Update on the CAP work on the Paekakariki Coastline

Prepared from DRAFT documentation for the CAP's meeting
on 9 February 2024
by Members of the KCDC Coastal Advisory Panel.

Presentation

- Insights on Community Values to inform objectives from the Community Values Workshop (7/11/23) and online survey (November 2023)
- Overview of the Paekākāriki Adaptation Area and Options (draft)
- Assessing Risk
- Pathways developed being considered by the CAP (draft)
- How CAP will score these
- Next Steps

Community Feedback Outcomes

Gathering Paekakariki Adaptation Area Values

CAP, supported by the Kapiti Coast District Council Coastal team, undertook a series of community engagements in the Paekākāriki Adaptation Area (PAA).

Two key engagements provided insights to gather the PAA values:

- St Peter's Hall – PAA Community Values Workshop (7November 2023)
- Online survey: Have Your Say – PAA (November 2023)

Insights: 50 recorded participants answered the 4 Values survey questions – this generated 448 comments

Five Key Themes: Paekakariki Community Values

1. The coastline contributes to the essence of our community
2. The proximity to the coastline connects us with our natural environment
3. Our community relies on well-maintained infrastructure for protection
4. We enjoy beach access for recreation and public use

And 5th equal

a. We are concerned about loss of value of our private assets
b. We want better information and proper consultation

MCDA Objective for Paekakariki Adaptation Area

Draft PAA Objective – *for CAP Discussion, Debate and Finalisation:*

Protecting our unique community for as long as possible from coastal hazards by maintaining essential infrastructure and ensuring that:

- We continue to enjoy beach access for recreation and public use;
- Our natural coastal environment is enhanced, and
- We are kept informed about coastal hazards, consulted on adaptation options and can increase our resilience.

MCDA Objective for Paekakariki Adaptation Area

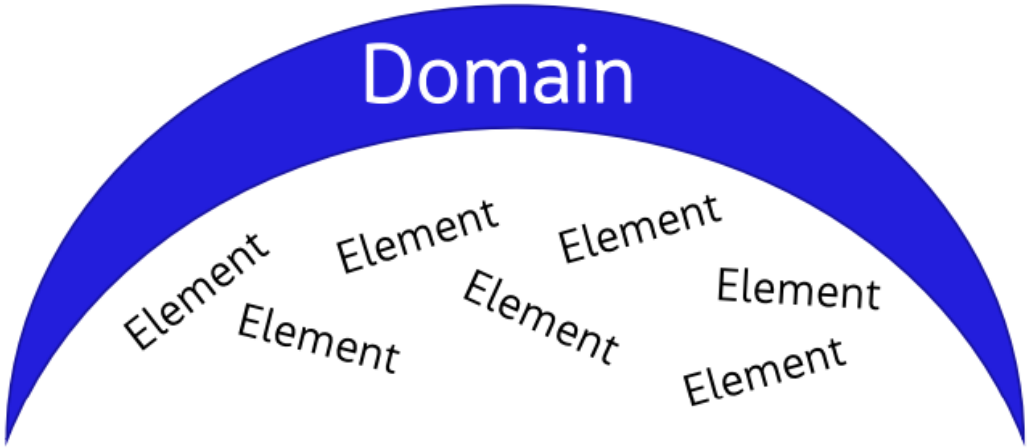
Draft PAA Objective – *as agreed by CAP:*

Protecting our unique community for as long as feasible from coastal hazards by maintaining essential infrastructure and ensuring that:

- We continue to enjoy beach access for recreation and public use;
- Our natural coastal environment is maintained, and
- We are kept informed about coastal hazards, consulted on adaptation options and
- We can increase our resilience to protect our properties, maintain our unique lifestyle and keep our community safe.

Assessing Risk

Terminology

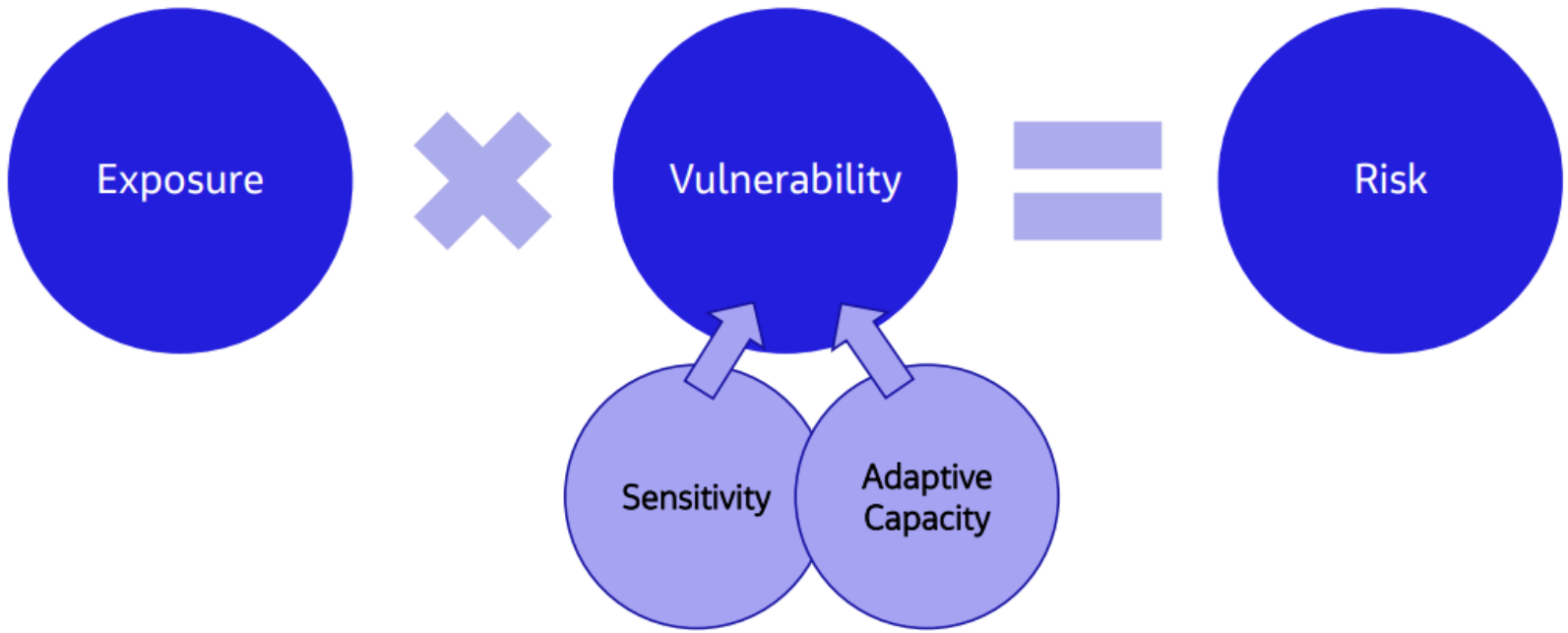


Domain	Element
Built Environment	e.g. Roads, Property, Water Supply
Ecological	e.g. Wetlands, dunes, ecological sites **(To be finalised)**
Natural Character	e.g. Areas of high natural character
Human	e.g. Physical health, social infrastructure and amenity, exacerbating inequities
Cultural	**Still to be completed with Iwi input.**

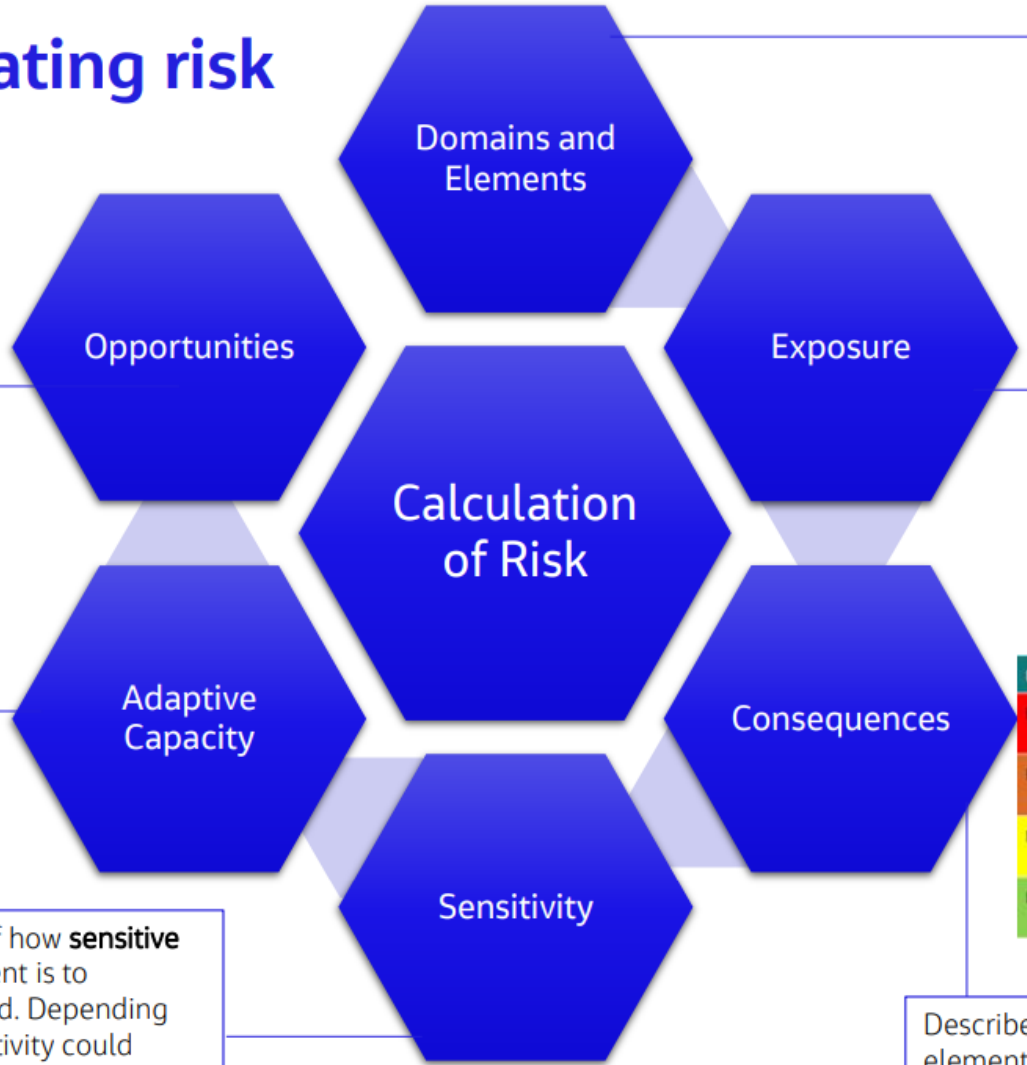
Purpose

What is a risk assessment?	Why do we need one?
A systematic way to assess the potential risks that may impact a person, activity, or asset from a hazard over time. It considers: - How **exposed** is an element to the hazard? - What are the **consequences** of the element being exposed? - And therefore, how **sensitive** is the element to being exposed? - Can the element **naturally adapt** with the hazard? It is a snapshot of what a 'do nothing' scenario may look like in the future. It looks at the PAA as a whole unit. It provides a 'baseline' that throughout the TK process we can use to assess our pathways against – e.g. do our pathways achieve what we need? It is based on the data we have available now, and can be built on in the future.	• To understand **what is in the Paekākāriki Adaptation Area (PAA), and what is at risk** to coastal erosion and inundation - now and in the future with SLR. • To understand **when** elements may become at risk. • To help us determine **where** we should focus our efforts to reduce risks in the future. • To help inform our objectives (what are we trying to achieve).

Process – Calculating Risk



Process – Calculating risk



Identify the **domains and elements** that will be assessed.
- Built environment
- Human
- Ecological (to be finalised)
- Natural Character
- Cultural (to be completed)

Description of potential **opportunities** there are for the element to have positive outcomes as a result of the hazard occurring, or potential opportunities outside of the adaptation planning scope to deal with the hazard.

Identify the **exposure** of the element to the hazard. Where possible, this is done using geospatial information to overlay with the hazard, and the exposure rating scale (MfE, 2017) is used, as per below. In some cases where the geospatial data was not available, these have been subjectively assessed.
Extreme, high, moderate, low ranking

A subjective measure of how easily/efficiently an element at risk can **adapt** naturally when exposed to a climate hazard.
Very low, low, moderate, high ranking

Exposure rating	Qualitative definition	Quantitative definition
Extreme	Significant and widespread exposure of elements to the hazard	>75% of sector or element is exposed to the hazard
High	High exposure of elements to the hazard	50–75% of sector or element is exposed to the hazard
Moderate	Moderate exposure of elements to the hazard	25–50% of sector or element is exposed to the hazard
Low	Isolated elements are exposed to the hazard	5–25% of sector or element is exposed to the hazard

Subjective measure of how **sensitive** (or tolerant) an element is to exposure to the hazard. Depending on the element, sensitivity could increase over time as the likelihood of exposure increases.
Extreme, high, moderate, low ranking

Describe the **consequences** of an element being exposed to the hazard.

Process - Risk Ranking

		Exposure			
		Low (L)	Moderate (M)	High (H)	Extreme (E)
Vulnerability	Extreme (4)	Moderate	High	Extreme	Extreme
	High (3)	Low	Moderate	High	Extreme
	Moderate (2)	Low	Moderate	Moderate	High
	Low (1)	Low	Low	Moderate	High

From: Ministry for the Environment. 2021. *He kupu ārahi mō te aromatawai tūraru huringa āhuarangi ā-rohe / A guide to local climate change risk assessments.* Wellington: Ministry for the Environment.

Risks Across All Domains

	Coastal Erosion						Coastal Inundation					
Climate Change Scenario	Both		SSP2-4.5		SSP5-8.5		Both		SSP2-4.5		SSP5-8.5	
Element	Present	2050	2070	2130	2070	2130	Present	2050	2070	2130	2070	2130
Built Environment												
Properties - Whole Adaptation Area	M	M	M	M	M	H	L	L	L	L	L	L
Beachfront Properties only**	H	H	E	E	E	E	-	-	-	-	-	-
Water Supply Infrastructure	L	L	H	H	H	H	L	L	L	L	L	L
Stormwater Infrastructure	L	L	L	L	L	L	L	L	L	L	L	L
Roads and Bridges	L	L	M	H	M	H	L	L	L	L	L	L
Electrical Transmission and supply infrastructure	L	L	L	M	M	H	L	L	L	L	L	L
Human												
Physical Health	L	L	L	L	L	M	L	L	L	L	L	L
Mental Health and Wellbeing	L	L	M	M	H	E	L	L	L	L	L	L
Social Infrastructure and Amenity	L	L	M	M	M	M	L	L	L	L	L	L
Exacerbating Inequalities	L	L	M	M	M	H	L	L	L	L	L	L
Social Cohesion and Community Wellbeing	L	L	M	M	M	M	L	L	L	L	L	L
Conflict, Disruption, and Loss of Trust in Government	L	M	M	H	H	E	L	L	L	L	L	L
Natural Character												
CTA3: Paekākāriki	L	L	L	M	L	M	L	L	L	L	L	L
Queen Elizabeth Park (Part of)	L	L	L	L	L	L	L	L	L	L	L	L

**Coastal erosion is considered for beachfront properties only. Coastal inundation is not considered for beachfront properties only for consistency with other Adaptation Area Risk Assessments.

Overview of Adaptation Area and Options

Overview of Management Units

The Paekākāriki AA has been split into three sub-units:

1. 11A Paekākāriki Seawall (erosion management unit)

2. 12A South of Paekākāriki Seawall (erosion management unit)

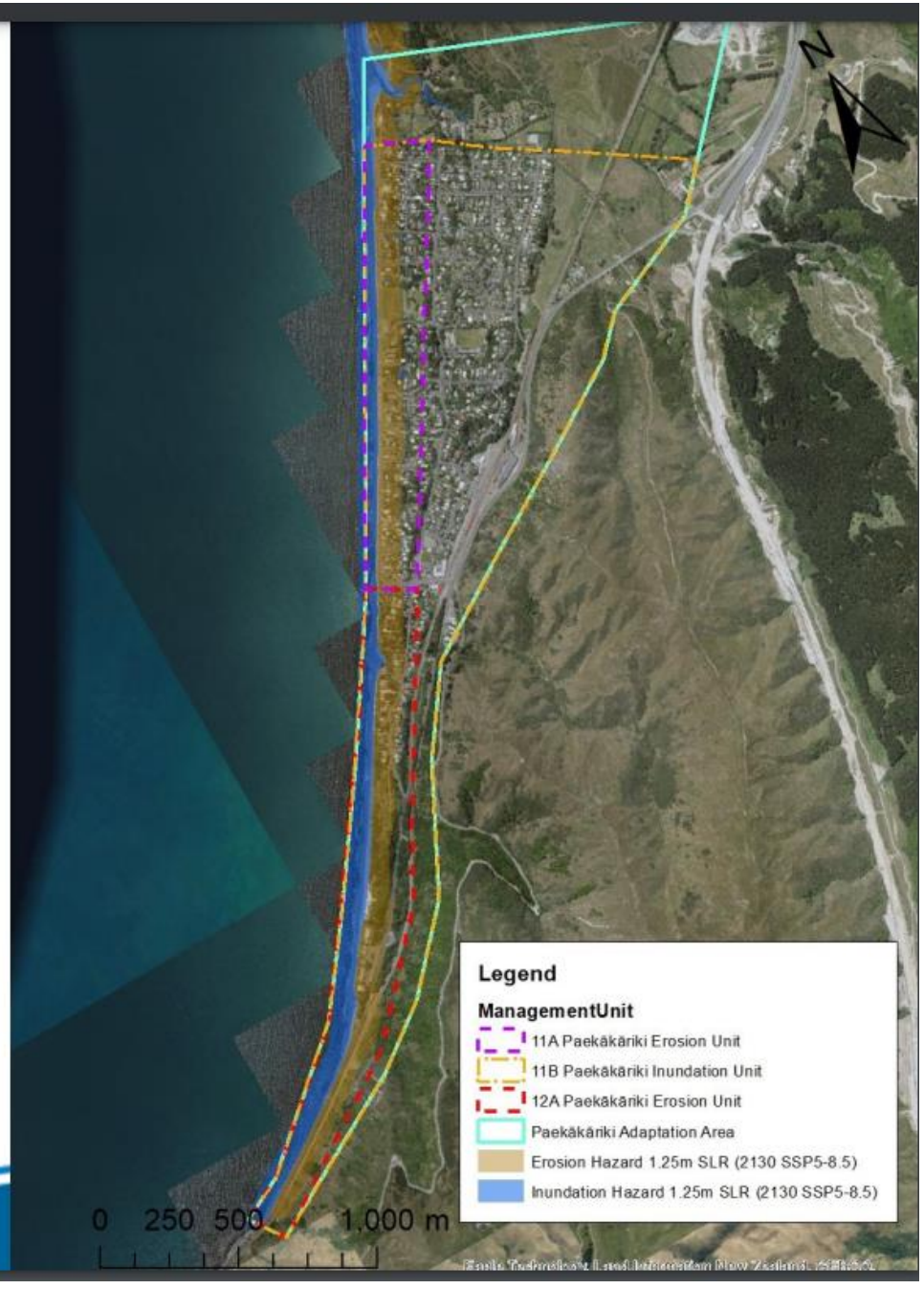
3. 11B Paekākāriki (inundation management unit)

The **inundation hazard** from coastal flooding in the PAA is generally confined to the area around the Wainui Stream. Approaches to dealing with inundation will likely be consistent throughout the PAA, and therefore there is no need to geographically split the inundation unit into smaller sub-units.

The **erosion hazard** in the PAA is generally consistent across the whole adaptation area. There are some differences in how the shoreline is currently managed, however in general the shoreline is currently protected by seawalls, with majority of the area being protected by the public Paekākāriki seawall.

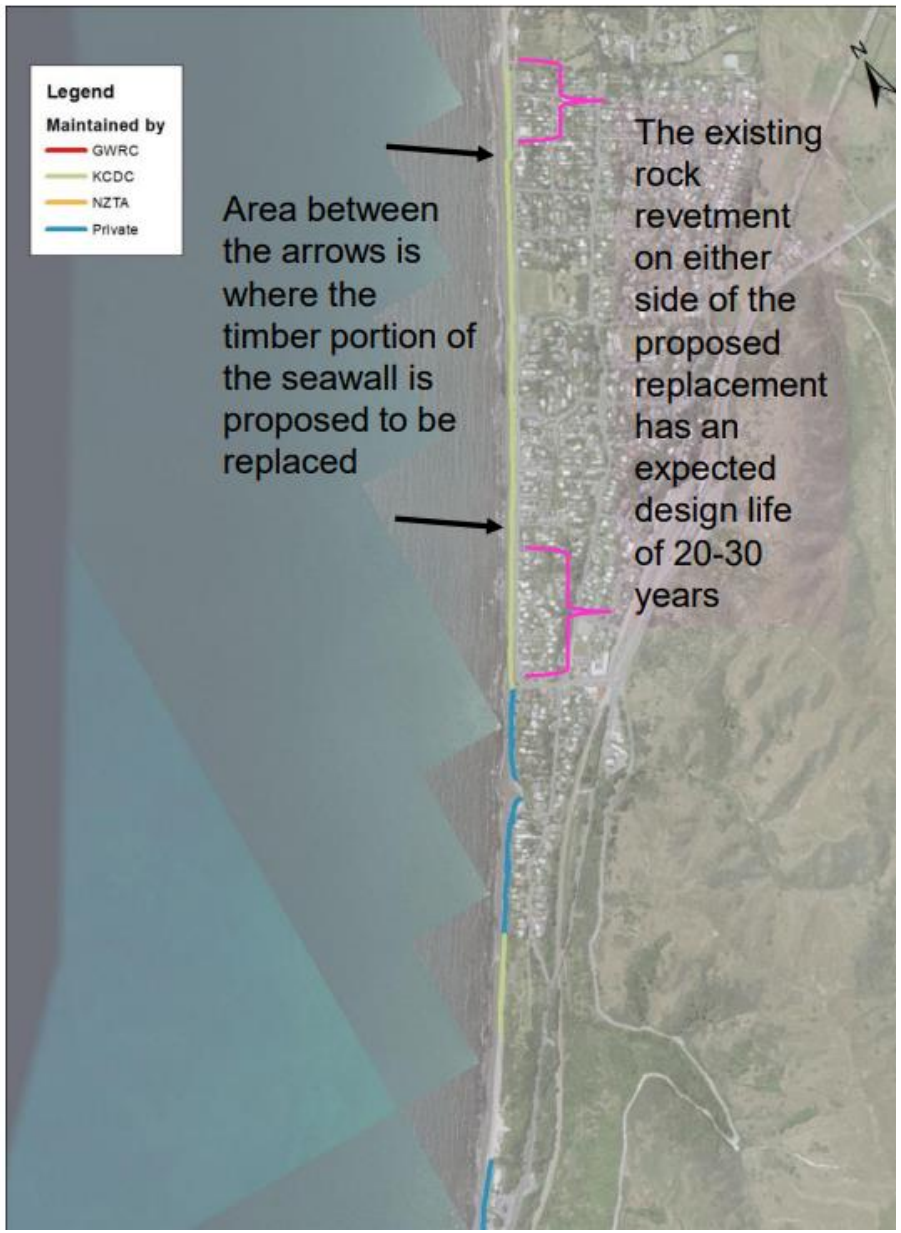
Because of Council's short-term plans of the proposed replacement of the wooden section of the Paekākāriki seawall and a similar expected lifetime of the existing rock revetments on either side of this seawall, the PAA has been split into two erosion management units (11A – Paekākāriki Seawall; 12A – South of Paekākāriki Seawall).

North of the Paekākāriki Seawall is Queen Elizabeth Park, which falls into the GW jurisdiction, so this short section of coast is not included in the erosion and inundation management units for pathway development.



Paekākāriki Coastal Protection Structures

- Most of the shoreline within the PAA has protection structures, with the exception of Ames Street Reserve.
- Most structures are maintained by KCDC, with private structures being in front of properties at Ames Street and Fisherman's Table. NZTA is responsible for the structure along SH59.
- The timber portion of the public Paekākāriki Seawall in the short term is proposed to be replaced as 'like for like' and will likely effectively manage the erosion risks for the next 20 years.



OPTIONS

ACTIONS

ENHANCE	ACCOMMODATE	PROTECT	RETREAT	AVOID
We maintain and improve what we are already doing	We live with the hazard	We keep the hazard away	We move away from the hazard	We don't move into the way of the hazard in the first place
				
• Enhance existing erosion protection structures • Enhance existing inundation protection • Enhance access and ramps • Dune and wetland enhancement/resilience • Emergency management • Environmental monitoring • Community education and risk awareness • Private owners' responsibility	• Relocatable buildings • Raising floor levels • Flood-proofing buildings • Flood proofing infrastructure	**Soft Engineering (Erosion)** • Renourishment • Dune reconstruction **Hard Engineering (Erosion)** • Sea walls (vertical, revetment, buried, interlocking) **Inundation controls** • Culvert outfalls • Stopbanks • Earth bunds • Pump stations	• Retreat • Re-establish the line with a setback ~~sea wall~~ protection structure	• Raising minimum floor levels of new builds • Reduce further intensification or development • Trigger-based or time limited land use consents • Zoning and setback controls

Pathways being considered by the CAP

Management Unit:
11A Paekākāriki Seawall (Erosion Unit)

Properties Exposed in Management Unit 11A Paekākāriki		
	Coastal erosion	
	SSP2-4.5	SSP5-8.5
0m SLR ~2020	0	0
0.2m SLR ~2050	0	0
0.35-0.45m SLR ~2070	69	92
0.85-1.25m ~2130	99	145

- Property counts are cumulative.
- Property count is low up to 2050 as the proposed Paekākāriki seawall and existing rock revetment has a 20 year residual life incorporated into the coastal modelling, so coastal erosion with up to a 0.2 m of sea level rise is based on what could happen in a significant storm causing these walls to fail and land behind to erode. However, because there is a road immediately behind the existing wall, the erosion line does not touch the property edges until the 2070 timeframe.

Pathways Template

Sub-area: 11A Paekākāriki Seawall (Erosion Unit)

Management Unit	Pathway	Short term	→	Medium term	→	Long term
Management Unit: 11A Paekākāriki (Erosion Unit)	Pathway 1	Status Quo[1] and Community Education and Emergency Management[4]	→	Sea wall[13] (Protect – Hard Engineering)	→	Re-establish the line with a setback protection structure[10] (Retreat & Protect)
	Pathway 3	Status Quo[1] and Community Education and Emergency Management[4]	→	Sea wall[13] (Protect – Hard Engineering)	→	Enhance Sea wall[2] (Protect – Hard Engineering)
	Pathway 4	Status Quo[1] and Community Education and Emergency Management[4]	→	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	→	Enhance protection structure[2] (Protect – Hard Engineering)
	Pathway 5	Status Quo[1] and Community Education and Emergency Management[4]	→	Re-establish the line with a setback protection structure[10] & Dune reconstruction[12] (Retreat & Protect)	→	Beach renourishment[11] (Protect – Soft Engineering)

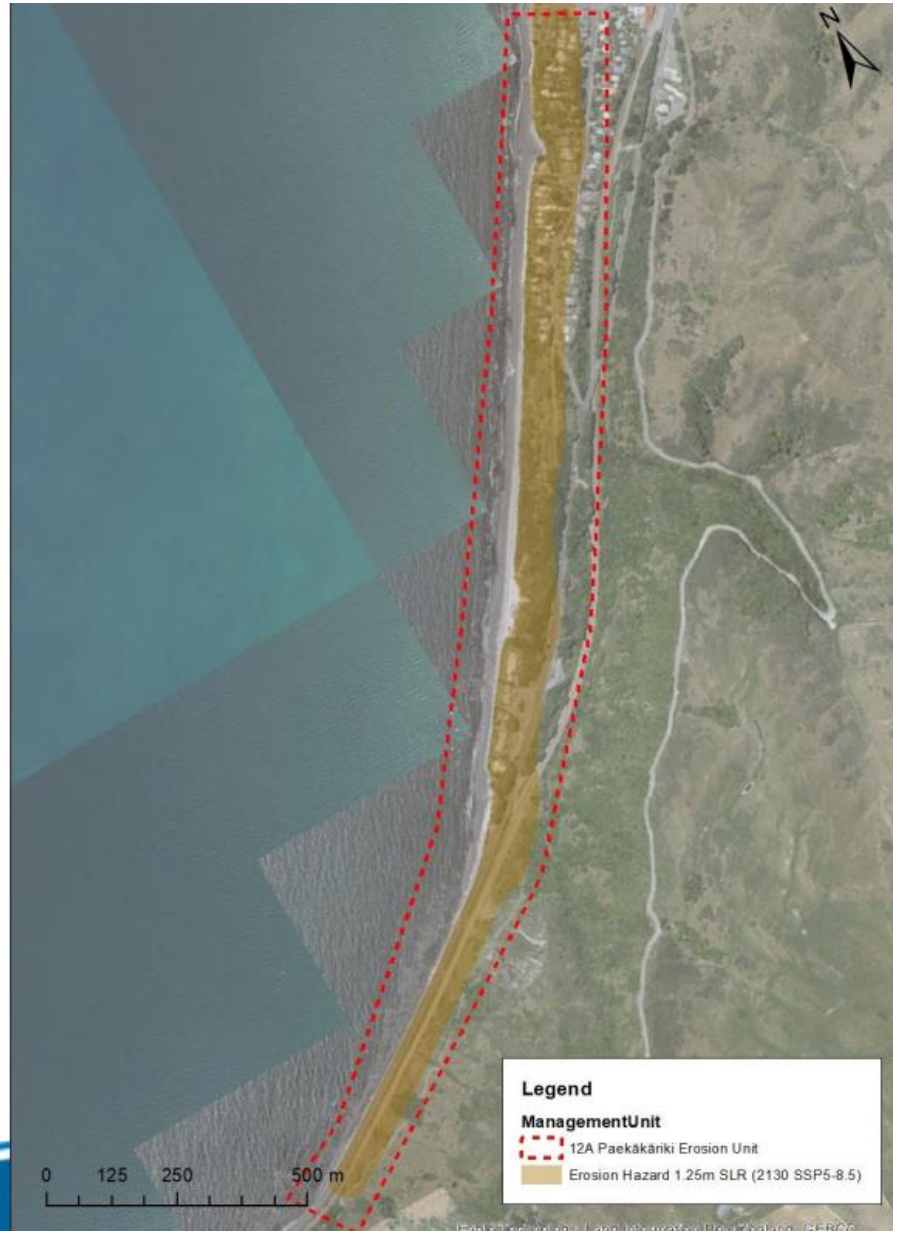
- **The proposed works for the Paekākāriki seawall replacement will have a design life of 20 years. Under 'status quo' it is assumed that these works will go ahead, and therefore will provide protection along this section of coastline for the short-term period. This is the same design life as the existing rock revetment which are on either of the proposed new seawall upgrade. Therefore, "status quo" for these walls will also provide protection for the short-term period.**
- **All pathways at all timeframes to include "Avoid" option through land-use planning (e.g short term is new coastal hazard provisions in Coastal Environment District Plan Change).**
- **Under existing RMA legislation, the success of planning actions is limited to re-developments and new developments. For re-development, this is dependent on the "turn-over" of building stock.**

CAP Discussion Draft

Management Unit: 12A South of Paekākāriki Seawall (Erosion Unit)

Properties Exposed in Management Unit 12A Paekākāriki		
	Coastal erosion	
	SSP2-4.5	SSP5-8.5
0m SLR ~2020	44	44
0.2m SLR ~2050	48	48
0.35-0.45m SLR ~2070	53	57
0.85-1.25m ~2130	67	80

- Property counts are cumulative.



Pathways Template

Sub-area: 12A South of Paekākāriki Seawall (Erosion Unit)

Management Unit	Pathway	Short term	→	Medium term	→	Long term
Management Unit:11B (South of Paekākāriki Seawall Erosion Unit)	Pathway 1	Status Quo[1] and Community Education and Emergency Management[4]	→	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Re-establish the line with a setback protection structure[10] (Retreat & Protect)
	Pathway 2	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Sea wall[13] (Protect – Hard Engineering)	→	Re-establish the line with a setback protection structure[10] (Retreat & Protect)
	Pathway 3	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	→	Enhance Sea wall[2] (Protect – Hard Engineering)
	Pathway 4	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Re-establish the line with a setback protection structure[10] & Dune reconstruction[12] (Retreat & Protect)	→	Beach renourishment[10] (Protect – Soft Engineering)
	Pathway 5	Sea wall[13] (Protect – Hard Engineering)	→	Enhance Sea wall[2] (Protect – Hard Engineering)	→	Enhance Sea wall[2] (Protect – Hard Engineering)
	Pathway 6	Status Quo[1] and Community Education and Emergency Management[4]	→	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Sea wall[13] (Protect – Hard Engineering)
	Pathway 7	Status Quo[1] and Community Education and Emergency Management[4]	→	Sea wall[13] (Protect – Hard Engineering)	→	Enhance Sea wall[2] (Protect – Hard Engineering)

- **All pathways at all timeframes to include "<u>Avoid</u>" option through land-use planning (e.g short term is new coastal hazard provisions in Coastal Environment District Plan Change).**
- **Under existing RMA legislation, the success of planning actions is limited to re-developments and new developments. For re-development, this is dependent on the "turn-over" of building stock.**
- **Seawall is a coordinated approach, yet to be determined if it is publicly or privately funded.**

CAP Discussion Draft

Management Unit:
11B Paekākāriki (Inundation Unit)

Properties Exposed in Management Unit Paekākāriki 11B		
	Coastal flooding	
	SSP2-4.5	SSP5-8.5
0m SLR ~2020	32	32
0.2m SLR ~2050	35	35
0.35-0.45m SLR ~2070	36	36
0.85-1.25m ~2130	45	53

- Property counts are cumulative.

Pathways Template

Sub-area: 11B Paekākāriki (Inundation unit)

Management Unit	Pathway	Short term	→	Medium term	→	Long term
Management Unit 11B: Paekākāriki (Inundation Unit)	Pathway 1	Status Quo[1] and Community Education and Emergency Management[4]	→	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	→	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)
	Pathway 2	Status Quo[1] and Community Education and Emergency Management[4]	→	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	→	Elevate floor levels of buildings[8] or Flood proofing buildings and infrastructure[6] (Accommodate)
	Pathway 4	Status Quo[1] and Community Education and Emergency Management[4]	→	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)	→	Enhance New Inundation Protection[3] (Enhance)
	Pathway 5	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	→	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)	→	Enhance New Inundation Protection[3] (Enhance)
	Pathway 6	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	→	Elevate floor levels of buildings[8] or Flood proofing buildings and infrastructure[6] (Accommodate)	→	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)

- **All pathways at all timeframes to include "Avoid" option through land-use planning (e.g short term is new coastal hazard provisions in Coastal Environment District Plan Change).**
- **Under existing RMA legislation, the success of planning actions is limited to re-developments and new developments. For re-development, this is dependent on the "turn-over" of building stock.**

How these will be scored and prioritised

Takutai Kāpiti MCDA Weighting Chart

	#	Criteria	Description	Weighting	Key Reasons
Impact Criteria	1.	**Ecology**	• Impact or enhancement on indigenous biodiversity values and habitat; and ecosystem functioning within the coastal environment and surroundings. • Ability to protect the natural adaptive capacity of the ecosystem.		•
	2.	**Landscape**	• Impact on the natural character of coastal environment and surroundings. • Aesthetic outcomes of implementing the option and the meaning of this to the community. • Ability to protect the natural adaptive capacity of natural character.		•
	3.	**Te ao Māori values**	• Impacts on or enhancement of the relationship of Māori and their culture and traditions with their ancestral lands. water. sites. waahi tapu and other taonga. • Maintains access to, and enables the carrying out of customary activities, such as mahinga kai.		•
	4.	**Community Social and Economic Wellbeing**	• The community has choice around: ▪ Health and safety of the community ▪ Certainty around future of community ▪ Social cohesion within the community ▪ Maintain the insurability of personal assets.		•
	5.	**Public Access and Recreation**	• Wider community/district use of the coastal environment • Opportunities for recreation • Public access to the coastal environment		•
Technical Criteria	6.	**Regulatory consenting and policy risk**	• Regulatory consenting and policy risks of implementing an option including: - Consenting requirements; - District plan changes; and - Consistency with statutory framework. - Carbon footprint associated with the pathway.		•
	7.	**Effectively manages the risks of coastal erosion**	• Effectively manages the risks of Coastal Erosion. • Proportionate to the nature and scale of the risk over time. • Avoids the exacerbation of risk in other areas. • Approaches are supported by best practice and a robust consideration of the science/Mātauranga		•
	8.	**Effectively manages the risks of coastal inundation**	• Effectively manages the risks of Coastal Flooding. • Proportionate to the nature and scale of the risk over time. • Avoids the exacerbation of risk in other areas. • Approaches are supported by best practice and a robust consideration of the science/Mātauranga		•
	Guidance • All criteria must be 'weighted' on a scale of 1 to 3 (no half numbers) • Weightings are assigned to reflect relative importance between criteria • All criteria are important – wouldn't be included if they weren't • Weightings reflect that while all criteria are important, they are not all equally important to the task at hand • The Panel must debate and ultimately agree which weighting to apply to each criteria				

	#	Criteria	Description	Scoring Guide				
				5. Highly Desirable	4. Desirable	3. Neutral	2. Undesirable	1. Highly Undesirable
Impact Criteria	1.	**Ecology**	▪ Impact or enhancement on indigenous biodiversity values and habitat; and ecosystem functioning within the coastal environment and surroundings. ▪ Ability to protect the natural adaptive capacity of the ecosystem.	Highly likely to provide for enhancement and increase of ecological habitats and values	Likely to provide for some enhancement and increase of ecological habitats and values	Little change likely to ecological habitats and values present	Some reduction in ecological habitats or values. Likely to be limited to the footprint of the options or short term.	Highly likely there will be a reduction in ecological habitat and values, which could be for larger footprint than existing protection and long-lasting
	2.	**Landscape**	▪ Impact on the natural character of coastal environment and surroundings. ▪ Aesthetic outcomes of implementing the option and the meaning of this to the community. ▪ Ability to protect the natural adaptive capacity of natural character.	Positive impact or enhancement of the natural character of the coast, and aesthetic outcomes which align with community expectations.	Likely to provide some increase to the natural character of the coastal environment and aesthetic outcomes mostly align with the community expectations.	Little change likely to the present-day natural character and aesthetics of the coastal environment.	Slight negative impact on natural character and aesthetic outcomes. Aesthetic outcomes do not align with some of the community.	Highly likely to have a negative impacton the natural character of the coastal environment. Aesthetic outcomes do not align with community expectations.
	3.	**Te ao Māori values**	▪ Impacts on or enhancement of the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga. ▪ Maintains access to, and enables the carrying out of customary activities, such as mahinga kai.	Highly likely to have a positive impact or enhancement on the identified Māori cultural values in the area	Likely to have some positive impact to identified Māori cultural values identified in the area	Little change likely to Māori cultural values identified in the area.	Likely small negative impact to identified Māori cultural values in the area	Likely large negative impact to identified Māori cultural values in the area
	4.	**Community Social and Economic Wellbeing**	▪ Health and safety of the community ▪ Certainty around future of community ▪ Social cohesion within the community ▪ Maintain the insurability of personal assets.	Highly likely to provide for all factors which contribute to community social and economic wellbeing.	Likely to provide for most factors which contribute to community social and economic wellbeing.	Little change from the present-day community social and economic wellbeing.	Only likely to provide for some factors which contribute to community social and economic wellbeing.	Unlikely to provide for any factors which contribute to community social and economic wellbeing.
	5.	**Public Access and Recreation**	▪ Wider community/district use of the coastal environment ▪ Opportunities for recreation ▪ Public access to the coastal environment	Highly likely to increase and enhance recreational opportunities and public access to the coastal environment.	Likely to have an increase in recreational opportunities and public access to the coastal environment.	Little change to recreational opportunities and public access from the present day.	Likely to restrict some recreational opportunities and public access to the coastal environment.	Highly likely there will be large restrictions or total loss of public access and recreational opportunities in the coastal environment.
Technical Criteria	6.	**Regulatory consenting and policy risk**	▪ Regulatory consenting and policy risks of implementing an option including: - Consenting requirements; - District plan changes; and - Consistency with statutory framework. - Carbon footprint associated with the pathway.	Low to no risk - Consents are not required or can be easily obtained. No plan change required. Not contrary to statutory framework.	Low risk - Consent or plan change is required but unlikely to be challenged. Not contrary to statutory framework.	Some risk – Requires resource consenting or plan change which could be challenged but is aligned with the current statutory framework.	High risk - Consenting or plan change required which is likely to be challenged. Some elements which are contrary to current statutory framework.	Very high risk - Requires resource consenting or plan change which is highly likely to be challenged by multiple parties, and is contrary to current statutory framework
	7.	**Effectively manages the risks of coastal erosion**	▪ Effectively manages the risks of Coastal Erosion. ▪ Proportionate to the nature and scale of the risk over time. ▪ Avoids the exacerbation of risk in other areas. ▪ Approaches are supported by best practice and a robust consideration of the science/Mātauranga	Highly likely to provide for all the factors listed which manage the risk of coastal erosion.	Likely to provide for most of the factors listed which manage the risk of coastal erosion.	Likely to provide for some of the factors listed to manage the risks of coastal erosion.	Only likely to provide for one of the factors listed which manage the risk of coastal erosion.	Unlikely to provide for any of the listed factors which manage the risk of coastal erosion.
	8.	**Effectively manages the risks of coastal inundation**	▪ Effectively manages the risks of Coastal Flooding. ▪ Proportionate to the nature and scale of the risk over time. ▪ Avoids the exacerbation of risk in other areas. ▪ Approaches are supported by best practice and a robust consideration of the science/Mātauranga	Highly likely to provide for all the factors listed which manage the risk of coastal flooding.	Likely to provide for most of the factors listed which manage the risk of coastal flooding.	Likely to provide for some of the factors listed to manage the risks of coastal flooding.	Only likely to provide for one of the factors listed which manage the risk of coastal flooding.	Unlikely to provide for any of the listed factors which manage the risk of coastal flooding.

Next Steps – Feedback – Questions?