Huia Water Treatment Upgrade - Assessment and Review of Ecological Values

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Background

An upgrade is proposed of the Huia Water Treatment Plant on the corner of Woodlands Park Road and Manuka Road, Waitakere. The Manuka Road site was selected as the preferred site for the replacement treatment plant in June 2017. An ecological survey has been undertaken by Boffa Miskell for Watercare Services Ltd (April 2018).

This report provides an independent assessment of the ecological values of the site and a peer review of the ecological survey undertaken by Boffa Miskell. The report has been commissioned by the Community Liaison Group.

This work has involved working alongside Boffa Miskell ecologists through the vegetation survey work, and providing reviews of draft survey methodologies for bats, birds, lizards and freshwater ecology.

I have been assisted with this report by Alison Davis, Aristos Consultants. Earlier drafts of Boffa Miskell survey methodologies were reviewed by Kessels Ecology.

Scope of the Ecological Survey

The scope of the project is limited to describing the ecological values of the site rather than an assessment of effects.

The original scope of the independent report was as follows[1]:

- Review of Boffa Miskell survey brief and methodology and provide feedback and recommendations on areas requiring additional work;
- Peer review of ecological survey methodology;
- Working alongside Boffa Miskell during aspects of the field survey;
- Independent ecological review of the Boffa Miskell survey and recommendations.

The ecological report undertaken by Boffa Miskell presents survey results for vegetation, herpetofauna, bats, birds, and freshwater ecology, and provides an overall summary of ecological values and significance. An invertebrate survey was undertaken by Dr Peter Maddison.

This report provides the following:

1. An independent assessment of the ecological values, significance and overall context of the site;
2. A review of Boffa Miskell report:
    - survey methodologies;
    - survey results;
    - ecological values and significance;
3. Overall comments and recommendations.

This report incorporates feedback from the Community Liaison Group on an earlier draft. Further discussions were held with Boffa Miskell following this review and the results of this are summarised on page 13.

[1] Brief for Independent Ecological Report for Upgrade of Huia Treatment Plant September 2017

Ecological Context

Waitakere Ranges

The site is almost completely covered in native forest and is part of the nationally significant Waitakere Ranges, which is identified as a Significant Ecological Area (SEA) in the Auckland Unitary Plan Operative in part (AUP-OiP).

Figure 1. Site location

Forest ecosystems characteristic of the Waitakere Ranges including kauri podocarp forest and regenerating secondary forest are dominant in the site. The forest types of the Ranges reflect the history of forest clearance and milling and include remnant kauri, podocarp-broadleaved forest and large areas of regenerating forest and shrubland (Esler 2006).

The site is significant in the context of the rich regenerating lowland forest in the foothills of the Waitakere Ranges. It lies in the foothills of the Ranges and within the Waitakere Ranges Heritage Area. The Waitakere Ranges Heritage Area Act 2008 describes the ecological importance of the ranges as follows:

"*The Waitakere Ranges and its foothills and coasts comprise an area of some 27,720 ha of public and private land located between metropolitan Auckland and the west coast of Waitakere City and Rodney District. The area is of local, regional, and national significance. The area is outstanding in northern New Zealand for its terrestrial and aquatic ecosystems, which include large continuous areas of primary and regenerating lowland and coastal rainforest, wetland, and dune systems with intact ecological sequences. The area contains distinctive and outstanding flora, fauna, and landscapes…The Waitakere Ranges also contribute to metropolitan Auckland's water supply…*"

The Waitakere Ranges are a botanically rich area containing 20% of New Zealand's vascular plant species and 60% of New Zealand fern species[2]. Kauri is taonga to Maori and is the most distinctive tree of the ranges. Dense stands of regenerating kauri are characteristic of the Titirangi Waima area. The kauri – podocarp forest on the Waitakere Ranges is a vital part of what remains of kauri forest globally. It is estimated that kauri forest once covered 1.2 million ha and there is now only around 7,500 ha mature kauri left[3]. Recent studies of the conservation value of gymnosperms on a global scale have ranked kauri as fourth on the list of conservation priorities (Forest et al. 2018). Kauri has recently been listed as a nationally threatened plant species ('Threatened – Nationally Vulnerable') (De Lange et al. 2017).

The regenerating forests of Waitakere Ranges have a prominent shrub layers of pigeonwood, mahoe, heketara, kohuhu, mapou, *Coprosma spp*., tree ferns and nikau (Esler 2006). Dense kauri ricker stands prominent feature of these regenerating forests.

Context of the site

The foothills of the ranges including the area where the site is located contains rich lowland ecosystems including dense kauri ricker stands, kauri-podocarp forest, and broadleaved forest communities.

The site lies in the headwaters of Little Muddy Creek, in the Yorkes Stream and Armstrong Gully catchments (Fig 2, Appendix). Forest in the foothills of the ranges provides the ecological connections, linkages and stepping stones for wildlife from the ranges to the Manukau Harbour and across the Auckland isthmus to the Hauraki Gulf. The Waitakere Ranges are part of the Northwest Wildlink[4] a corridor of interlinking habitat between the Ranges and the Hauraki Gulf Islands.

Within the local context, the site is connected to and forms a linkage with regional parkland to the south and west and is part of an extensive network of forest in the Titirangi Waima area (Fig 1, Appendix). Forest is fragmented by roads and urban settlement, but forest cover is dense. Adjoining regional parkland immediately to the south of the site contains two of the oldest kauri trees in the Auckland region (Clarks tree and Bishop tree) (New Zealand Tree Register[5][6]). The site is therefore an important connection within the local context and part of a wider area of adjoining kauri forest and regional parkland.

Kauri dieback disease

The threat of kauri dieback disease has heightened the value of remaining kauri forest nationally and regionally. Te Kawerau a Maki have placed a rahui over the Waitakere Forest to prevent human access and to prevent the spread of kauri dieback disease[7]. Auckland Council supported this rahui in 2018 by closing tracks in the regional parkland.

The Waitakere Ranges Regional Park (WRRP) now represents the most heavily kauri dieback infected area currently recorded in New Zealand (Hill et al. 2017). Of the distinct

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[2] Appendix B, Auckland Regional Policy Statement 1999
[3] https://teara.govt.nz/en/kauri-forest/page-1
[4] https://www.northwestwildlink.org.nz

[5] https://register.notabletrees.org.nz/tree/view/1443

[6] https://register.notabletrees.org.nz/tree/view/1444

[7] http://tekawerau.iwi.nz/node/13

areas of kauri forest within the WRRP which are above 5ha in size, 58.3% are exhibiting symptoms of kauri dieback infection to some degree.

The importance of kauri forest on the site, and the threat of the spread of kauri dieback disease within the local area are important factors to consider with the management and protection of the site.

Ecological Values

Vegetation Types

The forest on the site is in three main sections separated by Woodlands Park Rd and Manuka Rd. The main vegetation types present are described in the Vegetation Map in the Boffa Miskell report. Vegetation types have been determined by detailed recce plots and transects measuring tree biomass, dominance and vegetation composition.

The northern section of forest (north of Woodlands Park Rd) is contiguous with Exhibition Drive and with regional parkland to the west. It is characterised by broadleaved kohekohe forest on the steep escarpment leading up to Exhibition Drive, grading into kahikatea forest and swamp maire forest in the head of the gully to the north west and with kauri forest dominant on the western side beside the road. Regenerating kanuka broadleaved podocarp forest is dominant on the eastern sections of the forest. An area of weed species dominates the central area around the existing water tanks.

Kauri forest is the main vegetation type on the section containing the existing Water Treatment Plant, with mixed regenerating forest on the corner of Manuka Rd and Woodlands Park Rd.

The south eastern section of forest, south of Woodlands Park Rd, is contiguous with regional parkland to the south. The forest is more modified in the north-western section close to the road, with mahoe dominant vegetation, grading into kanuka broadleaved forest to the east. Kauri podocarp broadleaved forest is dominant in the southern half of the forest, with some large trees present.

Threatened ecosystem types

Broad scale indigenous terrestrial and wetland ecosystem types have been defined for the Auckland region and assessed against IUCN threat categories (Singers et al. 2017). The majority of the site contains regenerating native forest communities that fit within the following threatened ecosystem types, as defined by Singers et al. 2017 (see Figure 2):

- kauri forest (WF10) (regional IUCN threat status - endangered);
- kauri podocarp forest (WF11) (endangered);
- mixed regenerating broadleaved forest (WF7.2) (critically endangered);and
- swamp maire - kahikatea – pukatea forest (WF8) (critically endangered).

Much of the site contains regenerating mixes of kauri forest and kauri podocarp broadleaved forest (WF10 and WF11) with kanuka still dominant in the canopy.

The categories of ecosystem types defined for Auckland (Singers et al. 2017) are at a broad regional scale (e.g. kauri forest and puriri forest) and do not fully capture the complex of regenerating podocarp-broadleaved forest and shrubland associations that make up the Waitakere Ranges. However they are important in determining the extent of loss of forest types remaining in the region and the threatened nature of ecosystem types. The revised

threat status of kauri and Myrtaceae species (swamp maire, kanuka, manuka, rata) elevate the importance and significance of the forest on the site.

A total of 84 native plant species were recorded during the vegetation transect and plot survey (Appendix 3). This includes 7 gymnosperm tree species, 19 fern species, 36 tree and shrub species, and 8 climber and epiphyte species.

Threatened Flora

Threatened plant records for the site and from within the vicinity have been provided by Auckland Botanical Society[8], and recorded from field observations. It is intended that they will be listed and mapped in the Boffa Miskell report.

A revised conservation status of New Zealand indigenous vascular plants has been recently published by Department of Conservation (De Lange et al. 2017). This list includes kauri (due to the rapid spread by kauri dieback disease) and all species of Myrtaceae (due to the threat of myrtle rust), on the list of nationally threatened and at risk plants.

Nationally threatened and at risk plant species present at the site are as follows:

- *Agathis australis* (kauri) – Threatened – Nationally Vulnerable;
- *Kunzea robusta* (kanuka) – Threatened – Nationally Vulnerable;
- *Leptospermum scoparium* (manuka) – At Risk – Declining;
- *Metrosideros carminea* – Threatened – Nationally Vulnerable;
- *Metrosideros excelsa* (pohutukawa) - Threatened – Nationally Vulnerable;
- *Metrosideros diffusa* - Threatened – Nationally Vulnerable;
- *Metrosideros perforata* - Threatened – Nationally Vulnerable;
- *Syzgium maire* (swamp maire) – Threatened – Nationally Critical.

Regionally threatened flora species (Stanley et al. 2005) present in the vicinity of the site (within Clarks Bush area) are:

- *Elaeocarpus hookerianus* (regionally acutely threatened – critical)
- *Pennantia corymbosa* (regionally at risk – sparse).

Other species of note recorded in the vicinity by Auckland Botanical Society include matai, titoki, *Melicytus micranthus*, *Mida salicifolia, and* a hybrid *Metrosideros*.

Fauna Values

The site contains high value habitat for native birds and lizards. The bird species present are comparable to the diversity of species recorded and monitored by Auckland Council throughout the Ranges. North Island kaka and long-tailed bats are likely to visit the site. Forest gecko has been recorded previously at the site, and green gecko are likely to be present.

Native bird species recorded are: tui, kereru, grey warbler, kingfisher, fantail, shining cuckoo, morepork, silvereye, spur winged plover, harrier. Resident populations of grey warbler, kereru, tui, morepork have been observed[9].

[8] Sandra Jones, Auckland Botanical Society, 25/5/18

[9] Tina Hamlin, 26 May 2018

The site forms part of a network of habitat through the Waima area and adjoins regional parkland habitat to the north and south and forms an important connection for wildlife in this network. The Yorke and Armstrong Gullies provide high quality freshwater habitat. Longfin eel and inanga (at risk declining) are present in the Yorke Gully catchment.

Invertebrates

A survey of invertebrate fauna was undertaken by Dr Peter Maddison[10] and the following description summarises some of the main results. Over a 1000 specimens were collected as part of this survey, covering over 700 species. In general invertebrate fauna present is comparable with similar areas in the southern Waitakere Ranges and is dominated by native species, with little presence of adventive species detected. The kahikatea swamp area had an unusual specialised peri-aquatic fauna (Ostracoda, Copepoda and Turbellaria). Areas of forest sampled in Clarks Bush and the Huia Aqueduct had a large component of native and mostly endemic species associated with kauri, puriri and mamangi. A species of peripatus was found in Clarks Bush and the Huia Aqueduct track. Eighteen species of endemic small land snail were found as well as the larger Rytida. It is notable that the invasive Argentine ant was not found.

Ecological Significance

The site is part of the large Significant Ecological Area (SEA) of the Waitakere Ranges and meets all of the five criteria (representativeness; threat status and rarity; diversity; stepping stones, migration pathways and buffers; uniqueness or distinctiveness) for assessing ecological significance in Schedule 3 of the Auckland Unitary Plan (Operative in part). The site itself is representative of regenerating forest types including kauri, present in this part of the foothills. It contains threatened ecosystem types (regenerating kauri forest, broadleaved forest and kahikatea-swamp maire forest) and nationally and regionally threatened species. It contains a diversity of forest types including threatened ecosystem types. The site forms linkages and corridors for wildlife with adjoining regional parkland forest.

[10] P. Maddison. Waima Invertebrate Fauna. A report on survey 2017-2018, May 2018.

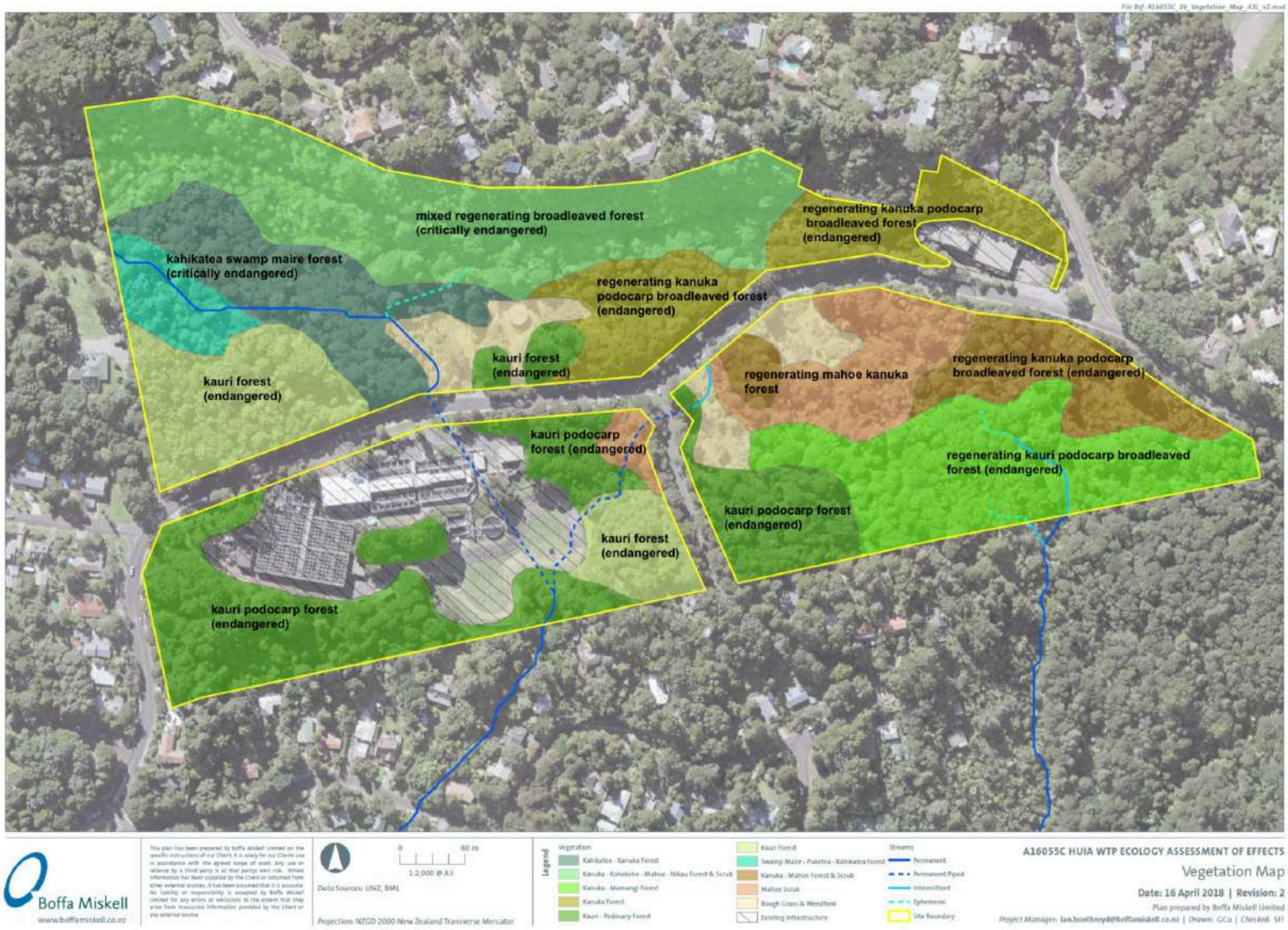

Figure 2. Vegetation types present, with threat status of comparable ecosystem type (map source Boffa Miskell 2018)

Review of Boffa Miskell Survey Report

Review of Survey Methodology

NB: Draft methodologies for the project were reviewed prior to survey work being undertaken on the site. The methods described in the report incorporate earlier recommendations and discussions regarding changes and alterations.

Vegetation survey

A detailed assessment of vegetation pattern and composition has been undertaken, with data collected through 37 recce plots, and 33 transects measuring canopy trees. The recce plot method followed standard methods for monitoring vegetation in NZ.
Robust statistical analysis of vegetation data was undertaken using classification and ordination to analyse recce plot data to identify vegetation patterns and determine vegetation types on the site. Canopy dominance patterns showing dominant tree species across the site were also analysed using the transect data.

A topographic survey was undertaken of the site to determine physical gradients (slope, elevation, aspect etc). More details of the methods would be useful to be presented in the survey report, as well as information on the accuracy of location of transects, plots and survey locations using an iPad.

It is noted that no transects were placed in the eastern end of Yorke Gully, due to the footprint not being located here. Information on parts of the site not surveyed (including this area) will be needed for a full assessment of effects.

Herpetofauna

Standard methods were used comprising a combination of systematic surveying and searching, pitfall traps and artificial retreats were used to survey for lizard fauna. It is recommended that additional searching hours and other survey methods such as tree wraps could have been used to increase the chance of detecting geckos. Forest gecko has been recorded previously at the site, and green gecko are likely to be present.

Bats

Bat detectors were set up in likely habitats, rather than on a grid basis, or in relation to vegetation types. The detectors were placed where a bat 'expert' thought bats were more likely to occur. We assume this method was used to increase the chance of detection.

Birds

A good sample size was used for 5-minute bird counts, with 48 in total. Bird counts however were done over a short time frame - 3 days in total over 3 weeks. The timing of bird counts effects the results. As the counts were done during 'summer' conditions there will be some seasonal effect (birds can be quieter at this time of the year). Acoustic monitoring was undertaken as initially proposed and included targeting key food sources present (flowering and fruiting large trees). This is useful information.

The comparisons with other birds counts in the Waitakere Ranges (Tim Lovegrove's counts) is useful information and a welcome addition.

Freshwater Ecology
Standard Stream Ecological Value (SEV) methodology was used. Fish communities were assessed through electrofishing methods.

Summary recommendations on methodology
Detailed vegetation methodologies have been used and standard methods for fauna survey. Additional sampling for lizards could have been undertaken. Good sample sizes were used for bird surveys, although these were only undertaken in summer period.

Review of Survey Results and Interpretation

Vegetation Communities
The vegetation analysis is detailed. The maps showing dominance and basal area of the key canopy species are useful to identify the pattern of occurrence of the different canopy species. It could have been useful to show the transect location on the same maps.

Cluster analysis of recce plot data was used to identify the main clusters of vegetation types across the site. Ten vegetation types were determined in total from a combination of cluster analysis and transect survey results, as well as field survey identification. Swamp maire - kahikatea - pukatea forest type was identified during field survey in the north western section of the site. Swamp maire forest is rare in the Ranges and on a regional scale. Areas of grassland and weedfield were also mapped.

The vegetation type map has been based on a good level of data and is representative of the vegetation types that are present. It is more detailed and accurate and provides a better description than earlier maps of the site (Tonkin and Taylor 2012).

The vegetation types identified are consistent with and typical of Waitakere forest types.

Regionally threatened species present are listed in the report. It should be noted that kauri forest is reduced significantly from its former extent and is threatened by kauri dieback disease. Swamp maire is also under threat of myrtle rust, as noted in the report.

Birds
The survey results show that tui were the commonest native bird. It is surprising that only two count stations had records of kereru. This is most likely due to their lack of conspicuous especially during December rather than few kereru being present. We agree with the comments about NI kaka being not resident but may use the site occasionally. It would be useful to find out whether residents around the site have observed NI kaka and if so how often.

Song thrush were surprisingly conspicuous. The graphs of bird counts are good, although hard to read. A table showing the mean no. of individuals per station at the site and compared to the Auckland Council counts would be useful.

An estimate of the total number of breeding pairs at the project site would be useful. This could be based on work done on territory size for the more common native birds on the Auckland Region (or upper N Is). If the information is available, it would be good to have density estimates in the absence of pest animal control and with control. This would be useful for an effects assessment.

A comment on the ecosystem services provided by birds would be useful. Birds will be moving from adjoining bush areas, through the site utilising food sources and by doing this assisting with pollination and spread of seeds (including weeds).

Herpetofauna

The lack of detection of geckoes at the site probably reflects the survey methods. This included searching but not lots of hours spent on this, not using tree warps where geckos are more likely to be rather than on the ground. Previous records show that forest gecko is present at the site. Elegant gecko is likely to be present especially in the kanuka vegetation

Bats

The conclusion that bats probably only use the site occasionally based on monitoring is supported. It would be useful however to back this up with a description of the potential quality bat habitat present (e.g. large trees that could support bat roosts).

Freshwater Ecology

Information on stream bank and channel erosion in the Armstrong Gully is useful. From past observations this is definitely an issue for these short catchment, with steep gradient and soft sediment streams. Stormwater runoff roads (and to a lesser extent paved surfaces around houses and roofs) is the major issue causing erosion in-stream.
The Yorke Steam is less impacted by stormwater runoff. A comment on what is influencing the hydrology at the site and in the wider catchment would be useful.

An assessment of potential fish barriers in the catchment should be undertaken. This may explain the reason why fish fauna is depauperate.

Survey Gaps

More analysis on threats would be useful, e.g. pest animal and pest plant status at the site. The site is impacted by weed species, particularly in edge habitat areas. It would useful to understand if any pest control is being undertaken on the site, or monitoring pest indices, and the nature of any pest control. Comments on the current pest pathways from adjoining areas and via activities at the site would be useful.

Ecological Values and Significance

The analysis of ecological integrity across the site is useful for assessing the condition and health of forest across the site. The report acknowledges the ecological values of the whole of the site.

While there is a gradient of ecosystem condition across the site, the forest adjoins and links with areas of forest to the south and the north. These connections should be described and recognised. The vegetation types on site are all part of a continuum. It is a single piece of forest, with mosaic of successional stages and canopy patterns that are connected.

Recommendations

The assessment of ecological values needs to consider the value of the site in the context of the Waitakere Ranges, as well as within the local area, including its importance as part of a network of habitat, ecological corridors and linkages.

- The ecological significance of the whole site should be given more prominence in the report;

- The ecological context of the site within the Ranges and local networks (adjoining regional parkland) needs to be better described and addressed;
- The importance of threatened vegetation types present – e.g. kauri forest, swamp maire forest needs to be emphasised. As well as the importance of regenerating kauri podocarp broadleaved forest types dominated by kanuka.
- Survey methods for fauna have used standard methodologies and data for birds especially is detailed. However, fauna data has been collected over a short time period and only in summer. Species such as forest gecko and green gecko are likely to be present.
- Information on current threats to the site should be covered, e.g. level of pest animal presence and pest plants.
- A comparison with adjacent areas of forest would be useful to understand more fully the ecological values and context of the site.
- The threat of kauri dieback disease within the site and with adjacent areas will need to be addressed going forward.

It is noted that in response to this review the following approach was discussed in a joint memorandum with Boffa Miskell:

- Descriptions of the ecological context of the site contained in this review will be incorporated into the final report by Boffa Miskell;
- Threatened flora and fauna records for the site will be mapped;
- Kauri dieback survey and assessment will be completed for the site;
- Further fauna survey and management requirements will be addressed as part of the AEE;
- Counts of mature trees within the footprint will be recorded and mapped.

Conclusions

- The site is part of the nationally significant Waitakere Ranges, which is identified as a Significant Ecological Area (SEA) in the Auckland Unitary Plan Operative in part (AUP-OiP).

- Within the local context, the site is connected to and forms a linkage with regional parkland to the south and west and is part of an extensive network of lowland forest in the Titirangi Waima area.

- The site contains endangered and critically endangered ecosystem types, including kauri forest, swamp maire – kahikatea - pukatea forest (rare in the ranges and regionally), regenerating podocarp-broadleaved forest, and the escarpment of broadleaved forest.

- The value of remaining regenerating kauri forest is heightened due to its threat on a national and global scale.

- The site is a high quality habitat for native fauna (birds, lizards).

- Threatened fauna such as long-tailed bats and North Island kaka are likely to visit the site occasionally.

- The site contains habitat for nationally threatened plant species, including kauri, swamp maire, climbing rata, kanuka and manuka.

- The invertebrate fauna present includes a large component of native species (mostly endemic) associated with kauri, puriri and mamangi in Clarks Bush, and an unusual and specialised fauna associated with the kahikatea swamp forest.

- The vegetation across the site is part of a relatively continuous area of forest that connects with regional parkland and is part of an important habitat in the catchment.

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Appendices

Appendix 1. Ecological Context of site

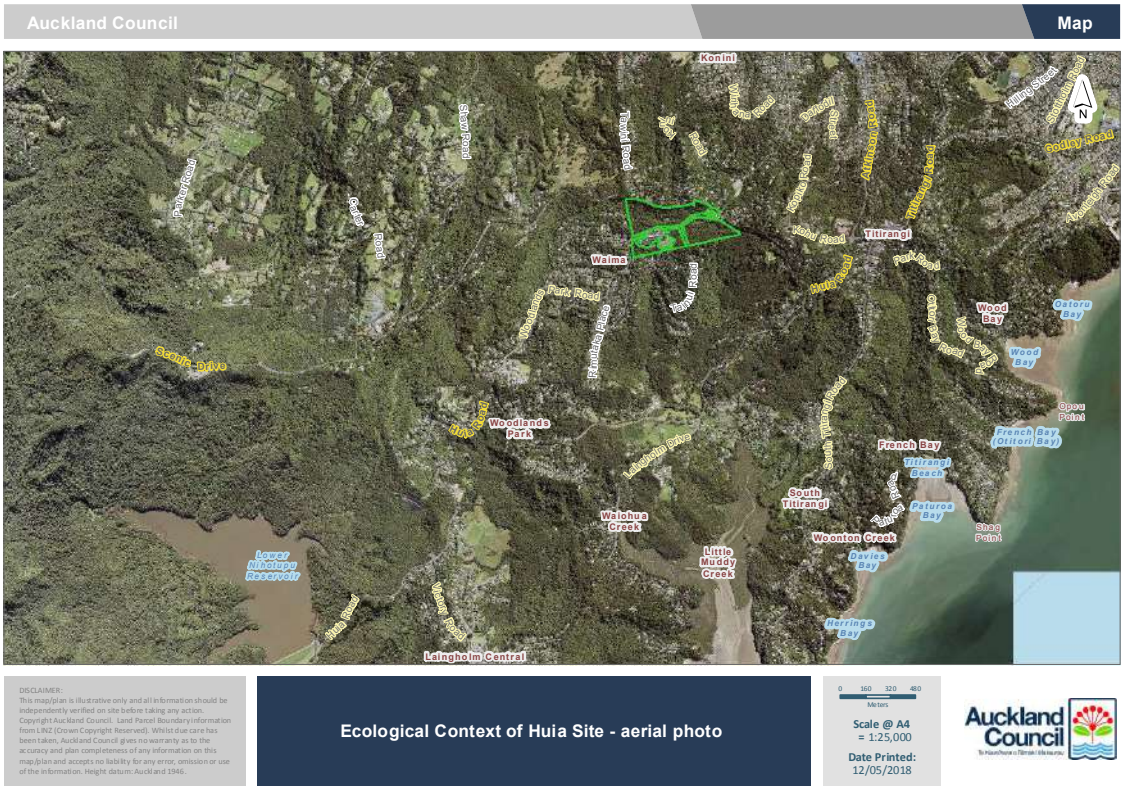

Fig 1. Ecological context of the site in the forested foothills of the Waitakere Ranges

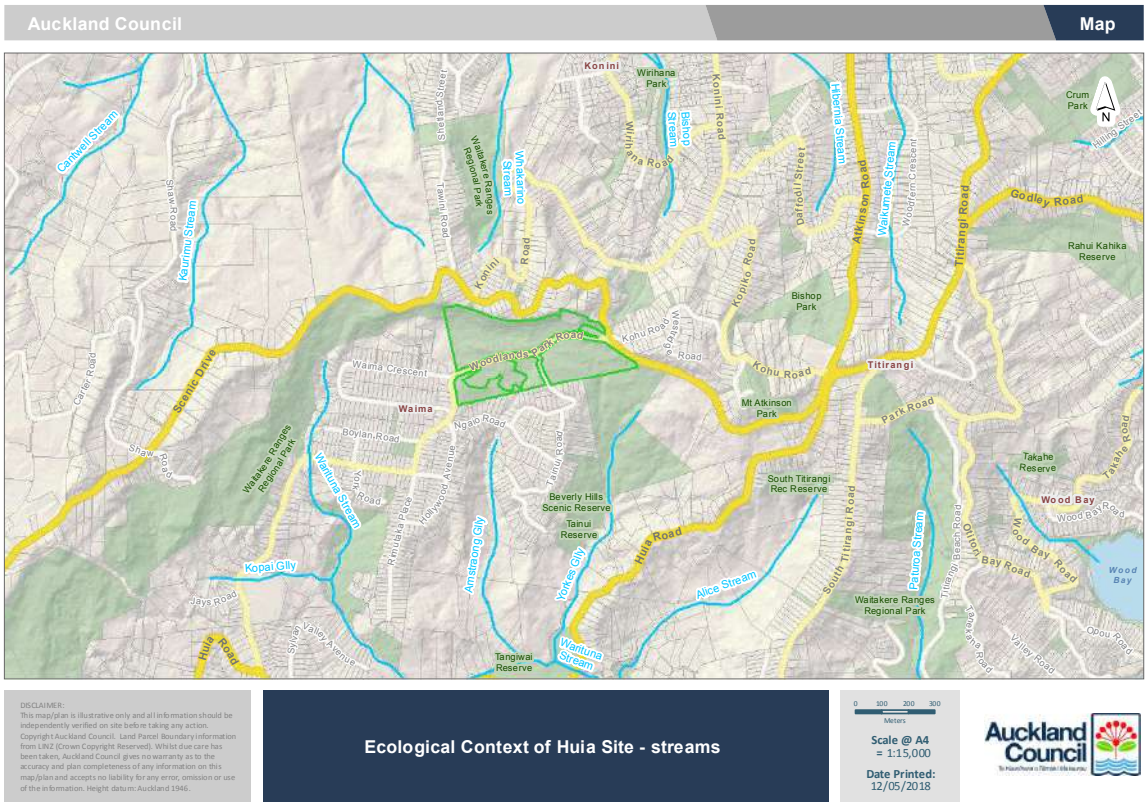

Fig 2. Ecological context of the site in relation to adjoining regional parkland

Appendix 2. Site Photos

Broadleaved Forest

Regenerating kauri podocarp forest

Escarpment forest

Kauri greenhood orchid

Appendix 3. Native vascular plant species list for Huia Water Treatment Site (from recce plot and transect data, source Boffa Miskell)

Gymnosperms (7)
Agathis australis
Dacrydium cupressinum
Dacrydium dacrydioides
Phyllocladus trichomanoides
Podocarpus totara
Prumnopitys ferruginea
Prumnopitys taxifolia

Monocotyledon trees and shrubs (3)
Cordyline australis
Cordyline banksii
Rhopalostylis sapida

Dicotyledon trees and shrubs (36)
Alectryon excelsus
Alseuosmia macrophylla
Aristotelia serrata
Beilschmiedia tawa
Brachyglottis repanda
Carpodetus serratus
Coprosma arborea
Coprosma grandifolia
Coprosma robusta
Coprosma rhamnoides
Corynocarpus laevigatus
Dysoxylum spectabile
Fuchsia excorticata
Geniostoma ligustrifolium
Hedycarya arborea
Hoheria populnea
Knightia excelsa
Kunzea robusta
Laurelia novae-zelandiae
Leucopogon fasciculatum
Melicytus ramiflorus
Metrosideros excelsa
Myrsine australis
Myrsine salicina
Nestegis lanceolata
Olearia rani
Piper excelsum
Pittosporum tenuifolium
Pomaderris kumeraho

Pseudopanax arboreus
Pseudopanax crassifolius
Pseudopanax lessonii
Schefflera digitata
Sophora chathamica
Syzygium maire
Vitex lucens

Ferns and fern allies (19)
Adiantum aethiopicum
Asplenium bulbiferum
Asplenium flaccidum
Asplenium oblongifolium
Asplenium polyodon
Blechnum novaezelandiae
Blechnum filiformis
Blechnum fraseri
Cyathea dealbata
Cyathea medullaris
Dicksonia squarrosa
Grammitis billardieri
Lastreopsis hispida
Lygodium sp
Microsorum pustulatum
Microsorum scandens
Pneumatopteris pennigera
Pyrrosia eleagnifolia
Tmesipteris tannensis

Lianes, epiphytes (8)
Astelia solandri
Calystegia sepium
Clematis paniculata
Freycinetia baueriana
Metrosideros diffusa
Metrosideros perforata
Parsonsia heterophylla
Ripoganum scandens

Herbs (4)
Dianella nigrum
Elatostema rugosum
Nertera ciliata
Nertera scapanioides

Orchids (2)
Corybas sp.

Pterostylis agathicola

Grasses, rushes, sedges (5)
Carex dissita
Gahnia pauciflora
Oplismenus imbecillis
Uncinia uncinata
Uncinia zotovii

Total: 84 species