

At Risk Catchments for Auckland

Response from Auckland Council Staff, August 2018

Disclaimer: Please note that this document provides staff only comments. This document has not been formally endorsed by Auckland Council Governing Body or any other Auckland Council Committee. Please also note that if formal endorsement of this document (or at-risk catchments more generally) is / are requested in the future, a timeframe of at least six weeks is required to get the necessary committee approvals. Formal consideration of this assessment is likely to be considered by the Environment and Community Committee in the coming months.

1. Purpose and scope:

This document provides an Auckland Council staff response to the Minister for the Environment and the Ministry for the Environment's (MfE) request for a draft list of at-risk catchments and supporting existing information, including regulatory and non-regulatory actions for those at-risk areas. This follows the joint approach envisaged by the Minister and councils to pull together a national picture of these catchments, in response to the Land and Water Forum's May 2018 report.

For operational purposes, there are ten watersheds in the Auckland region with numerous catchments and sub-catchments within each. For each, a general context of pressures at the watershed and marine receiving environment scale is provided. The context is important, as the council's responses are directed at multiple scales. Within six of these watersheds council staff have identified nine 'at risk' catchments based on the freshwater environment that meet the criteria provided by the Land and Water Forum, which are:

- there is a clear decline in water quality in the catchment or downstream receiving waterbody;
- where the water resource is under pressure from existing or anticipated future land use change, leading to a likely decline in water quality, or
- where the waterbody is vulnerable to irreversible detrimental change, and urgent action is needed.

For the specific catchments deemed 'at risk' council staff have outlined RMA (and other legislative tools) and non-statutory responses. At risk catchments identified are:

- North-East Watershed: Lake Tomarata catchment
- Kaipara Harbour Watershed: Hoteo River catchment
- Hibiscus Coast Watershed: Okura River and Lake Pupuke catchments
- West Coast Watershed: Lake Rototoa
- Waitemata Harbour Watershed: Oakley Creek catchment
- Manukau Harbour Watershed: Armour Bay and South Eastern catchments
- Islands Watershed: Waiheke Western catchments

Note: Along with this document a set of maps of each of the at-risk catchments has been provided.

In addition, there are issues and risks that act across most of the watersheds, most notably from the growth pressure which is discussed below under "Regional growth pressures". There are also broader policy and strategic responses relevant to planning provisions and

non-regulatory responses, these are summarized below under “Regional policies and strategies”. *These should also be considered alongside the details provided in the template.*

2. Regional pressures:

Growth:

A key pressure for the Auckland region is from population growth and associated land use changes, particularly urbanization which is putting continued pressure and risk across the regions’ watersheds and their catchments. This has also been recognized by SeaChange-Tai Timu Tai Pari and the Hauraki Gulf Forum.

The land area of the Auckland Region is 489,363 hectares, with the core urbanised area of the city covering just over 50,550 hectares. In the last 10 years the region’s population grew by 16 per cent or 223,900 people. The city’s population is projected to continue growing with an anticipated increase of 833,000 people between 2013 and 2043 – this increase accounts for more than half of New Zealand’s population growth over this time (Statistics New Zealand, 2017).

As well as an increase in population, the core urbanised area of the city is expected to increase in size also; the extent of the ‘urban’ and ‘future urban’ type zones the Auckland Unitary Plan (operative in part, November 2016) cover 59,453ha, potentially increasing the city’s main urban area by 18 per cent. The impacts on the natural environment from residential and business growth will be one of the greatest challenges Auckland Council will face over the next 30 years. Auckland’s environment is also affected by past decisions and its rapid growth and development. For example, marine and freshwater environments have been polluted by sediments and contaminants arising from development, building and industrial activities. A key feature of the Auckland Plan 2050 and Auckland Unitary Plan is to promote a compact urban form, which is more efficient and cost effective than urban sprawl.

Through giving effect to the National Policy Statement – Freshwater Management (NPS-FM) and developing land use controls and other methods raises difficult questions on what legislative instruments should prevail; giving effect to the NPS-FM would appear to be at odds with the National Policy Statement on Urban Development Capacity 2016, particularly in Auckland due to the focus on enabling growth. An option is to initially set a lower attribute state for urban areas but still above national bottom lines. The necessary imposition of limits and interventions to address the discharge of sediment is likely to lead to an effect on growth, in as much as any changes could have significant impact on development and land use activities across the region - not just within a specific watershed or sub-watershed level.

The choice of development focus (brownfields or greenfields) with respect to growth allocation to meet the National Policy Statement on Urban Development Capacity 2016 will need to be balanced with maintaining, and eventually enhancing water quality in our surface and ground waters. The likelihood of more onerous controls will be controversial and will have far reaching implications geographically, economically and socially. These issues are challenging to balance, particularly when central government direction is not reconciled and consistent (e.g. providing for both growth and environmental outcomes).

Climate Change:

Auckland Council acknowledges the increasing presence of climate change and environmental issues associated with this. Auckland Council and Council Controlled Organisations commissioned NIWA to analyse projected climate changes specifically for the Auckland Region. Auckland Council is undertaking a Risks and Vulnerabilities Assessment

to further understand what NIWA's climate projections mean for Auckland's environment, communities, businesses and infrastructure. We will use this work to prioritise climate actions in Auckland's Climate Action Plan and support programmes across the council group, including actions that could address pressures in at-risk catchments.

3. Regional policies and strategies:

A summary of regional plans and strategies relevant to addressing issues and risks for watershed areas follows. *These should be considered alongside planning provisions and non-regulatory responses in the template, as they relate to catchment scale responses.*

Auckland Plan 2050:

Auckland Council adopted the Auckland Plan 2050 in June 2018. The Auckland Plan 2050 sets the key strategic direction for Auckland and was developed in conjunction with a range of stakeholders. The Auckland Plan 2050 clearly sets out a need for a more integrated and holistic approach to its six outcomes, including Environment and Cultural Heritage. The Auckland Plan identifies environmental degradation as one of its three key challenges and proposes that urban growth and development can lead to improved environmental outcomes. It also acknowledges the connection people's actions and choices has to the quality of the environment and asserts that change is required to pass on a healthy environment to future generations. Two Environment and Cultural Heritage focus areas are related to this work:

- *Adapt to a changing water future*
- *Account fully for the past and future impacts of growth.*

<https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/Pages/default.aspx>

Urban Growth and Development Strategy:

Part of the Auckland Plan 2050, the Development Strategy defines how, when and where the region will grow and develop. This requires both redevelopment in existing urban areas ('brownfields'), and expansion into new areas ('greenfields'). The Development Strategy uses a nodal approach, with the bulk of growth clustered on Manukau, Westgate and Albany, but also expansion in smaller towns like Helensville, Warkworth and Drury. This strategy is supported by an Infrastructure Strategy to provide transport, water and wastewater links. This planned expansion is a key environmental pressure in Auckland.

<https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/Pages/default.aspx>

The Auckland Unitary Plan 2016 controls (operative in part):

This is the principal statutory planning document for the Auckland region giving effect to the Resource Management Act (1991). It includes the Auckland Regional Policy Statement, Regional Coastal Plan and Regional Plans for freshwater and discharges to land and water.

Key objectives of the plan relevant to at-risk catchments are:

- Enhance Mauri of, and the relationship of Mana Whenua with, natural and physical resources.
- Recognise and provide for Mana Whenua values, matauranga and tikanga associated with coastal, fresh and geothermal water.
- Maintain indigenous biodiversity where ecological values are degraded, or where development occurs.

- Enhance degraded freshwater systems and minimize loss of freshwater systems.
- Maintain the quality of fresh and coastal waters where it is excellent or good and progressively improve where it is degraded.
- Allocate fresh and geothermal waters efficiently.

Key policies and rules from the regional plan provisions relevant to at-risk catchments are:

- As resources vary within the region and may require different management approaches, Management Area Overlays have been identified e.g. Natural Streams, Lake Management Area, High Use Aquifer, Quality Sensitive, Significant Ecological Areas etc. to ensure the sustainable management of these resources depending on its location and characteristic. For example, water quality in rivers and streams within the highly urbanized areas of Auckland is significantly different than in pastoral farming areas and different again where there is significant riparian vegetation and little or no development.
- Provisions focus on avoiding adverse effects from point source and diffuse discharges particularly in greenfield developments where there are greater risks to do so.
- Discharges, subdivision, use and development that affect freshwater systems must have regard to NPS-FM National Bottom Lines and the relevant Macroinvertebrate Community Index guideline until catchment specific objectives and limits are set.
- Controls on the creation of impervious surfaces within the Stormwater Management Flow areas (areas susceptible to the effects of development or have relatively high values) seeks to protect and enhance water bodies and aquatic biodiversity by managing stormwater runoff and requiring stormwater hydrology mitigation.
- Application of water sensitive design to land use planning and land development to reduce or minimise negative effects on the environment and ensures stormwater management is targeted to where the greatest benefit can be achieved (both for the community and the developer).
- The preparation of structure plans as a precursor to plan changes is an important method in guiding future development. They identify, investigate and address the potential effects of urbanisation and development on natural and physical resources in the structure plan area and in neighbouring areas. This ensures that all the effects of the development are addressed in advance of development occurring. Structure plans within Auckland can assist in identifying greenfield land suitable for urbanisation; rezoning of existing urban areas for more intensive use; rezoning of Future Urban Zone land for urbanisation; and establish new or significantly expanding rural and coastal towns and villages.

4. Other regional tools:

- **Water Quality Targeted Rate:** The Water Quality Targeted rate provides accelerated (30 year work programme delivered in 10 years) funding for 5 work programmes, over the 2018-2028 Budget, designed to improve regional water quality:
 - **Stormwater portion of the western isthmus water quality improvement programme:** Reducing combined sewer overflows to the Waitemata Harbour.
 - **Contaminant reduction programme:** Reduction of sediment into the Kaipara Harbour and litter and road contaminants with stormwater treatment.
 - **Urban and rural streams rehabilitation:** Improves the ecological health of streams and enables urban development in areas such as Omaru creek in East Tamaki and stabilises areas of high stream erosion, reducing sedimentation in harbours.

- **Proactive compliance and monitoring of onsite waste water systems:** Improve water quality in areas like Waiheke Island by ensuring private systems are maintained and fit for purpose.
 - **Safe Networks (illegal stormwater and wastewater connections):** Programme to Reduce Safe Swim non-compliance alerts, and improve amenity value of recreational beaches around the region.
 - The Water Quality Targeted Rate is consistent with the objectives in the SeaChange Tai Timu Tai Pari Marine Spatial Plan (for watersheds draining to the Hauraki Gulf) (www.seachange.org.nz)
- **Modelling:** Auckland Council have developed a suite of models through its Safeswim programme to predict the risk to human health through the faecal contamination of marine swimming sites. This is now being developed for extension to freshwater swimming sites. This will help identify some catchments where investigations and investment are required.

Auckland Council is developing a Freshwater Management Tool which includes a model for the main freshwater watercourses and lakes in the region. This model will calculate in-stream concentrations of contaminants and the contaminant loads from surrounding land use. This will help identify catchments to focus investigations. The second part of the tool will allow the simulation of potential interventions to identify beneficial options for improving water quality in the urban and rural areas of the Auckland region. This will facilitate targeted conversations with interested parties on where to focus investment.

AT RISK CATCHMENTS FOR AUCKLAND

Name and location of the at-risk catchment	Reason for inclusion	Current and proposed planning provisions	Non-regulatory approaches
<p>North East Watershed: The North East Coast watershed has an area of approximately 24,232 hectares, extending from Sandspit in the south to Te Arai Regional Park on the boundary with Northland region in the north. The watershed's many waterways flow eastward to beaches and estuaries along the Hauraki Gulf. The watershed is predominantly rural consisting predominantly of pastoral farming with some horticulture and forestry (exotic and native).</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Lake Tomarata.</p> <p><i>For an aerial photograph of the catchment please see attached file: AtRiskCatchments_Tomarata Lake.pdf</i></p>	<p>Watershed level pressures and context: Many of the small East Coast estuaries are susceptible to sedimentation with the highest historical sedimentation rates in Auckland recorded in these estuary types. Whangateau estuary in this watershed is one of the least impacted east coast estuaries but remains vulnerable with high biodiversity values and recent sedimentation events from unidentified sources. Kawau Bay has been found to have high biological habitat diversity. There are localised issues with contamination in areas such as Point Wells with failing septic tank fields. Some of these issues are exacerbated by a high-water table, flat low-lying coastal land and issues with adequacy of drainage infrastructure. The Matakana River, the only State of the Environment (SOE) river monitored in this watershed is in band D for <i>E.coli</i> and trending downward.</p> <p>At Risk Catchment: Lake Tomarata Lake Tomarata and its catchment is at risk due to eutrophication from nutrient enrichment and nutrient release from the activity of pest fish. The lake frequently suffers from algal and cyanobacterial blooms. The lake water quality state sits within the NPS-FM "D" state for overall Chlorophyll-a and in the "B" state for both total nitrogen and total phosphorus. NOF 2015 banding results show a downward trend in some parameters with others already below national bottom lines.</p> <p>Catchment values at risk:</p> <ul style="list-style-type: none"> • Human Health: Recreational swimming risks from elevated pathogens • Ecosystem Health: the native ecosystem has been supplanted by exotic species. Lake Tomarata and its associated 20ha wetland have outstanding ecological values and is listed as a Significant Ecological Area (SEA) in the Auckland Unitary Plan. The lake and wetland areas provide habitat for a wide range of native species including one of the few populations in the region of native black mudfish • Cultural: impacts on traditional uses and values, including gathering of kai • Recreational: Algal and cyanobacterial blooms could impact on the current appeal of the lake for wide range of water based recreational activities which include swimming, kayaking, fishing (trout and coarse), boating, gamebird shooting, and shore-based activities such as camping <p>Risk sources:</p> <ul style="list-style-type: none"> • Highly erodible land and forestry land use • On site waste water system management • Pest fish <p>Pressure effects on water:</p> <ul style="list-style-type: none"> • Septic tank locations and maintenance behaviours • Pest fish in lakes • Forestry land use • Urban land use, urbanising catchments • Rural land use <p>Future risks:</p> <ul style="list-style-type: none"> • Potential urban development throughout watershed 	<p>RMA that are in place or planned to address the issues in the catchment:</p> <p>See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls.</p>	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <p>Lake Tomarata has been identified under the Proposed Regional Pest Management Plan as at risk, as follows:</p> <p><i>"While Tomarata and Rototoa do have some pests present, they retain relatively high freshwater biodiversity values. However, these ecosystems are at imminent risk of collapse due to pests and other pressures, leading to the likely loss of charophyte meadow ecosystems from the region, and loss of important populations of at-risk native species such as waikaka / black mudfish."</i> (pg 190)</p> <p>As a result, funds from the new Auckland Council Environment Targeted Rate are earmarked to attempt the eradication of a suite of pest fish and aquatic weeds in these two lakes. Scoping for this project is currently in its early stages.</p> <p>Other initiatives in Lake Tomarata, as well as for Spectacle and Slipper Lakes include Auckland Council support for Ngati Manuhiri in a successful application to MfE for a project to exercise kaitiaki over the three lakes that make up Ngāroto (Lakes Tomarata, Spectacle and Slipper). The funding will be over three years. Council is part of the project Steering Group which includes iwi, DoC, and community representatives. As part of the project Auckland Council committed to providing both technical and financial support. Part of the project involves looking at the water quality of the three lakes and assessing the major impacts. This assessment will facilitate a catchment management plan. So far, the water quality monitoring programme has been drafted and implemented. There has been several community planting events and a series of presentations to the local community about the initiative.</p>

AT RISK CATCHMENTS FOR AUCKLAND

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<p>Kaipara Harbour Watershed: The Kaipara harbour is the largest natural harbour in New Zealand. The South Kaipara Harbour watershed includes the 142,000 hectares of Auckland that drains into the Kaipara Harbour. The watershed encompasses approximately 24% of the wider Kaipara Harbour catchment, the remainder lying within the Northland region. The Kaipara's catchments are mostly rural, with agriculture and forestry land uses dominating, but also urban, commercial and industrial land uses.</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Hoteo River.</p> <p><i>For an aerial photograph of the catchment please see attached file: AtRiskCatchments_Hoteo Lake.pdf</i></p>	<p>Watershed level pressures and context: The watershed has been subject to long-term land use changes, particularly conversion of native forest and wetlands to pasture, which has contributed to high sediment loads entering the harbour. About 13% of the catchment has also been identified as "highly erodible land". These factors have resulted in high levels of historic sedimentation in the harbour. High levels of sediment load entering the harbour continue, estimated to be 700,000 tonnes per year, compared to approximately 120,000 tonnes per year in pre-human times. Since 2007, suspended sediment concentration and turbidity have decreased in the Kaipara Harbour, but they are still above threshold values for healthy ecosystems.</p> <p>At Risk Catchment: Hoteo River The Hoteo River is the largest catchment flowing into the Kaipara Harbour from the Auckland region. State of Environment monitoring data for the Hoteo River shows it sits within the NPS-FM "E" state for E.coli, which is below the minimum "C" state. This is also the case for several other river monitoring sites in the Kaipara Harbour catchment (Kaukapakapa River, Kumeu River and Makarau River). The Hoteo River also fails the ANZECC (2000) guideline for turbidity (as do the Riverhead Forest Stream, Kaukapakapa River and Kumeu River).</p> <p>Catchment values at risk:</p> <ul style="list-style-type: none"> • Human Health: Recreational swimming risks from elevated pathogens • Ecosystem Health: Reduction of habitat from sediment – impact on macroinvertebrate and fish habitats • Cultural: impacts on recreational values and traditional uses, including gathering of kai and mauri of the river • Recreational: Turbidity and sedimentation can impact on the recreational value which include kayaking, boating and fishing. <p>Risk sources:</p> <ul style="list-style-type: none"> • Highly erodible land, • Rural and forestry land use • Steep terrain • Urban contaminants <p>Pressure effects on water:</p> <ul style="list-style-type: none"> • Urban land use, urbanising catchments • Rural land use <p>Future risks:</p> <ul style="list-style-type: none"> • Potential urban development throughout watershed that are led by private developers • Due to the lowland, flat and fertile character of the catchment the area is at risk from intensive agriculture and future urban areas, for example Kumeu, Huapai and Helensville <p>https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/Documents/ds-nodes-combined.pdf.</p>	<p>RMA that are in place or planned to address the issues in the catchment:</p> <p>See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls</p>	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <ul style="list-style-type: none"> • The Contaminant Reduction Programme (Water Quality Targeted Rate) will help fund projects to reduce sediment into the Kaipara Harbour. • Waterways Protection Fund which provides assistance to landowners fencing and planting riparian areas. • Hoteo Sediment Reduction Programme, part funded by MfE and Auckland Council. Trialling novel solutions for high sediment areas. • Rodney Local Board Healthy Harbours and Waterways Fund

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<p>Hibiscus Coast Watershed: The Hibiscus Coast watershed comprises approximately 26,000 hectares. It contains a large mix of land use, ranging from the highly urbanised to pristine bush. The hinterland is still predominantly rural farm land, while the coastal areas themselves are characterised by extensive urban development as well as open space and reserves including the Long Bay Marine Reserve and Shakespeare Regional Parks.</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Okura River / Weiti River and Lake Pupuke.</p> <p><i>For an aerial photograph of the catchment please see attached file: AtRiskCatchments_Weiti.pdf</i></p>	<p>Watershed level pressures and context: Many of the small East Coast estuaries are susceptible to sedimentation with the highest historical sedimentation rates in Auckland recorded in these (average 5.1mm per year). All of the estuaries in the Hibiscus Coast watershed show ecological trends consistent with sediment stress.</p> <p><i>E.coli</i> is an issue for beaches along this coastline such as Takapuna Beach and Milford Marina. The sources of <i>E.coli</i> in this area are multiple and varied but will include avian (birds), pets and wastewater system overflows during rainfall as a result of cross-connections, leaky pipes and other faults in the system.</p> <p>Lake Pupuke has had increasing issues with algal blooms. The cause of these algal blooms is largely unknown and may be attributed to changes in nutrient cycling, pest weeds and pest fish.</p> <p>At Risk Catchment: Okura and Weiti Rivers Within this watershed, Okura Estuary is showing trends consistent with sediment stress with declining ecology and increasing muddiness. It is also the location of recent mass shellfish mortality events where pathology of cockles showed signs of environmental stress (cause undetermined). Mean annual turbidity concentrations between 2007 and 2016 at sites along the Hibiscus Coast exceeded sediment thresholds 45% of the time. Two State Of Environment river sites are monitored in the Weiti catchment. The Okura Creek and Vaughan Stream both sit within the NPS-FM "E" state for <i>E.coli</i>, which is below the minimum "C" state. These sites also fail the ANZECC (2000) guideline for turbidity.</p> <p>At Risk Catchment: Lake Pupuke The National Objectives Framework 2015 banding for lake Pupuke indicates that the lake may be experiencing certain stressors. The water quality sits within the NPS-FM "B" state for overall Chlorophyll-a and Total Nitrogen and is in an "A" class for Total Phosphorus.</p> <p>In 2017 Lake Pupuke was assessed as being in poor condition according to Lake Submerged Plant Index. This represents a substantial and significant deterioration since 2012. The main cause was a reduction of charophyte meadows from deeper water. There was also a significant retraction of bottom limits of the weeds across all sites compared with previous surveys in 2008 and 2012. Possible contributors to this decline are thought to be a result of sustained reduced water clarity and the influence of pest macrophyte species.</p> <p>Catchment values at risk:</p> <ul style="list-style-type: none"> • Human Health: Recreational swimming risks from elevated pathogens • Ecosystem Health: Decreasing ecology from sediment – impacts on shellfish in Okura and Weiti rivers. Change of habitat resulting from reduced water clarity and pest macrophytes • Cultural: impacts on recreational values and traditional uses, including gathering of kai. • Recreational: Algal blooms and increased muddiness could impact on water-based activities such as sailing and rowing 	<p>RMA that are in place or planned to address the issues in the catchment:</p> <ul style="list-style-type: none"> • See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls • There is a long planning history for the sub-catchments of Okura and adjacent Long Bay. Auckland Council recently defended its decision to maintain the Rural Urban Boundary (RUB) for Auckland along Vaughans Road at an Environment Court Hearing, held in September to November 2017. The Environment Court released its decision on 06 June 2018, dismissing the appeals, thereby retaining the Okura area outside of the RUB, and retaining Countryside Living zoning (with a 4ha site size additional subdivision control) over the land. Subsequently, Okura Holdings Limited has appealed this Environment Court decision to the High Court, on points of law. The council is currently in the process of defending the Environment Court decision in the High Court. A decision from the High Court is not expected until next year. 	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <ul style="list-style-type: none"> • A hydrodynamic model is being developed to better understand the fate of sediment and metals discharged into the estuaries, including the extent to which the Okura and Weiti systems exchange contaminants, or receive contaminants from further afield. The hydrodynamic model will be used to model the risk profile of various catchment development scenarios, in order to inform any future plan changes and structure planning exercises. Initial results from the modelling exercise are expected in late 2018. • To inform a mitigation strategy for Lake Pupuke, further investigations have been commissioned to identify the key drivers of lake health decline. Several mitigation measures are being considered to manage eutrophication and the risk of harmful algal blooms, these measures are set to be implemented by summer 2019.

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	<p>Risk sources:</p> <ul style="list-style-type: none"> Highly erodible land, Rural and forestry land use Steep terrain Urban contaminants <p>Pressure effects on water:</p> <ul style="list-style-type: none"> Urban land use, urbanising catchments Rural land use <p>Future risks:</p> <ul style="list-style-type: none"> Potential urban development throughout watershed that is led by private developers. Silverdale West Structure Plan Rural land use (land banking so poor management) Forestry Motorways and other roading projects 		
<p>West Coast Watershed: The West Coast watershed extends from the top of South Head (Kaipara Harbour) across the Manukau Harbour entrance to the boundary of the Waikato River to the south and feeds into the Tasman Sea marine environment. It includes part of the Waitākere Ranges, the iconic west coast beaches, coastal dune lakes and many first order and intermittently flowing streams. The West Coast is an entirely rural watershed.</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Lake Rototoa.</p> <p><i>For an aerial photograph of the catchment please see attached file: AtRiskCatchments_Lake Rototoa.pdf</i></p>	<p>Watershed level pressures and context: <i>E-coli</i> is the main risk to this area, particularly in the West Coast lagoons impacted from onsite waste water. Eutrophication in the Dune Lakes, in particular Lake Rototoa is a potential risk. Kereta, Kuwakitai, and Rototoa. Show some nutrient enrichment and elevated chlorophyll A.</p> <p>At Risk Catchment: Lake Rototoa Lake Rototoa is at risk due to eutrophication from nutrient enrichment and also the activity of pest fish. The lake water quality state sits within the NPS-FM “B” state for overall Chlorophyll-a and in the “B” state for both total nitrogen and “A” for total phosphorus.</p> <p>Whilst the attributes for Rototoa are relatively good, Lake Submerged Plant Index (SPI) monitoring suggests some significant issues. Most recently a slight but significant reduction in the maximum depth extent of plants suggests water clarity has decreased. This is in keeping with lower water transparency noted by divers and the degree of blue-green algal coatings on plants. Coarse fish, such as perch, goldfish, rudd and tench are recorded from the lake (New Zealand Freshwater Fish Database). Of concern is the level of sediment disturbance usually associated with coarse fish browsing, which was evident near the maximum depth limit of vegetation.</p> <p>Catchment Values at risk:</p> <ul style="list-style-type: none"> Ecosystem Health: the native ecosystem has been supplanted, and habitat changed by exotic species Cultural: impacts on recreational values and traditional uses, including gathering of kai Recreational: Fishing through change in diversity of fish species <p>Risk sources:</p> <ul style="list-style-type: none"> On site waste water management Forestry land management Pest fish and plants in lakes <p>Pressure effects on water:</p> <ul style="list-style-type: none"> Old or poorly maintained on site waste water systems <p>Future risks:</p> <ul style="list-style-type: none"> Increased population and visitors to coastal settlement areas with onsite systems Potential urban development throughout watershed. Pest fish and plants in lakes 	<p>RMA that are in place or planned to address the issues in the catchment:</p> <p>See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls</p>	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <p>Lake Rototoa has been identified under the Proposed Regional Pest Management Plan as at risk, as follows:</p> <p><i>“While Tomarata and Rototoa do have some pests present, they retain relatively high freshwater biodiversity values. However, these ecosystems are at imminent risk of collapse due to pests and other pressures, leading to the likely loss of charophyte meadow ecosystems from the region, and loss of important populations of at-risk native species such as waikaka / black mudfish.”</i> (pg 190)</p> <p>As a result funds from the new Auckland Council Environment Targeted Rate 2018-2028 are earmarked to attempt the eradication of a suite of pest fish and aquatic weeds these two lakes. Scoping for this project is currently in its early stages.</p>

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Name and location of the at-risk catchment	Reason for inclusion	Current and proposed planning provisions	Non-regulatory approaches
<p>Waitematā Harbour Watershed: The Waitematā Harbour watershed includes the approximately 45,000 hectares of Auckland that drains to the Waitematā Harbour. The Waitematā Harbour is surrounded by urban residential, commercial and industrial land uses, including Auckland city centre. The outer northern and western extents of the watershed contain substantial areas of rural and forest land use.</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Oakley Creek.</p> <p><i>For an aerial photograph of the catchment please see attached file: AtRiskCatchments_Oakley Creek.pdf</i></p>	<p>Watershed level pressures and context: Most of the foreshore along the Waitematā Harbour has been reshaped or reclaimed and lowland land cover has changed from native forest to rural pasture and urban areas.</p> <p>Long term marine water quality monitoring has shown an increase in suspended sediment—or a decrease in water clarity—and an increase in nitrogen from ammonia. These trends were particularly prevalent in the Upper Waitematā where recent development has potentially contributed to these decreasing trends in water quality. Benthic ecology is also showing declining health trends in the Upper Waitematā.</p> <p>The central harbour area has been subject to long-term sediment inputs and stormwater contaminants such as heavy metals (Pb, Zn and Cu). Contaminant levels and muddiness are highest in the tidal arms such as Whau, Henderson and Upper Waitematā. <i>E-coli</i> from combined sewer systems on the central isthmus is also a persistent issue for this watershed.</p> <p>At Risk Catchment: Oakley Creek Te Auaunga Awa The Oakley Creek is an example of an at-risk freshwater catchment within the Waitemata watershed. The Oakley Creek sits within the NPS-FM “E” state for E.coli, which is below the minimum “C” state. It currently meets the ANZECC guidelines for copper and zinc for 90% protection of species and meets the ANZECC guideline for turbidity. However, projected growth and redevelopment in this catchment pose a risk of these contaminants increasing.</p> <p>Catchment values at risk:</p> <ul style="list-style-type: none"> • Human Health: Recreational swimming risks from elevated pathogens • Ecosystem Health: impact on the freshwater ecology from contaminants – metals and sediment • Cultural: impacts on recreational values and traditional uses, including gathering of kai and mauri of the river • Natural form and character: the visual and physical characteristics, and consequently natural movement / flow regime of water are impacted by artificial channelling <p>Risk sources:</p> <ul style="list-style-type: none"> • Sediments • Urban contaminants • Faecal contamination <p>Pressure effects on water:</p> <ul style="list-style-type: none"> • Urban land use, urbanising catchments, particularly in areas with ageing infrastructure <p>Future risks:</p> <ul style="list-style-type: none"> • Potential urban development throughout watershed that is led by private developers • Future urban areas in as identified in council plans and strategies: Dairy Flat Structure Plan as well as development nodes identified in the link below: https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/Documents/ds-nodes-combined.pdf. 	<p>RMA that are in place or planned to address the issues in the catchment:</p> <p>See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls</p>	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <p>A number of projects to upgrade and improve waste and stormwater networks, increasing capacity and reducing overflows. Examples include the Central Interceptor, Northern Interceptor, the \$520 million Western Isthmus Water Quality Improvement Programme, and Wynyard Quarter wastewater network improvements.</p> <p>Parts of Oakley Creek have a concrete channel that Auckland Council are replacing with a naturalised stream channel. https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-projects/projects-central-auckland/projects-auckland-isthmus/Pages/te-auaunga-awa-stormwater-channel.aspx</p> <p>The project will increase the flood capacity of the creek which should lead to water quality improvements and restore native ecologies. This will mitigate the increase in stormwater as a result of growth in the catchment. The project is due for completion in 2019.</p> <p>The Oakley Creek catchment is predominately serviced by a separate wastewater and stormwater network with two small pockets of combined drainage (<5% of the catchment). The sewer network suffers a large wet weather contribution which results in discharge via engineered overflow points to Oakley Creek. The proposed Central Interceptor (CI) will provide considerable improvement to the frequency and volumes of wastewater overflow to Oakley Creek. The Central Interceptor is expected to be in operation by 2026, with construction due to start in 2019.</p> <p>For the combined drainage areas, significant growth is expected within these areas and separation of these areas will likely be driven by this growth.</p>

AT RISK CATCHMENTS FOR AUCKLAND			
Name and location of the at-risk catchment	Reason for inclusion	Current and proposed planning provisions	Non-regulatory approaches
<p>Manukau Harbour Watershed: The Manukau Harbour watershed covers approximately 89,000 hectares of the Auckland region (or roughly 19% of the regions land area) and drains to the Manukau Harbour. The harbour itself is just under half the size of its surrounding watershed, at roughly 37,000 hectares. Harbour water eventually exits to the west coast and the Tasman sea.</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Armour Bay and South Eastern catchments.</p> <p><i>For an aerial photograph of the catchment please see attached files for the SE catchments: AtRiskCatchments_Hingaia Stream.pdf, AtRiskCatchments_Ngakarora Stream.pdf and AtRiskCatchments_Whangamaire Stream, and for Armour BaY: AtRiskCatchments_Armour Bay</i></p>	<p>Watershed level pressures and context: The varied land use and wide range of contaminant sources pose a risk to this catchment. This is compounded by the fact that there will be roughly 1000 ha of greenfield development from extensive rural land use to urban industrial and residential.</p> <p>The western and southern shores of the main body of the harbour are relatively unmodified. Coastal structures and urban development are more common on the northern and eastern parts of the harbour, which has affected water quality. While the main harbour is well flushed, the tidal areas are muddy with relatively high contaminant levels and impacted ecology in some locations.</p> <p>In the northern area for example there are high levels of <i>E-coli</i> which result from septic tanks and poor wastewater infrastructure e.g. Laingholm, but there are also historical issues such as old landfill sites contributing to poor water quality.</p> <p>Water quality in the Manukau Harbour is improving, but it is still in poor condition. Nitrate concentrations are five times higher than threshold values even though they have been declining over the last ten years. Suspended sediment concentrations are also high, with 75% of samples above the threshold. Water temperature has also increased by 1°C over the last 10 years, adding another stressor to the ecosystem.</p> <p>There are very high concentrations of nitrate in the shallow volcanic aquifers in the Franklin area. This coupled with the future urban growth areas of Drury, Patumahoe and Pukekohe make this a very multi-faceted risk area.</p> <p>Erosion and sediment discharge from market garden lands in Franklin area is also a risk. In the winter-spring period, with its high frequency of storms and poor ground cover, sediment discharge from horticultural land could reach 1000t/km² in an individual storm.</p> <p><u>At Risk Catchment: Armour Bay</u> Streams discharging into Armour Bay (northern Manukau Harbour) are at-risk where levels of faecal contamination have recently reached those that pose a risk to human health, due to onsite wastewater management.</p> <p><u>At Risk Catchment: South Eastern catchments (Hingaia, Ngakarora, Whangamaire)</u></p> <p>The South Eastern catchments of the Manukau Harbour watershed are at risk due to a number of factors, including high and increasing nutrient concentrations and also large-scale future urban growth in the area.</p> <p>In South Eastern catchments, rivers monitored for State of the Environment reporting in this sub-catchment have high levels of nutrients, particularly nitrogen. For nitrate-nitrogen toxicity, the Whangamaire Stream is in the "D" state, and the Ngakarora and Waitangi Rivers are in the "C" and "B" states, respectively. Furthermore, the Ngakarora River shows an upward trend in nitrate concentration with a downward trend from the "C" state for nitrate toxicity.</p> <p>The Whangamaire Stream, Ngakarora River and Waitangi</p>	<p>RMA that are in place or planned to address the issues in the catchment:</p> <p>See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls</p>	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <p>As part of the council Water Quality Targeted Rate 2018-2028, swimming areas identified as having levels of faecal contamination which pose a potential high risk to human health will become part of an investigation programme which will assess the source of the contamination (such as bird, human, dog or stock) as well as possible mitigation actions. This programme includes Armour Bay, as well as other catchments along the Upper Manukau Harbour.</p> <p>In addition the water quality targeted rate will see the roll out of an onsite wastewater compliance monitoring programme to all catchments serviced with onsite wastewater systems. The aim of this programme is to record whether the properties with onsite systems are regularly maintaining these devices. The above catchments which will be included in this monitoring programme are: Armour Bay, Fosters Bay, and Huia Beach.</p> <p>For the South Eastern Catchments models will be developed to understand better the sources and risks to groundwater and surface water from nitrogen fertiliser use in food production activities in the Franklin Area.</p>

AT RISK CATCHMENTS FOR AUCKLAND

Name and location of the at-risk catchment	Reason for inclusion	Current and proposed planning provisions	Non-regulatory approaches
	<p>River also all sit within the NPS-FM "D" or "E" state for E.coli, which is below the minimum "C" state.</p> <p>Catchment values at risk:</p> <ul style="list-style-type: none"> • Human Health: Recreational swimming risks from elevated pathogens • Ecosystem Health: potential impacts to the ecology of the south eastern streams and rivers through increased nutrients, and similarly to Armour Bay through faecal contamination • Cultural: impacts on traditional uses and values, including gathering of kai and mauri of the streams and rivers <p>Risk sources:</p> <ul style="list-style-type: none"> • Poorly maintained, aged septic tank systems • Development earthworks • increased impervious surface area of newly developed land (future) • Increased contaminant loads from increased vehicle numbers, new roads and stormwater/wastewater systems • Poor rural land management practice <p>Pressure effects on water:</p> <ul style="list-style-type: none"> • Septic tank malfunctions due to age or lack of maintenance • Agricultural and horticultural land use (introducing further nutrients into Franklin groundwater) • Earthworks and environmental pressures from urban development activities <p>Future risks:</p> <ul style="list-style-type: none"> • Urban growth in greenfields areas e.g. Pukekohe Node (includes Paerata) (17,000 Ha., 14,000 dwellings by 2050) https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/Documents/ds-nodes-combined.pdf • Drury – 2,500 Ha. 20,000 dwellings by 2050 • Papakura/Takanini 700 Ha. 5,000 dwellings • Potential urban development throughout watershed that is led by private developers • Continued food production in Franklin contributing to continued high nitrate loads to groundwater, and sediment discharge to water bodies in winter time • There is a future risk of increased contaminants from future urban land use (increased metals from more roofs and vehicles, decreased groundwater recharge where recharge zones are developed) • Tension between the need for food production for a growing population in Auckland and the need for housing. This catchment is servicing both of these highly important needs 		

AT RISK CATCHMENTS FOR AUCKLAND

Name and location of the at-risk catchment	Reason for inclusion	Current and proposed planning provisions	Non-regulatory approaches
<p>Islands Watershed: This watershed plan focuses on the four Hauraki Gulf Islands with urban areas, namely Waiheke, Great Barrier, Kawau and Rakino. The numerous other Hauraki Gulf Islands located east of Auckland, including Motuihe, Motutapu, Motukorea (Browns Island), Pakatoa, Rangitoto, Tiritiri Matangi, are effectively uninhabited.</p> <p><i>An aerial photograph of the watershed is included below.</i></p>  <p>Specific catchment(s) at-risk within the watershed: Western Waiheke.</p> <p><i>For an aerial photograph of the catchment please see attached file: AtRiskCatchments_West Waiheke.pdf</i></p>	<p>Watershed level pressures and context: For both Waiheke and Great Barrier, this is a result of onsite waste water management. On Waiheke, this pressure is exacerbated due to tourism pressure.</p> <p>At Risk Catchment: Western Waiheke Waiheke has had ongoing issues in E. Coli, in particular in Little Oneroa catchment, which has had issues for many years. The Western Waiheke catchments (those West of Onetangi, including (but not limited to) Onetangi, Palm Beach, Surfdale, Oneroa and Little Oneroa) has been identified at risk due to the increased tourism on the island.</p> <p>Catchment values at risk:</p> <ul style="list-style-type: none"> • Human Health: Recreational swimming risks from elevated pathogens • Cultural: impacts on traditional uses and values, including gathering of kai <p>Risk sources:</p> <ul style="list-style-type: none"> • Poorly maintained, aged septic tank systems • Development earthworks (Waiheke) <p>Pressure effects on water:</p> <ul style="list-style-type: none"> • Tourism • Development <p>Future risks:</p> <ul style="list-style-type: none"> • Increased tourism and demand for rentals and housing on Waiheke will put pressure on water quality due to a greater number of septic tank systems and potentially a greater number of issues • Potential urban development throughout watershed 	<p>RMA that are in place or planned to address the issues in the catchment:</p> <p>See section 3 of Auckland Council Staff introductory text on the Auckland Unitary Plan controls</p>	<p>Non-regulatory approaches that are in place or planned to address issues in the catchment:</p> <p>As part of the council Water Quality Targeted Rate 2018-2028, swimming areas identified as having levels of faecal contamination which pose a potential high risk to human health will become part of an investigation programme which will assess the source of the contamination (such as bird, human, dog or stock) as well as possible mitigation actions. Within the Western Waiheke catchment, the following areas are currently proposed under this programme: Oneroa, Onetangi, Palm Beach, Sandy Bay, and Surfdale.</p> <p>In addition, the Water Quality Targeted Rate 2018-2028 will see the roll out of an onsite wastewater compliance monitoring programme to all catchments serviced by onsite wastewater systems. The aim of this programme is to record whether the properties with onsite systems are regularly maintaining these devices. All the above catchments have onsite wastewater systems present.</p>