (in that order) with some direction on when offsetting may be appropriate or inappropriate.
- Direction on **which activities should be permitted as they have minor effects on indigenous biodiversity** (Method 11.1.4), including maintaining, operating and upgrading lawfully established infrastructure, allowing existing lawfully established activities to continue (section 10 existing use rights), activities relating to maintaining or enhancing indigenous biodiversity, cultural practices and health/safety reasons.

2.7.2 Policy 11.2 to protect significant indigenous vegetation and significant habitats of indigenous fauna

This policy provides district councils direction on how to identify and map SNA in their district. The key message from the policy is that district councils need to protect SNAs by focusing on the characteristics that contribute to the significance and ensuring they are not reduced to the point that the significance of the SNA is reduced. Notably it is not a total 'avoidance' approach, rather a focus on whether the proposed activity actually impacts on the valued characteristics of the SNA that make it significant.

Implementing methods for Policy 11.2 direct how district councils need to identify and map SNA (using the criteria in Section 11A discussed below) and advocate for using an effects management hierarchy that gives priority to avoiding adverse effects before remediation, mitigation and offsetting should be considered, noting that this approach does not need to be taken for activities that have minor effects on indigenous biodiversity values under Method 11.1.4.

2.7.3 Section 11A criteria for assessing ecological significance

Section 11A contains the criteria for assessing the significance of areas of indigenous biodiversity and identifying the characteristics that make them significant. For an area to be identified as significant and classified as a SNA, one or more of the criteria must be met. The full list of criteria in Section 11A is included in **Appendix A** of this report.

2.8 Te Ture Whaimana o Te Awa o Waikato - Vision and Strategy for the Waikato River

In 2010, the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act established the Waikato River Authority as an independent statutory organisation tasked with the guardianship of the Te Ture Whaimana o Te Awa o Waikato - the Vision and Strategy for the Waikato River ('Vision and Strategy'). The Vision and Strategy was developed and published in 2008 by the Guardians Establishment Committee and is the primary direction-setting document for the Waikato River and its catchments. The Vision in Strategy has been inserted into the Waikato RPS (section 2.5) and prevails over any inconsistent provision in a national policy statement, the New Zealand Coastal Policy Statement, and a national planning standard[8]. The Hamilton City District Plan must therefore give effect to the Vision and Strategy where relevant.

The Vision and Strategy covers 11,000 square kilometres of Waikato River catchment and responds to the following four fundamental issues:

1. *The degradation of the Waikato River and its catchment has severely compromised Waikato River iwi in their ability to exercise mana whakahaere or conduct their tikanga and kawa;*
2. *Over time, human activities along the Waikato River and land uses through its catchments have degraded the Waikato River and reduced the relationships and aspirations of communities with the Waikato River;*
3. *The natural processes of the Waikato River have been altered over time by physical intervention, land use and subsurface hydrological changes. The cumulative effects of these uses have degraded the Waikato River; and*
4. *It will take commitment and time to restore and protect the health and wellbeing of the Waikato River.*

The Vision and Strategy states *"Our Vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come".*

To realise the vision, the Vision and Strategy has thirteen objectives including:

[8] Section 12 of the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010.

a. *The restoration and protection of the health and wellbeing of the Waikato River.*

b. *The restoration and protection of the relationship of Waikato-Tainui with the Waikato River, including their economic, social, cultural, and spiritual relationships.*

f. *The adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River, and in particular those effects that threaten serious or irreversible damage to the Waikato River.*

g. *The recognition and avoidance of adverse cumulative effects, and potential cumulative effects, of activities undertaken both on the Waikato River and within its catchments on the health and wellbeing of the Waikato River.*

h. *The recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities.*

i. *The protection and enhancement of significant sites, fisheries, flora and fauna.*

To achieve the objectives, the Vision and Strategy has twelve strategies including:

1. *Ensure that the highest level of recognition is given to the restoration and protection of the Waikato River.*

3. *Develop targets for improving the health and wellbeing of the Waikato River by utilising maatauranga Maaori and latest available scientific methods.*

5. *Develop and share local, national and international expertise, including indigenous expertise, on rivers and activities within their catchments that may be applied to the restoration and protection of the health and wellbeing of the Waikato River.*

6. *Recognise and protect waahi tapu and sites of significance to Waikato-Tainui and other Waikato River iwi (where they so decide) to promote their cultural, spiritual and historic relationship with the Waikato River.*

7. *Recognise and protect appropriate sites associated with the Waikato River that are of significance to the Waikato regional community.*

8. *Actively promote and foster public knowledge and understanding of the health and wellbeing of the Waikato River among all sectors of the Waikato regional community.*

9. *Encourage and foster a 'whole of river' approach to the restoration and protection of the Waikato River, including the development, recognition and promotion of best practice methods for restoring and protecting the health and wellbeing of the Waikato River.*

11. *Ensure that cumulative adverse effects on the Waikato River of activities are appropriately managed in statutory planning documents at the time of their review.*

A review of how the Hamilton City District gives effect to the Vision and Strategy was undertaken in 2021 which is discussed further in **section 3.3** of this report.

2.9 Waikato Regional Plans

The District Plan must not be inconsistent with a regional plan for any matter specified under section 30(1)(a) of the RMA. The Waikato Regional Council has a role under section 30(1)(ga) of the RMA to have provisions in their regional plans to manage indigenous biodiversity. The Operative Waikato Regional Plan 2007 does not identify SNA and only controls vegetation clearance for the purpose of managing high risk erosion areas.

The Operative Waikato Regional Coastal Plan 2012 identifies areas of significant indigenous vegetation and significant habitat in in the coastal marine area. As such, there is no potential inconsistency or conflict between the protection of terrestrial SNAs through the Hamilton City District Plan and the relevant regional plans.

3 STRATEGIC AND LOCAL CONTEXT

3.1 Overview of district

Hamilton City is New Zealand's largest inland city (c. 11,000 hectares), with a population of approximately 160,000 people. A major landscape feature of the city is the Waikato River, New Zealand's longest river that bisects the city area for a length of 16 km. Hamilton City has more than 1,000 hectares of open space, spread over 145 parks[9].

The Mangakotukutuku and Mangaonua gullies situated along the southern urban-rural interface of Hamilton City are the largest of the four gullies and, together with the Waikato River, form the single largest and most continuous ecotone in Hamilton. Conversely, the Kirikiriroa and Waitawhiriwhiri gullies are situated within the urban matrix in highly developed areas in the northern part of the city.

Within the Hamilton City Ecological District, it is estimated that since 1840, the Hamilton Ecological District has had a 97.8% reduction in indigenous vegetation[10]. The vegetation areas that are left (predominantly in gullies and along the Waikato River) are the habitat for several threatened and/or regionally uncommon species, notably the long-tailed bat where Hamilton is one of only a few cities in New Zealand where long-tailed bats are known to persist in an urban landscape[11].The overall picture is of a significantly depleted ecological system, with only 1.5% of the total city area protected by the current SNA overlay[12] and numerous areas of key habitat for fauna that are not protected by the operative SNA framework.

3.2 Updated SNA mapping by 4Sight

3.2.1 Significant Natural Areas of Hamilton City District – Draft Report (December 2021)

4Sight has completed updated mapping and assessment of SNAs within Hamilton City. The final report provides a summary of the ecological value and relative significance of terrestrial and wetland habitats remaining in Hamilton City within a regional and national context[13]. It is intended to assist HCC meet its obligations under section 6(c) of the RMA to protect significant habitats of indigenous fauna and flora.

The primary objective of the SNA mapping project was to review and update the existing Key Ecological Sites of Hamilton City[14] and identify new areas that are considered significant under the Section 11A of the Waikato RPS - criteria for determining significance of indigenous biodiversity. Two spatial data sets have been created through the project:

- *'**Floristic SNA' (fSNA):** Distinct areas of wetland or terrestrial vegetation communities dominated by naturally occurring indigenous plant communities or where naturally occurring indigenous vegetation define the primary aspects of the natural area which makes it significant in terms of Section 6c of the RMA (for example, the area meets criteria 4, 5, 6 or 10).*
- *'**Corridor/indigenous fauna habitat SNA' (cSNA):** Areas that are able to be delineated by topographical or vegetation features (such as gully systems, which can be dominated by exotic vegetation or restoration planting), which:*
  - *Provides significant fauna habitats (including stepping stone or corridor habitats), including regularly used habitats by nationally At Risk or Threatened indigenous fauna species (for example, the area meets criterion 3); or*
  - *Provides ecological buffering to a regionally or nationally important SNA, (for example, the area meets criteria 7, 8, 9,11).*

[9] Hamilton City Council. 2021. Website accessed in October 2021. https://www.hamilton.govt.nz/our-city/about-hamilton/learning%20about%20hamilton/Pages/default.aspx

[10] Leathwick, J.R., Clarkson, B.D., Whaley, P.T. 1995. Vegetation of the Waikato Region: Current and historical perspectives. Landcare Research Contract Report LC9596/022. Manaaki Whenua - Landcare Research, Hamilton.

[11] O'Donnell, C.F.J., Borkin, K.M., Christie, J.E., Lloyd, B., Parsons, S., Hitchmough, R.A. 2018: Conservation status of New Zealand bats, 2017. New Zealand Threat Classification Series 21. Department of Conservation, Wellington. 4 p.

[12] Cornes, T.S., Thomson, R.E., Clarkson, B.D. 2012. Key Ecological Sites of Hamilton City Volume I & II. CBER Contract Report 121 prepared for Hamilton City Council.

[13] 4Sight (2022) '*Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems',* prepared for Hamilton City Council.

[14]Cornes, T.S., Thomson, R.E., Clarkson, B.D. 2012. Key Ecological Sites of Hamilton City Volume I & II. CBER Contract Report 121 prepared for Hamilton City Council. .

The final report is primarily based on a desk-top exercise, however some ground truthing of private land was completed after community feedback was received on the draft SNA maps[15]. The assessments were conducted using high resolution orthorectified aerial imagery, oblique imagery (provided by LINZ), and by reviewing the original SNA dataset[16], existing spatial databases available in GIS software, existing ecological information available from reports, and local knowledge of 4Sight ecologists and the external reviewers Professor Bruce Clarkson and Gerry Kessels.

Each potential SNA was assessed against the 11 criteria in the Waikato RPS to determine if the site was ecologically significant or not. Each site was assessed as either 'Significant', 'Not Significant', or 'Indeterminate'. The assessment of each criterion followed Table 1 of the assessment guidelines (Waikato Regional Council and Wildland Consultants, 2019 – in prep.). If a site is found to tick at least one significance criterion, it was further assessed to determine a level of significance, i.e., 'International', 'National', 'Regional', or 'Local', in a Waikato Region context using the same guidelines (WRC and Wildland Consultants, 2019 – in prep.). Each SNA was also assigned a 'level of confidence', dependant on how much information was available and the level of detail that could be provided.

Corridor SNA

A total of 70 potential cSNA were identified, of which 52 sites were assessed as 'Significant'. These 52 sites equate to approximately 6.1% of Hamilton City's area and cover 671.81ha. This area includes the Waikato River (137ha) and waterbodies of the City's peat lakes. 63.5% of the significant sites were assessed as 'Nationally' or 'Regionally' significant, primarily as a result of 'Threatened - Nationally Critical' bat species utilising the site. The level of significance was often dependant on whether bats are known to utilise the area on a regular basis or sporadically. 57% of the potential cSNA were assessed with a high level of confidence, 33% with medium confidence, and 10% with low confidence.

Floristic SNA

The fSNA dataset followed the original SNA dataset prepared in 2010[17]. All fSNA sit within the 'newly' created cSNA in their entirety (aside from a few minor deviations in line work). A complete overlap of fSNA and cSNA is most common where a site comprises a standalone forest remnant (i.e., Te Papanui – Claudelands Bush).

A total of 65 fSNA were assessed as significant, comprising an area of 121.86 ha of high-quality vegetation situated within or overlapping with the cSNA layer. Of the significant fSNA, 60% (16 sites totalling 72.53 ha) were assessed as 'Nationally' significant, 16% as 'Regionally' significant (17 sites accounting for 19.74 ha), and 24% as 'Locally' significant (32 sites totalling 29.49 ha). A high level of confidence was assigned to 14 'Nationally', 10 'Regionally', and 9 'Locally' significant fSNA, and a medium level of confidence was assigned to 2 'Nationally', 7 'Regionally' and 23 'Locally' significant sites.

Total new SNA proposed

Overall, the total area of SNA identified by 4Sight is 695.47ha, which includes 137ha of the Waikato River, compared to 166ha of SNA in the Operative District Plan. This is an increase in SNA coverage of 529.47ha or 392.47ha of new terrestrial vegetation and habitat.

Management implications

The 4Sight report also provided some commentary on the management implications of the SNA assessment and updated mapping for consideration by HCC at the plan change level:

- *This SNA assessment has identified a wide range and diverse set of potential SNA dispersed throughout Hamilton City. This area includes many gully habitats that in the past would all have been linked and interconnected. Through urban development many of these gully systems are now reduced and some connectivity between natural areas lost. Besides reconnecting these habitats through revegetation and restoration efforts, buffer zones around these areas would benefit these areas and protect the functional values for indigenous flora and fauna. Many of these habitats are dominated by exotic vegetation or are situated within private ownership.*
- *Planning mechanisms need to acknowledge and account for incomplete scientific knowledge and incorporation of new information which may affect the ecological significance analysis presented in this report.*

[15] A total of 39 private landowners were visited to review potential cSNA mapping, and a total of 13 private landowners were visited to review potential fSNA mapping.

[16] Cornes, T.S., Thomson, R.E., Clarkson, B.D. 2012. Key Ecological Sites of Hamilton City Volume I & II. CBER Contract Report 121 prepared for Hamilton City Council.

[17] Ibid.

- *Planning mechanisms need to take into account the values of the two categories of SNAs (flora and corridor) and aim to protect those values. For example, the rules protecting a gully primarily valued as a bat corridor may be different from those protecting a high value stand of remnant vegetation*[18].

3.2.2 Ground truthing

Ground truthing of particular areas where public feedback indicated that further checking of proposed SNA boundaries was required was an essential step in SNA identification. On 2 February 2022, approximately 1,700 letters were sent to property owners of land with SNA areas identified on their property. Feedback in response to these letters was collated and informed which properties had the greatest need of ground truthing work and onsite assessments. It was not feasible to ground truth every single affected property, but the intent was to ground truth as many as possible based on the feedback received.

A total of 39 private landowners were visited to review potential cSNA mapping, and a total of 13 private landowners were visited to review potential fSNA mapping. Eight fSNA on public land were also visited and ground-truthed and minor changes were made to the extent of a few sites. Minor changes were made to SNA boundaries on private land to exclude areas such as orchards, driveways, ornamental gardens from the SNA layer.

3.3 Hamilton Nature in the City Strategy

Nature in the City Strategy 2020 -2050 (**'the strategy'**) has been developed by HCC as the city's 30-year strategy and direction for biodiversity. The scope for the strategy is the land within the Hamilton City Council boundaries however the importance of interconnections across ecological and cultural landscapes is recognised. Although the definition of nature in the Strategy includes all living things, including plants, trees, birds, fish and insects, the focus of the strategy is on restoring *native vegetation*. The strategy recognises only 2% native vegetation cover remains in Kirikiriroa/Hamilton and therefore courageous action is required.

The strategy sets a vision, goal and four outcome areas as detailed in Table 1 below. These are each supported by aspirational statements of what nature in the city looks like in 2050 once the vision, goal and outcome areas are achieved. The outcomes are interconnected and should not be read in isolation.

Table 1: Vision, goal and outcomes in the Nature in the City Strategy.

Vision *Nature thrives in Kirikiriroa/Hamilton and nurtures us wherever we are*			
Goal *We achieve 10% native vegetation cover in Kirikiriroa/Hamilton by 2050*			
Outcome Area One *We invest in the continued growth of nature in Kirikiriroa/Hamilton*	**Outcome Area Two** *We are courageous in staying the course'*	**Outcome Area Three** *We uplift the power of kaitiakitanga*	**Outcome Area Four** *Thriving nature is all around us*

3.3.1 Strategic Implementation Plan

The strategy sets out broad areas for action, rather than an exhaustive list of actions. It is intended that a strategic implementation plan will be developed with a three-year horizon (aligned with the Long-Term Plan process).

In November 2021 the first strategic implementation plan (2021-2024) was launched with the key focus areas:

1. *Establish a cross-council Nature in the City Working Group. The focus of the group will be to identify and capitalise on efficiencies and areas of mutual benefit in order to work towards achieving 10% native vegetation across the city. Establish a biodiversity monitoring and reporting programme which incorporates Maatauranga Maaori and Western science to determine progress on the strategy's vision, goal and outcome areas. Undertake reporting annually to Elected Members and the community.*

[18] 4Sight (2021), '*Significant Natural Areas of Hamilton City District: Terrestrial and Wetland Ecosystems – Draft Report*', pg. 38.

2. *Develop access in the six main gully systems in order to undertake restoration works and provide opportunities for recreation and connection with nature.*
3. *Undertake ecological restoration on Council-owned land in the six main gully systems.*
4. *Develop and implement an education and information programme to support community action in ecological restoration. Existing information will be reviewed and used to develop the programme.*
5. *Actively seek funding opportunities to undertake restoration activities.*
6. *Support and enable the community to care for and restore nature and create opportunities for the community to gather to undertake ecological restoration.*

These actions highlight the need for an enabling framework for restoration activities for SNA and indigenous biodiversity in the District Plan.

Some more specific projects that these actions translate into over the next three years (subject to Long-term Plan funding) are:

- Enhance nature at Donny Park and create better access to it.
- Begin pest control and plant restoration at Te awa o Katipaki.
- Begin pest control and plant restoration at Mangakotukutuku.

3.4 Review of Hamilton City District Plan Coverage of the Waikato Vision and Strategy

GMD Consultants were engaged by HCC at the end of 2021 to identify opportunities to embed provisions that support the Vision and Strategy into the Hamilton City District Plan through future plan changes. The scope of the review was very broad and covered a wider range of chapters than those focused on indigenous biodiversity. As such, this section focuses on the chapters with direct implications for indigenous biodiversity provisions in the District Plan.

Chapter 2 – Strategic Framework

The following opportunities and recommendations have been identified within the report prepared by GMD Consultants to embed provisions supporting the Vision and Strategy into Chapter 2. Key opportunities and recommendations relating to indigenous biodiversity and SNAs are **in bold**:

- ***Objective 2.2.8 sets out restoration and protection of the river**, consistent with the Vision and Strategy and further sets out that the River is a feature of national importance, consistent with the Vision and Strategy. As such, objective 2.2.8 provides a useful direction to implement the Vision and Strategy through the plan.*
- *An opportunity exists through Plan Change 12 to consider the landscape/landscape features of the City, including the Waikato River and gully network. The recognition of the Waikato River as a feature of national importance in Objective 2.2.8 is somewhat blurred by the explanation which introduces the River as an Outstanding Natural Feature. This recognition of the River as an Outstanding Natural Feature is not notably supported or recognised elsewhere in the plan, nor are there supporting technical assessment which address its outstanding values. Typically, district plans will map landscape features as confirmed through district wide landscape/cultural value assessments. The explanation note is not a provision of the plan and would likely carry little to no weight.*
- *Policy 2.2.8(a) **does not contain a restoration or enhancement component and instead it promotes 'preservation'. For the River, gully systems and river margins this fails to recognise the degradation these have faced and the potential for restoration or betterment as required by Te Ture Whaimana**.*
- *Policy 2.2.8(b) **regarding natural values and amenity values of the Waikato River does not address restoration. Could be reframed in light of restoration/betterment**.*
- *Objective 2.2.10 generally captures Policy 2.2.10(a), meanwhile (b) reflects the integrated, holistic and coordinated approach necessary in the management of the resources of the River. Whilst sitting under the subheading 'Tangata Whenua: Waikato Tainui' this policy framework seemingly directs an action of Council. Policy 2.2.10(a) does not purport any rules and may be better shifted to Chapter 1.5.*

Chapter 15 – Open Space Zone

This Chapter does not explicitly address or reference the Vision and Strategy. However, Section 15.1 recognises the Natural Open Space Zone includes esplanade reserves (e.g. river banks and lakes), reserves in gullies, Significant Natural Areas and the surface of water. The Natural Open Space Zone also includes both publicly and privately owned

areas that possess natural or landscape values. Notably, the majority of existing mapped SNAs in the Operative HCDP have an underlying zoning of Open Space.

The report prepared by GMD Consultants states there are opportunities to develop specific rules to require restoration of the Waikato River and gullies be undertaken as part of development of sites in the Natural Open Space Zone. Key recommendations specifically focusing on indigenous biodiversity or SNAs are **in bold**:

- *Policy 15.2.5a(iii) provides for the creation of esplanade reserves but does not include a component of betterment.* ***This policy or its replacement should focus further on the restoration or enhancement of esplanade reserves****.*
- ***Policy 15.2.5a(i) provides for the support and protection of ecosystems, ecological links, landscape features and biodiversity within the city but does not include a component of betterment. This policy or its replacement should focus further on the restoration or enhancement of all these matters.***
- *Similar to the Landscape Management Plan and Ecological Remediation Management Plan requirements of Plan Change 10 – Te Rapa North Industrial Deferred Land, there are* ***opportunities to introduce specific rules for restoration, e.g. that a gully restoration plan be developed, implemented and secured through covenants or similar legal protection. Restoration would also need to be site-specific and have ongoing commitment. Rules would be best supported by objectives and policies.***
- *Policy 15.2.2(b) or its replacement could be better supported by specific provisions for reserves/open space areas to increase recognition of their stormwater management function.*

Chapter 20 – Natural Environments

Chapter 20 does not explicitly address or reference the Vision and Strategy. However, this chapter identifies Significant Natural Areas including identified areas of the Waikato River corridor and gully systems. It also recognises the importance of trees, including providing land stability on gully and riverbanks. The purpose section acknowledges that peat lakes and wetlands have been degraded or lost due to a lack of information to their modification and drainage.

In relation to Chapter 20, the GMD report outlines the 'opportunities and recommendations' summarised below – all recommendations are directly relevant to indigenous biodiversity and SNAs so have not been highlighted in bold:

- *It is anticipated that fauna assessments (undertaken to inform the review of Chapter 20) will identify further areas as SNA, which could include gully areas of degraded or invasive flora but which offers restoration potential. This will assist in implementing the Vision and Strategy across a broader area.*
- *SNA assessments are a snapshot in time so regardless of current ecological significant of an area, the Vision and Strategy provides further impetus for comprehensive restoration and protection of the biodiversity generally, gullies and the River and would support a consistent framework of provisions and other methods. Plan provisions that support or encourage restoration would further contribute to the health and wellbeing of the River.*
- *Policy 20.2.4(e) or its replacements should move beyond maintaining the mauri of the water and focus on enhancement. There is an opportunity to provide for and integrate Maatauranga Maaori into the assessment of the mauri and spiritual dimension of water.*

Chapter 21 – Waikato River and Gully Systems

This chapter provides a mechanism for giving effect to the Vision and Strategy. The purpose of Chapter 21 outlines that the Waikato River is an Outstanding Natural Feature within the Waikato Region and sets out the management approaches that apply within the Waikato River corridor and gully systems. There are no rules within Chapter 21 and the objectives and policies are designed to be read in conjunction with other Chapters.

In relation to Chapter 21, the GMD report outlines the following opportunities and recommendations. Key recommendations specifically focusing on indigenous biodiversity or SNAs are **in bold**:

- *Chapter 21 is currently an 'other' chapter however it is rather a strategic one that applies to the entire city. To give the Vision and Strategy more visibility it could be moved to the front end of the District Plan, between the Strategic Framework and the Structure Plan chapters.*
- *There is an opportunity to reflect the importance of the Vision and Strategy within this chapter by moving objective 21.2.4 or its replacement from fourth to first place.*
- ***Overall, the link between Chapter 21 objectives and policies to the rules located in other chapters that are intended to implement them is not clear. As a result it is uncertain where this chapter applies and opportunities to implement this chapter are missed if it is effectively only considered when assessing applications for discretionary activities.***
- ***Chapter 21 provides an opportunity to integrate and apply Maatauranga Maaori to the restoration and enhancement of the Waikato River and its gully systems.***

- ***A broader approach is also needed to capture the entire catchment beyond the gully system. The objectives, policies and any provisions in other chapters need to address other activities within the catchment that could have a demonstrable effect on the River regardless of their proximity to the River corridor and the gullies.***
- *The purpose identifies the Waikato River as an outstanding natural feature, however the objectives and policies do not support this and the values that make it outstanding have not been identified. There is an opportunity to identify those values for the Waikato River corridor and its gully systems in order to better restore and protect them in line with Objective 21.2.1.*
- *The extent of the Waikato River corridor and its gully systems is not defined or mapped in the District Plan. Therefore, the general user would not know its extent and where the objectives and policies of Chapter 21 apply. To provide clarify the Waikato River corridor and gully systems should be spatially mapped on the planning maps.*

Chapter 22 – Natural Hazards

Does not explicitly address or reference the Vision and Strategy. In respect to the Waikato River this chapter recognises the flood hazards associated with the river corridor and recognises the slopes and soil types of the Waikato River and Gully systems potentially make these areas more susceptible to land instability.

In relation to Chapter 22, the GMD report recognises the following opportunities and recommendations. Key recommendations specifically focusing on indigenous biodiversity or SNAs are **in bold**:

- ***There is an opportunity to add to Objective 22.2.1 or create an additional objective and policies that focus on the wellbeing of the River.***
- *Add to Rule 22.5.1 Earthworks Ancillary to a Permitted Activity (or its equivalent) to require such earthworks avoid sediment discharges to the River and gullies and employ erosion sediment control measures.*
- ***There is an opportunity to direct that re-vegetation occur using indigenous plants and provide for their maintenance as part of rules 22.5.1(e) and 22.5.4(c). This would contribute to the restoration of flora and fauna of the River and its gullies while reducing the risk of erosion and land instability over time.***
- ***All vegetation removal is currently permitted within the Waikato Riverbank and Gully Hazard Area. There is an opportunity to restrict the removal of indigenous vegetation within the Gully Hazard Area and create a co-benefit for the River.***

4 REVIEW OF OTHER DISTRICT PLANS

To get a better understanding of how other district councils are managing their SNAs, a review of SNA provisions in a small selection of comparative district plans has been completed. The plans reviewed are outlined in Table 2 below.

Table 2: District plans reviewed and reasons

District Plan and relevant sections	Reason for selection
Proposed Waikato District Plan – Decisions Version January 2022 Part 2 – Chapter 3 – All Infrastructure Part 2 - Chapter 22 - Ecosystems and Indigenous Biodiversity Part 2 – Chapter 29 - Earthworks Part 3 – Chapter 4 - General Rural Zone	In the Waikato region so subject to the same Waikato RPS requirements, contains other sections of Waikato River, recently been through Schedule 1 process.
Operative Waipa District Plan, 2017 Section 4 – Rural Zone Section 24 – Indigenous Biodiversity Section 26 – Lakes and Water bodies	In the Waikato region so subject to the same Northland RPS requirements, contains other sections of Waikato River and contains the Waipa River (the largest tributary of the Waikato River).
Operative Auckland Unitary Plan, February 2022 Chapter D9 - Significant Ecological Areas Overlay Chapter E15 – Vegetation management and biodiversity Chapter E26 – Infrastructure	Similar urban council with significantly depleted indigenous biodiversity, known to incorporate use of effects management hierarchy (including offsetting).
Operative Tauranga City Plan, 2013 Chapter 5 – Natural Environment Chapter 4C – Earthworks	Similar urban council with significantly depleted indigenous biodiversity, known example of a tiered SNA classification system.

The review of the district plans focused on the following questions:

- Does the district plan take a tiered approach to identifying SNAs (i.e. whether different SNAs are ranked or classified in different ways) and, if so, how the activity rules are different between each SNA?
- Does the district plan use a buffer approach or setbacks to manage activities that could result in edge effects on the SNA (i.e. rules that restrict activities within a certain distance from the edge of the SNAs)?
- How the district plan provides for 'critical infrastructure' in SNAs (i.e. how the rules apply to infrastructure with public good benefit such as stormwater networks and potentially privately owned infrastructure)?
- What are the thresholds/consent requirements for earthworks and vegetation clearance in SNAs (or within the buffer if that approach is used)?
- What are the thresholds/consent requirement for buildings/structures in SNAs (or within the buffer if that approach is used)?

4.1 Tiered approach

Table 3: Summary of tiered approaches to SNA classification in selected district plans

District Plan	Description of provisions
Waikato District Plan	Does not take a tiered approach to SNA. There are separate provisions/rules for indigenous vegetation clearance outside of SNAs.

Waipa District Plan	▪ Takes a tiered approach by identifying three categories of indigenous vegetation and wetlands as follows:
	  ▫ SNAs: most restrictive provisions apply
	  ▫ Bush Stands: most restrictive provisions apply
	  ▫ Biodiversity corridors (indigenous forest and river corridors as identified on the planning maps): moderately restrictive provisions apply.
	▪ A separate set of provisions/rules applies to all remaining indigenous vegetation and wetlands within the district (least restrictive provisions apply).

	▪ Same activity status applies to most activities within SNAs and Bush Stand areas, key difference is sustainable harvesting within an SNA is a controlled activity whereas it is non-complying within a Bush Stand Area. ▪ Biodiversity corridors are considered to have potential significance to indigenous biodiversity values due to the ability to improve connectivity between wetlands and areas of indigenous vegetation. More permitted and controlled activities in the biodiversity corridors compared to SNAs and Bush Stands, particularly for new tracks, removal of manuka or kanuka, sustainable harvesting and removal of indigenous vegetation for any other purpose.
Auckland Unitary Plan	▪ A tiered approach is not taken explicitly. However, there are separate categories of Significant Ecological Areas (SEAs) for terrestrial areas and parts of the coastal marine area as follows: ▫ Significant Ecological Areas – Terrestrial (SEA-T) are identified areas of significant indigenous vegetation or significant habitats of indigenous fauna located either on land or in freshwater environments ▫ Significant Ecological Areas – Marine (SEA-M)[19] are identified areas of significant indigenous vegetation or significant habitats of indigenous fauna located in the coastal marine area. Four categories of SEA in the coastal marine area are identified on the planning maps as follows: – SEA-M: Significant Ecological Area – Marine – SEA-M1: Areas which, due to their physical form, scale or inherent values, are considered to be the most vulnerable to any adverse effects of inappropriate subdivision, use and development. – SEA-M2: Areas are of regional, national or international significance which do not warrant an SEA-M1 identification as they are generally more robust. – SEA-M1w, SEA-M2w: Areas that are identified as significant wading bird areas.
Tauranga City Plan	▪ Takes a tiered approach with two categories of Special Ecological Area (SEA): ▫ SEA Category 1: emphasis on protection ▫ SEA Category 2: emphasis on mitigation ▪ SEA Category 1 has a 5m buffer whereas SEA Category 2 does not (see buffer approach for more information). ▪ More RD and NC activities in SEA Category 1 compared to SEA Category 2, particularly for pedestrian and cycle tracks, buildings and structures, harvesting of forestry and indigenous vegetation clearance.

4.2 Buffer and setback approach

Table 4: Summary of buffers/setbacks from SNAs in selected district plans.

District Plan	Description of provisions
Waikato District Plan	▪ No buffer identified. ▪ Minimum setback rules are contained with zone chapters. No specific setback is required from SNAs. Specific setbacks are stipulated for buildings from water bodies with exemptions for public amenity buildings under 25m² and pump sheds set back a minimum of 5m.
Waipa District Plan	▪ No buffer identified. ▪ Minimum setback rules are outlined within Section 4 (Rural Zone) and Section 26 (Lakes and Water bodies) restricting construction of buildings to be a minimum of

[19] Separate rules apply to the SEA-M areas and are contained within Chapter F Coastal. These have not been reviewed given Hamilton City is not in the coastal environment.

	10m from SNAs and buildings, wastewater treatment systems, earthworks or vegetation clearance to be a minimum of 23m of the edge of any lake or water body. ▪ Earthworks and vegetation removal associated with conservation planting of riverbanks are excluded from the 23m setback rule.
Auckland Unitary Plan	▪ No buffer identified. No specific setbacks/minimum yard relating to the SEA-T are provided in Chapter E15 or individual zone chapters.
Tauranga City Plan	▪ Buffer only applied to SEA Category 1. ▪ Buffer is unmapped and measured 5m from SEA boundary. ▪ Activities that trigger a consent pathway are indigenous vegetation clearance, buildings or structures (minor structures are permitted however), managed accessways and signage. ▪ No earthworks trigger in the buffer, earthworks controls only apply to mapped SEA. ▪ Buildings and structures are D, indigenous vegetation clearance is RD on open space zoned land and D on all other land, managed accessways and signage are D.

4.3 Infrastructure and existing structures

Table 5: Summary of rules for infrastructure and existing structures within SNAs in selected district plans.

District Plan	Description of provisions
Waikato District Plan	▪ Specific rules applying to the trimming, pruning or removal of vegetation or trees associated with infrastructure are contained within Part 2 - Chapter 3. ▪ Trimming, pruning or removing trees and vegetation to protect all overhead electric or telecommunication lines and associated with infrastructure, including access tracks, is permitted subject to meeting standards (outlined below in Section 4.4 and in Appendix A). ▪ Permitted to trim, prune or remove vegetation for the safe operation or maintenance of the national grid. ▪ Removing vegetation in an SNA (either trimming, pruning or clearance) that endangers existing buildings or structures is permitted. ▪ Removing vegetation in an SNA (either trimming, pruning or clearance) for the maintenance of existing farm drains, tracks and fences is permitted ▪ Indigenous vegetation clearance inside an SNA which does not meet the specified standards within Chapter 3 or for any other infrastructure-related purpose would default to a D activity status
Waipa District Plan	▪ Trimming, pruning and removal of indigenous vegetation on or within 2m of water intake structures for maintenance purposes is permitted in all categories of indigenous vegetation ▪ Trimming or pruning of indigenous vegetation to avoid or mitigate effects on the operation of an existing network utility is permitted ▪ Removal of indigenous vegetation for the purpose of reducing risk to existing transmission or distribution lines is C in SNAs, Bush Stands and within Biodiversity Corridors ▪ Removal of indigenous vegetation for electricity transmission or distribution lines (excluding the above) is a RD activity in SNAs, Bush Stand areas and within Biodiversity Corridors ▪ No other infrastructure rules mentioned, any removal of indigenous vegetation not covered by those listed above would default to a NC activity within National or Regional SNAs and Bush Stands, a D activity within a local SNA, C or RD activity within biodiversity corridors and P in respect to district wide indigenous vegetation
Auckland Unitary Plan	▪ The following activities relating to the operation, maintenance, renewal, repair, construction and removal of network utilities and electricity generation facilities and minor infrastructure upgrading are permitted (subject to E26.3.5.1 and E26.3.5.2 standards):

	○ Biosecurity tree works ○ Dead wood removal ○ Emergency tree works ○ Pest plant removal ○ Vegetation alteration or removal for the operation, repair and maintenance of access tracks and fences for network utilities ▪ Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4 is RD ▪ Vegetation alteration or removal not otherwise provided for is D ▪ Vegetation alteration or removal for routine maintenance within 3m of existing buildings greater than 100m² gross floor area within a SEA (subject to compliance with the general standards) ▪ Vegetation alteration or removal for routine maintenance within 1m of other existing buildings within a SEA (subject to compliance with the general standards) ▪ Tree trimming is permitted (subject to compliance with the general standards)
Tauranga City Plan	▪ Maintenance of existing stormwater reserves is permitted in all SEA and buffers ▪ New stormwater reserves are RD in all SEA but permitted in buffers ▪ Maintenance or minor upgrading (in relation to electric lines) of existing network utilities is permitted in all SEA and buffers ▪ Trimming and pruning of vegetation necessary to protect electrical lines required to meet the Electricity (Hazards from Trees) Regulations 2003 is permitted in all SEA and buffers ▪ Maintenance of existing roads and carparks is permitted in all SEA and buffers ▪ No other infrastructure rules mentioned, so any infrastructure not covered by one of the rules listed above would default to a discretionary activity

4.4 Earthworks and vegetation clearance thresholds

Table 6: Summary of earthworks and vegetation rules within SNAs in selected district plans.

District Plan	Description of provisions
Waikato District Plan	▪ Earthworks associated with conservation activities, water reticulation for farming purposes or the maintenance of existing tracks, fences or drains within a SNA, provided they are not within a kauri root zone, are permitted. Specific earthworks limits for each Zone are outlined within the General Earthworks Chapter (Part 2 – Chapter 29) ▪ Earthworks within an SNA on Maaori Freehold Land or Maaori Customary land for a Marae Complex or Papakaainga housing must not exceed 500m³ in volume or 1500m² in area in a single consecutive 12-month period ▪ Indigenous vegetation clearance within an SNA on Maaori Freehold Land or Maaori Customary land for the purposes of development must not exceed 1500m² for a Marae complex, 500m² for a dwelling and 500m² for Papakaainga building ▪ Indigenous vegetation clearance for building, access, parking and manoeuvring areas in a SNA identified on the planning maps shall not exceed 250m² ▪ Indigenous vegetation clearance of up to 500m² outside an SNA for a building platform, associated access, parking and manoeuvring and up to 2000m² in the Aggregate Extraction Areas in a single consecutive 12-month period ▪ Clearance of manuka and kanuka within an SNA (outside of a wetland) for domestic firewood purposes or arts and crafts up to 5m² per single consecutive 12-month period per property ▪ Clearance of manuka and kanuka outside an SNA (and outside a wetland) for domestic firewood purposes or to maintain productive pasture up to 3000m³ per single consecutive 12-month period per site, and plants are less than 4m in height and more than 10m from a waterbody.

	▪ Vegetation clearance thresholds relating to removal of vegetation associated with infrastructure are contained within Part 2 - Chapter 3. Any removal or alteration of indigenous vegetation within an SNA must not include trees over 6m high or 600mm in girth at a height of 1.4m and must not exceed 50m² per 12-month period
Waipa District Plan	▪ No specific thresholds for earthworks are provided within Section 24. Earthworks rules sit within the underlying zone chapter (i.e., Rural Zone has a maximum earthworks volume of 1000m³ in a single activity or cumulative activities in any calendar year) ▪ No specific thresholds for indigenous vegetation clearance in SNAs and Bush Stands, only different activity status given (i.e., trimming/pruning vs removal as outlined in Section 4.3 above) except for: manuka and kanuka removal for use on the same holding which is restricted to 5m² per calendar year and removal of indigenous vegetation in respect to conservation activities which is restricted to no greater than 1 hectare or 1% of the area, whichever is the lesser, of the SNA or Bush Stand ▪ Clearance of indigenous vegetation less than 1ha within the biodiversity corridors is C, clearance of 1ha or more is RD
Auckland Unitary Plan	▪ Different thresholds apply for vegetation removal relating to specified activities within a SEA including: o Vegetation alteration or removal for routine operation, maintenance and repair of existing tracks, lawns, gardens, fences, shelterbelts and other lawfully established activities in riparian areas, coastal areas, all zones outside the RUB must not include trees over 6m in height, or 600mm in girth or must not result in greater than 25m² of vegetation removal from within a SEA overlay o Tree trimming within a SEA maximum branch diameter must not exceed 50mm and no more than 10 per cent of live growth of the tree is removed in any one calendar year o Vegetation alteration or removal for the operation, maintenance and repair of access tracks and fences for network utilities must not result in the removal of more than 20m² of vegetation within a significant ecological area ▪ Earthworks for maintenance, renewal and repair of network utilities and electricity generation activities are permitted in a SEA ▪ Earthworks for service connections are permitted in a SEA ▪ Earthworks for minor infrastructure upgrading are permitted in a SEA ▪ Earthworks for minor utility structures are permitted in a SEA ▪ Earthworks for minor upgrading of road network activities within the legal road or the formation width of the road are permitted in a SEA ▪ Earthworks for network utilities and electricity generation facilities that do not comply with the standards E26.6.5.2 are RD ▪ Other earthworks for Network utilities and electricity generation up to 10m² and 5m³ are permitted ▪ Earthworks for Network utilities and electricity generation from 10m² to 2500m² and from 5m³ to 2500m³ are RD ▪ Earthworks for Network utilities and electricity generation greater than 2500m² and 2500m³ are D
Tauranga City Plan	▪ No specific thresholds for indigenous vegetation clearance, only different activity status given (i.e. trimming/pruning to maintain an existing track is permitted, clearance of indigenous vegetation in open space zone is RD and D in any other zone) ▪ Earthworks associated with permitted activities in a SEA are also permitted ▪ Earthworks associated with all other activities must not exceed more than 5m³ in a 6-month calendar period (exemptions for maintenance of existing stormwater reserves and flow paths, farm tracks and fence lines)

4.5 Buildings and structures

Table 7: Summary of building/structure rules within SNAs in selected district plans.

District Plan	Description of provisions
Waikato District Plan	▪ No specific rules relating to the construction of buildings within a SNA, however specific vegetation clearance limits apply to specified building platforms as outlined above in Section 4.4. ▪ Construction of buildings and structures are controlled by the Zone rules. I.e., the Rural Zone construction of buildings and structures is permitted subject to compliance with standards
Waipa District Plan	▪ No rules relating to buildings and structures are contained within Section 24 ▪ Majority of SNAs and Bush Stands are located within the Rural Zone therefore construction of buildings and structures are subject to the rules within Section 4 which includes a minimum 10m building setback from SNAs.
Auckland Unitary Plan	▪ No specific rules relating to the construction of buildings within a SEA are specified, however specific vegetation clearance and earthworks rules apply to buildings as outlined above in Section 4.3 and 4.4 above. ▪ Construction of buildings and structures are largely controlled by the underlying Zone rules
Tauranga City Plan	▪ Maintenance of buildings and structures associated with public recreational facilities, surf live saving buildings/clubrooms are permitted ▪ Accessory buildings on land zoned Open Space are permitted ▪ Public pedestrian and cycle tracks including pathways, bridging, boardwalks and steps on land zoned Open Space is permitted in SEA Category 2 but RD in SEA Category 1 ▪ Buildings and structures on land zoned Open Space are RD in SEA Category 2 but NC in SEA Category 1 ▪ Activities undertaken on land **not** zoned Open Space that involve alteration, construction erection, placement and/or alteration of any building or structure are D in SEA Category 1 and NC in SEA Category 2 ▪ Managed accessways being walkways, cycleways, boardwalks and associated signage are D in all SEAs

5 REVIEW OF EXISTING DISTRICT PLAN PROVISIONS

5.1 Hamilton City District Plan

The Hamilton City District Plan was notified in December 2012. Following submissions and hearings, decisions on the proposed Hamilton City District Plan were released on 9 July 2014. 45 appeals were lodged with the Environment Court which have all been resolved by consent order or through withdrawal. The Hamilton City District Plan was made operative on 18 October 2017. The Operative District Plan chapters of most relevant to this review are:

- Chapter 2 – Strategic Framework
- Chapter 20 – Natural Environments (including SNAs)
- Chapter 21 – Waikato River Corridor and Gully Systems
- Chapter 22 – Natural Hazards
- Chapter 25.2 – Earthworks and Vegetation Removal (which cross-references back to Chapter 20).

Also of relevance to this review is Plan Change 5 (Peacocke Structure Plan) which includes a bespoke set of provisions and approach to manage indigenous biodiversity/SNAs within the structure plan area. The sections below provide a high-level summary of the relevant provisions in these chapters of the District Plan.

5.2 Chapter 2 – Strategic Framework

5.2.1 Overview of provisions

Chapter 2 (Strategic Framework) contains overarching strategic objectives and policies that support more specific objectives and policies relating to SNAs and the Waikato River/gullies in other chapters. This chapter includes two objectives relating to the management of the Waikato River and gully systems:

- *2.2.8 - The health and wellbeing of the Waikato River is restored and protected and the River is celebrated as being at the heart of the region's identity and a feature of national importance.*
- *2.2.10 - The health and wellbeing of the Waikato River is restored and protected so that it may sustain abundant life and prosperous communities.*

Objective 2.2.8 is supported by the following policies:

2.2.8a *-* ***The natural character of the Waikato River, gully system and its margins is preserved and protected from inappropriate subdivision, land use and development.***
2.2.8b - *The natural, cultural, heritage and amenity values of the Waikato River are protected, enjoyed and enhanced.*
2.2.8c - *Access and connections with the Waikato River are maintained and enhanced.*
2.2.8d - *The relationship of Waikato-Tainui with the Waikato River is recognised and provided for, including through a Joint Management Agreement.*
2.2.8e - *Communities' relationships with the Waikato River, including their economic, social, cultural and spiritual relationships, are restored and protected.*

Objective 2.2.10 is supported by the following policies:

2.2.10a *-* ***Provide programmes of action to achieve targets to improve the health and wellbeing of the Waikato River.***
2.2.10b - *Promote an integrated, holistic and coordinated approach to the management of the natural, physical, cultural and historic resources of the Waikato River.*

Chapter 2 also includes the following objective focused on the natural environment:

- **2.2.12-** Protect and enhance natural character, natural features and landscapes, ecosystems and indigenous biodiversity.

Objective 2.2.12 is supported by the following policies:

2.2.12a *- Land use and development protects natural character, natural features and landscapes and ecosystems and promotes positive outcomes for indigenous biodiversity in the Waikato region.*
2.2.12b - *Land use and development maintains the extent and, where possible, enhances ecological corridors.*

There are no implementing rules or methods for Chapter 2 as the provisions outlined in Chapters 20, 21 and 22 below give effect to Chapter 2.

5.3 Chapter 20 – Natural Environments

5.3.1 Overview of provisions

Chapter 20 (Natural Environments) of the District Plan contains the provisions relating to SNAs along with provisions relating to significant trees or groups of trees, and peat lakes and wetlands. Chapter 20 includes two objectives relating to SNAs:

- *20.2.1 - Significant Natural Areas are protected, maintained, restored and enhanced.*
- *20.2.2 - Public awareness and appreciation of Significant Natural Areas is increased.*

Objective 20.2.1 is supported by a large number of policies, including some strong "avoidance policies" as set out below.

***20.2.1a** - The values and characteristics that define the City's Significant Natural Areas shall be identified.*
***20.2.1b -** Areas of indigenous vegetation, biodiversity and habitats of indigenous fauna shall be scheduled as Significant Natural Areas.*
***20.2.1c -** The particular values and characteristics that make an area a Significant Natural Area shall be protected from adverse effects by having regard to:* *i. The character and degree of modification, damage, loss or destruction that will result from the activity.* *ii. The duration and frequency of effect (e.g. long-term or recurring effects).* *iii. The magnitude or scale of effect, including effects on ecological processes supporting or provided by the Significant Natural Area.* *iv. The irreversibility of effect.* *v. The resilience of the area to assimilate change.* *vi. The opportunities to minimise pre-existing or potential adverse effects (e.g. restoration or enhancement), where avoidance is not practicable.* *vii. The probability of effect.* *viii. Cumulative effects.* *ix. Need for, or purpose of, the works.*
***20.2.1d -** Adverse effects of development on the City's Significant Natural Areas shall be avoided.*
***20.2.1e -** The reduction, fragmentation and isolation of indigenous ecosystems and habitats shall be avoided.*
***20.2.1f -** The loss or disruption of corridors or connections linking indigenous ecosystems and habitat fragments shall be avoided.*
***20.2.1g -** The loss or disruption to migratory pathways in water, land or air shall be avoided.*
***20.2.1h-** Adverse effects on ecosystems resulting from changes to hydrological flows, water levels and water quality shall be avoided.*
***20.2.1i-** The loss or disruption of protective buffering of indigenous ecosystems shall be avoided.*
***20.2.1j -** The loss of ecosystem services shall be avoided.*
***20.2.1k -** The loss, damage or disruption to ecological processes, functions and ecological integrity shall be avoided.*
***20.2.1l-** The loss or reduction of the cultural and spiritual association with indigenous biodiversity which are held by tangata whenua shall be avoided.*
***20.2.1m -** Non-native pest species within Significant Natural Areas shall be controlled.*
***20.2.1n -** The loss of habitat that supports indigenous species classified as at risk or threatened shall be avoided.*
***20.2.1o -**Significant Natural Areas shall be restored and enhanced to meet at least the 10% threshold for habitat sustainability.*
***20.2.1p -** Develop a local indigenous biodiversity strategy to identify opportunities to restore and enhance biodiversity in Hamilton City.*

Objective 20.2.2 is supported by two policies as set out below.

20.2.2a *- Communication between affected landowners, Department of Conservation, iwi and other organisations that can assist in the management and conservation of these areas shall be encouraged. Information and other legislative means of protection shall be readily available to the public.*
20.2.2b - *Information and other legislative means of protection shall be readily available to the public.*

20.3 Rules - Activity Status Table[20] of the District Plan outlines rules relating to SNAs and associated activity status. These rules are summarised below.

Table 8: Summary of SNA rules in Chapter 20 of the District Plan.

Activity status	Activity
Permitted	▪ Pruning and maintenance of indigenous vegetation for specific purposes (disease, operation of network utilities, maintain existing tracks) ▪ Removal of dead or damaged indigenous vegetation for specific purposes (to maintain or enhance values of SNA, operation of network utilities, maintain existing tracks) ▪ Pest control ▪ Planting and management of eco-sourced indigenous vegetation or trees ▪ Emergency works where there is an imminent threat to life, property or a network utility or the tree carries a fatal disease
Restricted discretionary	▪ Removal of exotic trees
Non-complying	▪ Earthworks ▪ Laying or forming of any impervious surface ▪ Additions or replacement of any existing building that exceeds existing footprint ▪ Placement of construction of any building or structure ▪ Directional drilling or boring ▪ The storage of chemicals or other toxic substances ▪ Removal of, or transplanting indigenous vegetation

Chapter 20 also includes a specific standard (20.5.1) for pruning and maintenance in SNA which controls amount of foliage to be removed and maximum thickness of any branch or root that may be cut. There is also a specific standard (20.5.2) for emergency works to, or removal of, an indigenous tree in a SNA which requires HCC to be notified prior to works and ensure work is undertaken by an appropriately qualified person.

5.3.2 Key issues and changes through Schedule 1 process

The decisions on Chapter 20 were appealed by Waikato Regional Council who sought to include appropriate provisions for the restoration and enhancement of indigenous biodiversity in Hamilton City. The appeal was resolved by way of consent order on 1 May 2015 with the main changes relating to Objective 20.2.1 (protection, maintenance, restoration and enhancement of SNAs) and the range of supporting policies in 20.2.1a to 20.2.1p.

5.4 Chapter 21 – Waikato River Corridor and Gully Systems

5.4.1 Overview of provisions

Chapter 21 of the District Plan includes a set of objectives and policies relating to the protection, restoration and enhancement of the river corridor and gully systems within Hamilton. There are no rules directly associated with this chapter and, as such, it is only through resource consents (typically discretionary or non-complying activities) that these matters are able to be considered.

[20] This does not apply to activities and buildings in the Electricity National Grid Corridor which are managed under Chapter 25.7: City-wide – Network Utilities and the Electricity National Grid Corridor.

Chapter 21 has four objectives, two of which focus on some aspect of the health, wellbeing and values of the Waikato River corridor and/or gullies[21]:

- *21.2.1 - The ecological, amenity, landscape and cultural values of the river corridor and gully system are restored and protected.*
- *21.2.4 - The health and wellbeing of the Waikato River and gully systems shall be restored and protected.*

Objective 21.2.1 is supported by seven policies, five[22] of which directly apply to the vegetation and ecosystems associated with the gullies and river as outlined below.

21.2.1a - *An integrated, holistic and co-ordinated approach to management shall be used to protect, enhance and restore the natural, physical, cultural and historical resources and character of the river corridor and gully system.*
21.2.1b - *Development and activities that impact on landform shall be controlled, particularly the:* *i. Clearance of vegetation along the river and gullies.* *ii. Filling of gullies, including the cumulative effects of such incremental filling.*
21.2.1c - *The ecological functions of waterways shall be restored and protected by minimising the modification of natural watercourses and riparian margins.*
21.2.1f - *The loss or disruption of corridors or connections provided by the Waikato River corridor and gully systems which link indigenous ecosystems and habitat fragments shall be avoided.*
21.2.1g - *The connectivity and protective buffering of indigenous ecosystems provided by the Waikato River Corridor and gully system shall be maintained.*

Objective 21.2.4 is supported by three policies that all apply to protecting the gullies and the river corridor as outlined below.

21.2.4a - *Significant sites, fisheries, flora and fauna within the Waikato River and gully systems shall be protected and enhanced.*
21.2.4b - *Recognition and avoidance of adverse cumulative effects on the health and wellbeing of the Waikato River and gully systems.*
21.2.4c - *Restoration of water quality within the Waikato River and gully systems.*

5.4.2 Key issues and changes through Schedule 1 process

The majority of submissions on Chapter 21 were supportive of the chapter in principle, but many submitters (including the Waikato Regional Council and Department of Conservation) sought to include implementing methods, particularly rules to manage vegetation clearance, impervious surfaces and construction of buildings within the river and gully system. These requests were rejected by HCC on the basis that other chapters (i.e. Chapters 15, 20 and 22) adequately covered these issues in gullies. Waikato Regional Council appealed the wording of an objective and a policy in Chapter 21 to better promote restoration and enhancement of gullies. These changes were not made as part of the 2015 consent order resolving the Waikato Regional Council appeal.

5.5 Chapter 22 – Natural Hazards

5.5.1 Overview of provisions

Chapter 22 addresses all forms of natural hazards in the Hamilton district, and includes specific provisions to manage the 'Waikato Riverbank and Gully Hazard Area', which is identified as an overlay on the Planning Maps. The purpose of the overlay and associated provisions is to recognise that the slopes and soil types of the Waikato Riverbank and Gully systems potentially make these areas more susceptible to land instability (erosion, land slips and subsidence). The provisions relating to the overly seek to manage particular activities, such as constructing

[21] Objective 21.2.2 and associated policies are not relevant as they focus on the ways the river and gullies can be used to reflect various aspects of its social, cultural, spiritual and historical character (not about protection). Objective 21.2.3 and associated policies are not relevant as they focus on the river corridor being a key focus for tourism and events.

[22] Policies 21.2.1d and 21.2.1e focus on the relationships of various groups with the Waikato River.

buildings/structures and vegetation clearance, that are more vulnerable to, or could potentially exacerbate, land instability.

Chapter 22 of the District Plan has one objective as follows:

> *22.2.1 - Manage activities to avoid or mitigate adverse effects on, and minimise risk to:*
>
> 1. *People;*
> 2. *Property; and*
> 3. *The environment,*
>
> *from natural hazards, in order to increase community resilience, reduce the risks from natural hazards, and support effective and efficient response and recovery from natural hazard events.*

Objective 22.2.1 is supported by 13 policies – some are generic and apply to all types of hazards but two are specific to the Waikato Riverbank and Gully Hazard Area as outlined below.

> ***22.2.1l** - New use and development which is vulnerable to the adverse effects of land instability shall avoid the Waikato Riverbank and Gully Hazard Area, where the adverse effects and risks have not been minimised to an acceptable or tolerable level.*
>
> ***22.2.1m –** New use and development which is resilient to the adverse effects of land instability shall be provided for in the Waikato Riverbank and Gully Hazard Area.*

22.3 Rules – Activity Status Table of the District Plan outlines rules relating to activities in the Waikato Riverbank and Gully Hazard Area overlay and associated activity status. These rules are summarised in Table 9 below.

Table 9: Summary of rules in Chapter 22 relating to the Waikato Riverbank and Gully Hazard Area.

Activity status	Activity
Permitted	▪ Removal, planting, trimming or maintenance of trees or other vegetation ▪ Pest control ▪ Replacement, rebuilding, demolition or maintenance of existing buildings ▪ Additions and alterations to buildings where there is no increase in site coverage or habitable floor area ▪ Earthworks ancillary to a permitted activity in Table 22.3 ▪ Ancillary residential structures (excluding swimming pools, but including walls and fences) ▪ Walkways and cycle paths ▪ External storage of goods and materials ▪ Recreational activities ▪ Farming, horticultural or domestic gardening activities ▪ Lifeline utilities (above ground level) ▪ Maintenance and repair of existing lifeline utilities
Discretionary	▪ New buildings ▪ Additions and alterations to buildings with an increase in site coverage or habitable floor area ▪ Earthworks not otherwise permitted in Table 22.3 ▪ Flood protection structures ▪ Swimming pools ▪ Any vulnerable land use – residential, industrial, retail activities, childcare facility, community centre, healthcare service, offices or schools
Non-complying	▪ Emergency service facilities ▪ Hospitals ▪ Lifeline utilities (except for above ground) ▪ Regionally significant infrastructure not otherwise covered in Table 22.3

Chapter 22 includes a general standard (22.4.1) that restricts the maximum area of impermeable surface in that part of a site within a Hazard Area to 40%. It also includes specific standards (22.5) applying in the Waikato Riverbank and Gully Hazard Area, including standards that manage ancillary earthworks and removal of trees and other vegetation. Of most relevance are the rules that restrict the area of vegetation clearance to 50m² per calendar year, per site, OR 100m² per calendar year for each 50m length of watercourse or gully that is part of an esplanade reserve or Open Space Zone.

5.5.2 Key issues and changes through Schedule 1 process

Most submissions relating to the Waikato Riverbank and Gully Hazard Area relate to requests to remove the overlay from private property (which were rejected). The Waikato Regional Council requested that the scope of the overlay was expanded so that it covered ecological values and that stronger vegetation removal rules were introduced. These requests were rejected but a requirement to have a suitably qualified professional remove the trees was introduced into Rule 22.5.4.b. These provisions were not appealed by Waikato Regional Council.

5.6 Chapter 25.2 – Earthworks and vegetation removal

This chapter contains the city-wide earthworks and vegetation removal rules that apply to parts of the city not subject to any overlays (e.g. SNAs, historic heritage). There are no specific provisions that are relevant to this project. However, there are several cross references to Chapter 20 and 22 provisions in Chapter 25 that may require consequential amendments as a result of changes to Chapters 20.

5.7 Plan Change 5 – Peacocke Structure Plan

The Peacocke area is one of four significant growth cells in Hamilton, comprising approximately 740ha of land and is the only growth area located in the south of Hamilton. The Peacocke growth cell is currently zoned Peacocke Special Character Zone and subject to the Peacocke Structure Plan which was publicly notified in September 2007 and reviewed in 2012. Since this time the vision for this area has changed, hence the need for Plan Change 5 to introduce an updated structure plan.

Plan Change 5 was notified by HCC on the 24 September 2021 and submissions closed on the 5 November 2021. The period for further submissions is now open and closes on the 16 March 2022.

The key elements of the plan change include:

- The rezoning of approximately 690 hectares from General Residential Zone and Peacocke Special Character Zone to Peacocke Medium Density Residential Zone. This will enable up to 8400 residential units comprising a mixture of single dwellings, duplex dwellings, terraced houses and apartments.
- The rezoning of approximately 7.8 hectares from Peacocke Special Character Zone to Local Centre Zone to establish the main commercial centre within Peacocke.
- The rezoning of approximately 3 hectares from Peacocke Special Character Zone to Neighbourhood Centre Zone to allow the establishment of eight neighbourhood centres.
- Increase the Natural Open Space Zone from 16 hectares to 143 hectares. These areas of will include significant bat habitat buffers and corridors outside of the gully network, to join the Mangakootukutuku Gully network with areas outside of the Peacocke Structure Plan Area.
- The rezoning of 14 hectares of Peacocke Special Character Zone to Peacocke Sports and Active Recreation Zone for the purpose of establishing a sports park.
- The area of SNA will be increase to 58.2 hectares.
- A number of new archaeological sites have been identified and included on the Features Maps.
- The Waikato River and Gully Hazard Area overlay has been amended and a new Seismic Setback area has been introduced to reflect the work undertaken to identify hazards.
- New provisions are proposed to protect areas of significant bat habitat from future urban development. These provisions include controls over fixed lighting associated with urban development as well as a building setback from the boundary of Significant Bat Habitat Areas.
- It will include more details around the location of higher density areas and identification of the indicative transport corridor including proposed public transport routes.
- It identifies the indicative location of stormwater wetlands and areas of future open space.
- It also introduces a new infrastructure and staging plan for the Peacocke Structure Plan Area.

As part of Plan Change 5, HCC engaged 4Sight Consulting to undertake an ecological review and assessment of the effects of the land-use change on the long-tailed bat. As a result of this, the Plan Change 5 introduces a Bat Habitat Overlay within the Features Map. In addition, objectives and policies that manage the effects of artificial lighting at the boundary of the overlay and in other public spaces have also been introduced, as have provisions that seek to ensure habitat in the Natural Open Space is provided, protected and enhanced.

HCC also engaged Tonkin and Taylor Limited to undertake an assessment of significance for indigenous biodiversity within the Peacocke Structure Plan Area. Recommendations from the Tonkin and Taylor assessment include a much greater and wider extent of ecologically significant areas than previously identified in the earlier SNA report. Buffers and corridors are also recommended to protect habitats for long-tailed bats.

As a result of the above, the Peacocke Structure Plan includes a number of areas where it is envisioned that mitigation actions will be required to ensure bats are not excluded from using these Peacocke ecological areas post urbanisation. This includes categorising habitat for long-tailed bats into the following:

1) **Significant Bat Habitats**
2) **Significant Bat Habitat Buffer:** Adjacent to the Significant Bat Habitats a 20m buffer has been applied
3) **Bat Corridors:** Indicative bat corridors have been mapped
4) **Building Setback Areas:** A 5m building setback area is recommended to be applied on the outside of the Significant Bat Habitats Buffer and Bat Corridors.

5.7.1 Amberfield Development – Weston Lea Limited

The Amberfield development involves an approximately 105ha site located within the Peacocke area. The application was originally lodged for land use and subdivision consent to create a total of 86 fee-simple lots, including two large lots for future residential and commercial development, one commercial lot and two rural balance lots. The application was publicly notified on 1st September 2018. Following public notification, a hearing was held, and consent was granted to Weston Lea Limited by Independent Commissioners, subject to a number of conditions.

The decision was subsequently appealed to the Environment Court by the Director General of Conservation and Weston Lea Limited. The general reasons for the appeal by the Director General of Conservation was that the decision failed to address Part 2 of the RMA 1991 as consent conditions inadequately address the adverse effects of the development on the environment, in particular on long-tailed bats. The appeal noted that the decision to grant consent relied heavily on the adoption of an adaptive management approach but the adaptive management consent conditions have significant inadequacies, and the consent conditions leave critical adverse effects to be addressed via yet to be developed future management plans. The relief sought by the Director General of Conservation included amendments to the conditions of consent to ensure the actual and potential adverse effects on the long-tailed bat and other biodiversity issues are adequately addressed.

The principles of the approach to habitat preservation were not in dispute at the Environment Court hearing although the treatment of the Bat Priority Areas was a matter on appeal. The parties agreed on a number of issues for the purposes of the hearing including:

- Issues directly relating to development including a 50m buffer to the south of the East West Corridor, removal of Road 2, details of covenants attached to properties associated with the East West Corridor and the set-back of buildings from the East West Corridor boundary
- Management Plans
- Monitoring
- Lighting Standards
- Predator Control and Cats
- Monetary bond.

An interim decision by the Environment Court was granted on the 6 November 2020 subject to conditions being amended. This decision made a number of comments relating to Chapter 20 including:

> *"The sites are identified in the Planning Maps and are listed in Schedule 9C: Significant Natural Areas, in Volume 2, Appendix 9. To date, such Significant Natural Areas (SNAs) include identified areas of the Waikato River corridor and gully areas, peat lakes and wetlands and remnant indigenous vegetation or trees. it therefore comes as a surprise to the Court, in light of the warranted concern held for the future of the Long-tailed Bat, that no commonly identified and generally agreed Bat Protection Area is currently contained in Schedule 9C.*

This is an unfortunate oversight. It is a matter requiring urgent redress In fairness, we understand this to be the case with the necessary policy development work being undertaken by the Council.

At the same time, the oversight cannot be ignored. There is a diminishing population of an endangered species of native New Zealand fauna, deemed to be so rare as to be classified "Nationally Critical" pursuant to the New Zealand Threat Classification System. Given the acknowledged adverse effects from land use development, appropriate steps need to be taken based on Part 2 of the Acts 6(c) and relevant plans."[23]

A final decision was granted on the 27 September 2021. Final conditions include the requirement to prepare a Habitat Management Plan and a Bat Protection Plan, retention of trees within Bat Priority Areas, installation of artificial bat roost boxes, bat monitoring, bat-sensitive road lighting, roadside buffer planting adjoining Bat Priority Areas, restrictions on lighting within specified reserves and residential lots, specified building setbacks and a restriction/ban on cats and mustelids to be kept on residential lots.

[23] *Weaston Lea v Hamilton City Council* [2020] NZEnvC 189, paragraph 40-42.

6 KEY ISSUES IDENTIFIED WITH EXISTING PROVISIONS

6.1 Chapter 20 – Natural Environments

Key issues are:

- **Need to refine avoidance policies**
- **Need more support for restoration and enhancement projects**
- **Need more flexibility for public infrastructure/network utilities**
- **SNA area needs to increase to cover the full extent of the Waikato River and gully system**

Comment

Chapter 20 contains strong, restrictive rules to protect vegetation within mapped SNAs with most activities being non-complying except for minor pruning and maintenance activities associated with particular activities/purposes. It also has very directive "avoidance policies" covering a wide range of potential effects on SNAs and on development generally. Arguably, these policies are too blunt and wide-ranging (e.g. 'adverse effects of development of the City's Significant Natural Areas shall be avoided') and the strong avoidance approach should more focus on the effects that need to be avoided to protect ecological integrity, connectivity, function etc. of the SNA (as referenced in certain policies).

The policies are heavily focused on avoiding adverse effects and protecting the SNA and there are only two policies that mention restoration and enhancement (20.2.1.c.vi and 20.2.1o). There is the potential to provide more support at both the policy and rule level for restoration initiatives to assist individual landowners, community groups and HCC with restoration projects. Often projects to restore or enhance a SNA involve other activities such as earthworks or the creation of tracks for access, which are not provided for as permitted activities under the current Chapter 20 rules (they would generally default to non-complying).

The policies also fail to recognise that infrastructure assets and public walkways and cycleways are sometimes required to locate in a SNA due to the specific operational or functional needs of the infrastructure or the desire to improve public access. This is likely to become an issue of greater significance when the SNA mapping extends to gully systems as there are existing stormwater and water supply intake structures in the gullies and around the Waikato River. Under the operative rules in Chapter 20, there is limited recognition of the need to operate and maintain infrastructure or public walkways and cycleways (only minor punning and removal of dead or damaged indigenous biodiversity is permitted) and no clear consent pathway for the upgrading or installation of these assets. Recognition at both the policy and rule level that infrastructure assets do need to locate in SNAs where there is an operational or functional need and that public access through SNAs is often beneficial is consistent with relevant national and regional policy direction and would be of benefit to HCC's operational teams.

The technical memo from HCC's City Waters department[24] provides more details on the nature and extent of three waters infrastructure in the updated SNA layer and the need to undertake routine maintenance and asset replacement to ensure assets are delivering essential services to the community.

Finally, the objectives, policies and rules designed to protect SNAs in Chapter 20 need to be fit-for-purpose to manage the new classification of SNAs (i.e. the split between fSNA and cSNA). This may require a slightly different policy and rule framework for certain activities (e.g. exotic tree removal) to recognise the different ecological function, values and vulnerability of the two types of SNA.

6.2 Chapter 21 – Waikato River Corridor and Gully Systems

Key issues are:

- **Objectives and policies have no implementing rules**
- **Permitted vegetation removal often occurs within the Waikato River and gully system area prior to a resource consent being applied for**

Comment

[24] Memo from Hamilton City Council – City Waters, 30 May 2022, *'Plan Change 9: Three-Waters supporting context for Infrastructure Provisions within proposed Significant Natural Areas'*, File Reference D-4235849.

The wording of the Chapter 21 objectives and policies is relatively clear and directive - they prioritise protection, restoration, enhancement of the river corridor and gully network. However, the lack of implementing rules means there is a disconnect between the direction of Chapter 21 and the activity status of activities such as vegetation clearance within the river and gully systems. This can create scenarios where the overall activity status of an application is discretionary or non-complying (meaning that the Chapter 21 provisions can be considered), but the activity status of vegetation clearance is permitted, which can result in applicants clearing vegetation and undertaking preliminary site works as permitted activities prior to a decision on the resource consent being issued. This disconnect undermines the effectiveness of the Chapter 21 objectives and policies and can make it difficult for planners to recommend protection and/or restoration conditions if the vegetation in the river and gully systems is not protected by any rules.

6.3 Chapter 22 – Natural Hazards

Keys issues are:

- **Provisions focus on land instability rather than indigenous biodiversity, so cannot be used to protect or enhance vegetation**

Comment

The Waikato Riverbank and Gully Hazard Area overlay (administered through Chapter 22) covers the majority of the Waikato River and gully areas that also have indigenous biodiversity values. As such, some of the provisions that aim to manage natural hazard risks (namely land instability) in this overlay also have the secondary benefit of protecting vegetation in these areas from clearance, i.e. the limits on vegetation removal in 22.5.4 and the need to obtain a resource consent for new buildings, extended buildings or new vulnerable activities under Activity Table 22.3. However, the purpose of the overlay is not to protect indigenous biodiversity, rather it is to manage activities that are either vulnerable to, or may exacerbate, land instability. Provided an applicant can prove that the proposed vegetation removal or new/expanded building has an acceptable land instability risk, it is likely to be approved.

Chapter 22 does not mention indigenous biodiversity and there are no objectives or policies that direct vegetation or habitat to be retained for its ecological value. Further, it is clear from the vegetation clearance rule 22.5.4.c that re-grassing a cleared area is just as acceptable as revegetating it, so there is little incentive for applicants to replant and restore the gully areas. This focus on land stability as the primary adverse effect being managed means that a processing planner is unable to use the provisions of Chapter 22 to decline an application or impose vegetation management conditions on an applicant except for the purpose of managing land instability risk. As such, Chapter 22 is limited in its ability to protect indigenous biodiversity.

7 OPTIONS

7.1 Overview

Several options are being considered to improve the way SNAs are protected and managed through the Hamilton City District Plan. These options are all based on the assumption that the additional areas of SNA identified in the 4Sight ecological report will be included in an updated Schedule 9C through a Schedule 1 plan change (potentially with some refinement following ground truthing). The focus of these options is how the District Plan provisions can better protect and manage the updated schedule of SNAs rather than the extent of SNAs in the district. The scope of options considered focuses on amendments to existing chapters of the District Plan (primarily Chapter 20), as opposed to the creation of a new chapter or merging of multiple chapters.

The five key options explored in this section are as follows:

1. **Status quo** – existing Chapter 20 provisions will apply to the existing and new mapped areas of SNA.
2. **Tiered approach** – this option would introduce and apply different provisions to the two types of SNA - fSNA and cSNA - as identified by the 4Sight ecological report. This will involve slightly more flexible provisions for cSNA recognising the primary function of these areas as habitat and providing buffering function which means they can be less vulnerable to adverse effects of certain activities.
3. **Effects management hierarchy approach** – this option would refine the strong "avoidance policies" in Chapter 20 to focus the avoidance policies more on the key ecological attributes of SNAs that need to be protected. It would also refine the policies to better reflect the 'effects management hierarchy' approach, which aligns with the Waikato RPS, the proposed NPS-IB and other recent district plans.
4. **Providing for important activities and restoration** – this option would better provide for important activities such as infrastructure, public walkways and cycleways and restoration/enhancement activities through permitted and consenting pathways to recognise the importance of these activities for environmental, economic, social and cultural well-being.
5. **Buffer/setbacks approach** – this option would apply a buffer area or setback at the edge of mapped SNAs and control certain activities within this area to reduce edge effects from activities with potential for significant, permanent adverse effects such as residential buildings.

Note that Options 2-5 are modifications to the status quo (Option 1) and are not mutually exclusive and the preferred management approach may incorporate elements of each.

7.2 Option 1 – Status quo – retaining existing SNA provisions

7.2.1 Overview of option

This option involves retaining Chapter 20 with no amendments and applying it to the existing and new mapped SNAs. This would retain the strong avoidance policies and stringent rule framework for protecting SNAs outlined in **section 5.2** of this report.

7.2.2 Benefits and cons/risks

Table 10: Benefits and con/risks of Option 1

Benefits	Cons/risks
▪ Easiest approach to understand – well understood by HCC staff. ▪ Least amount of drafting required. ▪ Likely reduced scope of submissions as submissions will focus on the extent of the new SNA as opposed to the chapter content (as this will not be part of the plan change). ▪ Very strong avoidance policies likely to achieve positive ecological outcomes and strong protection of existing and new SNAs. ▪ Resolves issue of Chapter 21 not having implementing rules as the extension of the mapped SNA area means that most of the land	▪ May result in more push back on SNA mapping as existing Chapter 20 provisions are very stringent and have limited flexibility – may make the extended overlay seem more onerous, particularly to private landowners. ▪ Chapter 20 provisions may be a consenting roadblock for restoration and enhancement activities that have ecological benefits and should be encouraged i.e. all earthworks are non-complying, indigenous trees cannot be transplanted, new tracks are not permitted. ▪ There is no flexibility for infrastructure to establish in a SNA and insufficient flexibility for maintaining

subject to Chapter 21 will be managed through the rules of Chapter 20.	and upgrading infrastructure over time. There is also no recognition of existing public walkways and cycleways and/or the need to maintain these or construct new access paths in the future.

7.2.3 Key considerations

The efficiency benefits of this option need to be considered against the missed opportunities to resolve some of the existing issues with Chapter 20, i.e. the need to support enhancement and restoration projects and provide some flexibility for infrastructure projects and public walkways and cycleways. The potential opposition from private landowners to the existing Chapter 20 provisions applying to their land is also an important consideration, as most of the mapped SNA land is currently on publicly owned land (and zoned Natural Open Space), whereas most new areas being suggested as SNA are on private land.

Note that Option 1 – Status quo is the starting point that Options 2, 3, 4 and 5 are all aimed at improving and refining in light of the issues identified in this report and the updated SNA mapping. It is therefore suggested that HCC consideration should focus on the extent to which Options 2, 3,4 and 5 should be adopted to refine and improve the status quo.

7.3 Option 2 – Tiered management approach for the two SNA classifications

7.3.1 Overview of option

This option involves introducing new provisions into Chapter 20 to manage SNAs with two tiers of provisions (policies and rules) based on the two classifications of SNAs identified in the 4Sight ecological report. At a broad level, this could involve:

- A more stringent set of rules for SNAs classified as 'Floristic SNA' (fSNA), likely to be similar to the existing SNA rules in Chapter 20. This recognises that these areas contain wetlands or terrestrial vegetation dominated by naturally occurring indigenous plants/vegetation that score highly against the Waikato RPS ecological significance criteria.
- A slightly more lenient set of rules for SNAs classified as 'Corridor/indigenous fauna habitat SNA' (cSNA), with potentially more flexibility for activities such as restoration/enhancement projects, earthworks, infrastructure and public walkways and cycleways. This recognises that these SNAs have a primary function as habitats and providing connectivity, that they often contain non-indigenous vegetation, and are more able to tolerate disturbance without affecting the ecological function of the SNA.

Alternatively, it could involve a more nuanced approach with policies that recognise the different values and ecological function of each SNA classification and slightly different rules for certain activities (e.g. exotic tree removal) recognising the different vulnerability of each SNA to specific types of activities and effects.

7.3.2 Benefits and cons/risks

Table 11: Benefits and cons/risks of Option 2.

Benefits	Risks
▪ Sends a strong message that fSNA requires the maximum level of protection afforded by the District Plan and aligns well with section 6(c) of the RMA and the Waikato RPS. ▪ Provides more flexibility to undertake a wider range of activities in SNAs where there is a higher percentage of exotic vegetation and greater opportunities for enhancement and restoration. ▪ Retains status quo provisions for the majority of existing mapped SNAs (as most are fSNA), which will be well understood and familiar to landowners and council staff alike. ▪ Allows the different values of fSNA and cSNA to be recognised at the policy level, which should enable the effects of proposals to be assessed with	▪ Risk that cSNA is viewed as being 'less valuable' from an ecological perspective, when both types of SNA are equally valuable ecologically, just for slightly different reasons because they have different values and ecological functions. ▪ Consent staff may be placed under more pressure to allow a wider range of activities at a greater scale in cSNA areas compared to fSNA areas. ▪ Risk that a larger number of permitted activities changes the permitted baseline assessment in cSNA areas and makes it easier for applicants to argue for removal/clearance of cSNA.

respect to the specific values for which the SNA was identified.	

7.3.3 Key considerations

The key feedback received from the 4Sight ecology team about the ecological value of both the fSNA and cSNA areas is that both are equally valuable, but that they have been identified as SNA for different values (and score differently against the Waikato Regional Policy Statement criteria in Section 11A). Although both fSNA and cSNA would equally benefit from provisions that support restoration and enhancement projects, more care is required in fSNA areas to ensure that earthworks and vegetation removal does not impact the values for which the fSNA was scheduled. Similarly, the ability to remove exotic vegetation without adversely affecting the function of the SNA is likely to be more extensive in cSNA but the majority of vegetation needs to be retained in order to maintain the bat habitat for which the cSNA was scheduled.

On this basis, we would not recommend adopting a fully tiered approach with completely separate provisions for fSNA and cSNA. However, we do see benefit in differentiating between fSNA and cSNA at the policy level to make it clear that the two types of SNAs were scheduled for different values and that future consent applications should be assessed in light of those specific values. Similarly, some rules (particularly around exotic vegetation removal and earthworks) should be tailored to recognise that fSNA is more sensitive to land disturbance activities and that cSNA needs to retain large scale exotic vegetation to maintain bat habitat. The recommendations in **Section 8** of this report reflect this approach.

7.4 Option 3 – Effects management approach

7.4.1 Overview of option

This option involves amending the policy and rule framework of Chapter 20 to be less absolute in terms of avoiding all adverse effects on SNA, to focus on the key adverse effects that need to be avoided to protect SNAs and to incorporate the 'effects management hierarchy' into the policies. This would better align Chapter 20 with the approach that would be required under the proposed NPS-IB (when gazetted), the Waikato RPS, and more recent RMA plans (e.g. Auckland Unitary Plan). As discussed in **section 6.2** of this report, there are a range of very strong "avoidance policies" in 20.2.1 of Chapter 20. While some of these are aligned with the policy direction in the proposed NPS-IB and Waikato RPS and focus on key ecological effects (e.g. fragmentation of SNA), others are very blunt and restrictive (e.g. avoid adverse effects of development on SNAs). There is also no recognition of the effects management hierarchy or the use of offsetting of compensation for unavoidable adverse effects on SNAs.

This option would therefore refine the policies and rule framework in Chapter 20 to:

- Rationalise and refine the "avoidance policies" to limit the strong avoid policies to key ecological effects that should be avoided consistent with direction in proposed NPS-IB and Waikato RPS. This would focus on concepts such as ecological integrity, ecosystem representation and extent, fragmentation, population size of At-Risk or Threatened species, which are recognised as being critical to protect SNAs.
- Incorporate reference to the effects management hierarchy to make it clear that avoidance of adverse effects is the priority before minimising and remedying adverse effects should be considered and that offsetting and compensation should be considered for more than minor adverse effects that cannot be avoided. This better aligns with Policy 11.2.2 of the Waikato RPS and best practice nationally and internationally.

7.4.2 Benefits and cons/risks

Table 12: Benefits and cons/risks of Option 3

Benefits	Cons/Risks
▪ Better aligned with the anticipated NPS-IB approach, the Waikato RPS and the approach of other similar urban councils e.g. Auckland. ▪ Provides a pathway for key activities that either benefit the SNA or have a critical functional need to be located in the SNA, including infrastructure. ▪ Recognises that some activities have unavoidable adverse effects on SNAs and provides a means to	▪ Creates complexity for HCC consenting staff in terms of effects management, particularly when offsetting is proposed. ▪ Can be difficult to secure positive ecological outcomes through offsetting or compensation. ▪ May create additional complexity for landowners understanding what they can do without avoiding certain adverse effects, and increase the need for ecological assessments.

still achieve a net ecological benefit through offsetting.	

7.4.3 Key considerations

If this approach is adopted, a key consideration is how it is applied, how specific the effects management hierarchy should be and what adverse effects should be avoided.

7.5 Option 4 –Providing for important activities and restoration

7.5.1 Overview of option

This option aims to better recognise the functional and operation need of important activities with public good benefit to be located in or near SNAs (e.g. infrastructure[25] or public walkways and cycleways) and also better recognise and provide for activities that have minor adverse effects on SNAs or positive effects (e.g. restoration). It would involve introducing policies and permitted and consenting pathways for important activities that need to be located in SNA (including infrastructure and public walkways and cycleways) or contribute to the value and function of the SNA (e.g. restoration). This could work in combination with Option 3 above to amend the direction of the objectives and policies of Chapter 20 to move away from the absolute 'avoidance' approach and allow for important and beneficial activities in SNA. This option would focus on providing for activities that are:

- **Necessary to restoration activities** – e.g. removal of exotic vegetation where it is replaced with indigenous vegetation, creation of access tracks to assist with replanting projects, minor earthworks associated with tracks and planting.
- **Infrastructure and public walkways and cycleways that support economic, cultural and social wellbeing** – e.g. three waters infrastructure or a new public access track linking areas of SNA or providing access to the Waikato River where the impact on the ecological values of the SNA can be appropriately managed.

7.5.2 Benefits and cons/risks

Table 13: Benefits and cons/risks of Option 4.

Benefits	Risks
▪ Provides more enabling pathways for activities that benefit a SNA – likely to improve the quality of the SNA if restoration and enhancement activities are encouraged. ▪ Supports individual landowner and community restoration and enhancement projects by removing current consenting barriers that can be time consuming and costly to navigate. ▪ Ensures that infrastructure activities that have a functional and/or operational need to exist in a SNA can both establish there and be maintained/upgraded when necessary. There are economic, social and cultural benefits to supporting infrastructure and gullies are logical locations for some stormwater infrastructure. ▪ Ensures that public walkways and cycleways can be maintained and upgraded (if they already exist) and that there is a consenting pathway to construct new access paths if there is a public	▪ May be some adverse impacts on the SNA resulting from permitted vegetation alteration and earthworks rules associated with network utilities. ▪ Risk that a larger number of permitted activities changes the permitted baseline assessment in SNA areas and makes it easier for applicants to argue for removal/clearance of SNA. ▪ Less protection than the operative SNA rules as there will be more permitted activities in SNAs.

[25] The memo from HCC City Water's department provides more details on the extent of three waters infrastructure in the updated SNA layer and the need to undertake regular maintenance and asset upgrades and replacement. Refer: Hamilton City Council – City Waters, 30 May 2022, *'Plan Change 9: Three-Waters supporting context for Infrastructure Provisions within proposed Significant Natural Areas'*, File Reference D-4235849.

benefit and adverse effects on the SNA can be appropriately managed. ▪ It is anticipated that the NPSIB will set out similar pathways for restoration/enhancement activities, public access and infrastructure so aligning the SNA provisions would future proof the chapter. ▪ Aligns with numerous recommendations in the GMD Vision and Strategy recommendations report.	

7.5.3 Key considerations

Overall, it is considered that the benefits of this option outweigh the risks. An appropriate starting point for infrastructure rules would be operation and maintenance of infrastructure and public walkways and cycleways being permitted in a SNA (potentially also upgrading subject to certain standards), but new activities would need to go through a consent process. Similarly, vegetation clearance and earthworks associated with restoration and enhancement projects could have a permitted activity status, but specific thresholds will be needed to limit the scale of impacts on the SNA. Option 3 should also be considered in conjunction with Option 2 as slightly different rules may be appropriate for fSNAs and cSNAs (e.g. thresholds for removal of exotic vegetation may need to be more flexible in cSNAs given these are dominated by exotic species).

7.6 Option 5 – Edge effects and buffer/setbacks to SNAs

7.6.1 Overview of option

This option would involve introducing an ecological buffer ('buffer') or a setback around the SNAs boundaries. This could either be identified as a separate policy overlay on the GIS/planning maps, or it could drafted as a rule that controls certain activities within a set distance from the mapped SNA boundary. The words 'buffer' and 'setback' are typically used in district plans to manage the distances between activities and in practice they achieve the same outcomes. However, the two terms are often perceived differently as a 'buffer' is viewed as a corridor or an area where activities are restricted, whereas a 'setback' is viewed as a more targeted approach to keep specific activities (e.g new residential dwellings (with potentially adverse effects away from sensitive features or areas.

The purpose of the buffer/setback would be to control activities that have the potential to cause 'edge effects' that impact ecological values, i.e. lighting effects on bats, earthworks, pruning of canopies overhanging the SNA boundary, construction of buildings and structures. The buffer/setback would require these types of activities to go through a consent process, where an ecological impact report could be required to assess the impact of the proposal on the indigenous biodiversity values of the SNA. Another option could be setting a particular lighting standard that needs to be met at the boundary of the SNA, which would avoid the need for a blanket buffer but would still manage lighting effects on the SNA. This approach is proposed at Peacocke through Plan Change 5 (discussed further below).

A buffer could also be used to ensure the entirety of trees on the edge of the SNA have some protection from the adverse effects of development. The SNA boundary has been mapped to follow the tree line at the edge of the SNA and is based on where the trunks of trees are located, as opposed to the full extent of the canopy or the root zone. A buffer would be able to manage activities underneath the canopy or over the critical root zone of trees to ensure that proposals do not adversely affect the health of trees on the edge of a SNA. Another option is to focus on the dripline of the tree itself (rather than use a buffer) to ensure any controls are focused on SNA trees with canopy overhanging the boundary as opposed to a blanket buffer or setback.

The most appropriate dimension for a buffer or setback needs to be determined. A 5m buffer is suggested as a starting point for discussions as this has been applied in the Peacocke Plan Change. This was supported by the lighting memo prepared by J Mckensey[26] and ecological effects assessment prepared by G Kessels[27] with respect to an appropriate setback to keep artificial light sources away from bat habitat. However, both of these expert assessments were focused on the greenfield development at Peacocke, which allowed for buildings to be well setback from the SNA boundary. Given that most of the new areas of mapped SNA are located in an already developed urban environment, it is not considered appropriate or feasible to apply the Peacocke rules relating to lighting and SNAs to the new mapped areas of SNAs within Hamilton's existing urban area without significant modification (if at all). In this respect, it is

[26] Mckensey, J. 2021. Bat Sensitive Lighting Rules – Peacocke Structure Plan Area Change. Prepared for Hamilton City Council by LDP Ltd.
[27] Kessels, G. & Baber, M. 2021. Peacocke Structure Plan Area: Ecological Significance Assessment. Client report prepared by Tonkin and Taylor for Hamilton City Council.

noted that the lighting standard proposed for Peacocke (0.3 lux at external boundary of Significant Bat Habitat Area) is significantly lower that the lighting standard for residential zones in the Operative District Plan (3 lux measured at points 1.5m within the boundary of another site). It is also noted that the operative city-wide Lighting and Glare provisions (25.6) provide no recognition of the effects of lighting on indigenous fauna which is considered a gap given the updated mapping of SNA within Hamilton City.

7.6.2 Benefits and risks

Table 14: Benefits and cons/risks of Option 5.

Benefits	Cons/risks
▪ A buffer/setback would provide a balance between protecting SNAs from edge effects whilst providing flexibility for activities to occur where effects on the SNAs ecological values are demonstrated as being acceptable. ▪ Addresses the issue of the SNA mapping not fully capturing all of the canopy and root zone areas as activities of concern will be required to go through a consent process and consider the ecological impacts on the SNA. ▪ Buffers/setbacks would assist with connectivity, protecting the functional values for indigenous flora and fauna within the identified SNA and would align with criterion 11 of the Waikato RPS.	▪ Risk of the buffer/setback encroaching significantly into some private properties and creating onerous requirements for landowners or reducing ability to utilise land for residential and other purposes. ▪ A blanket buffer/setback does not recognise that this will not be appropriate in some circumstances (e.g. mapped SNAs with limited additional canopy) creating unnecessary restrictions and consent requirements on landowners. ▪ Risk of consenting staff being placed under pressure to approve consents within the buffer/setback where it is argued the SNA contains only exotic species/weeds. ▪ May get landowner push back when trying to apply buffer/setback to existing/established SNAs.

7.6.3 Key considerations

Given the approach to mapping SNAs excludes tree canopy and root systems, there are some obvious benefits to using a buffer or setback around SNA to ensure edge effects are managed appropriately. However, there are also some significant potential costs relating to impacts on private property rights and the practicality of achieving setbacks/buffers in already established urban areas. Key things to consider if a buffer rule or a targeted setback is adopted for SNAs include:

- Whether it is reasonable to impose a buffer/setback in more built-up areas and what the implications are likely to be for landowners and how they utilise their land.
- If a buffer/setback is adopted, the appropriate width of any buffer or setback.
- What activities should be restricted within buffer/setback and whether this should be limited to larger scale activities (e.g. residential development) with greater potential for adverse edge effects on the SNA.
- Whether the buffer is mapped, listed as a setback rule or refined even further to just the dripline of SNA trees.
- Whether is it actually practical or reasonable to:
  - Impose a buffer to manage lighting effects on SNAs within an existing urban environment.
  - Apply a lighting standard at the edge of the SNA within an existing urban area and how this may actually be assessed and enforced.
- Whether lighting effects on indigenous fauna in SNAs can be more cost effectively addressed when resource consent is required for development next to identified SNAs (recognising this will not address lighting effects from permitted activities).
- Whether any buffer/setback rules should be included in Chapter 20 or Chapter 25 or in the zone chapters. The rationale for including buffer/setback rules in the zone chapters (only if a blanket setback is applied) is:
  - Zone chapters are where most landowners will look first for constraints on their land and are typically where setbacks from particular features are recorded
  - The purpose of the setbacks is predominantly to manage the impacts of development, particularly intensification enabled by Plan Change 12, on the edge of SNAs. As such, including the rules in the zone chapters and considering them as part of Plan Change 12 makes it clearer that these need to be assessed in light of the changes to allow intensification in Hamilton City (if a blanket setback/buffer is adopted).

Further suggestions are included in **section 8** of this report for an edge effects policy and rule framework for SNAs.

8 RECOMMENDED SNA POLICY AND RULE FRAMEWORK

This section provides recommendations for an updated policy and rule framework for protecting and managing SNAs in Chapter 20 of the District Plan. The recommendations in this section consider feedback from internal HCC staff and consultation with Waikato Regional Council, Waikato Tainui, 4Sight's ecology team and external ecology experts. The recommendations are also based on the review of statutory and local context and the assessment of options outlined in this report. The recommended policy and rule framework is a combination of Options 3 and 4 outlined in **section 7** of this report but also recognises in both the policies and specific rules that fSNA and cSNA have different ecological values and functions (Option 2). This suggested policy and rule framework has been central to the recommended amendments to Chapter 20 provisions (and consequential amendments) and the supporting section 32 evaluation report for Plan change 9 (as it relates to SNAs).

8.1 Recommended SNA policy framework

Note that the recommended changes focus on the policies – the relevant operative Objective 20.2.1 is considered to be fit for purpose and encompasses all the matters that the recommended policies below are trying to achieve (i.e. protection, maintenance and restoration of SNAs).

Table 15: Recommended SNA policy framework.

Policies
1. Identify the values and characteristics that define the City's Significant Natural Areas as a schedule in Appendix 9C. 2. Map areas of significant indigenous vegetation and significant habitats of indigenous fauna on the planning maps as Significant Natural Areas. 3. Avoid the following adverse effects on Significant Natural Areas: i. Loss of ecosystem function, representation and extent; and ii. Fragmentation; and iii. Loss of connectivity or buffer function; and iv. A reduction in the habitat of any Threatened or At-Risk species to the extent it may result in a reduction in the occupancy and presence of those species. 4. Where it is not possible for infrastructure and public walkways and cycleways to avoid the adverse effects on Significant Natural Areas listed in Policy 3, manage adverse effects in accordance with the following effects management hierarchy: i. Adverse effects are avoided where practicable; and ii. Where adverse effects cannot be demonstrably avoided, they are minimised where practicable; and iii. Where adverse effects cannot be demonstrably minimised, they are remedied where practicable; and iv. Where more than minor residual adverse effects cannot be demonstrably avoided, minimised, or remedied, biodiversity offsetting is provided where possible; and v. Where biodiversity offsetting of more than minor residual adverse effects is not demonstrably possible, biodiversity compensation is provided; and vi. If biodiversity compensation is not appropriate, the activity itself is avoided. 5. Recognise that biodiversity offsetting and biodiversity compensation will not be appropriate when: i. The indigenous biodiversity affected is irreplaceable or vulnerable; or ii. The adverse effects on indigenous biodiversity are uncertain or unknown, but those adverse effects are significantly adverse; or iii. There are no technically feasible options to secure the proposed indigenous biodiversity gains. 6. When assessing adverse effects on significant natural areas, recognise the value and ecological function of mapped Significant Natural Areas in Appendix 9C by considering: i. The criteria for significant indigenous biodiversity in section 11A of the Waikato Regional Policy Statement (May, 2016) that the Significant Natural Area meets. ii. The classification of the Significant Natural Area as follows: a. Floristic SNA (fSNA) as areas of significant naturally indigenous vegetation, including wetland and terrestrial vegetation, that is under-represented in the Hamilton Ecological

District, is regionally or nationally uncommon or forms part of an exceptional or uncommon ecological sequence.

b. Corridor SNA (cSNA) as areas that provide significant fauna habitats, including Threatened or At-Risk indigenous species, and ecological buffering between regionally and nationally important Significant Natural Areas.

7. Enable infrastructure and public walkways and cycleways to be located near or within Significant Natural Areas where they:
   i. Have a operational or functional need for that location;
   ii. Provide public benefits; and
   iii. Contribute to the economic, social, cultural and environmental well-being of people and communities.
8. Recognise the need for essential pruning, maintenance and tree removal in Significant Natural Areas where these have minor adverse effects on indigenous biodiversity, including customary activities and actions necessary to address high risk to public health and safety, and property.
9. Promote increasing the extent of Significant Natural Areas and indigenous biodiversity to meet the target of 10% indigenous vegetation cover in the District by 2050.
10. Recognise the role of mana whenua as kaitiaki and landowners as stewards in protecting and restoring Significant Natural Areas and indigenous biodiversity.
11. Enable activities that improve public connection to, and appreciation of, indigenous biodiversity provided that:
    i. Significant Natural Areas are protected; and
    ii. Indigenous biodiversity is maintained or enhanced.
12. Enable activities that seek to implement the vision, goals and outcomes in the Nature in the City Strategy 2020-2050.

8.1.1 Rationale/comments

This recommended set of policies builds on the operative Chapter 20 policies but moves from a strictly 'avoidance' based approach to a more nuanced approach with more targeted effects management policies and that recognises the need for certain activities to occur within SNAs where adverse effects can be appropriately managed. Key changes include:

- A clear list of adverse effects on SNA that should be avoided (set out in recommended Policy 3 above). This focuses any ecological assessment of a proposal on whether the proposal is likely to have any of the listed adverse effects, as opposed to the approach in the operative Chapter 20 which focused on avoiding all adverse effects on SNAs, regardless of whether they were affecting the significant ecological and functions values for which the SNA was scheduled. This approach is aligned with the proposed NPSIB.
- The introduction of the 'effects management hierarchy' concept in recommended Policy 4 above in relation to infrastructure and public walkways and cycleways, to recognise that complete avoidance of all adverse effects on SNAs is not achievable in some situations and the benefits of providing public access to SNAs and key infrastructure projects that have a functional or operational need to locate in a SNA need to be taken into account (also recognised by Policy 7). This approach ensures robust management of adverse effects and a positive overall ecological outcome and is aligned with the proposed NPSIB and Waikato RPS.
- Recognition that SNAs are scheduled for a variety of values and ecological functions and that some activities may be acceptable in some SNAs but not others. This is reflected in recommended Policy 6, which makes the distinction between floristic SNA (fSNA) and corridor SNA (cSNA) and describes the values for which they were scheduled. This is further supported through the scheduling of SNA in Appendix 9C (recommended Policy 1), so that the specific values and ecological functions of each section of SNA can be identified (including the RPS criteria that make the area ecologically significant) and used as the basis for an ecological assessment of a proposal and its potential impact on the ecological values and functions of each SNA.

8.2 Pathways for infrastructure and public walkways and cycleways

Through this project, it became clear that there was a need to provide a pathway for infrastructure and public walkways and cycleways to be constructed and operate in SNAs, particularly in the new areas of cSNA being mapped. Feedback from the internal HCC teams was that there are existing infrastructure assets located in cSNA areas that need to be accessed, maintained and upgraded/renewed so that they can continue to service Hamilton City residents

and businesses. This is covered in detail in the memo prepared by HCC City Waters department to help inform the updated SNA mapping and provisions[28].

Similarly, there are existing public walkways and cycleways that either already exist in cSNA areas or would be desirable in the future to improve public connection to nature and the Waikato River and corridors. Given the public good benefits of these sorts of activities, we recommend a balanced approach where there is a permitted pathway for activities that are likely to have minimal adverse effects on cSNAs (primarily maintenance of existing infrastructure and walkways) and a resource consent pathway with supportive policies for other more substantial infrastructure or public access projects provided a robust effects management approach is adopted (based on effects management hierarchy discussed above).

The focus of these more enabling pathways has been on cSNA rather than fSNA because:

- Feedback received from ecology experts is that cSNA is better able to tolerate some changes to vegetation to accommodate infrastructure and public walkway and cycleway projects without having the same risk of adverse effects on the values for which the cSNA was scheduled. This is compared to fSNA, which is more valued for its vegetation species and requires a higher level of protection and less disturbance to maintain its ecological values.
- Areas identified as cSNA are not currently mapped as SNA in the Operative District Plan, so there is a much wider range of infrastructure and access tracks already located in these areas (i.e. in the gully network). As such, the provisions in Chapter 20 need to recognise the value of these existing assets and provide a pathway for them to function without undue resource consent requirements. This was not required in the operative Chapter 20 as feedback from internal HCC staff confirmed that there are very few existing infrastructure assets and very few public walkways or cycleways located in fSNA (generally the operative areas of SNA).

The recommended SNA rules, including those that relate to infrastructure and public walkways and cycleways, are set out in Table 16 below.

8.3 Enabling restoration and erosion stability planting in cSNA

One of the areas of feedback received through internal and external consultation on this project was the need to better support and enable restoration projects, particularly in cSNA areas which may be more degraded and contain a higher percentage of exotic tree species and weed/pest species. Activities that would need to be undertaken to restore a section of cSNA include removal of pest species, removal of exotic tree species (so they could be replaced with indigenous species), planting of indigenous trees/vegetation and earthworks associated with tree removal/planting. However, this needs to be balanced with the need to retain trees that form a critical part of fauna habitat, such as roosts for long-tailed bats. Often retention of an exotic tree is more beneficial from an ecological perspective than removal and replacement with an indigenous species because of the scale of the tree and the lag time before the replacement indigenous tree would attain a comparable height. There is also a need to cap the maximum area of vegetation that can be removed from a cSNA in a calendar year as a permitted activity to ensure that widespread removal of cSNA does not occur without going through a resource consent process.

The recommended SNA rules and standards, including those relating to restoration are outlined below in Table 16 below. Overall, the recommended approach aims to balance the need to be enabling of activities that will result in restoration of cSNAs, but also ensure that activities that could have an adverse effect on the values for which the cSNA is scheduled are subject to an ecological assessment and/or are subject to a resource consent process. Note that the same rules are not being recommended for fSNA because these areas are less likely to need restoration (given they are valued for the quality of their indigenous vegetation) and they are more sensitive to proposals that involve vegetation removal. For these reasons, it is considered appropriate that the removal of exotic vegetation in fSNAs is assessed through a resource consent process in most cases.

8.4 Recommended SNA rules and standards

The recommended rules for SNAs are outlined in Table 16 which would replace the existing SNA rules in Chapter 20 of the District Plan. Table 17 outlines specific standard for certain rules which would sit in section 20.5 (specific standards) in Chapter 20 of the District Plan.

Table 16: Recommended SNA rules (table 20.3 in Chapter 20).

[28] Memo from Hamilton City Council – City Waters, 30 May 2022, *'Plan Change 9: Three-Waters supporting context for Infrastructure Provisions within proposed Significant Natural Areas'*, File Reference D-4235849.

Activity	Class	
Vegetation pruning, maintenance, planting, and removal in a Significant Natural Area, Schedule 9C (Volume 2, Appendix 9)	**cSNA**	**fSNA**
a) Pruning, maintenance or removal of indigenous and exotic vegetation or trees where: i. Necessitated by disease or age; or ii. There is an unacceptable risk to public health, safety or property; or iii. The pruning or maintenance work is necessary to maintain or upgrade existing private tracks and fencing where Standard 20.5.1 is complied with; or iv. The pruning, maintenance or removal is for customary activities.	P	P
b) Removal or management of pest species, including pest control	P	P
c) Planting and management of indigenous vegetation or trees for the purposes of restoration, including relocation of indigenous vegetation or trees within the same Significant Natural Area	P	P
d) Planting of exotic vegetation or trees in a Significant Natural Area where Standard 20.5.3 is complied with	P	P
e) Pruning, maintenance or removal of indigenous or exotic vegetation or trees associated with restoration where: i. This is not provided for by either 20.3(a) or 20.3(b); and ii. Standard 20.5.4 is complied with in a cSNA.	P	RD
f) Planting of exotic vegetation or trees in a Significant Natural Area where Standard 20.5.3 is not complied with	NC	NC
Earthworks for specified activities in a Significant Natural Area, Schedule 9C (Volume 2, Appendix 9)	**cSNA**	**fSNA**
g) Earthworks associated with maintaining or upgrading existing private tracks and/or fencing or maintaining or upgrading existing walking access tracks used for restoration projects.	P	P
h) Earthworks associated with permitted vegetation removal	P	P
Buildings and structures, infrastructure, public walkways and cycleways in a Significant Natural Area, Schedule 9C (Volume 2, Appendix 9)	**cSNA**	**fSNA**
i) Alterations to, or the replacement of, any existing building or structure that does not exceed the existing envelope or footprint in a Significant Natural Area	P	P
j) Structures associated with erosion protection and sediment control in a Significant Natural Area where Council is provided with confirmation that these are required under a regional plan rule or regional consent from Waikato Regional Council and that this information is provided to Council at least 5 working days prior to undertaking the works.	P	P
k) The operation, maintenance, renewal or upgrading of, or access to, existing infrastructure and public walkways and cycleways, including associated pruning,	P	P

maintenance or removal of indigenous or exotic vegetation or trees and associated earthworks where: i. This is not provided for by either 20.3(a) or 20.3(b); and ii. Standard 20.5.5 is complied with.		
l) Construction of new public walkways and cycleways through a Significant Natural Area, including associated pruning, maintenance or removal of indigenous or exotic vegetation or trees and associated earthworks	RD	RD
m) Alterations to, or the replacement of, any existing building or structure that is proposed to exceed the existing envelope or footprint in a Significant Natural Area	D	D
n) Construction of, or access to, new infrastructure in a Significant Natural Area, including associated pruning, maintenance or removal of indigenous or exotic vegetation or trees and associated earthworks	D	NC
Activities not otherwise provided for in this rule table in a Significant Natural Area, Schedule 9C (Volume 2, Appendix 9)	**cSNA**	**fSNA**
o) All other earthworks in a Significant Natural Area not provided for by another rule in this table	D	NC
p) All other pruning, maintenance, planting or removal of indigenous or exotic vegetation in a Significant Natural Area not provided for by another rule in this table	NC	NC
q) The placement and/or construction of any new building or structures in a Significant Natural Area not provided for by another rule in this table	NC	NC
r) The storage of hazardous substances in a Significant Natural Area	NC	NC

Table 17: Recommended activity specific standards for SNAs.

Activity	Standards
Planting of Exotic Vegetation or Trees in a Significant Natural Area	Either: a) The planting is for the purpose of erosion stability and: i. Written confirmation is provided to Council that the planting is in accordance with a willow management strategy that has been approved by Council or Waikato Regional Council and this information is provided to Council at least 5 working days prior to the planting; and ii. The exotic vegetation or tree(s) is removed no longer than 10 years after it was planted, or as otherwise advised by a suitably qualified person; or b) It is for the purpose of restoration and written confirmation is provided to Council that the planting is in accordance with a restoration plan that has been approved by Council at least 5 working days prior to the planting taking place.
Pruning, maintenance or removal of indigenous or exotic vegetation or trees associated with restoration in a cSNA	a) Either: i. The works are required to maintain an existing walking access track used for restoration activities; or ii. No more than 50m² of vegetation or trees are removed per site per calendar year; and

	b) The area cleared is planted with eco-sourced indigenous vegetation or trees within 12 months; and c) Either: i. Any tree removed must have a diameter of no more than 150mm measured at 1.4m in height above ground level; or ii. The tree has a diameter greater than 150mm, measured at 1.4m in height above ground level and: 1. A suitably qualified person has confirmed that there is a low potential for the tree to be used as habitat for either bats or any other Threatened or At-Risk indigenous fauna; and 2. The report from the suitably qualified person is provided to Council prior to the removal of the tree(s).
The operation, maintenance, renewal or upgrading of, or access to, existing infrastructure and public walkways and cycleways	**Pruning, maintenance or removal of indigenous or exotic vegetation or trees** i. The works are required to maintain an existing walking access track to access existing infrastructure; or ii. Either; 1. The works do not result in the removal of more than 100m2 of indigenous vegetation per site, per calendar year; or 2. The works are limited to areas within two metres of the existing asset; and iii. Either: 1. Any tree removed must have a diameter of no more than 150mm measured at 1.4m in height above ground level; or 2. The tree has a diameter greater than 150mm, measured at 1.4m in height above ground level; and: i. A suitably qualified person has confirmed that there is a low potential for the tree to be used as habitat for either bats or any other Threatened or At-Risk indigenous fauna; and ii. The report from the suitably qualified person is provided to Council prior to the removal of the tree(s). **Earthworks** i. The disturbance is limited to areas within 2m of the asset being operated, maintained, renewed or upgraded; or ii. No more than 100m² of land is disturbed per site, per calendar year; and iii. The area disturbed is reinstated as soon as practicable following the completion of the works. **Renewal or upgrading of infrastructure** The asset being renewed or upgraded is increasing in footprint by a maximum of 5% or 30m², whichever is the greater.

8.5 Management of activities adjacent to SNA

As the area of land that is mapped as SNA increases, there is greater potential for edge effects on SNAs to occur, particularly in areas where residential land that has the potential for further intensification abuts a SNA boundary. Edge effects include impacts like ground disturbance on land adjoining SNAs that impacts the root zone of SNA trees,

pruning of trees in a SNA that overhang onto private property, and impacts of noise and lighting on fauna habitat (particularly where areas are identified as long-tailed bat habitat).

We considered several options for managing edge effects on SNAs, including:

- A blanket setback of 5m from all SNA boundaries so that any earthworks or buildings/structures within the setback would go through a resource consent process to consider the impact of the proposal on the SNA.
- A series of targeted setback rules that focus on managing particular adverse effects, e.g. lighting, earthworks around the root zone of SNA trees.
- Targeted controls relating to more intensive residential development enabled through the NPS-UD and Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021, i.e. intensive residential development in accordance with 'medium density residential standards' (**MDRS**). This could restrict medium density residential development within a setback to SNA as a 'qualifying matter' (i.e. to recognise and provide for section 6(c) of the RMA).
- Amendments to city-wide objectives and policies (rather than new rules and standards) as a more cost-effective way to ensure lighting effects on indigenous fauna are considered through consenting processes for more significant developments next to SNAs.

In principle, we recommend a more targeted approach to managing edge effects as there is more risk that a buffer will be overly onerous compared to setbacks for specified activities. This also recognises that many of the new areas of SNA that have been identified are located in existing built-up urban areas within Hamilton, where achieving a 5m setback is likely to impose significant compliance burden and is neither desirable nor practical. An approach targeting medium residential development within a setback buffer to SNAs is also not recommended as this is not likely to be necessary or appropriate in all circumstances, and is not considered to be an effective effects-based approach as other forms of urban development (e.g. industrial activities) may have greater lighting and other potential adverse effects on SNAs.

We recommend that any edge effects rules are highly targeted to managing the particular adverse effect of concern. There are two types of rules that we recommend for inclusion:

- **Management of earthworks within the dripline of a tree located in a SNA** – this is in response to the methodology for mapping SNA, which set the SNA boundary along the trunk line of trees, as opposed to the full extent of the tree canopy. While this approach was taken for pragmatic reasons (to ensure that the least amount of private land was mapped as SNA), it also means that there are benefits to controlling earthworks in situations where the root zone of a SNA tree extends outside the SNA boundary to ensure the long-term health of SNA trees. It is considered best to use the 'dripline of a tree' located in a SNA as the rule trigger given the definition of 'root protection zone' in the Operative District Plan requires arborist input to determine the extent of the area, which would be difficult for lay people to use. The dripline of a tree is also generally easily understood without any supporting definition.
- **Pruning and maintenance of the canopy of a tree overhanging the boundary of a SNA** – this is recommended for similar reasons to the earthworks control above and would ensure that the pruning/maintenance rules that apply in SNA also apply to parts of SNA trees that overhang the SNA boundary.

The intent is that there is a permitted pathway for all of the rules described above and a resource consent process will only need to be followed for activities that cannot meet the permitted standard. If a resource consent is required the activity status would be restricted discretionary, and matters would be tightly restricted to ecological impacts on the values of the SNA.

In terms of lighting, we considered the appropriateness of a lighting standard that would control the lux level as measured at the SNA boundary, similar to the approach proposed for the Peacocke area through Plan Change 5. However, this approach was not considered feasible to apply across Hamilton City given that most areas adjacent to SNA are existing urban areas where there is already a baseline level of lighting and a landowner expectation for both indoor and outside lighting. The preferred approach is therefore to amend the city-wide lighting and glare policy in section 25.6 of the District Plan (25.6.2.1a) to ensure that the effects of lighting on indigenous fauna are considered and managed when resource consent is required for development adjacent to SNAs. While this will not address lighting effects from permitted activities, it will ensure lighting effects on SNAs are considered for larger developments that require consent which are most likely to have adverse lighting effects. This approach also avoids the potentially significant compliance costs associated with a blanket lighting standard at the SNA boundary which could be very difficult to comply with.

Table 18 below provides recommendations for rules and supporting standards to manage edge effects on SNAs. Note that these rules should not apply within the Transport Corridor Zone as this could have a significant impact on being able to operate and maintain the road corridor effectively.

Table 18: Suggested rules for certain activities adjacent to SNAs.

Activity	**Plan chapter**
Any earthworks within the dripline of a tree located in a SNA, provided that the maximum thickness (cross-section) of any root that may be cut is 50mm.	Chapter 25.2
Pruning and maintenance of the canopy of a tree overhanging the boundary of a SNA, provided that the maximum amount of foliage that can be removed from a tree in any calendar year is 15% and the maximum thickness (cross-section) of any branch or root that may be cut is 50mm.	Chapter 25.2
25.6.2.1a Ensure that light spill and glare do not detract from the amenity values of other properties, compromise traffic safety, ~~or~~ have a negative effect on people's health and general welfare, or adversely impact indigenous fauna in a Significant Natural Area.	Chapter 25.6

Appendix A:

Relevant provisions in RPS and other distict plans

RELEVANT PROVISONS

Waikato Regional Policy Statement – Key provisions

Policy 11.1 Maintain or enhance indigenous biodiversity

Promote positive indigenous biodiversity outcomes to maintain the full range of ecosystem types and maintain or enhance their spatial extent as necessary to achieve healthy ecological functioning of ecosystems, with a particular focus on:

a) working towards achieving no net loss of indigenous biodiversity at a regional scale;

b) the continued functioning of ecological processes;

c) the re-creation and restoration of habitats and connectivity between habitats;

d) supporting (buffering and/or linking) ecosystems, habitats and areas identified as significant indigenous vegetation and significant habitats of indigenous fauna;

e) providing ecosystem services;

f) the health and wellbeing of the Waikato river and its catchment;

g) contribution to natural character and amenity values;

h) tāngata whenua relationships with indigenous biodiversity including their holistic view of ecosystems and the environment;

i) managing the density, range and viability of indigenous flora and fauna; and

j) the consideration and application of biodiversity offsets

Implementation methods

11.1.1 Maintain or enhance indigenous biodiversity Regional and district plans shall maintain or enhance indigenous biodiversity, including by:

a) Providing for positive indigenous biodiversity outcomes when managing activities including subdivision and land use change;

b) having regard to any local indigenous biodiversity strategies developed under Method 11.1.11; and

c) creating buffers, linkages and corridors to protect and support indigenous biodiversity values, including esplanade reserves and esplanade strips to maintain and enhance indigenous biodiversity values.

11.1.2 Adverse effects on indigenous biodiversity

Regional and district plans shall recognise that adverse effects on indigenous biodiversity within terrestrial, freshwater and coastal environments are cumulative and may include:

a) fragmentation and isolation of indigenous ecosystems and habitats;

b) reduction in the extent and quality of indigenous ecosystems and habitats;

c) loss of corridors or connections linking indigenous ecosystems and habitat fragments or between ecosystems and habitats;

d) the loss of ecological sequences;

e) loss or disruption to migratory pathways in water, land or air;

f) effects of changes to hydrological flows, water levels, and water quality on ecosystems;

g) loss of buffering of indigenous ecosystems;

h) loss of ecosystem services;

i) loss, damage or disruption to ecological processes, functions and ecological integrity;

j) changes resulting in an increased threat from animal and plant pests;

k) effects which contribute to a cumulative loss or degradation of indigenous habitats and ecosystems;

l) noise, visual and physical disturbance on indigenous species, particularly within the coastal environment; and

m) loss of habitat that supports or provides a key life-cycle function for indigenous species listed as 'Threatened' or 'At Risk' in the New Zealand Threat Classification System lists.

11.1.3 Avoidance, remediation, mitigation and offsetting (for indigenous biodiversity that is not significant)

Regional and district plans:

a) for non-significant indigenous vegetation and non-significant habitats of indigenous fauna (excluding activities pursuant to 11.1.4):

   i) shall require that where loss or degradation of indigenous biodiversity is authorised adverse effects are avoided, remedied or mitigated (whether by onsite or offsite methods).

   ii) should promote biodiversity offsets as a means to achieve no net loss of indigenous biodiversity where significant residual adverse effects are unable to be avoided, remedied or mitigated.

   iii) when considering remediation, mitigation or offsetting, methods may include the following:

      i. replacing the indigenous biodiversity that has been lost or degraded;

      i. replacing like-for-like habitats or ecosystems (including being of at least equivalent size or ecological value);

      ii. the legal and physical protection of existing habitat;

      iii. the re-creation of habitat; or

      iv. replacing habitats or ecosystems with indigenous biodiversity of greater ecological value.

b) for significant indigenous vegetation and significant habitats of indigenous fauna Method 11.2.2 applies.

11.1.4 Recognition of activities having minor adverse effects on indigenous biodiversity

Regional and district plans should include permitted activities where they will have minor adverse effects in relation to the maintenance or protection of indigenous biodiversity. They may include:

a) the maintenance, operation and upgrading of lawfully established infrastructure, regionally significant infrastructure and lawfully established activities using natural and physical resources of regional or national importance;

b) existing lawfully established uses of land where the effects of such land use remain the same or similar in character, intensity and scale;

c) activities undertaken for the purpose of maintenance or enhancement of indigenous biodiversity;

d) the collection of material for maintaining traditional Māori cultural practices; and

e) actions necessary to avoid loss of life, injury or serious damage to property.

Policy 11.2 Protect significant indigenous vegetation and significant habitats of indigenous fauna

Significant indigenous vegetation and the significant habitats of indigenous fauna shall be protected by ensuring the characteristics that contribute to its significance are not adversely affected to the extent that the significance of the vegetation or habitat is reduced.

Implementation methods

11.2.1 Identify areas of significant indigenous vegetation and significant habitats of indigenous fauna

For the purposes of identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna, Waikato Regional Council will identify areas of significant indigenous vegetation and significant habitats of indigenous fauna at the regional scale (significant natural areas) and make this information available to territorial authorities.

11.2.2 Protect areas of significant indigenous vegetation and significant habitats of indigenous fauna

Regional and district plans shall (excluding activities pursuant to 11.1.4):

a) protect areas of significant indigenous vegetation and significant habitats of indigenous fauna;

b) require that activities avoid the loss or degradation of areas of significant indigenous vegetation and significant habitats of indigenous fauna in preference to remediation or mitigation;

c) require that any unavoidable adverse effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna are remedied or mitigated;

d) where any adverse effects are unable to be avoided, remedied or mitigated in accordance with (b) and (c), more than minor residual adverse effects shall be offset to achieve no net loss; and

e) ensure that remediation, mitigation or offsetting as a first priority relates to the indigenous biodiversity that has been lost or degraded (whether by on-site or offsite methods). Methods may include the following:

   i) replace like-for-like habitats or ecosystems (including being of at least equivalent size or ecological value);

   ii) involve the re-creation of habitat;

   iii) develop or enhance areas of alternative habitat supporting similar ecology/significance; or involve the legal and physical protection of existing habitat;

f) recognise that remediation, mitigation and offsetting may not be appropriate where the indigenous biodiversity is rare, at risk, threatened or irreplaceable; and

g) have regard to the functional necessity of activities being located in or near areas of significant indigenous vegetation and significant habitats of indigenous fauna where no reasonably practicable alternative location exists.

11A Criteria for determining significance of indigenous biodiversity

The following criteria are to be used to identify areas of significant indigenous biodiversity and their characteristics as they exist at the time the criteria are being applied. Criteria may be specific to a habitat type including water, land or airspace or be more inclusive to address connectivity, or movement of species across habitat types.

To be identified as significant an area needs to meet one or more of the criteria identified in the table below.

Areas of significant indigenous biodiversity shall not include areas that have been created and subsequently maintained for or in connection with:

- artificial structures (unless they have been created specifically or primarily for the purpose of protecting or enhancing biodiversity); or
- beach nourishment and coastal planting (unless they have been created specifically or primarily for the purpose of protecting or enhancing biodiversity).

Table 11-1: Criteria for determining significance of indigenous biodiversity

Previously assessed site	
1.	It is indigenous vegetation or habitat for indigenous fauna that is currently, or is recommended to be, set aside by statute or covenant or by the Nature Heritage Fund, or Ngā Whenua Rāhui committees, or the Queen Elizabeth the Second National Trust Board of Directors, specifically for the protection of biodiversity, and meets at least one of criteria 3-11.
Ecological values	
2.	In the Coastal Marine Area, it is indigenous vegetation or habitat for indigenous fauna that has reduced in extent or degraded due to historic or present anthropogenic activity to a level where the ecological sustainability of the ecosystem is threatened.
3.	It is vegetation or habitat that is currently habitat for indigenous species or associations of indigenous species that are: ▪ classed as threatened or at risk, or ▪ endemic to the Waikato region, or ▪ at the limit of their natural range.
4.	It is indigenous vegetation, habitat or ecosystem type that is under-represented (20% or less of its known or likely original extent remaining) in an Ecological District, or Ecological Region, or nationally.
5.	It is indigenous vegetation or habitat that is, and prior to human settlement was, nationally uncommon such as geothermal, chenier plain, or karst ecosystems, hydrothermal vents or cold seeps.
6.	It is wetland habitat for indigenous plant communities and/or indigenous fauna communities (excluding exotic rush/pasture communities) that has not been created and subsequently maintained for or in connection with: ▪ waste treatment; ▪ wastewater renovation; ▪ hydro electric power lakes (excluding Lake Taupō); ▪ water storage for irrigation; or ▪ water supply storage; unless in those instances they meet the criteria in Whaley et al. (1995).
7.	It is an area of indigenous vegetation or naturally occurring habitat that is large relative to other examples in the Waikato region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type. Note this criterion is not intended to select the largest example only in the Waikato region of any habitat type.
8.	It is aquatic habitat (excluding artificial water bodies, except for those created for the maintenance and enhancement of biodiversity or as mitigation as part of a consented activity) that is within a stream, river, lake, groundwater system, wetland, intertidal mudflat or estuary, or any other part of the coastal marine area and their margins, that is critical to the self sustainability of an indigenous species within a catchment of the Waikato region, or within the coastal marine area. In this context "critical" means essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species. This includes areas that maintain connectivity between habitats.
9.	It is an area of indigenous vegetation or habitat that is a healthy and representative example of its type because: ▪ its structure, composition, and ecological processes are largely intact; and

	▪ if protected from the adverse effects of plant and animal pests and of adjacent land and water use (e.g. stock, discharges, erosion, sediment disturbance), can maintain its ecological sustainability over time.
10.	It is an area of indigenous vegetation or habitat that forms part of an ecological sequence, that is either not common in the Waikato region or an ecological district, or is an exceptional, representative example of its type.
Role in protecting ecologically significant area	
11.	It is an area of indigenous vegetation or habitat for indigenous species (which habitat is either naturally occurring or has been established as a mitigation measure) that forms, either on its own or in combination with other similar areas, an ecological buffer, linkage or corridor and which is necessary to protect any site identified as significant under criteria 1-10 from external adverse effects.

OTHER DISTRICT PLANS

Proposed Waikato District Plan - Key Provisions

Part 2 – Chapter 22 - ECO – Ecosystems and indigenous biodiversity		
ECO-R1	**Earthworks – general**	
All zones	(1) Activity status: PER Where: (a) Earthworks for conservation activities, water reticulation for farming purposes or the maintenance of existing tracks, fences or drains within a Significant Natural Area provided they are not within a kauri root zone	(2) Activity status where compliance not achieved: RDIS Council's discretion is restricted to the following matters: (a) Volume, extent and depth of earthworks; (b) Nature of fill material; (c) Contamination of fill material or cleanfill; (d) Location of the earthworks to waterways, significant indigenous vegetation and habitat; (e) Compaction of the fill material; (f) Volume and depth of fill material; (g) Protection of the Hauraki Gulf Catchment Area; (h) Geotechnical stability; (i) Land instability, erosion and sedimentation; and (j) The risk of earthworks exacerbating Kauri dieback disease.
ECO-R2	**Earthworks – within a Significant Natural Area on Maaori Freehold Land or Maaori Customary Land**	
All zones	(1) Activity status: PER Where: (a) On Maaori Freehold Land or Maaori Customary land within a Significant Natural Area, earthworks for a Marae Complex or Papakaainga housing where: (i) There is no alternative development area on the site outside of the significant natural area; and (ii) The earthworks do not exceed a volume of 500m3 in a single consecutive 12-month period; and (iii) The earthworks do not exceed an area of 1,500m2 in a single consecutive 12 month period; (iv) Sediment resulting from the earthworks is retained on the site through implementation and maintenance of erosion and sediment controls; (v) Do not divert or change the nature of natural water flows, water bodies or established drainage paths; and (vi) Provided they are not within a kauri root zone	(2) Activity status where compliance not achieved: RDIS Council's discretion is restricted to the following matters: (a) The effects on the indigenous vegetation and fauna; (b) Land instability, erosion and sedimentation; and (c) Volume, extent and depth of earthworks.
ECO-R3	**Earthworks in a Significant Natural Area for purposes other than the maintenance of existing tracks, fences or drains.**	
All zones	(1) Activity status: RDIS Council's discretion is restricted to the following matters: (a) The effects on indigenous vegetation and fauna; (b) Land instability, erosion and sedimentation; and (c) Volume, extent and depth of earthworks.	(2) Activity status where compliance not achieved: n/a

ECO-R4	**Vegetation clearance within a Significant Natural Area**	
All zones	(1) Activity status: PER Where: (a) Indigenous vegetation clearance, trimming or pruning of indigenous vegetation in a Significant Natural Area for the following purposes: (i) Removing vegetation that endangers human life or existing buildings or structures; (ii) Conservation fencing to exclude stock or pests; (iii) Maintaining existing farm drains; (iv) Maintaining existing tracks and fences; (v) Gathering plants in accordance with Maaori customs and values; or (vi) Conservation activities.	(2) Activity status where compliance not achieved: DIS
ECO-R5	**Vegetation clearance within a Significant Natural Area**	
All zones	(1) Activity status: PER Where: (a) Clearance of up to 5m3 manuka and/or kanuka outside of a wetland per single consecutive 12-month period per property for domestic firewood purposes and arts or crafts provided the removal will not directly result in the death, destruction or irreparable damage of any other tree, bush or plant.	(2) Activity status where compliance not achieved: DIS
ECO-R6	**Vegetation clearance within a Significant Natural Area on Maaori Freehold Land and Maaori Customary Land**	
All zones	(1) Activity status: PER Where: (a) On Maaori Freehold Land or Maaori Customary Land, indigenous vegetation clearance in a Significant Natural Area for the purposes of development where: (i) There is no other practicable alternative development area on the site outside the Significant Natural Area; and (ii) The following total areas are not exceeded: (1) 1500m2 for a Marae complex, including areas associated with access, parking and manoeuvring; (2) 500m2 per dwelling, including areas associated with access, parking and manoeuvring; and (3) 500m2 for a papakaainga building including areas associated with access, parking and manoeuvring.	(2) Activity status where compliance not achieved: DIS
ECO-R7	**Vegetation clearance within a Significant Natural Area**	
All zones	(1) Activity status: PER Where: (a) Vegetation clearance of non-indigenous species in a Significant Natural Area.	(2) Activity status where compliance not achieved: DIS
ECO-R8	**Vegetation clearance within a Significant Natural Area**	
All zones	(1) Activity status: CON	(2) Activity status where compliance not achieved: DIS

	Where: (a) Indigenous vegetation clearance for building, access, parking and manoeuvring areas in a Significant Natural Area identified on the planning maps must comply with all of the following standards: (i) There is no practicable alternative development area on the site outside the Significant Natural Area; (ii) The total indigenous vegetation clearance does not exceed 250m2; and (iii) The vegetation clearance is at least 10m from a natural waterbody. Council's control is reserved over the following matters: The effects on the indigenous vegetation and fauna.	
ECO-R9	**Indigenous vegetation clearance in a Significant Natural Area other than for purposes listed in Rules ECO-R4 – ECO-R6.**	
All zones	(2) Activity status where compliance not achieved: DIS	

Part 2 – Chapter 3 - AINF – All infrastructure		
AINF-R9	**Trimming, maintenance or removal of vegetation or trees associated with infrastructure**	
All zones	(1) Activity status: PER Activity-specific standards: (a) Trimming and pruning of trees and vegetation, necessary to protect all overhead electric lines or telecommunication lines; and any trimming, maintenance or removal of vegetation or trees associated with infrastructure, including access tracks, that meet all of the following standards: (i) No tree identified in SCHED2 – Notable trees is removed; (ii) Any required trimming of a tree identified in SCHED2 – Notable trees is either: (1) To remove dead, dying, or diseased branches and the tree work is undertaken by a works arborist; or (2) The maximum branch diameter does not exceed 50mm at severance and no more than 10% of live foliage growth is removed over any consecutive 12-month time period. (iii) Any indigenous vegetation alteration or removal within a Significant Natural Area must not: (1) Include any trees over 6m in height or 600mm in girth at a height of 1.4m; and (2) Exceed 50m2 per site over any consecutive 12-month time period. (b) Any trimming, maintenance or removal of vegetation, where required for the safe operation or maintenance of the National Grid or to remove a potential fire risk associated with the National Grid. *Advice Note: Trimming, maintenance or removal of vegetation or non-notable trees in and around electrical assets shall be managed in accordance with the Electricity (Hazards from Trees) Regulations 2003.*	(2) Activity status where compliance not achieved: RDIS Council's discretion is restricted to the following matters: (a) The extent of the works required; (b) Effects on the values, qualities and characteristics of any tree identified in SCHED2 – Notable trees or any Significant Natural Area; (c) Whether alternative methodologies avoiding the need to affect the tree(s)/vegetation have been adequately considered; and (d) Land transport network safety and efficiency.

Section 24 - Activity Status Table

24.4.1.1	Activities	Most restrictive		Moderate restriction	Least restrictive
		SNAs	Bush Stands	Biodiversity Corridors	District Wide Indigenous Vegetation
	For all permitted and controlled activities listed in this table the rules in 24.4.2 will apply. The activity status for activities which fail to comply with the rules is identified under each rule. For the avoidance of doubt where activities fail to comply with this table and have no associated rule, resource consent for a non-complying activity is required. For the avoidance of doubt, if a significant natural area or bush stand are located within a biodiversity corridor, the most restrictive rule provisions shall apply.				
Management of indigenous vegetation					
(a)	Trimming, pruning or removal of indigenous vegetation associated with the following activities: (i) To maintain or construct perimeter fences for stock exclusion; or (ii) Undertaken in accordance with the terms of a QEII National Trust covenant, or other relevant covenant, consent notice or encumbrance; or (iii) Carried out by, or under the direction or control of the Department of Conservation or Waipa District Council on Crown Reserve; or (iv) Undertaken pursuant to conservation activities where the activity complies with Rule 24.4.2.2; or (v) To undertake pest and weed control activities.	P	P	P	P
(b)	Planting of indigenous vegetation and conservation planting.	P	P	P	P
(c)	Pest control activities.	P	P	P	P
(d)	Removal of dead or damaged indigenous vegetation or indigenous vegetation presenting an imminent danger to human life.	P	P	P	P
Customary Activities					
(e)	Removal of indigenous vegetation undertaken pursuant to customary activities that does not adversely affect at risk or threatened indigenous species.	P	P	P	P
Construction and maintenance of tracks					

(f)	Trimming, pruning and removal of indigenous vegetation on or within 2m of existing tracks, or water intake structures, required for maintenance purposes.	P	P	P	P
(g)	Removal of indigenous vegetation for a track up to 3m wide for the Te Awa Cycleway.	C	C	C	P
	The matters over which Council reserves its control are: ▪ Location, extent and necessity of vegetation removal associated with the activity; and ▪ Effects on the connectivity, value and characteristics of the significant natural area, bush stand or biodiversity corridor (as relevant); and ▪ Appropriateness of mitigation measures proposed including consideration of the no net loss principle. These matters will be considered in accordance with the assessment criteria in Section 21.				
(h)	Removal of indigenous vegetation for construction of new tracks (excluding conservation activities and the Te Awa Cycleway).	NC National or Regional SNA	NC	C Where clearance is less than 1 hectare	P
		RD Local SNA		RD Where clearance is 1 hectare or more	
	The matters over which Council reserves its control are: ▪ Location and extent of vegetation removal associated with the activity; and ▪ The necessity of vegetation removal associated with the activity; and ▪ Effects on the connectivity, value and characteristics of the local significant natural area or biodiversity corridor (as relevant); and ▪ Appropriateness of mitigation measures proposed including consideration of the no net loss principle. Assessment of a restricted discretionary activity shall be limited to the following matters: ▪ The matters listed above for a controlled activity; and ▪ Alternatives to removal of indigenous vegetation. These matters will be considered in accordance with the assessment criteria in Section 21.				
Network utilities, electricity transmission and distribution					
(i)	Trimming or pruning of indigenous vegetation to avoid or mitigate effects on the operation of an existing network utility.	P	P	P	P
(j)	Removal of indigenous vegetation for the purpose of reducing risk to existing transmission or distribution lines	C	C	C	P

	The matters over which Council reserves its control are: ▪ Location, extent and necessity of vegetation removal associated with the activity; and ▪ Effects on the connectivity, value and characteristics of the significant natural area, bush stand or biodiversity corridor (as relevant); and ▪ Effects on indigenous biodiversity; and ▪ Effects on landscape; and ▪ Appropriateness of mitigation measures proposed including consideration of the no net loss principle. These matters will be considered in accordance with the assessment criteria in Section 21				
(k)	Removal of indigenous vegetation for electricity transmission or distribution line purposes, excluding matters in clause (j).	RD	RD	RD	P
	Assessment will be restricted to the following matters: ▪ Location, extent and necessity of vegetation removal associated with the activity; and ▪ Effects on the connectivity, value and characteristics of the significant natural area, bush stand or biodiversity corridor (as relevant); and ▪ Effects on indigenous biodiversity; and ▪ Effects on landscape; and ▪ Appropriateness of mitigation measures proposed including consideration of achieving the no net loss principle; and ▪ Alternatives to removal of indigenous vegetation. These matters will be considered in accordance with the assessment criteria in Section 21.				
Removal of manuka or kanuka					
(l)	Removal of manuka or kanuka for use on same holding where the activity complies with Rule 24.4.2.1.	D Regional or National SNA C Local SNA	D	P	P
	The matters over which Council reserves its control are: ▪ Location, extent and necessity of indigenous vegetation removal; and ▪ Effects on the connectivity between significant natural areas; and ▪ Effects on indigenous biodiversity; and ▪ Appropriateness of mitigation measures proposed including consideration of the no net loss principle; and ▪ Alternatives to removal of indigenous vegetation. These matters will be considered in accordance with the assessment criteria in Section 21.				
Sustainable Harvesting					
(m)	Sustainable harvesting where the activity complies with Rule 24.4.2.3.	C	NC	C	P

<table>
<tr><td></td><td colspan="5">The matters over which Council reserves its control are:
Effects on at risk or threatened species and methods to address those effects; and
The location of trees within significant natural area, or biodiversity corridor (as relevant); and
The area of trees to be harvested on an annual basis; and
Effects on the connectivity, value and characteristics of the significant natural area, bush stand or biodiversity corridor (as relevant); and
Potential adverse effects on indigenous biodiversity during harvesting and methods to avoid, remedy or mitigate those effects including consideration of the no net loss principle.
These matters will be considered in accordance with the assessment criteria in Section 21.</td></tr>
<tr><td colspan="6">Removal of indigenous vegetation for any other purpose</td></tr>
<tr><td rowspan="2">(n)</td><td rowspan="2">Removal of indigenous vegetation for any other purpose.</td><td>NC Regional or National SNA</td><td rowspan="2">NC</td><td>C Where clearance is less than 1 hectare</td><td rowspan="2">P</td></tr>
<tr><td>D Local SNA</td><td>RD Where clearance is 1 hectare or more</td></tr>
<tr><td></td><td colspan="5">The matters over which Council reserves its control are:
Location and extent of vegetation removal associated with the activity; and
The necessity of vegetation removal associated with the activity; and
Effects on the connectivity, value and characteristics of biodiversity corridor; and
Appropriateness of mitigation measures proposed including consideration of the no net loss principle.
Assessment of a restricted discretionary activity shall be limited to the following matters:
The matters listed above for a controlled activity; and
Alternatives to removal of indigenous vegetation.
These matters will be considered in accordance with the assessment criteria in Section 21.</td></tr>
</table>

24.4.2 Performance Standards

Rule - Removal of manuka or kanuka

24.4.2.1 Removal of manuka or kanuka from a holding shall comply with the following:

(a) The removal of manuka or kanuka is no more than 5m3 per calendar year; and

(b) The area from which manuka or kanuka is removed shall be replanted within 6 months or allowed to regenerate; and

(c) The removal of manuka or kanuka shall not adversely affect any at risk or threatened indigenous species.

Rule - Conservation activities

24.4.2.2 When undertaking conservation activities that involve the removal of indigenous vegetation, no greater than 1 hectare or 1% of the area, whichever is the lesser, of the significant natural area or bush stand shall be disturbed or removed.

Chapter E15 – Vegetation management and biodiversity

Table E15.4.2 Vegetation and biodiversity management in overlays (other than in the coastal marine area)

Activity		SEA-T [rp]
General		
(A24)	Permitted, controlled and restricted discretionary activities in Table E15.4.2 that do not comply with one or more of the standards in E15.6	D
Use		
(A29)	Vegetation alteration or removal within a SEA for a building platform and access way for one dwelling per site	C
(A30)	Vegetation alteration or removal within a SEA on Māori land or treaty settlement land for: (a) one marae per site; (b) up to 30 dwellings per site; (c) activities associated with a marae and with papakāinga	C
(A31)	Biosecurity Tree Works	P
(A32)	Dead wood removal	P
(A33)	Emergency tree works	P
(A34)	Vegetation alteration or removal for customary use	P
(A35)	Forestry and farming activities as existing at 30 September 2013	P
(A36)	Pest Plant Removal	P
(A37)	Conservation planting	P
(A38)	Vegetation alteration or removal for routine maintenance within 3m of existing dwelling	P
(A39)	Vegetation alteration or removal for routine maintenance within 3m of existing buildings greater than 100m2 gross floor area	P
(A40)	Vegetation alteration or removal for routine maintenance within 1m of other existing buildings	P
(A41)	Tree Trimming	P
(A42)	Vegetation alteration or removal for routine operation, maintenance and repair of existing tracks, lawns, gardens, fences and other lawfully established activities	P
(A43)	Any vegetation alteration or removal not otherwise provided for	RD
(A44)	Any vegetation alteration or removal within a Quarry Zone	D

E15.6.A1. General standards

The following standards apply to all permitted, controlled or restricted discretionary activities

(1) All kauri material (including sawdust and woodchips) must be retained within 3 times the radius of the canopy drip line of the tree or disposed of to an approved landfill facility.

E15.6.2. Vegetation alteration or removal for customary use

(1) No greater than 20m2 of vegetation is removed within a significant ecological area per site.

(2) No greater than 50m2 of vegetation is removed from areas not identified as significant ecological areas per calendar year.

E15.6.3. Conservation planting

(1) Conservation planting in significant ecological areas must only be for ecological restoration purposes.

(2) Conservation planting within the Outstanding Natural Features Overlay, Outstanding Natural Character Overlay, High Natural Character Overlay or the Outstanding Natural Landscapes Overlay must be limited to planting of indigenous species for ecological restoration or landscape restoration purposes.

E15.6.4. Vegetation alteration or removal for routine operation, maintenance and repair of existing tracks, lawns, gardens, fences, shelterbelts and other lawfully established activities in riparian areas, coastal areas, all zones outside the RUB and in overlays identified in Table E15.4.2 [other than the significant ecological areas in the coastal marine area – SEA-M]

(1) Vegetation alteration or removal must be undertaken within 1m either side of existing tracks or fences.

(2) Vegetation alteration or removal must not include trees over 6m in height, or 600mm in girth.

(3) Vegetation alteration or removal must not result in greater than 25m² of vegetation removal from within a Significant Ecological Areas Overlay, Outstanding Natural Features Overlay, Outstanding Natural Character Overlay, High Natural Character Overlay or the Outstanding Natural Landscapes Overlay per site.

(4) Vegetation alteration or removal must not result in greater than 50m² of vegetation removal from areas not identified as significant ecological areas per calendar year.

E15.6.5. Vegetation alteration or removal within a significant ecological area for a building platform and access way for a dwelling per site

(1) The total area of vegetation alteration or removal must not be greater than 300m².

E15.6.7. Vegetation alteration or removal within a Significant Ecological Areas Overlay, Outstanding Natural Features Overlay, Outstanding Natural Character Overlay, High Natural Character Overlay or the Outstanding Natural Landscapes Overlay, on Māori land or Treaty Settlement land for one marae per site and up to 30 dwellings and activities associated with a marae or papakāinga

(1) The total area of vegetation alteration or removal per site is not greater than:

(a) 1500m2 for a marae; and

(b) 300m2 per dwelling.

E15.6.8 Vegetation alteration or removal undertaken within the 100-year ARI floodplain

(1) Vegetation alteration or removal must ensure that erosion control measures associated with vegetation removal and replanting, such as mulch or bark, are not able to be swept off-site in a flood event.

E15.6.9 Tree trimming within Significant Ecological Areas

(1) The maximum branch diameter must not exceed 50mm.

(2) No more than 10 per cent of live growth of the tree is removed in any one calendar year.

(3) Trimming must meet accepted modern arboricultural practice.

(4) The trimming must retain the natural shape, form and branch habit of the tree.

Chapter 26 - Infrastructure

Table E26.3.3.1 Activity table – Network utilities and electricity generation and vegetation management

Activity	Auckland wide rules vegetation management	Overlay rules vegetation management

		Rural zones, coastal areas and riparian areas [rp]	SEA [rp]
Operation, maintenance, renewal, repair, construction and removal of network utilities and electricity generation facilities and minor infrastructure upgrading			
(A71)	Biosecurity Tree Works	P	P
(A72)	Dead wood removal	P	P
(A73)	Emergency tree works	P	P
(A74)	Pest plant removal	P	P
(A75)	Vegetation alteration or removal for the operation, repair and maintenance of access tracks and fences for network utilities	P	P
(A71)	Vegetation alteration or removal	P	P
(A77)	Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4	RD	RD
(A78)	Vegetation alteration or removal not otherwise provided for	D	D

E26.3.5. Permitted activity standards

All activities listed as permitted in Table E26.3.3.1 Activity table must comply with the following permitted activity standards.

Regional [rp]

Permitted activity standards for vegetation management in rural zones, coastal areas, riparian areas and the Significant Ecological Areas Overlay

E26.3.5.1. Vegetation alteration or removal for the operation, maintenance and repair of access tracks and fences for network utilities

(1) Must be undertaken within and to 1m either side of existing tracks and fences.

(2) Must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan.

(3) Must not result in the removal of more than 20m2 of vegetation within a significant ecological area.

(4) Must not result in the removal of more than 50m2 of vegetation from areas not identified as a significant ecological area.

E26.3.5.2. Vegetation alteration or removal

(1) Must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan.

(2) [deleted]

(3) Must not result in the removal of more than 50m2 of vegetation within a coastal area or riparian area not identified as a significant ecological area.

(4) Must not result in the removal of more than 20m2 of vegetation within the legal road or the formation width of the road in the Waitakere Ranges Heritage Area Overlay.

(5) Must not result in the removal of more than 500m2 of vegetation within the legal road or the formation width of the road in a rural zone.

(6) Must not result in the removal of more than 250m2 of vegetation outside the legal road or the formation width of the road in a rural zone.

(7) Vegetation alteration or removal from a significant ecological area must be for the purpose of:

(a) the operation, maintenance, renewal, repair or removal of network utilities or electricity generation facilities or minor infrastructure upgrading and not result in the removal of more than 20m2 of vegetation, except within the formation width of the road; or

(b) the operation, maintenance, renewal, repair or removal of network utilities or electricity generation facilities or minor infrastructure upgrading and must be undertaken in any of the following:

(i) within the formation width of existing roads, except where Standard E26.3.5.2(4) applies; or

(ii) within 1m of the network utility, or existing access track; or

(iii) in accordance with the Electricity (Hazards from Trees) Regulations 2003; or

(c) maintaining the safety of the network utility and must be undertaken in any of the following:

(i) within state highway designations as at 30 September 2013; or

(ii) within railway designations as at 30 September 2013; or

(d) installing a service connection and must not result in the removal of more than 10m2 of vegetation.

(7A) Tree trimming or alteration of trees must comply with the following standards:

(a) the maximum branch diameter must not exceed 50mm;

(b) no more than 10 per cent of live growth of the tree is removed in any one calendar year;

(c) the trimming or alteration must retain the natural shape, form and branch habit of the tree;

(d) trimming or alteration must meet accepted modern arboricultural practice.

(8) Standards E26.3.5.2(1)-(7A) do not apply to vegetation alteration or removal required to maintain the visibility of road safety signage, vehicle sightlines, carriageway clearance heights and widths as follows:

(a) clearance of 4.5m height above the road carriage way or up to 0.5m above any traffic signal, or road safety and directional signage located above the road carriageway

(b) clearance of a 0.5m width back from the road kerb;

(c) clearance of a 0.6m width back from the un-kerbed road; or

(d) clearance for any over dimension route requirement.

Table E26.6.3.1 Activity table - Earthworks in overlay areas except Outstanding Natural Features Overlay

Activity		**SEA-T [rp]**
(A110)	Earthworks for maintenance, renewal and repair of network utilities and electricity generation activities	P
(A111)	Earthworks for service connections	P
(A112)	Earthworks for minor infrastructure upgrading	P
(A113)	Earthworks for minor utility structures	P
(A114)	Earthworks for minor upgrading of road network activities within the legal road or the formation width of the road	P
(A115)	Earthworks for network utilities and electricity generation facilities that do not comply with the standards in E26.6.5.2	RD
(A116)	Other earthworks up to 10m2 and 5m3	P
(A117)	Earthworks from 10m2 to 2500m2 and from 5m3 to 2500m3	RD

(A118)	Earthworks greater than 2500m2 or 2500m3	D

E26.6.5.2. General standards

All activities listed as permitted, controlled or restricted discretionary in Table E26.6.3.1 Activity table must comply with the following standards.

Regional [rp]

Regional permitted activity standards for the Significant Ecological Areas Overlay and Water Supply Management Area Overlay

(1) Earthworks for network utilities outside the legal road or the formation width of the road shall be limited to the area and depth of the land previously disturbed or modified or within a width or depth not exceeding 2m either side of a National Grid structure or cable.

(2) Earthworks for network utilities (excluding road maintenance, repair and renewals, and minor infrastructure upgrading) within the legal road or the formation width of the road shall not exceed 10m2 and 5m3

(3) Earthworks for the minor upgrading of road network activities that exceed 10m2 or 5m3 shall not exceed an excavation depth of 0.6m, or the depth of land previously disturbed.

(4) Earthworks for service connections in SEAs shall be limited to the area and depth of earth previously disturbed or modified or shall not exceed 10m2 and 5m3

(5) After completion of the earthworks, the ground must be reinstated to at least the condition existing prior to any work starting.

(6) Land disturbance must not, after reasonable mixing, result in any of the following effects in receiving waters:

(a) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

(b) any conspicuous change in the colour or visual clarity;

(c) any emission of objectionable odour;

(d) the rendering of fresh water unsuitable for consumption by farm animals; or

(e) any significant adverse effects on aquatic life.

(11) Earthworks for maintenance and repair of driveways, parking areas, sports fields and major recreational facilities within a Significant Ecological Area Overlay shall be limited to the area of earth previously disturbed or modified.

(12) Earthworks associated with a temporary activity within a Significant Ecological Area Overlay shall be limited to the area of earthwork previously disturbed or modified.

Chapter 4C

4C.2.1 Exemptions to the Permitted Activity Rules

a. The following activities are permitted and exempt from Rule 4C.2.2 – All Zones through Rule 4C.2.9 – High Voltage Transmission Plan Area:

   i. Earthworks consented as part of an approved subdivision;

   ii. Earthworks in the Road Zone;

   iii. Earthworks associated with the maintenance, renewal and minor upgrading (in relation to electric lines) of network utilities listed in Chapter 10 – Network Utilities and Designations subject to Rule 10A.5.9 – Establishment, Maintenance or Demolition of a Network Utility;

   iv. Earthworks associated with the construction of stormwater reserves.

   v. Earthworks for domestic gardening;

   vi. Earthworks for grave digging;

   vii. Earthworks for archaeological investigations authorized by Heritage New Zealand, subject to the written approval of Transpower being clearly endorsed on all relevant investigation site plans where those investigations occur within the High Voltage Transmission Plan Area identified on the Plan Maps, Part B.

4C.2.2 All Zones

In addition to Rule 4C.2.3 – Tauriko Business Estate through Rule 4C.2.9 – High-Voltage Transmission Plan Area, earthworks are a Permitted Activity providing:

a. They are ancillary to an activity that is listed as a Permitted, Controlled or Restricted Discretionary Activity within that zone;

b. They use a combination of erosion and sediment control measures that are consistent with Appendix 4N: Erosion and Sediment Control Measures where earthworks on a site expose more than 100m2 of area. For the avoidance of doubt this rule shall not apply to approved earthworks or earthworks ancillary to primary production;

c. Any single cut on a site 1.5 metres in height or higher (either as a single cut or combination of cuts) where the angle of cut is 45o or greater is retained either before construction of any building foundations or retained no later than 3 months after that cut being created. This rule shall not apply to earthworks in the Rural Zone unless those earthworks are associated with construction of a building;

d. They do not take place within the drip-line of a Notable Tree or Heritage Tree;

e. They do not take place on any site that includes potentially contaminated land, unless:

   i. A consent for remediation has been obtained from the Bay of Plenty Regional Council;

   ii. A site investigation report prepared by a suitably qualified contaminated site investigator is submitted to the Council in accordance with Ministry for the Environment Guideline No.1 – Reporting on Contaminated Sites in New Zealand demonstrating that either the site does not have potentially contaminated land or the potentially contaminated land is separated from the earthworks by a safe distance (determined by the substance causing soil contamination);

   iii. Consent has been obtained pursuant to Rule 9B.3 – Restricted Discretionary Rules;

   iv. The provisions of Rule 9B.2.1 – Applicability to Subdivision and Land Use apply;

f. They are associated with sub-surface investigations of contaminated and potentially contaminated land to determine the presence, extent and nature of any contamination. This work shall be co-ordinated by a suitably qualified contaminated site investigator.

4C.2.4 Flood Hazard Plan Area

In addition to Rule 4C.2.2 – All Zones, earthworks within the Flood Hazard Plan Area shall not exceed more than 500m3 except where they are associated with the construction, erection or placement of a building.

4C.2.8 Special Ecological Areas

In addition to Rule 4C.2.2 – All Zones, earthworks within Special Ecological Areas shall:

a. Be associated with activities listed in Chapter 5 - Natural Environment (Table 5A.1); or

b. Not exceed more than 5m3 in a 6-month calendar period, except for:

   i. the maintenance of existing stormwater reserves and existing stormwater overland flowpaths (existing at 17 October 2009);

   ii. maintenance of existing farmtracks and fencelines (existing at 17 October 2009).

Chapter 5

Table 5A.1: Status for Activities Within or Adjoining any Special Ecological Area

Use/Activity	Relevant Rule	Activities within Category 1 SEA	Activities within 5m of any Category 1 SEA	Activities within Category 2 SEA
Activities in Open Space Zones that are listed as a Permitted Activity within the Plan, except for: Clearance of indigenous vegetation (unless otherwise provided for in Table 5A.1); (except for the trimming and pruning of indigenous vegetation on or directly adjoining existing pedestrian and cycle tracks to maintain the use of those tracks which is a Permitted Activity); a. Construction of new pedestrian and cycle tracks, including pathways, bridging, boardwalks and steps; b. Construction, erection or placement of new buildings (unless otherwise provided for in Table 5A.1); c. New public recreational facilities and activities; d. New carparks and access roads.	5A.5	P	P	P
The maintenance of existing: a. Minor public recreational facilities and activities; b. Surf life saving buildings (including clubrooms); c. Public recreational facilities and activities; d. Carparks and access roads; e. Public roads.	5A.5	P	P	P
Maintenance to existing stormwater reserves	5A.5	P	P	P
New stormwater reserves.	-	RD	RD	RD
Maintenance or minor upgrading (in relation to electric lines) of existing network utilities.	5A.5	P	P	P

Trimming and pruning of vegetation necessary to protect electrical lines required to meet the Electricity (Hazards from Trees) Regulations 2003	-	P	P	P
Erection of structures in the Road Zone.	-	P	P	P
Public pedestrian and cycle tracks including pathways, bridging, boardwalks and steps on land zoned Open Space.	-	RD	RD	RD
Clearance of indigenous vegetation on land zoned Open Space (unless otherwise provided for in Table 5A.1).	5A.6	RD	RD	RD
Buildings and structures on land zoned Open Space (unless otherwise provided for in Table 5A.1).	-	NC	NC	NC
Demolition of buildings/structures	5A.5	P	P	P
Accessory buildings (including public toilets) on land zoned Open Space.	-	P	P	P
Activities undertaken on land not zoned Open Space (unless otherwise provided for in Table 5A.1) that involve: a. Alteration, construction erection, placement and/or alteration of any building or structure; b. The clearance of indigenous vegetation.	-	NC	D	D
Minor structures and activities.	-	NC	P	D
Surf Life Saving Buildings (including Clubrooms).		NC	D	D
Harvesting of Forestry, in existence at the notification of the Plan	5A.6	-	-	RD
a. Managed accessways being walkways, cycleways, boardwalks and associated signage; and/or b. Surf lifesaving activities and associated structures, excluding surf life saving buildings (including clubrooms); associated with an approved camping ground within the Te Tumu Future Urban Zone	5A.7	D	D	D

5A.5 Permitted Activity Rules

5A.5.1 Reinstatement & Restoration

a. All activities shall ensure that reinstatement and restoration, including ecological restoration of the area disturbed is undertaken using indigenous vegetation species found within the Special Ecological Area;

b. Reinstatement and restoration, including ecological restoration planting, shall be established in accordance with accepted ecological practice within 6 months of completion of work.

5A.6 Restricted Discretionary Activity Rules

Restricted Discretionary Activities shall comply with the following Standards and Terms:

a. For any application for resource consent within or adjoining to any Special Ecological Area, a qualified ecologist shall prepare an assessment of the effects of the proposed *activity* on the ecological values of that Special Ecological Area;

b. The assessment shall have particular regard to the factors, values and associations that make the area a Special Ecological Area, considering those matters outlined in Appendix 5A: Special Ecological Area (SEA) Register.

Memo

Infrastructure Operations – City Waters

To:	Jamie Sirl – Team Leader, City Planning Unit		
From:	Kyall Foley – Environmental Policy Analyst, City Waters Mike Safey – Asset Engineer, City Waters		
Copy:	Mark Davey – City Planning Manager, City Planning Unit Maire Porter – Unit Manager, City Waters		
Subject:	**Plan Change 9: Three-Waters supporting context for Infrastructure Provisions within proposed Significant Natural Areas**		
Date:	21 June 2022	File:	D-4235849

City Planning Unit are undertaking a plan change which focuses on identifying areas associated with historic heritage and high value natural environment. The plan change will also include an update to the objectives, policies, and provisions around these matters.

The purpose of this memo is to provide supporting context relating to three-waters infrastructure operation within proposed Significant Natural Areas ('SNA') which are included as part of Plan Change 9 to the Hamilton City Operative District Plan ('Plan Change 9').

Activities which support the operation, maintenance and renewal of infrastructure is regularly undertaken by Council staff. These activities assist Hamilton City Council ('Council') in meeting its legislative responsibilities.

Some of these activities will be located within proposed SNA's, therefore permitted activity pathways to enable these critical activities are required. The impacts of not having specific permitted pathways to enable these activities may include:

- financial impacts passed onto ratepayers;
- delayed customer response time; and
- environmental and public health impacts

This memo will;

- Provide a breakdown of the business which City Waters operates, with a particular focus on reticulation. This includes context on the critical nature of our business, and our legislative drivers which detail the 'why' behind our operation.
- Provide a summary of each of the 'three-waters' infrastructure, including the amount of infrastructure located within the proposed SNAs.
- Provide a generalised methodology for the two key activities undertaken in regard to our infrastructure within the proposed SNAs.

Plan Change 9 differentiates between two distinct types of SNA's, namely Corridor SNA's and Floristic SNA's. SNA's will not be differentiated within this memo.

A range of different projects undertaken by City Waters has been provided as Attachment 1 to this memo.

The business of City Waters

City Waters is responsible for the management and operation of Hamilton City Councils three-waters network in a safe, efficient, and sustainable manner. This includes:

- providing residents and businesses with a high-quality, reliable, and sustainable water supply.
- managing wastewater (including the network, treatment, and discharge) in order to minimise effects of the community and the environment, protecting public health, and supporting economic development.
- providing an effective stormwater service that protects property from flooding and minimises the impacts caused by stormwater.

Legislative Drivers

The requirements of Council to provide, manage and maintain three-water services are set out in two pieces of key legislation. These are the Water Services Act 2021 (WSA) and the Local Government Act 2002 (LGA).

Water Services Act 2021: Council are a 'drinking water supplier' as defined by Section 8 of the Water Services Act (WSA). As a drinking water supplier, Council "*must ensure that the drinking water supplied by the supplier is safe*" (Section 21(1)). Under the WSA, Council;

- Must immediately investigate, remediate, notify affected parties, and implement measures to prevent an event which may result in unsafe drinking water (Section 21(2)).
- Must ensure that the drinking water supplied complies with drinking water standards (Section 22).
- Must ensure that a sufficient quantity of drinking water is provided to each point of supply, noting that planned restriction or interruption of the supply of drinking water by a drinking water supplier must not exceed 8 hours (Section 25).

Local Government Act 2002: Those local government organisations which provide water services (consisting of water supply, wastewater, and stormwater services) are "*required to continue to supply these services*" (Section 130 (2)), both for the current population and future growth projections. Specifically, the LGA requires Council to:

- Prepare Long Term Plans which shows levels of service, measures, and targets together with Annual Plans which report on them;
- Maintain public water services;
- Adopt a significance policy setting which includes a list of 'strategic assets' i.e., the stormwater network;
- Undertake assessments of public water services;
- Ensure water service assets are not used as security, or divest ownership to a non-local government organisation; and
- Manage the effects of people's actions on the public waters network.

Additionally, the activities undertaken by Council Staff contributes to the overall obligations set out within several key pieces of legislation

Te Ture Whaimana o Te Awa o Waikato, and the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010: The overarching purpose of the Waikato River Settlement Act is the restoration and protection of the Waikato River for future generations. Council gives effect to this though:

- The continued operation and maintenance of our three-waters network;
- Ensuring the efficient use of abstracted drinking water;
- The prevention of wastewater overflows or short circuiting due to failing infrastructure; and
- By remediating the impact of stormwater discharges on the tributaries of the Waikato River.

Health Act 1956: The Health Act sets out specific requirements for local authorities, for the purpose of improving, promoting, and protecting public health. These requirements include the provision of '*sanitary works*' (including waterworks, drainage works, sewerage works, and works for the disposal of sewage) (Section 21(1)) and the prevention of nuisances which may be offensive or likely to be injurious to health (Section 29).

Land Drainage Act 1908: The Land Drainage Act enables 'Boards' to construct and maintain drains and water courses for the purpose of stormwater drainage.

Soil Conservation and Rivers Control Act 1941: The objectives of this act include the prevention and mitigation of soil erosion and the prevention of damage by floods. This relates to the stormwater activity undertaken by Council as the activity has the ability to exacerbate erosion and flooding if not adequately managed.

Resource Management Act 1991: The purpose of the Resource Management Act (RMA) is to promote the sustainable management of natural and physical resources. Council provides three-waters services in a way which aligns with the purpose of the RMA, whilst also providing for the matters of national importance in Section 6, taking into account the matters in section 7, and having particular regard to Te Tiriti o Waitangi.

Stormwater

Council provides stormwater services to Hamilton's residents and businesses that:

- Protects the health of people;
- Protects habitable building inundation from flooding; and
- Minimises the pollution of the city's streams, lakes, and the Waikato River.

This is achieved through the following:

- Providing and managing public stormwater infrastructure;
- Operating and maintaining the public stormwater network;
- Responding to customers queries and complaints relating to the public stormwater network;
- Conveying and discharging stormwater into the city's streams, lakes, and the Waikato River.
- Collecting and treating stormwater; and
- Monitoring stormwater impacts and infrastructure/catchment management performance.

Stormwater assets include service connections, reticulation pipes, manholes, treatment/detention/flood management devices, soakage pits, and lined open watercourses.

In addition to the above, the tributaries of the Waikato River (as well as the Waikato River itself) is an important feature of our stormwater network. There is an estimated 168km of streams which receive stormwater from the urban catchment of Hamilton City. These are registered as 'stormwater channels' within our asset management plans. A number of ancillary devices are also required to support the ability of stormwater channels to service our urban stormwater. These include stormwater inlets and outlets, fish barrier remediation devices and erosion control devices.

Table 1 below outlines the number of stormwater assets which City Waters manages.

Table 1: Stormwater Assets profile (source: Stormwater Asset Management Plan and Council GIS).

Asset Group	Asset Type	Number / Length
Network	Service connections	50,125
	Reticulation Pipes	16,587 km

	Manholes	14,374
Treatment	Treatment / Detention / Flood Management	29
Assets within streams and rivers	Stormwater Channels	131km
	Outlets and Inlets	157
	Erosion protection devices	Numerous

Stormwater infrastructure and related projects within proposed SNA's

There are a number of Councils stormwater assets located within a proposed SNA. The considerable proportion of assets within these areas (gullies, or the banks of the Waikato River) can be linked to the limited options for stormwater disposal available.

The types of stormwater infrastructure which are located within the proposed SNA's include stormwater outlets and inlets, mains, manholes, as well as the stormwater channels. The number of individual stormwater assets within the proposed SNA's are outlined within Table 2.

Table 2: Comparison of the number of total stormwater assets and stormwater assets within proposed Significant Natural Areas.

Asset Type	Total Number of Asset	Number of Assets Within Proposed SNA	Percentage in SNA
Reticulation Pipes	16,587	778	4.6%
Manholes	14374	293	2%
Stormwater Channel	131km	66.6km	50.7%
Outlets and Inlets	1045	397	37.9%

Stormwater assets are like any other assets and require regular maintenance and upkeep to ensure their continued successful operation. Physical assets such as mains, manholes or stormwater outlets can have an asset life of up to 100 years. Factors such as bank instability, fallen trees, erosion and scour and root interception may require the asset to be replaced earlier. This does not include the regular asset renewal programme which outlines of physical stormwater assets that to be replaced over the next 10 years.

The gully scarps within Hamilton are dominated by alluvium, predominantly reworked ash, and pumice (Lowe, 12-16 December 2016). As a result, the beds and banks are characterised by unconsolidated silts and sands which are prone to erosion, and continued intervention will be required. Erosion protection activities are regularly required within the stormwater channels to protect property and the health and safety of persons.

Erosion protection solutions can be characterised into soft and hard engineering. Soft engineering is the preferred solution by Council staff, and generally consists of vegetation planting along unstable banks which generates root balls that stabilise the bank. Root balls which intercept the waterbody also provide potential habitats for freshwater species.

Notably, two sterile versions of willows (*salix matsudana* and *salix boothii*) are used by Council staff as the species root balls grows wide and rapidly. This provides cost effective maintenance, whilst maintaining the natural character of the subject waterbody. The species are treated as assets, and are pruned, maintained and managed. Once a rootball has been established, the trunk of the willow is removed. Council have utilised this method of stabilisation three times over the previous three years.

Although soft engineering is the preferred option, hard engineering is often required. Hard engineering can consist of bank armouring, installation of gabion walls, and installation of rock riffles within stream beds. Hard engineering is generally required six times a year, with the projects themselves only requiring up to one to three days on site.

Council Staff have identified certain lengths of the stormwater channel that may require future erosion protection intervention. Approximately $26 million has been set aside in the 2021-31 Long Term Plan for stream interventions. The Stormwater Master Plan identifies 45 lengths of stream within the city which require investigation to whether intervention is required.

Certain sections of the stormwater channel also require sediment removal. Stormwater discharges from the urban environment and ongoing erosion of the stormwater channel displaces and transports sediment to 'pooling areas. These areas may accumulate sediments to such a degree that the capacity of stormwater assets such as outlets or culverts are compromised, and flooding may occur. City Waters undertake desludging activities, which consists of using an excavator to remove the build-up of sediment and ensure the safe continuation of the stormwater network.

It is noted that the frequency of work within the stormwater channels is unlikely to reduce. As previously mentioned, options for stormwater disposal are limited within Hamilton, and the use of the tributaries will continue. Rather, the increased growth of the city, as well as the future levels of intensification will likely see the level of stormwater increase within both existing and proposed urban areas. This will also increase the need to undertake interventions within the stormwater channels.

Wastewater

Council provides Hamilton's residents and businesses with a sustainable, reliable, and cost-effective service which includes collection, conveyance, and treatment of wastewater. The objective of the wastewater services provided by Council is to ensure the protection and improvement of public health and safety and providing appropriate water sanitary services and hazard management practices. This is achieved by:

- Collecting discharged wastewater (including trade waste) from individual properties throughout the city;
- Conveying discharged wastewater through the network, consisting of a series of mains, manholes and pumpstations to the wastewater treatment plant;
- Receiving discharged wastewater at Pukete Wastewater Treatment Plant, and providing tertiary level treatment of wastewater prior to discharging into the Waikato River; and
- Undertaking regular maintenance, renewals and upgrading in an efficient and sustainable manner, to provide for the future growth of the city.

Wastewater is discharged from properties into a network of mains and pumpstations which convey it to the treatment plant. The reticulated network consists of a range of different pipes, including gravity pipes, rising mains, and interceptors. There are also aerial mains which assist the conveyance of wastewater across our gullies, streams, and the Waikato River.

A large proportion of local wastewater networks flows via gravity to low points within the network. Pump stations collect wastewater at these low points and lift them to high areas where it continues its journey to the treatment plant under gravity.

Table 3 below outlines the number of wastewater assets which City Waters manages.

Table 3: Wastewater Assets profile (source: Wastewater Asset Management Plan and Council GIS)

Asset Group	Asset Type	Number / Length
Network	Service connections	55,485
	Reticulation Pipes	18,949
	Manholes	15,370
Pump Stations	Pump Stations	136
Wastewater Treatment Plant	Civil, structural, mechanical, electrical and automation	1

Wastewater infrastructure and related projects within proposed SNA's

There are a number of Councils wastewater assets located within a gully, or along the banks of the Waikato River.

The types of wastewater infrastructure which are located within SNA's predominantly consist of mains, manholes, as well as several pump stations. The number of individual wastewater assets within the SNA's are outlined within Table 4.

Table 4: Comparison of the number of total wastewater assets and wastewater assets within proposed Significant Natural Areas.

Asset Type	Total Number of Asset	Number of Assets Within SNA	Percentage in SNA
Reticulation Pipes	18,949	551	2.9%
Manhole	15,370	177	1%
Pump Station	136	8	5.8%

Similar to stormwater assets, wastewater assets are required to be regularly inspected, maintained, renewed, and (where required) upgraded. This is required to ensure that wastewater networks maintain capacity for demand, and to ensure that an aged asset does not compromise the objectives set for the wastewater network.

The 2021-31 assets renewal programme identifies those wastewater assets which are required to be replaced or upgraded. A total of 2,599 number of wastewater mains and manholes are to be replaced over the next 10 years. This includes 77 assets which are located within a proposed SNA, and nine aerial mains over the next three years.

The eight pump stations located within the proposed SNA overlays will require regular maintenance and periodic upgrades. City Waters note that these works generally remain within the existing footprint of the pumpstation.

When compared to stormwater infrastructure, there is less wastewater infrastructure located within the gullies of the city. Notwithstanding this, there is still a functional need for it to be located there. Gravity mains convey local wastewater to a low point in the network. Pump stations convey wastewater from the low point in the network, to an elevated point where gravity can convey it into a wastewater interceptor, which conveys wastewater to the treatment plant. Several of these low points within the network are located within the city's gullies.

Water Supply

Council provides Hamilton's residents and businesses with a safe, high-quality, reliable, and sustainable water supply by the treatment, distribution, and management of Hamilton's water supply.

Raw water is drawn from the Waikato River into the water treatment plant, where it is treated to provide a high standard of drinking water. This water is conveyed by bulk mains to one of the nine water reservoirs within the city. From here, water is reticulated throughout the remainder of the network, supplying water to over 50,500 households and 5,500 commercial, industrial, and rural premises.

Table 3 below outlines the number of water supply assets which City Waters manages.

Table 5: Water Supply Assets profile (source: Water Supply Asset Management Plan and Council GIS)

Asset Group	Asset Type	Number / Length
Water Supply Network	Service connections	58,969
	Reticulation Pipes	17,828 km
Storage	Reservoirs	9
Water Treatment Plant	Civil, structural, mechanical, electrical and automation	1

Water supply infrastructure and related projects within proposed SNA's

Council has a limited amount of water supply infrastructure located in SNA's. A majority of these assets are aerial mains which transverse gullies and are fixed to existing public amenities (an example being Donny Avenue Bridge which doubles as a water supply main). Of note, two of the four bulk mains leaving Wairoa Water Treatment Plant transverse proposed SNA's.

The number of individual wastewater assets within the SNA's are outlined within Table 4.

Table 6: Comparison of the number of total water supply assets and water supply assets within proposed Significant Natural Areas.

Asset Type	Total Number of Asset	Number of Assets Within SNA	Percentage in SNA
Reticulation Pipes	17,828	77	0.43%

As opposed to wastewater infrastructure, water supply infrastructure is constantly pressurised when operational. This is reflected the amount of infrastructure located within proposed SNA's.

Like wastewater infrastructure, water supply assets located within SNA's are subject to asset renewal via the asset renewal programme, as well as ongoing maintenance to ensure consistent delivery of water supply services to the community. No assets within the 2021-31 Asset Renewal Programme are within a SNA.

Unlike wastewater and stormwater infrastructure, there is no functional need for water supply infrastructure to be intercepting gully areas (and by consequence, proposed SNA's). It is likely the amount of water supply infrastructure located within the proposed SNA's will remain consistent.

Work Methodologies

The following content outlines general methodologies followed by Council staff and contractors for three-waters infrastructure operation, maintenance and upgrading activities. It is noted that the methodology provided is generalised. Each project will have a specific work methodology, which has been derived based on the unique situation of the work site.

Generalised methodologies have been split into works on the stormwater channel, and asset renewals.

Stormwater Channel projects within Significant Natural Areas	
1. Site Selection	The natural stormwater channel is regularly inspected by staff, with the intent that the same area of the channel is inspected at 6 to 9 monthly intervals. Existing hand-cut tracks through gully vegetation are maintained during each inspection visit. The work (undertaken by City Delivery) is to check stormwater channels for existing blockages, imminent blockages, erosion and undercutting, and any other issues that may result from the operation of the stormwater network. As well as ongoing inspections, City Delivery also respond to service requests by the general public. Any erosion project works identified which requires significant intervention (over and above what can be dealt with on site as part of normal maintenance) are escalated to the City Water Assets team for scoping and prioritisation. In addition, stream walkovers are also undertaken periodically by river engineers as part of catchment planning for specific catchments. An issue or scope of work may be identified as part of these walkovers and inserted into the Stormwater Master Plan for future works planning.

2. Access	To be able to complete the specific project involving the natural stormwater channel, access to the site will be required. The access route will be utilised by subcontractors and their equipment. The use of established and maintained access track is preferred as this minimises the overall cost and vegetation clearance required. Where existing access is not available, an access track is created. The access track can either be temporary or permanent. Generally speaking, the width of an access track is required to be 4 metres as a minimum. This takes into consideration the requirement for contractors' machinery and materials, and Council's requirement to create a safe work environment. The size of the machinery depends on scale and scope of job. The length of the access track depends on the location of the site of works. The nearest access into a site is determined, and in the case of privately owned land, requires an agreement to be met between private property owners and Council. Where this is not available, the distance from an access point may be a long distance (for example 50 metres) from the edge of the gully.
3. On-Site Methodology	The on-site methodology depends on the project that is proposed, however what is consistent with all projects is the need to have a safe working environment. Creating a safe working environment is a key driver on the total amount of space required. The on-site methodology is driven by the contractors who are doing the work, in consultation with City Delivery and/or City Waters. This may include the creation of work platforms, access routes for plant and material delivery to site, and laydown areas. Where possible, this is kept out of the gully networks. Council prefers to engage contractors who are experienced in undertaking instream works.
4. Reinstatement	Immediately following completion of the works, any disturbed or cleared ground is stabilised using hydroseeding or mulch. Revegetation with native species is then undertaken during the next planting season using appropriate locally sourced native species. Should future access by staff be required at that specific site, revegetation will be limited to grasses, sedges, or small, hardy shrubs Parks and Open Spaces are engaged to advise on appropriate locally sourced indigenous plant species, and to coordinate planting for the specific location where the works are located on council-owned and private land. Where vegetation has been removed for erosion works on private land, the owner is also consulted regarding the choice of plants to be used in the restoration planting.

Asset Renewals within Significant Natural Areas	
1. Site Selection	Specific assets which are required to be renewed are identified by council staff as part of the asset renewal programme. The programme is run by council staff yearly, identifying the next ten years of asset renewals.

	All assets are subject to ongoing monitoring and maintenance. The assets which require renewal are identified by several distinct factors, including their age, the asset type and their material, condition, location, and the maintenance history of the specific asset. Once identified, the assets are grouped based on their location, logistics, complexity, and the proximity to other assets subject to renewal. Assets which are located within gully areas are also grouped together. Council staff then engage contractors to carry out the renewal of the group of assets.
2. Access	The methodology behind accessing assets located within gully areas is like that of Access
3. On-Site Methodology	The onsite methodology relating to asset renewals is highly dependent of the nature of the asset renewal. A renewal project might include the realignment, replacement, or redirection of the asset. For mains, different methodologies could be utilised to undertake the work: - Pipe lining – the old pipe is lined with a new pipe from the inside. - Pipe bursting – breaking and expanding the existing buried pipe while simultaneously replacing it with a new pipe. - Directional Drilling – trenchless method of excavation, while simultaneously installing a new pipe. - Trenching – excavation and exposure of pipe to enable renewal. - Pile driving – the use of a drop hammer to create new (or reinforce existing) structural supports for aerial mains. The preferred methodology is selected using a range of distinct factors. These include pipe condition and material, capacity, type of renewal (i.e., realignment), gradient, environmental, economic, cultural. There is also a wide range of materials or equipment required for the project. Bedding and backfill material, machinery and generators may need to be bought in to complete asset renewal projects.
4. Reinstatement	The methodology behind reinstating worksites located within gully areas is like that of accessing the natural stormwater network. Parks and Open Spaces still provide input into the species which are replanted near infrastructure assets, however of consideration is the risk of root intersection from any planted species. In some instances, a generalised ‘stabilisation’ approach is adopted as opposed to replanting.

Document control			
Prepared by		Authorised by	
Kyall Foley	Mike Safey	Eeva-Liisa Wright	
Environmental Policy Analyst – City Waters	Asset Engineer – City Waters	General Manager – Infrastructure Operations	
Reviewers			
R Simpson	☒	M Porter	☒

Attachment 1 – Project Examples

2022/23 Erosion remediation projects.

Erosion remediation site	Construction cost	Vegetation removed for site access and construction (m2)	Approx distance to worksite from edge of existing vegetation (m)	Comment
Tauhara Park TRB erosion upstream of Tauhara Drive	$13,328	20	2	Worksite located alongside existing vehicle track

Tauhara Park TRB erosion upstream of Tauhara Drive

Tauhara Park TRB erosion upstream of Tauhara Drive

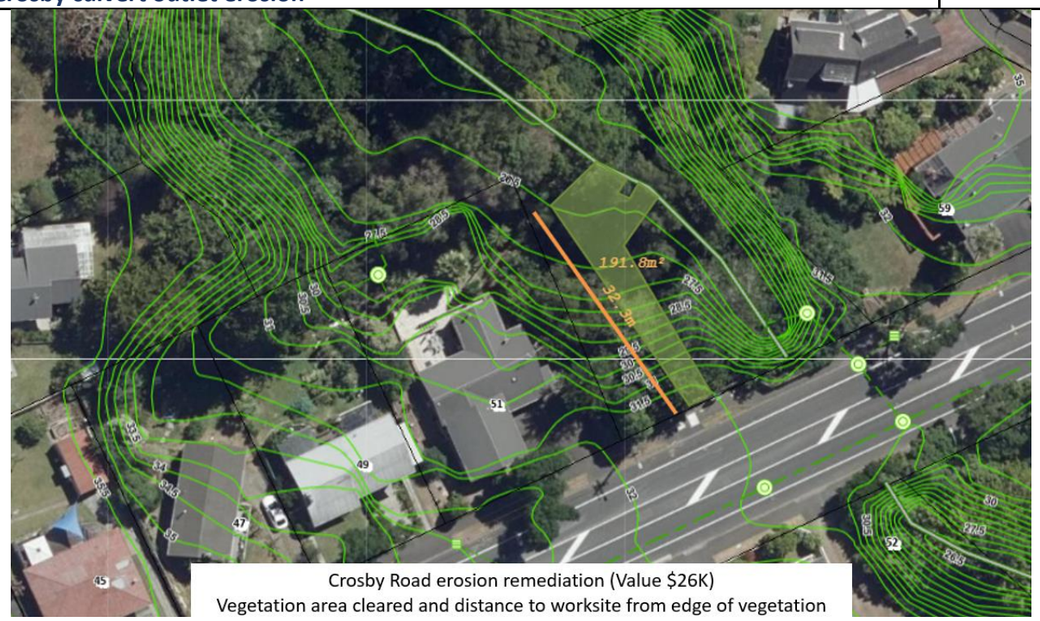
Tauhara Park TRB erosion upstream of Tauhara Drive

Sandford Park footbridge erosion	$56,520	140	5	Worksite located alongside existing vehicle track

Sandford Park footbridge upstream view – before.

Sandford Park footbridge erosion remediation
Upstream view.

Crosby culvert outlet erosion	$25,986	192	33	Existing recently-planted native trees removed. To be replanted with natives to owners requirement

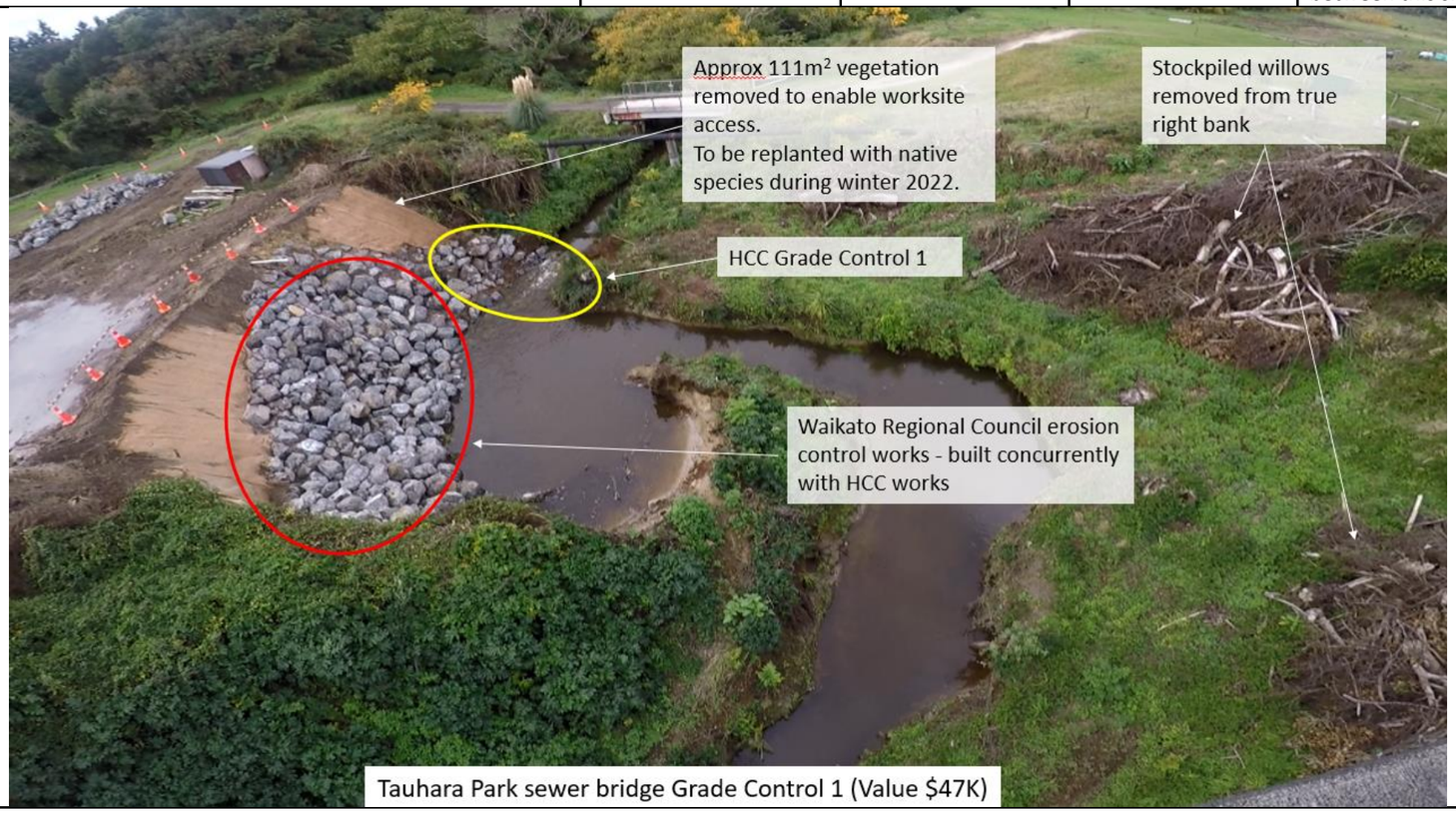


Crosby Road erosion remediation (Value $26K)
Vegetation area cleared and distance to worksite from edge of vegetation

Crosby Road erosion remediation (Value $26K)

Crosby Road erosion remediation (Value $26K)

Tauhara Park sewer bridge grade control 1	$47,704	111	13	Fallen large willows removed. Restoration plan being developed for entire stream between this site and River Road. Approx length 1.1km.



Tauhara Park sewer bridge Grade Control 1 (Value $47K)

Tauhara Park sewer bridge grade control 2 & toe protection	$43,934	183	16	Fallen large willows removed. Restoration plan being developed for entire stream between this site and River Road. Approx length 1.1km.

Tauhara Park sewer bridge Grade Control 2 & toe protection (Value $44K)

Awatere Ave cycleway bridge erosion	$83,630	60	15	In progress. Access via adjacent cycleway Existing riverbank native vegetation removed from riverbank

Awatere Ave cycleway bridge erosion remediation

209 Maeroa Road culvert outlet erosion remediation	$325,479	321	32	**In progress.** To be replanted with natives to owners requirement
Nevada Road culvert outlet erosion remediation	$44,539	140	6	Site was accessed via the stream channel. No access route required through vegetation. Native planting to be done as part of Mangaonua restoration programme.

Nevada Road culvert outlet erosion remediation

67 Maeroa Raod SW outlet erosion remediation.	$833,000	333	50	Existing SW outlet extended through existing SNA. Resource consent from both Waikato Regional Council and Hamilton City Council required

67 Maeroa Road erosion remediation

67 Maeroa Road erosion remediation

67 Maeroa Road erosion remediation