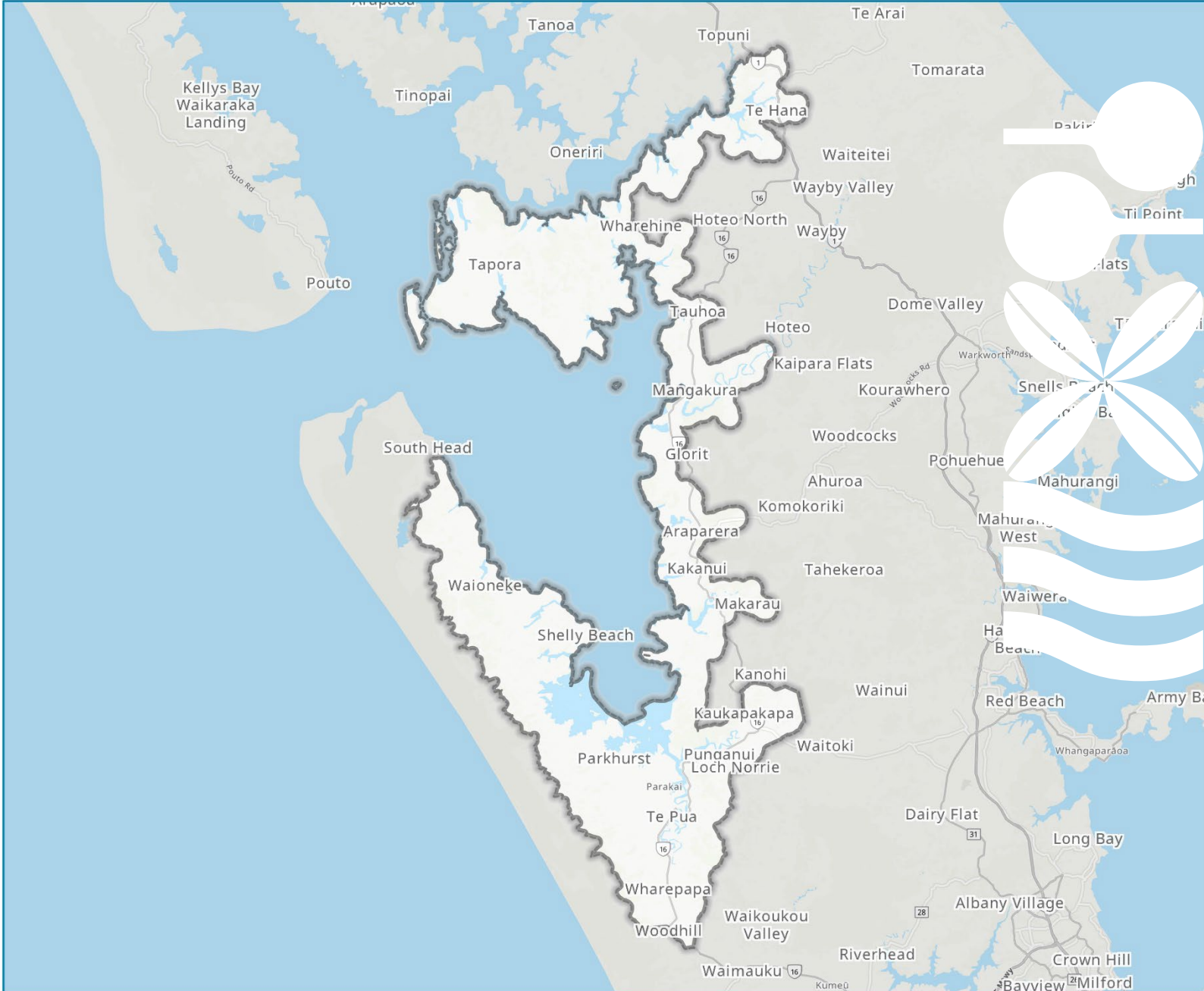




DRAFT for Engagement

Draft Shoreline Adaptation Strategies: Kaipara Moana (Harbour)

Shoreline Adaptation Plan

September 2024



2024

DRAFT Draft Shoreline Adaptation Strategies: Kaipara Moana (Harbour)

September 2024

Auckland Council

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Front Cover

Shoreline Adaptations Plan area overview map for Kaipara Harbour. Map prepared for Auckland Council by Tonkin + Taylor 2023.

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Glossary

Annual Exceedance Probability (AEP)	The probability of an event occurring in any given year. For example, the 1% AEP has a 1% chance of being met or exceeded in any given year.
AVD-46	Auckland Vertical Datum – 1946 was the mean sea level established in 1946 and used to define the zero datum for land development.
Biodiversity focus area (BFA)	An area of ecological significance prioritised by Auckland Council for conservation actions.
Coastal Marine Area	The coastal marine area is defined as the area of sea from the line of Mean High Water Springs (MHWS) to 12 nautical miles off the coast.
Fetch	The length of an area of the harbour, estuary or sea in which waves are generated by wind, measured in the direction of the wind.
Highest Astronomic Tide (HAT)	The highest tidal level that can be predicted to occur under average meteorological conditions and any combination of astronomical conditions.
Mean High Water Springs (MHWS)	The average of high levels of spring tide.
Significant Ecological Areas	Identified areas of significant indigenous vegetation or significant habitats of indigenous fauna located either on land or in freshwater environments or in the coastal marine area.

1.0 The Shoreline Adaptation Plan programme

Tāmaki Makaurau, Auckland, is a coastal city, bounded to the east by the South Pacific Ocean and to the west by the Tasman Sea. The region has around 3,200 km of dynamic coastline and encompasses three major harbours: the Kaipara, Manukau and Waitematā. Due to its location, much of the city's urban development and supporting infrastructure is concentrated in coastal areas and exposed to coastal processes such as erosion and inundation. These natural processes are considered hazards when they impact on things or locations of value. Climate change related to greenhouse gas emissions is contributing to rising sea levels, which have a range of impacts including increasing the frequency and magnitude of coastal hazard events. In 2021, Auckland Council began developing a series of area-based Shoreline Adaptation Plans (SAPs) as the first step for the SAP programme in achieving a resilient future for Auckland's coasts.

1.1 Purpose and use of this document

The purpose of this document is as a community consultation document.

This document does not represent a complete draft of a finalised Shoreline Adaptation Plan for Kaipara Harbour. It has been prepared solely to enable the community engagement process for the development of the Kaipara Shoreline Adaptation Plan (SAP) area.

The draft document provides a foundation to guide an understanding of the preliminary recommendations for adaptation strategies (across three timeframes) informed by the technical inputs of the Coastal Management Team within the Engineering, Assets & Technical Advisory department of Auckland Council.

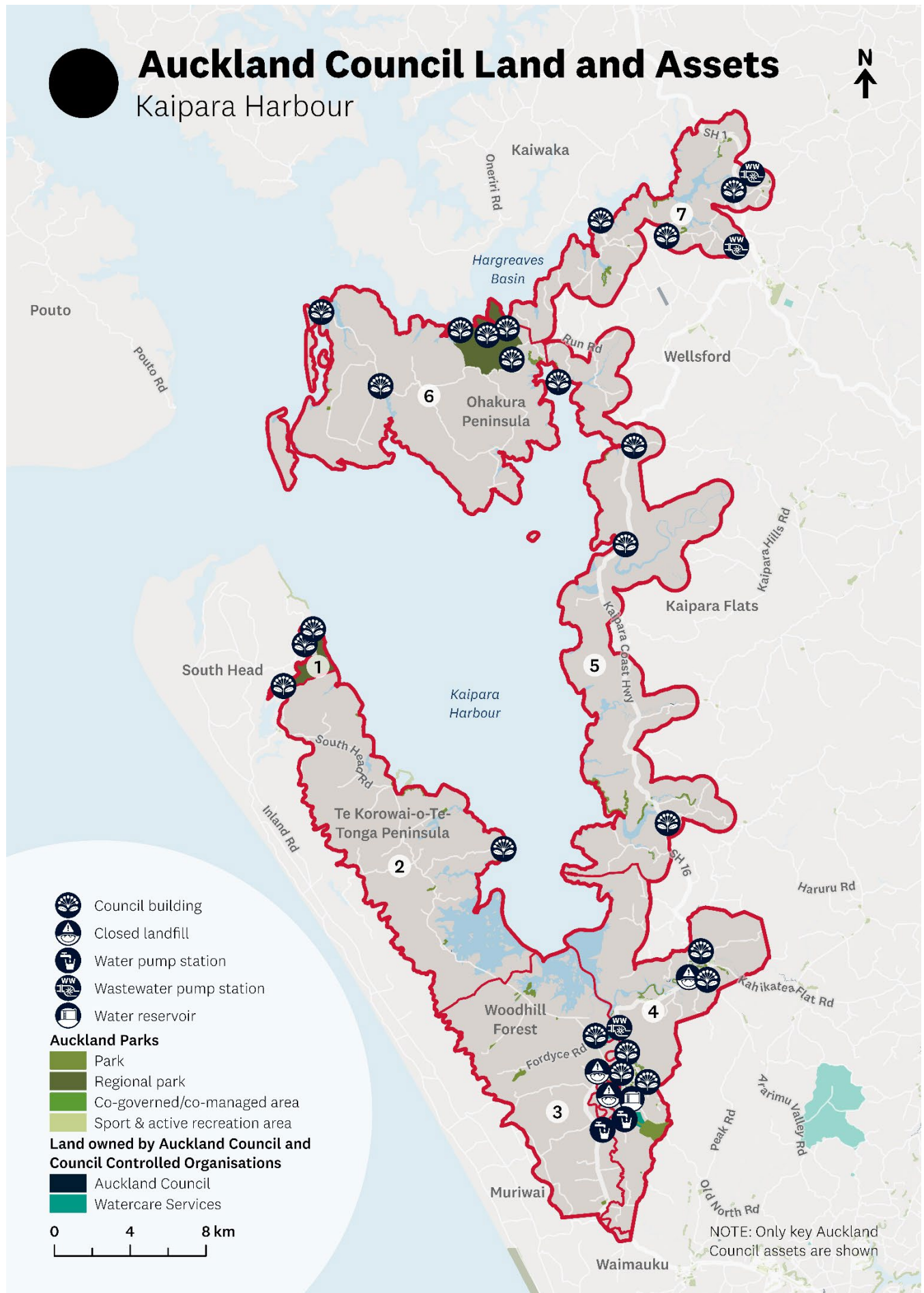
1.2 Auckland Council-Owned Land and Assets

Auckland Council-owned assets in the Kaipara Harbour SAP area are summarised in the table below. They are primarily located within the area's regional parks and recreation reserves. The two regional parks, Te Rau Pūriri and Ātiu Creek, located in Unit 1 and Unit 6 respectively, are the primary location of Auckland Council-owned assets in the Kaipara Harbour SAP area outside of the residential centres. This is shown in the following map (Auckland Council Assets) that clusters assets to reflect the SAP area level overview.

Assets include numerous sheds, toilets, and small buildings. Civic buildings are mostly found in and around Helensville, the largest population centre for this SAP area. Further detail on location of Auckland Council-owned assets at a unit level is included in the unit maps for each area.

Type	Description
Auckland Council Land	Regional parks: Te Rau Pūriri; Ātiu Creek. Co- governed park: Kaipātiki Reserve (formally Parakai Recreation Reserve) which is governed by the Te Poari o Kaipātiki ki Kaipara Recreation Reserve Board Local parks/reserves: Higham Road Waioneke; Lot 3 DP 393873, South Head Rd-Temp; South Head Road Mairetahi; South Head Road Waioneke; 5 James McLeod Road-Provisional; Omana Ave Esplanade Reserve; Shelly Beach Reserve; Omana Ave Stormwater Pond; Kiwitahi Road, Paehoka; Sec 1 SO 327676 Springs Road, Parakai; Springs Road Wharf & Boat Ramp; Fordyce Road Te Pua Auckland; Kaipara River Helensville; Kaipara River Parakai; South Head Road Haranui; Te Horo Marginal Strip; Parkhurst Cemetery; South Head Road Parkhurst; Takapau Reserve South Head Road; Te Hihi Creek South Head Road; Te Moau Reserve & River Esplanade; Thomas Grace Scenic Reserve; 35 Mill Road Helensville; Commercial Road, 27; Creek Lane; Sec 9 SO 336295 Kaipara View Rd Kiwitahi; Helensville Cemetery; Awaroa Stream Helensville; Bridge Street - Awaroa Stream Espl; Kaukapakapa River; Kaukapakapa Sh16 #887 Esplanade Res; Land at Mill Road Helensville-Temp; Mill Rd Esplanade Reserve Helensville; Ourauwhare River Kaipara Coast Highway; Pipitiwai Creek Helensville; Waikahikatea Stream Kaukapakapa; 4 Oioi Lane Reserve - Provisional; Audrey Luckens - Rautawhiri Reserve; Awatiro Drive Reserve-Provisional; Cabeleigh Reserves; Green Lane Reserve; Helensville A & P (Civic Centre Grounds, River Reserve, River Walkway); Kaipara Crescent Reserve; Kaukapakapa Hall/Library/Fire Station; Kawariki Reserve - TEMP; Pioneer Reserve; Pipitiwai Reserve; Rata Reserve; Rautawhiri Park; Sinclair Park; West Park; Cabeleigh Drive Pond Reserve; Manuka Grove Stormwater Pond; Sw Drainage Basin Res - Urumaraki Ave; Sec 1 SO 62295 Wharehine, Tauhoa; Glorit Cemetery; Jordan Road; Kaipara Coast Highway Kakanui; Makarau Esplanade Reserve; Parkland Kaipara Coast HighW Tauhoa-Temp; Run Road Esplanades; Makarau Bridge Reserve; Mangakura Reserve; Naumai Domain Recreation Reserve; Omeru Scenic Reserve; Stables Landing Reserve; Tauhoa Landing Reserve; Te Pahi Stream Naumai; Taporā Cemetery; Okahukura Road; Birds Beach Recreation Reserve; Taporā Recreation Reserve; Wellsford Cemetery; Res behind 100 Harataua Rd-Temp; Reserve at 1020 Port Albert Road-Temp; Waimanu Rd Te Hana; Waireia River Wharehine Road; Wellsford Valley Road; Port Albert Recreation Reserve; Port Albert Wharf Reserve; Silver Hill Rd Esplanade Reserve; Te Hana Reserve; Watson Place Reserve Closed landfills: Helensville River Reserve; Makiri Street; Anderson Road.
Auckland Council Community Facilities	Toilets: Te Rau Pūriri; Shelly Beach Reserve; Kaipātiki Recreation Reserve Parakai; Rautawhiri Park; Sinclair Park; Creek Lane; Kaukapakapa Hall; Helensville A & P; Mangakura Reserve; Omeru Scenic Reserve Stables Landing Reserve; Ātiu Creek Regional Park (main entrance and campground); Birds Beach Recreation Reserve; Port Albert Recreation Reserve; Port Albert Wharf Reserve; Te Hana Reserve. Buildings: Shelly Beach Café; Shelly Beach Fire Station; Pukoro Bach at Kaipatiki; Mahana Tiny Home; Te Whare Oranga o Parakai; Bore Shed (Kaipātiki Recreation Park); 150 Parkhurst Rd (Parakai Recreation Park); Rautawhiri Pavilion; Change Room (Carpark Macky Rd); Kaukapakapa Pony Club; Helensville Museum; Shop 02 (Commercial Road, 27); Helensville Civic Centre; Helensville Scouts Den; Kaukapakapa Old Library; Kaukapakapa Hall; Helensville A & P (Green Stables; Half

Type	Description
	Round Barn; Horse Measuring Shed; Pavilion); Tauhoa Hall; Mangakura Boating Club; Tapora Community Hall; Settlers Centennial Memorial Grandstand; Barn (Former Hockey Pavilion); Rodney & Otamatea Soccer Club; Te Hana Hall Park assets: Te Rau Pūriri Regional Park assets (Shearing Shed; Workshop Store Shed & Office; Farm House; Chemical Storage; Prawn Farm Large Shed); McLeods Farm (Milking Shed, Hay Barn, House, Cottage, garages); Ātiu Creek Regional Park assets (Woolshed; Red Brick House Lean To; Campground Barn; Workshop and Office; Airstrip Storage Shed; Cottage Wood Shed; Retired Pump Shed Run Road; Cottage Storage; Ātiu Cottage Garage; Takahe Cottage Garage; Store Shed Sth; Kaipara Sheep Yards; Red Brick House; Courtyard House; Takahe & Ātiu Cottages; Barn (Heather Paddock); Agrichemical Shed; Flammable Goods Shed). Walking tracks: Te Rau Pūriri Track; Shelly Beach Reserve; Helensville Riverside;
Water assets and infrastructure	Mangakura Dam; Wishart Road Reservoir; Helensville Wastewater Treatment Plant; Kaipara Coast Water Supply Well Pump sheds: McLeods Farm(Te Rau Pūriri); Kaipātiki Recreation Reserve (WW); Rautawhiri (irrigation); Ātiu Creek Regional Park.
Transport Infrastructure	Boat ramps: Te Rau Pūriri Regional Park; Shelly Beach; Parakai Springs Road; Jordan Road; Makarau River; Mangakura Hoteo River; Stables Landing Witheford Road; Birds Beach Reserve; Wharf Road (Point Albert). Numerous road & road bridges.



1.3 Shoreline Adaptation Plan programme purpose and scope

SAPs are non-statutory, strategic documents that support the sustainable management of Auckland Council-owned coastal land and assets (including but not limited to, reserves, coastal defence structures and public facilities), over the next 100 years.

These plans consider the potential impacts of coastal erosion, coastal inundation, rainfall flooding, and climate-change (including sea-level rise). They seek to provide an adaptive planning approach that responds to the changing nature of Auckland's coastal environment, asset and infrastructure owners' requirements, and the needs and values of local iwi and local communities.

This 'first generation' (Series 1) of plans have been developed in response to the *Coastal hazards and climate change guidance* from the Ministry for the Environment¹. SAP area plans provide a 'roadmap' for changing coastal management strategies over time (over three timeframes) which can be further developed to implement Dynamic Adaptive Policy Pathways. The SAP area plans' development process also ensures consultation and the initiation of an opportunity for collaboration with mana whenua and communities to develop and implement the strategies identified in the SAP area plans. While this 'series' of SAP reports applies specifically to Auckland Council-owned land and assets, the programme acknowledges the need for holistic 'systems' thinking both in relation to coastal management and adaptation. The draft reports represent the initial technical recommendations ahead of the development of the full SAP report for the Kaipara area ahead of a second opportunity for community engagement and ongoing engagement with programme partners.

1.4 Limitations

The SAP Series 1 reports are strategic documents which set a high-level direction for Auckland Council's shoreline management and the assets within those areas. It is important to note there are limitations to the scope of these plans:

- They are not developed with the intention of applying directly to privately-owned land and/or assets within the wider SAP area.
- As the focus is on Auckland Council-owned land and assets, they are developed with limited consideration of third-party land, assets, interests and values.
- Draft adaptation strategies are selected using technical knowledge and understanding of coastal management. Analysis is supported by the best available information as set out in this report and supporting reports.
- They do not consider site-specific options assessments for what may be delivered in implementing each of the adaptive strategies.
- They do not consider any site or parcel-specific legal mechanisms, covenants or requirements or identify specific conditions or actions associated with individual resource consents (such as consents for coastal structures or discharge consents associated with water infrastructure).

¹ Ministry for the Environment (2024). Coastal Hazards and Climate Change – Guidance for Local Government

2.0 Kaipara Moana context and overview

2.1 Kaipara Moana SAP area overview

The Kaipara Harbour SAP area extends for approximately 400 km of the southern Kaipara Harbour, within Auckland Council's regional boundaries – starting at Te Rau Pūriri Regional Park, following the Kaipara Harbour coastline to Tapora, turning east up Oruawharo River and culminating at Te Hana.

Kaipara Harbour is a complex drowned-valley/barrier-enclosed type estuary which is broad and predominantly shallow. It is the largest estuary in New Zealand and one of the largest in the Southern Hemisphere with a high tide surface area of around 947 km² and around 800 km of coastline (Reeve, Swales, & Reed, 2008). The harbour extends for some 60 km from north to south at its widest point, with several large arms extending inland. The harbour mouth to the Tasman Sea narrows to approximately 6 km. The southern arm and Oruawharo River are within the Auckland region.

The harbour supports a diverse range of estuarine environments including extensive wave-exposed intertidal flats, sand barriers, extensive mangrove and salt marsh habitats and large tidal creek systems. There are many stream flows and rivers flowing into the harbour and low-lying land is prone to coastal inundation and catchment flooding.

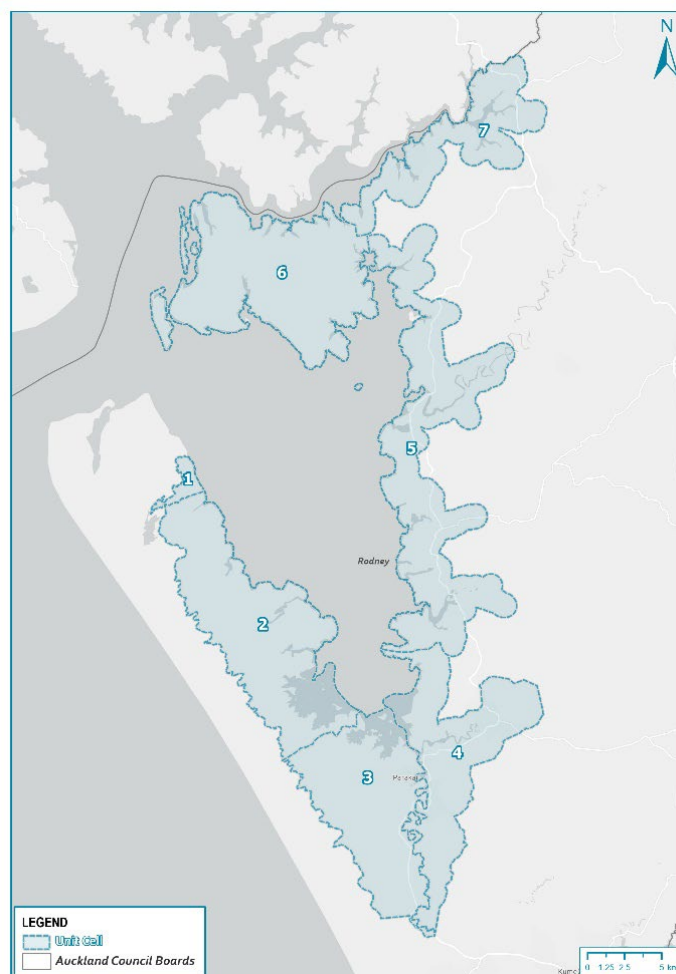


Figure 2-1: Unit areas for Kaipara Moana

2.2 Units and stretches

The Kaipara Moana SAP area is divided into 7 separate unit areas to enable a more detailed and comparative view of how risk from coastal hazards is attributed across the SAP area. Within each unit, smaller coastal ‘stretches’ have been identified based on coastal processes, the presence of Auckland Council-owned land and asset location, public-land boundaries, and infrastructure considerations. A stretch is the smallest scale at which the SAP plans apply bespoke adaptation strategies.

Table 2-1: Summary of the units and stretches for the Kaipara Moana SAP area

Unit		Stretches	Short	Mid	Long
Unit 1	Te Rau Pūriri	1.1 Te Rau Pūriri	LI	LI	LI
Unit 2	Waioneke to Parkhurst	2.1 Waioneke	NAI	NAI	NAI
		2.2 Aotea Shelley Beach	HTL	HTL	HTL
		2.3 Omana (South of Aotea Shelley Beach)	LI	LI	LI
		2.4 Mairerahi to Parkhurst	NAI	NAI	NAI
Unit 3	Parakai	3.1. Parakai North	NAI	NAI	APA
		3.2 Kaipātiki	LI	APA	APA
		3.3 Kaipara River inlet west	NAI	APA	APA
Unit 4	Awaroa/ Helensville	4.1 Kaipara River inlet eastern banks	NAI	NAI	APA
		4.2 Awaroa River side	HTL	HTL	APA
		4.3 Awaroa North & Showgrounds	LI	APA	APA
		4.4 Watercare treatment and Helensville north	HTL	APA	APA
		4.5 Kaukapakapa	NAI	LI	LI
		4.6 Kaipara Harbour River inlet North	NAI	NAI	NAI
Unit 5	Makarau to Wharehine	5.1 Kanohi	NAI	NAI	NAI
		5.2 Makarau	LI	LI	LI
		5.3 Kakanui, Araparera & Glorit	NAI	NAI	NAI
		5.4 Mangakura	LI	LI	LI
		5.5 Tauhoa & Wharehine	NAI	NAI	NAI
Unit 6	Okahukura Peninsula	6.1 Wharehine and Ōkahukura Peninsula	NAI	NAI	NAI
		6.2 Birds Beach	LI	LI	LI
		6.3 Tapora	NAI	NAI	NAI
		6.4 Ātiu Creek Regional Park	LI	LI	LI
Unit 7	Port Albert & Te Hana	7.1 Oruawharo inlet west	NAI	NAI	NAI
		7.2 Port Albert	LI	LI	APA
		7.3 Te Hana	NAI	NAI	NAI

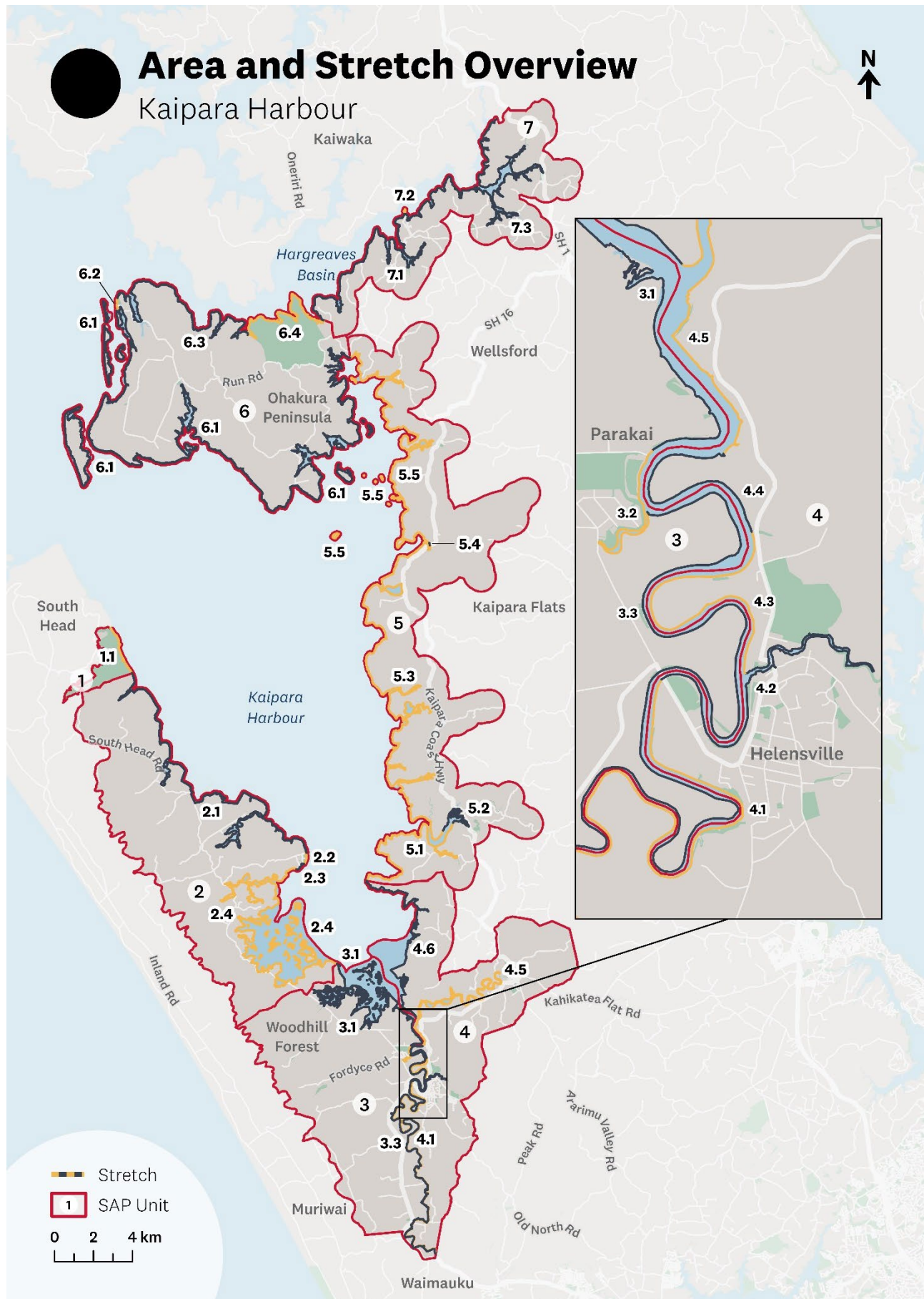


Figure 2-2: Coastal stretches and units within the Kaipara Moana SAP area

2.3 Natural hazards and climate change

This SAP report considers natural hazards relating to sea-level rise, catchment flooding, coastal inundation, coastal erosion and land instability. Other hazard types, including inland land instability, drought, tsunami and wildfires, are not within the scope of this assessment. Risks from low probability but high potential impact events, such as volcanic, tsunami, and earthquake events, are also not addressed through land-use planning. Instead, they are addressed through emergency management measures put in place by groups such as Auckland Emergency Management (Civil Defence).

Natural processes, such as coastal inundation and erosion, become hazards when they have the potential to negatively impact things of value. Tāmaki Makaurau / Auckland is frequently affected by natural hazard events and is likely to experience more frequent and severe events in the future due to climate change. Sea-level rise will increase the zone of exposure. For shoreline areas with assets and infrastructure, or cultural heritage sites near the coastal edge (including recreational and environmental areas), the impacts of coastal hazards can be significant.

For this work, the following timeframes are used to evaluate how the risk of coastal inundation, erosion and instability and sea-level rise adversely impacting the coast may change over time as a result of climate change, noting that projected conditions may occur sooner or later depending upon rates of climate change:

- Short-term, 2021-2050
- Medium-term, 2051-2080
- Long-term, 2081-2130.

2.3.1 Sea-level rise

Sea level influences how coastal processes interact with the landward edge, and can significantly impact the exposure of assets and facilities. As the climate changes and sea levels rise, this rise, combined with coastal storm surge (discussed further under coastal inundation below) will dictate the frequency and magnitude of future coastal inundation events. Over time, sea-level rise will alter the position of mean high-water spring levels and the land-sea interface.

The NZ SeaRise: *Te Tai Pari O Aotearoa Programme* (NZ SeaRise, 2024) has completed sea-level rise projections for the New Zealand coastline. This is based on Intergovernmental Panel on Climate Change (IPCC) Assessment Report 6 (AR6) projections and including climate-ocean responses, earth crustal, gravitational changes and vertical land movement (VLM) specific to New Zealand. The combination of projected sea-level rise and vertical land movement results in relative sea-level rise indicating more localised changes in sea level.

Ministry for the Environment guidance recommends using the high-end emission scenarios SSP5-8.5 for coastal planning (Ministry for the Environment, 2024). This is because the world has been on a high emissions trajectory over the past few decades, and the physical interactions at play that drive sea-level rise operate on very long timeframes (decadal to centuries). This means that there is a certain amount of sea-level rise that is 'locked in' for the future because of this long time frame, but the timeline of this is uncertain. There is uncertainty on future emissions and planetary tipping

points, which would mean the ‘expected’ sea-level rise might happen on a faster timescale than is expected (Ministry for the Environment, 2024). Table 2-2 below sets out MfE’s projections for the years in which absolute sea-level rise could be reached for a central location in New Zealand.

Table 2-2: Summary of approximate year when absolute sea-level rise (SLR) heights could be reached using the recommended projections for a central location in Aotearoa New Zealand (Source: Ministry for the Environment, 2024)

SLR (metres)	Year achieved for SSP5 -8.5 H+ (83 rd percentile)	Year achieved for SSP5 -8.5 (median)	Year achieved for SSP3-7.0 (median)	Year achieved for SSP2-4.5 (median)	Year achieved for SSP1-2.6 (median)
0.2	2035	2040	2045	2045	2050
0.3	2050	2055	2060	2060	2070
0.4	2055	2065	2070	2080	2090
0.5	2065	2075	2080	2090	2110
0.6	2070	2080	2090	2100	2130
0.7	2080	2090	2100	2115	2150
0.8	2085	2100	2110	2130	2180
0.9	2090	2105	2115	2140	2200
1.0	2095	2115	2125	2155	>2200
1.2	2105	2130	2140	2185	>2200
1.4	2115	2145	2160	>2200	>2200
1.6	2130	2160	2175	>2200	>2200
1.8	2140	2180	2200	>2200	>2200
2.0	2150	2195	2200	>2200	>2200

2.3.2 Coastal inundation

Coastal inundation is the flooding of low-lying coastal land that is normally dry, due to elevated sea levels. Extreme high sea-water levels (commonly referred to as storm tides) are a result of storm surge. Storm surge occurs due to relatively low atmospheric pressure (the “inverted barometer” effect of 1 cm rise in sea level per 1 hPa fall in pressure) combined with water level set-up at the coast from onshore or alongshore winds. When king tides (the highest spring tides that occur over the year) occur, the risk of coastal inundation is greatest. In the future, present-day temporary coastal inundation extents (e.g. during storms) will become permanent inundation as what is presently dry land will become intertidal due to sea-level rise.

A coastal inundation event with 1% Annual Exceedance Probability (AEP) (1% probability of occurring in any given year) has been considered in the short term, with no sea-level rise. In the medium term, 0.5 m of sea-level rise will increase the depth and extent of coastal inundation for the places that are exposed in the short term. The frequency of coastal inundation events is predicted to increase over

time. In the long-term, 1.0 m of sea-level rise will further increase the depth and extent of coastal inundation for the places exposed in the short and medium term. Some areas that were not previously exposed, may now be exposed to coastal inundation. These maps are available through Auckland Council's Geomaps tool online.

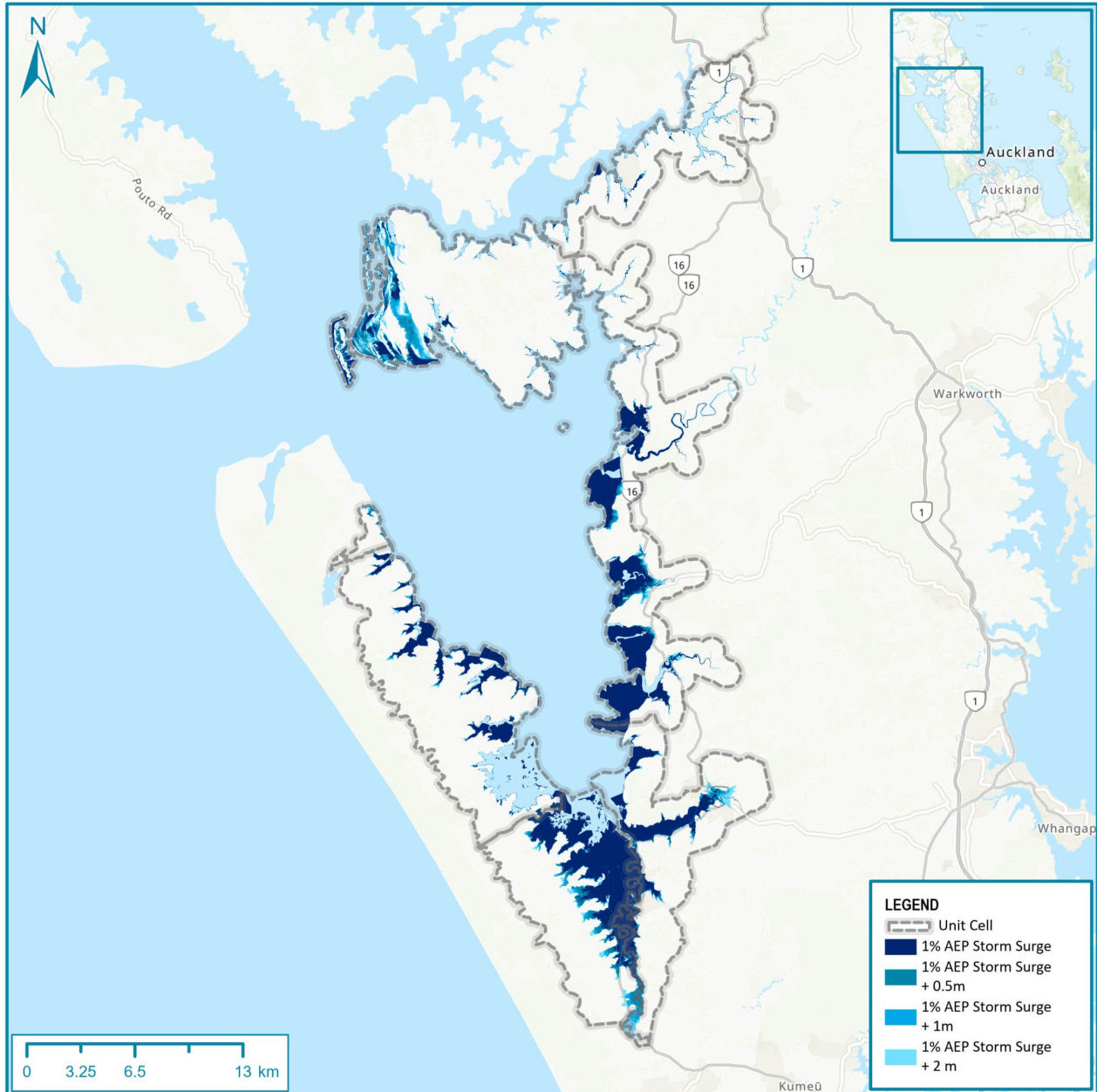


Figure 2- 3: Coastal inundation areas for Kaipara Moana (prepared by T+T for Auckland Council 2023) based on Auckland Council coastal inundation mapping (Carpenter, N., Roberts, R., & Klinac, P. (2020). Auckland's exposure to coastal inundation by storm-tides and waves.)

2.3.3 Coastal erosion

Coastal erosion is the process by which natural forces remove material from the land causing the coastline to gradually move inland over time. It is a complex process caused by factors such as wave energy, changes to sediment availability and land use, and sea-level rise. Although some types of shorelines (e.g. beaches) may undergo short-term periods or episodes of erosion and then recover (i.e. build out again), other types of shorelines (e.g. cliffs) continuously erode with no cycle of recovery. Coastal instability is the movement of land (typically as a landslide) resulting from the loss of support caused by coastal erosion.

Areas Susceptible to Coastal Instability and Erosion (ASCIE) have been mapped using IPCC Assessment Report 5 (AR5) climate change scenarios (RCP emission trajectories), and LiDAR data. In the short-term (2050), RCP4.5 has been used, whereas in the medium-term (2080), and long-term (2130), have been used the RCP8.5 emission scenario. The ASCIEs are shown as a line, representing the distance (in metres) landward of the current coastline that is predicted to be susceptible to coastal instability and erosion, for a given time. These maps are available through Auckland Council's Geomaps tool online.

Areas with higher exposure to erosive forces are more at risk to coastal instability and erosion, where waves interact directly with cliff faces (e.g. no beach) or where cliffs are steep with little vegetation cover. As sea-level rise occurs, waves will interact with a larger portion of the cliff and slope instability and erosion along the coast are expected to increase. Evaluation of projected shorelines in this report considers predicting Auckland's exposure to coastal instability and erosion, Technical Report (Roberts, 2020), as well as site-specific understanding based on recent observations. If observational trends change, this assessment of cliff erosion would require updating.

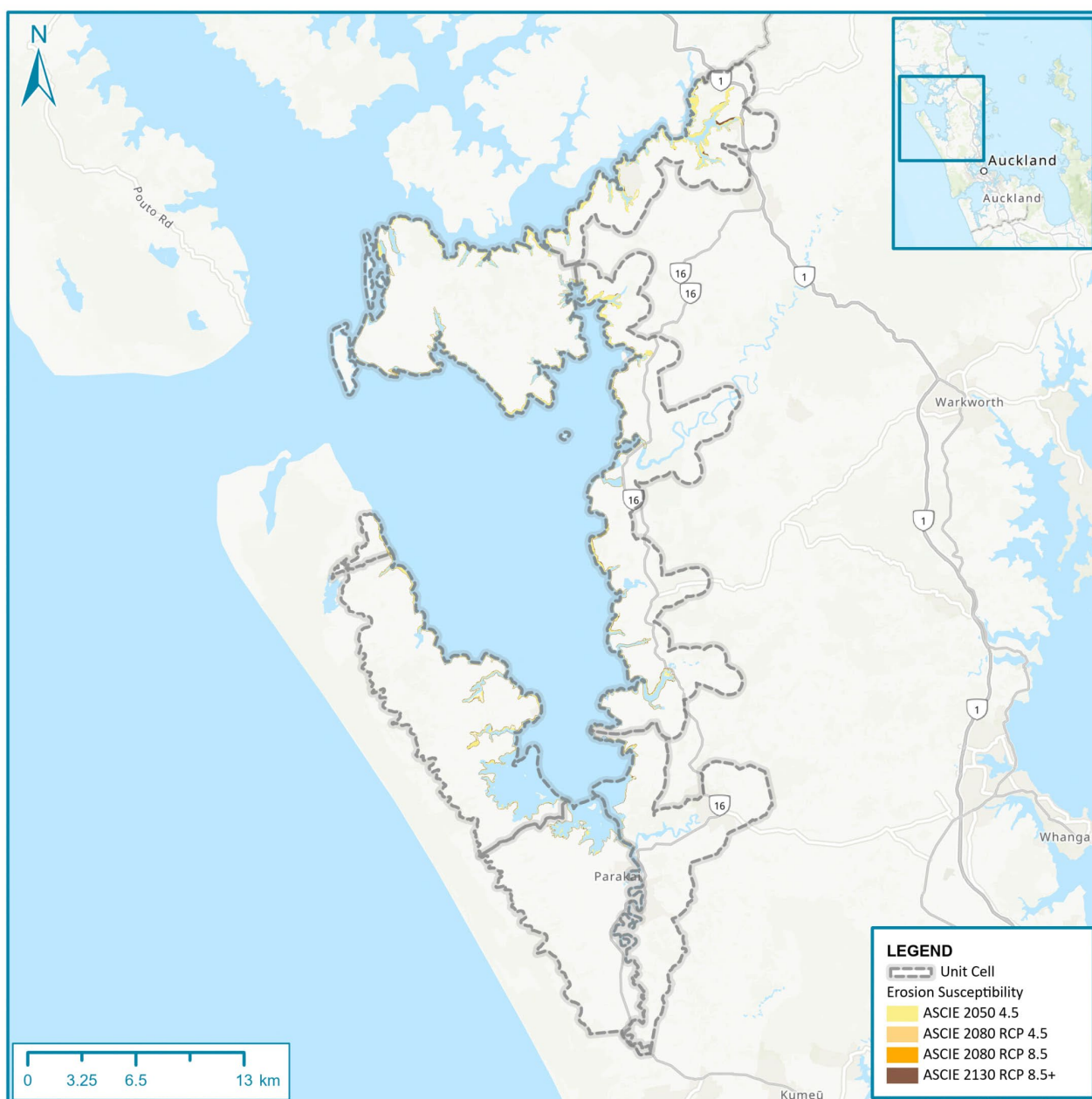


Figure 2- 4: Coastal instability and erosion susceptibility for Kaipara Moana, prepared by T+T for Auckland Council (2023) based on Roberts, R., N. Carpenter and P Klinac (2020). Predicting Auckland's exposure to coastal instability and erosion, Auckland Council, technical report TR2020/021

2.3.4 Catchment flooding

Flooding, as a result of extreme rainfall when the drainage capacity of the natural and/or built environment systems cannot cope, is a natural occurrence and is Auckland's most commonly occurring natural hazard. The flooding event with the highest probabilistic risk is a 1 % AEP event (1% probability of occurring in any given year), because an event of such intensity is likely to result in more severe consequences than flooding events that are more common but of lesser intensity. The Kaipara SAP area is intersected by a number of separate catchments which drain to the coast.

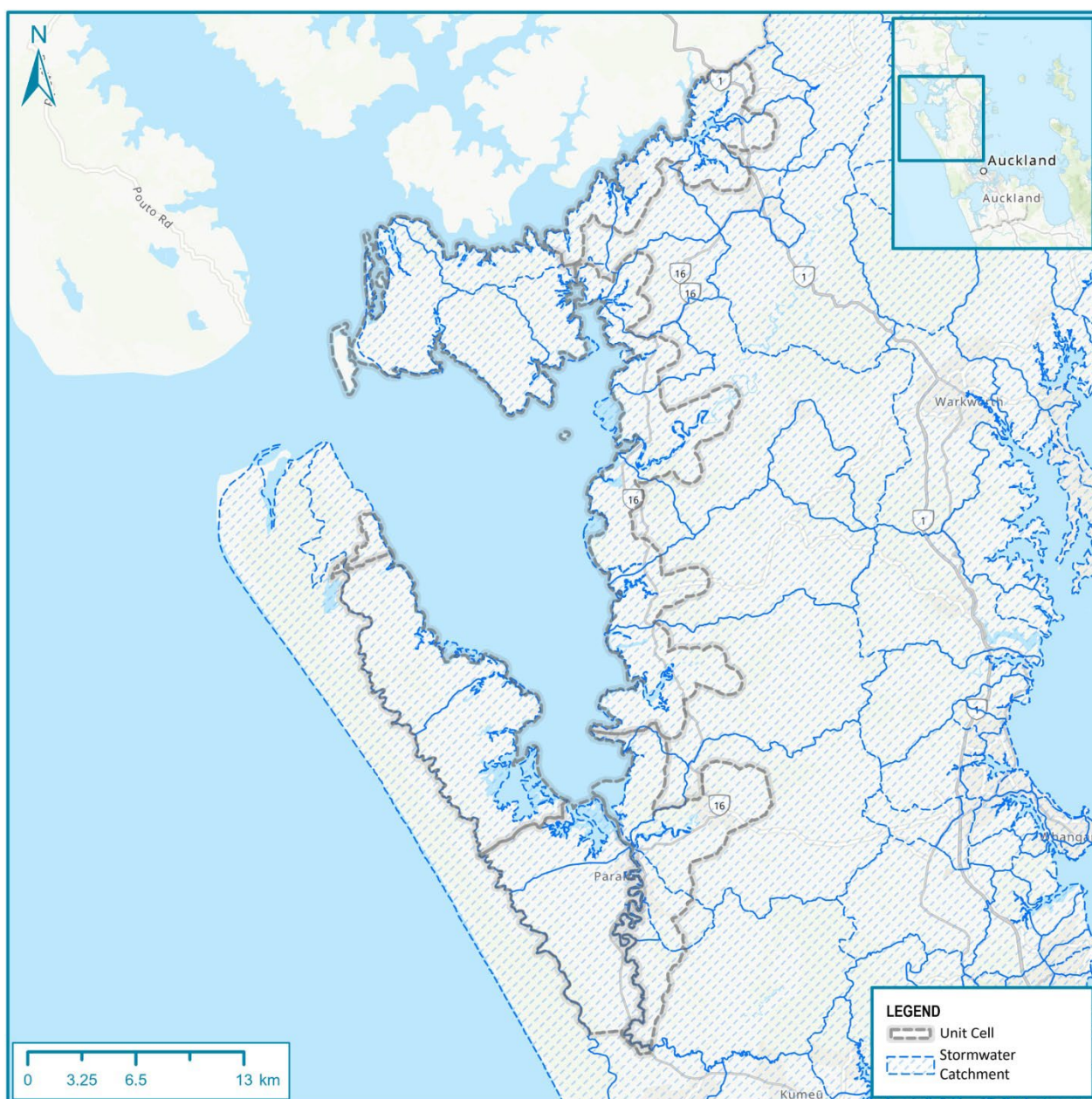


Figure 2- 5 Catchments located within the Kaipara Moana SAP area, prepared by T+T for Auckland Council

Auckland Council's web-based portal GeoMaps (Natural hazard theme) models the spatial extent of potential flooding. The maps, developed at catchment scale, indicate areas – flood plains, flood prone areas, flood sensitive areas, and overland flow paths - which may be affected by a rainfall event that has a 1% AEP, assuming maximum probable development in the catchment (as per the AUP:OP) and future climate change.

The map (Figure 2- 6) illustrates that flooding hazards are focused in lower-lying areas of Units 2 to 5 where streams and overland flow paths within the catchment drain to the coast. Overland flow paths and floodplains cross throughout the SAP area. Further details can be accessed through Auckland Council's Flood Viewer.



Figure 2- 6 Flood Plain areas 1% AEP hazard, area relevant to units 2-5 of the Kaipara Moana SAP area, Auckland Council Geomaps Flood viewer.

2.3.5 Other natural hazards

In addition to coastal inundation, coastal instability, coastal erosion, and flooding, Auckland is affected by a number of natural hazards that occur less frequently. Wildfire, volcanic activity, tsunamis, earthquakes, severe wind (such as cyclones), and tornadoes are other notable but less frequently occurring natural hazards that may impact Auckland. This report does not specifically consider risks from any of these aforementioned hazards in the development of these draft adaptation strategies.

2.4 Adaptation strategies and timeframes

Adaptation strategies are then assigned to each coastal ‘stretch’ over three timeframes:

- Short term (0-20 years)
- Mid-term (20-60 years)
- Long term (60-100 years)

The timeframes consider an assumed change in sea-level rise in relation to the coastal hazards present and consider the spatial extent of this based on Auckland Council’s best available information. This translates to the consideration of the sea-level rise scenarios over the timeframes as follows:

- For the short term, a 1% Annual Exceedance Probability (AEP) (1% probability of occurring in any given year) coastal inundation event has been considered in the short term.
- In the medium term, 0.5 m of sea-level rise is considered and the impact of this on the 1% Annual Exceedance Probability (AEP) event.
- In the long-term, 1.0 m of sea-level rise is considered. And the impact of this on the 1% Annual Exceedance Probability (AEP) event.

The adaptation strategies are described below and are applicable to all Auckland Council-owned land and assets and may respond to more than one hazard risk, e.g. coastal erosion, coastal inundation and catchment flood risks may all be relevant considerations in some coastal areas.

SAP area plans provide a ‘roadmap’ for changing coastal management strategies over time (over three timeframes). Further engagement and focus for each SAP area will be required to identify ‘signals triggers and thresholds’ to replace timebound assumptions and ensure plans are responsive to a changing environment.

Strategy name	Summary	What does this mean?
Hold the line	The coastal edge is fixed at a certain location.	• Defence of the coastal edge may be through nature-based options (e.g. beach nourishment) or engineered hard structures (e.g. sea walls). • Nature-based options are the preferred method where possible, but in most cases, engineered hard structures would be required. • An identified use or service is maintained within its existing location, e.g. a road is maintained in a fixed location or parks’ land uses are maintained in an existing location. • This approach could result in losing some intertidal areas or beach space due to preventing landward realignment of the coast in response to sea-level rise.
Limited intervention	Maintaining and managing existing assets, uses and land.	• Repair and maintenance of existing protection structures. Works may support localised realignment of individual assets. • Maintain uses or assets within a general area, not in a fixed location. • Does not support a fixed coastline.

Strategy name	Summary	What does this mean?
Adaptation priority area	Further adaptation planning is required to manage risks to Auckland Council-owned land and assets.	• Further engagement with multiple partners, communities and stakeholders will be required to ensure risk from coastal hazards can be managed and other values maintained. • Assets and land uses are relocated or realigned from hazard areas to reduce risk to assets/activities and maintain identified values (ecological, cultural, recreational etc). • Relocation is planned and undertaken proactively over time. • Planning to retreat or relocate assets and land uses are responsive to community, cultural and ecological opportunities needs and aspirations. • Supports opportunity for nature-based solutions, and maintenance of coastal values.
No active intervention	Natural processes are allowed to continue. Pro-active management of risk to Auckland Council land and assets is not identified	• Includes no investment in the provision or maintenance of any hazard protection structures associated with coastal hazards and flood protection (does not apply to the management of land stability or subsidence or other hazard risk management). • This strategy is identified for areas of the coastline where Auckland Council-owned land and assets are not identified as exposed/vulnerable to coastal hazard and catchment flooding risk. • Does not preclude the management of risk if required.

2.5 Next steps

Draft strategies and supporting notes included in this document are designed to inform the community and enable feedback through the engagement process. Once engagement has been completed, all feedback will be reviewed and analysed.

Unit and stretch-specific feedback on the adaptation strategies will be considered alongside feedback and advice from asset owners, mana whenua and technical experts. This information will be used to support review of the draft strategies alongside use of a decision-making framework to confirm selection of final strategies. The number and extent of stretches within each unit may also be subject to review following engagement process and review.

The final Shoreline Adaptation Plan will include further detail on the social, cultural, ecological, unique regulatory or policy context. Also included at the SAP, unit or stretch scale may be inputs from local iwi, communities and other area specific context or guidance notes to support implementation. These notes may also reference feedback received through this engagement process and community engagement reports.



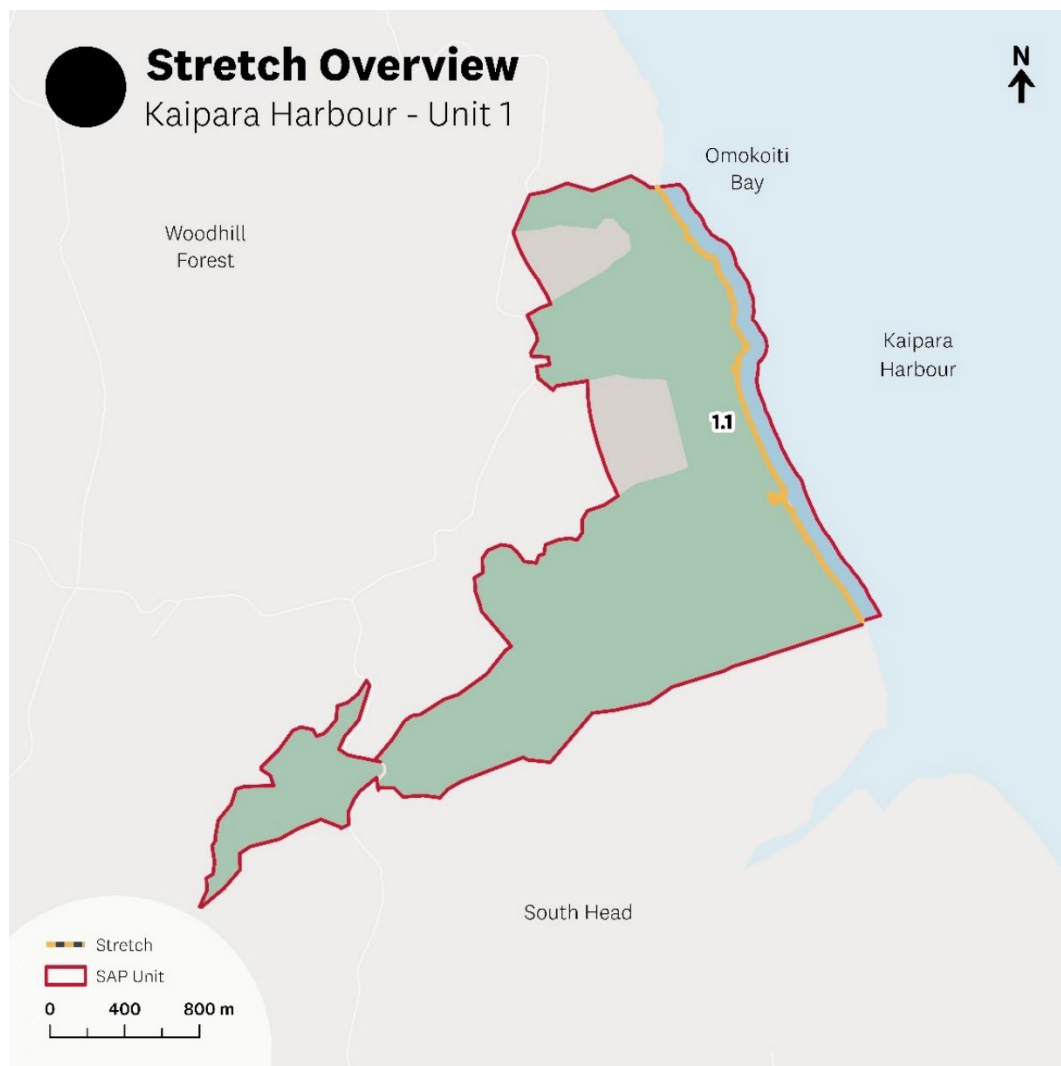
Unit 1

Kaipara Harbour



Unit 1: Te Rau Pūriri

Unit 1 encompasses Omokoiti Bay in the north and Te Rau Pūriri Regional Park in the south. At the unit level, risk from coastal erosion susceptibility to Auckland Council-owned land and risk to environmental features such as ecological areas is moderate. This unit is generally bordered by privately owned and DoC land on either side. The recently developed Regional Parks Management Plan² identifies regionally significant geological features located within the park, including at the mouth of Pataua Creek where there is one of the best examples of a 6 m high coastal terrace formed by the high sea level during the last interglacial period (about 120,000 years ago).



² <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/parks-sports-outdoor-plans/regional-parks-management-plans/Documents/regional-parks-management-plan-2022.pdf>

DRAFT Adaptation strategy summary stretch 1.1

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
1.1: Te Rau Pūriri From the commencement of the SAP area at Omokoiti Bay in the north, culminating at the end of the regional park to the south. The stretch includes regional park land, associated fencing, walking tracks and amenities.	LI	LI	LI	Limited intervention provides for the management of risk to low-lying areas of the park over time. This may necessitate the need to relocate defined park assets landward. There may also be a need to support ecosystems to manage dune habitats.



Unit 2

Kaipara Harbour



South Head
Hall

S Head Rd

South Head
Golf Club

Wilson Rd

Shelly Fire
Station

Shelly Beach
Reserve



Kawau Parua
Inlet

S Head Rd

Haranui Marae

- Unit boundary
- Informal recreation park
- Auckland Council owned land
- Jetty / wharf
- Boat ramp
- Playground
- Community buildings
- Marae

0 1km 2km

Unit 2: Waioneke to Parkhurst

Unit 2 includes the coast south of Te Rau Pūriri Regional Park and culminates at the northern side of Haranui Road. It includes the islands in the Kawau Parua Inlet (e.g. Waikauri Island, Motukuru Island, Puharakeke Island and Opahekeheke Island).

Auckland Council-owned land is limited within the unit, located mainly at the coastal settlement of Shelly Beach. Auckland Council community facilities, including Shelly Beach Reserve, recreational assets and wharf area and transport infrastructure (South Head Road, Shelly Beach Road) are currently exposed to coastal hazards with risk increasing over time. Risk from coastal erosion susceptibility and coastal inundation is relatively low for water infrastructure, reflective of the large rural area and limited assets present.

Exposure of significant ecological areas (including the Islands in the Kawau Parua Inlet, either side of Parekawa Creek) and identified cultural sites from coastal inundation and coastal erosion susceptibility is high where the majority of cultural and significant ecological areas are located in coastal areas.



DRAFT Adaptation strategy summary stretches 2.1 to 2.4

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.1: Waioneke Commences at the start of Unit 2 (south of the regional park) and includes all the coastline until the northern headland at Shelley Beach.	NAI	NAI	NAI	No active intervention is identified reflective of predominately private ownership and the location of small unconnected, unmaintained areas of esplanade reserve. Coastal inundation presents a risk to Auckland Transport roading infrastructure in low-lying areas. Roads in the area include Higham Road, McLeod Road, Mareitahi Road, Southhead Road. No active intervention does not preclude that asset-specific measures may need to be identified to confirm continued safe roading connections are maintained.
2.2: Aotea Shelley Beach Commences at the headland to the north of Shelley Beach Road, includes the Shelley Beach shoreline and culminates at the headland adjacent to James McLeod Place. This stretch includes key community and harbour access facilities; Shelley Beach Road, Shelley Beach recreational reserve, playground, parking, boat trailer parking, wharf and boat ramp.	HTL	HTL	HTL	Hold the line confirms the need to maintain the coastal edge to respond to coastal erosion. This includes the maintenance of existing coastal management structures that includes a seawall and groyne structures that mitigate shoreline and beach erosion within the stretch. With sea-level rise, inundation from the coast will be an increasing issue over time. Management of risks from inundation to trailer parking and the roading connections may be required to protect these uses in the long term.
2.3: Omana (South of Aotea Shelley Beach) Commencing adjacent to the end of James McLeod Place and culminating at the end of Auckland Council esplanade reserve south of Shelley Beach settlement. This coastal stretch includes Omana Avenue Esplanade Reserve, the southern area of Shelley Beach Reserve and includes assets such as access stairs and path network to coastal areas.	LI	LI	LI	Limited intervention is identified to reflect the need to maintain and keep safe the access structure and to manage risks associated with eroding cliffs. No coastal defences would be proposed and actions to manage risk are focused on the targeted realignment of assets and nature based management options.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.4: Mairatahi to Parkhurst This stretch includes the extensive shoreline south of the Aotea/ Shelley Beach settlement including the estuary and privately-owned coastal areas. Auckland Council-owned assets located within this stretch include isolated and unmaintained areas of esplanade reserve (represented as green in the figure above) and Tuparakura Road.	NAI	NAI	NAI	No active intervention is reflective of the limited Auckland Council land and assets present within hazard areas. No active intervention does not preclude the management of risk to roading infrastructure. Areas of Southhead Road which are in low-lying areas and utilise causeway connections may require management of risk associated with catchment and coastal flooding. Management of risk through location and design of assets is preferred to the use of protection structures. Note: This stretch also includes numerous cultural heritage sites and environmental values and infrastructure. The strategy does not preclude advocacy for managing natural hazard risk to these values.



Unit 3

Kaipara Harbour



Unit 3: Parakai

Unit 3 is bordered by the intersection of Tarawera Road and Haranui Road in the north, following Kaipara River south to Helensville. Large areas of the unit's coastline and river inlet are in private ownership with limited Auckland Council-owned land and assets located within rural areas.

The Parkhurst and Parakai areas are low-lying and notably exposed to flooding, coastal inundation and longer-term impacts of sea-level rise (including vertical land movement) and rising groundwater levels. The Parakai area also includes unique geothermal resources which are highly valued by iwi, the local community, and visitors, and will be exposed to inundation risk as well as changing groundwater levels. This presents challenges for the management of risk from inundation from both catchment and the coast.

Auckland Council land and assets include transport infrastructure, Auckland Council-owned (and co-owned) land and water infrastructure servicing the settlements of Awaroa and Parakai. Existing transport infrastructure including Auckland Transport roads, the State Highway and the north Auckland rail line, provide important community and infrastructure connections, and experience flooding impacts. In some areas where roads and rail lines are elevated, they can act as stop banks (although they are often not designed for this purpose) but also can impound or hold water, resulting in flooding in areas where water cannot drain to the coast beyond.

Reserve areas include the Kaipātiki Reserve (located within Parakai township) and areas of low-lying esplanade reserve. Harbour access is provided and marine rescue facilities are located in proximity to these facilities.

The strategy of *no active intervention* identified in areas of this unit relates to the presence of limited Auckland Council assets and infrastructure. This does not mean there is no risk to be managed to the transport network or to other land and assets. The low-lying nature of the Kaipara River catchment and the need to traverse (cross) this area to reach key settlements and infrastructure presents challenges for risk management and will require innovation in future adaptive options.



DRAFT Adaptation strategy summary stretches 3.1 to 3.3

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
3.1: Parakai north Commencing at the northern extent of the unit and culminating at the northern boundary of Springs Road. This stretch includes the airfield and numerous parcels of DoC-owned coastal marginal land.	NAI	NAI	APA	The predominant strategy, in the short and mid-term is no active intervention. This is reflective of limited Auckland Council land and assets located in proximity to the coastal edge. This does not preclude localised interventions as required for roading connections (Southhead Road) to respond to catchment and coastal flooding. Adaptation priority is identified in the long term to signal the need for further adaptation planning to ensure that plans are in place to respond to sea-level rise and how this will impact coastal and catchment hazards in this low-lying catchment and both impact on the landward unit area and transport connections to the north. Note: There are no identified Auckland Council-owned coastal management or flood protection structures located within this stretch.
3.2: Parakai & Kaipātiki Stretch 7 commences at Springs Road, including the coastal access (wharf & boat ramp) at the road end, and encompasses the coastline of the Te Moau Reserve & River Esplanade. This stretch includes Kaipātiki Reserve (formally Parakai Recreation Reserve) which is governed by the Te Poari o Kaipātiki ki Kaipara Recreation Reserve Board. The stretch culminates at the western side of Parakai Road. It includes piped wastewater networks, roading and stormwater management assets.	LI	APA	APA	Limited intervention is identified in the short term to manage risk to Auckland Council piped assess, roads and coastally located parks and connections. This includes the use of protection structures, such as those currently in place within this stretch. Limited intervention supports the aspirations identified in the Kaipātiki Co-Governed Reserve Management Plan which sets out the vision for the area over the short 5-10 and medium term (50 years). Adaptation priority is identified in the mid to longer term (assuming 0.5 to 1 m of sea-level rise) to signal a need to undertake further adaptation planning to support the continued use of and access to public areas, unique features and opportunities presented in relation to geothermal resources, roading connections to adjoining settlements and access to the harbour (at Springs Road). Adaptation priority signals a need to respond to inundation risk. Specifically in relation to the function of piped wastewater infrastructure, the land uses this supports and to maintain environmental health associated with the management of wastewater services.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
3.3: Kaipara River inlet west This stretch extends south of the Parakai Road area and includes all the western banks of Kaipara River inlet which are located within the unit area.	NAI	APA	APA	No active intervention is the predominant strategy identified for this stretch in the short to mid-term. Adaptation priority is identified in the mid to long term to signal the need to respond to sea-level rise and how this will impact coastal and catchment hazards in this low-lying catchment, in particular, in relation to the local roads (e.g. Mill and Kiwitahi Roads) which are located landward of the coast and traverse the river inlet in several places. Noting SH16 is not an Auckland Council-owned road. Note: There are no Auckland Council-owned and maintained flood or coastal defence structures (stop banks) located within this stretch.



Unit 4

Kaipara Harbour



Kawau Parua Inlet

Helensville Showgrounds



x 4



x 4



x 2



x 2



x 3

Sinclair Park

Rautawhiri Park/
Reserve



x 4



x 2



x 2

Helensville Rugby
Football Club

- Unit boundary
- Informal recreation park
- Sport & active recreation area
- Stormwater pond
- Watercare asset
- Auckland Council owned land

16 State Highway 16

Jetty / wharf

Boat ramp

Playground

Community buildings

Closed landfill

Cemetery

Fitness

Skatepark

0 1km 2km

Waimauku

Huapai

Kumeu

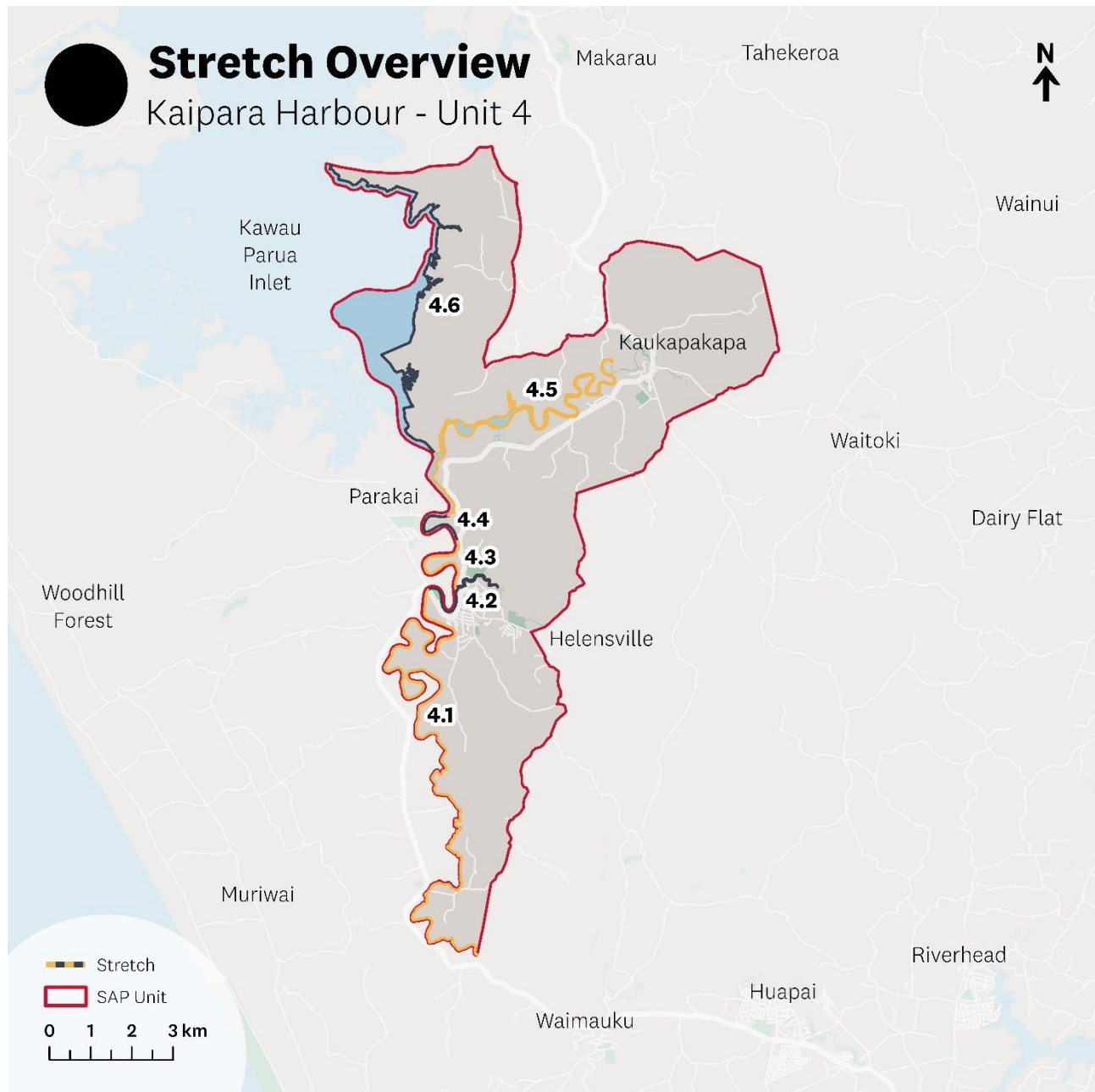
Unit 4: Awaroa / Helensville

Unit 4 includes the eastern end of Kawau Parua Inlet, following the eastern bank of the Kaipara River upstream to Reweti. The eastern extent of the SAP area reaches to Kaukapakapa and Makarau River to the north.

The majority of assets tend to be located in the south-west of Unit 4 around Awaroa Helensville, including several highly utilised parks (Helensville A&P showgrounds, Rautawhiri Park) key transport connections and critical wastewater infrastructure (Helensville wastewater treatment facility). Within the northern areas of the stretch, land uses are generally rural and Auckland Council land is limited. Environmental and culture and heritage features and values are more dominant in the northern areas of the unit towards Kaukapakapa.

At a unit level, risk from coastal inundation is higher than risk from coastal erosion susceptibility. Auckland Council water infrastructure, including Helensville wastewater treatment plant is located within low-lying areas of this unit. A closed landfill, managed by Auckland Council, is located on Auckland Council-owned land in the Mill Road area. Parks and reserve areas in and around Awaroa and supporting road networks are increasingly exposed to inundation hazards.

This unit includes the rural centre of Awaroa Helensville and the populated settlements of Parakai, Awaroa Helensville and Kaukapakapa. These areas support social, cultural and economic activities within the wider unit and SAP area including schools, medial facilities, emergency services, retail and commercial areas and other important community and social facilities and services. The Awaroa River also supports marine uses and harbour access.



DRAFT Adaptation strategy summary stretches 4.1 to 4.6

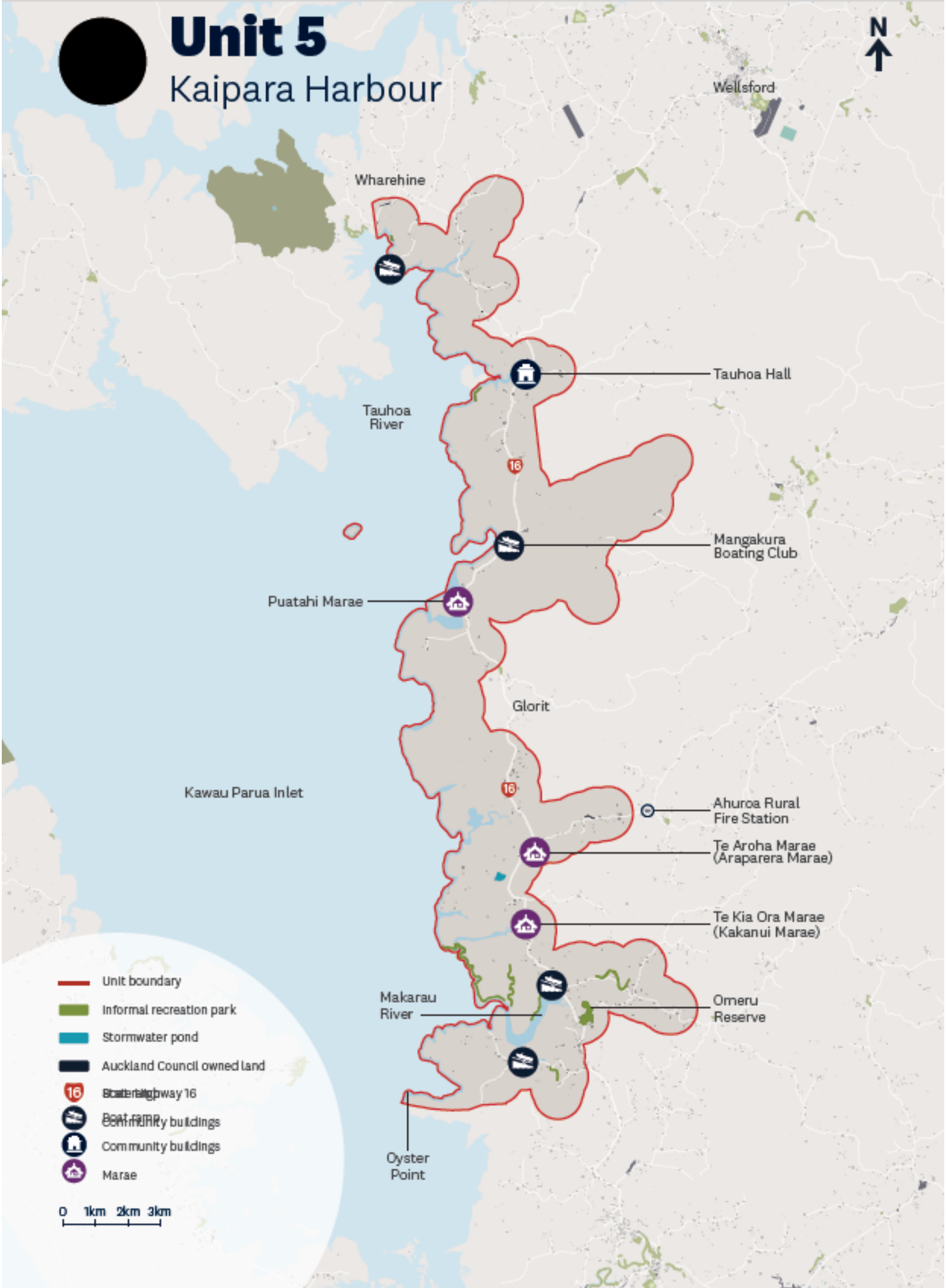
Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
4.1: Kaipara River inlet eastern banks The southern and eastern banks from the commencement of the unit culminating at the southern side of Mill Road.	NAI	NAI	APA	No active intervention is the predominant strategy identified for this stretch, reflective of the predominantly privately-owned land. Auckland Council-owned land is generally limited to isolated and few portions of esplanade reserve. SH16 and several local roads (e.g. Mill and Kiwitahi Roads) are located landward of the coast and traverse the river inlet in several places. Asset-specific (roading) management of risk will be required to maintain transport connections. Adaptation priority is identified in the long term to signal the need to respond to sea-level rise and how this will impact coastal and catchment hazards in this low-lying catchment including the piped infrastructure, the Helensville waste recovery centre and roading connections which support this area. There are no Auckland Council-owned coastal defence structures (seawalls) located within this stretch.
4.2: Awaroa Riverside Commencing at the southern side of (and including) Mill Road bridge and the reserve (including closed fill) and walkway network along the riverside, culminating at Green Road Reserve at Bridge Street north of the main village area.	HTL	HTL	APA	Hold the line is applicable to the existing assets and any associated existing protection structures, for example the Helensville River walkway. Catchment flooding risk, particularly in low-lying areas, and inundation risk to the southern areas of this stretch (Mill Road area) result in the identification of adaptation priority in the long term to signal the need to consider risk to Auckland Council land and assets, in particular transport networks and water services. Note: Hold the line does not extend to the protection of the coastal edge where this is in private ownership. The Helensville closed landfill will be managed in accordance with the Closed Landfill Asset Management Plan.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
4.3: Awaroa North & Showgrounds Commencing at Bridge Road and including the area north, including Railway Street (and the former station area) the Helensville A&P showground reserve area and the areas east along the catchment (to Rautawhiri Park) culminating at Pipitiwai Creek. This stretch includes piped networks and roads (including Stewart, West and Saleyard, Awaroa, Rautawhiri).	LI	APA	APA	This predominantly low-lying area north of Awaroa Helensville centre includes areas exposed to catchment and coastal flood hazards. Limited intervention in the short term confirms the management of risk to assets and landholdings through design and location. Anticipated increasing inundation risk in the mid to long term presents a need to proactively consider how to manage this. Adaptation priority is identified to signal the need to consider the design and the location of assets and uses within the wider area to maintain the values of the area and support the needs of the community.
4.4: Watercare treatment and Helensville North Commencing north of the Pipitiwai Creek (including the pumping station) and culminating to the north of Watercare landholdings.	HTL	APA	APA	Hold the line in the short term confirms the continued operation of the plant at this location. Adaptation priority in the mid to long term acknowledges the low-lying nature of the facility and the adaptive planning undertaken by Watercare Services for these assets.
4.5: Kauakapakapa Commencing north of the Helensville wastewater treatment plant and including the coast north, to the north side of Kauakapakapa River inlet.	NAI	LI	LI	No active intervention in the short term is reflective of the limited Auckland Council land and assets located within this stretch (which reaches east to the settlement of Kauakapakapa). Limited intervention in the mid to long term identifies the need to support the management of risk to reserve areas and road connections in relation to both catchment flooding and coastal inundation.
4.6: Kaipara Harbour River Inlet North Commencing north of the Kauakapakapa River inlet and culminating at the unit boundary in the north at Oyster Point.	NAI	NAI	NAI	No active intervention is reflective of the minimal Auckland Council assets located within this stretch.



Unit 5

Kaipara Harbour



Unit 5: Makarau to Wharehine

Unit 5 commences at Oyster Point (north of Kaukapakapa) and includes the coast north including multiple rural coastal settlements (Kanohi, Araparera, Makarau, Glorit, Mangakura, Tauhoa), and culminates at Wharehine to the north.

The topography of much of this unit is low lying and subsequently exposed to coastal inundation and catchment flooding. While coastal erosion is also a hazard this unit is exposed to, this has a lesser interface with Auckland Council land or assets, due to the predominant private ownership of coastal areas.

This eastern shore of the Kaipara Moana is predominantly rural in land use and held in private ownership. There are several marginal strips and scientific reserves (Omaumau Scientific Reserve) many managed/owned by DoC and limited physical coastal assets. Auckland Council-owned reserves which include boat launching facilities are located at Makarau and Mangakura providing valuable harbour access. Mangakura Reserve includes a boat ramp, wharf, building lease to the Mangakura Boating Club, toilets, carpark, reserve access road.

Glorit is part of the legacy Rodney District Drainage District under which Auckland Council has a role in supporting the maintenance and management of private waterways and stormwater infrastructure in this area.

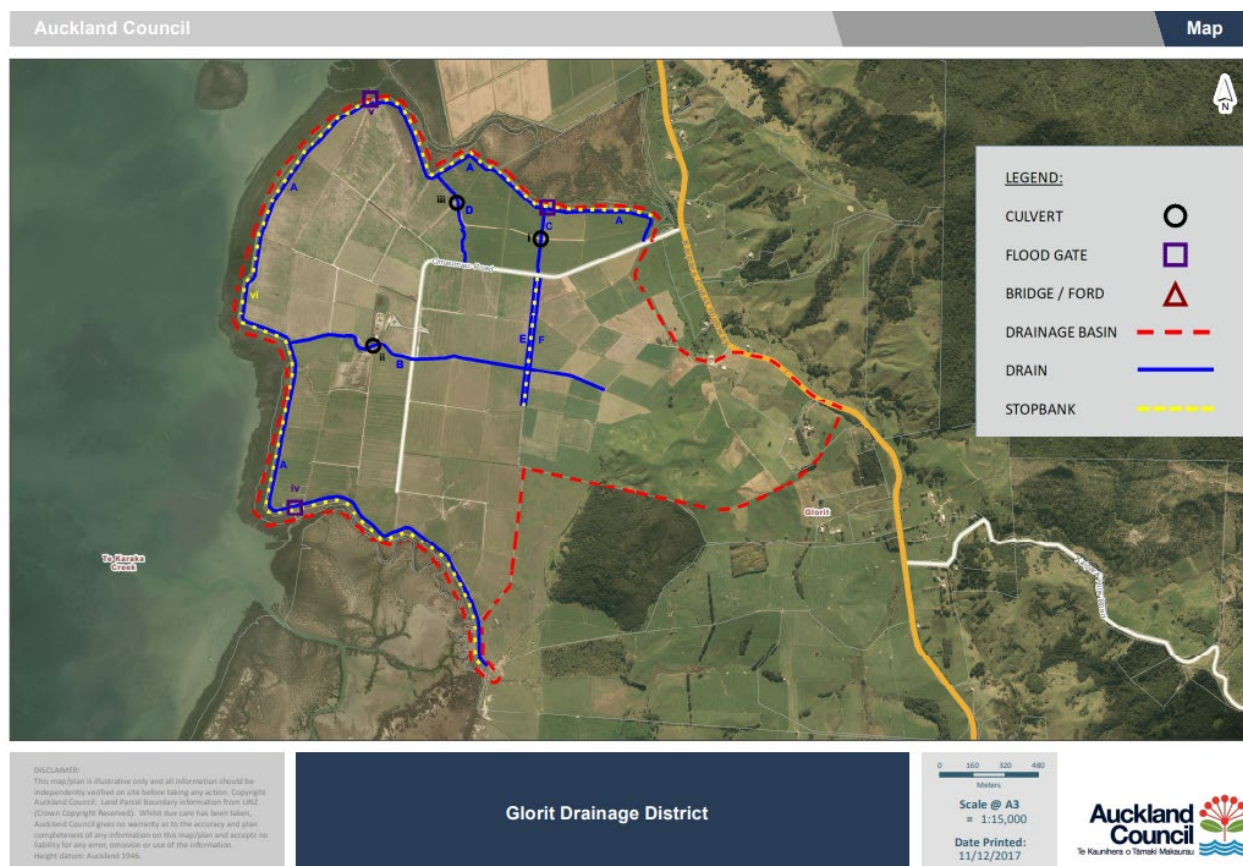
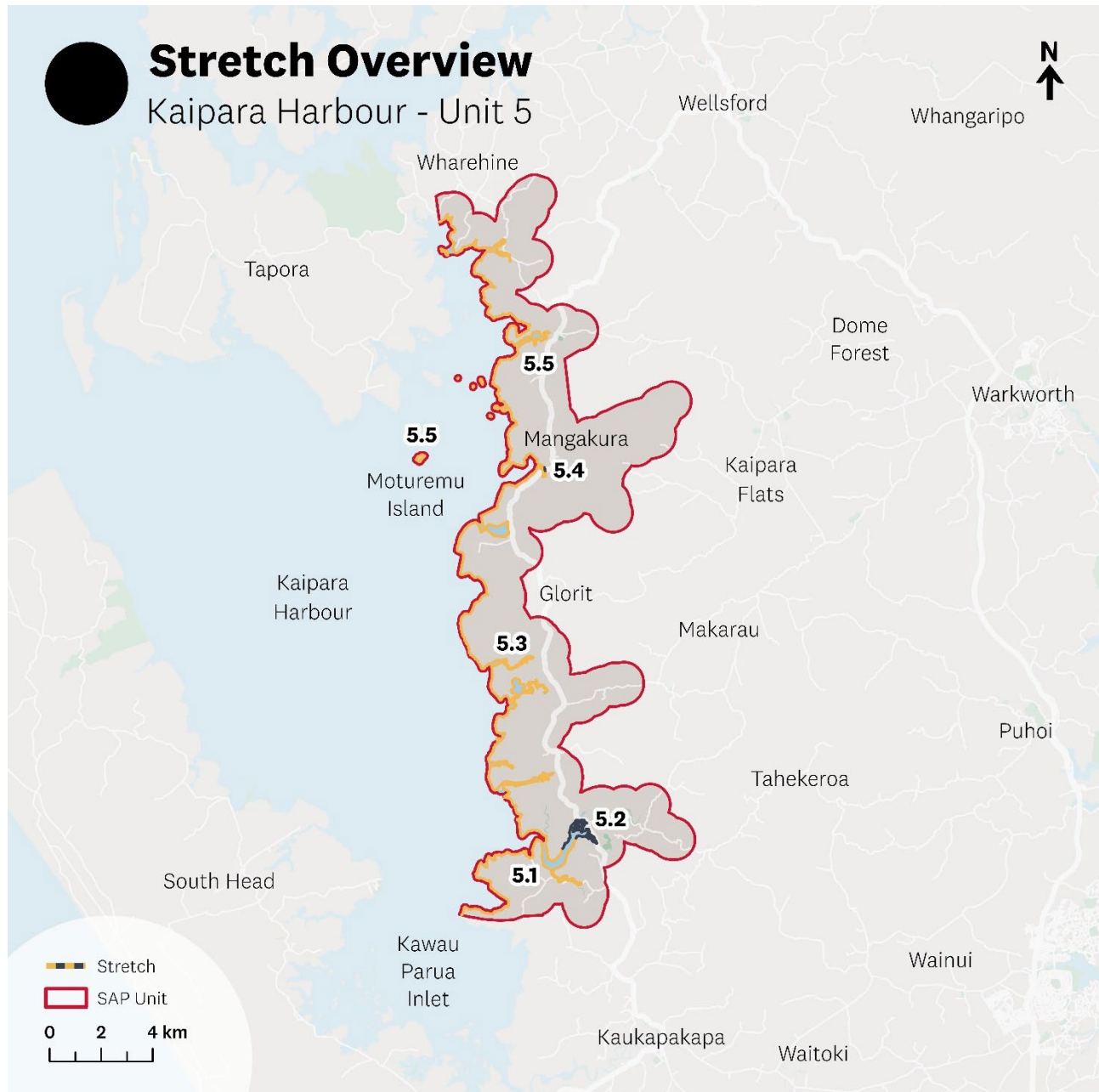


Figure 5-7 Map of Glorit Drainage District

While there are limited Auckland Council landholdings and assets located within the unit area, it is important to note that Unit 5 includes sites of cultural and historic heritage and social importance including marae, rural fire station and NZTA Waka Kotahi roading connections. Ecological areas, both marine and terrestrial are numerous and prolific within this unit area, located within privately-owned coastal areas.



DRAFT Adaptation strategy summary stretches 5.1 to 5.5

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
5.1: Kanohi Commencing north of Kauakapakapa (at Oyster Point) and culminating adjacent to Basil Orr Road end in the north.	NAI	NAI	NAI	No active intervention is reflective of the limited Auckland Council land and assets located within this stretch of the coast. Roading assets are generally located away from coastal areas.
5.2: Makarau Commencing adjacent to the Basil Orr Road end and culminating in the north at the western end of the Makarau Bridge Reserve. Includes the Omeru Reserve, Makarau Esplanade Reserves and the Makarau Bridge Reserve.	LI	LI	LI	Limited intervention signals the need to manage risk to, and maintain, key harbour connections at Makarau Jetty and boat ramp, located within the Makarau Bridge Reserve. The wider stretch also includes Makarau Road and esplanade reserves and the Omeru Reserve. Risk from catchment flooding and increasing reach of inundation from the coast will impact these assets in their current locations.
5.3: Kakanui, Araparera & Glorit Commencing from the west of the Makarau Reserve and including the coasts north to the eastern side (SH16 Road bridge) of the Hoteo River.	NAI	NAI	NAI	No active intervention for this extensive stretch is reflective of the limited land and assets in this section of the coast. This stretch includes the Glorit Drainage Districts which are one of limited remaining areas of rural Auckland where Auckland Council provides ongoing stormwater management services to private landowners. The Glorit Drainage District is a community-led management agreement with Glorit landowners. Auckland Council's responsibilities in relation to this scheme are not impacted by the identification of no active intervention for this stretch. Note: this stretch includes numerous cultural and social facilities, sites and values. No active intervention is identified exclusively in relation to Auckland Council landholdings and the strategy selection does not preclude support and advocacy to manage risk to other values, sites and features.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
5.4: Mangakura Commencing to the south of the road bridge and culminating to the north west of the reserve landholdings.	LI	LI	LI	Mangakura boating club is located on an Auckland Council reserve area and includes boat launching facilities and a jetty supported by a coastal edge armoured in the past with stabilised sediment. Limited intervention over all timeframes signals the ongoing management to the facilities here while responding to inundation risk through design and location of uses within reserve areas.
5.5: Tauhoa & Wharehine Commencing to the west of Mangakura Reserve and culminates where Run Road turns south to meet the coast, to the east of the Run Road esplanade reserve. (This stretch includes Moturemu Island).	NAI	NAI	NAI	No active intervention is identified due to the limited Auckland Council land and assets located within this stretch. Landholdings and asset interests include Tauhoa Reserve north to the end of the unit, Witheford Road end and the Stables Landing Esplanade Reserve and boat access. The strategy of no active intervention relates primarily to the management of the coastal edge and does not impact the continued maintenance and support of these facilities or collaboration with third party land owners, (DoC) in relation to coastal reserve areas.

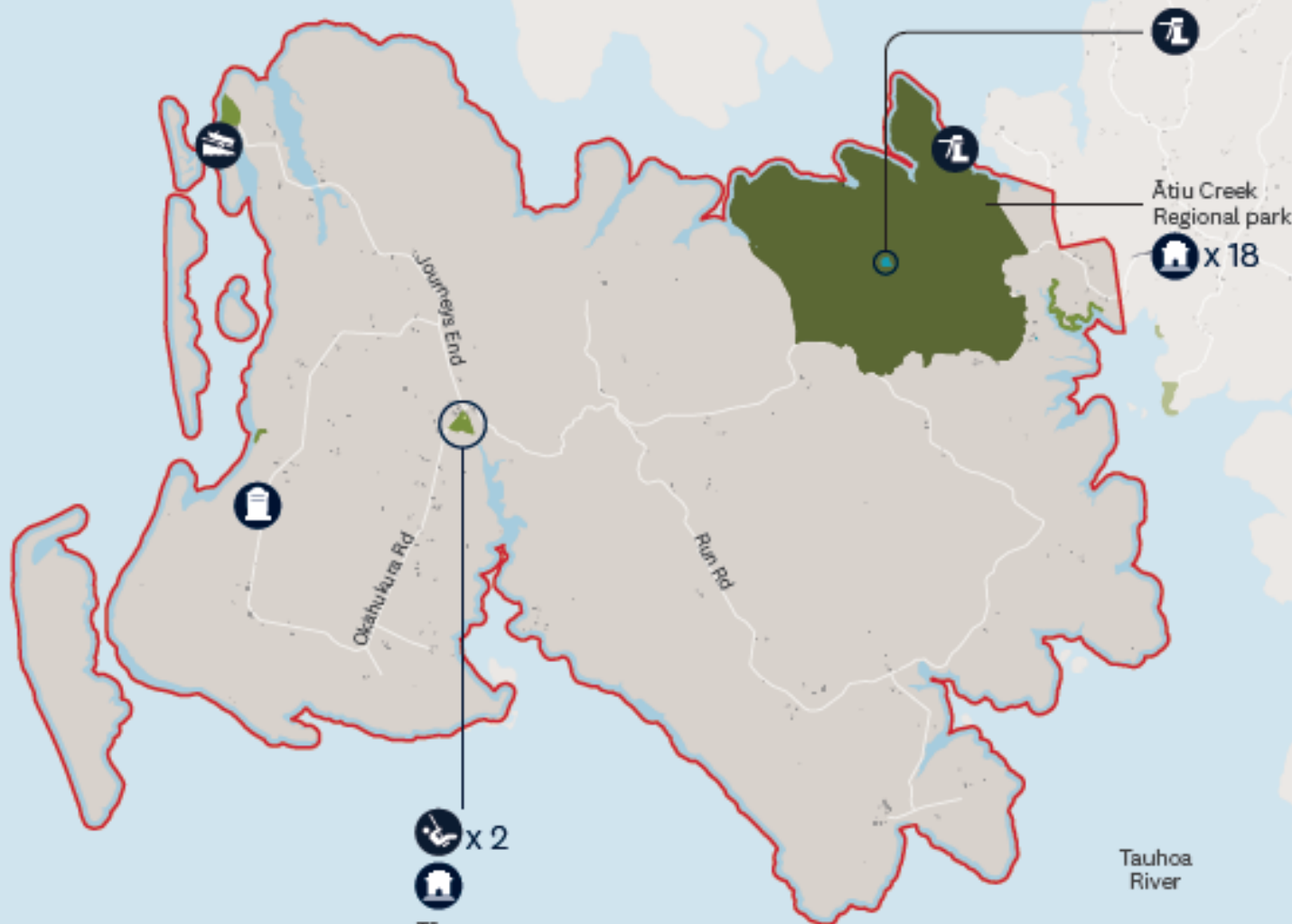


Unit 6

Kaipara Harbour



Wairoa River



- Unit boundary
- Informal recreation park
- Regional park
- Sport & active recreation area
- Boat ramp
- Community buildings
- Jetty / wharf
- Cemetery
- Playground

0 1km 2km

Unit 6: Ōkahukura Peninsula

Unit 6 includes the Okahukura Peninsula, commencing at Wharehine and culminating on the northern coast just to the east of the Ātiu Creek regional park landholding. This unit includes Manakapua Island.

The low-lying extents, particularly to the west of Taporā are exposed to coastal inundation including Manukapua Island and Ōkahukura stewardship area. Coastal erosion is more apparent on the northern extents of this unit, where the topography steepens.

Ōkahukura (stretch 6.1) is part of the legacy Rodney District Drainage District under which Auckland Council has a role in supporting the maintenance and management of private waterways and stormwater infrastructure in this area.



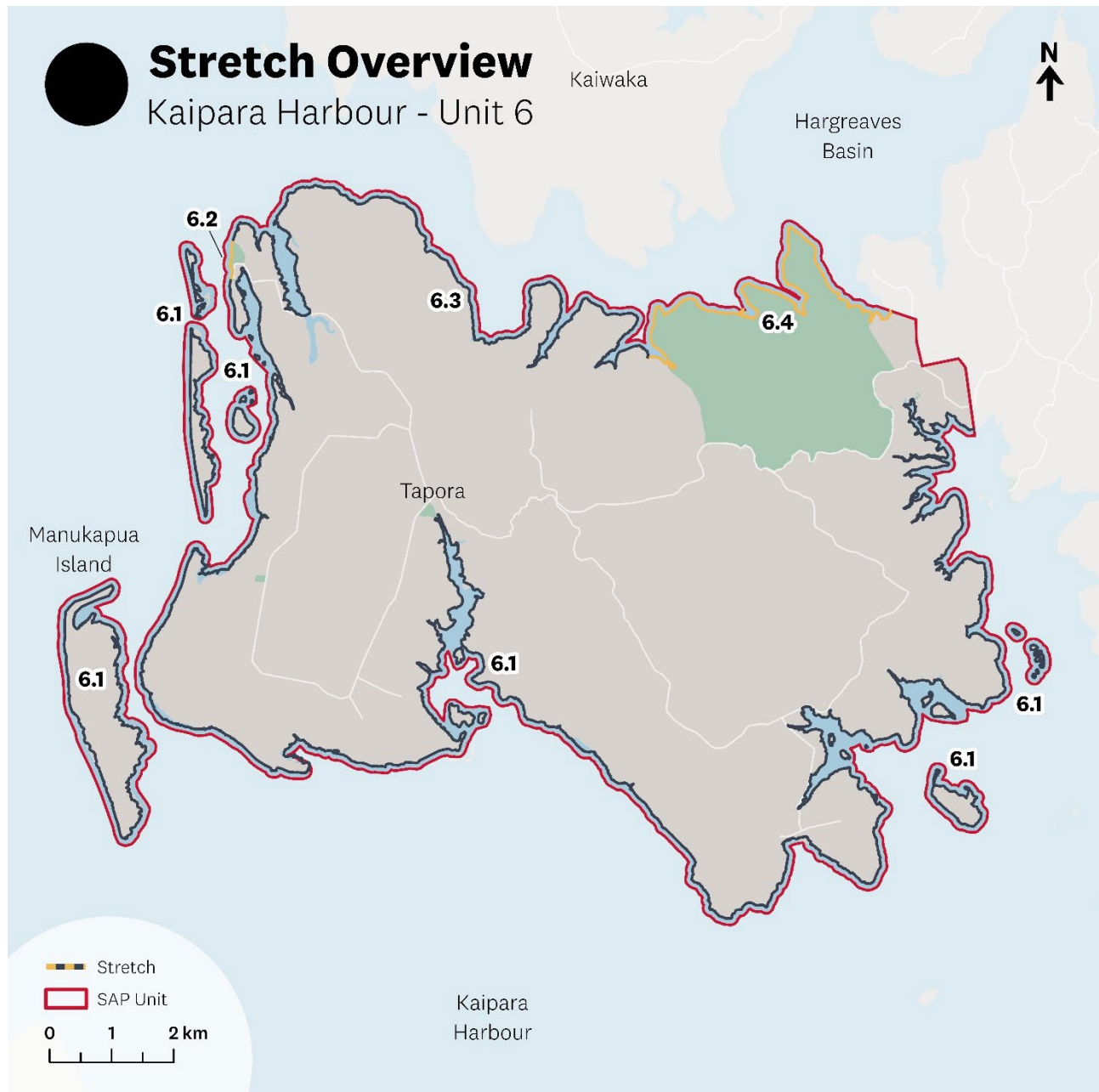
Figure 2-8 Ōkahukura Drainage District map

Birds Beach (located with stretch 6.2) is a small coastal settlement located to the north-western end of the peninsula. Reserve areas support a boat ramp for harbour access. Auckland Council landholdings are limited reserves and facilities within the western areas of this unit. The settlement of Taporā is located inland from the coast.

Ātiu Creek Farm is an Auckland Council Regional Park (stretch 6.4) located on the Okahukura (Taporapora) Peninsula. Atiu Creek was officially opened in 2009 and at 843 ha is one of Auckland's

largest regional parks. While the regional park land of Atiu Regional Park is exposed to coastal processes, infrastructure and assets are typically set back from the coastal edge.

This unit includes Manukapua Island and Okahukura Sequence biodiversity focus area including critically endangered ecosystems.



DRAFT Adaptation strategy summary stretches 6.1 to 6.4

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
6.1: Wharehine and Ōkahukura Peninsula Commencing at Run Road Reserve in the east and including the majority of the peninsular west, culminating at the south of Birds Beach Reserve.	NAI	NAI	NAI	No active intervention relates to the approach to management of coastal areas where Auckland Council-owned land and assets are limited. Roading infrastructure provides access to rural coastal communities, rural industries, Taporā Golf Club and Taporā settlement. This stretch includes the Ōkahukura Drainage Districts which are one of the limited remaining areas of rural Auckland where Auckland Council provides ongoing stormwater management services to private landowners. Auckland Council's responsibilities in relation to this scheme are not impacted by the identification of no active intervention for this stretch. Note: This stretch includes numerous cultural and social facilities, sites and values. No active intervention is identified exclusively in relation to Auckland Council land holdings and the strategy selection does not preclude support and advocacy to manage risk to other values, sites and features.
6.2: Birds Beach Commencing at the southern end of the Birds Beach Reserve.	LI	LI	LI	Limited intervention over all timeframes is selected to provide for the management of risk to Auckland Council land (reserve and road connections) and continued provision of important coastal connections, such as boat launching facilities. Inundation risk will increase over time and the management of activities within Auckland Council landholdings, in proximity to the coast may be required. Within northern areas of this stretch and more generally the unit area, highly valuable ecological areas are present. Collaboration with other agencies, iwi and private land owners to support ecological values is also anticipated for this stretch.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
6.3: Tāpora Commencing north of Birds Beach recreational reserve, including the coast north and east and culminating to the west of the Regional Park.	NAI	NAI	NAI	No active intervention is identified reflective of the limited Auckland Council-owned land and assets within this stretch.
6.4: Ātiu Creek Regional Park Commences at the western boundary of the park and culminates at the unit boundary to the east of the park landholdings. This includes a small area of coast (privately owned) located to the east of the Regional Park.	LI	LI	LI	Limited intervention provides for the management of risk to assets and uses located within the Ātiu Creek Park. Note no Auckland Council-initiated intervention to manage coastal hazard risk is anticipated in relation to the privately-owned landholdings to the east of the park and also included within the stretch.



Unit 7

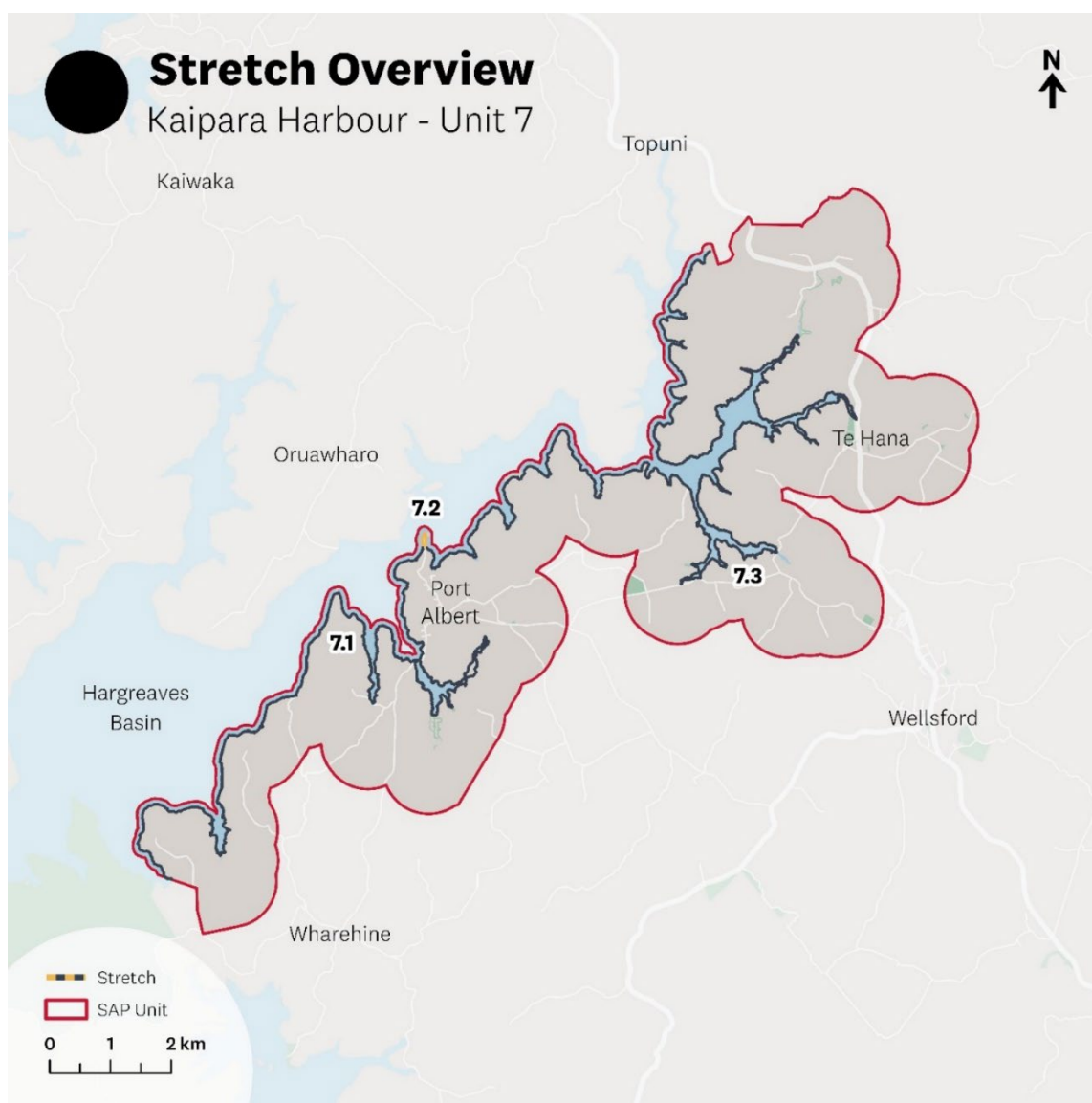
Kaipara Harbour



Unit 7: Port Albert & Te Hana

Unit 7 commences to the east of Ātiu Creek Regional Park and includes the southern shore of the Ōruawhoro inlet east to Te Hana. This includes the rural coastal settlement of Port Albert and Te Hana township.

With steeper land elevations than the other units within the Kaipara Moana SAP, this unit is more predominantly exposed to coastal erosion and instability. Areas with Auckland Council-owned land and assets exposed to both coastal erosion and inundation include Wharf Road at Port Albert and the Port Albert camping and sports ground, wharf and boat ramps (noting the functional need for such assets to be located at the coast), playground, toilets, reserve access road and carparking. A rock seawall is located between the wharf and northern boat ramp at Port Albert.



DRAFT Adaptation strategy summary stretches 7.1 to 7.3

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
7.1: Oruawharo inlet west Commencing to the east of Ātiu Creek Regional Park and culminating to the west of Port Labert reserve area.	NAI	NAI	NAI	No active intervention is identified reflective of predominately private ownership and the location of small unconnected, unmaintained areas of esplanade reserve. Coastal inundation and catchment flooding presents a risk to Auckland Transport roading infrastructure in low-lying areas. No active intervention does not preclude asset-specific measures may need to be identified to confirm continued safe roading connections are maintained.
7.2: Port Albert Commencing at the western side of Port Albert reserve area and culminating to the west of the reserve area.	HTL	LI	APA	Hold the line in the short -term, supports the management of risk to existing facilities through location and design within Auckland Council landholdings. Adaptation priority in the long term is reflective of increased inundation risk and the need to consider how key values are maintained and access to the coast and park uses can be managed with increasing inundation risk.
7.3: Te Hana Commencing at Port Albert to the east of the recreational reserve and culminating at Te Hana.	NAI	NAI	NAI	No active intervention is identified reflective of predominately private ownership and the location of small unconnected, unmaintained areas of esplanade reserve. Coastal inundation and catchment flooding presents a risk to Auckland Transport roading infrastructure in low-lying areas. No active intervention does not preclude asset-specific measures may need to be identified to confirm continued safe roading connections are maintained.

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