

Natural environment assessment paper

Warkworth Structure Plan

June 2019



Prepared by:

Adam Morris (Natural Environment Strategy) and Jacinda Woolly (Biodiversity)

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1 Executive Summary

Auckland's natural environment is our primary infrastructure. The ability for it to function well and be of high quality is important in supporting biodiversity, improving water quality, reducing air pollution and protecting against severe weather and flooding. Structure Planning provides an opportunity to protect and enhance natural environmental values through restoring ecological connectivity and function which is a key direction in the *Auckland Plan 2050: Environment and Cultural Heritage Outcome*.

This report provides an assessment of how the Warkworth Structure Plan (the Plan) and proposed zoning have incorporated environmental principles, policy and strategic outcomes. The details of those principles and outcomes are reported in the *Warkworth Structure Plan – Environment Topic Report (June 2018)* which was prepared to inform the development of the Plan.

The key desired outcomes of the Plan include the creation of continuous 'green corridors' across the plan area in the form of esplanade reserves, protection areas, and riparian planting along all tributaries of the Mahurangi River, as well as appropriate restoration along these corridors to improve the health and quality of the river, which forms the heart of Warkworth Township. These restoration actions will also assist in creating ecological corridors that connect small, fragmented patches of native vegetation within the Plan area. At the larger spatial scale, restoring these corridors provides a key linkage between the Dome Valley Forest in the north, to the Mahurangi River, and out into the Mahurangi Harbour and pest-free islands of the Hauraki Gulf.

The benefits of healthy rivers and streams and green infrastructure in urban environments include increased resilience to climate change impacts, reduced impacts of stormwater runoff from urban areas (e.g., sediment and contaminants) on streams, and increased quality of the living environment. Proposed cycling and walking networks along these proposed green corridors will help to get people out of cars reducing carbon emissions, which in turn will assist with achieving environmental outcomes (see also *Warkworth Structure Plan Sustainability Topic Report*).

Overall, the Plan uses the proposed growth and development in Warkworth as an opportunity to protect and enhance the natural environment in line with the *Auckland Plan 2050*. Anticipated environmental and sustainability outcomes will contribute to the implementation of national and regional environmental policies and strategies such as: *the National Policy Statement for Freshwater Management 2014*; *the New Zealand Coastal Policy Statement 2010*; *Auckland's Indigenous Biodiversity Strategy* and *Auckland's Urban Ngahere (Forest) Strategy 2017*. They also align with the *Auckland Growing Greener 2016* principles related to urban transformation and restoring nature and healthy waterways.

2 Purpose and scope of the report

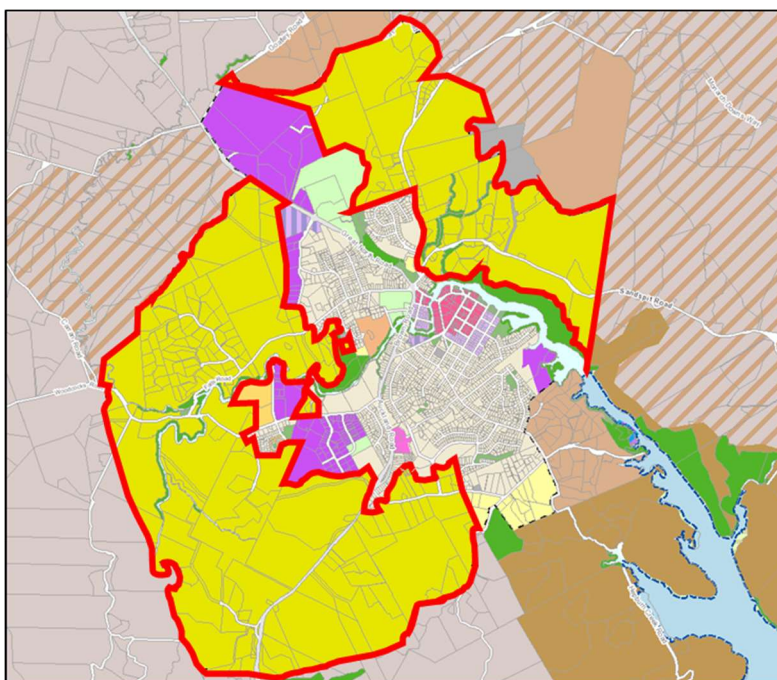
This report provides an assessment of how the Warkworth Structure Plan (the Plan) and proposed zoning have incorporated environmental principles, policy and strategic outcomes. It is one of several assessment reports which cover various other topics.

Environmental principles and outcomes for the Warkworth Structure Plan area were set out and detailed in the *Warkworth Structure Plan – Environment Topic Report (June 2018) (Environmental Topic Report)*¹ and are not repeated in this report. Details included current and historic environmental and ecological values, outcomes sought, and information gaps and detail on planning context.

There are also opportunities for shared outcomes with other topic areas. Although these are outside the scope of this report, they include urban design principles (e.g., inclusion of green infrastructure in proposed development) and sustainability principles (e.g., compact urban form and climate change resilience).

The Plan area includes 1,000 hectares of land within the Future Urban Zone around the existing Warkworth town centre extending to Clayden Road in the north and to Thompson Road and Avicé Miller Scenic Reserve in the south (Figure 1). The area immediately outside of the study area is zoned under the *Auckland Unitary Plan Operative in Part (AUP-OP)* as Rural – Countryside Living; Mixed Rural; and Rural Production Zone.

Figure 1: Warkworth structure plan study area (outlined in red)



¹ <https://www.aucklandcouncil.govt.nz/have-your-say/topics-you-can-have-your-say-on/warkworth-structure-plan/Pages/consultation-documents.aspx#panelLinks>

3 Warkworth Structure Plan

3.1 Overview of the Warkworth Structure Plan

The Warkworth Structure Plan sets out the pattern of land uses and the supporting infrastructure networks for the Future Urban zoned land around Warkworth. In preparing the Warkworth Structure Plan, the following were considered:

- the context of the existing town in Warkworth
- the opportunities and constraints of the structure plan area as identified in 16 technical papers²
- the feedback received from various stakeholders and public engagement events³.

The draft structure plan is shown in **Figure 2**.

Some of the key high-level features of the draft Warkworth Structure Plan include:

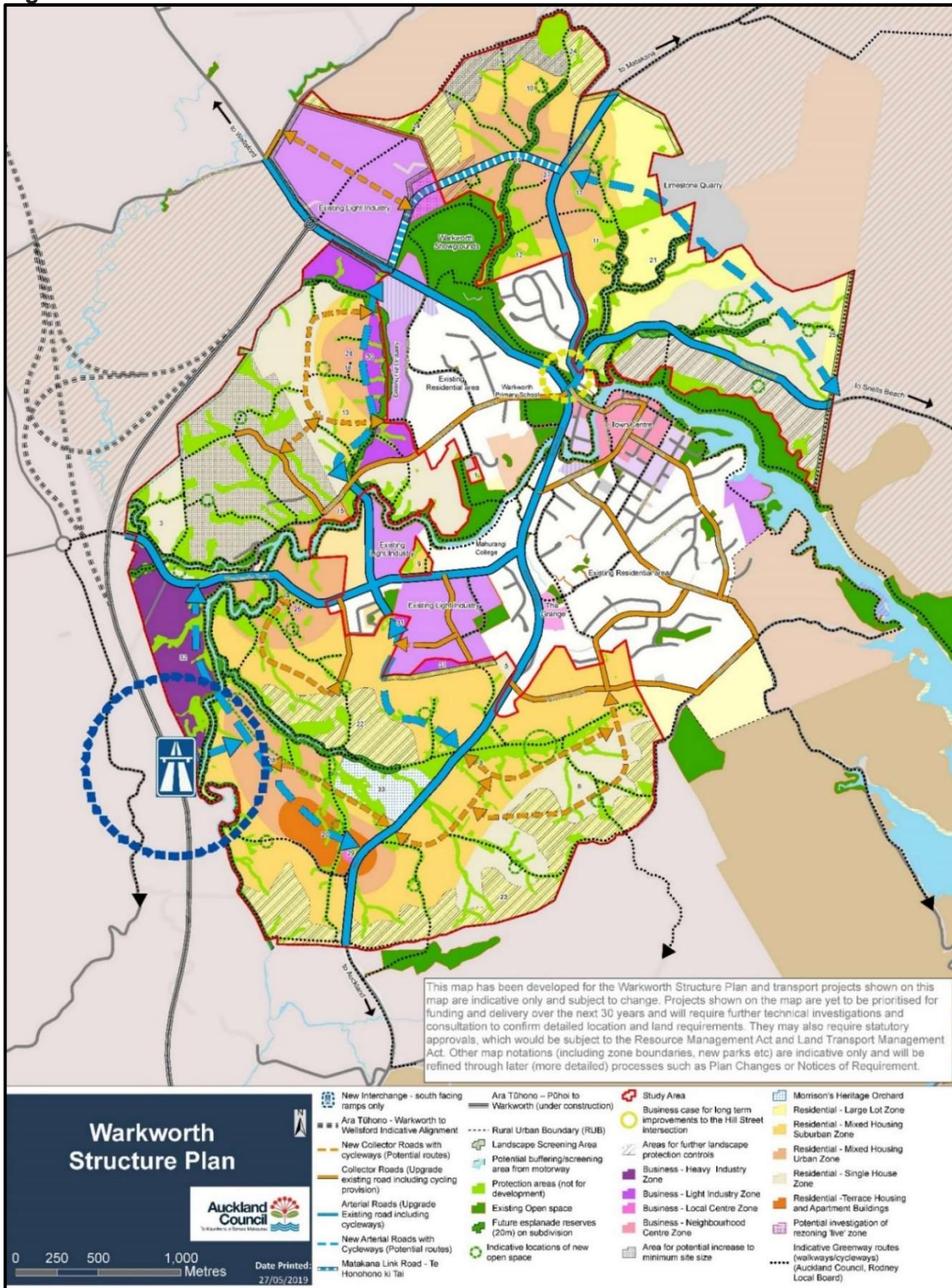
- Ecological and stormwater areas are set aside from any built urban development.
- The new residential areas across the Future Urban zone enable around 7,500 dwellings and offer a range of living types from spacious sections around the fringe to more intensive dwellings such as town houses and apartments around the new small centres and along public transport routes
- Warkworth's local and rural character is protected through various measures including provisions to protect the bush-clad town centre backdrop by the Mahurangi River and retaining the Morrisons orchard as a rural feature of the town.
- New employment areas are identified, comprising land for new industry (e.g. warehousing, manufacturing, wholesalers, repair services) and land for small centres (e.g. convenience retail, local offices, restaurants/café). The existing Warkworth town centre by the Mahurangi River will remain as the focal point of the town.
- The land uses are supported by infrastructure including:
 - A separated walking and cycling network providing connectivity to new and existing centres, employment areas, schools and public transport stations.
 - An arterial road network connected to a southern interchange on Ara Tūhono - Pūhoi to Warkworth, along with a possible collector road network.
 - A public transport network built upon the recently introduced 'New Network for Warkworth'. In the long term the network has a bus interchange in Warkworth's southern local centre and a Park and Ride near the southern interchange.
 - Other infrastructure such as utilities, parks, schools, and community facilities have plans underway to service the planned growth of Warkworth.

Further details on the draft Warkworth Structure Plan can be found in the draft structure plan document on the project website.

² 16 topic papers that were prepared in February 2018 as part of initial consultation of the draft structure plan

³ This includes feedback from mana whenua, business, resident and community groups, engagement survey findings and community workshops held to generate land use ideas for the Warkworth area.

Figure 2: Warkworth Structure Plan



3.2 Assessment summary

Through recognition of the Mahurangi river as the “*Mahurangi River is Warkworth’s taonga*”⁴ the Plan has the potential to contribute to environmental benefits on a larger scale than the Future Urban zoned area, and therefore across a larger area of the Auckland region. Key to achieving this will be the creation of continuous ‘green corridors’ across the Plan area in the form of esplanade reserves, protection areas and riparian planting along all tributaries of the Mahurangi River. If realised, these corridors will provide linkages between the Dome Valley Forest in the north through to the Mahurangi River and out into the Mahurangi Harbour and pest-free islands of the Hauraki Gulf in the east (see also *Environment Topic Report*).

To achieve this large-scale outcome, the Plan utilises proposed zoning to protect existing natural values whilst identifying ecological restoration opportunities. This approach aligns with outcomes sought through the *Auckland Plan 2050* to use growth as an opportunity to protect and enhance the natural environment.

Through the AUP-OP much of the remaining terrestrial native vegetation has been identified as Significant Ecological Areas (SEAs)⁵. As discussed in the Environment Topic Paper, these areas are generally small and their ecological value and long-term viability compromised through historic and ongoing human activities. The function they have, however, is important in providing ‘stepping stones’ of habitat for the movement of wildlife across a landscape where habitats and biodiversity have become fragmented and less resilient to change.

In addition to SEAs, there are many small statutory covenanted areas that are a mixture of remnant and regenerating forest areas, as well as wetland, riparian vegetation and revegetation planting areas. These areas are protected by way of covenant in perpetuity.

SEAs and covenants have been incorporated into Protection Areas as part of the Plan. The Protection Areas are made up of a variety of overlays including floodplains, streams (with a 10 metre riparian buffer), Significant Ecological Areas, and covenanted bush. The Plan intends that these areas are not developed. This will provide some protection to the important existing natural and ecological values which those areas hold. To protect those values over the long-term, ecological corridors need to be established to connect those areas together, as well as to a range of other terrestrial, aquatic and / or marine habitats. Ecological corridors help improve the quality and resilience of habitats by facilitating movement of wildlife and providing opportunities to increase vegetation cover and biological diversity (especially native species). Creating these corridors will require revegetation of the intervening gaps between existing areas of native vegetation.

It is important from an environmental perspective that these Protection Areas in the Plan are given suitable protection through some form of statutory method (i.e. covenants, District Plan rules). If these areas are only followed through with weak provisions, then this would not lead to the environmental outcomes sought.

⁴ Warkworth Structure Plan, planning principle: The Mahurangi river is Warkworth’s taonga

⁵ AUP-OP Chapter D9 Objectives and Policies and rules relating to Chapters E3, E11, E15 and E26

While there are advantages to the Protection Areas being publicly owned in the future, this is not necessary to achieve most of the environmental outcomes sought. The Protection Areas can remain on privately owned land into the future, as long as there are provisions in place to adequately protect them.

The Protection Areas should also be proactively restored (e.g. planting up floodplain areas and riparian margins with appropriate native species) if the environmental outcomes sought are to be achieved.

The Plan proposes to achieve ecological connections through utilising the existing extensive network of streams and tributaries across the Plan area, identifying the main Mahurangi River tributaries and all permanent and intermittent streams as protection areas and / or future esplanade reserves with 20 metre buffers. Known wetlands and modelled floodplains have also been included within these Protection Areas.

Along with appropriate restoration, e.g. riparian planting, if given appropriate statutory protection these Protection Areas will afford protection of existing freshwater ecological values as well as improve the long-term life supporting capacity of the freshwater systems in the area of which sections are currently degraded and lacking suitable riparian cover. Restoration also supports the delivery of objectives for the *National Policy Statement for Freshwater Management (NPS-FM) 2014*. The active restoration of the Protection Areas could be achieved through mitigation for urban development or through regulation and/or incentives.

An approach of connecting varying habitat types across the Plan area is in-line with the visions and objectives sought in *Auckland Council's Indigenous Biodiversity Strategy (2012)*, *Auckland's Urban Ngahere (Forest) Strategy (2017)*, and the *New Zealand Biodiversity Strategy (2000-2020)*.

The Protection Areas if suitably restored will reconnect riparian vegetation along the main Mahurangi River corridor with SEA remnants to the west and south of the plan area as well as a connection between Dome Valley in the north down through to the Mahurangi River and out into the Mahurangi Harbour. These connections are important for the ecological value of the marine environment which is impacted by what happens on the land. This aligns with the *New Zealand Coastal Policy Statement (2010)* and *The Auckland Plan 2050*⁶.

Currently, the marine environment of the Mahurangi Harbour is being adversely affected by sedimentation which is impacting the harbour's environmental and broader social and cultural values. To prevent further degradation of those values, it is important that potential erosion and sedimentation effects from development are identified and avoided as far as possible, minimised or mitigated. One way the Plan is proposing to minimise erosion and sediment potential from earthworks is through the allocation of much of the industry land to existing flatter areas. Industry developments usually involve large footprints and would otherwise necessitate significant earthworks to achieve this. Whilst the Plan provides spatial planning tools through zoning, precincts and designations, there are also non-spatial tools which can be utilised during the Plan Change to manage erosion and sediment. The *AUP-OP* for example includes objectives and best

⁶ Auckland Plan 2050: Environment and Cultural Heritage - Supporting information "Ridge to Reef: Auckland's marine environments and their relationship to the land"

practices for earthwork operations such as *Guidance for Erosion and Sediment Control (GD05)*, which together with sustainable design principles can be used to better protect waterways. There is also an opportunity to consider using models to assess levels of erosion and sediment generation to minimise environmental impacts (see *Warkworth Structure Plan Sustainability Topic Report*).

Other non-spatial opportunities could also be explored during the Plan Change process by looking, for example, at how roads, streets and pathways can be utilised to increase canopy and vegetation cover across the Plan area (see the *Urban Ngahere (Forest) Strategy*).

Continuous ‘green corridors’ provide an opportunity to support the delivery of broader outcomes. For example, aligning corridors with active travel infrastructure such as walkways and cycle ways, creates an opportunity to support health and wellbeing outcomes through promoting healthy lifestyles and connecting people with the natural environment and reducing the negative impacts on air quality (see *Warkworth Structure Plan Sustainability Topic Report*). It is important that any such alignment does not compromise ecological values which can be avoided by having wider riparian margins and/or locating the pathways to the outer edges of those margins. For example, the Rodney Local Board Greenway Network Plan explores options for integrating ‘green corridors’ with active travel routes between Pūhoi and Pakiri⁷

The identification of Protection Areas around streams and avoidance of development in floodplains and known wetland areas will help in maintaining their natural form and function and will afford some resilience to climate change. Intact or restored habitats are better able to withstand high-intensity rain events that are projected to increase in the Auckland Region and also act as a buffer to developed areas. This also aligns with the approach of the *Auckland’s Climate Action Plan (ACAP)* in preparing for the impacts of climate change⁸.

A detailed analysis against environmental principles, and policy and strategic outcomes is provided in Appendices A, B and C of this report.

4 Conclusion

This assessment concludes that the Warkworth Structure Plan land use map aligns with environmental principles, policy, and strategic outcomes documented in the *Environment Topic Report*. The overall approach of the Plan also aligns with outcomes sought through the *Auckland Plan 2050* to use growth as an opportunity to protect and enhance the natural environment.

The alignment of the Plan with environmental principles and outcomes is largely due to structuring the Plan around the fundamental planning principle that “the *Mahurangi River is Warkworth’s taonga*”. In realising this, the Plan proposes to create a continuous ‘green corridor’ across the Plan area that connects terrestrial and freshwater habitats with the Mahurangi River and Mahurangi Harbour.

⁷ <https://www.aucklandcouncil.govt.nz/about-auckland-council/how-auckland-council-works/local-boards/all-local-boards/rodney-local-board/docspuhoigreenways/puhoi-pakiri-greenways-part-one.pdf>

⁸ Low Carbon Auckland (2014) is currently under review with a climate change action plan (ACAP), adding both emissions reductions and preparing for climate change.

The corridors will improve coverage of vegetation across the Plan area and provide habitat for wildlife. This is important for improving the quality of existing terrestrial, freshwater and marine habitats and supporting their long-term resilience to change.

The benefits of healthy rivers and streams and green infrastructure in urban environments include increased resilience to climate change impacts, reduced impacts of stormwater runoff from urban areas (e.g., sediment and contaminants) on streams, and increased quality of the living environment. Proposed cycling and walking networks along these proposed green corridors will help to get people out of cars reducing carbon emissions, which in turn will assist with achieving environmental outcomes.

Recommendations:

- Ensure that through the Plan Change phase of the process there is suitable statutory protection for the Protection Areas and either regulation or incentives to actively rehabilitate these areas.
- Opportunities should be explored at the Plan Change phase of the process for non-spatial options to manage erosion and sediment. For example, modelling to assess levels of erosion and sediment generation would assist in balancing cut and fill volumes to minimise environmental impacts.
- Opportunities should be explored at the Plan Change phase for synergies between outcomes across various topic areas. For example, can roads, streets and pathways be used to increase canopy and vegetation cover to improve environmental and health and wellbeing outcomes.
- At the Plan Change phase an assessment of notable trees should be undertaken throughout the structure plan area, including on private land, as there may be a number of trees that warrant protection based on historic, cultural, aesthetic or amenity reasons. These trees unlikely to be captured by the current SEA overlay which assessed the ecological value of areas of vegetation rather than the values of individual trees. Without this assessment these trees may not otherwise be afforded any protection when development proceeds.
- The Warkworth Stream Classification and Esplanade Assessment, prepared by Morphem Environmental Ltd, April 2018, has provided much more information than was previously available regarding the extent of permanent and intermittent streams in this area. Further mapping of wetlands may be required for the areas not included in this assessment. This is recommended for the Plan Change phase.

Appendices

Appendix A: Alignment of planning principles with ecological principles

Appendix B: Assessment of the structure plan against regional policy and strategic outcomes

Appendix C: Assessment of the structure plan against national policy and strategic outcomes

Appendix A: Alignment of planning principles with ecological constraints and principles

A-1: Assessment of the Warkworth Structure Plan against environment planning principles

Table A1 lists seven Planning Principles (the Principles) for the Warkworth Structure Plan (the Plan) and identifies which aspects of those Principles are relevant to this environment report and how they align with the ecological constraints and principles outlined in the *Warkworth Structure Plan – Environment Topic Report (June 2018) (Environment Topic Report)*. Table A2 provides an assessment of how the Plan and proposed zoning have incorporated environmental constraints and principles. Note that only those aspects of the Principles relevant to this report are assessed.

Table A1: Alignment of the Planning Principles with environmental constraints and principles outlined in the Environment Topic Report.

Planning principles	Principles relevant to this topic paper	Alignment with ecological constraints and principles ⁹
<p>1. The Mahurangi River is Warkworth’s taonga</p> <ul style="list-style-type: none"> Protect the Mahurangi River from the effects of urbanisation as a matter of paramount importance in the development of the Future Urban zone Use the development of the Future Urban zone to improve the health and quality of the Mahurangi River wherever possible Treat all the tributaries in the Future Urban zone as being vital to the health of the Mahurangi River 	<ul style="list-style-type: none"> Protect the Mahurangi River from the effects of urbanisation as a matter of paramount importance in the development of the Future Urban zone Use the development of the Future Urban zone to improve the health and quality of the Mahurangi River wherever possible Treat all the tributaries in the Future Urban zone as being vital to the health of the Mahurangi River 	<p>Constraints:</p> <ul style="list-style-type: none"> Proximity to developable area in relation to watercourses Avoidance of native vegetation loss, especially Significant Ecological Areas (SEAs) and existing riparian vegetation <p>Opportunities:</p> <ul style="list-style-type: none"> Retaining and enhancing remaining native vegetation to improve wildlife habitat Aligning reserves and recreational connections with existing natural watercourse corridors to provide user integration with nature and wider buffering for wildlife movement
<p>2. Character and identity</p>	<ul style="list-style-type: none"> Use the Future Urban zone efficiently to protect against the need for further urban 	<p>Opportunities:</p> <ul style="list-style-type: none"> Retaining and enhancing remaining native vegetation to improve wildlife habitat

⁹ *Warkworth Structure Plan – Environment Topic Report (June 2018)*

Planning principles	Principles relevant to this topic paper	Alignment with ecological constraints and principles ⁹
<ul style="list-style-type: none"> • Celebrate and protect Warkworth’s heritage, both Maori and European, and its relationship with mana whenua • Retain the current town centre as the focal point and ‘beating heart’ of Warkworth • Protect the views from the current town centre to the bush clad northern escarpment of the Mahurangi River and the rural views out from the Future Urban zone that contribute to Warkworth’s rural character • Apply lower density residential zones to areas valued for their landscape, character, or heritage significance • Use the Future Urban zone efficiently to protect against the need for further urban expansion into Warkworth’s valued rural hinterland 	<p>expansion into Warkworth’s valued rural hinterland</p>	
<p>3. A place to live and work</p> <ul style="list-style-type: none"> • Provide a range of housing options in Warkworth so that it is a place for people to live at all stages of life • Provide new local employment areas (e.g. small centres, industrial areas) so people can work locally in Warkworth 	<p>N/A</p>	<p>N/A</p>
<p>4. Sustainability and natural heritage</p>	<ul style="list-style-type: none"> • Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing 	<p>Constraints:</p> <ul style="list-style-type: none"> • Proximity and scale of development in relation to floodplains

Planning principles	Principles relevant to this topic paper	Alignment with ecological constraints and principles ⁹
<ul style="list-style-type: none"> Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies Design the Future Urban zone to be able to adapt to the effects of climate change Protect and enhance existing bush/natural areas and create ecological corridors linking the Future Urban zone to other ecological areas 	<ul style="list-style-type: none"> local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies Design the Future Urban zone to be able to adapt to the effects of climate change Protect and enhance existing bush/natural areas and create ecological corridors linking the Future Urban zone to other ecological areas 	<ul style="list-style-type: none"> Retaining and enhancing remaining native vegetation to improve wildlife habitat <p>Opportunities:</p> <ul style="list-style-type: none"> Retaining natural topography as far as possible to ensure watercourses can maintain natural form and function
<p>5. A well-connected town</p> <ul style="list-style-type: none"> Use the development of Warkworth’s growth areas to help address Warkworth’s existing road congestion through integrated land use and transport planning and new infrastructure Provide convenient, segregated, and safe walking and cycling routes through the Future Urban zone connecting residential areas with key locations (e.g. schools, parks, centres), and the existing town, and to regional walking/cycling routes 	<ul style="list-style-type: none"> Provide convenient, segregated, and safe walking and cycling routes through the Future Urban zone connecting residential areas with key locations (e.g. schools, parks, centres), and the existing town, and to regional walking/cycling routes 	<p>Opportunities:</p> <ul style="list-style-type: none"> Aligning reserves and recreational connections with existing natural watercourse corridors to provide user integration with nature and wider buffering for wildlife movement

Planning principles	Principles relevant to this topic paper	Alignment with ecological constraints and principles ⁹
<ul style="list-style-type: none"> Provide convenient, high quality public transport routes through the Future Urban zone (connecting to the rest of Warkworth, the surrounding rural settlements, and Auckland) 		
<p>6. Quality built urban environment</p> <ul style="list-style-type: none"> Design the Future Urban zone to enable high-quality and integrated urban development that reinforces the town's identity Locate higher density residential areas around appropriate amenities Provide well located and accessible areas of open space linked by a green network of walking and cycling trails along the streams 	<ul style="list-style-type: none"> Provide well located and accessible areas of open space linked by a green network of walking and cycling trails along the streams 	<p>Opportunities:</p> <ul style="list-style-type: none"> Aligning reserves and recreational connections with existing natural watercourse corridors to provide user integration with nature and wider buffering for wildlife movement
<p>7. Infrastructure</p> <ul style="list-style-type: none"> Plan for infrastructure (transport, water, etc) to be sequenced to enable new houses and businesses are built in the Future Urban zone Provide for social and cultural infrastructure (i.e. libraries, halls, schools, community meeting places) to support the needs of the community as it grows 	None	N/A

Table A2: An assessment how the Plan and proposed zoning have incorporated environmental constraints and principles. Note that only those aspects of the Planning Principles relevant to this report are assessed.

Principles	Assessment Summary
<p>1. The Mahurangi River is Warkworth's taonga</p>	<p><i>Protect the Mahurangi River from the effects of urbanisation as a matter of paramount importance in the development of the Future Urban Zone</i></p> <ul style="list-style-type: none"> • Much of the current native vegetation within the structure plan area is encompassed within SEAs which are identified as Protection Areas within the study area, those also include existing covenants and the main Mahurangi river tributaries with an associated buffer applied. It is important that this identification leads to statutory protection. They provide opportunity for restoration planting to connect and enhance remaining native vegetation in the area. <p><i>Use development of the Future Urban zone to improve health and quality of the Mahurangi River wherever possible</i></p> <ul style="list-style-type: none"> • The identification of 'Future Esplanade reserves' and connecting them to 'Protection Areas' and the main Mahurangi river provides a key opportunity to reconnect the main river corridor with SEA remnants to the west and south of the plan area and improve habitat connectivity and quality. • The Protection Areas shown on the plan along the floodplains, permanent and intermittent streams, and the mapped Future Esplanade Reserves show clearly where development needs to be avoided and where there are opportunities for enhancement. Appropriate ecological restoration of these areas would result in improved water quality. <p><i>Treat all tributaries in the Future Urban zone as being vital to the health of the Mahurangi River.</i></p> <ul style="list-style-type: none"> • The main Mahurangi river tributaries (and all permanent and intermittent streams) have been identified as Protection Areas and / or Future Esplanade (20m buffer).
<p>2. Character and identify</p>	<p><i>Use the Future Urban zone efficiently to protect against the need for further urban expansion into Warkworth's valued rural hinterland</i></p> <ul style="list-style-type: none"> • The north-eastern and southern edges of the structure plan area have been identified as Residential – Large Lot zone and the east and north-west fringe as Residential – Single Lot Zone providing a grading effect from the rural fringes through to the higher density residential zoned land. • There is a proposed compact urban form proposed around the three small urban centres, with a grading out of residential zoning around these. • There may be some limited potential for expansion beyond the future urban zone however the extent of this is largely physically constrained by natural features in the wider area. • The Large Lot zoning on the north-eastern and southern edges of the plan provides opportunities for more vegetation on sites and could enable further ecological linkages and help retain the

Principles	Assessment Summary
	<p>rural and bush character of Warkworth, creating a grading effect into the larger SEA forest areas beyond.</p>
<p>4. Sustainability and natural heritage</p>	<p><i>Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies:</i></p> <ul style="list-style-type: none"> • Small urban centres are proposed which will be of compact urban form with intensity of urban development grading outwards. This will provide positive environmental outcomes through acting as a ‘buffer’ between those urban areas and the rural urban boundary (RUB). <p><i>Design the Future Urban zone to be able to adapt to the effects of climate change:</i></p> <ul style="list-style-type: none"> • Under climate change predictions there is an anticipated greater risk from flooding¹⁰. The urban centres are not located in floodplain areas and should be designed to not impact on the natural topography of floodplains, therefore providing some resilience to those urban areas. • Within the structure plan area floodplains are associated with watercourses and so generally fall within Protection Areas or Future Esplanade, which have a 20m buffer area to protect those areas. Residential use zones are identified outside of modelled floodplain areas. • In addition to floodplains, the natural form and function of watercourses are protected in-part where Future Esplanade areas and Protection Areas have been identified around some of the main stream tributaries of the Mahurangi and the Mahurangi itself with regards to Protection Areas. This will also be important in terms of supporting long-term resilience to climate change. <p><i>Protect and enhance existing bush/natural areas and create ecological corridors linking the Future Urban zone to other ecological areas</i></p> <ul style="list-style-type: none"> • Much of the current native vegetation within the structure plan area is encompassed within SEAs which are identified as Protection Areas within the study area. Those also include existing covenants and the main Mahurangi river tributaries. This identification must eventually afford statutory protection. The Protection Areas also provide opportunity for planting to improve the quality of the habitats along within those areas and to create connections between patches of existing riparian vegetation utilising the watercourse network.

¹⁰ <http://www.knowledgeauckland.org.nz/publication/?mid=1747>

Principles	Assessment Summary
	<ul style="list-style-type: none"> • Creating connections between existing areas of native vegetation in this area is generally along watercourses and shown as Protection Areas or future esplanade reserve. The restoration and enhancement of the areas is supported by B7.3.2(6) of the AUP-OP.
<p>5. A well-connected town</p>	<p><i>Provide convenient, segregated, and safe walking and cycling routes through the Future Urban zone connecting residential areas with key locations (e.g. schools, parks, centres), and the existing town, and to regional walking/cycling routes:</i></p> <ul style="list-style-type: none"> • The proposed connection of Future Esplanade reserves to Protection Areas and the main Mahurangi River provides a continuous ‘green corridor’ between the Neighbourhood Centre Zones and proposed large parks. There is, an opportunity to integrate active travel routes with these corridors. This would also provide an opportunity for community interaction with the natural environment.
<p>6. Quality built environment</p>	<p><i>Provide well located and accessible areas of open space linked by a green network of walking and cycling trails along the streams:</i></p> <ul style="list-style-type: none"> • New possible Neighbourhood and larger reserves have been indicated on the draft plan but are to be refined. Anticipated new esplanade reserves have been mapped as well as protection areas. Walking and cycling routes are likely to incorporate these features. • Existing and proposed open space areas are generally located near areas identified for protection or esplanade reserves which as discussed above are generally associated with areas included in the indicative active travel routes in the <i>Greenways</i> plan.

Appendix B: Assessment of the structure plan against regional policy and strategic outcomes

B-1: Assessment against the AUP-OP Regional Policy Statement

The Auckland Unitary Plan (AUP-OP) became operative in part in November 2016 and details new land use policy, rules and zoning for Auckland, along with overlays which identify important natural and historic values and characteristics which must be considered when making decisions about land use. Included in the AUP-OP are provisions to protect and enhance ecological values across the Auckland region. The policies considered of most relevance to this assessment are included in the following Table B1.

Table B1: AUP-OP policies relevant to the Warkworth Structure Plan

Relevant Policy	How the policy has been considered or applied
<i>B7.2.1 (2) Indigenous biodiversity is maintained through protection, restoration and enhancement in areas where ecological values are degraded, or where development is occurring.</i>	The Future Urban zone is an area where development will occur. The structure plan will guide development. By incorporating identified areas of ecological value into the Protection Areas on the plan, it provides certainty regarding the purpose of these areas. The Protection Areas will provide for the protection of existing ecological values as well as opportunities to buffer, restore and connect natural features.
<i>B7.3.1 (1) Degraded freshwater systems are enhanced; (2) Loss of freshwater systems is minimised; (3) The adverse effects of changes on land use on freshwater area avoided; remedied or mitigated</i>	All identified permanent and intermittent streams, known wetlands and modelled floodplains have been included on the plan as Protection Areas or Future Esplanade Reserve regardless of condition. This identification is intended to protect freshwater systems and provide opportunity for enhancement through riparian restoration - connecting up areas of existing native vegetation. Riparian restoration in the areas identified would help address some of the effects associated with the urbanisation of this area.
<i>B7.3.2 (1) Integrate the management of subdivision, use and development and freshwater systems by undertaking the following... (d) avoiding development where it will significantly increase adverse effects on freshwater systems, unless these adverse effects can be adequately mitigated</i>	Through mapping the freshwater system as Protection Areas or Future Esplanade Reserve it provides certainty that these areas are not intended to be available for development.
<i>B7.3.2 Management of freshwater systems:</i>	

Relevant Policy	How the policy has been considered or applied
<i>(2) Identify degraded freshwater systems</i>	Undertaken in the <i>Warkworth Stream Classification and Esplanade Assessment</i> (April 2018) and incorporated into the plan.
<i>(3) Promote the enhancement of freshwater systems identified as being degraded to progressively reduce adverse effects</i>	Streams, known wetlands and floodplains form the main part of the Protection Areas shown on the plan. Enhancement and restoration of this area is key to achieving this.
<i>(4) Avoid the permanent loss and significant modification or diversion of lakes, rivers, streams (excluding ephemeral), wetlands and their margins</i>	By showing the freshwater system as Protection Areas on the plan it provides a level of certainty to future developers that these areas are intended to be avoided for development purposes.
<i>(5)(d) maintain or where appropriate enhance:</i>	
<i>(i) freshwater systems not protected under Policy B7.3.2(5)(a)</i>	The freshwater system that is not otherwise identified in the Natural Stream Management Areas and Wetland Management Areas is captured in the Protection Areas on the plan
<i>(iii) existing riparian vegetation located on the margins of lakes, rivers, streams and wetlands...</i>	Existing areas of riparian vegetation are captured in the Protection Areas of the plan. This Protection Area also identifies areas suitable for riparian restoration to connect existing areas of vegetation.
<i>(6) Restore and enhance freshwater systems where practicable when development, change of land use, and subdivision occur</i>	Protection Areas provide opportunities to connect, restore and enhance existing areas of riparian vegetation. Riparian vegetation of suitable widths will help enhance freshwater systems over the current state particularly where some sections currently have livestock access and erosion issues
<i>B7.4(5) The adverse effects from changes in or intensification of land use on coastal water and freshwater quality are avoided, remedied or mitigated....</i>	By identifying areas for restoration and protection throughout the freshwater system it is intended that this will address some of the effects that will otherwise result from the urbanisation of the area. Erosion and sedimentation resulting from development is a major concern to water quality in the subject area and for the Mahurangi Harbour. Further consideration of how to avoid effects from this is needed.

B-2: Assessment against the Auckland Plan 2050

Adopted by Auckland Council in 2018, this is Auckland’s spatial plan and development strategy which provides the basis for aligning the Council’s implementation plans, regulatory plans, policy development, funding programmes and internal operations and investments, including that of council-controlled organisations.

It identified three key challenges for the Auckland Region and how to address them over the next 30 years:

- Population growth and its implications;
- Sharing prosperity with all Aucklanders, and
- Reducing environmental degradation.

Key to the Auckland Plan is that social, economic and environmental outcomes are integrated into the region’s decision making. Identifying opportunities for growth and development to improve environmental outcomes is important, as are areas where growth and development can be used to protect and enhance Auckland’s natural environment.

Table B2: Auckland Plan 2050 outcomes relevant to the Warkworth Structure Plan

Relevant Outcome	How the outcomes have been considered or applied
<i>Environment and Cultural Heritage -</i>	
<i>Focus area 2: Focus on restoring environments as Auckland grows</i>	Protection Areas and Future Esplanade Reserves have been identified on the plan to protect existing natural values and as a way to identify key ecological restoration opportunities.
<i>Focus area 3: Account fully for the past and future impacts</i>	As per above, areas have been identified for protection and for ecological restoration potential. If restored they will remedy past impacts of vegetation removal by restoring native habitat.
<i>Focus area 4: Protect Auckland's significant and natural environments and sites of cultural heritage from further loss</i>	Significant Ecological Areas have formed part of the Protection Areas layer. While they would be protected anyway under the AUP-OP, this identification identifies connection and buffering opportunities around them.
<i>Focus area 5: Adapt to a changing water future</i>	The freshwater system (excluding ephemeral streams) has been identified and mapped for protection, including floodplains and known wetlands. Development is to be excluded from these areas. Wide

Relevant Outcome	How the outcomes have been considered or applied
<i>Focus area 6: Use green infrastructure to deliver greater resilience, long-term coast savings and quality environmental outcomes</i>	<p>planted riparian buffers will help buffer developed areas against the impact of the more frequent high intensity rain events predicted to occur and will help provide stability to stream banks that are currently prone to erosion.</p> <p>As per above, the Protection Areas and Future Esplanade Reserve areas if suitably restored with riparian planting will help buffer the freshwater system in relation to a changing water future. The greater width the riparian planting is the greater resilience it will have to changing conditions (e.g. drought stress; weed invasion) and the less longer-term maintenance will be required (such as weed management). A minimum riparian buffer of 10 metres has been applied for the plan, with a greater width applied where an existing or future esplanade reserve is anticipated and where there is overlap with other features e.g. existing vegetation and floodplains.</p>

B-3: Assessment against Auckland Council’s Indigenous Biodiversity Strategy (2012)

Auckland Council has statutory obligations to maintain and sustainably manage biodiversity and must respond to the requirements of the proposed National Policy Statement (NPS) on Biodiversity. An updated proposed NPS on Biodiversity is due out in the near future.

Table B-3: Indigenous Biodiversity Strategic Principles relevant to the Warkworth Structure Plan

Relevant Principles	How the Principles have been considered or applied
<i>Manage the region as a network of protected habitats (including aquatic, terrestrial and marine) which are buffered, and linked to other habitats. Ideally these habitats sit in a matrix of land uses and actions which support the ecological function of these habitats</i>	<p>Regionally significant natural areas were identified as SEAs under the AUP-OP. These have been incorporated into the Protection Areas on the plan as well as other areas of riparian vegetation, known wetlands, floodplains and permanent and intermittent streams (with an associated buffer applied). It is intended that these areas are protected from development. Where they are currently degraded there are opportunities for them to be restored and enhanced. This would link existing areas of native vegetation and create corridors or a network of</p>

Relevant Principles	How the Principles have been considered or applied
	protected habitat for wildlife throughout an area that will become otherwise urbanised.

B-4: Assessment against Auckland Growing Greener (2016)

Auckland Growing Greener describes Auckland Council’s roles and commitments to deliver the environmental outcomes for Auckland that underpin the Auckland Plan vision/ The Elements of Growing greener relevant in this context are:

- *.....restoring and enhancing natural ecosystems to ensure their resilience and productivity*
- *using natural assets and green infrastructure to manage stormwater and flood risks ...*

Table B4: Auckland Growing Greener priorities relevant to the Warkworth Structure Plan

Relevant Priorities	How the priorities have been considered or applied
<i>Natural habitats in urban areas act as stepping stones and corridors where indigenous species can rest, feed, roost and move across the landscape. They can also provide homes for rare and threatened species that prefer different types of habitat...</i>	As per above under the Indigenous Biodiversity Strategy, if the identified Protection Areas and Future Esplanade Reserves are appropriately restored it will result in a network of native habitat throughout the future urban area that will have important habitat value and provide opportunity for wildlife to move across the landscape utilising it. A particularly important connection will be from the north down through to the Mahurangi River and out into the Mahurangi Harbour. The Protection Areas includes a number of different ecosystem types and so a range of ecosystems and habitats will be protected or restored through this.

B-5: Assessment against Low Carbon Auckland (2014)

This document sets out how Auckland is to reduce its greenhouse gas emissions. It recognises that a network of green and open spaces, and, waterways provides a wide range of benefits including enhanced biodiversity and improved stormwater management, and can provide carbon ‘sinks’ that remove greenhouse gas from the atmosphere.

Note: this is currently under review with a climate change action plan (ACAP), adding both emissions reductions and preparing for climate change.

Table B5: Low Carbon Auckland actions relevant to the Warkworth Structure Plan

Relevant Actions	How the actions have been considered or applied
<i>Integrate and consider native forestry planning when undertaking local area plans and structure planning to expand Auckland's ecological corridors</i>	There is the opportunity to include future provisions to restore native forest through the Protection Areas and Future Esplanade Reserves on the plan. It is intended that existing areas of vegetation will be protected and enhanced, and connected through restoration planting, creating a network of protected habitat throughout the future urban area.

B-6: Assessment against Auckland’s Urban Ngahere (Forest) Strategy (2017)

Urban forest is defined as a network of all trees, other vegetation and green roofs in existing and future urban areas. This strategy to consolidate and amplify existing directives that support Auckland’s urban forests and addresses negative drivers which threaten it.

Table B6: Urban Ngahere (Forest) Strategy objectives relevant to the Warkworth Structure Plan

Relevant Objectives	How the objectives have been considered or applied
<i>Ensuring urban forest diversity</i>	The Protection Areas and Future Esplanade Reserves incorporate areas of existing vegetation. Within these existing areas there is some diversity in the ecosystem types covered. The Protection Area provided opportunities for ecological restoration to occur that could further increase the diversity of species and ecosystems within this future urban area where appropriate.

Relevant Objectives	How the objectives have been considered or applied
<i>Providing all residents with access</i>	The incorporation of future active transport routes along the Protection Areas and Future Esplanade Reserves will provide access to all residents to connect with the natural environment.
<i>Deploying regulatory and non-regulatory tools</i>	The structure plan is a non-regulatory tool to set out a direction that development avoids areas with existing natural values and areas where there are opportunities for restoration and enhancement. A future Plan Change will follow on from the structure plan and is a regulatory tool where the structure plan’s intentions can be given ‘teeth’ through statutory provisions.
<i>Managing urban forest on public and private land</i>	The Protection Areas and Future Esplanade Reserves cover both public and private land. Therefore, the ecological corridors created are intended to move across both public and private land.
<i>Creating ecological corridors and connections</i>	The Protection Areas and Future Esplanade Reserves if appropriately restored over time will create corridors of native habitat connecting fragments of native vegetation. Because this mapping has been closely aligned to the freshwater system it will result in a network of native habitat relatively evenly spread throughout the future urban area.
<i>Protecting mature, healthy trees</i>	Most existing areas of native vegetation have been incorporated into the Protection Areas and Future Esplanade Reserves on the plan. These areas will include mature healthy trees. There may be a number of mature healthy trees, particularly exotic trees not included (e.g. they are isolated from patches of vegetation, such as individual trees in paddocks) that may warrant protection for other reasons such as amenity, cultural, historic or aesthetic value rather than ecological. An assessment for potential notable trees in the FUZ has not been undertaken. Such an assessment is recommended at the Plan Change stage.

Appendix C: Assessment of the structure plan against national policy and strategic outcomes

C-1: Assessment against the National Policy Statement on Freshwater Management (NPS-FM) (2014)

This policy statement sets out the objectives and policies for freshwater management under the RMA. The objective relevant to this report area set out below.

Table C1: NPS-FM Objectives relevant to the Warkworth Structure Plan

Relevant Objectives	How the objectives have been considered or applied
<i>Objective A(1) To safeguard (a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, and of freshwater...in sustainably managing the use and development of land</i>	The freshwater system has been identified and mapped as Protection Areas and Future Esplanade Reserves within the plan. These areas have the opportunity to be restored and enhanced as well as protected and are areas not intended to be available for other development purposes. Through this, areas of existing habitat value for indigenous species will be maintained but preferably enhanced. If the identified Protection Areas are suitably restored, in the longer-term the life-supporting capacity of the freshwater system in this area should be improved as much of freshwater system here is currently degraded and lacking suitable riparian cover.

C-2: Assessment against the New Zealand Coastal Policy Statement (2010)

This policy statement is relevant to the structure plan area as activities in the structure plan area will directly impact on the coastal marine area downstream of it linked by the streams and the Mahurangi River that drains the area. The relevant policies in this context therefore relate to protecting the water quality of coastal environment from discharges of sediment and contaminants resulting from development of the catchment.

Table C2: New Zealand Coastal Policies relevant to the Warkworth Structure Plan

Relevant Polices	How the policies have been considered or applied
<i>Policy 22 Sedimentation - (2) Require that subdivision, use, or development will not result in a significant increase in sedimentation in the coastal marine area, or other coastal water....</i>	Increased sedimentation is a significant concern to the ecological health and life-supporting capacity of the freshwater system here and for the Mahurangi Harbour, particularly as it appears that

Relevant Polices	How the policies have been considered or applied
<i>(4) Reduce sediment loadings in runoff and in stormwater systems through controls on land use activities.</i>	sedimentation overtime is already having negative impacts and its ability for the system tolerate more is limited. The Protection Areas and Future Esplanade Reserves could be used as a buffer to the freshwater system that earthworks and development are to remain outside of, but this is unlikely to have much impact in preventing sedimentation effects overall. Zoning decisions included some consideration for the potential earth-working required to achieve the respective densities.

C-3: Assessment against the New Zealand Biodiversity Strategy (2000-2020)

The New Zealand Biodiversity Strategy was prepared in response to the state of decline of New Zealand’s indigenous biodiversity and fulfils in part, the New Zealand’s commitments made under the Convention of Biological Diversity. It sets out a number of themes and outcomes. Those of most relevance in relation to the creation of the structure plan are set out below.

Table C3: New Zealand Biodiversity Strategy Themes and Outcomes relevant to the Warkworth Structure Plan

Relevant Polices	How the policies have been considered or applied
<i>Theme 1 - Biodiversity on land</i>	
<i>Desired outcome for 2020 - Threats to indigenous biodiversity from the activities of people are avoided or mitigated through sustainable use regimes and the sustainable management of production landscapes and urban areas</i>	This is reflected in the draft plan through the identification and mapping of areas of ecological value or potential value as Protection Areas and Future Esplanade Reserves. These areas are to be avoided for development purposes but would be available for ecological restoration and enhancement.
<i>Theme 2 - Freshwater bodies</i>	
<i>Desired outcome for 2020 - The extent and condition or remaining natural freshwater ecosystems and habitats is maintained. Some degraded habitats such as...important wetlands and riparian areas are restored...</i>	The freshwater system has been mapped as Protection Areas and Future Esplanade Reserves to ensure it is recognised as an area development is to avoid. This is intended to ensure that freshwater ecosystems here are maintained but also enhanced and restored.
<i>Theme 23 - Coastal and marine biodiversity</i>	

Relevant Policies	How the policies have been considered or applied
<p><i>Desired outcome 2020 - Natural marine habitats and ecosystems are maintained in a healthy functioning state. Degraded marine habitats are recovering...</i></p>	<p>The Mahurangi Harbour is the receiving environment for the freshwater system of the structure plan area. Negative impacts from ongoing sedimentation issues in this catchment are evident, and the ability for the system to continue to cope with this is limited. In order to maintain functionality and prevent further degradation of the ecological values and life-supporting capacity of the harbour it is of significant importance that potential erosion and sedimentation effects from development are addressed. As per above, the identification and protection of the freshwater system contributes to achieving this but other measures will be needed.</p>

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