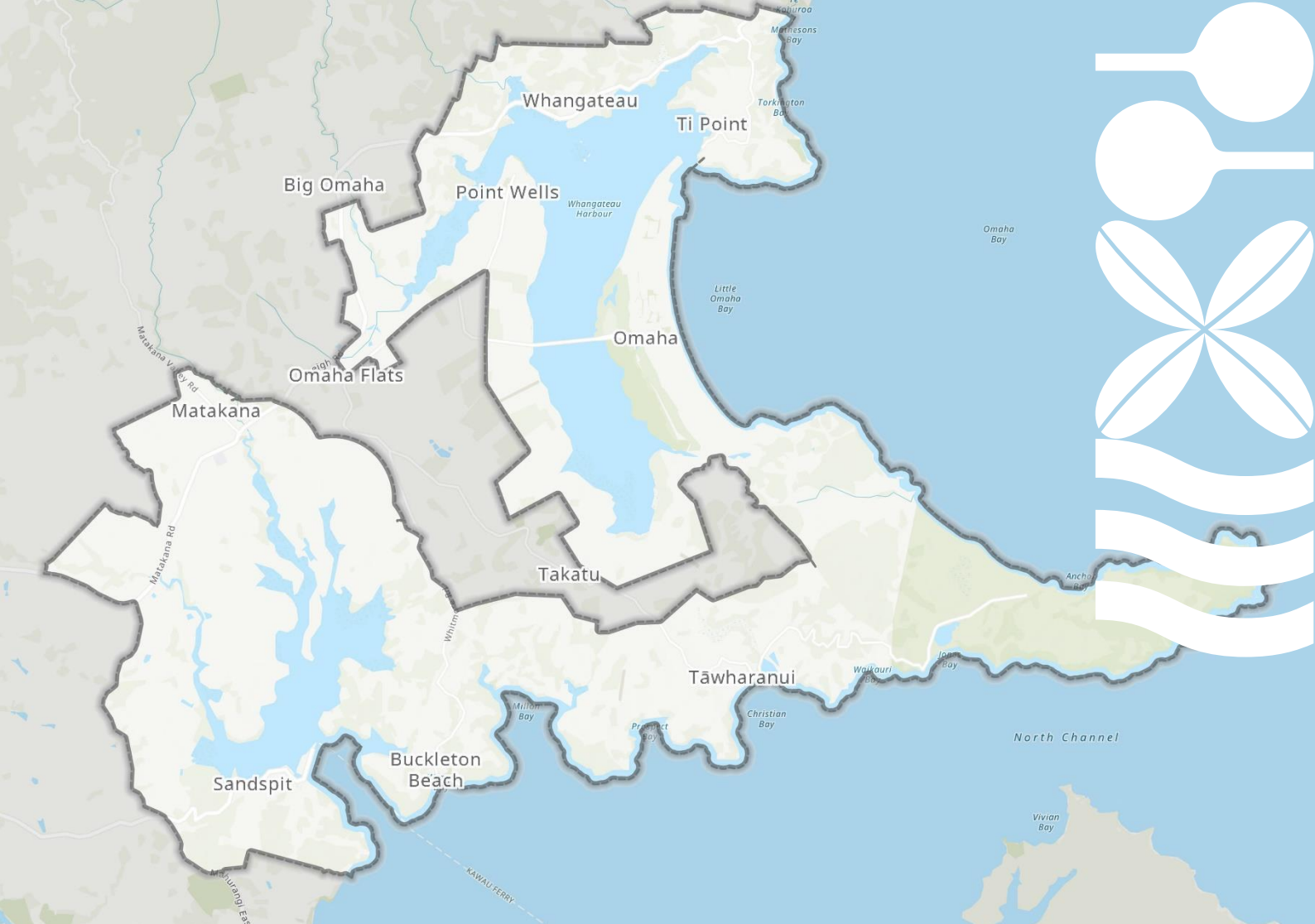




DRAFT for Engagement

Draft Shoreline Adaptation Strategies: Ti Point to Sandspit

Shoreline Adaptation Plan

October 2024 DRAFT

2024



DRAFT Shoreline Adaptation Strategies: Ti Point to Sandspit

October 2024

Auckland Council

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Front Cover

Shoreline Adaptations Plan area overview map for Ti Point to Sandspit. 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 and west by the South Pacific Ocean and 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 consultation document.

The document does not represent a complete draft of a finalised Shoreline Adaptation Plan for Ti Point to Sandspit. It has been prepared solely to enable the community engagement process for the development of the Ti Point to Sandspit 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 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

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

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 Ti Point to Sandspit area ahead of further community engagement and detailed engagement with programme partners.

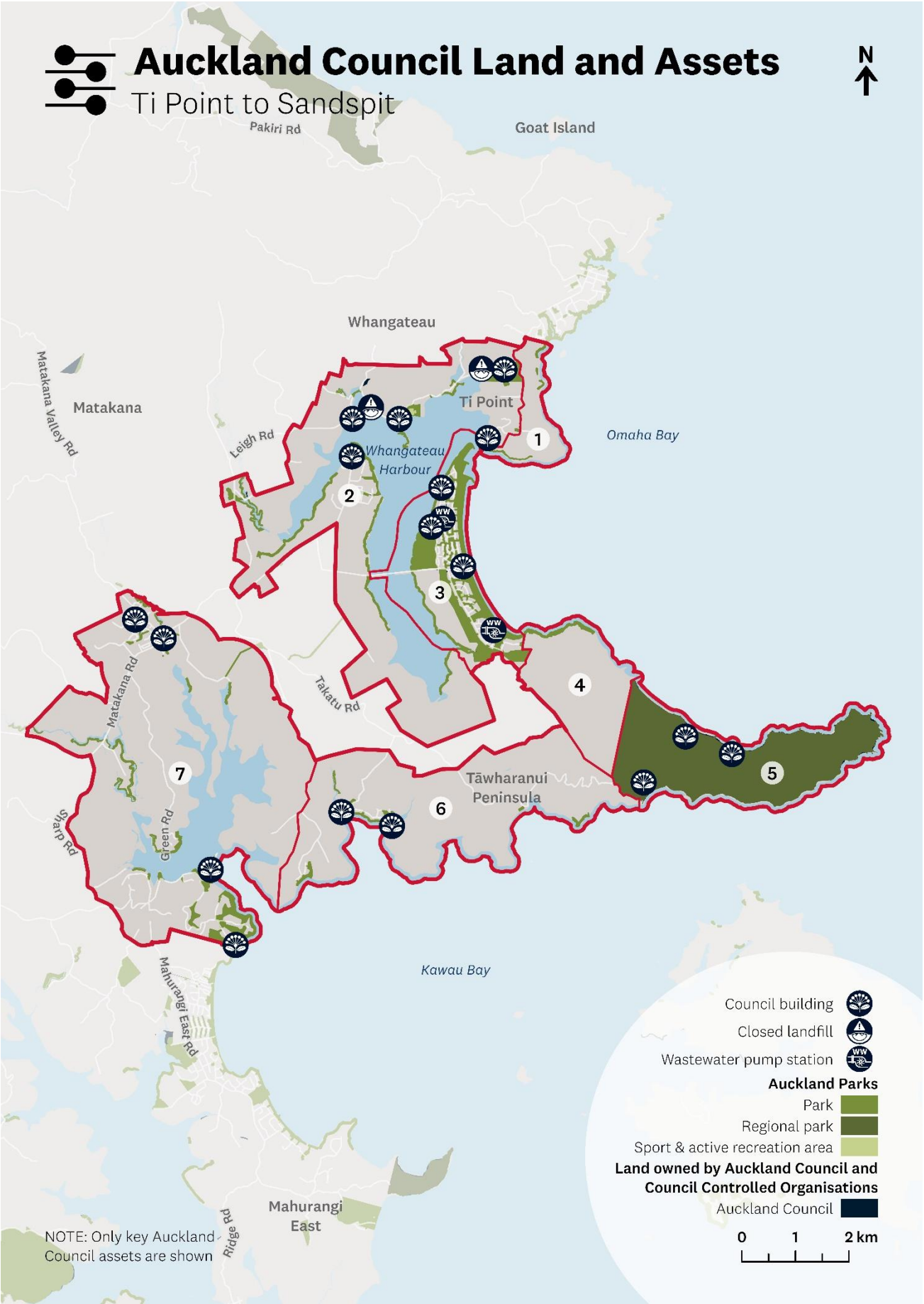
1.3 Auckland Council owned land and assets

Council owned assets and land areas are summarised in the table below. the highest concentration of council assets in this SAP area are located within Whangateau Reserve, including a Holiday Park, (Unit 2) Omaha area (comprising harbour access and coastal walkways) and Tāwharanui Regional Park (Unit 5). This is shown in the following map (Auckland Council Assets) that clusters assets to reflect the SAP area level overview. Ōmaha contains five community/club facilities. Outside of these areas are several toilets and some community buildings. Further detail on location of Council owned assets at a unit level is identified as relevant within each unit and stretch discussion.

Table 1: Summary of Council owned assets in this SAP area.

Type	Description
Auckland Council Land	Regional parks: Tāwharanui Regional Park Local parks/reserves: Ti Point Walkway; Reserve behind 227 Leigh Road-Temp; Ti Point Road Esplanade; Matheson Bay Reserve; Ashton Road - Leigh Road Reserve; Lews Bay; Whangateau Hall Grounds; Whangateau Holiday Park; Birdsall Stream Whangateau; Ōmaha Estuary; Ōmaha Estuary Causeway Reserve; Ōmaha River Point Wells; Tamahunga Stream Leigh Road; Big Ōmaha Wharf; Darroch Shipyard Bridge Reserve; Ōmaha Matakana Cycleway; Opango Creek Reserve; Point Wells Community Centre - Land; Point Wells Foreshore Reserve; Ti Point Road Reserve; Waimanu Reserve; Whangateau Harbour Esplanade Reserve; Whangateau Recreation Reserve Islands; Whangateau Domain Recreation Reserve; SW Sandpiper Avenue - Provisional; Blue Bell-Thistle-Day Dawn Walkway; Day Dawn-Blue Bell-Darroch Walkway; Dune Walkway; Dungarvon-Blue Bell Walkway; Excelsior Way Reserve; Golf Course Reserve; Ida Way - Rita Way Reserve; Jane Gifford-Meiklejohn Walkway; Kewai Street Reserve; Kokopu Street Reserve; Manuhiri Reserve; Ōmaha Beach Boat Launching & Wharf; Ōmaha Beach Reserve; Ōmaha Golf Course Bush; Ōmaha Reserve; Ōmaha South Quarry Reserve; Ōmaha South Quarry Track; Pukemateko Reserve Ōmaha South; Rahui Te Kiri Reserve; Rita Way-Excelsior Way-Lagoon Way; Success-Dungarvon-Dornie Walkway; Tuna Place Reserve; William Fraser Reserve; Takatu Road Esplanades; Baddeleys Beach Reserve; Baddeleys Creek; Buckleton Beach Reserve; Campbells Beach Reserve; Clinton Road-Baddeleys Beach Walkway; Pigeon Place A/Way, Campbells Beach; Vera Reserve Baddeleys Road; Lot22 DP201990 Riverglade Lane, Matakana; Beach Street Esplanade Reserve; Lot 2 DP 109706, Tongue Farm Rd-Temp; Lot 3 DP 337043, Beach St-Temp; Matakana River Esplanades; Reserve next to 184 Tongue Farm Road; Sharp Road Matakana Esplanade Reserve; Awanui Crescent Reserve, Matakana; Brick Bay Drive; Brick Bay Drive - Puriri Place Reserve; Green Point Reserve; Horseshoe Bay Reserve; Kanuka Reserve (Sandspit) ; Laly Haddon Esplanade

Type	Description
	Reserve; Matakana Diamond Jubilee Park; Matakana Wharf Reserve; Rainbows End Reserve - Rodney; Riverglade Lane A/Way & Espl Reserve; Sandspit Reserve - Rodney; Sandspit Road - Brick Bay Drive; Sw Storage Basin Res - Laly Haddon Place Closed landfills: Whangateau Tip Site, Ashton Road.
Auckland Council Community Facilities	Toilets: Whangateau Holiday Park (Whangateau Hall grounds and Whangateau Reserve); Point Wells boat ramp; Ti Point end of road walkway; Big Ōmaha Wharf; Ōmaha Community Centre; Ōmaha Surf Life Saving Club; William Fraser Reserve (including changing rooms); Ōmaha Beach boat Launch and Wharf; Tāwharanui Regional Park (Anchor Bay (including changing rooms), ten vault toilets at Camp Bay, Jones Bay, Anchor Bay Beach, behind Woolshed); Baddeleys Beach Reserve; Campbells Beach Reserve; Sandspit ferry terminal; Sandspit playground; Matakana Wharf; Puriri Place Reserve. Buildings: 307 Leigh Road; Whangateau Hall; 11 accommodation buildings and 11 other buildings (amenity/services) at Whangateau Holiday Park; Rodney Rams Rugby League & Sports Club; Point Wells Hall; Point Wells Croquet Club & Grounds; Big Ōmaha Wharf Shed; Ōmaha Community Centre; Ōmaha Beach Golf Club; Ōmaha Bowling Club; Ōmaha Surf Life Saving Club; 18 buildings at Tāwharanui Regional Park (Visitor Information Hut, Rangers House, Lunch Room, Office and volehole, Bach, and 13 sheds/workshops/barns); Matakana Branch Pony Club; 1451 Sandspit Rd (Dwelling); Historic Sandspit School House; 1336 and 1440 Sandspit Rd, Sandspit (Leased Land). Park assets: Point Wells Recreation Reserve playground and tennis courts; Ōmaha Recreation Reserve playground; William Fraser Reserve playground; Tuna Place playground and tennis courts; Pukemateko Reserve playground and tennis courts; Manuhiri Reserve playground and tennis courts; Baddeleys Beach playground and tennis courts; Matakana Diamond Jubilee Park tennis courts; Sandspit Road Walking tracks: Ōmaha (numerous unnamed paths); Tāwharanui (West End Track, South Coast Track, Ecology Trail, Fishermans Trail, North Coast Track, Mountain Bike Track, Tokatu Point Lookout Track); Puriri Place Reserve Track; Horseshoe Bay Reserve Track
Water assets and infrastructure	Pump sheds: Whangateau Holiday Park; Tāwharanui Regional Park; Ōmaha boat ramp; Success Court, Ōmaha; Anchorage, Ōmaha; Esme Grove, Ōmaha; Broadlands, Ōmaha; Kokopu, Ōmaha; Paraoa, Ōmaha; Mangatawhiri, Ōmaha; Taumata, Ōmaha.
Transport Infrastructure	Boat ramps: Ti Point; Whangateau – Leigh Road; Whangateau Reserve; Big Ōmaha Wharf; Point Wells Riverside Drive; Ōmaha Drive x2; Baddeleys Beach Reserve; Campbells Beach; Buckletons Beach; Matakana Wharf Reserve; Rainbows End; Sandspit Green Point. Numerous Roads.



1.4 Limitations

The SAP Series 1 reports are strategic documents which set a high-level direction for 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).

2.0 Ti Point to Sandspit Context and overview

2.1 Ti Point to Sandspit SAP area overview

This SAP area includes the shoreline from Ti Point south of Mathesons Bay Te Kohurua in the north and culminates east of Sandspit at the southern end of Brick Bay in the south. This SAP area is entirely located within the Rodney Local Board area.

This coastline is significantly varied in character, ranging from higher energy, rocky foreshores, coastal cliffs and shore platforms, the larger and higher energy sandy beaches of Omaha and Tāwharanui, smaller more sheltered pocket beaches, and the estuarine environments of the Whangateau and Matakana Estuaries/Harbours.

This coastline is highly varied in terms of wave-climate exposure, from the sheltered estuarine harbours to more open ocean beaches. The estuarine or harbour environments of Whangateau and Matakana Estuary are low-energy environments, only exposed to low, short period, depth-restricted wind-waves, with limited local fetch distances.

While not as exposed to high wave energies as the Te Arai/Pakiri Beaches, the Ti Point, Omaha, and northern coastline of the Tāwharanui Peninsula is frequently exposed to medium to high wave-energies, with periodic large events resulting in significant wave heights of 2 m or larger. This includes longer period swell events generated from some distance away, to more localised shorter period storm waves generated by strong onshore winds.

The northern extent of this unit is characterised by a predominantly rocky shoreline backed by coastal cliffs, before the entrance to Whangateau Harbour. The Ti Point coastline and Omaha Beach are most exposed to wave energies generated across the easterly facing fetch.

Omaha is a large Holocene barrier sand spit, with the northern position of the spit controlled by large rock revetment groynes. Omaha Beach is an exposed sandy beach that extends for approximately 4 km in total length.

Whangateau Harbour is a relatively large estuarine environment, characterised by a sequence of depositional sands with extensive intertidal flats. There are low seawalls in place along the harbour's coastline, while in other places, there is native saltmarsh vegetation and established mangroves along or adjacent to the coastal edge. Mobile, and in places, vegetated sand banks are present within the harbour. South of the causeway that crosses the harbour, extensive areas of established mangroves extend into saltmarsh and an area of kahikatea swamp forest.

The Tāwharanui Peninsula extends towards the east from Omaha. The Tāwharanui Peninsula's northern coastline is more exposed to wave energies from the north to northeast angle. The peninsula's northern-facing coastline is characterised by sandy beaches contained within shore platforms and subtidal reefs, backed by vegetated sand dunes, and coastal cliffs and rocky foreshore at the eastern end of the peninsula. The peninsula's southern-facing coastline, and the coastline extending to the entrance of the Matakana Estuary, is characterised by coastal cliffs and small pocket beaches. Due to sheltering by Kawau Island, the coastline on the southern facing Tāwharanui

Peninsula extending to the entrance of the Matakana Estuary, is only exposed to short-period fetch and depth-restricted waves.

In the southern area of the SAP area the Matakana Estuary is a shallow, sandy to muddy intertidal environment, sheltered from any significant wave energies by the sand spit feature at the mouth. A number of upper estuary arms/tributaries connect to freshwater streams/waterways. Large areas of established mangroves are present in the upper estuary areas, with saltmarsh habitat in places extending into coastal kanuka-manuka shrublands and coastal forest.

The large sand spit feature at Sandspit has been modified by reclamation and associated development, with much of its perimeter armoured with seawalls. Sandspit marina occupies a dredged area of the estuary. Beyond Sandspit, the coastline along the southern entrance to the Matakana Estuary is characterised by vegetated coastal cliffs, before the small sandy pocket beach of Brick Bay.

Sections of this coastline are armoured with seawalls, with some reclamation, with other sections relatively unmodified sandy or rocky coastline that are dynamic in response to coastal processes.

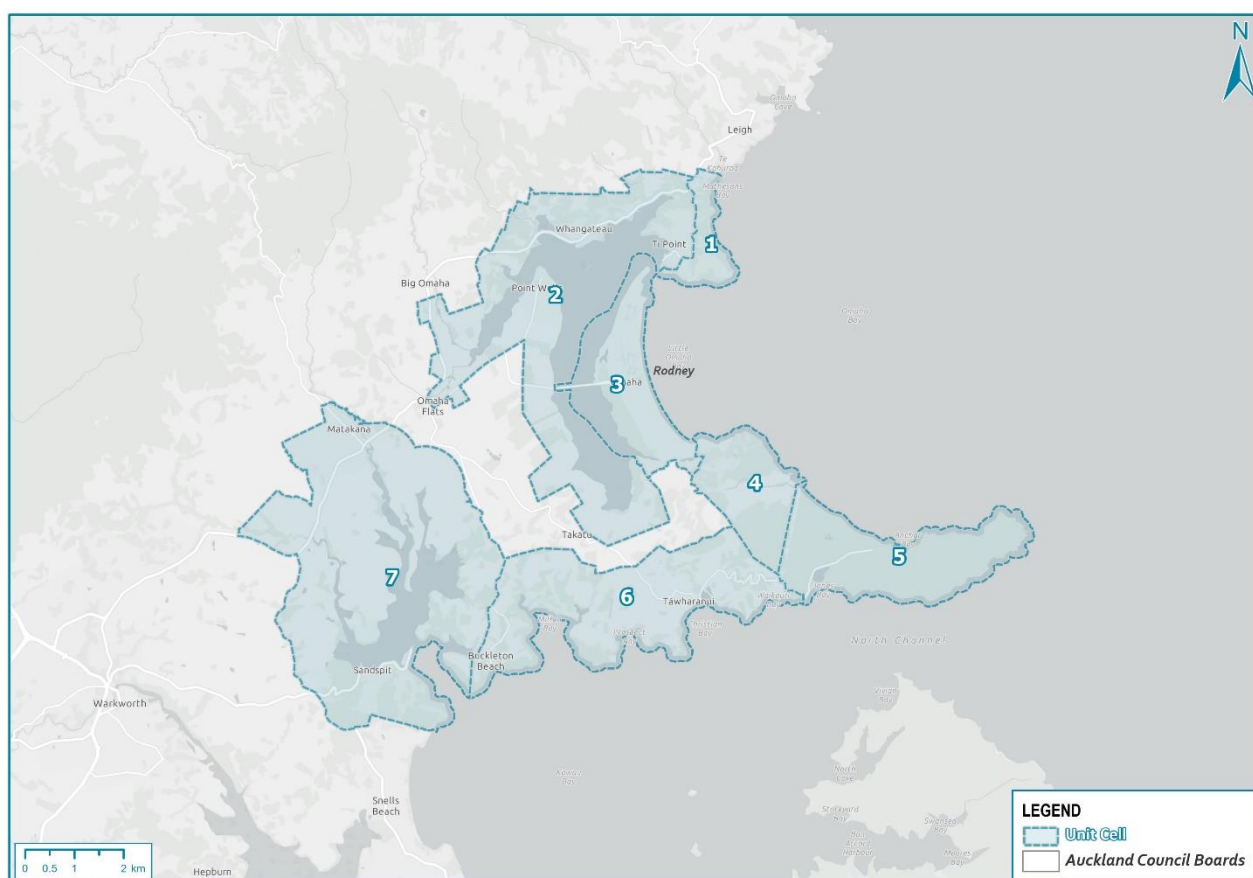


Figure 2-1: Unit areas for Ti Point to Sandspit

2.2 Units and stretches

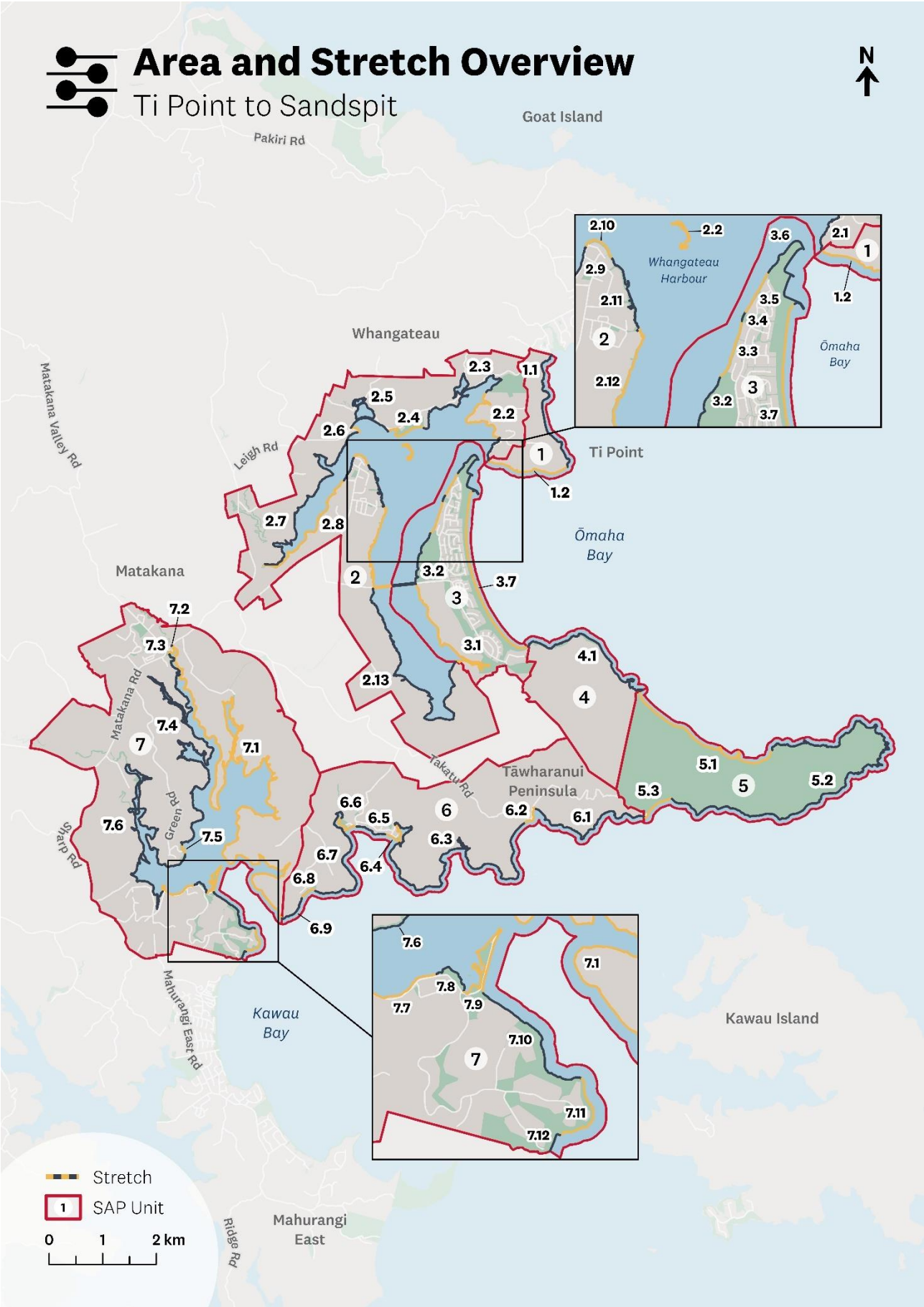
The Ti Point to Sandspit SAP area is divided into 7 separate unit areas to enable a more detailed and comparative view of how risk from coastal hazards is attributed across the SAP area. Within each unit, smaller coastal ‘stretches’ have been identified based on coastal processes, the presence of Auckland 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.

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.



	Unit	Stretches
Unit 1	Torkington Bay to Ti Point	1.1: Te Kohuroa South 1.2: Ti Point Walkway
Unit 2	Whangateau Harbour (Point Wells)	2.1: Ti Point access 2.2: Ti Point west 2.3: Whangeteau North 2.4: Whangeteau Domain & Holiday Park 2.5: Whangeteau Causeway 2.6: Big Omaha wharf 2.7: Omaha River inlet west 2.8: Point Wells west 2.9: Riverside Drive 2.10: Point Wells Wharf 2.11: Point Wells east 2.12: Point Wells south 2.13: Waikokopu Creek

Unit		Stretches
Unit 3	Omaha	3.1: Omaha Taniko Wetlands 3.2: Golf course 3.3: Omaha community facilities 3.4 Omaha Boat ramp 3.5 Omaha Sandcliffs accessways west 3.6 Omaha Sandspit 3.7 Omaha Beach
Unit 4	Omaha East	4.1 Omaha East
Unit 5	Tāwharanui	5.1 Northern Beaches 5.2 North Coast to Jones Bay 5.3 Jones Bay and Matatūahu Point
Unit 6	Waikauri to Buckleton	6.1 Tāwharanui west (Waikauri) 6.2 Christian Bay 6.3 Karangatuoro Peninsula and Prospect Bay 6.4 Campbells Beach 6.5 Campbells to Baddeleys 6.6 Baddeleys Beach 6.7 Baddeley's to Buckleton 6.8 Buckleton Beach
Unit 7	Matakana to Sandspit	7.1 Takatu to Matakana 7.2: Matakana River 7.3: Matakana Wharf 7.4: Matakana River inlet west 7.5: Rainbows End 7.6: Matakana South (Sharp Road) 7.7: Sandspit west (Green Point to Marine) 7.8 Sandspit Reserve (Marina) 7.9: Sandspit (Wharf and access) 7.10: Sandspit to Horseshoe Bay (Holiday Park) 7.11: Sandspit South (Puriri Place) 7.12: Brick Bay



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 timeframe, 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 2-1 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 2-1: 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.

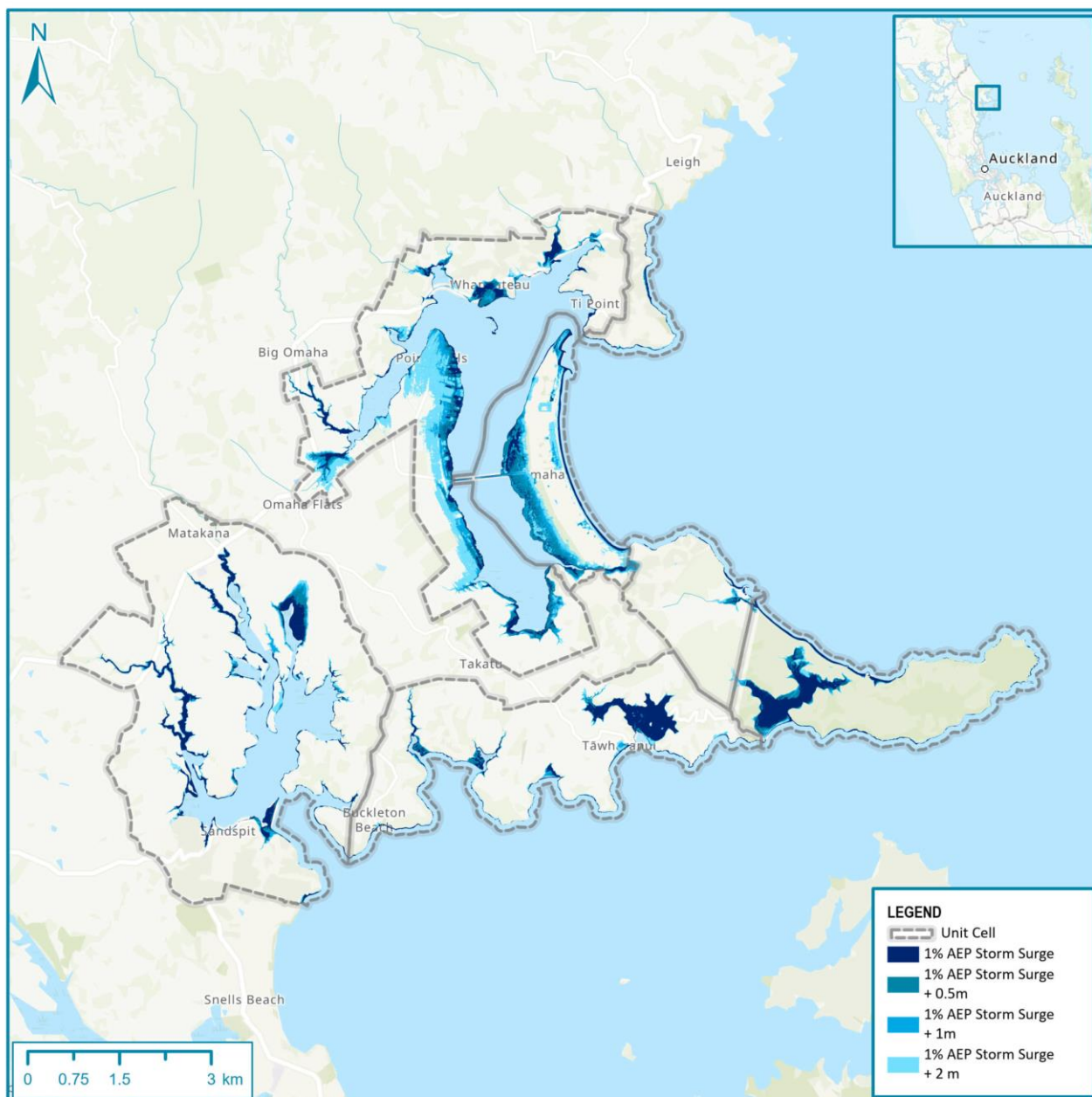


Figure 2- 2: Coastal inundation areas for Ti Point to Sandspit (prepared by T+T for Auckland Council 2023) based on Auckland Council coastal inundation mapping (Carpenter, N., Roberts, R., & Klinac, P. (2020). Auckland's exposure to coastal inundation by storm-tides and waves.)

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.

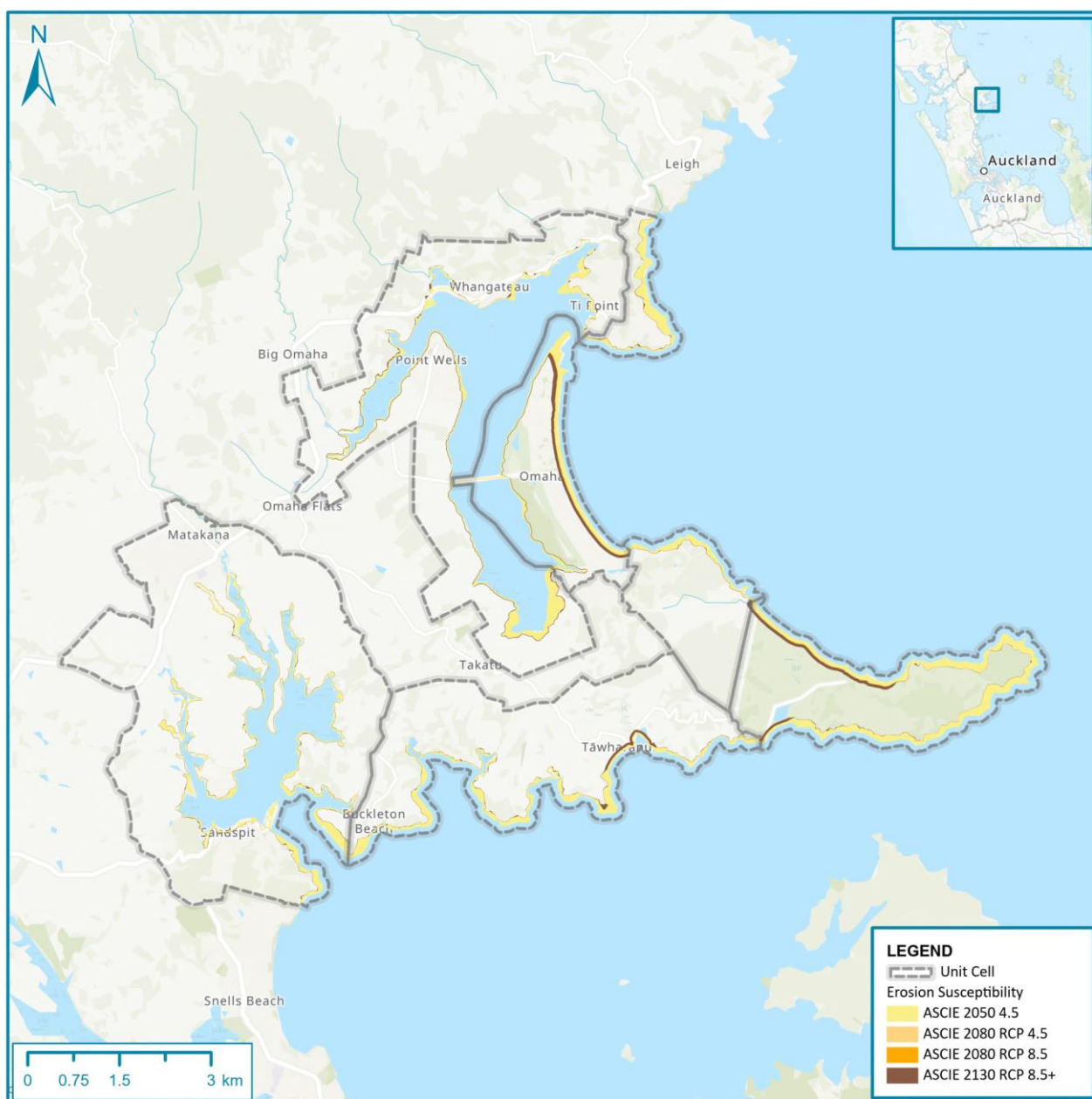


Figure 2- 3: Coastal instability and erosion susceptibility for Ti Point to Sandspit, prepared by T+T for Auckland Council (2023) based on Roberts, R., N. Carpenter and P Klinac (2020). Predicting Auckland's exposure to coastal instability and erosion, Auckland Council, technical report TR2020/021

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.

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 at Figure 2- 4 illustrates that flooding hazards are focused in lower-lying areas where streams and overland flow paths within the catchment drain to the coast. Overland flow paths and floodplains cross throughout the SAP area.

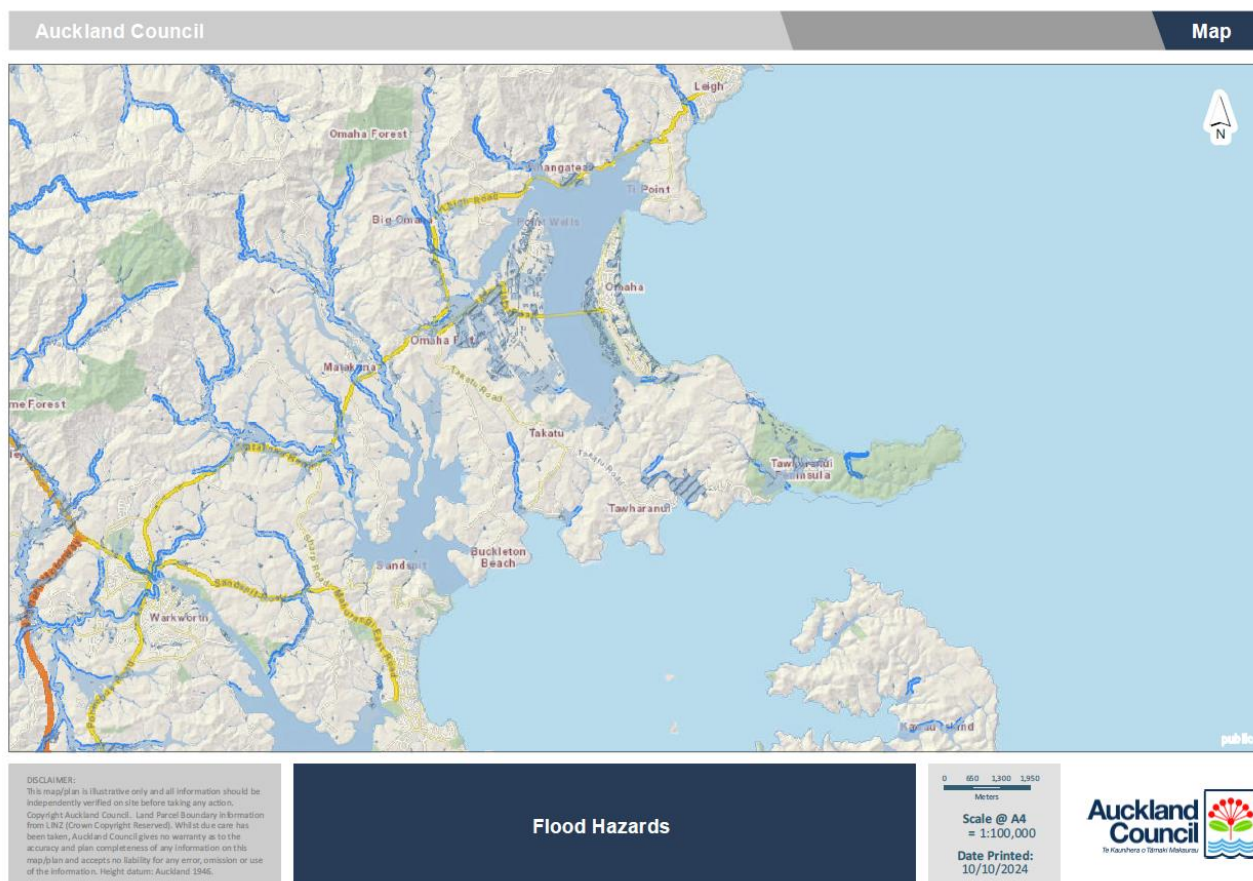


Figure 2- 4 Flood Plain areas 1% AEP hazard, Auckland Council Flood viewer.

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, tsunami, 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 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.

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.
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.

Strategy name	Summary	What does this mean?
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

The draft strategies and supporting notes included in this document are designed to inform the community and enable feedback through the engagement process.

Following engagement close, all feedback will be reviewed and analysed. This is used to inform the develop of community objectives, which are applicable to all areas within the SAP and considered in the decision-making framework. 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 the selection of final strategies.

The final Shoreline Adaptation Plan will include guidance notes to support implementation and may refer to key values, features and considerations required. These notes may also reference feedback received through this engagement process.



Unit 1

Ti Point to Sandspit

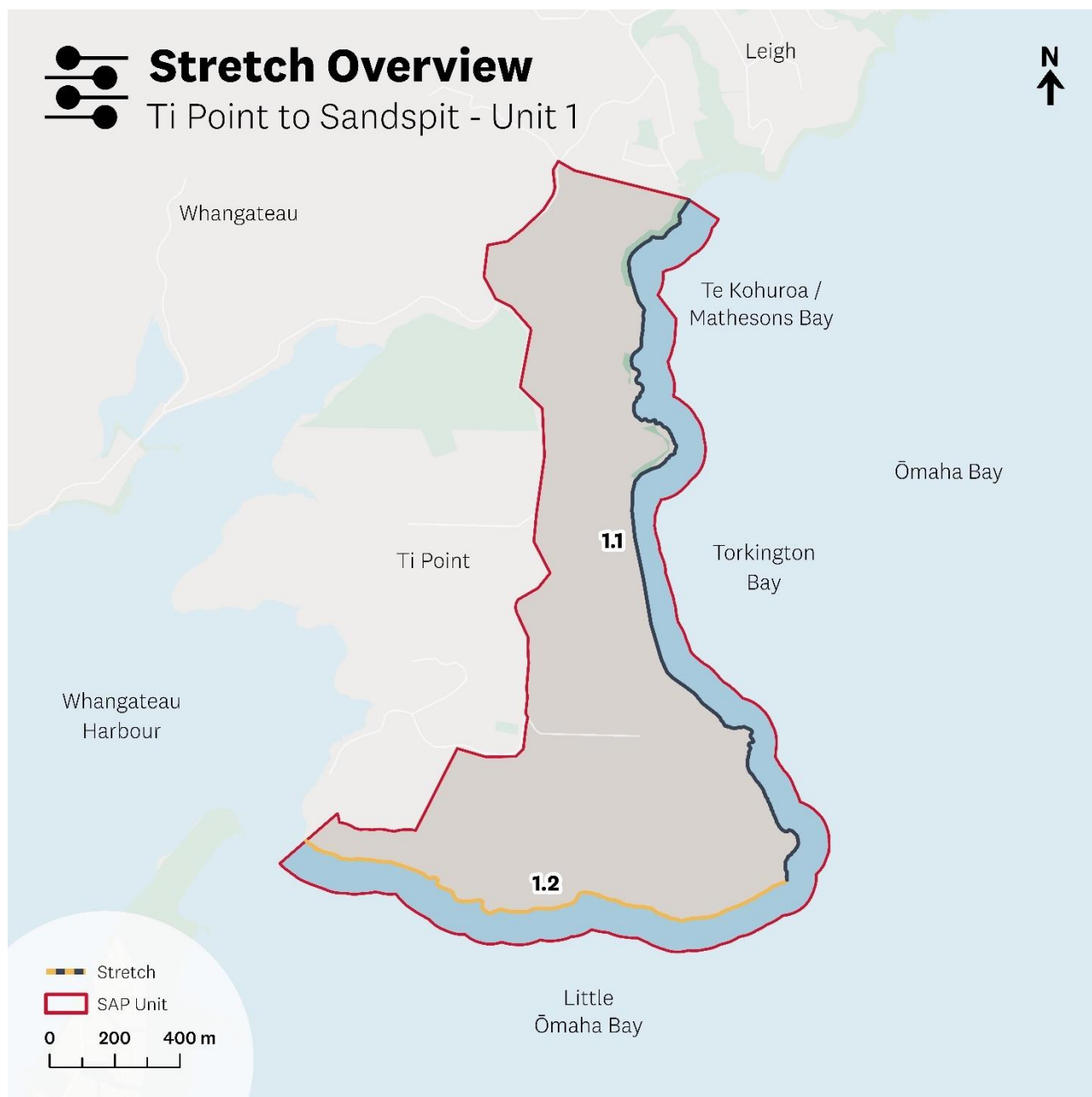


Unit 1: Torkington Bay to Ti Point

The unit includes approximately 4 km of coastline, which is predominantly a rocky shoreline backed by vegetated coastal cliffs. While there is some sheltering from Cape Rodney, Hauturu (Little Barrier Island) and Aotea (Great Barrier Island), the Ti Point coastline is periodically exposed to moderate to high wave-energies from the northeast to southeast angles.

A long, sandy pocket beach is present along this unit's eastern coastline. This sandy pocket beach of Torkington Bay along the Ti Point is dynamic in response to coastal processes, likely going through cycles of erosion and accretion. Intertidal rock shelves along this beach help dissipate wave energies arriving at the beach.

Established low density and lifestyle residential development is present at Ti Point. However, public access from land to the foreshore along this unit's coastline is limited and on the open east coast, small areas of disconnected esplanade reserve are located alongside isolated parcels of Crown land. Auckland Council maintains a walkway (Ti Point walkway) located within areas of Crown-owned (DoC) and road reserve areas along the southern coast of Ti Point. The wider area includes a boat ramp and dinghy storage (located within Unit 2) with a formal walkway along the coast. Auckland Council Parks' Team maintains this land, although it is identified as road reserve. Management of this walkway requires coordination with multiple partners and both contaminated land, presence of nesting sea birds and impacts from coastal inundation are identified in relation to this walkway.



DRAFT Adaptation strategy summary stretches 1.1 to 1.2

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
1.1: Te Kohuroa South Commencing at the southern end of Te Kohuroa Bay to the mouth of the Whangateau Harbour and culminating at the end of the open coast (Ti Point Pā).	NAI	NAI	NAI	No active intervention is identified due to limited Auckland Council land and assets located within this open east coastal stretch.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
1.2: Ti Point walkway: Commencing in the east to the south of Ti Point Pā and culminating in the west adjacent to the Omaha spit and entrance to the Whangateau Harbour.	LI	LI	LI	Limited intervention over all timeframes is reflective of the management of risk to walking access that is responsive to the coastal character and identified ecological and cultural values of this stretch. Noting that inundation in the mid to long term may require further management of walking access to ensure safety. No coastal protection structures are envisaged; risk should primarily be managed through design and management of accessways.



Unit 2

Ti Point to Sandspit



Unit 2: Whangateau Harbour (Point Wells)

This unit covers approximately 20 km of indented coastline that includes Whangateau Harbour, excluding the inner coastline of the Omaha Spit, and the estuarine Omaha River which connects to Whangateau Harbour.

The coastline of this unit is estuarine, with established mangroves and saltmarsh present, and sections of rock and concrete seawalls. In places, mangroves and coastal edge saltmarsh were historically removed from the harbour. With relatively short, inner-harbour fetch distances, the coastline is exposed to low, short period, depth-restricted wind-waves, with limited local fetch distances. However, during extreme events, storm surge from the open coast can elevate water levels within the harbour. During these elevated water levels and strong winds, localised short period, wind-waves can transport sediment within Whangateau Harbour as evidenced by the mobile sand bars within the harbour.

The land adjacent this coastline is low-lying in places and currently impacted by coastal inundation during extreme events which is expected to be exacerbated by sea-level rise (ref to figure 2-2). This includes existing residential development at Point Wells, and Whangateau.

Whangateau (stretches 2.1 to 2.5)

- Within the northern inlets of Whangateau Harbour, roading connections provide access to northern areas of Leigh and Mathesons Bay. Both Ti Point Road Reserve and Opango Creek Reserve are in this area with the Ti Point Road reserve including a boat ramp enabling harbour access.
- A closed landfill is located within the northeastern area of this unit.
- The holiday park at Whangateau is exposed to coastal inundation. Current management in response to present-day coastal inundation and through king tides and storm surge have been experienced by communities and inundation is anticipated to become an increasing issue for future management of this low-lying area, associated infrastructure (water and wastewater) within the wider the Whangateau Domain and the offshore Horseshoe Islands. Coastal erosion is also a documented challenge for this reserve area and coastal hazard impacts are also identified in the local park's plan in relation to shore/sea bird habitat on Horseshoe Island.
- The small pocket beaches adjacent the Whangateau Domain Recreation Reserve are periodically topped up with imported sand (by Auckland Council Parks and Community Facilities), under an existing resource consent. Maintenance of the rock rip-rap seawall adjacent the campground at Whangateau occurred in 2019.
- A number of seawalls are present along the Whangateau coastline comprising various designs, including stabilised sediment, rock rip-rap, and concrete seawalls. Some seawalls require repair or maintenance works, or consideration of alternative reserve edge treatment options.
- A public boat ramp is located to the northern end of the beach which is tidal and a popular access point for boats and other coastal users.

Big Omaha wharf and south (stretch 2.6 and 2.7)

- A coastal renewal project has recently been completed at the end of Big Omaha Wharf Road where the toilet block and approximately 10 m of masonry rock seawall are being renewed.
- A smaller public boat ramp is located at Big Omaha.

Point wells and Waikokopu Creek inlet (stretch 2.8 to 2.13)

- Point Wells has an established community and residential development. An all-tide public boat ramp is present at Point Wells.
- In places, there is evidence of very slow rates of erosion occurring along this estuarine coastline. However, this has typically occurred where mangroves or coastal edge saltmarsh habitat has been removed. Stronger tidally-induced currents, particularly within the all-tide channels, can entrain and transport bed sediments.
- The eastern-facing Point Wells coastline is low lying and periodically impacted by coastal inundation and will be significantly impacted by coastal inundation with sea-level rise.
- At Point Wells Foreshore Reserve, a coastal renewals project is currently in the early phases of scoping to assess the condition of the existing coastal protection structures and their ongoing maintenance and renewal requirements along this stretch of coast.

In addition to the number of Auckland Council-owned coastal structures along this stretch of coast, others are in private ownership. Some of these structures are located within parcels of Auckland Council land and encroach onto the esplanade reserve.



DRAFT Adaptation strategy summary stretches 2.1 to 2.13

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.1: Ti Point access Commencing at the eastern end of the unit and culminating in the north west where Ti Point Road turns east away from the coast.	LI	LI	LI	This stretch includes roading and boat launching facilities. Limited intervention indicates the continued management of this harbour access and roading connection.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.2: Ti Point west Commencing in the south where Ti Point Road turns away from the coast and culminating to the east of the Whangateau Tip Landfill Reserve. This stretch also includes Horseshoe Island.	NAI	NAI	NAI	Limited Auckland Council-owned land and assets are located within this stretch. No coastal protection structures are anticipated within this stretch. No active intervention does not preclude the advocacy for actions to support ecological outcomes, specifically in relation to Horseshoe island.
2.3: Whangateau North Commencing in the east at the start of the reserve landholding and including the coast (Coxhead Creek inlet) west and south, culminating at the northern side of Whangateau Reserve. Note: this stretch includes a closed landfill area, roading connections and reserve areas. Areas of private land, including Whangateau Cemetery are not subject to the strategies in the SAP.	LI	LI	APA	Limited intervention in the short to mid-term is reflective of the uses (including historic uses and leases) located within reserve areas and the management of risk to these uses and assets. Limited intervention also confirms the maintenance of important roading connections providing north/south access for communities of Mathesons Bay and Leigh immediately to the north. Adaptation priority in the long term signals the need to consider how risk is managed to landholdings and Auckland Council assets given the identified ecological, social (historic heritage) and cultural values and the increasing coastal hazard risks. Note: this stretch includes a closed landfill which is subject to the Closed Landfill Asset Management Plan.
2.4: Whangateau Domain & Holiday Park Commencing at the northern boundary of Whangateau Reserve and culminating at the western side of the Leigh Road Layby/ boat ramp access. This stretch includes Whangateau Holiday Park, reserve areas and facilities, water assets and harbour access points. This area is also traversed by a key roading connection.	LI	APA	APA	Limited intervention in the short term confirms the continued maintenance of existing coastal protection measures and the continued need to consider how risk to uses within Auckland Council-owned land is managed, including localised realignment of uses and assets. Adaptation priority in the mid to long term is reflective of the increasing inundation risk (with inundation impacts already experienced) and the need to consider the highly valued reserve areas, leases, assets and infrastructure and provided for further engagement with iwi, communities, key stakeholders and asset owners regarding how risks can be managed and values maintained.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.5: Whangateau Causeway Commencing west of Whangaeatu/ Leigh layby boat ramp and including the coast west to the access to Big Omaha Wharf. This stretch includes the inlet/estuary area to the north.	LI	LI	LI	Limited intervention provides for the continued management of risk to arterial and other roading assets which traverse this stretch, areas of reserve land, i.e. Ashton Road - Leigh Road Reserve and Darroch Shipyard Bridge Reserve. Management through design and location of uses and assets is preferred, noting the presence of historic heritage sites within this stretch. Note: The management of closed landfills is subject to the Closed Landfill Assets Management Plan.
2.6: Big Omaha wharf Commencing at the northern side of the wharf access road and reserve, including the wharf and associated access from Leigh Road, culminating to the south of the wharf structures in the west.	HTL	HTL	HTL	Hold the line is identified for this stretch reflective of the historic heritage value, important harbour access location and the existing coastal protection structures. Response to inundation risks and management of historic heritage values may require further design consideration in the long term.
2.7: Omaha River inlet west Commenting south/west of Big Omaha Wharf and including the coastal line south to the southern-most area of the river inlet, culminating in the Omaha River Point Wells reserve.	NAI	NAI	NAI	Limited Auckland Council-owned land and assets are located within this stretch. No coastal protection structures are anticipated within this stretch. No active intervention does not preclude the advocacy for actions to support ecological outcomes or the management of risk to cultural and historic heritage values and sites.
2.8: Point Wells west Commencing on the southern side of the Omaha river inlet, including the western side of the Point Wells Peninsula, extending north to where Riverside Road meets the coast.	NAI	NAI	NAI	Omaha River Point Wells reserve is currently an unmaintained esplanade reserve, access along the reserve is restricted and no assets or Auckland Council-owned protection structures are identified as present. No active intervention is identified reflective of the current uses and assets, supporting a natural coastal edge in this location. Note: aspirations for further public access and walkway connections is identified in the Rodney Greenways Plan.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.9: Riverside Drive Commencing where Riverside Drive meets the coastal edge and culminating to the south of the Dunbar Road intersection with Riverside Drive. Note: this stretch includes the wharf and coastal access structures.	LI	LI	APA	Limited intervention in the short to medium term provides for the management of risk to assets (including reserve, access structures and roading connections) through design and location of assets. Adaptation priority is identified in the long term to signal the need for further consideration and engagement regarding how increasing coastal hazard risk and identified values can be managed within this stretch.
2.10: Point Wells Wharf Commencing at the Dunbar Road intersection in the west and including the coastline north around the Point Wells Peninsula, culminating adjacent to the southern extent of Dunbar Road.	HTL	HTL	APA	Hold the line is identified in response to coastal erosion. This provides for the maintenance of highly valued coastal access connections and reserve uses. Nature-based and soft engineering solutions are preferred to manage coastal hazard risk. Inundation risks in the mid to long term will present the need for further adaptation planning which will need to respond to the identified values and priorities for this low-lying coastal area.
2.11: Point Wells east Commencing adjacent to the reserve areas, from the southernmost end of Dunbar Road, including Point Wells Foreshore Reserve and Waimanu Reserve, culminating at Sandpiper Avenue stormwater reserve.	LI	LI	APA	Limited intervention in the short to mid-term is identified to signal the need to manage risk to assets located within the northern areas of this stretch. Within northern areas, limited intervention recognises the coastline is not fixed. Within central areas, access is limited (with assets located in proximity to the Waimanu Reserve access) and ecological values are identified. For the southern areas of this stretch, limited intervention relates to the management of stormwater devices and coastal access point provided from Sand Piper Avenue. Adaption priority is identified in the long term to signal the need to consider how risk to landholdings is managed, coastal access maintained and ecological and cultural values supported.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
2.12: Point Wells south Commencing at the Sand Piper Avenue stormwater reserve access to the coast and including the coastline south culminating to the south of the causeway crossing (including the western aspects of the causeway/road bridge).	LI	LI	LI	Limited intervention provides for the management of risk to key roading and wastewater connections which service the Omaha area. Noting this is an arterial road and access is a priority to maintain. Within northern areas of the stretch (Point Wells Foreshore Reserve) a no active intervention approach for the management of risk to Auckland Council assets is identified reflective of the current uses and assets, supporting a natural coastal edge and coastal ecology and amenity values in this location. Note: Aspirations for further public access and walkway connections is identified in the Rodney Greenways Plan and private coastal defences are located within this stretch.
2.13: Waikokopu Creek Commencing south of the causeway and including the coastal inlet south to the end of the unit area. This stretch includes a portion of the Whangateau Harbour Esplanade Reserve.	NAI	NAI	NAI	No active intervention is reflective of the limited Auckland Council land and assets. No active intervention does not preclude the advocacy for management of risk to ecological values or proactive measures to support ecological outcomes.



Unit 3

Ti Point to Sandspit



Unit 3: Omaha

This unit commences within the Whangateau Harbour Inlet to the west of the Omaha peninsula and includes the wider Omaha area, stretching for approximately 9 km length of coastline, including the exposed Omaha Ocean Beach, and the sheltered inner harbour side of Omaha barrier sand spit.

Omaha Beach is a moderately exposed dynamic ocean beach. While not as exposed to the same wave energies as Te Arai and Pākiri beaches, Omaha Beach is exposed to significant fetch distances from the northeast to southeast angles. As a result, the beach is periodically subject to medium to high wave energies from these angles. During extreme storm events and elevated water levels, erosion of the dune toe can occur, following which sand levels typically recover. Regular beach profile surveys across Omaha Beach undertaken since 1978 (Auckland Council's most extensive beach monitoring area) show net minor accretion of the beach over this period. Planting of native dune grasses (spinifex and pingao) is periodically undertaken on the Omaha Beach sand dunes, including the steep inner spit coastal edge slope, immediately north of the wharf (stretch 3.5).

Three large rock revetment groynes stabilise the northern end of the spit (stretch 3.6). The rock groynes help contain beach cells with these structures. Both within northern areas and further south established sand dunes vegetated with native spinifex and pingao back the ocean beach. The dune buffer is wider for the southern approximately 1.7 km length of beach, with the more recent residential development, to the south set back further than the original, northern development. Rope and bollard-defined pedestrian accessways, and timber boardwalks extend through the sand dunes for the length of the ocean beach.

On the western side of the peninsula the Broadlands Drive causeway crosses Whangateau Harbour connecting to Omaha Spit and includes a bridge section towards the middle enabling tidal movements. Established mangroves are present south of the causeway. An all-tide public boat ramp extends from the inner harbour coastline, alongside a large public wharf (stretch 3.4). To the south of the wharf extending as far south as the causeway a stabilised sediment and gabion basket seawalls armour the inner harbour Omaha Spit coastline (stretch 3.2 & 3.3). to the north of the boatramp

Auckland Council reserve land extends along the seaward and inner harbour coastal edge of Omaha Spit. Landholdings include areas leased to community uses, including golf course, bowling and community uses. Within the southern areas reserve land includes stormwater reserves and borders the Omaha Taniko Wetlands Scientific Reserve (managed by DOC) (stretch 3.1). On the northern side of the spit council reserve land includes the dune area and an extensive network of walkways providing access to the coast (stretch 3.7).



DRAFT Adaptation strategy summary stretches 3.1 to 3.7

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
3.1: Omaha Taniko Wetlands Commencing at the southern end of the unit within the esplanade reserve and including the coast north to the southern side of the causeway.	NAI	LI	LI	No active intervention is identified due to the limited assets located within this area of the coast. Limited intervention is identified in the mid to long term, most specifically in relation to the southern areas where catchment flooding and coastal inundation risk increase to

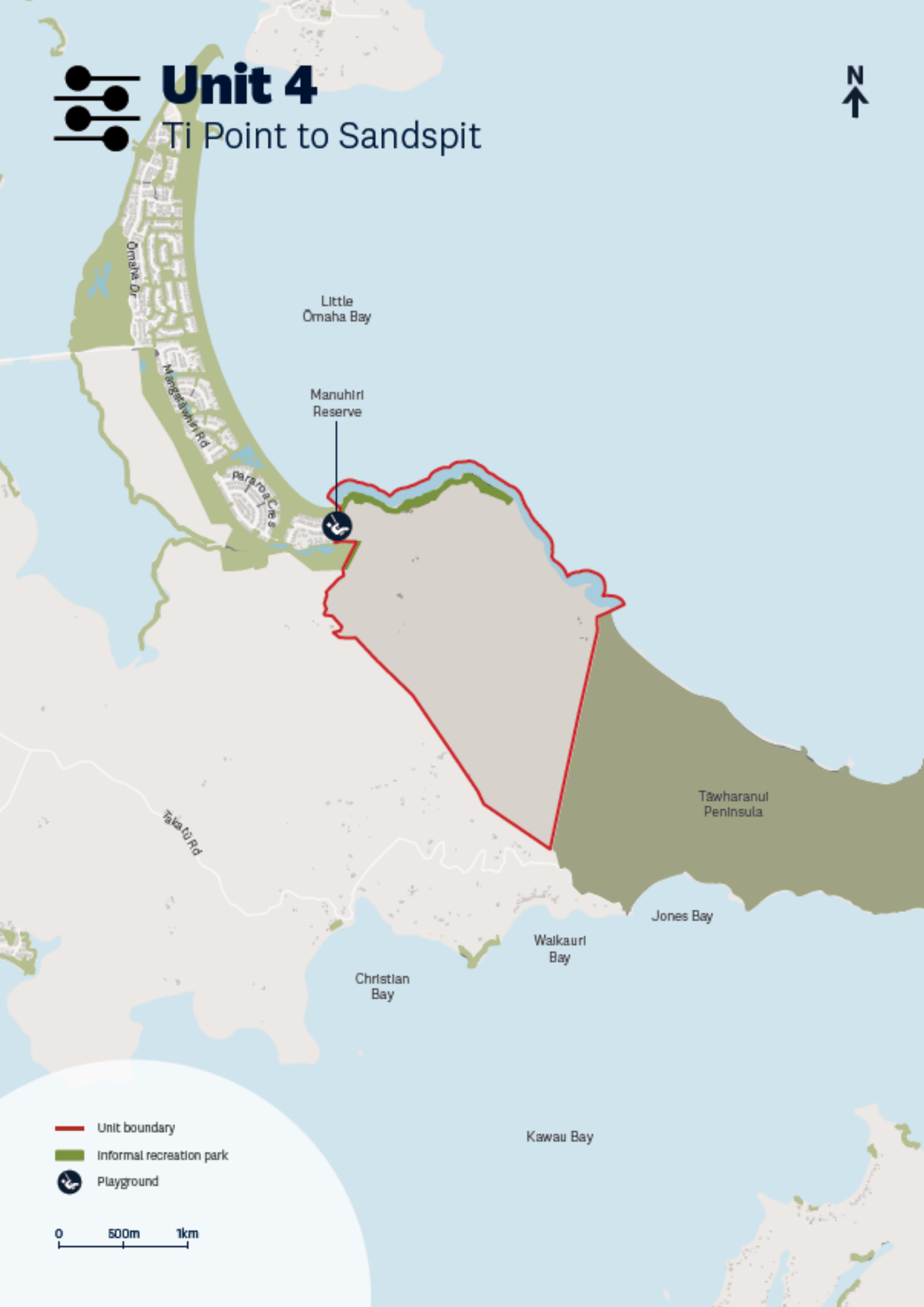
Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
				stormwater management areas noting this area also contains ecological values.
3.2: Causeway & Golf course Commencing at the Causeway (and including this connection) and culminating at the northern end of the Golf Course reserve. This stretch includes the causeway roading connection and wastewater connections for the Omaha area.	LI	LI	LI	The causeway roading connection is an arterial road link providing access to the spit area and conveys the wastewater connections for the residential development within the spit. Limited intervention provides for the continued maintenance of these connections. Limited intervention in relation to golf course areas (over all timeframes) may require review based on the experience of inundation and the ability to maintain the function of uses within the landholdings with increased inundation impacts.
3.3: Omaha community facilities Commencing north of the Golf Course Reserve and including the coast north to the southern extent of the boat ramp area. Note: this stretch includes the areas adjacent to Bowling Club, Tennis courts and a portion of the Whangateau Harbour Esplanade Reserve.	HTL	LI	APA	Hold the line in the short term is reflective of the maintenance of the coastal edge in this location to maintain this connection between key community facilities. Limited intervention in the mid-term maintains the coastal edge in relation to erosion while responding to an increased inundation risk. In the long-term, Adaption priority is identified due to increased inundation risk to leased land uses and assets and the maintenance of the coastal connection.
3.4: Omaha Boat ramp Commencing to the south of the Omaha Beach Boat Launching & Wharf reserve and culminating to the north of the wharf structure.	HTL	HTL	HTL	Hold the line is identified to confirm the maintenance of this key public boat access facility and existing infrastructure. While the coastal edge is maintained with access structures, inundation risk to the landward uses may increase and the design and location of associated uses or assets may be required.
3.5: Omaha Sandcliffs accessways west Commencing to the north of the boat ramp including the coast north (including a portion of the Whangateau Harbour Esplanade Reserve) and culminating north of	LI	LI	LI	Limited intervention over all times frames signals that the coastline is not fixed. Management of risk of assets through location and design of assets and continued maintenance of access to the coast is preferred. Limited intervention supports the consideration of nature-based solutions such as planting, sand push-ups and sand

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
Ida way where the northern spit reserve (fenced area) commences.				nourishment. Interventions should respond to and support the ecological values, character and beach amenity. Hard engineered structures are not envisaged for this stretch.
3.6: Omaha sandspit Commencing on the western side of the inlet and including the coast north and east, culminating to the south of the groyne structures and the fenced reserve area.	LI	LI	LI	This stretch includes areas and habitats of significant ecological value. Management of risk to ecological values is provided for through limited intervention alongside the continued maintenance of the groyne structures and associated dune management. Uncertainty regarding how the spit and associated groyne structures may respond to sea level rise, and increased inundation events, may prompt review in the future.
3.7: Omaha Beach Commencing to the south of the northern reserve area including the coast south to the end of the Omaha beach embayment area. This stretch includes the balance of the Omaha beachfront, associated reserves areas and beach accessways.	LI	LI	LI	Limited intervention confirms the management of risks through the maintenance and support for the nature-based defence provided by the existing dune system. Limited intervention also confirm the management of accessways and access to the coast. Limited intervention in the long term is based on current data, studies and modelling. Continued monitoring and understanding of coastal processes will be required to confirm the efficacy of this approach in the mid to long term. In lower lying southern areas of the stretch further management of risk via design and location of assets may be require to respond to inundation risk.



Unit 4

Ti Point to Sandspit



- Unit boundary
- Informal recreation park
- Playground

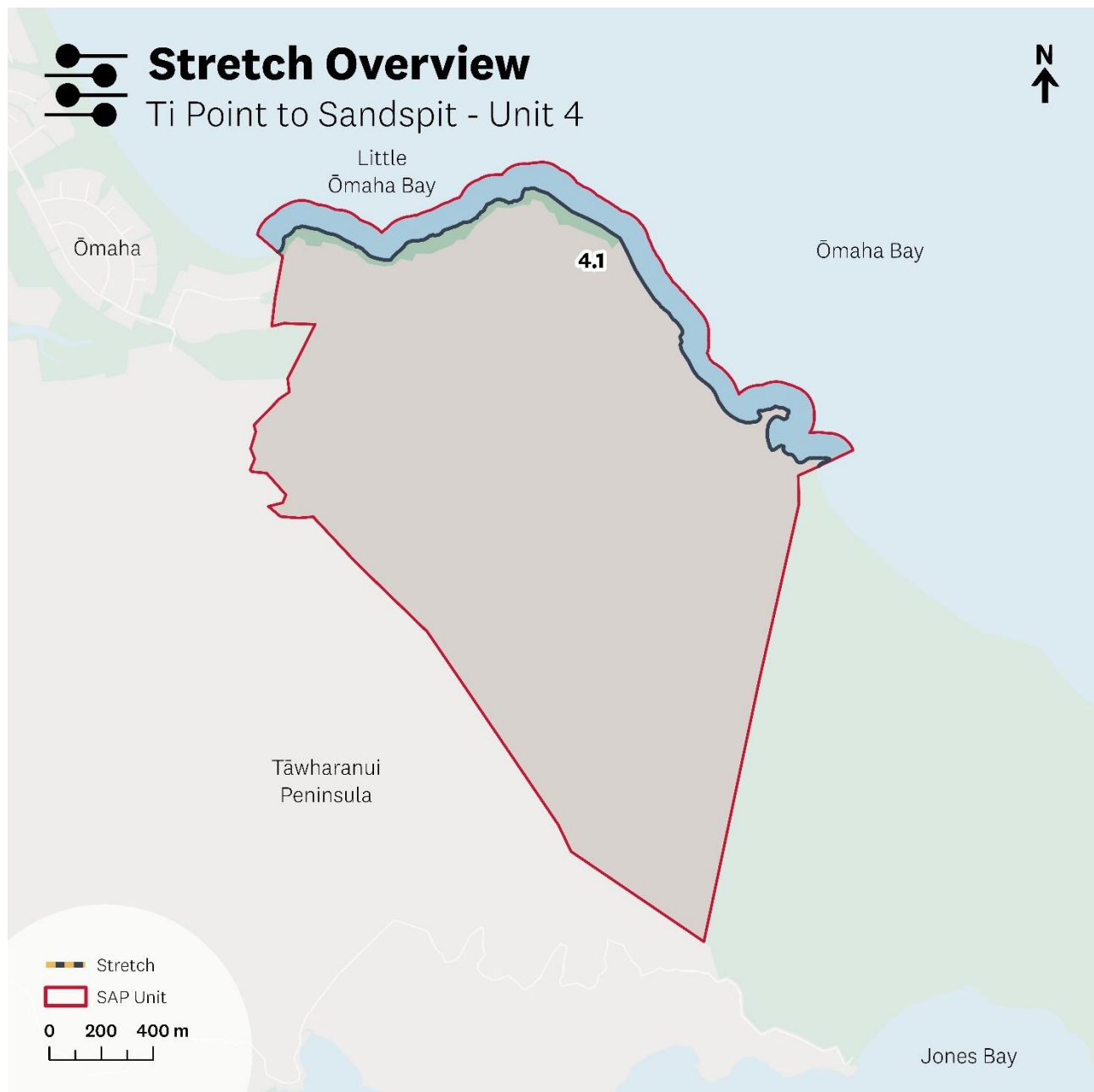
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Unit 4: Omaha east

This unit includes the coastline east from Omaha Beach stretching approximately 3 km in length, extending to the beginning of Tāwharanui Regional Park.

The coastline is characterised by a rocky intertidal shoreline, with small pocket beaches, backed by vegetated coastal cliffs. Areas of the foreshore are accessible at low tide from Omaha Beach and Tāwharanui Regional Park.

The stretch includes limited areas of Auckland Council-owned land. Noting that coastal areas include cultural heritage sites, including Te Kie Point Pā. Esplanade reserve land in this unit is identified as the 'Dune Walkway Reserve' which also includes an area of southern Omaha Beach. Associated management intentions include protection of cultural heritage and the enablement of greenways outcomes including the creation of an Omaha to Tāwharanui coastal route.



DRAFT Adaptation strategy summary stretch 4.1

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
4.1: Omaha East Commencing at the southern end of Omaha Beach and culminating in the east at the regional park.	NAI	NAI	NAI	No active intervention is reflective of the limited assets located with reserve areas and the natural coastal character of this coastal area. Note that no active intervention does not preclude support and consideration of risk to cultural heritage sites located within Auckland Council landholdings.



Unit 5

Ti Point to Sandspit



Unit 5: Tāwharanui Regional Park

Unit 5, located within the Rodney Local Board area, includes approximately 11 km of coastline including Tāwharanui Regional Park. It is bordered on the northern coast by Tāwharanui Marine Reserve.

Tāwharanui Peninsula's north-facing coastline is characterised by a dynamic sandy beach contained between rocky intertidal and subtidal outcrops, and backed by vegetated sand dunes. Coastal cliffs dominate the peninsula's eastern coastline.

A coarse-grained pocket beach is present at the southwestern boundary of the regional park (Jones Bay), with a stream and lagoon feature discharging onto the beaches northern end.

The northern coastline is exposed to a relatively open fetch from the direct north. These sandy beaches are therefore frequently exposed to medium to high wave energies, particularly from the northerly angle. This includes longer period swell events generated from some distance away, and more localised shorter period storm-waves associated with strong onshore winds.

Upper beach and intertidal sand levels fluctuate in response to the wave climate, going through cycles of erosion and accretion. Erosion of the dune toe and upper beach can occur during significant storm events, following which sand levels recover.

As with all Auckland Council regional parks, efforts are made to ensure the natural character and minimise the need for hard protection structures and more intrusive management techniques. Dune restoration works have been previously undertaken at Waikōkōwai Anchor Bay. This involved removing fill material from the dunes at the main beach access point and reshaping and planting the dune with native dune grasses.

Within the northern coastal area of the park, assets include access roads, parking, camping and picnic areas. Assets and facilities are generally set back from the coastal edge. Periodic dune planting is undertaken as required and defined pedestrian accessways extend through the sand dunes; these are maintained or modified to adapt to the dynamic dunes.

In eastern areas, the rocky cliff coast is backed by rejuvenating coastal forest. Walking tracks and look-out areas are located within these areas of the park. Numerous cultural and historic heritage sites are identified along this coastal area.

Within the southern areas of the park, low-lying areas in proximity to Jones Bay lagoon are several buildings (Tāwharanui Bach, Jones Homestead) and key park road accessways into the northern areas of the park. Also in this area is the Ōpōnui Pā and an associated (historic) fortified Māori settlement. Erosion of the coastal edge at Jones Bay is documented in the Regional Parks Management Plan (2022) with investigations of options to manage this and protect access to the parks is identified as a management intention for the park.



DRAFT

DRAFT Adaptation strategy summary stretches 5.1 to 5.3

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
5.1: Northen beaches Commencing at the western end of the regional park and including the coast east to the culmination of Waikōkōwai Anchor Bay.	LI	LI	LI	Limited intervention reflects the continued management of coastal areas through support for nature-based defences such as dune planting, managing dune areas and the accessways through these areas to the beach. Limited intervention also provides for consideration of the design and location of assets in proximity to coastal hazard areas where inundation and catchment flood risks may change over time.
5.2: North Coast to Jones Bay Commencing east of Waikōkōwai Anchor Bay and including the rocky shoreline to Tokatū Point and the southern shoreline west culminating at the eastern end of Jones Bay.	NAI	NAI	NAI	The north-eastern areas of the park are predominantly cliff coast with a rocky shoreline. Walking access is generally set back and can be managed within park areas. No active intervention does not preclude the further consideration of how risk to cultural heritage may be addressed but responds to the natural coastal character and ecological outcomes within this stretch.
5.3: Jones Bay and Matatūahu Point Commencing at the eastern extent of the bay and culminating in the south west at Matatūahu Point and the end of the regional park landholdings.	LI	APA	APA	Limited intervention in the short term indicates the need to consider how current risks from coastal hazards to park assets are managed through location and design. In the mid to long term with increased sea level rise adaptation priority is identified to reflect the complex (historic, cultural and ecological) values and the need to continue to provide for park access and respond to risks to physical assets and sites. Relocation or alignment of some assets may be required.



Unit 6

Ti Point to Sandspit



- Unit boundary
- Informal recreation park
- Auckland Council owned land
- Boat ramp
- Playground

0 500m 1km

Unit 6: Waikauri to Buckleton

Unit 6 includes approximately 13 km of highly indented coastline, characterised by small pocket beaches with wide, shallow intertidal areas, contained within headlands and coastal cliffs. This south-facing coastline is sheltered from higher wave energies by Kawau Island. The coastline is typically only exposed to low, short period, wind-waves. However, during extreme conditions from the south to southeast angle and elevated water levels, moderate wave-energies can propagate through the gap south of Kawau Island and impact Campbells, Baddeleys and Buckleton beaches.

The small rural coastal settlements of Waikauri Bay, Campbells Beach, Baddeleys Beach, and Buckleton Beach, are located along this coastline. Auckland Council land and assets and associated coastal infrastructure located within this unit is in proximity to coastal settlement as follows:

- At Campbells Bay Beach, a boat ramp provides water access while reserve areas include parks amenities and a playground.
- A public boat ramp is located at Baddeleys Beach, reserve areas include leased community uses (tennis club) parks amenities and play facilities.
- Access roads a boat ramp and parking areas are located at Buckleton Beach.
- Rock and timber seawalls are present at Baddeleys and Buckleton beaches.
- Waikauri bay is privately owned and no council assets are identified within this area.

Aspirations for further access and connections through out this unit are identified in the Rodney Greenways I Paths and Trails Plan (Pūhoi to Pakiri) from 2017, there is a proposal to create a bridle and walking route that connects Baddeleys Beach to Matakana. The route passes through Baddeleys, Beach Reserve, Clinton Road-Baddeleys Beach Walkway and Campbells Beach Reserve.



DRAFT Adaptation strategy summary for stretches 6.1 to 6.9

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
6.1: Tāwharanui west (Waikauri) Commencing to the west of the Tāwharanui regional park including the coast west to the eastern side of Christian bay.	NAI	NAI	NAI	No active intervention is reflective of the limited land and assets located in proximity to the coast. No active intervention in this stretch does not preclude the need to manage risk to roading assets if required.
6.2: Christian Bay Commencing in the east where Takatu road traverses the low-lying area of	LI	LI	LI	Limited intervention relates to the management of risk to road access, providing access to coastal settlements to the east and

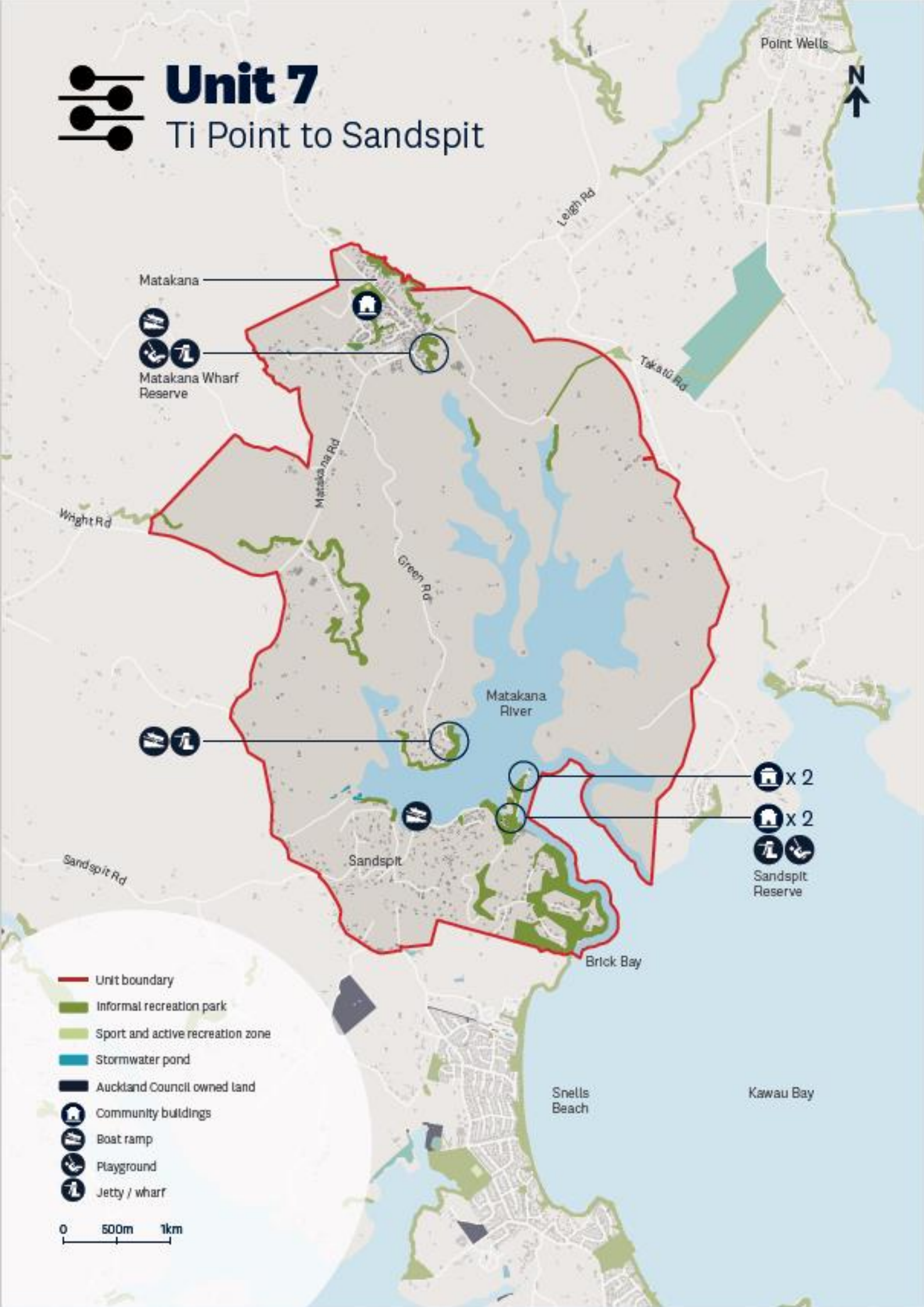
Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
Christian bay this stretch includes the central area of the embayment and the coast to the west where the road crosses the roadbridge and climbing to the west away from the coast.				the regional park. Noting the presence of cultural sites and historic structures, and exposure to both coastal and catchment hazards. Further engagement with Auckland Transport will inform further development of strategies for this stretch.
6.3: Karangatuoro Peninsula and Prospect Bay Commencing to the west of Christian bay including the coast west to Campbells beach, including the inner embayment, culminating to the north of Campbells Beach Reserve and Campbell road.	NAI	NAI	NAI	No active intervention is reflective of the limited council land and assets located within coastal hazard areas within this stretch.
6.4: Campbells Beach Commencing at the northern extent of Campbells Beach Reserve including the area west, culminating at the end of the beachfront area where the coast steepens to the west.	LI	LI	APA	Limited intervention provides for the ongoing management of lawfully established council owned structures and assets to support uses within coastal reserve areas. Limited intervention for this stretch supports nature-based responses including sand nourishment. Limited intervention also confirms the continued management of boat access ramps within this stretch. Adaptation priority in the long term responds to increasing coastal hazard risk, in particular inundation and sea level rise, to the low-lying reserve areas and roading connections landward of these areas.
6.5: Campbells to Baddeleys Commencing to the west of the Campbells Bay beach area and including a portion of the Campbells Beach Reserve and the Clinton Road-Baddeleys Beach Walkway, culminating where the road meets the coast.	NAI	NAI	NAI	No active intervention is reflective of the current distribution of assets within reserve areas. No active intervention does not preclude maintenance of access structures to the coast and it is noted that strategies can be updated to respond to future coastal access aspirations.
6.6: Baddeleys Beach Commencing to the east of the bay including the portion of coastal road to the west of the Clinton Road-Baddeleys Beach Walkway reserve and	LI	LI	APA	Limited intervention in the short term supports the continued management of assets and uses and lawfully established coastal management structures. This includes hard protection for roading connections (east/west)

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
culminating to the north west of the reserve area (within the inlet)				and the coastal reserve edge. Planting and nature-based solutions to coastal hazard impacts may also be promoted. Management of risks to parks use, included leased areas and onsite services (wastewater) supporting parks amenities may need to be managed through location and design. In the long term increased inundation risk and catchment flooding lead to the identification of adaptation priority actions to enable further planning and engagement regarding the use of reserve areas, values of iwi, communities and coastal aspirations.
6.7: Baddeley's to Buckleton Commencing to the north of the Baddeleys beach and extending west to Buckleton Beach Reserve	NAI	NAI	NAI	No active intervention is reflective of the limited council land and assets located within coastal hazard areas within this stretch.
6.8: Buckleton Beach Commencing to the west of the beach area including the reserve area west to the end of the reserve landholding.	LI	LI	LI	Limited intervention confirms the maintenance of existing coastal protection structures and boat ramp access. The Buckleton reserve maintains a higher elevation than the neighbouring reserves at Baddeley's and Campbells reserves reducing likely inundation risk. Erosional trends may require further monitoring.
6.9: Buckleton west Commencing to the west of the Buckleton Beach Reserve and including the coast to the peninsula/ end of the unit.	NAI	NAI	NAI	No active intervention is reflective of the limited council land and assets located within coastal hazard areas within this stretch.



Unit 7

Ti Point to Sandspit



Unit 7: Matakana to Sandspit

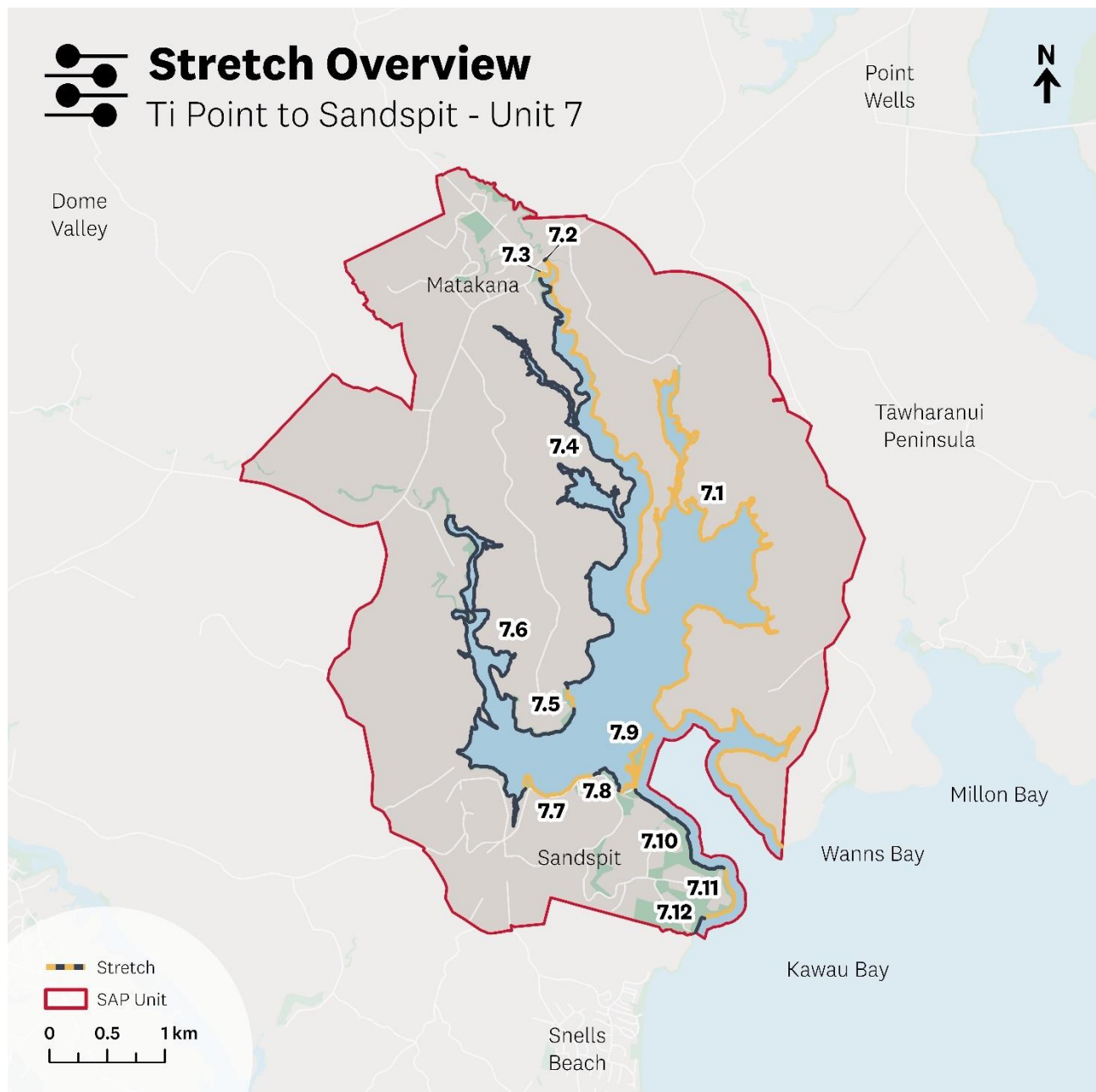
The Matakana Estuary and Sandspit coastline is an estuarine environment, characterised by extensive intertidal flats ranging from sandy to muddy sediments. Large areas of established mangroves are present within the upper estuary areas with saltmarsh species/habitat along the coastal edge in places.

The large sand-spit feature towards the estuary mouth has been significantly modified and developed, including reclamation and seawalls. A wharf structure extends from the end of the spit. The inner western side of the sand spit remains more naturalised, with established mangrove and saltmarsh vegetation and a shellbank along the outer edge. Sandspit Marina occupies an area of Matakana Estuary, with the marina basin dredged and sheltered by rock revetment breakwater structures.

The low-energy, small sandy pocket beach of Brick Bay is located at the southern end of this coastline.

Council owned and managed land and assets located within this unit include:

- Key roading and harbour transport connection of Sandspit wharf and marina and southern areas of the Matakana cycle trail and rural coastal roading connections to coastal settlements to the east.
- Boat ramps and key local harbour access reserves (Rainbows end and Brick Bay).
- Leased areas of council reserve land for marine and boating uses, holiday park usage and by community facilities.
- the historic settlement of Matakana is also traversed by key transport connection servicing northern communities and harbour access structures.



DRAFT Adaptation strategy summary for stretches 7.1 to 7.12

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
7.1 Takatu to Matakana Commencing south of Buckletons beach including the coast to the Matakana centre (the northern side of the road bridge).	NAI	NAI	NAI	No active intervention is reflective of the limited land and assets located in proximity to the coast. No active intervention in this stretch does not preclude the need to manage risk to roading assets if required including Matakana Cycle trail and Tongue Farm Road. Note that there are numerous sites of cultural significance in this coastal stretch which may be exposed to coastal hazard risk and no active intervention does not

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
				preclude engagement and advocacy for management of risk.
7.2: Matakana River This short stretch is designed to capture the upper reaches of the Matakaka river north west of the road crossing.	LI	LI	LI	Limited intervention is identified to reflect the management of risk to assets from flood hazards noting the historic, cultural and ecological values associated with this catchment.
7.3: Matakana Wharf Commencing south of the Leigh road bridge including the coast south Matakana Wharf Reserve	HTL	HTL	HTL	Hold the line here is applicable to council landholdings and the areas of reclamation and coastal access (boat ramp access). Hold the line confirms the uses within this area including play spaces and reserve areas, with a preference for nature-based options and design and location of assets in place of hard protection.
7.4: Matakana River inlet west Commencing south of the wharf reserve including the coast south, culminating to the north of the Rainbows end reserve.	NAI	NAI	NAI	No active intervention is reflective of the limited council land and assets located within coastal hazard areas within this stretch. Noting that the area includes the Riverglade Lane Esplanade Reserve.
7.5: Rainbows End Commencing at the northern extent of the reserve and including the coast south culminating at the point south of the boatramp access where the coast rises from the lower lying reserve area.	LI	LI	APA	Limited intervention in the short and mid-term is reflective of the management of risk through design and location of assets, including existing coastal access structures (including the Rainbows end seawall). In the long term adaptation priority is identified in response to increase inundation risk to parks assets such as dingy lockers, parking and recreational areas. Relocation and landward alignment of assets may be feasible but increasing risk may impact on the viability of all current uses to remain within this locally important coastal park area.
7.6: Matakana South (Sharp Road) Commencing at the point south of the main boat ramp access and including a portion of the Rainbows end reserve and coast first north in to the inlet and then	NAI	NAI	NAI	No active intervention does not preclude the management of the southern areas of the Rainbows end reserve, noting no coastal protection structures are envisaged for these areas and any assets located within these areas should be suitably located to avoid hazard risk. No active intervention is reflective of the limited

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
south, culminating to the west of Green point reserve. Note this stretch includes numerous areas of unconnected and currently unmaintained (by council) esplanade reserve.				assets located within reserve areas. Strategies can be revised should future investment be made in establishing greenways connections.
7.7: Sandspit west (Green Point to Marine) Commencing at the green point reserve (including this area) and including the coastline east to the Marina area.	LI	LI	LI	Limited intervention is selected to provide for a range of approaches (with a preference for nature based and soft options) to maintain coastal road connections and public access connections within this stretch noting the width of the coastal area is variable as is the elevation above sea level inundation risk over time may impact aspects of this stretch and design of assets may need to be considered accordingly.
7.8 Sandspit Reserve (Marina) From the western site of the marine area including the coast east, culminating at the end of the wider reserve area and west of the road bridge.	HTL	HTL	HTL	Hold the line for the modified sandspit marine area and wharf access is provided to confirm the continued provision for this important harbour access point and supporting uses (subject to community leases). Hold the line supports the continued maintenance of uses and coastal structures and the location of the coastal edge. NOTE: Strategies do not apply to privately owned land noting engagement with third parties where coastal structures are involved, at this location, will be required.
7.9: Sandspit (Wharf and access)	HTL	HTL	HTL	Hold the line for this stretch is applied at a wider scale, acknowledging areas within this stretch will require different treatments including nature-based measures to ensure that ecological outcomes are also supported alongside ongoing access. Hold the line supports the maintenance of access to key coastal infrastructure (wharf areas) which support the island communities of the Hauraki Gulf, in particular Kawau Island. Management of uses within the spit area; including supporting ecological outcomes and managing risk to a range of council assets and uses (boat trailer, vehicle parking, refuse transfer) will require further adaptive planning.

Stretch	Terms (years)			Explanatory notes
	Short (0-20)	Medium (20-60)	Long (60-100+)	
7.10: Sandspit to Horseshoe Bay (Holiday Park) Commencing at the south eastern side of the spit including the land east, culminating at the eastern extent of the embayment of Horseshoe bay.	LI	APA	APA	Limited intervention in the short term supports the management of uses through design and location within reserve areas. This is applicable to leases (including holiday park uses) and uses within low lying areas and to the alignment of walking tracks within areas east of the sandspit area. Adaption priority in the mid to long term acknowledges the highly dynamic and in places low lying nature of this coastal area and the increased risk presented by catchment flooding and coastal hazards with sea level rise. Adaptation planning which supports iwi, community, parks user and asset owners values and requirements will be required.
7.11: Sandspit South (Puriri Place) Commencing within the Horseshoe Bay reserves and including the coast south east around the headland, culminating at the northern end of Brick Bay.	NAI	NAI	NAI	No active intervention is reflective of the limited council assets located within reserve areas, noting that walking tracks within the wider reserve area are generally maintained by local volunteers and historic heritage values are identified within this wider stretch. No active intervention does not preclude advocacy and support of management of risk if required.
7.12: Brick Bay Commencing at the northern extent of the reserve and culminating at the southern end of the reserve, at the end of the SAP area.	LI	LI	LI	Limited intervention provides for the management of risk to assets within reserve areas through design and location of assets. No coastal protection structures are envisaged and a natural coastal edge is preferred.

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