Shoreline Adaptation Plan: Āwhitu

2023

Report Series 1

May 2023 Version 1.0

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Front Cover
Image: Kaitara (Aawhitu Regional Park) looking out toward Matakawau. Submitted by Ngāti Te Ata Waiohua.

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Acknowledgement of Rangatira

“Ka whiti te rā ki tua o Rehua, ka ara a Kaiwhare i te rua.”

“As long as the sun shines on the West Coast, Ngāti Te Ata Waiohua will rise from the depths of the Manukau Harbour.”

We would like to acknowledge the contributions and recent passing of Ngāti Te Ata Waiohua leader and rangatira kaumātua, the late George Flavell, a staunch advocate of kaitiakitanga and environmental tikanga along the Āwhitu Peninsula and the wider Tāmaki Makaurau.

During the development of this report the SAP team had the privilege of spending time with kaumātua George. He shared his, passion, humility, and extensive cultural knowledge of the peninsula and Manukau Harbour, continuing to raise awareness around cultural values, land conservation and coastal adaptation.

We envisage this plan, and its implementation will ignite much discussion, and in the words of kaumātua George “educate our next generation of rangatahi to keep the fires burning”.

Acknowledgements

This document was developed in conjunction with Ngāti Te Ata Waiohua, Ngāti Tamaoho, Waikato – Tainui and Te Ākitai Waiohua. Te Ākitai Waiohua have been involved in this kaupapa as strategic observers and consulted throughout the development of this document. Auckland Council and the Project Team acknowledge the importance of the autonomy of each of iwi and respect their individual and collective involvement in the development of this SAP report.

The Franklin Local Board and Ward Councillors have actively supported the development of this report, promoting, and attending community events and providing valuable insights regarding the challenges for shoreline engagement in the Āwhitu area. The project team would like to acknowledge their support for the programme, as well as the local community along the Āwhitu Peninsula for their engagement, support, and ongoing interest in this SAP.

This document was prepared by the project team, led by Resilient Land and Coasts; supported by advice from Healthy Waters, Parks and Community Facilities, Auckland Transport and Watercare and several other teams and departments across Auckland Council. As consultants to Auckland Council, Tonkin + Taylor have led technical risk assessment input to the plan and RCP have supported programme management and engagement.

Mātauranga Protection Statement (Disclaimer)

Mihi

He hōnore, he korōria, he maungārongo ki te whenua, he whakāro pai ki ngā tāngata katoa. Ko te Atua tō tātou piringa, ka puta, ka ora, pai mārire.

Me whakahōnore ki tō tātou Kīngi Tūheitia Pōtatau Te Wherowhero Te Tuawhitu, te pouherenga ō ngā waka o te motu, e noho mai rā i runga ake i te ahurewa tapu i ōna mātua tūpuna, pai mārire.

E kore te puna aroha e mimiti ki a rātou, kua timu i te tai, arā, ko Dame Whaea Ngāneko Minhinnick, rāua ko Wātara Black me ngā parekawakawa katoa kua ngaro atu ki te pō, haere atu rā koutou ki te pūtahi nui o Rehua, haere ki tua o Paerau, okioki ai.

Ka aro atu te whatumanawa ki a tātou te hunga ora, ko ngā uri whakaheke, kia mau ki ngā kōrero a ōu mātua, a ōu tūpuna, arā, ka pā taua, ko ngā kāhu pōkere me ngā kurī rangaunu o Tāmaki Makaurau e kore e ngaro i te hinapōuri.

Pai mārire.

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Whakataukī

Local iwi have gifted the following whakataukī (proverb) as a guide and ultimate objective for this shoreline adaptation plan:

Toitū te marae a Tāne, Toitū te marae a Tangaroa, Toitū te iwi.

If the land is well and the sea is well, the people will thrive.

Summary statement

The Āwhitu SAP (Shoreline Adaptation Plan) provides a strategic adaptive direction for Auckland Council-owned coastal land and assets, located within 82 km of Auckland's shoreline stretching from the regional boundary at Karioitahi Beach, to the western Manukau Harbour south of Pollok.

The development of these strategies is a starting point for adaptation planning for the Auckland region and also acknowledges Te tiro ā Māori ki tōna ake ao, a Māori worldview. This reflects the consideration of intergenerational time horizons as a fundamental part of addressing the impacts of climate change and sea-level rise. This also acknowledges the need to consider the tangible and intangible, the inter-relationship of all living and non-living things and the vital connection between people and te taiao (the natural environment) in which they live.

The adaptive strategies (Section 5.0) which guide how Council-owned coastal land and assets will be sustainably managed have been informed by:

- Local iwi, acknowledging the cultural values and associations of iwi which centred on supporting local iwi objectives and aspirations set out in Section 3.2
- The objectives of the local community, identified through community engagement
- Technical inputs including hazard risk, coastal hazard and climate change projections, ecological and policy framing (as set out in Section 2.0)
- Advice from infrastructure and assets owners/managers (Auckland Council asset owners, Auckland Transport and WaterCare Services).

Council-owned land and assets within the Āwhitu SAP can largely be managed in the short to medium term with '***no active intervention***' to '***limited intervention***'. The need to '***hold the line***' in select locations responds to the presence of critical infrastructure and high social value. In the longer term, areas will require '*managed retreat*' of assets and uses to manage risks from coastal hazards, rainfall flooding and the impacts of climate change. This provides the opportunity to support natural systems and maintain the highly valued natural character of the coastal environment. Changes in management strategies over time reflect not only the increasing risk over time but provides for a planned and adaptive management approach for Council-owned coastal assets and infrastructure.

Implementation of this SAP is a live and developing process which will require continued collaboration across multiple Council departments and Council-controlled organisations and entities. This will be undertaken alongside ongoing engagement with iwi to ensure that iwi have a partnership/co-management role in the project design, development, and implementation phases. Regional matters identified through the development of this SAP, including the management of risk to cultural values and sites; and the maintenance of public access to and along the coast (utilising Council-owned land), will require further detailed consideration and planning. Adaptation planning will more generally need to respond to national and regional legislative and policy changes (refer to Section 1.3.6) and transition to the use of signals, triggers, and thresholds in place of static timeframes (refer to Section 1.3.7.3).

Purpose of this document and navigation

Purpose

This Shoreline Adaptation Plan (SAP) for Āwhitu has been developed to provide a strategic management approach for Council-owned land and assets located within coastal areas. It is a non-statutory plan developed in collaboration and consultation with local iwi, communities, and asset owners.

As a first generational shoreline adaptation plan, it is intended as a long-term strategy of at least 100 years. As such, it will remain a living document subject to review and updated to ensure it remains dynamic, relevant, and fit-for-purpose.

Audience

It is intended to be accessible to and utilised by a diverse range of users including asset owners and managers, planners and policy makers and local iwi and communities. While this document contains technical detail, a suite of supporting reports are available to provide further guidance to the reader.

Navigating this document

This document has five (5) key sections as follows:

Section 1	• Provides an overview of the SAP programme, the development process for area plans (of which this is one) and the general principles which inform the development of this SAP area plan.
Section 2	• Provides the cultural, social, physical, and ecological context applicable to the development of shoreline adaptation strategies for Council-owned land and assets within the Āwhitu SAP area.
Section 3	• Identifies the outcomes of engagement with local iwi, including cultural outcomes, aspirations, and principles applicable to the development and implementation of this SAP report. • Includes the results of the technical physical risk assessment for Council-owned land and assets within the Āwhitu SAP area.
Section 4	• Provides commentary of the development of adaptive strategies for the Āwhitu SAP area and includes general guidance for the implementation of strategies identified in the Āwhitu SAP report.
Section 5	• Includes the adaptation strategies as identified for each of the nine (9) units and 23 stretches within the Āwhitu SAP area.

Associated and supporting documents

The following reports should be read in support of this Shoreline Adaptation Plan:

- Tonkin and Taylor (2023). Āwhitu Shoreline Adaptation Plan – Risk Assessment Technical Report
- Community Consultation Summary – Shoreline Adaptation Plan: Āwhitu 2023
- Cultural Statements/Value Assessments as provided by iwi.
    - Ngāti Te Ata Waiohua Manukau Harbour Report. 2023. Shoreline Adaptation Plans: Manukau South and Āwhitu. *Guiding Principles and Cultural Values*

Glossary

1% Annual Exceedance Probability (AEP)	• The probability of an event occurring in any given years, so this means there is a 1% chance in any given year that this event occurring.
AVD-46	• Auckland Vertical Datum – 1946 was the mean sea level established in 1946 and used to define the zero datum for land development.
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.
Ecosystem Management Unit	• Ecosystem Management Units are places identified as important for management because of the types and condition of the ecosystems and species there. They are usually quite large and often include groups of related ecosystems, which are managed together. Many also include threatened species.
Embayed	• An indentation of the shoreline resembling a bay.
Highest Astronomic Tide (HAT)	• The highest 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 Overlay	• Significant ecological areas have been identified in the Auckland Unitary Plan for terrestrial areas, and parts of the coastal marine area.
Significant Ecological Areas	• Identified areas of significant indigenous vegetation or significant habitats of indigenous fauna located either on land or in freshwater environments.

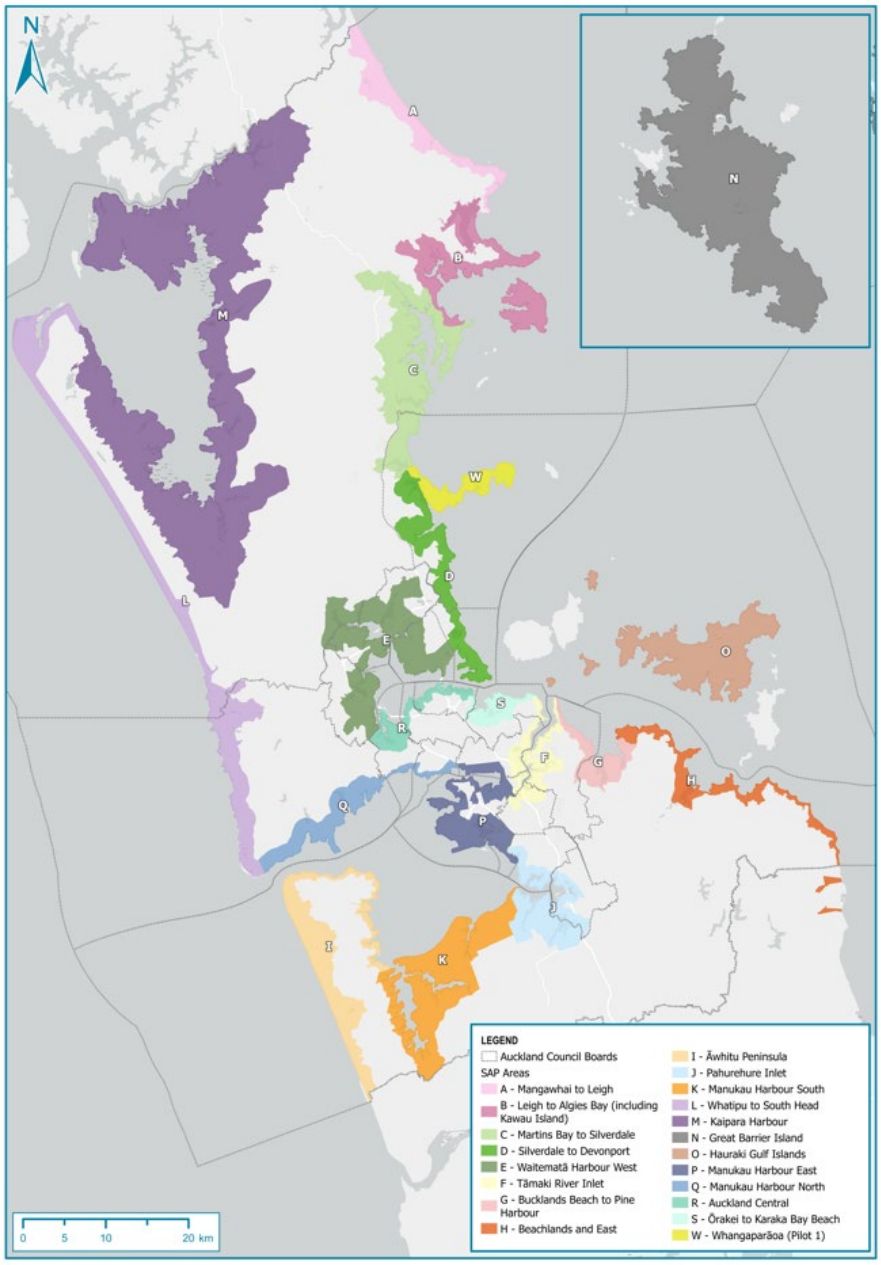
Kupu Māori – Māori Glossary

Te reo Māori terms	Translation
Kaitiaki	Guardians, protectors.
Kaitiakitanga	Kaitiakitanga is the ethics and practice of protection and conservation of the natural environment and the resources within it, on which people depend. It is considered an obligation of mana whenua to care for their lands and waters to which they whakapapa (have a genealogical relationship).
Manākitanga	Manākitanga is a powerful way of expressing how Māori communities care about each other's wellbeing, nurture relationships, and engage with one another. Manākitanga also extends to the whenua that needs care in order to ensure sustainability for future generations. The value of Manākitanga is often expressed through the responsibility to provide hospitality and protection. Manākitanga derives from two words - 'mana' and 'aki'. Mana is a condition that holds everything in the highest regard. Aki means to uphold or support. Extending Manākitanga requires respect, humility, kindness, and honesty.
Mātauranga	Mātauranga Māori literally translated means 'Māori knowledge'. It's a modern term that broadly includes traditions, values, concepts, philosophies, world views and understandings derived from uniquely Māori cultural points of view. Mātauranga Māori will articulate and include both physical and non-physical values (such as mahinga kai species, swimmability, sense of place, identity and relationships, and wai tapu) and the positive and negative influencers of these values.
Taonga	Treasures.
Tōnuitanga	Tōnuitanga refers to the process of restoring and revitalizing the environment. As kaitiaki, mana whenua has a duty of care, to seek balance and harmony within our surroundings.
Wāhi tapu	Sacred areas.
Whakapapa	Whakapapa is genealogy, a line of descent from ancestors down to the present day. Whakapapa links people to all other living things, and to the earth and the sky, and it traces the universe back to its origins.

1.0 The Shoreline Adaptation Plan programme

1.1 SAP 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 Waitemata. 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.



Auckland Council began developing a series of Shoreline Adaptation Plans (SAPs) in 2021. These area-based plans form the first step for the Shoreline Adaptation Plan programme, in achieving a resilient future for Auckland's coasts.

Figure 1-1 identifies the 20 areas for which individual plans will be developed. The purpose, scope and guiding principles for these plans are discussed in further detail below in Section 1.3.

Figure 1-1: Auckland Shoreline Adaptation Plan Programme Areas

1.2 Te Ao Māori

Te tiro ā Māori ki tōna ake ao, a Māori worldview, acknowledges the tangible and intangible, the inter-relationship of all living and non-living things and speaks to the vital connection between local iwi and te taiao (the natural environment) in which they live. Within te ao Māori, people, birds, fish, trees, oceans, rivers and streams, and weather patterns - are all interconnected, and these relationships stretch back into the past, sit within the present and look to the future.

The wellbeing of tāngata whenua (indigenous people) and the ecosystems that support them is interlinked with the concept of *'mai te rangi ki the whenua, mai te whenua ki te rangi'*, (from Ranginui to Papatūānuku, from Papatūānuku to Ranginui) which underpins the holistic world view for many iwi / hapū of Tāmaki Makaurau, and how the traditional concept of kaitiakitanga is approached. Understanding inter-relationships and interconnectedness is a fundamental part of addressing the impacts of climate change and sea-level rise.

As an adaptation workstream within Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan, the Shoreline Adaptation Plan programme considers te ao Māori by giving effect to the Kia Ora Tāmaki Makaurau and Te Ora ō Tāmaki Makaurau frameworks, underpinned by the principles of te Tiriti o Waitangi, and recognising and providing for te ao Māori concepts. This is explained further at Section 1.4.

1.3 Shoreline Adaptation Plans: Series 1

1.3.1 Purpose and scope of SAPs

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 impacts (including sea-level rise) and seek to provide an adaptive planning approach that responds to the changing nature of Auckland's coastal environment, asset and infrastructure owners' requirements and needs and values of local iwi and local communities.

1.3.2 Context and background

The SAP programme responds to two key parent documents:

The Coastal Management Framework 2017[1]	• Adopted by Auckland Council in 2017[2], it provides the overarching regional philosophy to coastal management. • The Coastal Management Framework identified the need for SAPs to inform comprehensive long-term planning, guided by local iwi, infrastructure providers, and local community engagement.
Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan	• The SAP Programme forms an important implementation pathway for Te Tāruke-ā-Tāwhiri supporting the outcomes focused on ensuring communities and individuals are prepared for our changing climate and coastline. • It informs the connection to Te Ora ō Tāmaki Makaurau, the wellbeing framework developed by the Mana Whenua Kaitiaki Forum in response to Te Tāruke-ā-Tāwhiri. • The Te Ora Framework incorporates kaupapa Māori and mātauranga-ā-iwi and is underpinned by the principles of te Tiriti o Waitangi, particularly the principles of partnership and active protection. This is discussed further in Section 1.4.1 below.

More broadly, the SAPs acknowledge the New Zealand Coastal Policy Statement 2010, which directs councils to identify areas that may be affected by coastal hazards over a timeframe of at least 100 years. The SAP area plans provide a 'first generation plan' response to the Coastal Hazards and Climate Change Guidance from the Ministry for the Environment[3]. The SAP area plans provide a 'roadmap' for changing coastal management strategies over time (over three timeframes) which can be further developed to respond to the concept of Dynamic Adaptive Policy Pathways (addressed

1 Carpenter, N., Sinclair, S., Klinac, P., Walker, J (2017) *Coastal management framework for the Auckland region.*

2 Within the Coastal Management Framework, Shoreline Adaptation Plans were previously referred to as Coastal Compartment Management Plans

3 Ministry for the Environment (2017). Coastal Hazards and Climate Change – Guidance for Local Government

further at Section 1.3.7 below). 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 to Council-owned land and assets, the programme acknowledges the need for holistic 'systems' thinking both in relation to coastal management and adaptation. Section 1.3.8 identifies the limitations relevant to this report and acknowledges the need for further development of adaptation planning to respond to the interconnectedness and complexity of natural systems, cultural values, other land, and assets on land and in the coastal marine area.

1.3.4 SAP area plan development process

The SAP area plan development plan process includes four key stages underpinned by engagement with ngā hapū me ngā iwi o Tāmaki Makaurau (the hapū and iwi of Tāmaki Makaurau). The four elements of this development process are identified in Figure 1-2 and discussed below in greater detail.

Scoping and development	• This stage includes the gathering of relevant information for each SAP area, including building an understanding of the history of shoreline management and the development of the supporting technical risk assessment for Council-owned land and assets.
Local engagement and events	• Engagement events both in-person and online support the community and wider public to engage with the identification of coastal uses, enjoyment, and values.
Adaptation strategy development	• Adaptive strategies are identified for each coastal unit (or stretches within units). This selection is informed by the engagement undertaken, values developed and technical information and risk assessment. These strategies are refined through further feedback from local iwi and asset owners.
Endorsement and implementation	• As non-statutory plans, endorsement is sought from the Local Board(s) within the SAP area. the SAP area plans are then presented to the Governing Body Planning, Environment & Parks Committee for final approval by councillors.

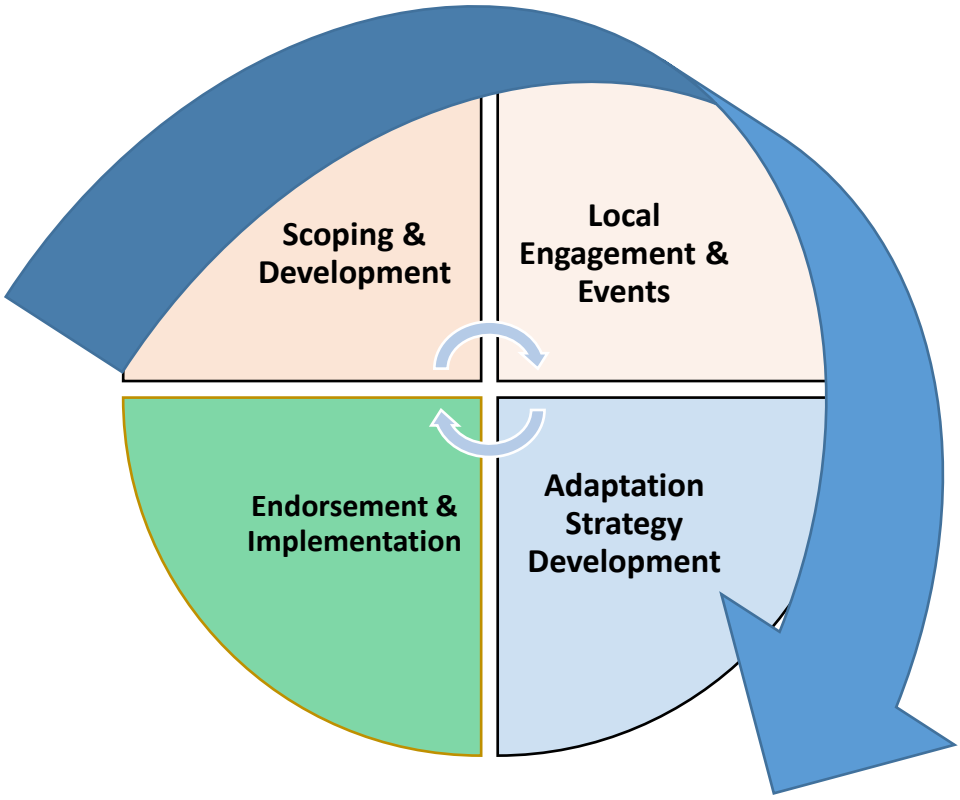


Figure 1-2: SAP Area Plan development process

Engagement with Ngā hapū me ngā iwi o Tāmaki Makaurau: engagement with local iwi supports all stages of plan development and follows the development of the SAP area plans to their implementation.

1.3.5 SAP area plan adaptation strategies

Four major adaptation strategies to set long-term management approaches are considered which are outlined below:

No Active Intervention (NAI)	• Natural processes are allowed to continue. • This includes no investment in the provision or maintenance of any defences. • This strategy is automatically selected for areas of the coastline that are not owned by Auckland Council.
Limited Intervention (LI)	• Limited works are undertaken to extend the existing asset life or to ensure assets remain safe, including localised realignment of individual assets. • This approach acknowledges that the coastline's position will not be fixed into the future and may include small-scale, nature-based measures (e.g. dune planting) to support the coastline's resilience.

Hold the Line (HTL)	• The coastal edge is fixed at a certain location, using nature-based options (e.g. beach nourishment) or hard structures (e.g. sea walls). • Nature-based options are the preferred method, where possible.
Managed Retreat (MR)	• Assets and activities are moved away from hazard-prone areas in a controlled way over time. • Managed retreat allows greater space for natural buffers and reduces asset exposure to natural hazards.

1.3.6 Implementation

SAPs will be implemented through the integration of the adaptive strategies into relevant Council plans and processes. Implementation planning is a live process reflecting the need to respond to national and regional legislative and policy changes over time.

Currently, two key pathways for implementation are identified over immediate and longer-term timeframes.

- Local implementation- short term: Once a SAP is endorsed it becomes an Auckland Council document and can be used to inform local decision-making, investment and planning
- Regional implementation: Following the completion of all areas plans (2025+), an understanding of regional risk to assets and land can be considered alongside the strategic response across all ~3200 km of Auckland's shorelines. This will enable consideration of prioritisation and funding at a regional level.

Tools for implementation may include both statutory and non-statutory plans alongside operational tools. Some examples of these include:

- Operational responses (such as post-storm decision making and operational maintenance of coastal assets)
- Capital investment through the Coastal Renewals Programme which manages the renewal and maintenance of existing coastal assets such as seawalls, boat ramps, wharves, and other coastal structures (this may be supported at a local/short-term level where existing budget is available)
- Future asset management planning including through the Coastal Asset Management Plan and risk-based decision making
- Landowner and lease approvals for building and structures on Council-owned land, in coastal areas
- Inform the development of future statutory plans such as Local Parks Management Plans, required to be developed under the Reserves Act.

Note that many of these pathways to implementation interface with other legislative and policy requirements. These regulatory requirements will also need to be met, as applicable

1.3.7 Review, evaluation and next steps

SAP area plans are being developed as non-statutory plans. They are supported by the best available hazards and risk information and informed by the current understanding of asset records including condition, materials and age and extent (where land is included). This data is ever changing, as is the built and natural environment within which these land and assets exist. As such, updates to data and hazards and risk assessment may be required to ensure the outputs which underpin this reporting remain as accurate as possible. Likewise, cultural and social values change as communities grow and change and different challenges and opportunities present themselves.

These plans are long term and will require review and updating to ensure they remain accurate and reflect the aspirations of mana whenua and the communities they support; and the asset owners and managers responsible for the assets and infrastructure to which this plan relates.

1.3.7.1 Review

The SAP area reports are anticipated to be reviewed on a ten-yearly cycle so they can be revised with updated information related to assets, hazard risk or changing cultural and social aspirations. Reviews may also be requested by iwi or required because of a specific trigger or signal being met which requires an accelerated need for change.

Reviews will incorporate any new information available for each SAP area, including coastal hazards, climate change and coastal asset data, signals, and triggers (including cultural and environmental), along with any changes to cultural values and associations (including cultural outcomes and objectives). The future review cycle will also enable any implications of legislative reforms to be addressed and appropriately reflected in the future scope and implementation of the SAPs.

1.3.7.2 Dynamic approach: signals, triggers & thresholds

Once an adaptation strategy has been identified for a given area, it may be implementable subject to various timeframes, leading to different pathway options. The need to switch from one management strategy to another is usually tied to a ‘signal’, an indicator that highlights the upcoming need for change, or a ‘trigger’, an identified threshold that requires an immediate change. The identification of appropriate signals/triggers requires a robust framework which may involve multiple scales and actors. This may include the need for monitoring and feedback associated with physical systems, indications of risk tolerance or other cultural or community-based indicators. Implementation at the asset level will also require development of specific ‘signals’, indicators that highlight the upcoming need for change, and ‘triggers’, identified thresholds that indicate an immediate change. The development of these signals, triggers, and thresholds will be progressed as a component of implementation planning.

1.3.8 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 in both development and application:

- They are not developed with the intention of applying directly to privately-owned land and/or assets within the wider SAP area
- They are developed with limited consideration of third-party land, assets, interests, and values. This limits a 'whole of system' consideration across all values (social, cultural, ecological, and economic)
- There are limitations to the multi-criteria, decision-making process which supports the selection of adaptive strategies. This 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 under 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).

1.4 Guiding principles and outcomes

As identified in Section 1.2 and Section 1.3.2, the SAP programme is underpinned by an ambition to respect a Te Ao Māori approach and draws from its foundation documents, the Coastal Management Framework and Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan. This leads to the identification of guiding principles for the programme which inform the development of the SAP area plans. These are identified and discussed as follows:

- 1.4.1: Mana whenua/ Ngā hapū me ngā iwi o Tāmaki Makaurau objectives and outcomes
- 1.4.2: Coastal management principles.

1.4.1 Ngā hapū me ngā iwi o Tāmaki Makaurau

The hapū and iwi of Tāmaki Makaurau, hold important values as kaitiaki (guardians, protectors). These include their environmental and spiritual ties to ancestral lands, water, sites, wāhi tapu (sacred areas) and other taonga (treasures), and the wellbeing of the entire iwi.

Auckland Council, as set out in The Auckland Plan 2050, looks to recognise, and provide for Te Tiriti outcomes. Te Tiriti principles provide guidance for decision-making, partnership, and collaboration between the 19 iwi of Tāmaki Makaurau and government. This can include co-governance and co-management approaches, including for natural resources where holistic, integrated, and sustainable outcomes are sought.

The cultural values, association, objectives, and outcomes communicated by each iwi involved in the development of each SAP will help to inform the selection of adaptation strategies within each SAP. Such cultural values and outcomes are anticipated to be developed through the ongoing involvement of iwi throughout the development of all 20 SAP area plans and their implementation. Guiding frameworks, principles for engagement and regional principles for SAP plan development which have informed the development of the SAP programme to date are set out below in Sections 1.4.1.1 to 1.4.1.3. Section 2.4 and Section 3.3 build on these regional principles, identifying those of local iwi who have been involved in the development of this plan.

1.4.1.1 Te Ora ō Tāmaki Makaurau Wellbeing Framework

Te Ora ō Tāmaki Makaurau is the wellbeing framework developed by the Mana Whenua Kaitiaki Forum in response to Te Tāruke-ā-Tāwhiri. It is a regional innovation that is built on generations of knowledge and reflects the world view of the various mana whenua, iwi, rangatahi Māori and Māori communities of Tāmaki Makaurau. Te Ora aligns with Kia Ora Tāmaki Makaurau and supports the concept of Te Tātai. The Te Ora framework incorporates kaupapa Māori and mātauranga-ā-iwi and is underpinned by the principles of te Tiriti o Waitangi, particularly the principles of partnership and active protection.

Within Te Ora, there are three dimensions of wellbeing that form a holistic approach: **Taiao** (environment), **Whenua** (land, earth), **Tāngata** (people). When considered together, dimensions within the Te Ora framework (Taiao - environment, Whenua -land, Tāngata - people) can frame our

adaptation to climate change by taking a whole living systems approach. Our response to climate change is also guided by the following values and principles:

- Manākitanga
- Kaitiakitanga
- Whanaungatanga
- Rangatiratanga
- Mātauranga
- Oritetanga
- Tōnuitanga.

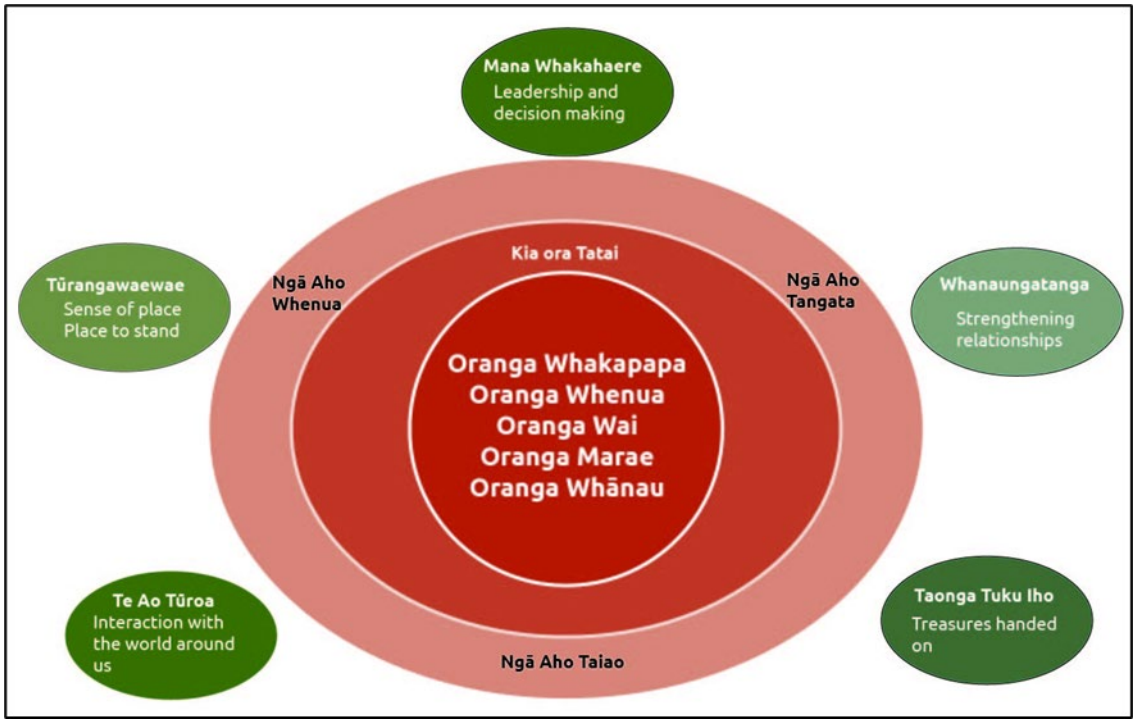


Figure 1-3: Graphic of Te Ora ō Tāmaki Makaurau Wellbeing Framework

1.4.1.2 Principles for Partnership for the development of the SAPs

While not exhaustive, other relevant cultural objectives and outcomes sought for the SAP programme include:

- Ensuring iwi are engaged to speak to and identify:
  - Their cultural values and associations of an area
  - Any impacts to their cultural values and associations
  - Any necessary mitigation and management of any impacts and effects on cultural values and associations.
- Prioritising the protection and recognition of wāhi tapu / sites of cultural significance within or adjoining the coastal area
- Recognising and providing enduring kaitiaki opportunities for mana whenua

- Supporting iwi to implement and maintain rāhui
- Proactively protecting and restoring nature's first line of defence for the coastline (prioritising nature's ability to absorb the effects of climate change)
- Respecting the role nature has in te taiao, allowing Tangaroa to take back the whenua, tāna mokopuna te ika, that was taken from him by Māui
- A return to native habitats - mangroves and dunes with native planting all around the coastal area, consistent with what was historically present. A planting regime should be commenced in advance of any potential risks
- Proactively protect and enhance taonga species and habitats
- Proactively protect coastal cliffs (pari) and coastal dunes
- Proactively protect and enhance coastal and inland wetlands, and indigenous habitats and biodiversity
- Prioritise protection of, and contribute to the enhancement of, kaimoana / shellfish habitats with a focus on the regeneration for mahinga mātaitai sites
- Make room for wai (water), enable natural processes where possible and naturalising aquatic environments where possible (e.g. daylighting of streams)
- Enhance existing, and provide for new, natural connections and access points to the coastal environment
- Prioritise a 'te taiao (environment) centred' approach, over a 'human-centred' approach when implementing the shoreline adaptation approaches
- Ensuring there is a process to revisit the shoreline adaptation strategies into the future as technology and methodologies change.

How these objectives are realised within each SAP needs to be undertaken alongside local iwi. This must be provided for through further engagement.

1.4.1.3 Infrastructure and Environmental Services Mana Whenua Kaitaiki Forum regional guiding principles for Shoreline Adaptation Plans

In the spirit of partnership, the Auckland Council Infrastructure and Environmental Services Mana Whenua Kaitiaki Forum developed the following guidance principles for all SAPs:

- Responsive to iwi management plans
- Accept reversal of infrastructure to rectify hazard issues
- Naturalise, let nature take its course
- Look at emissions as well (if any)
- Whenua concepts are written up and understood by all in plans
- Protect koiora (biodiversity) and traditional mahinga kai (fish stocks, kaimoana)
- Protect heritage where possible.

These principles align with both the Kia Ora Tāmaki Makaurau and Te Ora ō Tāmaki Makaurau frameworks and help guide the SAP work programme and its implementation.

1.4.2 Coastal management

The Coastal Management Framework includes guiding principles which are relevant to the development of the SAP programme. These are summarised below and can be read in full in the Framework (refer to Table 3 of the Framework):

- Health and safety integral to decision making: To ensure all management options are safe
- Aligns with regulatory documents: Considers all statutory objectives and policies for an appropriate and balanced outcome
- A systems approach: The awareness that the whole system needs to be considered for a strategic outcome
- 100-year timeframe: The use of a longer time horizon to enable sustainable, strategic decision making
- Time or event-dependent options: The acknowledgement that the future vision for the coast may not be achieved in one step, and that interim measures are acceptable
- Climate change impacts embedded into approach: To ensure sustainability and resilience
- Appropriate technical solutions: Consider a range of effective solutions and communicate why they are or are not effective
- Principles need to be developed outside specific project issues
- Applies the coastal management framework.

2.0 Āwhitu SAP area

The Āwhitu SAP area extends 82 km from the regional boundary at Karioitahi Beach, around the Āwhitu Peninsula and western Manukau Harbour to the northern area of the Renall Road esplanade reserve at the entrance to the Waiuku Inlet.

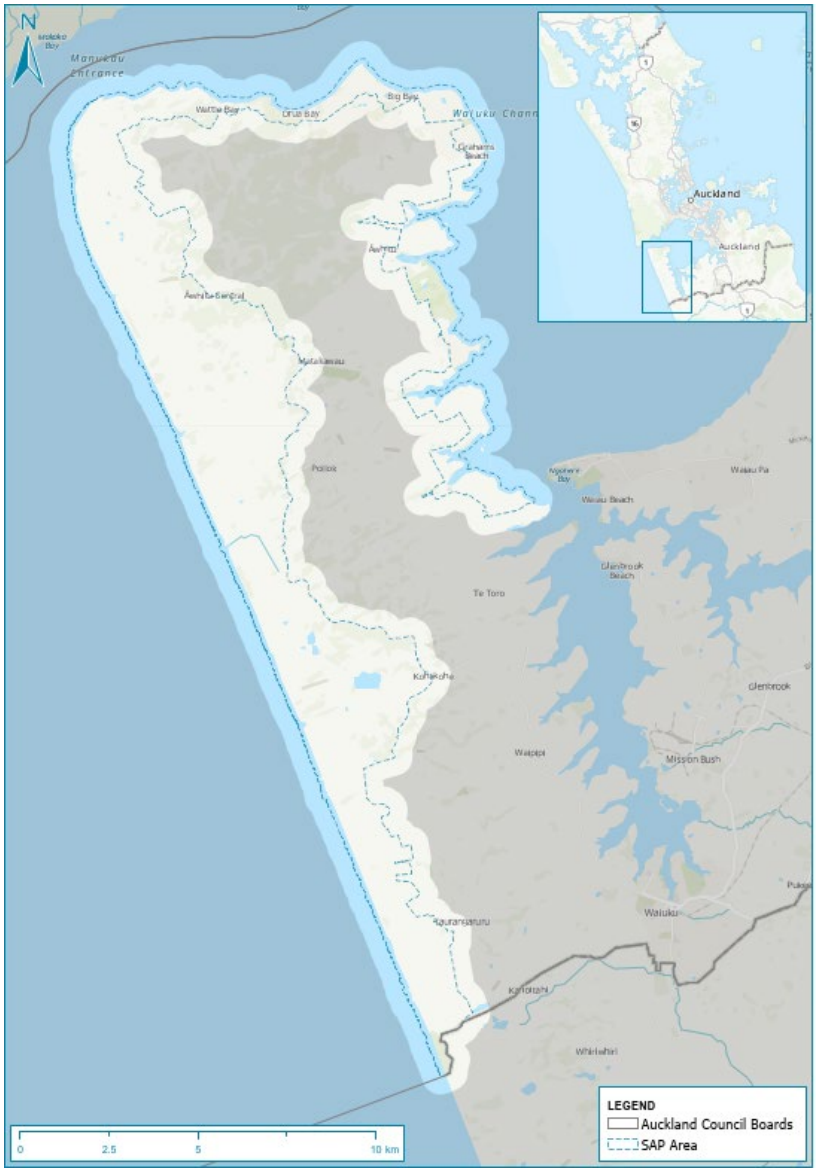


Figure 2-1: Extent of Āwhitu Peninsula SAP area (light shaded area)

2.1 Council-owned infrastructure, assets and land

Auckland's SAPs are directed at Auckland Council-owned coastal land and assets, including but not limited to, reserves, coastal defence structures and public facilities, roads, and water infrastructure. This includes infrastructure located within these coastal areas where it is located on, in, or under Council land or private land.

While the SAPs also consider third party infrastructure near the coast and identified areas of cultural and ecological value, these plans are not directed at these assets and values specifically. However, the strategies (and associated guidance) may acknowledge these linkages at a unit or stretch-specific level. These plans included input from stakeholder partners such as Auckland Transport and Watercare for assets located in shoreline areas. No Eke Panuku or Tātaki Auckland Unlimited assets have been identified within this SAP area.

Table 2-1 includes a summary of both Council-owned assets and infrastructure and the area and the number of ecological and cultural features identified with the Āwhitu SAP area. This is broken down by a series of units.

Within the SAP area, there are over 208 ha of parks and reserve land and over 36 km of transport corridor. Water infrastructure is concentrated in units with greater urban settlement. Reflective of the environments and rich cultural landscape, there are over 1,029 ha of Significant Ecological Areas identified within the SAP area and over 330 mapped cultural heritage points.

Coastal management practices for the Āwhitu SAP area respond to a range of physical environments from the high energy, open west coast to the more sheltered inner harbour environments. For example, on the west coast, management activities are focussed on nature-based coastal dune planting and provision of access (including parking and amenities) at key locations. Within the harbour, there is a broader range of coastal protection works present along reserve frontages in areas of established communities enabling access and recreation, including beach access ramps and boat launching facilities.

Table 2-1: Summary of key elements in each unit

Unit name	Park and reserve land – Park structures, carparks, accessways, buildings (ha)	AT roads (km)	Water pipes (km)	Water assets (No.)	Ecological area (ha)	Cultural heritage assets (No.)
Unit 1: Āwhituwhitu | Āwhitu Peninsula West Coast	54.6	19.4	0.1	2	889.6	188
Unit 7: Kaitara / Matata | Āwhitu Regional Park	121.4	1.3	-	-	48.2	34
Unit 3: Te Mako | Big Bay	6.2	1.7	0.4	5	16.8	3

Unit name	Park and reserve land – Park structures, carparks, accessways, buildings (ha)	AT roads (km)	Water pipes (km)	Water assets (No.)	Ecological area (ha)	Cultural heritage assets (No.)
Unit 5: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach	6.7	1.8	0.1	4	0.0	2
Unit 6: Kauritutahi | Kauritutahi Creek	1.7	4.1	-	-	19.5	23
Unit 8: Matakawau | Matakawau Point	7.1	2.4	0.3	15	1.4	9
Unit 2: Rehia | Wattle Bay to Orua Bay	5.9	2.4	-	-	16.4	27
Unit 4: Te Mako ki Taitimu | Kauri Point	-	0.4	-	-	6.7	1
Unit 9: Hikurangi | Pollok Wharf & South	4.7	2.3	-	-	30.8	48
TOTAL	**208.2**	**36.6**	0.9	**26**	1,029.3	**335**

2.2 Coastal processes

The Āwhitu Peninsula forms a near-rectangular block of high relief, bounded to the southwest by the Tasman Sea, to the north by the Manukau Harbour entrance, to the northeast by the Manukau Harbour, and to the south by the Waikato River.

There are three distinct physical settings for this SAP area:

- The exposed **open coast to the southwest** along the southern shores of the tidal inlet to Manukau Harbour that is dominated by wave-driven processes
- The **southern shores of the tidal inlet** from the flood to ebb shoals that are dominated by tidal currents and by swells
- The more **easterly setting** along the more sheltered, indented shores of the peninsula.

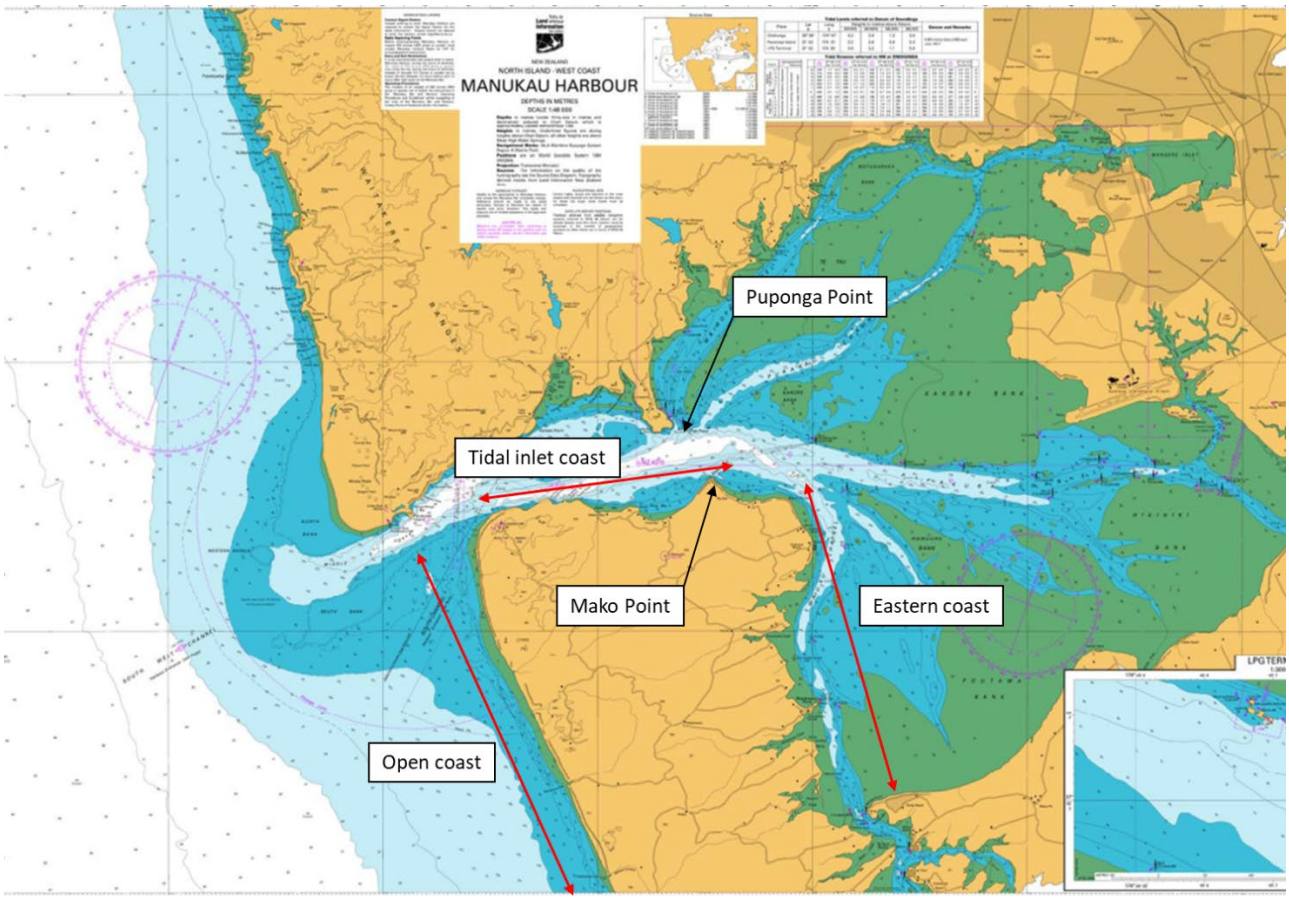


Figure 2-2: Hydrographic chart of Manukau Harbour showing the three main physical settings of the peninsula

Open coast

Apart from small streams discharging onto the beach, the west-facing Āwhitu Peninsula is an uninterrupted uniform coast exposed to wind and waves from southwest to northwest. Beaches comprise grey-black fine sediment mixed with some shell. Most of the west coast sediments are derived from the Taranaki volcanoes via longshore drift, with contributions from the Central Volcanic

Zone via the Waikato River (Barter, 1976)[4]. There is no significant high-tide beach, and the base of the cliffs are subject to wave attack at most high tides.

Southern shore of the tidal inlet

The southern shores of the tidal inlet transition from very steep cliffs with the deep inlet adjacent to them at the harbour entrance, to lower cliffs and wider intertidal areas and embayments to the east.

East coast

Along the eastern coast, the shoreline is characterised by low cliffs and deeply indented bays that have been formed by stream valleys. The range of cliff heights is due to a combination of marine processes and varying geologic conditions. There are narrow sandy beaches fronting some of the cliff shores. These beaches have a thin veneer of sand which gently grades from the intertidal flats to the base of the backshore cliff. The source of sand sediment for these beaches is predominantly from local eroding cliffs, intertidal flats and from the predominantly sandy soils of the western catchments. Sediments in the intertidal area generally comprise silty sand sediments.

2.2.1 Geology

The Āwhitu Peninsula is a straight and cliffed block of Pliocene and Quaternary sediments. It is indented only by a series of gullies, referred to locally as ‘gaps’, which have been created over time by the weathering and erosion processes of springs and groundwater. These valleys contribute to the variable and indented shorelines that are especially characteristic of the east coast of the peninsula[5]. Deposition of the Āwhitu Peninsula sediments took place in the Pliocene during marine transgression and in the Pleistocene during major sea level changes. The Holocene has been marked by dune deposition along the west coast, forming the young dunes (Mitiwai Formation), and by cutting back of the cliffs. This is explained further in Section 2.2.1.1, which details the formation of the Manukau Harbour environment.

2.2.1.1 Manukau Harbour formation

Manukau Harbour is the second largest on the west coast of the North Island and has a total area of about 368 km^2. The volume of water between high and low tides is around 918 million m^3 [6]. The harbour experiences a 3.8 m spring tide range which results in around 140 km^2 of intertidal flats being exposed at low tide.

The harbour originated in events that commenced less than 10 million years ago, when sea invaded much of the North Island. A large bay formed in the Manukau – Port Waikato area, into which the ancestral Waikato River flowed, depositing sediments and slowly extending the coast northwards. At the same time, the current sweeping northwards along the west coast of the island was depositing

[4] Barter T.P. (1976) The Kaihu Group (Plio-Quaternary) of the Awhitu Peninsula, Southwest Auckland, Thesis, University of Auckland

[5] MacDonald, 1986. Cliff erosion and coastal processes on the west coast of Awhitu Peninsula. Thesis, University of Auckland

[6] Bell et al., 1998. Hydrodynamics of Manukau Harbour, New Zealand, New Zealand Journal of Marine and Freshwater Research, March 1998

sand in the quieter waters as it passed the threshold of the bay. The resultant bar grew until it emerged as Āwhitu Peninsula, which, because of the scour of the ebbing and flowing tides, has not connected with the resistant volcanic rocks of the Waitakere Ranges (to the north).

About 3 million years ago, lava flows erupted from centres in the Pukekohe-Bombay area and diverted the Waikato River to the west, which at times almost certainly followed the course of the present Waiuku River, but now discharges into the Tasman Sea at Port Waikato.

The strong, dominantly westward winds have drifted sand dunes up to the present height along Āwhitu Peninsula. Within the last half million years, the Manukau has been effectively sealed off from the Pacific Ocean by volcanism around the Tamaki Isthmus, except for transient connections at times of high sea level. The modern-day Manukau Harbour formed approximately 15,000 years ago by flooding of existing river valleys. Approximately 6,500 years ago, the sea level stabilised to present day levels[7].

2.2.2 Waves, currents and sediment transport trends

Along the open west coast, the wave environment is mixed and consists of locally generated, westerly and southerly storm waves, and swell waves generated to the south. Extreme significant wave heights (Carpenter et al. 2020) can reach more than 8 m and storm-surge levels can reach around 2.3 m (Auckland Vertical Datum [AVD]). The south-western swell and storm waves drive net sediment transport to the north.

Strong rip-currents are noted to be present along much of the west-coast. These currents are intersected by shore parallel bars. Coastal processes act to enhance the natural undulations that are present along the coastline and result in the variable rates of alongshore sediment transport that are observed on this highly dynamic coast.

The northern shores of the peninsula are situated along the tidal inlet to Manukau Harbour. The bathymetry shows significant depths close to the coast near the open coast, and a wider intertidal area towards the main harbour. This area is tide-dominated with velocities of up to 2.2 m per second at the water surface in the main channel between Mako Point to the west of Big Bay and Puponga Point at the southern end of Cornwallis (Figure 2-2). In the shallow intertidal areas, the net flows are in a net westerly direction, but gross easterly and westerly transports are significant. The inlet is protected from exposure of waves generated in the Tasman Sea due to waves breaking on the flood bar to the inlet, although some swells are likely to penetrate during high tides. The remainder of the wave climate is due to wind-generated waves and is typically, low energy and depth limited.

Wind data from Auckland Airport show that winds are most persistent from the southwest and western sectors, although strong winds are also possible, but less frequent, from the north to northeast (see Figure 2-3).

Due to the shallow depth of the harbour, waves that impact the shores along the eastern shores are depth limited, although it is still possible during extreme onshore events at high tide to have waves of up to 2 m.

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7 Te Ara, 1966 https://teara.govt.nz/en/1966/manukau-harbour

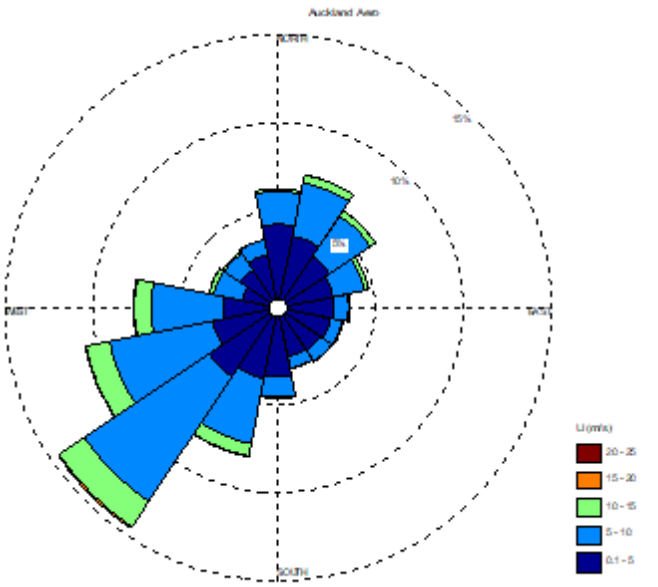

Figure 2-3: Auckland airport wind rose (Cliflo site C74082)

2.2.3 Historic erosional trends

The regional assessment of areas susceptible to coastal instability and erosion[8] considers long-term erosion rates, in terms of metres per century. The assessment considered the majority of the Āwhitu SAP areas as cliff coast, apart from the beaches at Wattle Bay, Orua Bay and Big Bay (northern coast) and eastern areas of Āwhitu Peninsula (Hudsons/Grahams Beach and Āwhitu Regional Park). Cliff erosion rates on the open coast range from 3 to 5 m per century while within the harbour, coast rates can be up to 10 to 15 m per century due to the soft geology. Beach erosion rates are typically low, ranging from 0 to 2 m per century, but are higher at Big Bay with up to 20 to 49 m per century.

[8] 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 Hazards and climate change

Natural processes, such as coastal inundation and erosion, become hazards when they have the potential to negatively impact things of value. 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. Hazard mapping is therefore a key component of long-term, sustainable management of shoreline areas.

2.3.1 Coastal inundations

Previous studies by NIWA, STANTEC and DHI were compiled to derive coastal inundation levels at the shoreline around the Auckland region and were included in TR2020/24[9]. They considered present-day extreme storm-surge conditions, including a 1% Annual Exceedance Probability (AEP) event (equivalent to a storm surge with a 1% chance of occurring in any year, or 1 in 100-year return period) and this event with 0.5 m, 1.0 m and 2.0 m sea-level rise added to the present-day storm surge levels. Figure 2-4 shows the key parameters for coastal inundation and the change in inundation that will occur with increases in sea level.

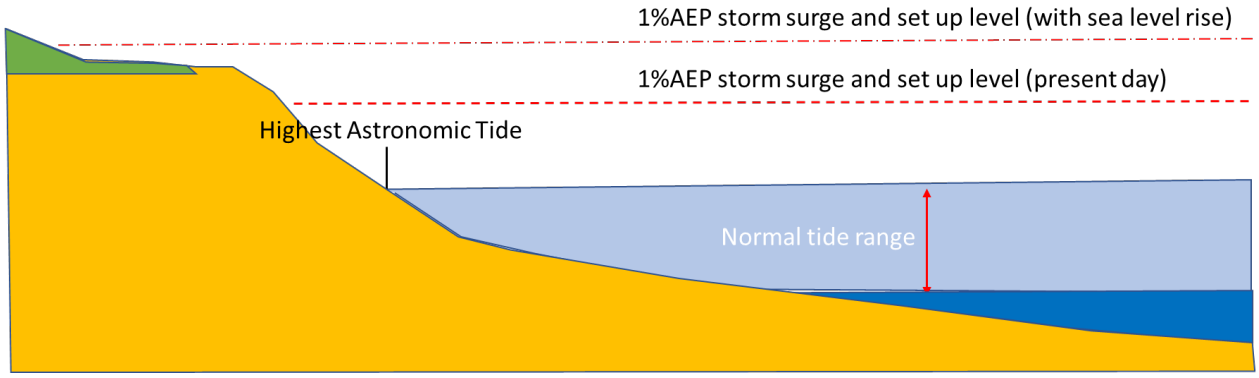

Figure 2-4: Key features for coastal inundation including storm surge, wave set-up and sea-level rise changing the inundation extent

Figure 2-5 shows the resulting coastal inundation hazard extents for the four scenarios (i.e. 1% AEP storm surge and 1% AEP storm surge with 0.5 m, 1.0 m and 2 m sea-level rise).

2.3.1.1 Results of assessment

Figure 2-5 identifies the low-lying areas of the northern coast (Wattle Bay, Orua and Big Bay) as exposed to coastal inundation over all timeframes. Coastal inundation also impacts the lower lying areas and embayments of the inner harbour coastline, while the nature of topography on the open west coast limits the exposure of land along this coastline to coastal inundation over all timeframes.

[9] Carpenter, N., R Roberts and P Klinac (2020). *Auckland's exposure to coastal inundation by storm-tides and waves*. Auckland Council technical report, TR2020/24

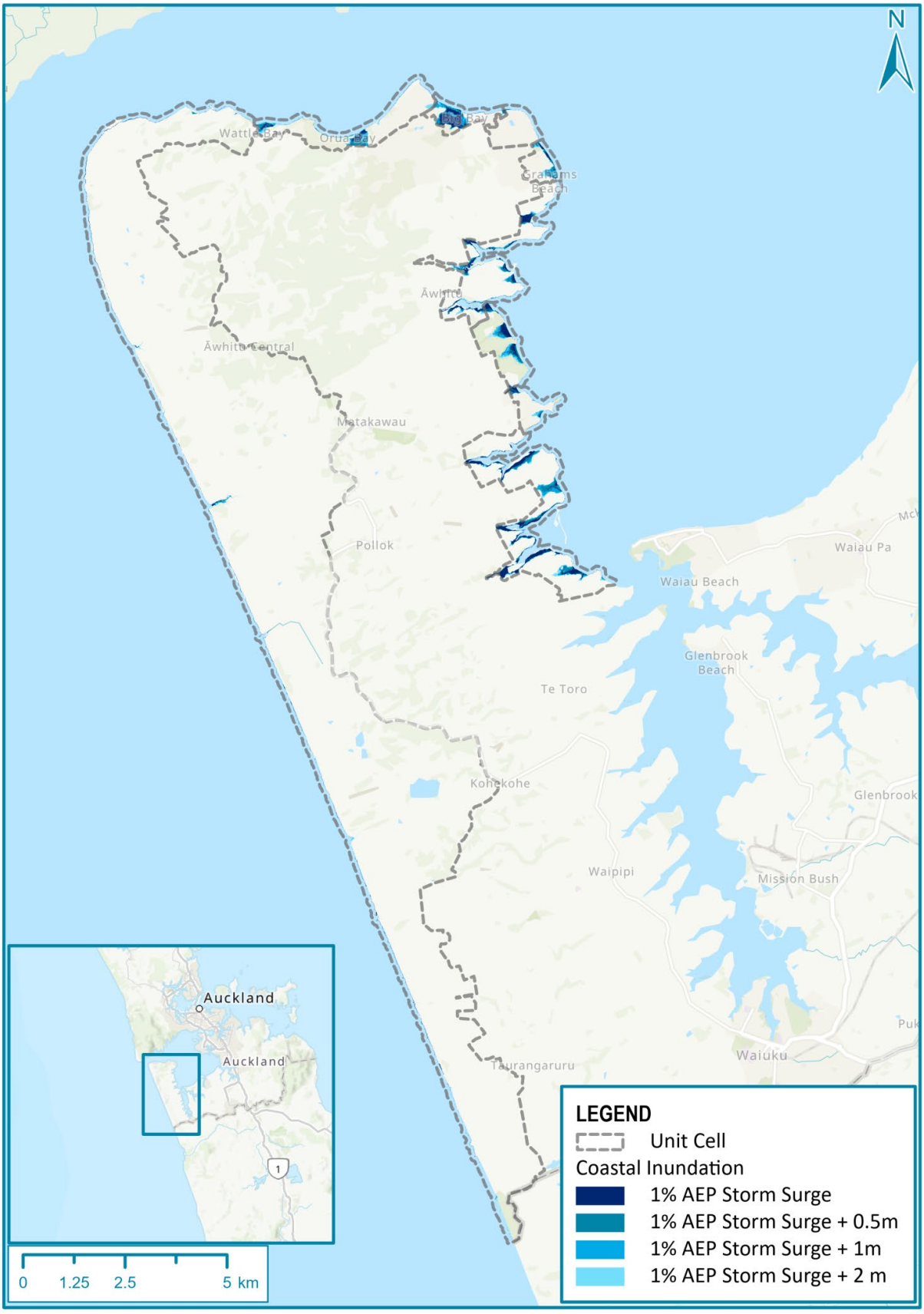

Figure 2-5: Coastal inundation for 1% AEP storm surge for present day, and with 0.5 m, 1 m, and 2 m sea-level rise

2.3.2 Erosion susceptibility

The T+T study included Roberts et al. (2020)[10] and provides a regional-scale assessment of *Areas Susceptible to Coastal Instability and/or Erosion (ASCIE) for the Auckland Shoreline*. The regional scale assessment is a 'first-pass' assessment, in line with the New Zealand Coastal Policy Statement (NZCPS, 2010) and Ministry for the Environment (MfE, 2017)[11] '*Coastal Hazards and Climate Change Guidance'*, that provides high-level information on possible ASCIE on a regional scale. This dataset represents Auckland Council's best available data at this time.

2.3.2.1 Climate change scenarios

The 2021 report considers recent sea-level rise and climate change guidance (e.g. MfE, 2017). Resulting ASCIE areas have been mapped for the following scenarios as shown in Figure 2-6:

- 2050 RCP4.5M
- 2080 RCP8.5M
- 2130 RCP8.5M
- 2130 RCP8.5H+.

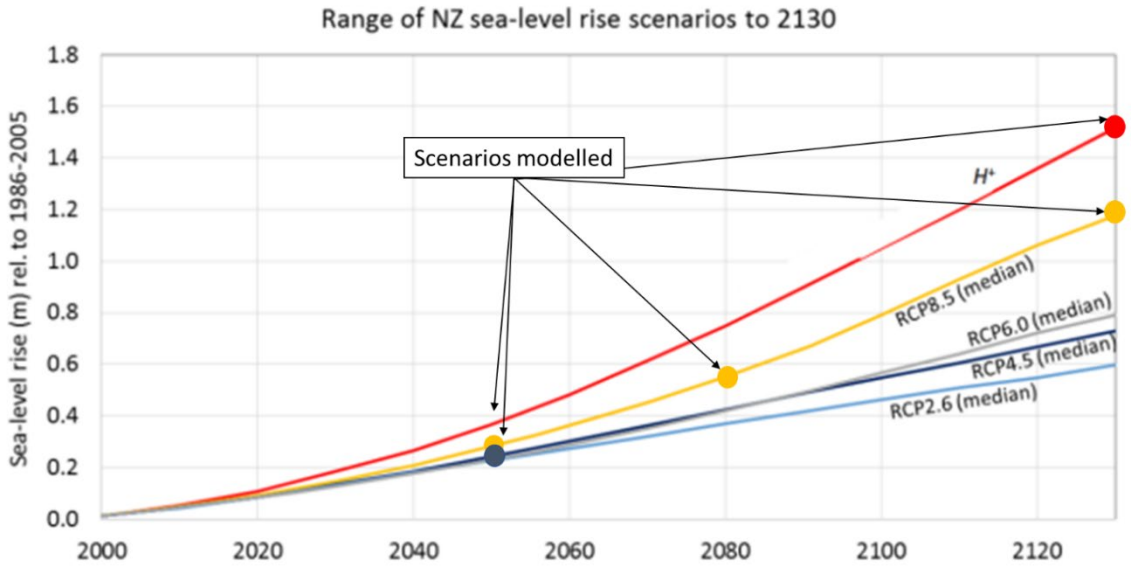

Figure 2-6: Four scenarios of New Zealand-wide regional sea-level rise projections showing the values used for the ASCIE assessment (Source: MfE, 2017)

These scenarios represent a range of time periods and sea-level rise values that are predicted to occur with a high emission representative concentration pathway (RCP). Water level predictions based on the median trajectory and the 83rd percentile were assessed for 2130, described as RCP8.5H+. MfE (2017) recommends the use of this value for regional hazard screening to broadly identify areas potentially exposed to coastal hazards.

[10] Roberts, R., N Carpenter and P. Klinac (2020. Predicting Auckland's exposure to coastal instability and erosion, Auckland Council Technical Report TR2020/021

[11] MfE (2017) *Coastal Hazards and Climate Change Guidance for local government, prepared by Ministry for the Environment*

2.3.2.2 Results of assessment

Figure 2-7 shows the resulting extents for these four scenarios. The 2130 extent was derived from the RCP8.5H+ scenario. Erosion extents are generally greater along the open coast than within the inlets, but impact both beach and cliff coasts.

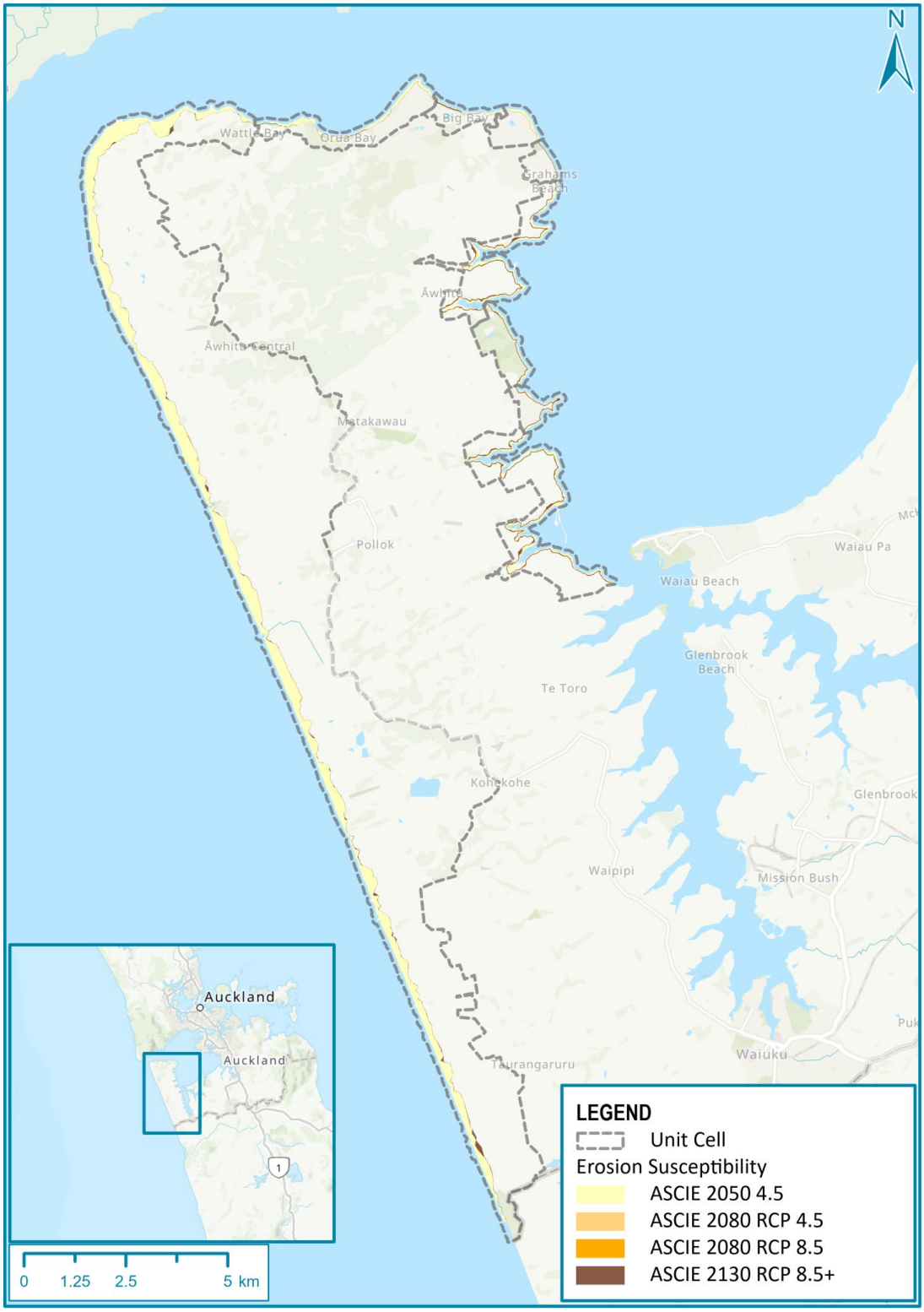

Figure 2-7: Coastal erosion susceptibility for 2050, 2080 and 2130 considering RCP4.5 and RCP8.5 emission scenarios

2.3.3 Rainfall flooding

Rainfall flooding extents have been based on existing published data from Auckland Council. All rainfall flood modelling has been undertaken to comply with Auckland Council's modelling specification[12] concentrating on high flood-risk areas including primary open channels and streams using the 2016 LiDAR.

2.3.3.1 Boundary conditions and parameters used

The Auckland Regionwide Model for Rural Area Stage 1, created by Auckland Council's Healthy Waters, was utilised to assess rainfall-induced flooding. Key aspects of the modelling included:

- The model and flood results were produced based on the datasets available at the time of model build. Therefore, the modelling information cannot be used as a substitute for site-specific investigations
- It uses a rain-on-grid modelling approach with 10 m x 10 m output resolution and assumes the pipe network is fully blocked
- The ground elevations are based on LiDAR 2016 bare earth DEM
- The Maximum Probable Development (MPD), 1% AEP event with 2.1^{0}C climate change impact was used
- A constant tailwater level of MHWS10 + 1 m sea rise as a boundary condition.

2.3.3.2 Results of assessment

The modelling outputs are shown in Figure 2-8. The results show rainfall flooding on the open coast is limited to the incised stream channels that discharge onto the beach. However, as many of these are also the points of access to the beach, flooding has the potential to affect access. On the northern and eastern sides of the peninsula, there is flooding in many of the indented bays and many areas of beach settlements that also experience coastal inundation. However, inundation extents are reasonably limited due to the varying topography and generally incised nature of the stream outlets.

[12] Auckland Council, 2012. Stormwater Rapid Flood Hazard Assessment Modelling Specification

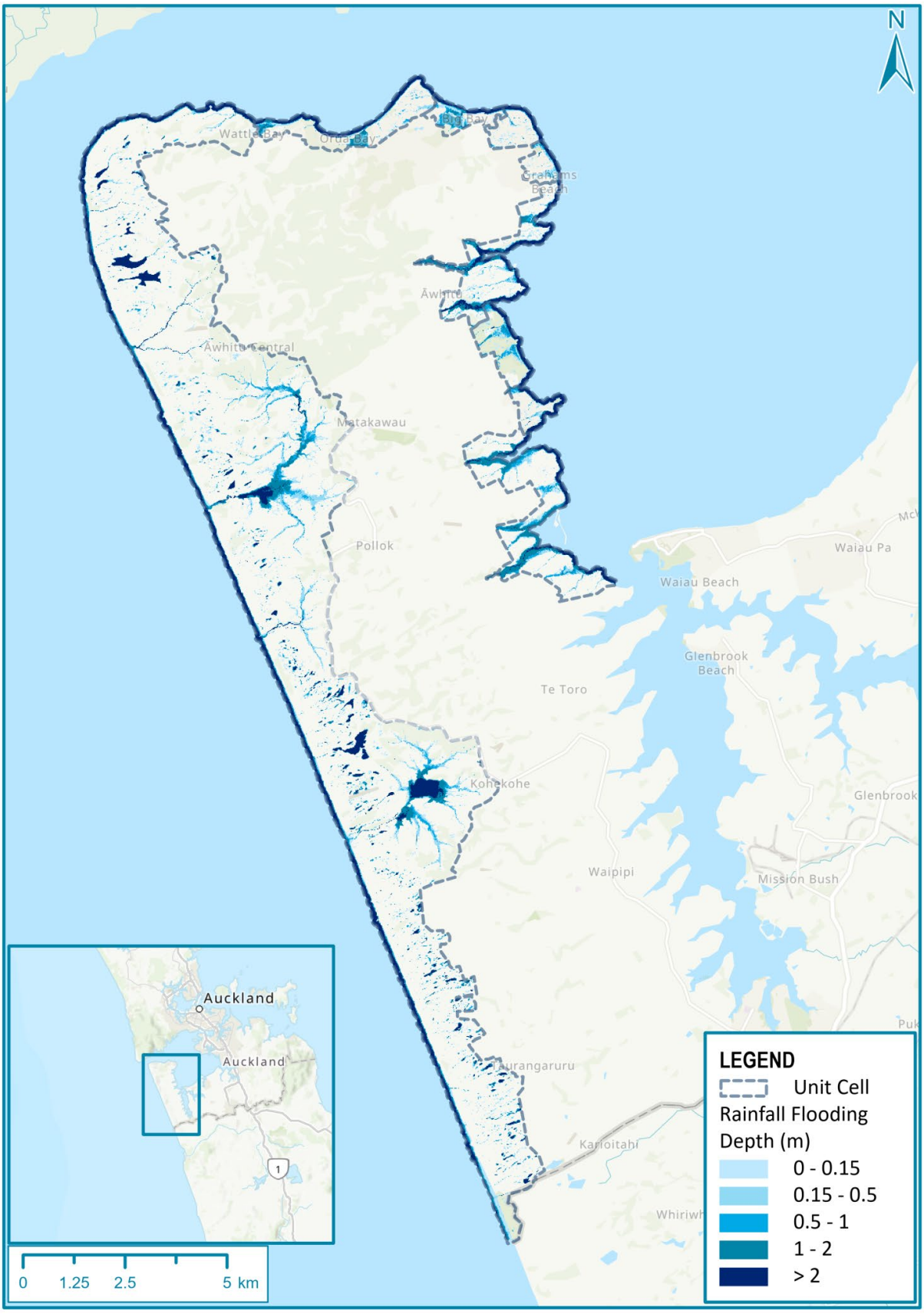

Figure 2-8: Rainfall flood extents and depths for the Maximum Probable Development, 1% AEP rainfall event with 2.10 C allowance for climate change

2.3.4 Other natural hazards impacting coastal areas

Auckland is affected by natural hazards including those that occur frequently such as coastal inundation, rainfall flooding, coastal erosion (including the effects of sea-level rise), freshwater erosion and land instability that can manifest as landslides or slips; and those that occur less frequently such as wildfires, volcanic activity, tsunami, earthquakes, and meteorological hazards such as cyclones, tornadoes and drought. All these hazards can affect people, property and the wider environment.

There are also secondary effects of climate change on groundwater systems that can modify natural hazards such as inundation or liquefaction. Changes to groundwater as a result of climate change can include increased groundwater salinity and raising of groundwater levels; changes in surface evaporation and transpiration may also result in lowering of groundwater levels. However, the potential effects and interactions between groundwater and seawater are highly localised and complex, and it is uncertain how groundwater in many places will respond as the sea rises.[13]

Some risks from events with low probability but high potential impact (e.g. volcanic activity, tsunami, and earthquakes) cannot be addressed through land-use planning and may be better addressed through measures put in place by emergency management groups such as Civil Defence. These include education, warning systems and emergency preparedness. Meteorological hazards are typically managed through building controls and management approaches.

[13] https://pce.parliament.nz/explore/sea-level-rise/groundwater/#:~:text=If%20sea%20level%20rise%20makes,respond%20as%20the%20sea%20rises.

2.4 Local cultural context

The lands and waters that now comprise Tāmaki Makaurau Auckland have been occupied and accessed for over 1,000 years by mana whenua as the first peoples of Tāmaki Makaurau and form the ecological and cultural fabric of the region. Mana whenua have specific values in relation to their mana of the land and coastal environments. Te Ao Māori calls for the protection and preservation of whole living systems, and for maintenance, sustainability and regeneration of the whakapapa relationships that enable the wellbeing of these systems. Our coastal environment plays an important part of this system.

Each iwi has specific and wider cultural values, interests and associations with the coastal environment and the adjoining whenua captured within this SAP and in individual, iwi-authored 'Cultural Statements' which outline each iwi's guiding principles and cultural values. It is critical to note that each iwi is the kaitiaki (guardian) of their respective mātauranga associated with these areas and thus each 'Cultural Statement' report is safeguarded and subject to a disclaimer to protect an iwi's intellectual property. The same applies for all cultural kōrero, values and mātauranga embedded within this report.

In recognition of the partnership and co-management approach of the coastal environments and adjoining whenua, following publication of this report, each iwi has communicated that they will direct how their respective mātauranga should be shared through the 'site focused' concept/detailed design and development processes. This will take place through subsequent consenting processes for each coastal stretch, as required.

It is important to note that the coastal units and stretches have been developed to capture Auckland Council asset units and do not reflect the historical cultural boundaries which often extend over multiple units or coastal stretches. Therefore, all attempts have been made to align with the identified coastal units, the cultural commentary provided throughout this SAP often extends across multiple areas. Where possible, the names of these stretches and units have also been updated to reflect the traditional names.

The cultural history and context of the area, particularly how we embed mātauranga Māori and Te Ao Māori principles, is relevant to the Āwhitu SAP development.

2.4.1 Protection of Mātauranga Māori and cultural values

As identified in the opening pages of this document, all cultural information within this document is the intellectual property of iwi who have contributed to the development of the Āwhitu SAP.

To ensure the protection of any Mātauranga Māori, cultural information must not be recirculated to other workstreams without direct consultation with and approval by local iwi, to whom this information belongs.

To ensure that cultural values and associations are recognised and provided for in any works programme, it is fundamental that this partnership and co-management approach is applied to each specific coastal stretch when implementing the direction set out in this SAP. Failure to do so has the potential to result in significant adverse cultural impacts.

Early and meaningful engagement with the relevant iwi groups on projects under this SAP is necessary. This will ensure that Auckland Council and Council-owned organisations meet their obligations to Ngā Mana Whenua o Tāmaki Makaurau and Te Tiriti o Waitangi. Iwi must be given the opportunity to act in their role as Kaitiaki for their rohe.

2.4.2 Te Mānukanuka o Hoturoa / Manukau Harbour

Te Mānukanuka o Hoturoa / Manukau Harbour on which Āwhitu Peninsula sits, is marked by an ever-changing pattern of sand banks and channels, and a treacherous sand bar beyond its mouth (Te Moananui-o-Rehua) which is known as Te Kupenga o Taramainuku, 'the fishing net of Taramainuku.' It is said that the shifting of the banks and channels in the harbour are due to the tarainga (swishing movements) of Kaiwhare, as he swims along these waterways.

Figure 2-9: An illustration depicting Te Mānukanuka o Hoturoa, the Manukau Harbour and its entrance via Te Moananui o Rehua (the Tasman Sea) and Te Kupenga o Taramainuku. Sourced from Ngāti Te Ata Waiohua Manukau Harbour Report. 2023.

The name for the tidal estuary between Te Motu o Hiaroa (Puketutu Island) and the mainland to the south and east is known as Te Tarai o Kaiwhare, 'the swishing of Kaiwhare.'

Traditionally, the Manukau was a well-travelled route and considered a ‘gateway’ into areas of settlement, resource use and occupation. The main waka route used by all tribes traversing north and south was via the Waikato River, then onto Manukau Harbour via the Awaroa River. Wāhi nohoanga (encampments) are still known among Waiohua iwi today on the many headlands and promontories around the Harbour. From these vantage points it was possible to observe waka movements and receive early warning of the approach of friend or foe and access to kaimoana was favourable.

The above reflects how the entirety of Āwhitu Peninsula and Te Mānukanuka o Hoturoa / Manukau Harbour is of great cultural significance to iwi. While many cultural sites are recorded as wāhi tapu sites, it is of note that not all are always known by iwi. Or the specific location of those, that are known, may be protected by iwi and not shared. Where Council has an asset or an interest within these areas, it is important for direct engagement to be undertaken with iwi to ensure these sites are protected.

In addition, iwi may share additional mātauranga, through the implementation of projects subject to the Āwhitu SAP.

Figure 2-10 helps to illustrate the documented cultural landscape of the Āwhitu Peninsula. This information is accessible publicly through Auckland Council’s cultural heritage inventory and the NZ Archaeological Association database.

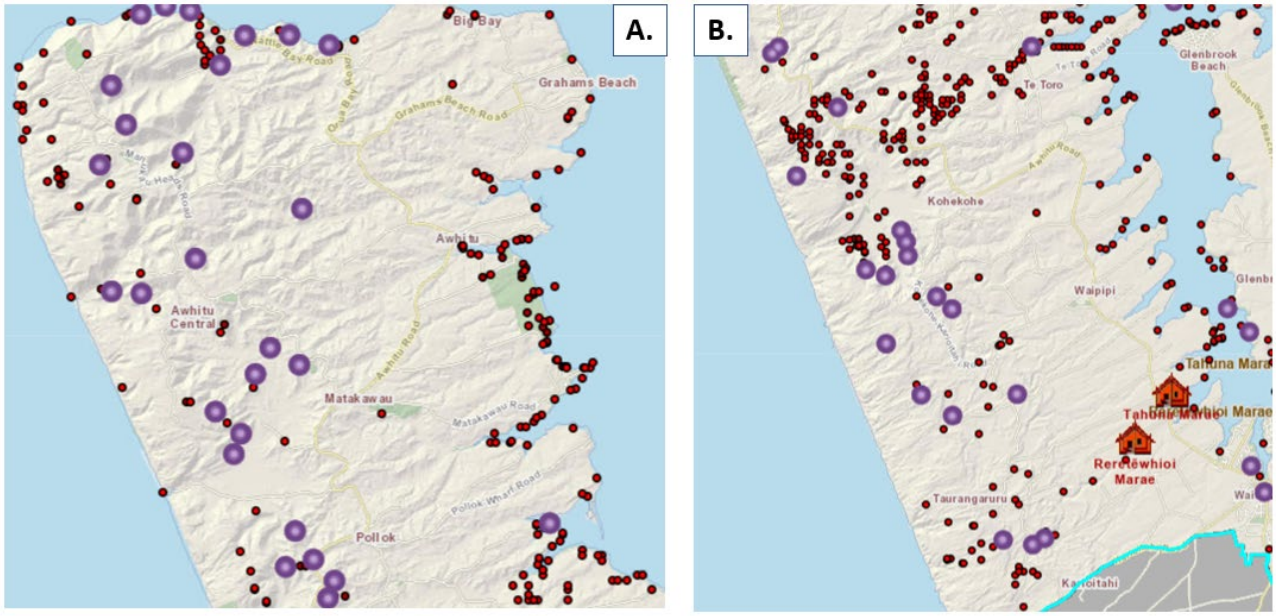

Figure 2-10: Tangata Whenua Map layers illustrating the extent of cultural archaeological sites (red dotes), historic Māori occupation (purple dots) and marae (red houses) along the Āwhitu Peninsula, identified using the CHI inventory and the NZ Archaeological Association database. Map A covers the northern extent of the Awhitu SAP, covering the area from Manukau Heads to Pollok. Map B covers the southern extent of the Awhitu SAP area, covering the area from Pollok down to the Auckland boundary just south of Karioitahi Beach.

2.4.3 Lost land of Paorae

This legend or korero is often referenced as the 'Lost Atlantis' that once existed on the western coast of the North Island[14] of New Zealand. This korero is of particular relevance to the Āwhitu SAP and the management of shoreline areas as a historical acknowledgment of the considerable history of coastal change.

As recounted in the local historic summaries[15][16], the first Europeans to visit the area heard stories about a vast sandy land called 'Paorae', a great flat space of land that occupied the place where the sea coast now is. This area was described as flat, sandy and covered by a dense scrub. This was an area utilised and valued for fresh-water lagoon abound in eels and wild duck. "*There were villages of the ancient people on the land, and it became a favourite spot for the tribes to go for kai mataitai - fish, and pipi and mussels...*[17]" kumara was cultivated on this land in an area called Papakiekie[18].

In 1898, historian James Cowan gained a more detailed description of Paorae from two Rangatira, Patara Te Tuhi and his brother Honana Maioha who were then living at Mängere. Pätara Te Tuhi. They noted that:

> *"Anciently the face of the land round the Manukau Harbour and the Heads presented a very different appearance...In those days there was no South Channel...The three creeks of the Manukau, then, according to ancestral traditions, discharged to the north of the present bar, out beyond where the sharp volcanic heights of Paratütai and Marotiri stand..."*[19]

and at that time the greater part of what is now Manukau Harbour, with its shallow tidal flats, was solid land, covered with kauri and other heavy timber.

When the canoe Tainui from Hawaiki sailed down the west coast, this Paorae was described as a large extent of land; when European historians inquired about its disappearance, the following accounts were shared:

Te Tuhi noted that *"his father, the warrior chief Maioha remembered seeing in his boyhood (1780-1800) the fast-vanishing land of Paorae*[20]*."* This occurred gradually and is described by Patara as "*Kua kai e te tai"* (it was eaten up by the sea). Thus, the Manukau was turned into a saltwater sea, and seabirds screamed and fishes played where once thick forests grew[21].

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14 Lost Land of Paorae (Otago Daily Times 9-5-1914). Alexander Turnbull Library, Wellington, New Zealand. /records/32694511

15 Legends of the Maori (Volume 1), James Cowan, Southern Reprints, 1987 Source; New Zealand Texts Collection, accessed 18/04/2023 from https://nzetc.victoria.ac.nz/tm/scholarly/Pom01Lege-fig-Pom01LegeFCo.html

16 Auckland Regional Council (date unknown) Whatipu: our History No.4, accessed 19 April 2023 https://www.aucklandcouncil.govt.nz/arts-culture-heritage/heritage-walks-places/Documents/whatipu-heritage-walk.pdf

17 (J. Cowan 1930:118)

18 (J. White 1888: 80-81)

19 (J. Cowan 1930:118)

20 (J. Cowan 1930:119)

21 Ibid

Patara's document account goes on to describe a continued process of retreat from the sea:

> *"Ever since it was first inhabited and cultivated, that land was gradually being bitten into by the ocean. Each year, each year, the sea would eat a piece of the Paorae; the waves would roar right up to the plantations, and the growers of the kumara would be edged back and back. The great waves of the Tai-Hauauru dashed against that land of sand and washed portions of it away, and so in time the ocean rolled over it all. But there was no great or sudden catastrophe. It did not perish by any great earthquake, or by a sudden and awful hurricane from the sea. It was worn away gradually until now, as you may see, there is not a sign of that ancient Paorae."*

2.4.4 The Manukau Harbour Claim (Wai 08)

In 1985, the Waitangi Tribunal (the Tribunal) reported on a claim on behalf of the people of the Manukau Harbour. It concerned pollution of seafood resources and loss of surrounding land from confiscations after the New Zealand wars, and for public works.

This claim is integral in understanding the impact on the wellbeing of those iwi and hapu who live on and around the Manukau and have done so for centuries. [22] [23]

Findings by the Tribunal on the Manukau Harbour are as follows:

- There is insufficient research to assess the impacts of development on the Manukau Harbour and its environs
- The waters of the Manukau once supported abundant marine resources and these are now seriously depleted and adversely affected
- Loss of fish stocks is unquantifiable but overfishing has depleted stocks and the marine habitat has been seriously affected by reclamations, sedimentation, and discharges
- The Māori people have been substantially affected by the loss of their traditional access to the sea, the destruction of traditional fishing grounds, and by failure to define and protect areas of special significance to them.

The Report has a number of recommendations that address the findings of the Tribunal, however, the claim remains unsettled. As such, the Manukau Report identifies the loss to the people of the Manukau. Further korero on the Manukau Claim (Wai 08) is documented in the cultural values assessment report provided by Ngāti Te Ata Waiohua [24].

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22 Waitangi Tribunal, 1985 The Manukau Report WAI08. Accessed from https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68495207/The%20Manukau%20Report%201985.pdf

23 pg1, Waitangi Tribunal, 1985 The Manukau Report WAI08.

24 Ngāti Te Ata Waiohua Manukau Harbour Report. 2023. *Shoreline Adaptation Plans: Manukau South and Aawhitu. Guiding Principles and Cultural Values*

2.5 Social context and values

Āwhitu Peninsula supports a diverse number of coastal communities and has a rich cultural landscape. Key communities situated along Āwhitu Peninsula and within the SAP extent include Karioitahi, Big Bay, Orua Bay, Pollok, Grahams Beach and Matakawau. The Āwhitu SAP falls within the Franklin Local Board area (Figure 2-11).

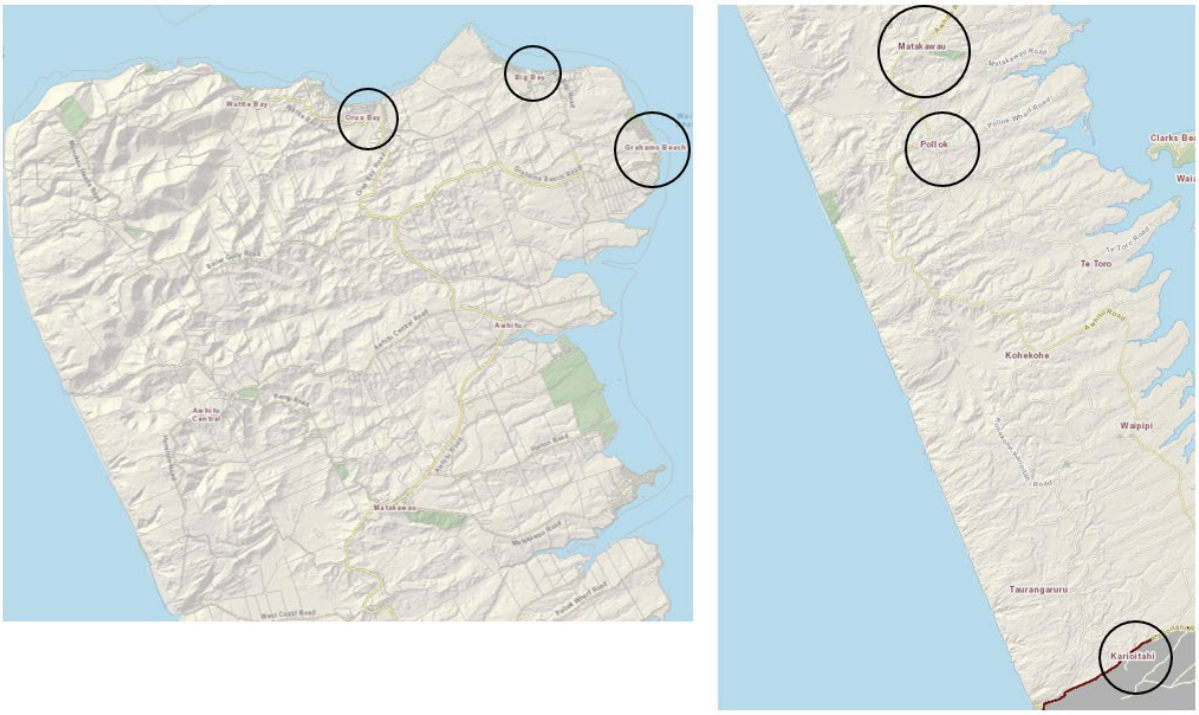


Figure 2-11: Key communities situated along Āwhitu Peninsula and within the SAP extent include Karioitahi, Big Bay, Orua Bay, Pollok, Grahams Beach and Matakawau (circled in black). Left: covers the northern extent of the Awhitu SAP, covering the area from Manukau Heads to just south of Matakawau. Right: covers the southern extent of the Awhitu SAP area, covering the area just south of Matakawau down to the Auckland boundary south of Karioitahi Beach.

To provide an understanding of the social values and aspirations that an area or community hold, an analysis of local policy and social information has been undertaken.

2.5.1 Regulatory and policy context

Understanding the regulatory and policy context applicable to the Āwhitu area helps us understand the communities previously expressed issues, values, objectives and aspirations. An identification of relevant plans has been undertaken. This is appended in the Consultation Summary Report for Āwhitu.

Of specific relevance to the Āwhitu Peninsula are the following plans:

- **Towards a Pest-Free Peninsula:** Animal Pests (Āwhitu LandCare Group) which demonstrates the communities' focus on collaborative community outcomes.
- **Āwhitu Peninsula Strategic Framework:** Developed by Auckland Council in partnership with the local community and sets out a vision and strategic direction for the Āwhitu

Peninsula. It identifies key issues and opportunities for the area and outlines a range of actions and initiatives to help achieve the desired outcomes.

- The **Regional Parks Management Plan** (Āwhitu Regional Park) and **operative Local Parks Management Plans** are identified as relevant documents and further consideration of these will be required through implementation. It is noted that an update to the Franklin Local Parks Management Plan(s) is currently being progressed and close engagement with that the plan is occurring to ensure that SAPs and developing local parks management plans are aligned.
- The **Franklin Local Board Plan 2020** is a three-year plan due for renewal in 2023. This plan focuses on six outcomes that each contribute towards enhancing and supporting the community across the Franklin Local Board area. These outcomes include:
    - Our strengths generate local opportunity and prosperity
    - Improved transport options and fit-for-purpose roads
    - Fit-for-purpose places and facilities
    - Kaitiakitanga and protection of our natural environment
    - Cultural heritage and Māori identity is expressed in our communities
    - A sense of belonging and strong community participation.

This Plan refers to the following matters: climate change, coastal erosion, drought, flood, extreme weather events, resilience, environmental conservation, restoration and regeneration projects, assets, future needs, and local character.

2.5.2 Key community locations and groups

As an area with rich historic background and well-established local communities, there are many community groups and organisations active along the Āwhitu Peninsula that frequently visit the coast and utilise coastal assets for a range of purposes. The table below outlines just a few of the identified community groups and networks along the Āwhitu Peninsula.

Table 2-2: Āwhitu key community locations/assets and groups

Suburb Area	Community Organization
Āwhitu	Āwhitu District School
Āwhitu	Āwhitu Regional Park and golf club
Āwhitu	Āwhitu Peninsula Landcare Inc
Āwhitu	Āwhitu Peninsula Historical Society Inc
Āwhitu	Manukau Peninsula Playcentre
Āwhitu	Matakawau Boating Club
Big Bay/Grahams Beach	Residents and Ratepayers Association
Grahams Beach	Grahams Beach Settlers Association
Karioitahi	Karioitahi surf club

Matakawau	Matakawau community
Manukau	Manukau Heads Lighthouse Trust Inc
Pollok	Pollok hall and market
Pollok	Pollok Art Gallery
Te Toro	Te Toro hall community
Te Toro	Counties Sport Fishing Club

2.5.3 Growth, development, and future generations

The most recent census data for Āwhitu was collected during the 2018 New Zealand Census of Population and Dwellings. According to the census, Āwhitu had a population of 582 people, an increase from 507 people in the 2013 census. The census data also provides information on the demographics of Āwhitu's population. Of the total population, 53.6% identified as male and 46.4% identified as female. The median age of the population was 49.6 years, which is higher than the national median age of 38 years. In terms of ethnicity, the majority of the population identified as European (89.3%), followed by Māori (14.9%) and Pacific peoples (3.1%).

The demographic data and information provide a general overview of the existing situation and trends of the Āwhitu SAP area as well as informing an understanding of the local context and needs. Considering the community feedback alongside identified population growth, it can be concluded that the communities of Āwhitu are steadily increasing. This increase in local population, alongside the wider southern population growth is likely to result in growing demand pressures on infrastructure and assets within coastal areas - such as park reserves and coastal infrastructure.

2.6 Ecological context and values

The Auckland region is home to a variety of ecosystem types and species (Attachment B). This is evident in the range of ecosystems in microcosms found along the shores of Āwhitu Peninsula, which hosts terrestrial and aquatic habitats and associated species.

2.6.1 Identified ecological areas and values

Āwhitu Peninsula and the wider Manukau Harbour, includes a number of indigenous coastal saline, wetland, cliff, forest and regenerating ecosystems supporting native fauna such as birds, geckos, and bats endemic to New Zealand.

Mangrove forest and scrubland, saltmarsh - sea rush oioi and shell-barrier beaches [Chenier Plains] can also be found along the Āwhitu Peninsula providing important nursery and breeding grounds for a range of native, threatened species[15].

A range of shoreline habitats can be found along the shores of Āwhitu Regional Park and Kauritutahi Creek. These ecosystems provide habitat diversity to wading and coastal birds in addition to a number of threatened coastal fringe and wetland birds that dwell in the saline vegetation, such as banded rail and North Island fern birds. The area is an integral part of Manukau Harbour and is an internationally important wetland selected by the Department of Conservation as an Area of Significant Conservation Value (ASCV). A variety of coastal birds and thousands of international migratory and New Zealand endemic wading birds (some endangered) can also be found along the sand banks around Pollok (functional as a high-tide roost). Often the adjacent intertidal flats around Pollok serve as an interim habitat for waders before moving onto the roost. Saltmarsh habitats join the spit with fairly extensive intertidal mangrove areas in Rangiriri Creek. The Department of Conservation has selected the roosts and closely adjacent intertidal banks as an ASCV.

The Āwhitu Peninsula has numerous Biodiversity Focus Areas (BFA) and Significant Ecological Areas (SEAs) as indicated in Figure 2-12 below.

- Biodiversity Focus Areas represent the minimum sites requiring targeted management to ensure protection of Auckland's indigenous ecosystem and threatened species. BFA within the Āwhitu area include:
  - Āwhitu coast
  - Lake Pokorua-Pehiakura complex
  - Central-North Awhitu complex
  - Āwhitu Regional Park wetlands
  - Rangiriri.
- Significant Ecological Areas are located throughout Āwhitu, particularly on the peninsula's west coast and Southern Head area to Big Bay:
  - Awhitu's South Head to Big Bay includes an identified significant ecological ecosystem (SEA – M2) which supports diverse and rich marine fauna which shows open coast, harbour, and southern affinities

- The marine ecosystem found at Karioitahi (Stretch 1) contains a diverse mix of flora and fauna, merging into areas of coastal vegetation, within which a range of threatened plants grow[16]
- Pollok Spit (included in Stretch 23): Made up of intertidal flats and sand banks, waders and migratory and endemic wading birds congregate here. Saltmarsh habitats join the spit with extensive intertidal mangrove areas in Rangiriri Creek (SEA- M2 and SEA M1).

Figure 2-12: Map of Āwhitu Peninsula showing Biodiversity Focus Areas (light green) and Significant Ecological Areas (dark green). Tiaki Tamaki Makaurau Map, Auckland Council.

2.6.2 Threats and opportunities

Manukau Harbour is largely intertidal, with highly productive sand and mudflats. There are ecosystems along Āwhitu Peninsula and within Manukau Harbour facing transformation over the last couple of decades as a result of anthropogenic modification and environmental change. Such change poses threats to the biodiversity of these areas and can be exacerbated by the interventions and management choices we make in our coastal environments.

Conversely, understanding past ecosystem extent can provide a view to opportunities for enhancement and restoration and the role that choices around shoreline management may contribute to ecological outcomes within the Āwhitu SAP area. Mapped extents represent the

ecosystem that would have been present prior to human settlement versus the current extent (refer to Figure 2-13). This information helps us understand level of change of each ecosystem type over time and assists with proactive management of an area and its ecosystem[25].

2.6.2.1 Threats

The International Union for the Conservation of Nature (IUCN) classification for describing the risk status of an ecosystem has been used to describe the vulnerability ranking of ecosystems found within and along Āwhitu Peninsula. This assists in identifying which ecosystems require prioritisation of protection, management, and restoration[25]. The IUCN vulnerability ranking of ecosystems within and along Āwhitu Peninsula varies from least concern to threatened or endangered and includes the following as shown in the table below:

Table 2-3: International Union for the Conservation of Nature (IUCN) classification for ecosystems identified as present on the Āwhitu Peninsula

Ecosystem	Threat level
Mānuka, tangle fern scrub/ fernland (Mānuka fen)	Critically endangered
Tōtara, kānuka, broadleaved forest (Dune forest)	Critically endangered
Oioi, knobby clubrush sedgeland	Critically endangered
Spinifex, pīngao grassland/ sedgeland	Endangered
Raupō reedland (wetland)	Endangered
Oioi, restiad rushland/ reedland	Endangered
Pōhutukawa, pūriri, broadleaved forest (coastal broadleaved forests)	Endangered
Pōhutukawa treeland, flaxland and rockland ecosystem (cliff ecosystem)	Vulnerable
Mānuka, kānuka scrub	Least concern
Kānuka scrub/forest	Least concern

2.6.2.2 Opportunities

Map A in Figure 2-13 illustrates how prior to human colonisation and modification, the former vegetation of Auckland was dominated by distinct, location-specific forest types. Coastal forests differed from inland kauri, podocarp, broadleaved forests and they differed from kahikatea forests on low-lying, flood-prone alluvial river terraces. The region also had a variety of non-forest vegetation on sand dunes and in wetlands, which were particularly diverse. This is in contrast to Map B, showing the current ecosystem extent of Auckland following human settlement. The following potential ecosystem extents are evident along the Āwhitu Peninsula:

[25] Singers et al, 2017

- Fen / swamp mosaic potential ecosystem
- WF7-1, Puriri forest potential ecosystem
- Open water potential ecosystem.

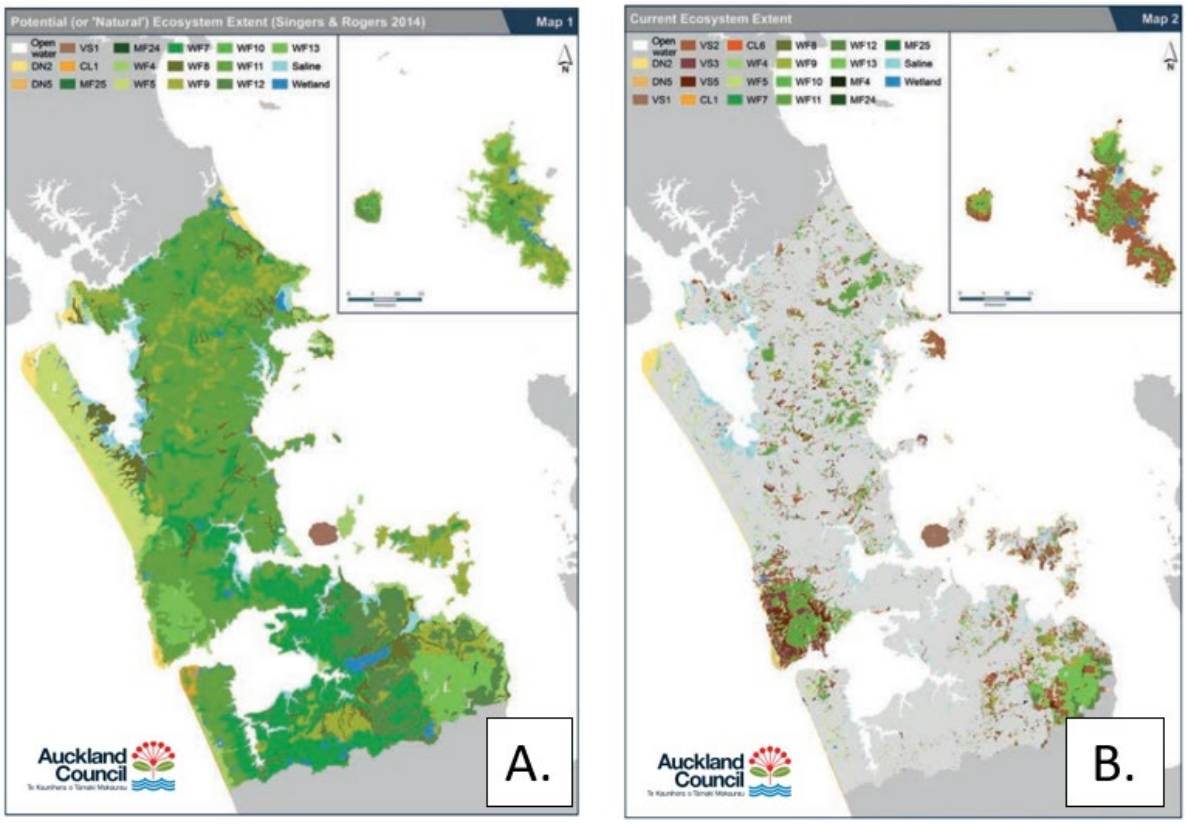


Figure 2-13: Map A represents the potential extent of indigenous terrestrial and wetland ecosystems whilst map B represents the current extent of indigenous terrestrial and wetland ecosystems in Auckland (Singers and Rogers, 2014).

2.6.3 Adaptive capacity and sensitivity to climate change

The term 'sensitivity' when used in relation to a changing climate refers to the degree to which a species or environment is influenced or affected by a change in its environment and how well it may be able to cope with such a change[26]. A consideration of the ecosystems present within the Āwhitu SAP area has been undertaken and is appended as Attachment B.

[26] Foley and Carbines, 2019

3.0 Āwhitu Area outcomes and analysis

3.1 Local iwi engagement

The development of this SAP and selection of management strategies has been guided primarily by Ngāti Te Ata Waiohua, and Ngāti Tamaoho. Throughout the development of this document, mana whenua engagement has taken place with Ngāti Te Ata Waiohua, Ngāti Tamaoho, Te Ākitai Waiohua and Waikato Tainui. Each of these iwi groups have been involved in the development of this SAP as they have expressed interest in the development of the SAP for the Āwhitu area.

Te Ākitai Waiohua has undertaken a role of 'observer' in this process to assist in the development of future SAPs which relate to the rohe of Te Ākitai Waiohua.

Waikato Tainui have been involved throughout the development of both the Manukau South and Āwhitu SAPs.

Engagement occurred between May 2022 and remains ongoing (in support of the development of further area plans, and their implementation under the SAP programme). Engagement has included hui both online and in-person. Site visits by the project team have been undertaken with local iwi within the Āwhitu SAP area and reviews of SAP plan documents as they are developed and completed for endorsement have been undertaken by iwi partners.

Photos shown as Figure 3-1 and Figure 3-2 below were taken on hikoi around the Āwhitu Peninsula with local iwi.

Figure 3-1: Local iwi and Auckland Council project team (02/12/2022) location (Orua Bay) Photo Credit: Sage Vernall

Figure 3-2: Local iwi and Auckland Council project team (16/03/2023) location (Hamiltons Gap) Photo Credit unknown

3.2 Cultural aspirations and outcomes

The cultural objectives and outcomes sought by the respective iwi that are underpinned by the partnership and co-management approach taken in developing these SAP documents need to be recognised and used as a basis for all facets of their implementation.

It is of vital importance that this partnership and co-management approach is applied when implementing the direction set out in this SAP to each specific coastal stretch. Failure to do so has the potential to result in significant cultural impacts if iwi are not recognised as kaitiaki of their rohe and their values and associations are not considered when implementing these plans. Therefore, the primary cultural objective for any process that flows from this SAP, and any SAP or associated document in the future, is the need for a formalised process to establish and formally recognise and provide for the role of iwi as partners as part of a co-management approach. The formalisation of this process will provide for mahitahi participation / working together / individual and shared priorities, all of which are key cultural outcomes. The need for the partnership/co-management approach applies to the rohe of each iwi and also their lands identified through their Treaty settlements.

For the Āwhitu SAP area, iwi have provided the following aspirations and outcomes to guide the development and implementation of the Āwhitu SAP.

Aspirations and outcomes sought by Ngāti Te Ata Waiohua[27]:

- Embrace and empower kaitiakitanga and rehabilitate and heal the natural systems that support us all. Ngāti Te Ata Waiohua has never relinquished its rangatiratanga or its kaitiakitanga over natural and physical resources including its coastal environment and coastal resources.
- Restore Ngāti Te Ata Waiohua capacity to manage our natural and physical resources according to our own preferences. The natural environment is a taonga. It is the source of our nourishment, our kai and our spiritual and physical welfare. We whakapapa to it and we are not separate from it. Inability to exercise our rightful kaitiakitanga affects our welfare and despoils our environment.
- Implement programmes such as riparian planting and protect sensitive receiving environments and protect and enhance water quality. Ngāti Te Ata Waiohua emphasise the importance of healthy uncontaminated water throughout the rohe. Waiora is the water of life, the purest form of freshwater that gives and sustains life and can rejuvenate damaged mauri. Mauri is the life force that regenerates and binds the physical and spiritual elements of resources together.
- Give special attention to Manukau Harbour to rehabilitate it and secure its future.
- That no further species extinctions occur including the Maui dolphin and that biodiversity is managed to sustain our communities consistent with our kaitiakitanga practices. Biodiversity is integral to Ngāti Te Ata Waiohua. We are not separated from it; rather it is part of us and our conception of health and wellbeing. Biodiversity continues to be under threat despite successive plans to ‘turn the tide’. Its value cannot be over-estimated, and

[27] Ngāti Te Ata Waiohua Manukau Harbour Report. 2023. Shoreline Adaptation Plans: Manukau South and Āwhitu. Guiding Principles and Cultural Values

it is interwoven with many of our traditional values and practices. As Kaitiaki, we take an ecosystem view, and we have a responsibility to manage and protect healthy ecosystems and the biodiversity that they support.

- No ashes of the deceased are to enter into sacred waterways as this is a cultural insult and in conflict with the traditional harvest of kai moana[28].
- That Ngāti Te Ata Waiohua be supported to conduct its own monitoring of the effectiveness of environmental regulation in the protection of its cultural resources, biodiversity wāhi tapu and other taonga within its rohe.

Additionally, Ngāti Te Ata Waiohua has further articulated the need to suitably manage any effects in the hierarchy of avoid, remedy, minimise, mitigate, or balance. This is a hierarchy where the first and preferred option to manage an effect is to avoid it. Should this not be possible, the next option is to remedy the effect, and so on through to suitably balancing the effect, which might include offset mitigation. Importantly, only mana whenua can determine the effects and the degree of those effects on themselves and their cultural values.

3.2.1 Mātauranga ā iwi from Ngāti Te Ata Waiohua

The table below sets out a series of guiding principles provided and advocated for by Ngāti Te Ata Waiohua and Ngati Tamaoho. Future coastal management strategies across the Āwhitu SAP area (set out in Section 5.0) aim to acknowledge and support these principles through implementation, recognising the principles below as the starting point for more meaningful consultation with local iwi groups along the Āwhitu Peninsula.

Mana Whakahaere	• Recognising whanau, hapu, and iwi rights to exercise their own tikanga concerning the CMA, foreshore and seabed.
Iwi Rangatiratanga	• Recognising iwi rights to self-determination including their right of self-governance and self-regulation of their CMA, foreshore and seabed.
Maru Taha Tika	• Actively protecting whanau, hapu and iwi rights as well as interests concerning the CMA, foreshore and seabed.
Paneketanga	• Recognising the whanu hapu and iwi rights to development over its foreshore and seabed within their own cultural preferences.
Manākitanga	• Recognising the role that government and Council must play in supporting whanau, hapu and iwi rights, needs and aspirations concerning CMA, foreshore and seabed.
Hono Marino	• Acknowledging that Ngāti Te Ata Waiohua would not unreasonably or without good cause deny others the use and sharing of certain CMA, foreshore and seabed resources consistent with the tikanga of the iwi.
Turukitanga	• Ngāti Te Waiohua consider the principles of access, certainty and protection can be met through recognition of the above principles as the starting point for more meaningful consultation.

[28] Note: this matter is beyond the scope of the SAPs.

Kaitiakitanga	• Or guardianship is inextricably linked to tino rangatiratanga and is a diverse set of tikanga or practices which result in sustainable management of a resource. Kaitiakitanga involves a broad set of practices based on a world and environmental view and is about healing and restoring the land and water. The root word is tiaki, to guard or protect, which includes a holistic environmental management approach which provides for the following: ○ Restore mana of the Iwi (e.g. protect sensitive cultural and natural features of the environment) ○ Restoration of damaged ecological systems ○ Restoration of ecological harmony ○ Ensuring that resources and their usefulness increases, i.e. plan for the provision for and the restoration of traditional resource areas for future generations (e.g. kaimoana, fish, tuna) ○ Reducing risk to present and future generations (i.e. plan long term management and use of taonga) ○ Providing for the needs of present and future generations ○ Advocate for no illegal seawalls and coastal structures, reclamations that impede our ability to exercise our kaitiakitanga and access to our traditional fishing grounds.

3.2.2 Ngāti Tamaoho

Ngāti Tamaoho have been engaged through a series of hui (online and in-person) and hikoi and are in the process of developing a rohe-based response to the SAP programme. For the purposes of the development of the Āwhitu SAP area plan, Ngāti Tamaoho have identified support for the Mātauranga ā iwi from Ngāti Te Ata Waiohua.

It is important to note that Ngāti Tamaoho may provide a further statement of cultural values, aspirations and outcomes. Implementation of this SAP area plan must reflect further early engagement and consultation with Ngāti Tamaoho.

3.2.3 Te Ākitai Waiohua

As identified in Section 2.4, Te Ākitai Waiohua has undertaken a role of 'observer' in this process to assist in the development of future SAPs which relate to the rohe of Te Ākitai Waiohua. Documents have been shared with Te Ākitai Waiohua through the development of this plan. No specific mātauranga have been identified through this process to include in the development of this report.

3.2.4 Waikato Tainui

Waikato Tainui has directed the Auckland Council SAP team to the Waikato Tainui Environmental Plan to inform the understanding of values, principles and objectives Tainui have in relation to coastal areas of their rohe. Chapter 10 of the Environmental Plan sets out the Tribal Strategic Plan -

Whakatupuranga Waikato -Tainui 2050. Chapter 14 identifies customary activities - Ngā Mahi Tuku Iho a Waikato -Tainui. Both of these chapters have been identified by Waikato Tainui as being of relevance to the development of the SAP Plan for Āwhitu.

The Environmental Plan identifies the mana whakahaere of Waikato-Tainui has associated requirements to responsibly use, protect, and enhance customary resources, and to ensure their on-going health and wellbeing. Waikato-Tainui customary activities and resource use include but are not limited to the activities below.

Waikato -Tainui's customary activities (outlined in Chapter 14) include:

Koroneihana	The annual celebration of the coronation day of the Head of the Whare Kāhui Ariki.
Waka or kohikohia	Gathering together.
Tangihanga and hari tuupāpaku	The transportation of human remains and the accompanying funeral ceremonies.
Tangohia ngā momo takawai	The collection of resources, such as river stones, shingle, and sand from the Waikato-Tainui rohe for the purposes of customary practices including: • The building of a tuahu (altars) • Carvings • The preparation of hāngii.
Rāhui	The imposition of restrictions, from time to time, on all or part of an activity, or the use of a resource, or rohe.
Hauanga kai	The customary and contemporary gathering and use of naturally occurring and cultivated foods.

Core objectives in this chapter speak to enabling Waikato -Tainui to access and undertake, protect and enhance, customary activities.

Whakatupuranga Waikato-Tainui 2050 (outlined in Chapter 10) is the blueprint for cultural, social and economic advancement for the Waikato-Tainui people. It is a long-term development approach to building the capacity of Waikato-Tainui marae, hapuu, and iwi. Whakatupuranga 2050 will be Waikato-Tainui's legacy for future generations[29]. Within Whakatupuranga Waikato-Tainui 2050, there are three critical elements fundamental to equipping future generations with the capacity to shape their own future:

- A pride and commitment to uphold their tribal identity and integrity
- A diligence to succeed in education and beyond
- A self-determination for socio-economic independence.

Waikato -Tainui's strategic direction charts a course of significant developments to protect tribal identity and integrity. The development of a core strategy designed to provide maximum support for Waikato -Tainui's kaumātua, the caretakers of mātauranga, and experts of Waikato -Tainui's reo and tikanga, is a key priority. Waikato -Tainui's whenua, rivers, lakes and other waterways are living

[29] https://waikatotainui.com/wp-content/uploads/2022/08/Waikato-Tainui-Environmental-Plan-2013.pdf

embodiments of Waikato -Tainui's tribal identity. The necessity to forge a partnership with the Crown is vital to the preservation and protection of 'te taiao', our environment:

- To preserve our tribal heritage, reo and tikanga
- To grow our tribal estate and manage our natural resources.

With the above in mind, Waikato Tainui are primarily interested in ensuring that affiliate marae are engaged and aware of the SAP programme and the opportunities to start korero about innovation, co-benefits and use of mātauranga (by iwi for iwi) in responding to environmental/climate change challenges, acknowledging these things are often interconnected and closely related to social/cultural and economic interest and outcomes. Engagement with affiliate marae may be facilitated through local iwi connections; in particular Ngāti Te Ata Waiohua, Ngāti Tamaoho, Te Ākitai Waiohua, Ngai Tai Ki Tamaki, and the marae at: Whātāpaka (within Manukau South SAP), Umupuia, Tahunakaitoto, Puukaki, Kakaurau and Te Puea.

Waikato Tainui have identified the following ongoing outcomes of the SAP programme and its implementation:

- Remaining engaged with the development of SAP area plans which include areas where affiliate marae are located
- Ensuring data and knowledge is shared appropriately with agreements and protection of mātauranga is clearly specified/documented
- Supporting opportunities for innovation, utilise mātauranga, and being directly engaged in discussion around implementation of the SAP programme.

3.3 Āwhitu risk assessment

To identify the potential impact of coastal hazards on Auckland Council-owned land and assets and to understand the escalating risk due to climate change, a high-level risk assessment[30] was undertaken. The risk assessment identified which elements of interest were located within hazard zones and may subsequently be adversely affected by hazard events, now and in the future.

For Āwhitu Peninsula, elements of interest included Auckland Council-owned parks and reserve land and assets, infrastructure, ecological and environmental areas, and cultural and historic heritage sites around the coast. Their exposure and risk were assessed using the wellbeing focus of cultural, social, environmental, and economic indicators, as detailed in the Risk Assessment Technical Report. To understand the varying impacts across Āwhitu Peninsula, the area was broken into nine separate units as shown in Figure 3-3.

3.3.1 Results of risk assessment

Risk classification provides an understanding of the quantity or extent of a particular asset or value. This enables an understanding of which unit has more or less risk, compared to other units.

Table 3-1 to Table 3-3 show how the risk for each unit changes across the short, medium, and long term in relation to coastal hazards. The results are split by the following four wellbeings:

- Social (park and reserve assets)
- Economic (public infrastructure including roads and three-waters' pipes)
- Environmental (ecological areas)
- Cultural (cultural and historic heritage sites).

The overall risk outcomes for this SAP area are highly variable. However, the west coast generally has high to very high risks in the present day, with increased risk from coastal inundation to economic wellbeing (network infrastructure) over the long term. The northern coast is most at risk to coastal and rainfall inundation although erosion and cultural risks increase over time. The east coast has more variable risks, with the highest risks occurring in the long term at Unit 7 the Āwhitu Regional Park unit.

[30] Tonkin and Taylor (2023). Āwhitu Shoreline Adaptation Plan – Risk Assessment Technical Report

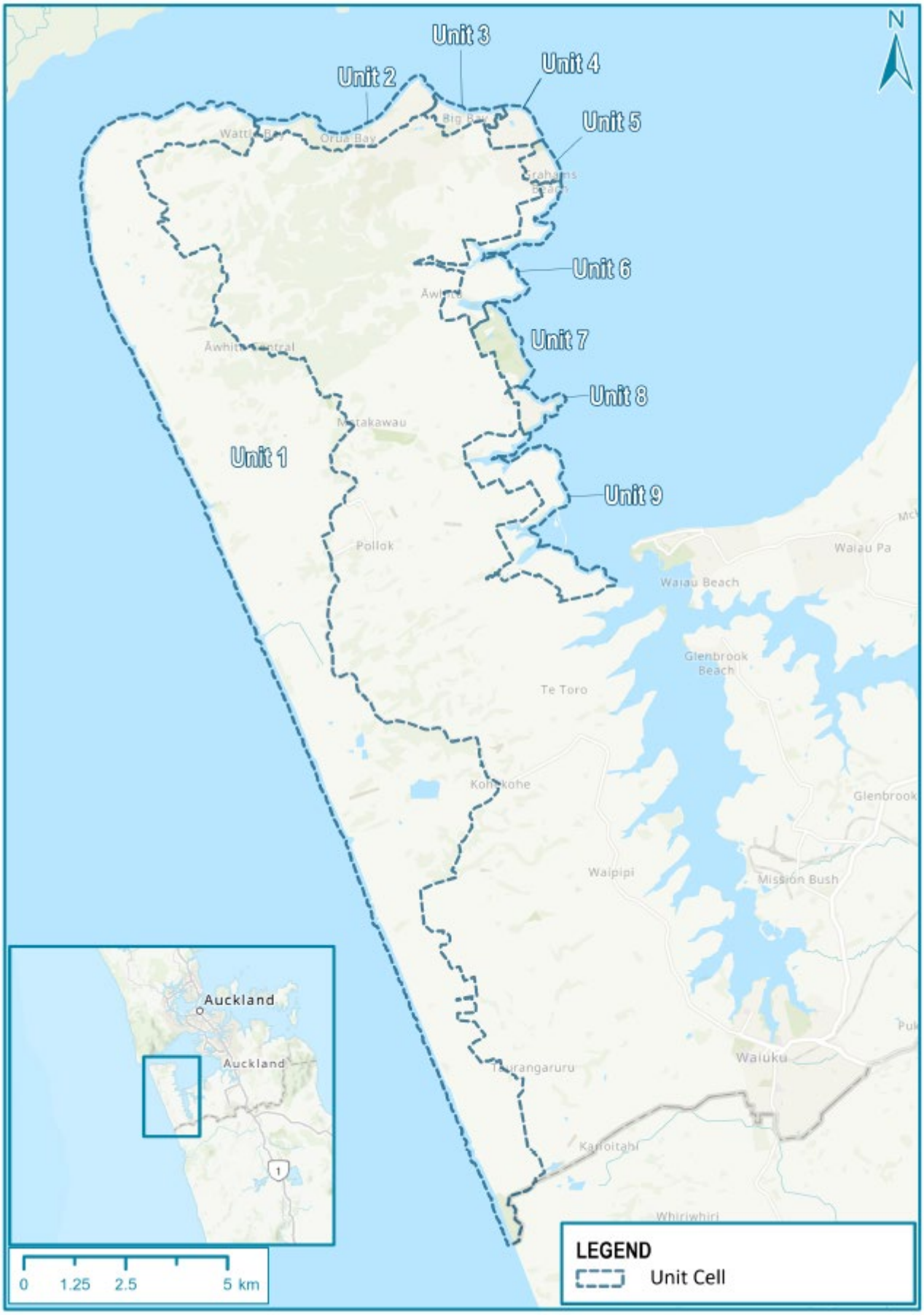


Figure 3-3: Map of Āwhitu Peninsula SAP Area Units

3.3.1.1 Coastal erosion

Short term	• Existing risks are moderate to high for park and reserves across the entire SAP area. • There are only modest extents of economic wellbeing (network infrastructure) in the erosion hazard area in the short term, with risks varying from none to moderate. • Ecological wellbeing has very high-risk classification in Unit 1 but is low to moderate for the remaining units. • Cultural wellbeing classifications are very high in the present day for Unit 1 and high at Unit 7, Āwhitu Regional Park, and Unit 9.
Medium term	• There is no significant change to the risk rating in the medium-term, except for Grahams Beach, which increases from low to moderate risk in the medium-term for economic wellbeing (network infrastructure).

Long term	• Risks do not substantially change classification over the long term. Exceptions being:
	  ○ Risk classification at Unit 2, Orua Bay increases from low to moderate in the long term for both economic and ecological wellbeing (network infrastructure and ecological land) and increases from moderate to high for cultural wellbeing.
	  ○ Unit 8, Matakawau increases from low to moderate for economic wellbeing (network infrastructure)
	  ○ Unit 6, Kauritutahi increases from moderate to high for cultural wellbeing.

3.3.1.2 Coastal inundation

Short term	• Existing risk classification is predominately moderate to high for the present day for social wellbeing (park and reserves) across the SAP area. • Risk classification is generally low to moderate in the present day for economic risk (network infrastructure) except at Unit 3, Big Bay where it is high. • Risk classification for ecological wellbeing in the present day is low to moderate. • Risk classification for cultural wellbeing in the present day range from low to very high. • The very high classification is at Unit 1, the West Coast.

Medium term	• There are limited changes in risk in the medium-term except for:
	  ○ Unit 7, Āwhitu Regional Park, where risk increases from high to very high, and Unit 8, Matakawau Point, where the risk classification increases from none to low for economic wellbeing (network infrastructure).
	  ○ Unit 6, Kauritutahi Creek, where risk increases from low to moderate for ecological wellbeing.
	  ○ Unit 5, Grahams Beach, where risk increases from low to moderate for cultural wellbeing.

Long term	• Risk classification increases to high at Unit 5, Grahams Beach in the long term for social wellbeing (parks and reserves). • Risk classifications for economic wellbeing (network infrastructure) change from moderate to high in the long term at Unit 5, Grahams Beach and low to moderate at Unit 1, Āwhitu Peninsula West Coast. • Apart from these, there are no other changes to risk classifications in the long term.

3.3.1.3 Rainfall flooding

Short term	• Rainfall flooding risk classification is generally moderate for social wellbeing (park and reserves), except for Unit 7, Āwhitu Regional Park and the Unit 1, West Coast units where risk classifications are high. • Risk classifications for economic wellbeing (network infrastructure) in the present day are high for Unit 1, West Coast, Unit 2, Orua Bay and Unit 3, Big Bay, and low to moderate for the remaining units. • Risk classifications for ecological wellbeing are generally low to moderate in the short term. • Risk classifications for cultural wellbeing in the present day range from low to very high. • The very high classification for Unit 1, West Coast, and the high classifications at Unit 2, Orua Bay, Unit 6, Kauritutahi Creek, Unit 7, Āwhitu Regional Park and Unit 9, Pollock Wharf and south.
Medium term	• No changes in risk classification are observed in the medium-term across the SAP area.
Long term	• There are very limited changes in risk classification in the long term across the cell. • Unit 7, Āwhitu Regional Park increases from high to very high for social wellbeing (parks and reserves) and Unit 6, Kauritutahi increases from low to moderate risk to ecological wellbeing.

Table 3-1: Aggregated risk classifications for coastal erosion susceptibility

Unit	Social - parks and reserves			Economic - Network Infrastructure			Environmental - ecological			Cultural		
	Short term	Medium term	Long term	Short term	Medium term	Long term	Short term	Medium term	Long term	Short term	Medium term	Long term
Unit 1: Āwhituwhitu | Āwhitu Peninsula West Coast	High	High	High	Low	Low	Low	Very high	Very high	Very high	Very high	Very high	Very high
Unit 2: Rehia | Wattle Bay to Orua Bay	Moderate	Moderate	Moderate	Low	Low	Moderate	Low	Low	Moderate	Moderate	Moderate	High
Unit 3: Te Mako | Big Bay	Moderate	Moderate	Moderate	Low	Low	Low	Low	Low	Low	Low	Low	Low
Unit 4: Te Mako ki Taitimu | Kauri Point	None	None	None	None	None	None	Low	Low	Low	None	None	None
Unit 5: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	Low	Low	None	None	None
Unit 6: Kauritutahi | Kauritutahi Creek	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Moderate	Moderate	High
Unit 7: Kaitara / Matata | Āwhitu Regional Park	High	High	High	Moderate	Moderate	Moderate	Low	Low	Low	High	High	High
Unit 8: Matakawau | Matakawau Point	High	High	High	Low	Low	Moderate	Low	Low	Low	Moderate	Moderate	Moderate
Unit 9: Hikurangi | Pollok Wharf & South	Moderate	Moderate	Moderate	None	None	Low	Moderate	Moderate	Moderate	High	High	High

Table 3-2: Aggregated risk classifications for coastal inundation

Unit	Social - parks and reserves			Economic - Network Infrastructure			Environmental - ecological			Cultural		
	Short term	Medium term	Long term	Short term	Medium term	Long term	Short term	Medium term	Long term	Short term	Medium term	Long term
Unit 1: Āwhituwhitu | Āwhitu Peninsula West Coast	High	High	High	Low	Low	Moderate	Moderate	Moderate	Moderate	Very high	Very high	Very high
Unit 2: Rehia | Wattle Bay to Orua Bay	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	High	High	High
Unit 3: Te Mako | Big Bay	Moderate	Moderate	Moderate	High	High	High	Moderate	Moderate	Moderate	Low	Low	Low
Unit 4: Te Mako ki Taitimu | Kauri Point	None	None	None	None	None	None	Low	Low	Low	Low	Low	Low
Unit 5: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach	Moderate	Moderate	High	Moderate	Moderate	High	Low	Low	Low	Low	Moderate	Moderate
Unit 6: Kauritutahi | Kauritutahi Creek	Low	Low	Low	Low	Low	Low	Low	Moderate	Moderate	High	High	High
Unit 7: Kaitara / Matata | Āwhitu Regional Park	High	Very high	Very high	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	High	High	High
Unit 8: Matakawau | Matakawau Point	Moderate	Moderate	Moderate	None	Low	Low	Low	Low	Low	Moderate	Moderate	Moderate
Unit 9: Hikurangi | Pollok Wharf & South	High	High	High	None	None	None	Moderate	Moderate	Moderate	High	High	High

Table 3-3: Aggregated risk classifications for rainfall induced flooding

Unit	Social - parks and reserves			Economic - Network Infrastructure			Environmental - ecological			Cultural		
	Short term	Medium term	Long term	Short term	Medium term	Long term	Short term	Medium term	Long term	Short term	Medium term	Long term
Unit 1: Āwhituwhitu | Āwhitu Peninsula West Coast	High	High	High	High	High	High	Moderate	Moderate	Moderate	Very high	Very high	Very high
Unit 2: Rehia | Wattle Bay to Orua Bay	Moderate	Moderate	Moderate	High	High	High	Low	Low	Low	High	High	High
Unit 3: Te Mako | Big Bay	Moderate	Moderate	Moderate	High	High	High	Moderate	Moderate	Moderate	Low	Low	Low
Unit 4: Te Mako ki Taitimu | Kauri Point	None	None	None	Low	Low	Low	Low	Low	Low	Low	Low	Low
Unit 5: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	Moderate	Moderate
Unit 6: Kauritutahi | Kauritutahi Creek	Low	Low	Low	Moderate	Moderate	Moderate	Low	Low	Moderate	High	High	High
Unit 7: Kaitara / Matata | Āwhitu Regional Park	High	High	Very high	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	High	High	High
Unit 8: Matakawau | Matakawau Point	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	Moderate	Moderate
Unit 9: Hikurangi | Pollok Wharf & South	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High

3.4 Community engagement

3.4.1 Engagement purpose

The purpose of community engagement throughout the SAP area plan development process is to:

- Identify how the community use and value their coastal areas including contemporary interests, issues, and aspirations of the community regarding their interaction, and use of coastal areas.
- Identify risk perceptions and experiences held by communities in relation to coastal change and coastal hazards and provide an opportunity to share information on hazards, risk and climate change and the potential impacts these may have over time.
- Facilitate community discourse on adaptive planning, the role of different values and the consideration of options to manage risk such as *holding the line* and *managed retreat* from areas of coastal risk.
- Support the development of community objectives which can be used to inform the selection of adaptations strategies.
- Provide unit or area-specific feedback on the use of coastal assets and land to inform adaption strategy selection.

It is important to note that the SAP programme does not include consultation with the community on the selection of adaptive strategies.

3.4.2 Community engagement for Āwhitu

Community engagement for the Āwhitu Peninsula SAP included a series of in-person public outreach events. Public consultation was open from mid-July to mid-October 2022. This ran in parallel to consultation for the Manukau South SAP.

To capture a diversity of demographics, a range of events and engagement opportunities were utilised, including:

- In-person events were spread across the peninsula, taking place at Pollok Hall Market, Grahams Beach Settlers Hall and Waiuku Community Hall
- Digital engagement was undertaken using Social Pinpoint and Engagement HQ:
    - Social Pinpoint operates as an on-line engagement platform which allows users to drop pins, write comments, add images, and complete surveys on an interactive map
    - Engagement HQ provided a second digital engagement platform where the community could complete surveys and ask questions.
- In addition to the in-person and online platforms, feedback was also provided through email submissions.

Following the close of community consultation, analysis of the results was undertaken, and community objectives were developed (see Section 3.4.1) based on the themes identified across the feedback received.

This enabled the final step in community consultation, the ‘close the loop’ phase of community engagement. This was undertaken online and through email communications in early 2023. The purpose of this phase was to ensure that the community were informed of the results of their consultation.

3.4.3 Engagement results

Across both the Manukau South and Āwhitu SAP engagement platforms ~270 users participated in digital engagement via Social Pinpoint and a total of 38 surveys for Āwhitu were submitted via Engagement HQ.

The information collated via these digital platforms helped identify key community values across the coastline and highlighted ‘areas of interest’ as summarised in Figure 3-4 and Figure 3-5. A more detailed overview of community engagement and development of the community objectives for the Āwhitu SAP can be found in the supporting Consultation Summary for Āwhitu.

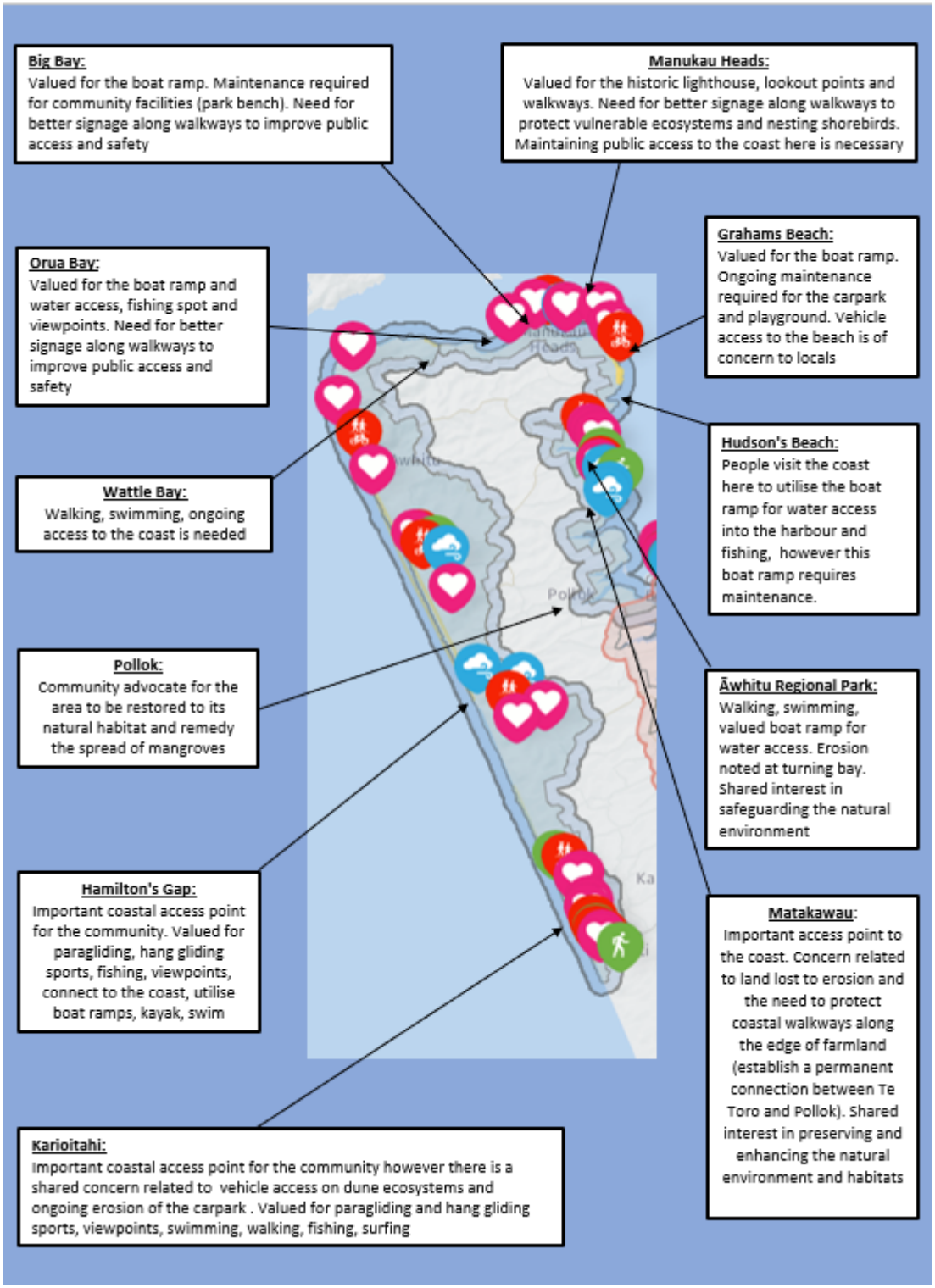


Figure 3-4: Summary of feedback received via Social Pinpoint- Āwhitu Peninsula

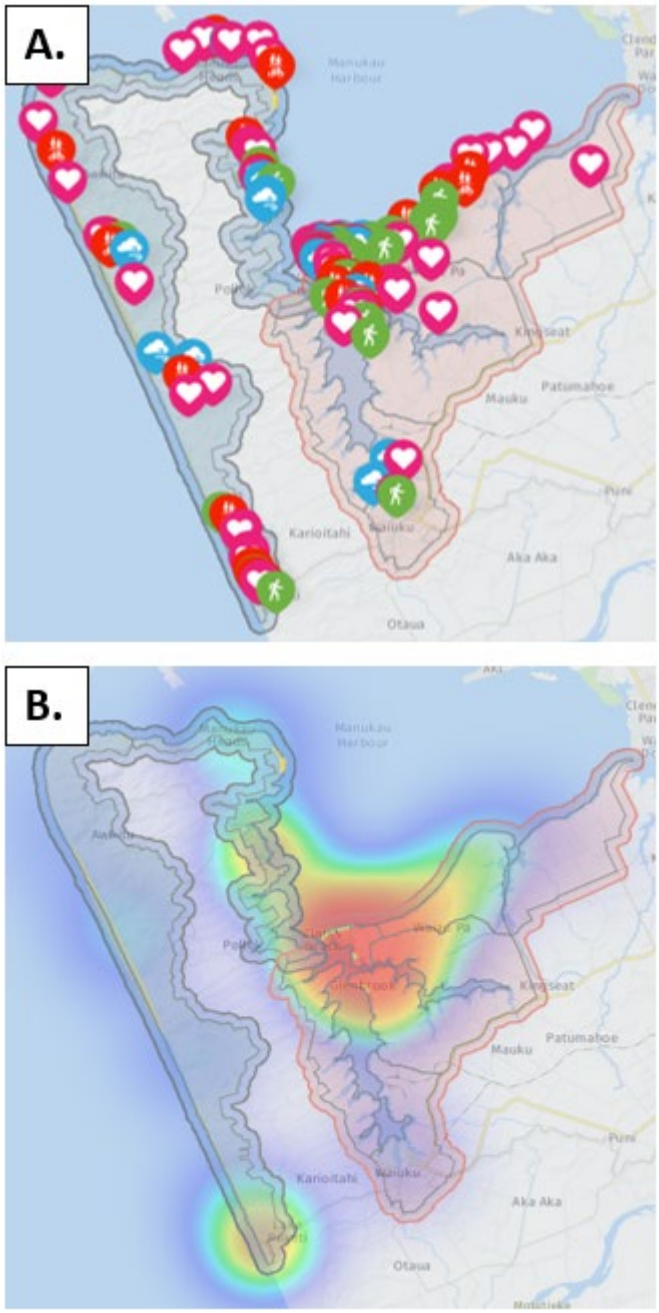


Figure 3-5: Social Pinpoint maps generated from the digital engagement. Map A displays the location of specific comments, with green circles representing the "I go here because" pins, blue circles representing "I remember this storm event…", red circles representing "I access the coast here" and pink circles representing "I value this because" pins. Map B is a heatmap highlighting the areas most commented on during the digital engagement, which for Āwhitu is Karioitahi, Big Bay and Āwhitu Regional Park, meaning that these are areas of high interest to the local community.

In addition to the in-person and online platforms, feedback was also provided through email submissions.

3.4.4 Community objectives for Āwhitu Peninsula

The information collected via all engagement channels was collated and reviewed. This was sorted and grouped into eight major categories (See Table 3-4 below):

Table 3-4: Key categories developed from community feedback

Active recreation	• How people utilise the coastal areas and provided amenities.
Passive recreation	• How people connect to and enjoy the coast and reserve areas.
Environmental	• Concerns related to the care and protection of the natural environment.
Transport	• Concerns related to roading networks across the Manukau South and Awhitu coastlines.
Heritage, history and community	• Comments related to the cultural and historic significance of the coast, along with those detailing the importance of the coast the community.
Community memory	• Coastal hazards and/ or storm events that the local community remember, along with changes to the coastline over time.
Coastal engineering and assets	• Values and concerns related to coastal engineering and assets (wharfs, seawalls etc.)
Management and maintenance issues	• Management and maintenance concerns the community has for the coastline and its assets and facilities.

These categories and themes assisted in the development of community objectives, developed in collaboration with the Parks and Community Facilities Departments at Auckland Council. Some of the feedback and comments related to topics outside the scope of SAPs, including maintenance and bylaw management issues, and these were shared with other departments within Council and CCOs.

The community objectives developed for the Āwhitu area are as follows and have been used to inform the development of the adaptive strategies in Section 5.0 of this report.

Table 3-5: Community objectives for Āwhitu

Preservation of natural environment	• Adaptation strategies preserve and enhance the natural environment and ecosystems that support biodiversity, whilst protecting vulnerable flora/ fauna from adverse activities that damage these delicate systems.
Connectivity and access	• Open-space areas provide for and maintain suitable paragliding and hang-gliding take-off and landing places. • All-tide access to the beach, coast and harbour at key community access locations is maintained to enable a range of recreational and water-based activities (e.g. swimming, paragliding, hang- gliding, walking, picnicking, sailing/boating, kiteboarding and surfing).
Asset resilience	• Resilience of community facilities and assets in hazard zones is a priority. • Community facilities in the Āwhitu area support community resilience and recovery.
Management and maintenance of coastal spaces	• Pedestrian safety and use of public coastal walkways and lookouts is supported by improvements to signage and maintenance of coastal spaces.
Transport considerations	• A resilient road network supports and maintains access for a diverse range of transport types (i.e. bikes, vehicles) to and along the coastal environment (improve/ support connectivity between coastal spaces).

4.0 Adaptation strategies for Āwhitu

This section provides a commentary on the development of adaptive strategies for the Āwhitu SAP area (Sections 4.1 and 4.2) and includes general guidance for the implementation of strategies identified in the Āwhitu SAP Report (Section 4.3).

4.1 Adaptation strategy examples

Four major adaptation strategies are considered which are outlined in Section 1.3.5 of this report. To support the understanding of how adaptation strategies may be considered or applied in practice, some examples of local relevance, are provided below.

No Active Intervention (NAI)	• This is the 'do nothing' strategy of allowing nature to run its course, including responding to climate change effects. With this strategy it is expected that shorelines will continue to erode and low-lying areas will become exposed to more frequent and intense rainfall flooding events • Can include advocacy and guidance for aspects such as vegetation restoration or planting techniques undertaken by local community groups or private property owners.
Limited Intervention (LI)	• Limited Intervention may include protection of existing dune habitat, dune restoration or riparian and slope planting programmes to create a more resilient, natural buffer along the coast to mitigate coastal hazard and climate change impacts as well as providing ecological benefits such as habitat corridors • It can also include management of pedestrian and vehicle uses through provision of and control of access.
Hold the Line (HTL)	• Can include either hard protection structures or more nature-based solutions designed to maintain the coastline or maintain a particular use at a given location. • This may be utilised to protect assets over time or may be an intermediary measure until retreat or change in uses is triggered. • Hold the line may apply to one or multiple hazards. All engineered structures have a limited design life and specification.
Managed Retreat (MR)	• Managed retreat involves moving physical amenities (car parks, toilets and walkways) from areas when the risk to these assets becomes intolerable as a way to reduce the risk. • Where possible, they will be located landward on existing reserve areas, but there may be areas where this is not possible.

4.2 Development of the strategies for Āwhitu

The development of adaptation strategies for the Āwhitu area considered technical inputs (such as hazard risks, asset attributes and coastal hazard and climate change projections) alongside iwi and community values and feedback from partners and stakeholders. Ecological and policy framing (as set out in Section 2.0) are also relevant to the feasibility and implementation of adaptive strategies. Table 4-1 identifies the input.

Table 4-1: Key inputs and descriptions of the potential considerations

Input/consideration	Description
Cultural values regional and local	• Section 1.4 identifies guiding principles provided by Mana Whenua at a regional level for the SAP programme. These values are utilised at a high level and are generally built upon through local iwi engagement. • Local iwi have chosen to share mātauranga ā iwi values that are fundamental to ensuring that coastal management is respectful of the cultural associations and supports and reflects the cultural values that they have with their rohe. This is included in Section 3.0 of this report. • These values and aspirations are considered as criteria when considering the choice of adaptive strategies.
Cultural values/location specific feedback and guidance	• More detailed information has been shared through hui and on hikoi around the Āwhitu Peninsula and through communications with the project team. This has informed the te reo names of coastal stretches and units and supported an understanding of cultural values located within the units. • In some cases, specific details, and locations of sites or the stories/korero which relates to them have not been identified by iwi or publicly in this document. • As identified in Section 1.3, further engagement through implementation of this SAP area plan will be required to ensure cultural values are appropriately identified and responded to. • It is important to note that there are a significant number of cultural heritage sites within the SAP area which are not recorded. These exist both above and below mean high water spring tides (within the Coastal Marine Area).
Community objectives	• The objectives at Section 3.4 are considered in the selection of strategies.
Community – location-specific input	• Section 3.4 sets out the approach to and outcomes from the community engagement undertaken over the course of the development of this SAP. Site or location-specific feedback was received through a variety of platforms and utilised to develop overarching community objectives. • This feedback is also directly considered at a unit and stretch level for the selection of adaptions strategies.
Technical inputs - risk assessment results	• The exposure of infrastructure and assets and associated physical risk over the time periods is considered to understand the opportunity for risk management through different adaptive strategies.
Technical inputs- hazard and climate change information	• A consideration of coastal hazard and climate change impacts supported by regional and local hazard mapping and identification. • Local and expert understanding is also sought from the project team to inform the understanding of coastal processes and hazard scape.
Asset owners/managers consultation	• A series of workshops are held with asset and infrastructure owners to elicit feedback and test the feasibility and implications of different adaptive strategies.

4.3 Applying the strategies

The adaptive strategies are intended to remain strategic with the opportunity to apply a range of differing responses at a site-specific level. Note that the SAP plans respond to multiple hazards. The interaction between hazards and their coincidental (e.g. a storm surge and rainfall flood event at the same time) or cascading impacts (e.g. rainfall events exacerbating coastal cliff erosion) should be considered when assessing options for implementation under the SAP plans.

Section 4.3.1 below contains some general guidance specifically directed at asset owners/managers. Section 4.3.2 identifies the specific requirement to ensure that local iwi are engaged in the implementation of the Āwhitu SAP plan.

4.3.1 Guidance for Auckland Council asset owners

The adaptation strategies developed in the SAP are designed to be integrated across relevant Auckland Council plans. The guidance below is specifically tailored towards asset management operational decision-making and planning:

- Best practice guidance should be identified and applied. It should include but not be limited to, relevant technical regional publications and guidance documents and national guidance. Of particular importance for areas with a high number of identified and unidentified cultural and historic heritage sites, are the accidental discovery protocols in the Heritage New Zealand Pouhere Taonga Act 2014 and as set out in the Auckland Unitary Plan.
- The location of new assets in the areas susceptible to coastal erosion and instability (over all timeframes) is not recommended.
- Where an asset has a functional need to be within the hazard zone (such as a boat ramp or beach access), the dynamic nature of the coastal environment must be considered, and resilient design prioritised.
- The location of new assets in areas at risk of the present-day coastal inundation or rainfall flooding at 1% AEP is not recommended. Avoidance of risk is a priority where practical. Where an asset has a functional requirement to be located within the hazard zone, both increasing and residual risk must be considered.
- Where renewal of existing assets within hazard areas is contemplated, both increasing and residual risk should be considered, and options should be considered which identify appropriate location and resilient design.
- To support natural drainage and not increase the risk of rainfall flooding, all projects in the shoreline area must consider the location of overland flow paths and ensure that future works do not block these paths.

4.3.2 Māori outcomes

Future coastal projects in the Āwhitu SAP area need to consider the Kia Ora Tāmaki Makaurau Māori Outcomes Performance Framework, the Te Ora Tāmaki Makaurau Wellbeing Framework, and the values highlighted in Section 3.2. Specific cultural values and outcomes for each coastal stretch are anticipated to be further shared and developed through ongoing involvement of iwi in respective work programmes.

5.0 Adaptation strategies for Āwhitu

5.1 Navigating Section 5.0 by unit and stretch

Section 5.0 includes the adaptation strategies for Āwhitu. It is structured by unit with stretches included under each unit. Units are numbered 1-9 and stretches are numbered 1-23 in a clockwise direction around the Peninsula (from Karioitahi around to Pollok/Hikurangi). Table 5-1 below provides a quick reference index to identify the location of stretches within the units.

Naming of units and stretches is provided, as possible, in both Te reo | English.

Unit specific information is included for each unit as follows:

Identification of Council-owned land and assets within the unit and corresponding risk ratings for those assets/land	• As identified in the risk assessment and summary of Council-owned land and assets. • Risk is identified in the tables included in these sections using traffic-light colours - green to red, indicating risks changing from very low (green) to very high (red).
The environmental context	• Identifying the coastal setting, hazard scape and key ecological features within the unit.
The cultural context	• Identifying any specific cultural values, features or sites (to a level of detail chosen to be shared by iwi), including those identified through Sections 2 and 3.
The social and policy context	• Identifying any specific features or sites including those identified through Sections 2 and 3.

Stretch specific information is provided as follows:

- Description of the stretch
- Tabulated identification of the hazard scape, Council-owned land and assets and current management approaches
- Adaptation strategy
- Guidance for implementation.

Table 5-1: Summary of the Units and Stretches for Āwhitu

	Unit	Stretches
Unit 1	Awhituawhitu | Āwhitu Peninsula West Coast	1: Karioitahi ki Rukuwai | Karioitahi 2: Awhituwhitu | Āwhitu Peninsula 3: Waimatuku | Hamiltons Gap 4: Waimatuku ki Kawakawa | Hamilton's Gap North
Unit 2	Rehia | Wattle Bay to Orua Bay	5: Te Raroa | Wattle Bay 6: Te Raroa ki Taratara | Wattle Bay to Orpheus Road Boat Ramp 7: Orua ki Rehia | Orua Bay Beach 8: Orua - Mako | Orua Bay stream to Mako Point
Unit 3	Te Mako | Big Bay	9: Te Mako | Big Bay Beach 10: Te Mako | Big Bay East
Unit 4	Te Mako ki Taitimu | Kauri Point	11: Te Mako | Kauri Point
Unit 5	Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach	12: Te Ngaio ki Taitimu | Hudsons Beach and Grahams Beach
Unit 6	Kauritutahi | Kauritutahi Creek	13: Kauritutahi | Kauritutahi Creek
Unit 7	Kaitara / Matata | Āwhitu Regional Park	14: Kaitara / Matata | Āwhitu Regional Park
Unit 8	Matakawau | Matakawau Point	15: Matakawau | Sergeants Beach 16: Matakawau | Matakawau Point North 17: Te Kurae o Matakawau | Matakawau Point 18: Matakawau | South of Matakawau Point 19: Matakawau | Matakawau Beach 20 Matakawau | Matakawau Road
Unit 9	Hikurangi | Pollok Wharf and South	21: Matakawau | Matakawau Creek 22: Hikurangi | Pollok Wharf 23: Hikurangi | Rangiriri Creek

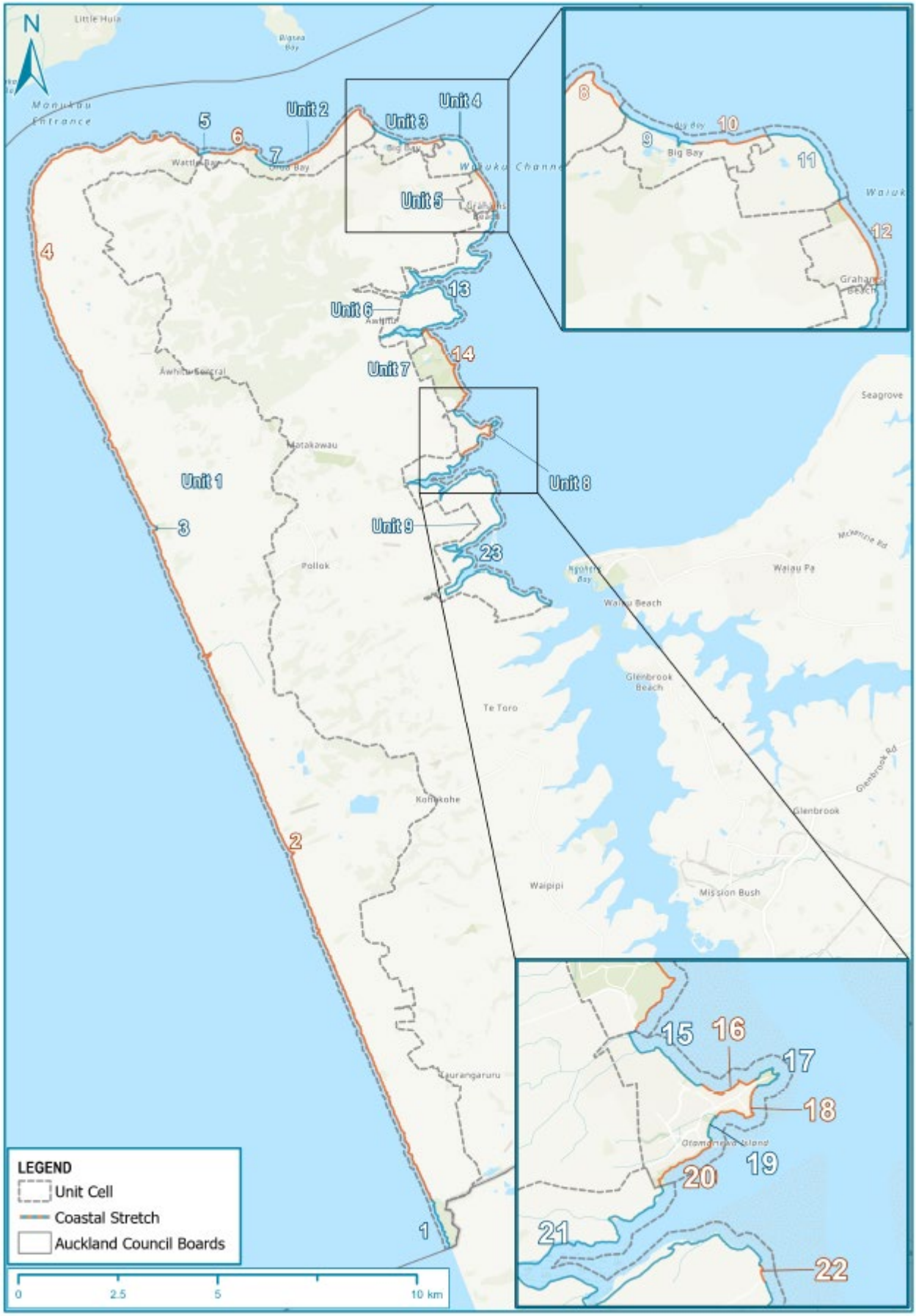


Figure 5-1: Breakdown of coastal stretches and units across the Āwhitu Peninsula

Unit 1: Āwhituwhitu| Āwhitu Peninsula, West Coast

Unit 1: Āwhituwhitu| Āwhitu Peninsula, West Coast

Unit 1 begins at the southern Auckland regional boundary at Rukuwai | Karioitahi Beach (including the reserve) and extends north to Waimatuku | Hamiltons Gap, culminating at the top of the peninsula to the west of Te Raroā | Wattle Bay (4 coastal stretches).

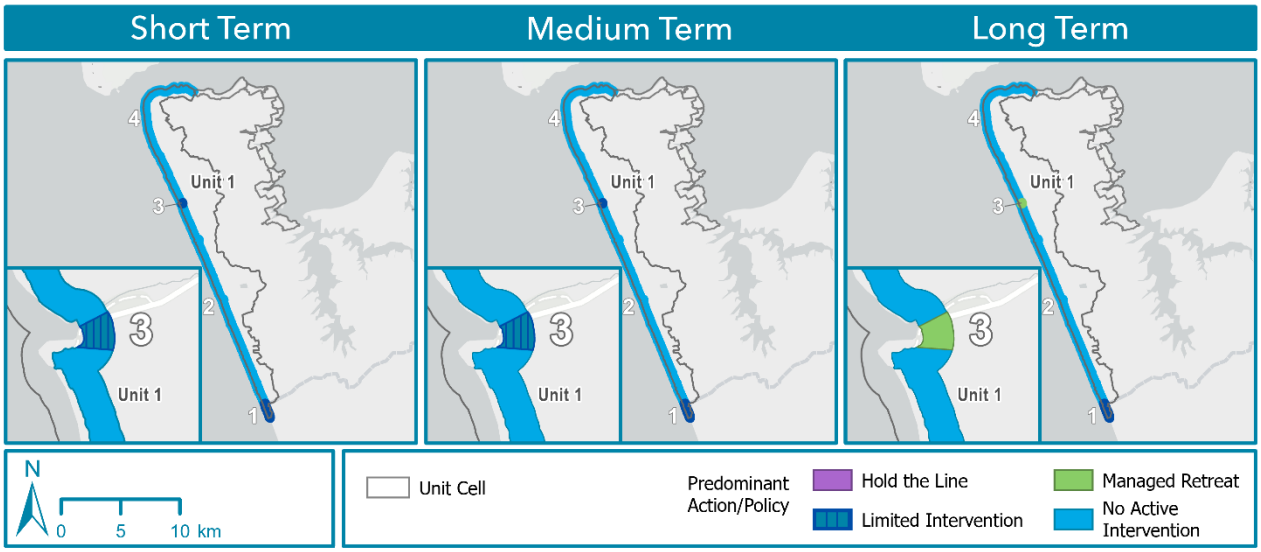


Figure 5-2: Adaptation strategies for coastal stretches within the Āwhitu Peninsula West Coast Unit area (insert shows Waimatuku | Hamiltons Gap, Stretch 3)

Adaptation summary stretches 1 to 4

Table 5-2: Unit 1 Adaptations strategies summary

Stretch	Short term	Medium term	Long term
1: Karioitahi ki Rukuwai | Karioitahi	LI	LI	LI
2: Āwhituwhitu | Āwhitu Peninsula	NAI	NAI	NAI
3: Waimatuku | Hamilton's Gap	LI	LI	MR
4: Waimatuku ki Kawakawa | Hamilton's Gap North	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

This unit contains a mix of assets including car parks, access roads, toilet blocks, beach accessways (including vehicle access), and Council reserves. Risks to the reserve land are currently present and change only slightly in the medium and long term. Risks to environmental land and cultural heritage due to coastal erosion is very high.

Coastal dune restoration has been undertaken at Karioitahi and Waimatuku | Hamiltons Gap by beach-care groups supported by Auckland Council (legacy Auckland Regional Council and Franklin District Council).

Table 5-3: Unit 1 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social – parks and reserves			Economic – network infrastructure			Environmental – ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (54.6 ha)			AT roads (19.4 km) Water pipes (0.1 km) Water assets (2)			Ecological area (889.6 ha) Notable biodiversity overlays - CL1, DN5, DN2, WF4			Cultural heritage assets (188)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None | Low | Moderate | High | Very high

Environmental context: Coastal setting, hazard scape and ecological setting

Steep, erosion and drought-prone slopes, salt spray and exposure to strong winds are the environmental factors which determine the composition and structure of this unit, along with human modification and land-use changes. Coastal cliff ecosystems (pōhutukawa treeland/ flaxland/ rockland- CL1), active dune ecosystems (oioi, knobby clubrush sedgeland- DN5), dune forests (tōtara, manuka, broadleaved forests- DN2) and coastal broadleaved forest (pōhutukawa, pūriri, broadleaved forest-WF4) are located in many areas of the coastal edge.

Active dune ecosystems provide seasonal habitats for waterfowl, crakes, pūkeko and bittern; breeding habitats for harrier and shorebirds such as variable oystercatchers, New Zealand and banded dotterels; and feeding and breeding habitats for pipit. The erosion of coastal cliffs along this stretch influences species composition which is a heterogeneous mix of plant forms that reflect micro-habitat, slope and aspect, and disturbance history. Given the extent of significant ecosystems found in microcosms along this stretch of coast, this unit sits within a Biodiversity Focus Area (refer to Section 2.6).

Coastal management strategies which consider the ability to support the more vulnerable ecosystems such as dune fencing, have been historically utilised in this area. A Department of Conservation Ecosystem Management Unit present within this unit, identified using the ecosystem management unit layers on the Tiakitamaki Makaurai conservation map.[31]

[31] https://www.tiakitamakimakaurau.nz/conservation-map/

Cultural context

The entirety of the peninsula is of high cultural value to Ngāti Te Ata Waiohua (local iwi) with numerous sites of significance found close to the coast. In recognition of Ngāti Te Ata Waiohua values and preferences in coastal management strategies, a combination of *limited intervention* and *no intervention* has been applied to this coastal unit, working to preserve important wahi tapu while maintaining the natural coastline and supporting biodiversity. Korero shared by Ngāti Te Ata Waiohua kaitiaki on a hikoi around Āwhitu Peninsula further reinforced the cultural significance of the peninsula, with remnants of hangi stones, shells and midden and sites of significance along the west coast reflecting the cultural history, uniqueness of the coastline and a reminder of what once was. Large pā sites sit just inland of the west coast (this unit), reflecting remnants of large defensive settlements and terraces.

Social and policy context

This unit provides two important access points to the west coast for the public (Rukuwai | Karioitahi Beach and Waimatuku | Hamilton's Gap). People visit to take in viewpoints, swim, walk, fish, surf, horse ride/train, paraglide/handglide and 4WD.

The Karioitahi Surf Lifesaving Club is located within this unit (Stretch 1) and its surf club building is located at the base of a steep vegetated cliff. The club has a high profile at Karioitahi Beach having had a surf club building there since the 1960s. The club is located on Council land and is managed through a landholder lease approval alongside regulatory (consenting) requirements.

There is shared community interest in preserving and enhancing the natural environment and dune ecosystems that support nesting shorebirds habitats. The community has observed ongoing erosion along this coast and highlighted a desire to ensure public facilities, including Karioitahi Beach access, are maintained.

This feedback was captured in the following community objectives:

- Adaptation strategies preserve and enhance the natural environment and ecosystems that support biodiversity, whilst protecting vulnerable flora/ fauna from adverse activities that damage these delicate systems
- Open-space areas provide for and maintain suitable paragliding and hang-gliding take-off and landing places
- All-tide access to the beach, coast and harbour at key community access locations is maintained to enable a range of recreational and water-based activities (e.g. swimming, paragliding, hang- gliding, walking, picnicking, sailing/boating, kiteboarding and surfing).

Concern was raised regarding beach vehicle access and damage caused in relation to this. Vehicle access to beaches is a matter addressed through regional bylaws and provisions in the Auckland Unitary Plan.

Stretch 1: Karioitahi – Rukuwai | Karioitahi

Stretch description

This coastal stretch contains the area from Karioitahi Reserve (southern Auckland regional boundary) to the northern end of Karioitahi Beach.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Multiple floodplains and overland flow paths flow towards the coast through narrow incised outlets, some traverse Karioitahi Road. • Coastal inundation and coastal erosion pose a threat to Karioitahi Beach now and over the next 100 years.	• Car park • Access road • Toilet block • Revegetated dune habitat • Beach accessways • Vehicle access to beach	• Modification of active dune ecosystems because of development near the coast. • Dune fencing and dune planting.

Adaptation strategies

Stretch	Short term	Medium term	Long term
1: Karioitahi – Rukuwai | Karioitahi	LI	LI	LI

Guidance notes for implementation

- Landward relocation of assets: Alternative options for visitor parking and beach access will be required over time in response to ongoing coastal erosion risk.
- Continued use of nature-based solutions: Dune planting has been successful in restoring sand dunes seaward of the surf lifesaving club, with native sand-binding species successfully trapping wind-blown sand.
- Ecological restoration: Protection of existing dune habitats and dune restoration that creates a buffer along the cliff toe and habitat corridor is required. This will also require appropriate management of pedestrian and vehicle uses.

Stretch 2: Āwhituwhitu | Āwhitu Peninsula

Stretch description

This coastal stretch contains the area between Karioitahi Beach and Hamiltons Gap.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues /approaches
• Overland flow paths flow toward the coast, including from Lake Pehiakura and Lake Pokorua. • Coastal inundation and coastal erosion pose a current and future risk.	• No Council-owned land or assets, comprises privately owned farmland. • Note: DOC land near Cochranes Gap (unformed road) is approximately 2.5 km south of West Coast Road and Hamilton's Gap.	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
2: Āwhituwhitu | Āwhitu Peninsula	NAI	NAI	NAI

Guidance notes for implementation

- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch. Aspirations, objectives and guiding practices and principles set out in Section 3.2 and 1.4 above, work to guide ongoing engagement with local iwi in managing coastal hazard risks and coastal management (i.e. local iwi are supported to conduct their own monitoring of the effectiveness of environmental regulations in the protection of cultural resources, biodiversity wāhi tapu and other taonga within their rohe).
- Advocacy: Promotion of fencing to exclude stock, and advice on coastal revegetation as required (seek guidance/ direction from local iwi in planting initiatives- refer to Section 3.2).

Stretch 3: Waimatuku | Hamiltons Gap

Stretch description

This coastal stretch contains the area from Hamiltons Gap (West Coast Road) to where Dickey Runs outwards the coast (Hamiltons Gap North). A small beach extent runs into Hamilton's Gap inlet.

Figure 5-3: Waimatuku | Hamiltons Gap

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues /approaches
• Over the next 100 years, coastal inundation and coastal processes pose a risk to this stetch, inundating the seaward end of West Coast Road.	• West Coast Road, beach access. • Toilet block. • Passive recreational grass areas with picnic tables, and amenity planting.	• Dune planting. • Stream clearance - to route the stream away from the base of steep sand hills due to mobile sand dune blocks/alters stream mouth outlet - resulting in upstream flooding. • Unstable sand hills, cracking evident on slope above northern side of stream, risk of slope failure / coastal hazards.

Adaptation strategies

Stretch	Short term	Medium term	Long term
3: Waimatuku | Hamiltons Gap	LI	LI	MR

Guidance notes for implementation

- *Limited intervention*: Protection of existing dune habitat and dune restoration that creates a buffer along the cliff toe and habitat corridor. This will also require appropriate management of pedestrian and vehicle uses.
- *Managed retreat* of amenities (parking, toilet block and reserve) from the reserve adjacent to the stream and the relocation (landward) of the beach access point will be required to avoid ongoing exposure to coastal erosion and flooding.

Stretch 4: Waimatuku - Kawakawa | Hamiltons Gap North

Stretch description

This coastal stretch extends north from Waimatuku around South Head and into the entrance of Manukau Harbour, to Āwhituwhitu Reserve at the western end of Wattle Bay. Manukau signal station is located above the harbour entrance[32]. Te Pirau Point (Jones Head), Taratara Point (Cake Island) and Tipitai Point are features along this stretch.

Hazards	Council-owned infrastructure, land, and assets	Current management approach / risks
• Steep erosion prone sand hills	• Private land (Ports of Auckland and Department of Conservation)	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
4: Waimatuku - Kawakawa | Hamiltons Gap North	NAI	NAI	NAI

Guidance notes for implementation

- Cultural and historic heritage: There are numerous cultural and historic sites located within the erosive coastal landscape which will be subject to coastal hazard risks over time. The need for intervention and ultimately retreat, are strategies identified for consideration by local iwi.
- Advocacy and guidance: For aspects such as vegetation restoration or planting techniques to support local community groups or private property owners (seek guidance/ direction from local iwi in planting initiatives- refer to Section 3.2).

[32] Note this is located on Ports of Auckland land, with Department of Conservation land seaward

Unit 2: Rehia | Wattle Bay to Orua Bay

Unit 2: Rehia | Wattle Bay to Orua Bay

This unit begins at Awhituwhitu Reserve at the western end of Te Raroa | Wattle Bay and continues east, including Orua Bay, to Mako Point.

Te Raroa | Wattle Bay is divided into two stretches, with the western end (Stretch 5) comprising a grass reserve area with a gravel parking area, park amenities (toilet block, picnic tables) fronted by a low planted bank and narrow dry, high-tide beach. Stretch 6, to the east of Wattle Bay stream outlet, is largely unmodified with a sandy beach backed by low foredunes that transition to coastal vegetation backed by rural land. Orua Bay (Stretch 7) is a 3 km long embayed north-facing beach with development extending along the backshore from Orpheus Road in the west, to the campground at Orua Bay Road to the east.

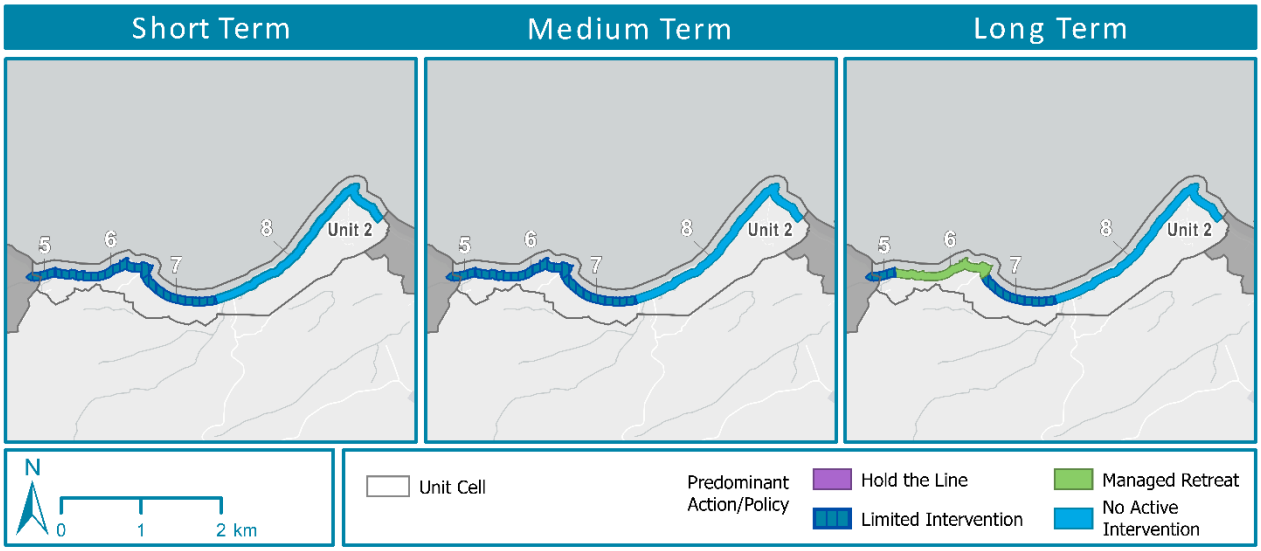


Figure 5-4: Adaptation strategies for coastal stretches within the Orua Bay unit area

Adaptation summary stretches 5 to 8

Stretch	Short term	Medium term	Long term
5: Te Raroa | Wattle Bay	LI	LI	LI
6: Te Raroa ki Taratara | Wattle Bay to Orpheus Road Boat Ramp	LI	LI	MR
7: Orua ki Rehia | Orua Bay Beach	LI	LI	LI
8: Orua - Mako | Orua Bay stream to Mako Point	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

A number of parks and reserve land areas, including ecologically significant areas are located within this unit. There are several road access points perpendicular to the coast, smaller reserve areas, coastal accessways and limited assets in this unit. There are no Council-owned three water assets.

Risks to parks and reserves remain moderate across timeframes and hazards. Flooding is the most significant risk to economic infrastructure and cultural heritage items.

Table 5-4: Unit 2 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (5.9 ha)			AT roads (2.4 km) Water pipes (-) Water assets (-)			Ecological area (16.4 ha) Notable biodiversity overlays - DN2, VS5, WF5, DN5, VS2			Cultural heritage assets (27)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None | Low | Moderate | High | Very high

Environmental context: Coastal setting, hazard scape and ecological setting

Much of this shoreline is privately owned, with discontinuous sections of reserve. Privately-owned baches at the western end of Orua Bay (Stretch 7) are armoured with privately constructed seawalls of various design and alignment. The Orpheus Road boat ramp provides coastal access to these properties at the western end of Orua Bay (which do not have direct road access). At Orua Bay, a narrow grass reserve extends along the central beach area, with an unsealed vehicle accessway providing access from the end of Gap Road to the beach. Properties between Gap Road and Orua Bay Road are accessed from the grass reserve. Approximately 200 m of narrow road reserve extends along the central beach adjacent to Gap Road, with a small frontal dune. Orua Beach campground is located east of Orua Bay Road. Orua Bay Reserve is located inland of the campground adjacent to the small stream that flows around the perimeter of the campground.

This unit contains both a variant of remnant dune forests (WF5), dune plains (DN5), coastal forest (CL1) and scrub, saltmarsh, sea rush, oioi (coastal saline ecosystems) and kānuka scrub/forest (regenerating ecosystems). This provides habitats for native bush birds including morepork, kingfisher, shining cuckoo, grey warbler, fantail, silvereye and tūī. Dotterels and oyster catchers have been identified as nesting along within this unit. Current threats to these ecosystems include land use changes, erosion, invasive species, edge effects and habitat fragmentation.

Cultural context

The history of this area remains as important to Ngāti Te Ata Waiohua today as it was to their ancestors of the pre-colonial times. An important pā site sits above Te Raroa | Wattle Bay along the

ridge line. This pā site is located landward of current erosion exposure extents, however monitoring maybe be required in the future. Sites of significance also sit along the foreshore of this unit with a high potential for further unrecorded archaeological sites. Guiding principles are set out in Section 1.4 overlayed with local iwi aspirations and values. Section 3.2 should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

This piece of the coastline has high amenity value to the community providing important coastal accessways, utilities (boat ramps) within a historic landscape. People visit to utilise popular fishing points, access the beach and boat ramps and connect to a rural, untouched part of Auckland's coastline. In recognising the value of the natural environment, some community members have advocated for signage to protect vulnerable bird species.

A historic wharf remains on the headland between Te Raroa | Wattle Bay and Orua Bay (Stretch 6). This wharf is both a popular fishing spot and has links to historic industry and settlement sites associated with a church mission society. Further research will be required to understand the significance of this asset, working in partnership with local iwi, the local historical society, and the museum.

The Orpheus Road boat ramp (Stretch 6) provides vehicle access to properties at the western end of Orua Bay. Vehicle access may be subject to site-specific legislative requirements which will require further detailed assessment to consider how easements for access (at high tide), including a section of reserve may be managed over time.

The objectives below work to support the implementation of adaptation strategies in alignment with community values related to this section of the coast:

- *Adaptation strategies* preserve and enhance the natural environment and ecosystems that support biodiversity, whilst protecting vulnerable flora/ fauna from adverse activities that damage these delicate systems.
- All-tide access to the beach, coast and harbour at key community access locations is maintained to enable a range of recreational and water-based activities (e.g. swimming, paragliding,

Stretch 5: Te Raroa | Wattle Bay

Stretch description

This coastal stretch contains the area from Āwhituwhitu Reserve at the eastern end of Te Raroa | Wattle Bay extending west to the stream outlet adjacent to Coulthards Reserve. The narrow beach is backed by a wide, low-lying grass reserve.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Subject to flood plain; extends onto Dodd Road, situated along the stream outlet next to the reserve. • Coastal inundation and sea-level rise poses a significant future risk to this stretch, with Coulthard's Reserve being entirely inundated with 1 m sea-level rise. • Coastal instability.	• Coulthard's Reserve (passive grass reserve with picnic tables). • A toilet block (eastern end of Coulthard's Reserve). • An unsealed carpark area is located in the centre of the bay. • Two formed accessways connecting Āwhituwhitu Reserve with Coulthard's Reserve at the western end of the bay.	• Coastal revegetation planting along the seaward edge of reserve at Wattle Bay; traps some wind-blown sand to reduce build-up on parking area; enhances biodiversity values; delineates access points to manage vehicle access to beach area; and protects erodible soils along the back beach.

Adaptation strategies

Stretch	Short term	Medium term	Long term
5: Te Raroa | Wattle Bay	LI	LI	LI

Guidance notes for implementation

- *Limited intervention*: This stretch includes coastal planting, managed realignment and landward movement of physical assets including the park facilities, access and parking areas (when renewed/require replacement).
- Future consideration of localised *managed retreat* given the exposure to both flooding and coastal hazards, the retreat/relocation of uses (parks and roading) landward may be required. Subject to monitoring and review.

Stretch 6: Te Raroa ki Taratara | Wattle Bay to Orpheus Road Boat Ramp

Stretch description

This coastal stretch extends west from Wattle Bay stream outlet next to Coulthard's Reserve to Orua Bay (Orpheus Road boat ramp).

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Multiple small overland flow paths traverse the reserve to the coast. • A flood plain is identified to the east of the Wattle Bay stream outlet next to Coulthards Reserve. • Coastal erosion.	• Informal walking track to Orpheus Point (seats located along walkway). • Small gravel carpark area. • Orpheus Road boat ramp. • An informal track provides walking access from gravel carpark above the ramp around the cliff to Orpheus Point.	• The road reserve is currently managed by Community Facilities (Auckland Council). • The relocation of bollards, along cliff top to a landward position, is an existing example of localised *managed retreat*.

Adaptation Strategies

Stretch	Short term	Medium term	Long term
6: Te Raroa ki Taratara | Wattle Bay to Orpheus Road Boat Ramp	LI	LI	MR

Guidance notes for implementation

- *Limited intervention*: To maintain existing assets and infrastructure including the management of the carparking area and coastal accessways. Includes maintaining safe public access to Orpheus Point until risks from coastal erosion are unacceptable. The landward relocation of smaller assets when they are renewed should also be considered in the short and medium term to respond to ongoing erosional processes.
- *Managed retreat:* In the longer term to address risks associated with safe public access to Orpheus Point.
- Further investigation and consultation*:* Will be required to determine the longer-term access options for properties at the western end of Orua Bay.

Stretch 7: Orua - Rehia | Orua Bay Beach

Stretch description

This coastal stretch includes Orua Bay Beach area from Orpheus Road ramp to Orua Bay stream mouth. Much of this shoreline is privately owned, with discontinuous sections of reserve. Orua Bay Reserve and Gap Road Reserve are located inland of the beach, within the eastern extent of this stretch.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Flood plain and coastal inundation identified to the east of the stream (Orua Bay Reserve and Gap Road Reserve over time). • Coastal erosion risk to parks and road assets/access over time.	• Several unconnected stretches of esplanade reserve. • Road reserve (Orua Bay Beach Road- centre of the embayment to Gap Road). • Public road/ beach access points and informal parking areas. • Gap Reserve and Orua Reserve, (located landward) includes passive grass recreational area, sealed carpark, toilet block and park amenity structures.	• Rock rip rap and gabion baskets utilised to prevent stormwater discharges from Orpheus Road undermining the boat ramp. • Orua Bay Beach Road eroded to the west of Gap Road. • Access, over unconnected Council reserve, is required to maintain high-tide access to private properties. • Franklin District Council previously undertook stream mouth clearance to mitigate flooding risk to Orua Bay campground.

Adaptation strategies

Stretch	Short term	Medium term	Long term
7: Orua - Rehia | Orua Bay Beach	LI	LI	LI

Guidance notes for implementation

- *Limited intervention*: To maintain existing assets and infrastructure including the management of the park's area and coastal accessways from legal roads.
- *Limited intervention:* May also include dune planting along the road reserve between Gap Road and Orua Bay Road, and sand transfer/stream mouth clearance. The landward relocation and design of assets when they are renewed should also be considered in the short and medium term to respond to ongoing hazard exposure. Consideration of the management of flood/inundation risk to Orua Bay and Gap Road Reserve will be required.
- Further investigation and consultation*:* Will be required to determine the longer-term access options for properties within this stretch.

Stretch 8: Orua - Mako | Orua Bay stream to Te Mako Point

Stretch description

This coastal stretch contains the area from the east of the Orua Bay stream to Te Mako Point headland. This stretch is largely privately owned farmland with one section of unconnected reserve.

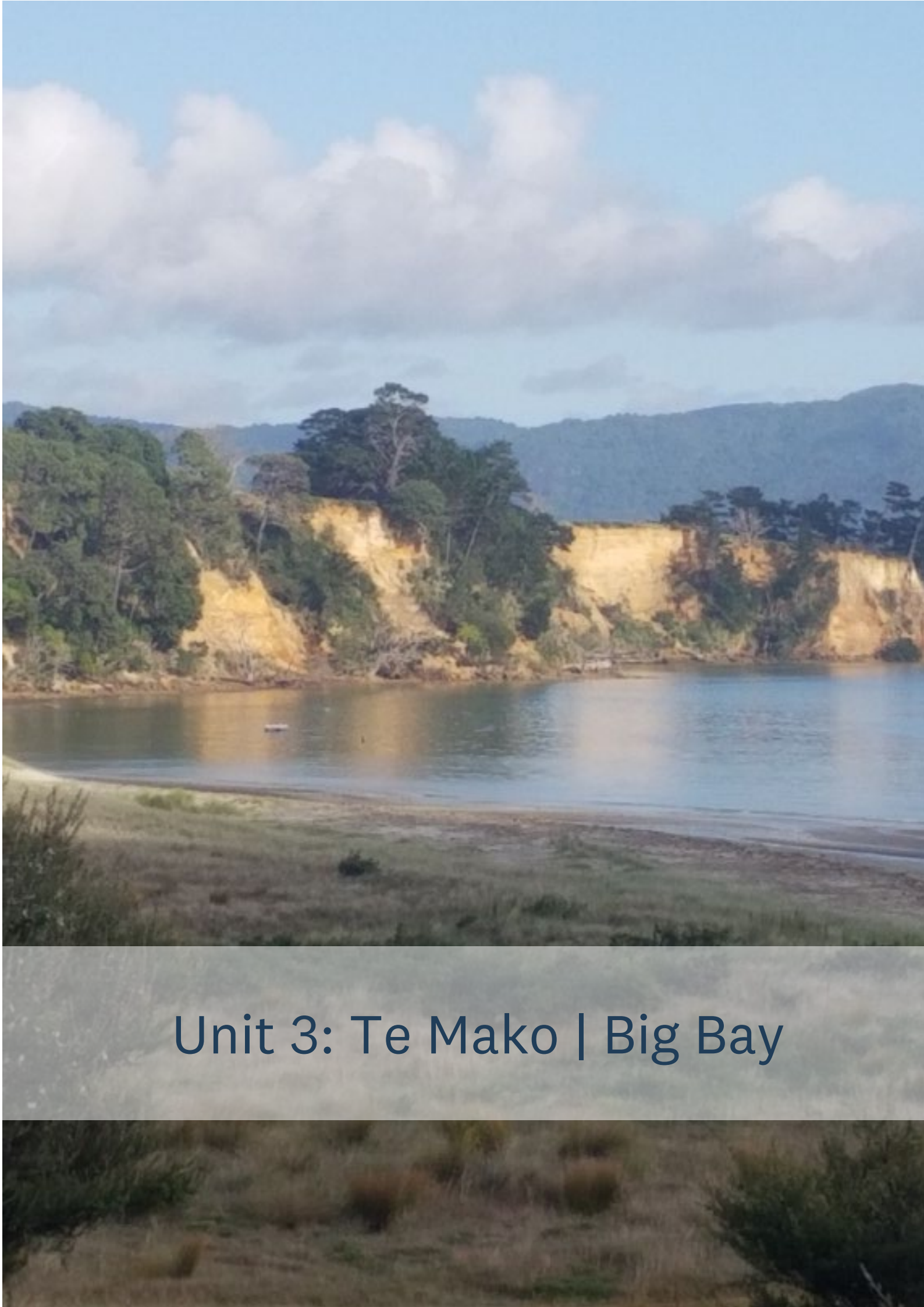
Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Erosion	• Section of unconnected esplanade reserve (accessed via private farmland).	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
8: Orua - Mako | Orua Bay stream to Mako Point	NAI	NAI	NAI

Guidance notes for implementation

- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch. Aspirations, objectives and guiding practices and principles set out in Section 3.2 and 1.4 above, work to guide ongoing engagement with local iwi in managing coastal hazard risks and coastal management (i.e. local iwi are supported to conduct their own monitoring of the effectiveness of environmental regulations in the protection of cultural resources, biodiversity wāhi tapu and other taonga within their rohe).
- Advocacy: Promotion of fencing to exclude stock, and advice on coastal revegetation as required (seek guidance/ direction from local iwi in planting initiatives- refer to Section 3.2).



Unit 3: Te Mako | Big Bay

Unit 3: Te Mako | Big Bay

Big Bay is a long northeast-facing embayment between Mako Point (west) and Kauri Point (east). The western stretch contains lower-lying coastal beachfront areas and a stream which discharges to the beach. The eastern stretch comprises coastal cliffs, including one disconnected section of esplanade reserve.

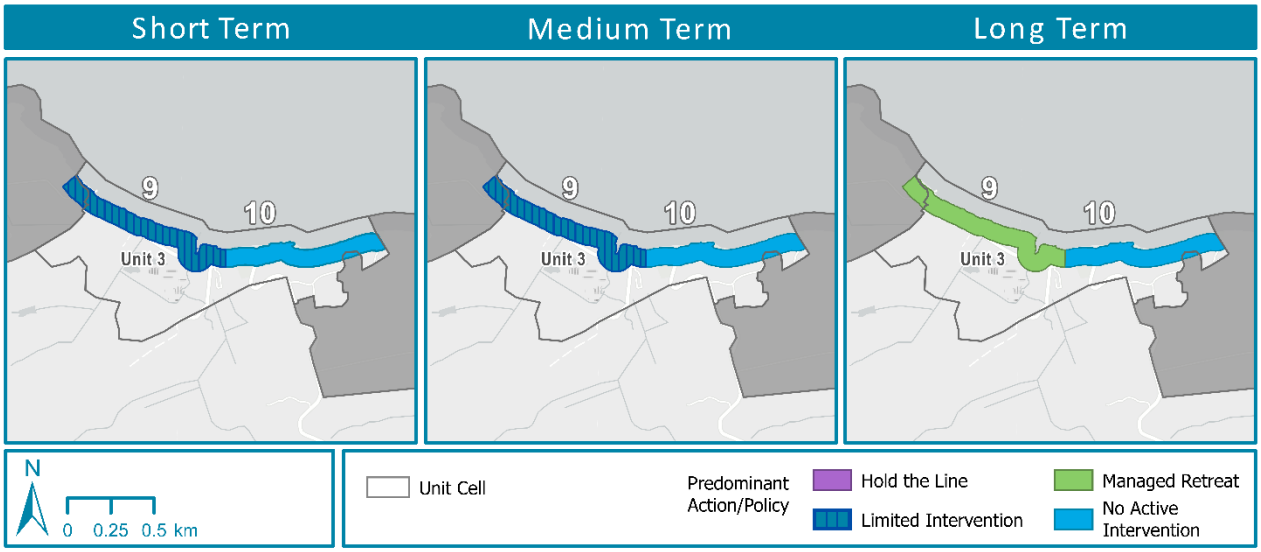


Figure 5-5: Adaptation strategies for coastal stretches within the Big Bay unit area

Adaptation summary Stretches 9 and 10

Stretch	Short term	Medium term	Long term
9: Te Mako | Big Bay Beach	LI	LI	MR
10: Te Mako | Big Bay East	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

Big Bay settlement is located within this unit. The unit includes areas of residential development accessed by road which runs parallel to the coastal edge. At the western end of the bay, a vehicle ramp provides access to the beach for boat launching. Adjacent to the ramp is Big Bay Reserve, which includes mature pōhutukawa and picnic tables. The reserve is currently protected by a timber seawall.

Within the central area of the unit is another recreational reserve, located adjacent to Big Bay stream (Big Bay Reserve East). This reserve has been developed with park amenities including a toilet block, playground, picnic tables and parking. Two sea walls protect this reserve area, one a timber wall for stream channel migration, the second being un-engineered rock rip rap to the east of the reserve.

Limited stormwater network infrastructure is located within this unit, located within the low-lying central areas, including an outfall to the beach.

There are no Council assets in the eastern stretch, with only an area of disconnected reserve fronting rural land.

Table 5-5: Unit 3 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			**Economic - network infrastructure**			**Environmental - ecological**			**Cultural – culture and heritage**		
Park & reserve land: structures, carparks, accessways, buildings (6.2 ha)			AT roads (1.7 km) Water pipes (0.4 km) Water assets (5)			Ecological area (16.8 ha) Notable biodiversity overlays - VS3, WL12, SAW.5, WF4, CL1			Cultural heritage assets (3)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None | Low | Moderate | High | Very high

Environmental context: Coastal setting, hazard scape and ecological setting

This section of the coast is made of up of small, fragmented pockets of coastal broadleaved forest ecosystems forest (pōhutukawa, pūriri, broadleaved forest) identified as an endangered ecosystem[25]. Slightly inland, sections of mānuka, tangle fern, scrub, fernland ecosystems are also evident. Shell-barrier beaches (Chenier plains) line the coastal edge of the western section of this unit. This is a nationally rare ecosystem type, of high biodiversity value [25]. This microcosm of ecosystems provides habitats for burrowing and surface-nesting seabirds and bush birds such as tui and kererū.

The western half of the embayment comprises a wide sandy beach with a wide vegetated backshore. This includes large areas of native sand-binding plants including spinifex and pingao towards the centre of the bay. The shoreline to the east of the stream is characterised by a sandstone cliff and exposed wave-cut shore platform.

Big Bay stream outlet discharges in the centre of the embayment, draining a significant tidal wetland area inland of the road and residential development. Mangrove vegetation has been cleared from the stream mouth.

Within the eastern stretch (Stretch 10), private landowners have constructed tipped rock armour to protect baches at the start of the stretch, with the eastern shoreline comprised of vegetated low cliffs backed by farmland.

The hazard scape for this unit is dominated by flooding and coastal inundation. There have been recent slips along the cliffs to the east of the reserve.

Risks to reserve areas are applicable over all timeframes. The risk to network infrastructure is greatest from inundation and catchment flooding. Coastal erosion presents a risk for the small western reserve and mature pōhutukawa, and also the eastern reserve adjacent to the stream outlet. Road access and stormwater infrastructure in this area will also require consideration to manage both erosional and inundation risks over time.

Cultural context

This unit includes sites and areas of cultural importance with potential for further unrecorded archaeological sites. Guiding principles set out in Section 1.4 overlayed with local iwi aspirations and values in Section 3.2, should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

People access this coast to visit the beach and use the boat ramp at Big Bay for recreational water-based activities (fishing). Community feedback identified the value of the boat ramp and surrounding assets (including picnicking areas and the protecting seawall). People visit the coast to take in viewpoints.

The objectives below work to support the implementation of adaptation strategies in alignment with community values related to this section of the coast:

- All-tide access to the beach, coast and harbour at key community access locations is maintained to enable a range of recreational and water-based activities (e.g. swimming, paragliding, hang-gliding, walking, picnicking, sailing/boating, kiteboarding and surfing).
- Resilience of community facilities and assets in hazard zones is a priority.
- Pedestrian safety and use of public coastal walkways and lookouts is supported by improvements to signage and maintenance of coastal spaces.

Stretch 9: Te Mako Tātahi (beach) | Big Bay Beach

Stretch description

This area contains the western half of Big Bay embayment, from Mako Point including the cliff-top reserve east of Big Bay stream.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• A significant floodplain covers much of the lower lying area of the bay. This includes the western reserve and road access. • Coastal inundation within the central areas of the bay and landward following the stream course.	• Big Bay Road Esplanade Reserve. • Boat launching access ramp. • Western reserve amenities (picnic table, mature pōhutukawa) and seawall. • Eastern reserve park amenities (playground, picnic facilities), toilet block timber seawall, un-engineered rock rip rap. • Big Bay Road. • Stormwater assets and outfall.	• Current renewal (2023) of western seawall to protect shaded recreational reserve, mature pōhutukawa and vehicle access ramp underway. • Operational stream mouth clearance undertaken by Healthy Waters to divert outflow from scouring the base of cliff. • Stream 'training wall' for eastern reserve. • Rock rip rap to eastern end of the reserve.

Adaptation strategies

Stretch	Short term	Medium term	Long term
9: Te Mako Tātahi (beach) | Big Bay Beach	LI	LI	MR

Guidance notes for implementation

- *Limited Intervention*: For the eastern area of this stretch includes dune planting and stream mouth management in the short to medium term. Limiting the degree of intervention is important to maintain the natural habitat located within the esplanade reserve along the beach frontage and is important to support ecological values. The western reserve has been recognised as a highly valued recreational access point that also has highly valued tree assets. To maintain this reserve and access, structures are required for this small, localised area.
- *Limited intervention:* Within the eastern reserve at Big Bay Reserve, required to maintain the toilet block and playground. As the area is subject to ongoing erosional processes, the sustainable location of assets in the reserve needs to be considered over time.
- *Limited intervention:* The central areas of this stretch will need to respond to flood risks to roads and stormwater networks. This may include stream-mouth management as has been undertaken in the past.
- *Managed retreat:* Will be required in the long term to manage risks to the road, stormwater and reserve areas. Continued provision of access to and along the coast needs to be considered within this broader strategy.

Stretch 10: Te Mako Kūrae | Big Bay East

Stretch description

This coastal stretch contains the area east of the cliff-top reserve above Big Bay stream, to the end of the esplanade reserve, east of Kauri Point.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Coastal erosion	• Sections of non-contiguous esplanade reserve	• N/a • Note: Private landowners have constructed tipped rock armour to protect baches at the start of the western end of this stretch.

Adaptation strategies

Stretch	Short term	Medium term	Long term
10: Te Mako Kūrae | Big Bay East	NAI	NAI	NAI

Guidance notes for implementation

- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch (pā on privately owned farmland).
- Advocacy: Promotion of protection of coastal vegetation and advice on coastal revegetation, as required.

Unit 4: Te Mako ki Taitimu | Kauri Point

Unit 4: Te Mako ki Taitimu | Kauri Point

This unit contains the area from Kauri Point, the eastern headland at Big Bay, towards Hudsons Beach in the southeast.

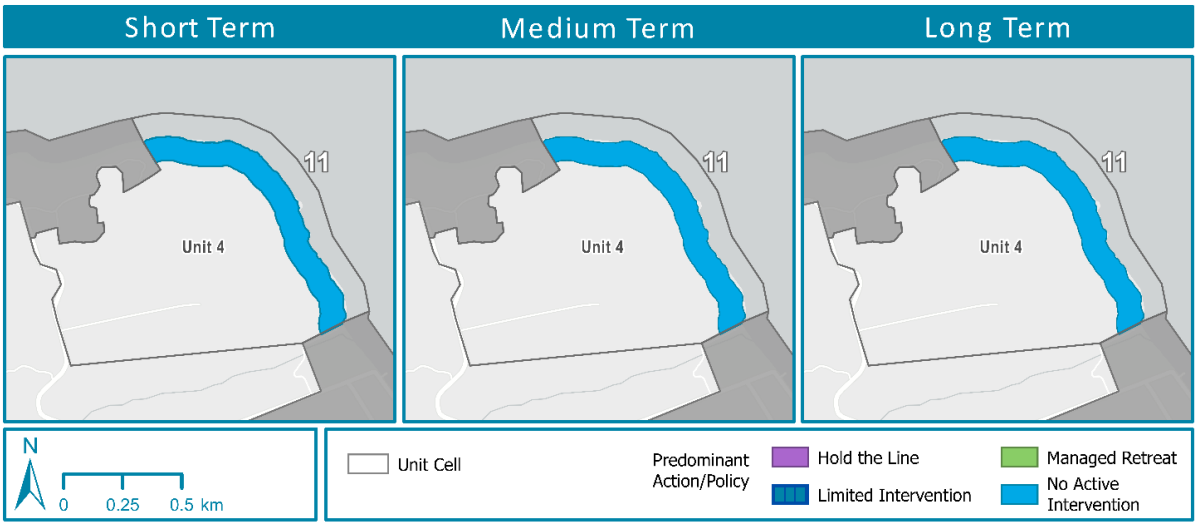


Figure 5-6: Adaptation strategies for the private land between Big Bay and Grahams Beach unit area

Adaptation summary Stretch 11

Stretch	Short term	Medium term	Long term
11: Te Mako | Kauri Point	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

There is no Council-owned land or assets located within this coastal unit. There is a contiguous area of significant ecological area located along the coastal edge.

Table 5-6: Unit 4 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (-)			AT roads (0.4 km) Water pipes (-) Water assets (-)			Ecological area (6.7 ha) Notable biodiversity overlays - WF4			Cultural heritage assets (1)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None	Low	Moderate	High	Very high

Environmental context: Coastal setting, hazard scape and ecological setting

This unit is made up predominantly of farmland lined by pōhutukawa, pūriri, broadleaved forest (coastal broadleaved forest- WF4). Prior to human settlement, these coastal cliff ecosystems would have provided habitats for a range of invertebrates, amphibians, reptiles and birds. Kererū, geckos, kākā, tūī and bellbirds can still be seen, alongside more common bush birds such as morepork. Invasive species and anthropogenic climate change induced impacts (sea-level rise) pose two of the greatest threats to this ecosystem, with increased erosion and possible inundation posing an ever-increasing risk.

The significant ecological area for this unit has been identified as containing ecosystems which hold a relevant threat status. Management for these ecological values is recognised through the advocacy identified for Stretch 11.

Cultural context

Part of the legacy Auckland Regional Council coastal survey identified coastal middens. Their current condition is unknown as these were recorded in the early 2000s. Local iwi have identified cultural values within this wider area (refer to Section 3.2 above).

Social and policy context

The adjacent farmland is zoned Rural Coastal. No specific feedback was identified through community engagement.

Stretch 11: Te Mako | Kauri Point

Stretch description

This coastal stretch contains the area around Kauri Point, the eastern headland at Big Bay towards Hudsons Beach in the southeast. This stretch is privately-owned farmland.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues and approaches
• Coastal erosion of the coastal edge is identified in the hazard maps.	• N/a	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
11: Te Mako | Kauri Point	NAI	NAI	NAI

Guidance notes for implementation

- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch.
- Advocacy: Promotion of fencing to exclude stock, and advice on coastal revegetation, as required.

Unit 5: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach

Unit 5: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach

This coastal stretch contains both Hudsons Beach and Grahams Beach.

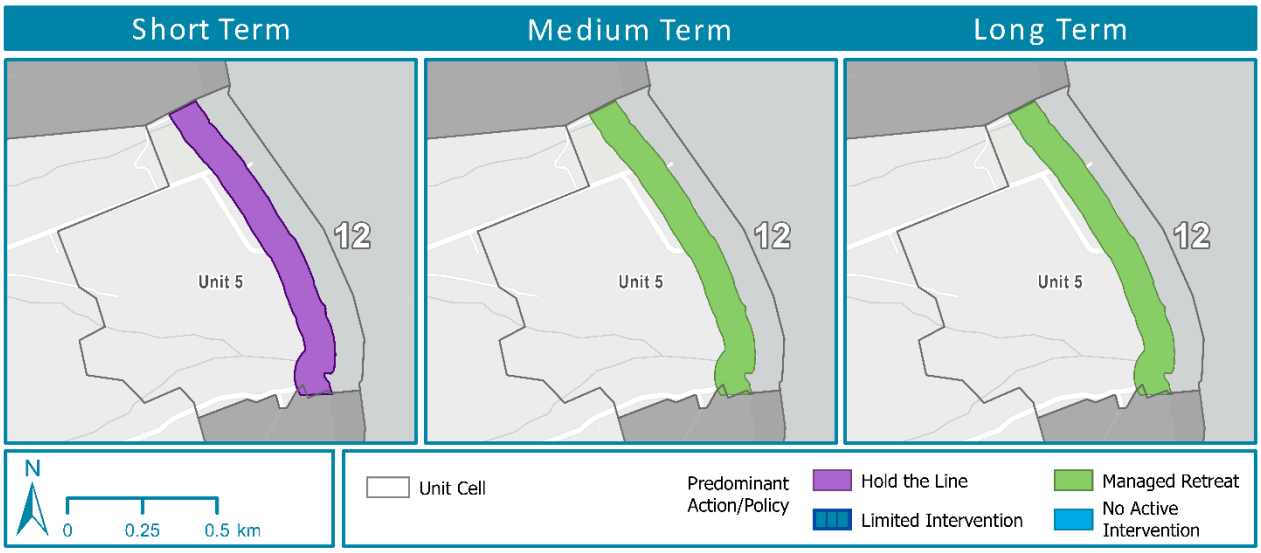


Figure 5-7: Adaptation strategies for coastal stretches within the Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach unit

Adaptation summary Stretch 12

Stretch	Short term	Medium term	Long term
12: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach	HTL	MR	MR

Council-owned infrastructure, land, and assets

The Hudson Beach reserve located to the north of the unit includes a paved parking area, boat access ramp, toilet block, playground area and park facilities. Along the coastal esplanade connecting Hudson Beach to Grahams Beach, various mature trees and park amenities are located.

The Grahams Beach reserve located within the southern portion of this unit includes unsurfaced parking areas, boat launching and park facilities and amenities (toilet block, picnic tables and play areas)

Reserves at both Hudsons Beach and Grahams Beach, (and a section of private land in between) are armoured with a timber seawall and a series of low-timber groynes. The groynes extend from the southern end of Seaview Terrace to the Grahams Beach stream in the south.

Logan Drive, Seaview Terrace and Grahams Beach Roads provide public road access to beach-front properties. There are limited stormwater assets located within this unit; they primarily include outfalls to the coast.

Table 5-7: Unit 5 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (6.7 ha)			AT roads (1.8 km) Water pipes (0.1 km) Water assets (4)			Ecological area (0.01 ha) Notable biodiversity overlays - WF4, CL1, VS3, SA1.3, SA1.2			Cultural heritage assets (2)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None	Low	Moderate	High	Very high

Environmental context: Coastal setting, hazard scape and ecological setting

The Hudsons-Grahams Beach system is approximately 1.2 km long and has unusual geomorphology with a shoreline that is shaped convex seaward rather than concave landward. The northern end of the beach system and the small holiday settlement accessed via Seaview Terrace and Logan Drive is known as Hudsons Beach. The southern part of the beach and small holiday settlement accessed via Grahams Beach Road is known as Grahams Beach. There are two large private properties in the central area of the beach system that separates the Hudsons Beach and Grahams Beach esplanade reserves.

Auckland Council currently holds (coastal) consent for the timber seawall that armours the narrow strip of reserve fronting Logan Drive and Seaview Terrace at Hudsons Beach. There is no dry high-tide beach along this section, and limited space for naturalising the shoreline with current low beach sand levels. The seawall requires renewal in the medium term. At Grahams Beach, the sandy, dry, high-tide beach is backed by a timber seawall and wider recreation reserve fringed with pōhutukawa.

Areas of saltmarsh and coastal scrub (SA1.3, SA1.2) are located adjacent to the small creek at the northern part of this unit at Hudsons Beach, and the upper beach and sand banks in this area are used by coastal birds (SA1.5). The majority of this northern area contains passive grass, with some isolated mature pōhutukawa and Norfolk pine trees along the coastal margin (WF4, CL1).

Overland flow paths are at the northern end of the Hudsons Beach Recreation Reserve and at the Hudsons Beach Esplanade, and southern end of Grahams Beach. In a 100-year flooding event combined with sea-level rise, the Hudsons Beach and Grahams Beach park amenities and residential private properties in the coast will be fully inundated. The coastal areas within this unit are also being affected by coastal instability and erosion.

Cultural context

Several coastal middens are recorded along this coastal unit, with evidence of wider Māori settlements inland. Further, historic middens, wharves, jetties and coastal structures associated with early European settlement and industry (primarily saw milling) have also been identified here, with some historic maps showing homesteads and hotels not recorded and demolished.

The above is indicative of a high potential for further unrecorded archaeological sites. Guiding principles set out in Section 1.4 overlayed with local iwi aspirations and values in Section 3.2, should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

The reserve areas at both Hudson and Grahams Beach are valued by the resident community and visitors to this area. The esplanade reserve area is highly valued for both recreation and also for access (via Logan Drive) to private properties along the coastal edge. People visit to utilise the boat ramp for water access and fishing; however this boat ramp requires regular maintenance.

At Grahams Beach, there is shared community concern related to vehicle access and damage caused to the foreshore and current carparking facilities. Community feedback also noted the need for operational maintenance of stream outfalls with potential for seasonal ponding of water.

In 2001, a coastal hazard management plan[33] was prepared and includes historic information regarding coastal hazard events. Research has identified community memories of storm inundation and erosion including instances where residents have needed to evacuate their inundated homes.

The objectives below work to support the implementation of adaptation strategies in alignment with community values related to this section of the coast:

- All-tide access to the beach, coast and harbour at key community access locations is maintained to enable a range of recreational and water-based activities (e.g. swimming, paragliding, hang-gliding, walking, picnicking, sailing/boating, kiteboarding and surfing).
- Resilience of community facilities and assets in hazard zones is a priority.
- Community facilities in the Āwhitu area support community resilience and recovery.

[33] 2001, Coastline Consultants, Hudson Beach coastal hazard management plan. Document held in council files.

Stretch 12: Te Ngaio / Taitimu | Hudsons Beach and Grahams Beach

Stretch description

This coastal stretch contains both Hudsons Beach and Grahams Beach.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Floodplain located in proximity to the streams and overland flow paths. • Coastal slope instability and erosion in the next 100 years.	• Hudsons Beach recreation (sealed carpark, toilet block and playground, flexi concrete plank vehicle ramp for boat launching). • Roads: Logan Drive and Seaview Terrace. • Hudsons Beach Esplanade Reserve (timber seawall with access steps) mature trees and shaded passive grass areas • Grahams Beach Road Reserve Park amenities (includes a toilet block and playground, flexi-concrete plank vehicle ramp for boat launching, and a timber seawall and groyne field with access steps.	• Sand transfer and channel realignment of the stream at northern end of Hudsons Beach. • Ongoing maintenance of timber seawall armouring Logan Drive (erosional protection only, does not prevent inundation).

Adaptation strategies

Stretch	Short term	Medium term	Long term
12: Te Ngaio / Taitimu | Hudsons Beach & Grahams Beach	HTL	MR	MR

Guidance notes for implementation

- *Hold the Line:* Is identified in the short term, to mitigate risk from erosion. This refers to the existing timber seawall that armours the narrow strip of reserve fronting Logan Drive and Seaview Terrace at Hudsons Beach. At Grahams Beach, the sandy, dry, high-tide beach is backed by a timber seawall. *Hold the line* in the short term recognises the value of the accessways and reserve area(s) to the community. These seawalls are not designed to prevent inundation which will exacerbate over time with ongoing sea-level rise. The seawall(s) are coastal structures and have limited design life/consent terms.
- *Managed retreat:* Reflective of the hazard risk from coastal inundation (as well as erosion) *managed retreat* of assets including parks, road and stormwater will be required in the mid to long term. A more landward alignment of any park infrastructure, assets and coastal protection structure (such as sea walls) should be considered. Inundation alongside erosional hazards will need to be considered, noting that rising sea levels also impact on groundwater and both public and private three waters' infrastructure. Cultural values and aspirations (see Section 3.0) support the need to maintain access to the coast and support natural systems.
- Note: private land holdings in this coastal stretch are already exposed to and have experienced, inundation.

Unit 6: Kauritutahi | Kauritutahi Creek

Unit 6: Kauritutahi | Kauritutahi Creek

This stretch extends south of Grahams Beach recreational reserve and stream to the Kauritutahi Creek inlet (and Featon Avenue) in the south, where the Āwhitu Regional Park unit is located.

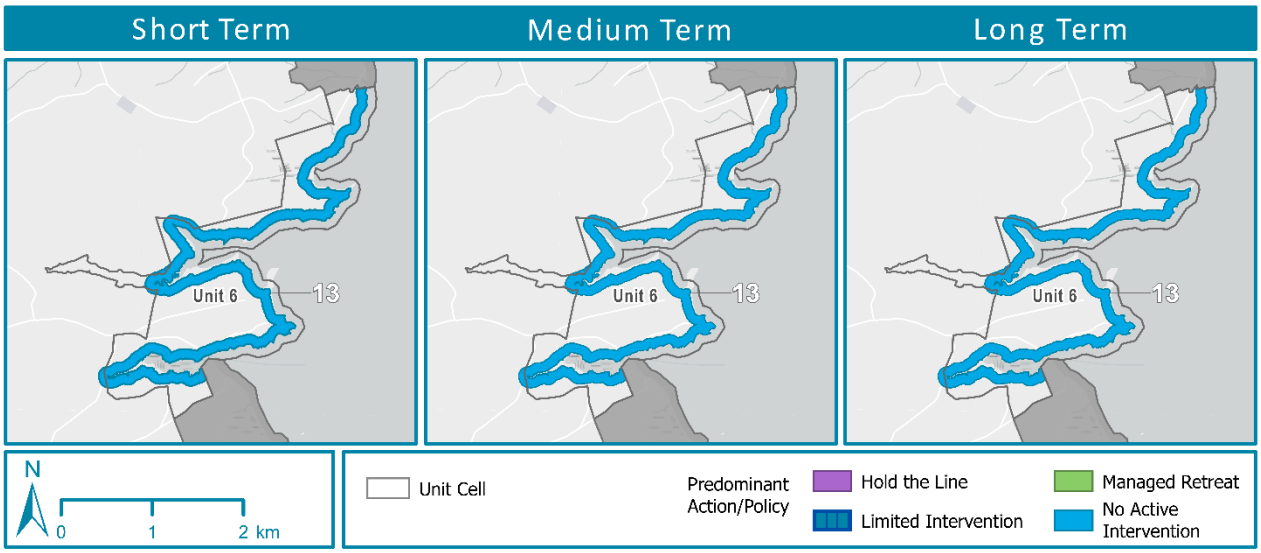


Figure 5-8: Adaptation strategies for coastal stretches within the Kauritutahi | Kauritutahi Creek unit area

Adaptation summary Stretch 13

Stretch	Short term	Medium term	Long term
13: Kauritutahi | Kauritutahi Creek	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

There are limited assets located within this coastal unit with several roads culminating at, or adjacent to the coast, and associated public stormwater infrastructure located in relation to roads and private settlement areas near Grahams Beach.

There are disconnected portions of the esplanade reserve located seaward of the private landholdings on Greennook Drive and a historic landing at Colbeck Road. There is a small boat launching ramp on the southern shoreline of Kauritutahi Creek, accessed from Featon Avenue.

The risk to park' land and other network infrastructure is identified as increasing in the longer term, primarily in response to coastal hazards.

Table 5-8: Unit 6 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (1.7 ha)			AT roads (4.1 km) Water pipes (-) Water assets (-)			Ecological area (19.5 ha) Notable biodiversity overlays - VS3, SA1.2, WF4, SA1.5			Cultural heritage assets (23)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None | Low | Moderate | High | Very high

Environmental context: Coastal setting, hazard scape and ecological setting

A number of indigenous ecosystems can be found in this stretch, with identified significant ecological areas mapped to the inlets and marine ecological environments identified within the Coastal Marine Area. Mangrove forest and scrub (SA1.2) dominate two small inlets along this coastal stretch, with shell barrier beaches (SA1.5), developed from wave-driven accumulations of shells and sand. This area includes habitats which support a wide range of bird species (e.g. shags, herons, spoonbill, pūkeko, fernbird, fantail etc.). Broadleaf forest (WF4) and regenerating areas (VS1) connecting from the Matakawau Creek ecosystem can also be found in this stretch.

The coastal cliff area is identified as susceptible to coastal erosional processes while the inlet areas are identified as exposed to both rainfall flooding and coastal inundation.

Cultural context

There are numerous identified cultural sites within this unit. Several coastal middens have been recorded and a Māori settlement is inland. This is indicative of a high potential for further unrecorded archaeological sites. Guiding principles set out in Section 1.4 overlayed with local iwi aspirations and values in Section 3.2, should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

This unit encompasses largely privately-owned farmland with some smaller sections of road reserve in proximity to Grahams Beach within the northern end of the stretch. This unit also includes a small high-tide boat launching ramp on the southern shoreline of Kauritutahi Creek (Featon Avenue). Small jetty structures and a timber seawall were noted at this location; these structures are private structures. An informal coastal walkway connected to the regional park commences from this public road.

Stretch 13: Kauritutahi | Kauritutahi Creek

Stretch description

This stretch extends south of Grahams Beach to the Kauritutahi Creek inlet.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Overland flow paths and flood plains located within southern estuarine areas. • Coastal inundation in areas of inlet. • Coastal erosion prone coastal edge.	• Grahams Beach Esplanade Reserve. • Colbeck Road Esplanade Reserve.	• N/a - the identified reserves are not actively managed. • A small high-tide boat ramp is provided at Featon Avenue.

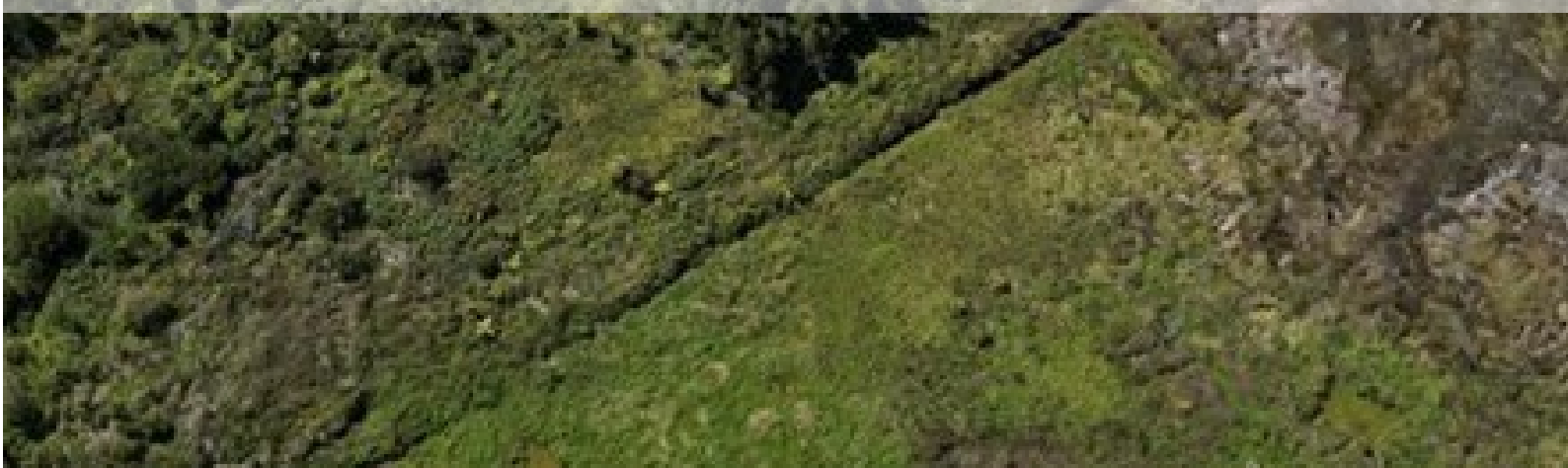
Adaptation strategies

Stretch	Short term	Medium term	Long term
13: Kauritutahi | Kauritutahi Creek	NAI	NAI	NAI

Guidance notes for implementation

- *No active intervention* has been identified for this stretch. While a high-tide boat launching facility is located at the end of Featon Avenue, the choice of strategy is not intended to preclude ongoing maintenance of this coastal access point and structure. No current hazard risks or issues have been identified for this facility at this time.
- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch.

Unit 7: Kaitara / Matata | Āwhitu Regional Park



Unit 7: Kaitara / Matatā | Āwhitu Regional Park

This unit includes the area east of Kauritutahi Stream mouth (from Featon Avenue), extending to the boundary of the Regional Park at Opoia Creek (near Hatton Road) in the south.

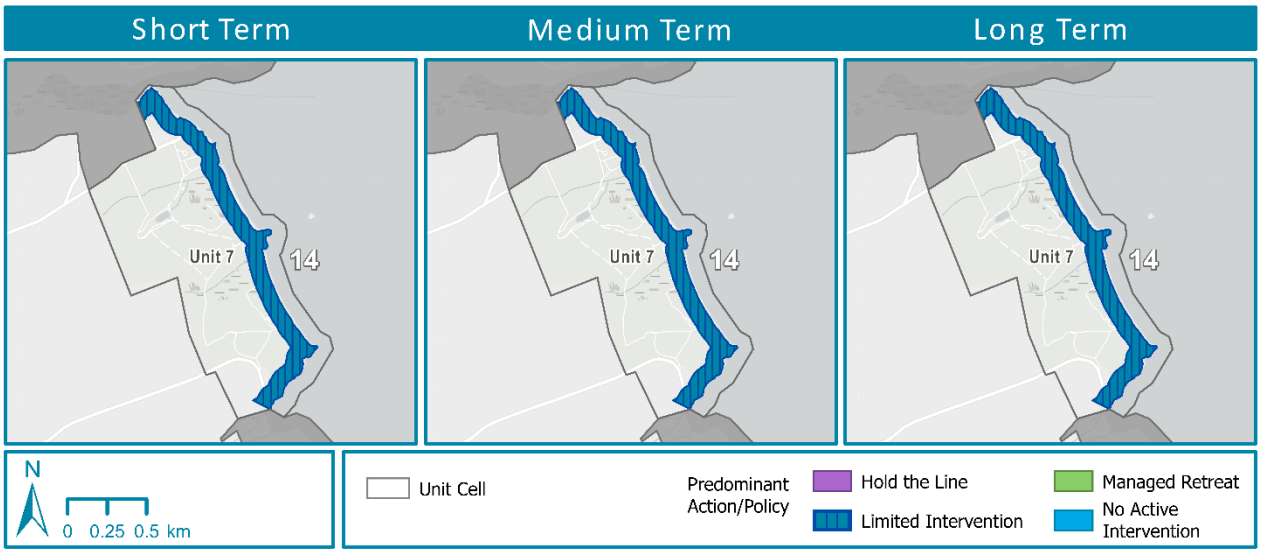


Figure 5-9: Adaptation strategies for coastal stretches within the Kaitara / Matata | Āwhitu Regional park unit area

Adaptation summary Stretch 14

Stretch	Short term	Medium term	Long term
14: Kaitara / Matata | Āwhitu Regional Park	LI	LI	LI

Council-owned infrastructure, land, and assets

This unit includes limited areas of network infrastructure, including small connections from the public road to accessways within the regional park.

It also includes the Āwhitu Regional Park in its entirety. The park extends over 116 ha and is characterised by rolling open pasture, restored coastal wetlands and saltmarsh that has a raised timber boardwalk. Approximately one third of the parkland is farmed. Council-owned assets include the sealed accessway to Brook Road Esplanade Reserve and carpark area, signs, trees, public toilet, campsite facilities and water supply. The reclamation at Brook Road Esplanade Reserve, is known locally as the Dog Park.

There are two sandy beaches backed by two restored wetland systems. The historic Brook Homestead is located back from the beach, nestled between the wetlands and two cliff top campgrounds. A timber jetty located at the southern end of the beach is associated with Brook Homestead and is backed by a small grass reserve area that is protected by a timber seawall. Numerous walking tracks offer high points that provide vistas of Manukau Harbour. The salt marshes on the northern corner are home to wading birds and the park includes the Āwhitu Golf Club[34]. Please

[34] Auckland Council, (2022) Regional Parks Management Plan

refer to the Regional Parks management plan for a full discussion of the park's features and amenities.

Table 5-9: Unit 7 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (121.4 ha)			AT roads (1.3 km) Water pipes (-) Water assets (-)			Ecological area (48.5 ha) Notable biodiversity overlays - SA1.2, CL1, WL19, WF5, WL11			Cultural heritage assets (34)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None	Low	Moderate	High	Very high

Environmental context: Coastal setting, hazard scape and ecological setting

The majority of the Brook Road Esplanade Reserve Park Road will be affected by inundation, slope instability and/or erosion in the next 100 years.

This unit contains a vast array of indigenous ecosystems, with the Awhitu Regional Park wetlands listed as a Biodiversity Focus Area (refer to Section 2.6):

Raupō reedland (WL19)	An endangered ecosystem occurring on the margins of lakes, lagoons, ponds and river oxbows, and in flooded valleys.
Oioi, restiad rushland/reedland (WL10)	This is an endangered ecosystem vulnerable to invasive species of plants. It is considered to be endangered. Fernbird commonly occurs in this ecosystem.
Machaerina sedgeland (WL11)	A critically endangered ecosystem highly vulnerable to invasion by a range of weeds.
Mangrove forest and scrub (SA1.2)	This is a common ecosystem considered to be the least concern in terms of endangerment. It does, however, support a wide range of bird species including native and introduced passerines.
Pōhutukawa treeland/flaxland/rockland cliffs (CL1)	Prone to active erosion due to weather exposure. Its coastal cliffs are used by a wide range of seabirds (e.g. petrels, shags and gulls) as roosting and nesting sites.

Mānuka, kānuka scrub (VS3)	Mānuka-dominated regenerating ecosystem considered to be the least concern in terms of endangerment. This ecosystem supports a wide range of reptiles and birds such as geckos and native bush birds (e.g. morepork, kingfisher, etc.).
Tōtara, kānuka, broadleaved forest (Dune forest) (WF5)	This is a rare and threatened ecosystem considered critically endangered. It occurs in frost-free areas on stabilised dunes and less than one percent remain across its entire national range.

Cultural context

There are numerous cultural heritage sites within the park, including archaeological sites with cultural and/or historic significance. Evidence from the middens on the park indicates that Māori used the area for fishing and resource-gathering. The large waka Te Toki-a-Tapiri, now in the Auckland Museum, came from this area[35]. Guiding principles set out in Section 1.4 overlayed with local iwi aspirations and values in Section 3.2, should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

English immigrants John and Sarah Brook settled on the land in 1875. They built the Brook Homestead in 1878, and the family added the bach in front of the homestead in 1907. They also planted a variety of exotic trees including Lawson cypress, Japanese cedar, as well as several kauri trees, which followed the Brook family tradition of planting a kauri tree to mark a family event[36].

As a regional park, the Regional Park Management Plan 2022 is one of the key policy documents which relates to the management of assets and land in this unit. The plan identifies the Āwhitu Park as a developed natural park and sets out the management intentions for the park over the next 10 years. Identified issues and management intentions of relevance to coastal processes and management of risks include (refer to Book 2, section 7 of the Regional Parks Management Plan):

- *"Actively monitor erosion of the sandstone cliffs around the Peninsula campground and move the campground away from the cliff edge in high-risk areas"* (Management Intention 2)
- *"Continue to enhance the coastal forest remnants and mitigate the impacts of erosion through regeneration planting, including along the base of the cliff to the south of the jetty from where the sea wall ends"* (Management Intention 4)
- *"Work with mana whenua to identify, protect and interpret Māori heritage"* (Management Intention 9)
- *"To ensure visitor safety, continue to direct recreation activity away from the eroding sandstone cliff edge and restrict activities such as abseiling and climbing on the cliff face"* (Management Intention 18).

[35] Auckland Council, (2022) Regional Parks Management Plan

[36] Ibid

- *"As erosion continues along the coastal interface at the end of Brook Road, avoid further development and structural intervention and implement appropriate measures to manage coastal retreat"* (Management Intention 19)
- *"As the access to the wetland at the end of Fenton Road becomes inundated more frequently, avoid significant walkway maintenance and upgrades and retain access and on a tidal basis"* (Management Intention 20)

Key stakeholders include the golf club, Āwhitu Landcare Group, Presbyterian Christian camp, and the Highwire Charitable Trust. The park is zoned as Open Space - Informal Recreation Zone under the Unitary Plan.

Community engagement highlighted the value of coastal access across the Regional Park. The value of the dog exercise area was also recognised noting that dogs are not permitted on the Regional Park more broadly.

The objectives below work to support the implementation of adaptation strategies in alignment with community values related to this section of the coast:

- Adaptation strategies preserve and enhance the natural environment and ecosystems that support biodiversity, whilst protecting vulnerable flora/ fauna from adverse activities that damage these delicate systems
- Resilience of community facilities and assets in hazard zones is a priority
- Community facilities in the Āwhitu area support community resilience and recovery
- Pedestrian safety and use of public coastal walkways and lookouts is supported by improvements to signage and maintenance of coastal spaces.

Stretch 14: Kaitara / Matata | Āwhitu Regional park

Stretch description

This unit includes the area east of Kauritutahi Stream mouth (from Featon Avenue), extending to the boundary of the Regional Park at Opoia Creek (near Hatton Road) in the south.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• The sandstone cliffs are weak and highly susceptible to both wind and coastal erosion. • Coastal inundation (and sea-level rise) will impact low-lying areas of the stretch. • The low-lying reclamation is exposed to ongoing erosion and inundation.	• Brook Road Esplanade Reserve and Dog Park, including sealed accessway and vehicle parking/turning. • Awhitu Regional Park. • Historic jetty associated with Brook Homestead, timber seawall protecting small, shaded grass recreational area with park amenities (BBQ, shower). • Saltmarsh wetland and timber boardwalk. • Cliff top campsites and associated park amenities.	• Realignment of the turnaround at the end of Brook Road, removal of BBQ and picnic table, and planting of coastal margin has been undertaken. • A raised boardwalk through the Kauritutahi wetland behind the shell barrier beach provides all-weather, all-tide access.

Adaptation strategies

Stretch	Short term	Medium term	Long term
14: Kaitara / Matata | Āwhitu Regional Park	LI	LI	LI

Guidance notes for implementation

- *Limited intervention:* This is specifically required at Brook Road Esplanade Reserve and the section of grass reserve adjacent to historic jetty where limited works may be required in accordance with this strategy. This aligns with the identified parks management direction for this Regional Park.
- Localised retreat and hazard risk management: Over the medium to longer term there will need to be some localised *managed retreat* of services and assets from these low-lying areas of reserve (the dog park's exercise area) as they will be regularly inundated and exposed to ongoing coastal erosion. Areas and uses are identified and discussed in the Regional Park Management Plan with associated management intentions providing direction for the next 10 years.

Unit 8: Matakawau | Matakawau Point

Unit 8: Matakawau | Matakawau Point

This unit includes the wider Matakawau Point area, from Opoia Creek in the north to the end of the Matakawau Point Esplanade Reserve (Poaka Road) in the south.

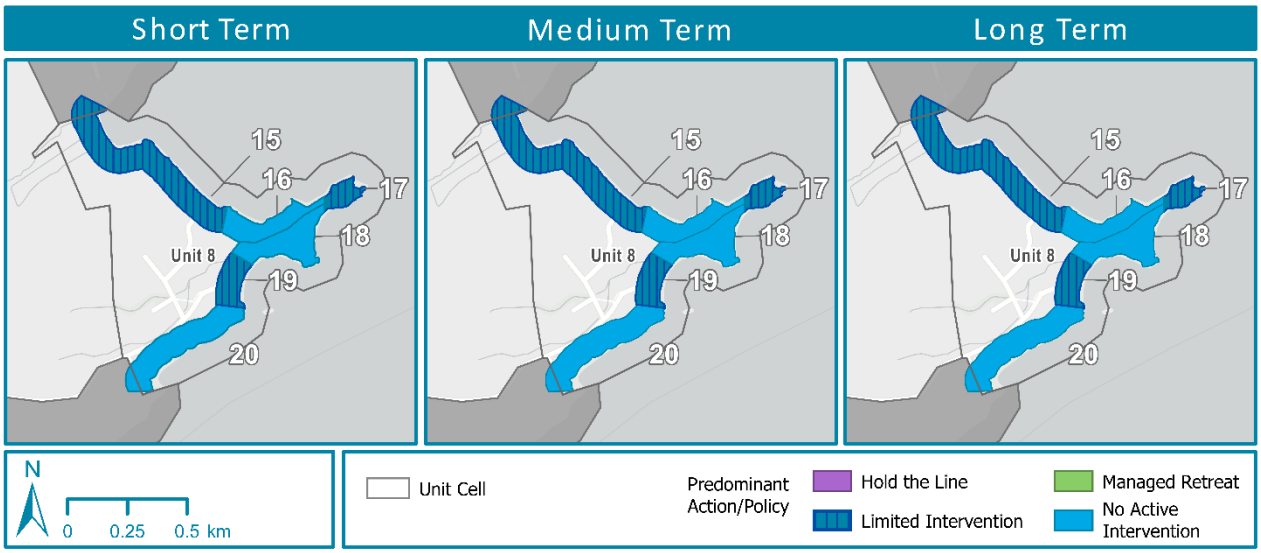


Figure 5-10: Adaptation strategies for coastal stretches within Matakawau | Matakawau Point unit area

Adaptation summary Stretches 15 to 20

Stretch	Short term	Medium term	Long term
15: Matakawau | Sergeants Beach	LI	LI	LI
16: Matakawau | Matakawau Point North	NAI	NAI	NAI
17: Te Kurae o Matakawau | Matakawau Point	LI	LI	LI
18 Matakawau | Matakawau Point South	NAI	NAI	NAI
19: Matakawau | Matakawau Beach	LI	LI	LI
20: Matakawau | Matakawau Road	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

This unit includes semi-contiguous areas of esplanade reserve, identified parks and reserve areas, boat launching facilities and recreational beach access.

As a rural coastal settlement, there is little three waters' infrastructure and assets located within this unit. Roads are generally parallel to the coast, as is the case for Sergeants and Matakawau Roads. Cul-de-sacs such as Duncan, Tainui and Poaka Roads run perpendicular to the coastal cliff tops.

Reserve areas contain a range of amenities and facilities such as public toilets (with associated on-site infrastructure) play equipment, benches and picnic facilities, carparks and hardstand areas.

Table 5-10: Unit 8 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (7.1 ha)			AT roads (2.4 km) Water pipes (0.3 km) Water assets (15)			Ecological area (1.4 ha) Notable biodiversity overlays - CL1, SA1.2, SA1.3			Cultural heritage assets (9)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None	Low	Moderate	High	Very high

Environmental context: Coastal setting, hazard scape and ecological setting

Matakawau | Matakawau Point unit is characterised by sandstone cliffs and coastal vegetation with several sandy high-tide beaches located to the north and south of the point. Sergeants Beach to the north and Matakawau Beach to the south provide the two main publicly accessible beach areas within the unit. The area north of Stretch 15 contains limited areas of Council-owned land. Within this stretch, private farmland includes modified environments landward of the coast.

These sandstone coastal cliff areas are particularly prone to erosion with coastal erosion susceptibility mapped as extending landwards some 50 m in many areas of the unit. This erosive process has resulted in some areas of the 20 m wide esplanade reserve no longer being safely passable due to the loss of coastal land.

Lower lying areas adjacent to the coast (including Matakawau Beach) are also identified as being susceptible to coastal inundation. In many cases, these lower lying areas are also identified as floodplains with overland flow paths draining to the coastal edge.

Cliff ecosystems are typical within coastal areas of the unit, including coastal cliff vegetation comprising pōhutukawa treeland, flaxland and rockland ecosystems (CL1), along with coastal saline ecosystems made up of mangrove forest and scrub vegetation and saltmarsh – sea rush oioi (SA1.2, SA1.3). These are particularly vulnerable to erosion and weathering. Significant ecological areas are identified within the northern areas of this unit.

Erosional risks to reserve land are the highest within this unit over all timeframes. Risk to network (primarily roads) infrastructure increases from all hazards over time.

Cultural context

Matakawau Point is of significance to iwi; cultural markers have historically been established within the Point reserve. There are numerous identified and unidentified areas of value and significance within this unit. For many of the stretches, the need to manage risk to cultural values (where they are located within the coastal marine area, private land or unmaintained Council land) is identified as a future management consideration. Guiding principles set out in Section 1.4 overlayed with local iwi aspirations and values in Section 3.2, should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

The unit contains a narrow esplanade reserve which extends from Sergeants Beach in the north to the end of Stretch 20 (Matakawau Road in the south). This reserve is not passable in some areas due to safety issues associated with coastal erosion. Public access is available at Sergeants and Matakawau Beaches. Matakawau 'Point Reserve' at the tip of the headland contains an important access point to the coast for the community, with an all-tide boat launching ramp and small jetty located at the headland cliff cutting. Within the esplanade reserve and landward and adjacent to the reserve, private property owners have constructed seawalls in some locations.

Engagement has identified shared community concerns for this unit which related to:

- Land lost to erosion and the need to continue to provide coastal walkways along the edge of farmland (establish a permanent connection between Te Toro and Pollok)
- A shared interest in preserving and enhancing the natural environment and habitats within these coastal areas.

The objectives below work to support the implementation of adaptation strategies in alignment with community values related to this section of the coast:

- Adaptation strategies preserve and enhance the natural environment and ecosystems that support biodiversity, whilst protecting vulnerable flora/ fauna from adverse activities that damage these delicate systems
- Pedestrian safety and use of public coastal walkways and lookouts is supported by improvements to signage and maintenance of coastal spaces.

Stretch 15: Matakawau | Sergeants Beach

Stretch description

This stretch extends south from Opoia Creek (Hatton Road), including the saltmarsh fringe and narrow sandy beach at the stream outlet, and concludes at the eastern end of Sergeants Beach.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Ongoing erosion, inundation of low-lying reserve.	• Northern portion of Matakawau Point Reserve, known as Sergeants Beach Reserve. • Timber seawall and rock armour revetment within the reserve area. • Opoia Creek pedestrian bridge and boardwalk.	• Seawalls protect the narrow esplanade reserve and public access connection around the cliff headland to Matakawau Point north to the east.

Adaptation strategies

Stretch	Short term	Medium term	Long term
15: Matakawau | Sergeants Beach	LI	LI	LI

Guidance notes for implementation

- *No active intervention*: Required for the vegetated cliff coastline to the north/west, and Opoia Creek shoreline areas.
- *Limited intervention:* Applies primarily to the management of erosion at the Sergeants Beach Reserve, using a timber seawall and rock revetment.
- Note: The north/western areas present an opportunity for enhancing habitat values. Should future development be proposed landward in this stretch, this should be responsive to its ecological and cultural values and consider opportunity for appropriate coastal access from Hatton Road (Opoia Creek pedestrian bridge) to Matakawau.

Stretch 16: Matakawau | Matakawau Point North

Stretch description

This stretch extends from the headland at the eastern end of Sergeants Beach and culminates at the conclusion of private land holdings to the north of the point (around 511 Matakawau Road).

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Coastal cliff erosion.	• Matakawau Point Reserve.	• Cliff edge is partially fenced and planted for public safety.

Adaptation strategies

Stretch	Short term	Medium term	Long term
16: Matakawau | Matakawau Point North	NAI	NAI	NAI

Guidance notes for implementation

- *No active intervention:* The narrow cliff-top reserve is inaccessible to the public and alternate access is available around Sergeant Road and Matakawau Road. Contiguous access is no longer safely available with a section of the cliff-edge reserve closed due to this risk.
- Advocacy: The retention of mature pōhutukawa and additional coastal revegetation is relevant for this stretch.

Stretch 17: Te Kurae o Matakawau | Matakawau Point

Stretch description

This stretch includes Te Kurae o Matakawau | Matakawau Point, from the extent of private land on the northern side to the end of the informal boat parking area to the south (520 Matakawau Road).

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Coastal cliff erosion.	• All-tide boat ramp • Matakawau Point Reserve • Park facilities (toilets, benches, bbq) • Sealed carpark	• Fencing is currently provided to manage safety risks, around the cliff at the end of the headland.

Adaptation strategies

Stretch	Short term	Medium term	Long term
17: Te Kurae o Matakawau | Matakawau Point	LI	LI	LI

Guidance notes for implementation

- *Limited intervention* for the boat launching facilities recognises that the all-tide boat launching ramp is an important 'all-tide'[37] access point to Manukau Harbour. Ongoing management will be required over all time frames to ensure ongoing safe access to this highly valued public asset used for boat launching. This may include some coastal protection and interventions associated with retaining the ramp and associated jetty and access stairs.
- *Limited intervention* for other uses located within the reserve such as parking areas. Due to ongoing erosion processes, the toilet block and associated servicing (water tanks and disposal field) should be realigned/ located to a more landward position over the mid to long term.
- Cultural values: Te Kurae o Matakawau | Matakawau Point is of significance to local iwi. Signage to assist with interpretation of Māori cultural heritage is identified for this stretch. There is historic diorama at headland, which was erected in conjunction with Ngati Te Ata Waiohua, which may be required to be moved further landward. This should be considered in consultation with local iwi.

[37] Meaning accessible/operational at both high tides and low tides for boat launching.

Stretch 18: Matakawau | Matakawau Point South

Stretch description

This stretch extends from the southern side of the Point reserve area (around 520 Matakawau Road) culminating to the east of Matakawau Beach (adjacent to the intersection of Sergeants and Matakawau Roads).

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Coastal erosion	• Unmaintained esplanade reserve. • No identified Council-owned assets.	• The narrow cliff-top esplanade reserve along this stretch is inaccessible for public access.

Adaptation strategies

Stretch	Short term	Medium term	Long term
18: Matakawau | Matakawau Point South	NAI	NAI	NAI

Guidance notes for implementation

- *No active intervention* is selected as this cliff-top reserve is inaccessible to the public and contains no identified Council assets.
- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch.
- Advocacy: Advice on protection and retention of coastal vegetation, as required.

Stretch 19: Matakawau | Matakawau Beach

Stretch description

Matakawau Beach stretch is located on the east-facing shoreline of the Matakawau Point headland. The stretch includes the area adjacent to the eastern intersection of Matakawau and Sergeants Road and culminates to the south at the point opposite Otamanewa Island (and Tainui Road) to the south.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Coastal erosion and instability • Coastal inundation, particularly in the central area of the embayment. • Floodplain and overland flow paths follow the stream and traverse the southern side of the reserve, discharging to the coast.	• Matakawau Beach Reserve, park amenities/facilities including a playground and toilet block. • Carparking area. • Hand boat-launching ramp.	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
19: Matakawau | Matakawau Beach	LI	LI	LI

Guidance notes for implementation

- *Limited intervention* is intended to enable the management of increasing risk from coastal inundation and catchment/rainfall flooding to the Matakawau Beach reserve area. This will require the relocation and consideration of the design of park amenities. These facilities should be located outside of the hazard zone, where possible. A *no active intervention* approach may be applied to the narrow esplanade reserve areas beyond the coastal beach park, consistent with Stretches 18 and 20.
- *Limited intervention* strategy along this stretch also enables opportunity for enhancement and further coastal planting, noting the saltmarsh vegetation present within the backshore area of the beach.

Stretch 20 Matakawau | Matakawau Road

Stretch description

The stretch extends southwest from the headland at the southern end of Matakawau Beach embayment (adjacent Otamanewa Island) and includes the narrow cliff-top reserve culminating at Poaka Road.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Coastal erosion	• Matakawau Point cliff-top reserve • No identified council assets	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
20: Matakawau | Matakawau Road	NAI	NAI	NAI

Guidance notes for implementation

- *No active intervention* is selected as this cliff-top reserve is inaccessible to the public and contains no identified Council assets.
- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch.
- Advocacy: Advice on protection and retention of coastal vegetation, as required.

Unit 9: Hikurangi | Pollock Wharf and South

Unit 9: Hikurangi | Pollok Wharf & South

This unit is the final unit on the east coast of the Āwhitu Peninsula within the Āwhitu SAP area. It includes the area from Poaka Road (off Matakawau Road) in the north, including the Matakawau Creek Esplanade Reserve, and culminates at the A Renall Road Esplanade Reserve/paper road, west of Rauau Point. This unit is broken into three stretches and includes Matakawau Creek, Rangiriri Creek, and the Pollock headland in between.

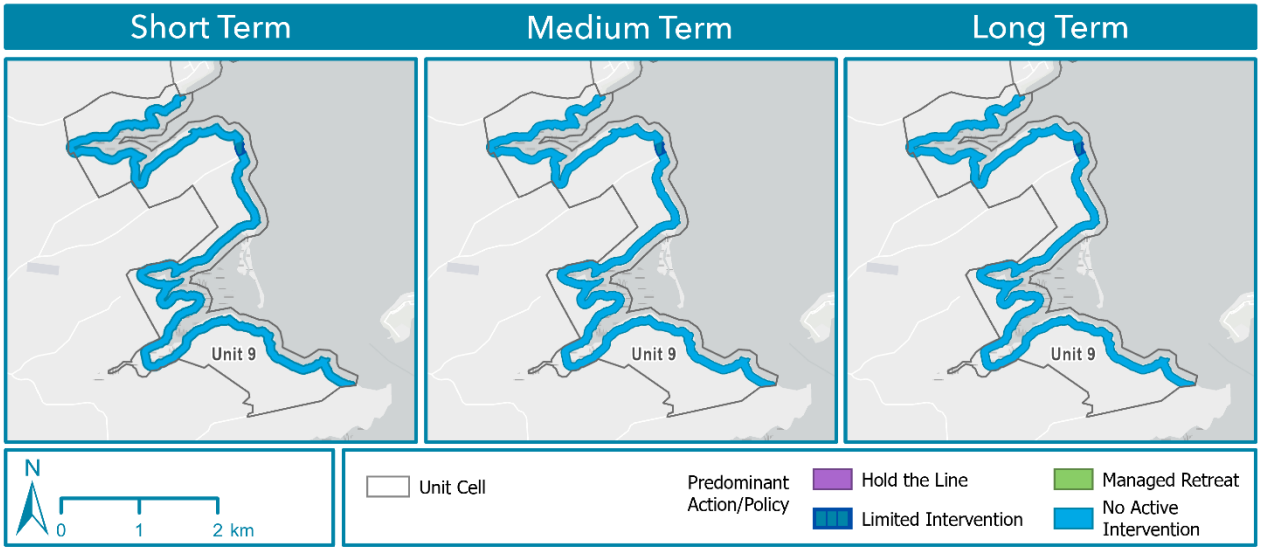


Figure 5-11: Adaptation strategies for coastal stretches within the Matakawau Point unit area

Adaptation summary Stretches 21 to 23

Stretch	Short term	Medium term	Long term
21: Matakawau | Matakawau Creek	NAI	NAI	NAI
22: Hikurangi | Pollock Wharf	LI	LI	LI
23: Hikurangi | Rangiriri Creek	NAI	NAI	NAI

Council-owned infrastructure, land, and assets

This unit is largely rural farmland with unmanaged esplanade reserve and road reserve extending around the coastal margin. There is a small area of reclaimed reserve at the end of Pollock Wharf Road, developed with picnic facilities and small vessel launching ramp.

Pollok Wharf comprises a reclaimed reserve and vehicle access connection armoured with a timber seawall. A concrete ramp set into the seawall provides for launching small craft and is useable at high tide. Toilet facilities have been relocated from the reserve to a landward and more elevated site adjacent to the end of Pollok Wharf Road. Advice suggests targeted repairs are needed to address failure mechanism on the low-lying saturated section of retaining wall, with additional drainage and management of overland flow from Pollock Wharf to avoid further deterioration of the accessway.

Table 5-11: Unit 9 Council-owned land & assets metrics and associated risk scores (short, medium, long terms)

Social - parks and reserves			Economic - network infrastructure			Environmental - ecological			Cultural – culture and heritage		
Park & reserve land: structures, carparks, accessways, buildings (4.7 ha)			AT roads (2.3 km) Water pipes (-) Water assets (-)			Ecological area (30.8 ha) Notable biodiversity overlays (WF4, SA1, WL18, WL19, WL12, CL1)			Cultural heritage assets (48)		
Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Coastal erosion susceptibility											
Coastal inundation											
Rainfall induced flooding											

None	Low	Moderate	High	Very high

Environmental context: coastal setting, hazard scape and ecological setting

This unit includes three stretches: North of Pollok Wharf including areas of unconnected esplanade local purpose and road reserve, with limited Council assets; Pollok Wharf (Stretch 22); and the stretch to the south of the wharf area, reflective of the northern stretch again including disconnected areas of road reserve.

All shoreline areas within the unit are subject to erosion and in places, to coastal inundation and catchment flooding, dependent on the elevation of the land and location of streams. Large slips have occurred on coastal cliffs to the north and south of the Pollok Road Reserve.

The land bordering the inlet is used for pastoral farming and can generally be characterised as low, sparsely vegetated cliff shoreline grading to saltmarsh and mangrove vegetation. The ecology of this unit consists of a variation of saline coastal ecosystems (SA1), mangrove forest and scrub land, indigenous wetlands (WL18, WL19), and sea rush sprouting in zones where saltwater dilution is greatest. Pōhutukawa, pūriri and broadleaved forest (coastal broadleaved forest- CL1) are also evident along this unit, an endangered indigenous ecosystem susceptible to land clearance and habitat fragmentation.

Cultural context

A number of coastal middens have been recorded along the coast, indicative of the historic Māori settlement. There is need for further engagement with local iwi groups to identify sites of value and significance and interpret the Māori cultural history. In turn, guiding principles set out in Section 1.4

overlayed with local iwi aspirations and values in Section 3.2, should be used to inform the implementation of coastal management strategies, alongside ongoing engagement with local iwi.

Social and policy context

Pollok Wharf holds local importance as a coastal access point, and the historical value of former Pollok Wharf site.

The objectives below work to support the implementation of adaptation strategies in alignment with community values related to this section of the coast:

- All-tide access to the beach, coast and harbour at key community access locations is maintained to enable a range of recreational and water-based activities (e.g. swimming, paragliding, hang-gliding, walking, picnicking, sailing/boating, kiteboarding and surfing).
- Resilience of community facilities and assets in hazard zones is a priority.
- Pedestrian safety and use of public coastal walkways and lookouts is supported by improvements to signage and maintenance of coastal spaces.

Stretch 21: Matakawau | Matakawau Creek

This coastal stretch starts from the Matakawau Creek Esplanade Reserve near Poaka Road and includes the shoreline to the north of Pollock Wharf.

Stretch description

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Floodplain and overland flow paths are identified within the lower lying areas of Matakawau Creek Esplanade Reserve. • Esplanade Reserve and the shoreline north of Pollok Wharf Road are susceptible to erosion and coastal inundation.	• Matakawau Creek Esplanade Reserve. • McPike Road culminates within this stretch (within rural farmland). • Northern portion of Pollok Road Reserve.	• N/a

Adaptation strategies

Stretch	Short term	Medium term	Long term
21: Matakawau | Matakawau Creek	NAI	NAI	NAI

Guidance notes for implementation

- *No active intervention* is selected as the reserve within this stretch which is generally inaccessible to the public and contains no identified Council assets. Other areas of the stretch are bordered by private landholdings.
- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch.

Stretch 22: Hikurangi | Pollok Wharf

Stretch description

This small stretch includes the southern portion of Pollok Wharf Road Reserve, including the wharf and access road, and reclaimed area of the reserve accessed via Pollok Wharf Road.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• The reserve and majority of the accessway is at risk to coastal inundation. • The reclamation is at risk of erosion (currently mitigated by the existing seawall).	• Pollok Wharf Road Reserve, reclamation armoured with timber seawall. • High-tide launching ramp for small craft. • Park amenities (park bench, tables). • Toilet facilities.	• Reserve (access) currently armoured with a timber seawall requiring ongoing maintenance. • Large slips have occurred on coastal cliffs to the north and south of the reserve.

Adaptation strategies

Stretch	Short term	Medium term	Long term
22: Hikurangi | Pollok Wharf	LI	LI	LI

Guidance notes for implementation

- *Limited intervention* recognises the need for continued management of this harbour access from erosion and flood hazards. The accessway may only be suitable for pedestrian access to the low-lying reserve at lower stages of the tide, with limited carparking at the end of Pollock Wharf Road.

Stretch 23: Hikurangi | Rangiriri Creek

Stretch description

This coastal stretch includes the shoreline south of Pollok Wharf and includes Pollok Headland, including Pollok Spit (that extends from Wairoa Point) Rangiriri Creek, and includes the two small, embayed beaches between Tokaroa Point and Rauau Point.

Hazards and climate change	Council-owned infrastructure, land, and assets	Current management issues / approaches
• Areas of floodplain and overland flow paths traverse areas of this coastal stretch discharging to the coast. • Coastal erosion and coastal inundation.	• Capes Road (including unformed road reserve). • Capes Local Purpose Reserve. • Lee Gully Local Purpose Reserve. • A Renall Road Reserve.	• Auckland Council biodiversity team has a consent to remove mangroves for shell barrier ecosystem restoration at Pollock Spit and Waipipi.

Adaptation Strategies

Stretch	Short term	Medium term	Long term
23: Hikurangi | Rangiriri Creek	NAI	NAI	NAI

Guidance notes for implementation

- *No active intervention* is selected as these areas of unconnected local purpose and road reserve are not actively managed and include no identified Council assets.
- Cultural values: Feedback from local iwi has sought recognition of the need to manage risks to cultural sites within this stretch.
- Advocacy: Advice on management of coastal vegetation as required.

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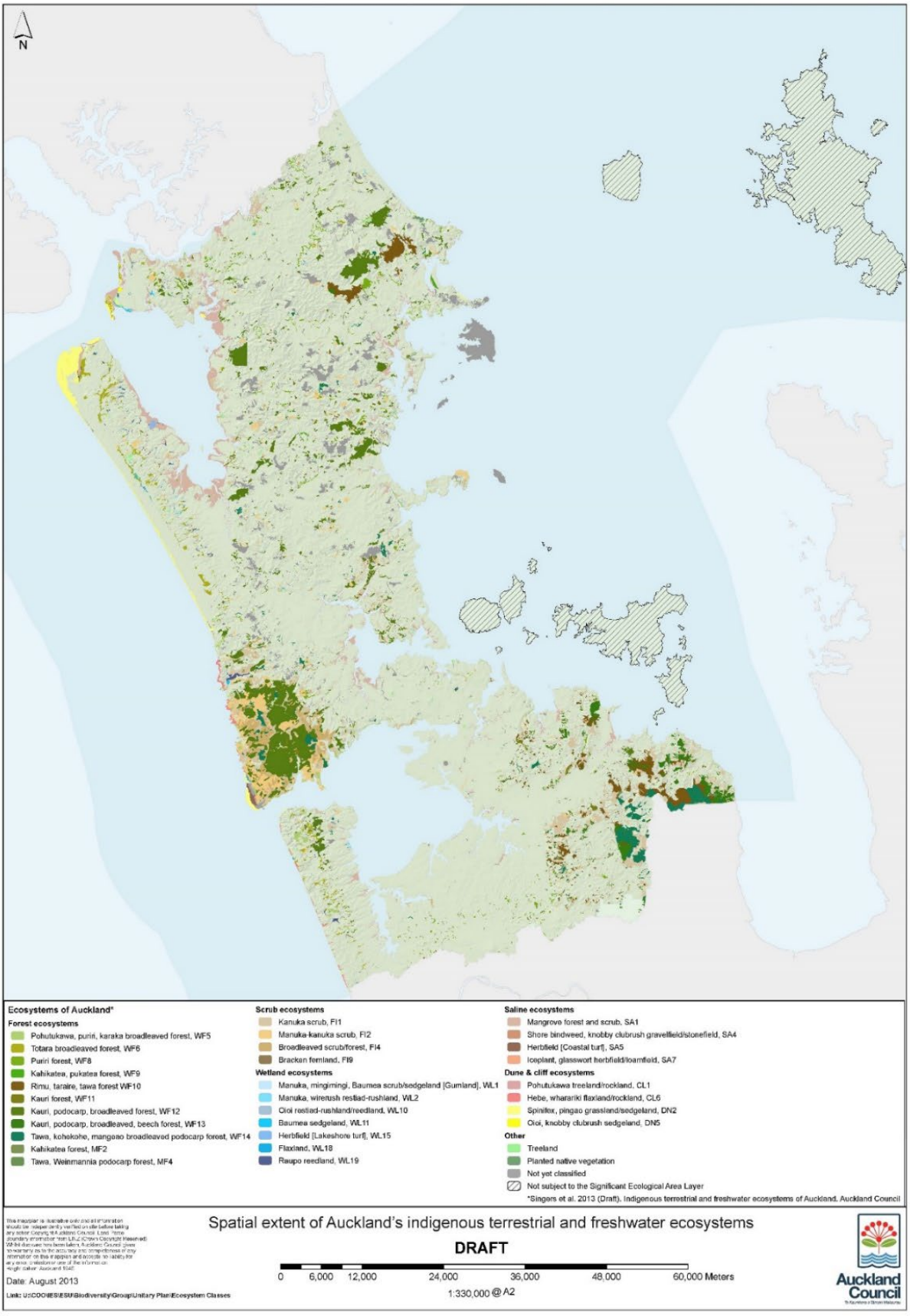
Attachments

Attachment A: Spatial extent of Auckland's indigenous terrestrial and freshwater ecosystems (Auckland Council Unitary Plan Ecosystem Classes, 2013).

Attachment B: Sensitivity analysis

Attachment C: Adaptation strategies for Āwhitu By Coastal Stretch

Attachment A: Spatial extent of Auckland's indigenous terrestrial and freshwater ecosystems



Attachment B: Sensitivity analysis

Table B-1 below summarises the key changes of concern to each ecosystem type and illustrates the sensitivity of these ecosystems to climate change and coastal hazards. The table supports the consideration of ecological values where these are located within Council-owned land and may be influenced by shoreline management options. In the absence of a comprehensive understanding around how multiple stressors cumulatively affect ecosystems, precautionary and adaptive approaches should be considered[38].

Table B-1: Key changes of concern to each ecosystem type

Ecosystem type	Key impacts of concern	Associated impacts & discussion
Marine ecosystems- present within Manukau Harbour	• This ecosystem is susceptible to increasing air and water temperatures, sedimentation, eutrophication, decreasing ocean pH and nutrient concentrations, alterations to current and wind patterns, and sea-level rise.	• Intertidal habitats, kelp forests, and subtidal rocky reefs are among those the most sensitive to changing conditions within marine ecosystems[26]. • Coastal management strategies which work to safeguard intertidal habitats should be supported where appropriate.
Freshwater ecosystems	• Comparatively increasing air temperature, eutrophication from excess nutrient runoff, drought, increase in the frequency of extreme rainfall events, invasive species, as well as decreasing river flows contribute to the gradual decline of these ecosystems.	• Freshwater fish and macroinvertebrates are amongst those particularly sensitive to changing conditions (shifts in water temperatures in Manukau Harbour, especially species that are already living close to their maximum thermal threshold[26]).
Dune ecosystems	• Dune ecosystems are composed of small groups of highly specialised, drought-tolerant plants that capture sand and build dunes and are under threat from increasing coastal development and population growth. • Sea-level rise and subsequent inundation, floods, storm surge, increased storm frequency, excess salt deposition, debris flow and sedimentation and physical damage/ disturbance[39].	• Shorebirds including oystercatchers, dotterels, gulls and terns, New Zealand quail are all heavily reliant on the vulnerable dune ecosystems evident along the Āwhitu peninsula. • Ongoing management and maintenance of dune ecosystems is needed, particularly when dune plains are also widely used and damaged by off-road vehicles.
Coastal cliffs ecosystem	• Often exposed to the elements and salt spray, coastal cliffs experience extreme weathering from storms, erosion, and even droughts which damage vegetation and cover plants in salt spray. • They are especially vulnerable to increased sea-level rise and erosion exacerbated by climate change.	• Ongoing impacts of the weather and the sea can over time lead to vegetation disturbance and erosion for the Āwhitu coastal cliff ecosystems. • This allows a wide range of invasive plant species to take hold. Adaptive weed and pest management is critical to maintain cliff ecosystems, especially where

[38] Foley and Carbines, 2019

[39] Bishop and Landers, 2019

Ecosystem type	Key impacts of concern	Associated impacts & discussion
		• vulnerable plant populations are limited in distribution and extent (a likely scenario for Āwhitu' s coastal cliff ecosystems with population growth and coastal squeeze).
Forest ecosystems	• Thrive in warm, humid conditions. • In some situations, the vegetation provides a physical buffer from erosion. In some situations, the vegetation provides a physical buffer from erosion whilst providing habitat for native bush birds, e.g. morepork, keruru, kingfisher, shining cuckoo, fantail, grey warbler, tūī and silvereye.	• Key elements that influence the composition and structure of forest ecosystems include the age of the landforms occupied and the associated repeating ridge–gully landforms, which create variable soil fertility and moisture deficits. • Habitat fragmentation and invasive species are amongst two of the greatest threats to these ecosystems. • Coastal management strategies should ensure they are supporting rather than hindering the expansion of ecological corridors across Āwhitu.
Regenerating ecosystems	• Often occurs following a natural or human disturbance. They may be naturally transient, so the species adapted to their often-specialised habitats are especially vulnerable to any change in their environment. • Key known threats include invasive species, habitat fragmentation and land clearance for farming, urban development etc.	• Sometimes regenerating vegetation/ ecosystems can work to provide a physical buffer protecting more-mature ecosystem types from other land uses and edge effects and reducing erosion. • Ongoing active advocacy of the values of these often-undervalued ecosystems is vital for their protection, along with the protection of neighbouring ecosystems.
Wetland ecosystems (Raupō reedland)	• Wetlands are ecologically sensitive, diverse habitats, housing plants and animals that have adapted to wet and often changeable conditions. • They are uniquely characterised by factors of the water itself (the permanent or transient presence of water, the volume, the velocity, and the salinity) and its interaction with surrounding geology, soil, climate, ground-water levels, water fertility and chemistry, and flora and fauna present. • Wetlands are known to be productive environments, storing carbon, retaining nutrients and sediments, and providing nurseries and habitats for native fish and eels. [25]	• Although wetlands buffer the impact of sea-level rise and provide amelioration during droughts, they are highly sensitive and continually threatened by ongoing drainage and land clearance, invasive species, eutrophication, sedimentation, pollution, and damage from livestock. • These stressors are exacerbated by changes in water chemistry as warmer climates and changing weather patterns take effect, altering wetland's ability to manage water quality and flooding events.

Ecosystem type	Key impacts of concern	Associated impacts & discussion
Coastal saline ecosystems	• These ecosystems provide services such as buffering coastal erosion, providing habitat, sediment retention, and carbon sequestration. • The major threats to this ecosystem are primarily abiotic and include eutrophication and increased sedimentation rates as a result of changing land use in surrounding catchments, however sea-level rise (SLR) is most likely to have the greatest impact on coastal habitats that sit at the land-sea margin.[40]	• Coastal saline ecosystems (such as intertidal and mangrove habitats) are particularly susceptible to SLR, having little room to migrate up the shore due to coastal development or steep coastlines (coastal squeeze)[41]. • This is an important consideration for Āwhitu's coastal saline ecosystems, which are characterised purely by mangrove forest and scrub, saltmarsh - sea rush, oioi, and shell-barrier beaches (chenier plains) and its sea rush estuarine and shell barrier beach variants.

[40] Bishop, C. D. and T. J. Landers (2019). Climate change risk assessment for terrestrial species and ecosystems in the Auckland region. Auckland Council technical report, TR2019/014

[41] Swales et al., 2008; Lundquist et al., 2011, cited in Foley and Carbines, 2019

Attachment C: Adaptation strategies for Āwhitu By Coastal Stretch

- Map A shows the short-term adaptation strategies
- Map B shows the medium-term adaptation strategies
- Map C shows the long-term adaptation strategies

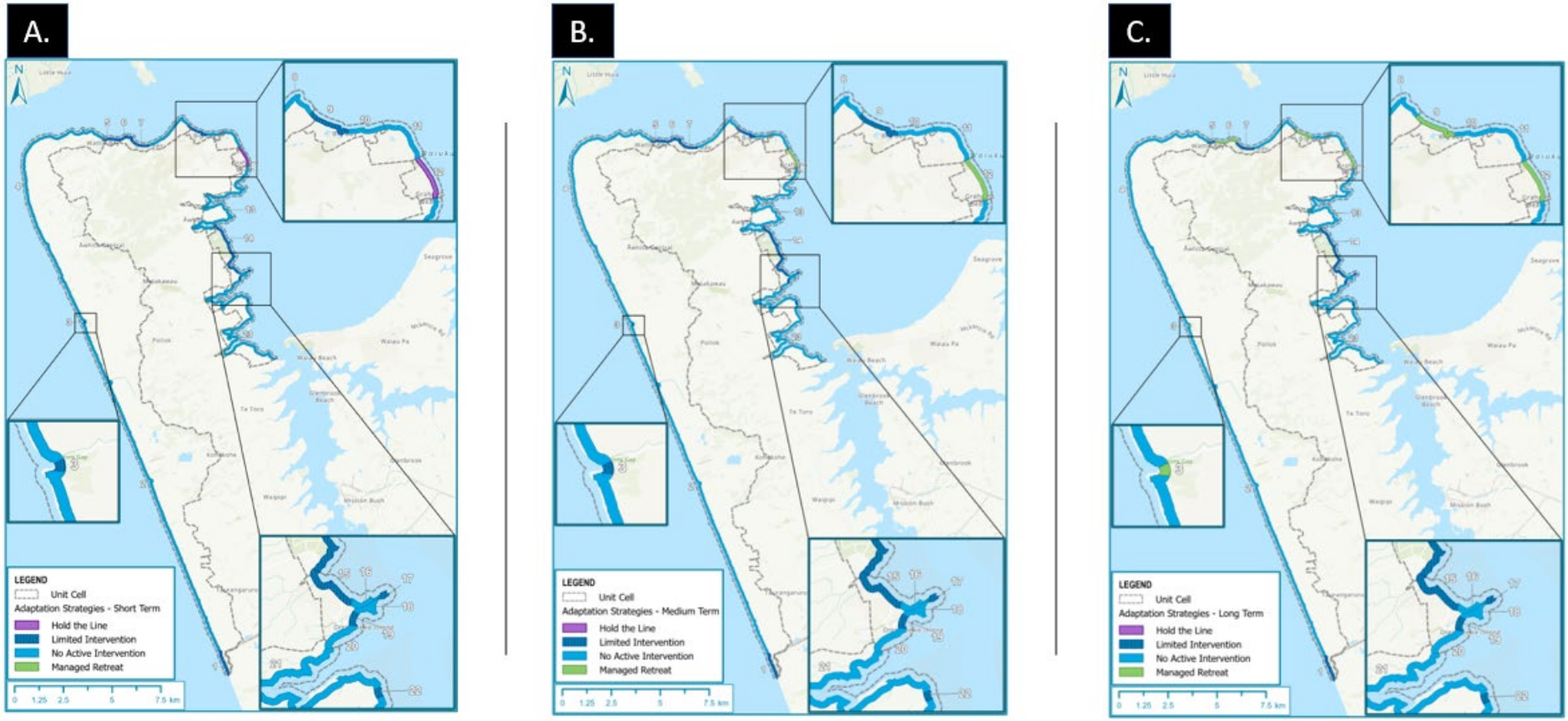


Figure 6-1: Adaptation strategies across all 23 coastal stretches. Map A shows the short term adaptation strategies, Map B shows the medium term adaptation strategies and Map C shows the long term adaptation strategies

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