Raumati Adaptation Area: Draft Adaptation Pathways

CAP Meeting 15th November 2023

Information prepared by TAG

This workshop:

The aim of this part of the workshop session is for CAP to:

1. Develop a short-list of pathways for each management unit warrant should be considered further in the MCDA scoring;
2. Define at a high-level what package of actions could be used for each option in the short-listed pathways.

A long list of possible high–level pathways which could give effect to the draft RAA Objective and risk assessment have been drafted as a starter for CAP discussion.

Overview of Management Units

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

1. 9A Raumati - North of Wharemauku Stream (erosion management unit)

2. 10A Raumati - South of Wharemauku Stream (erosion management unit)

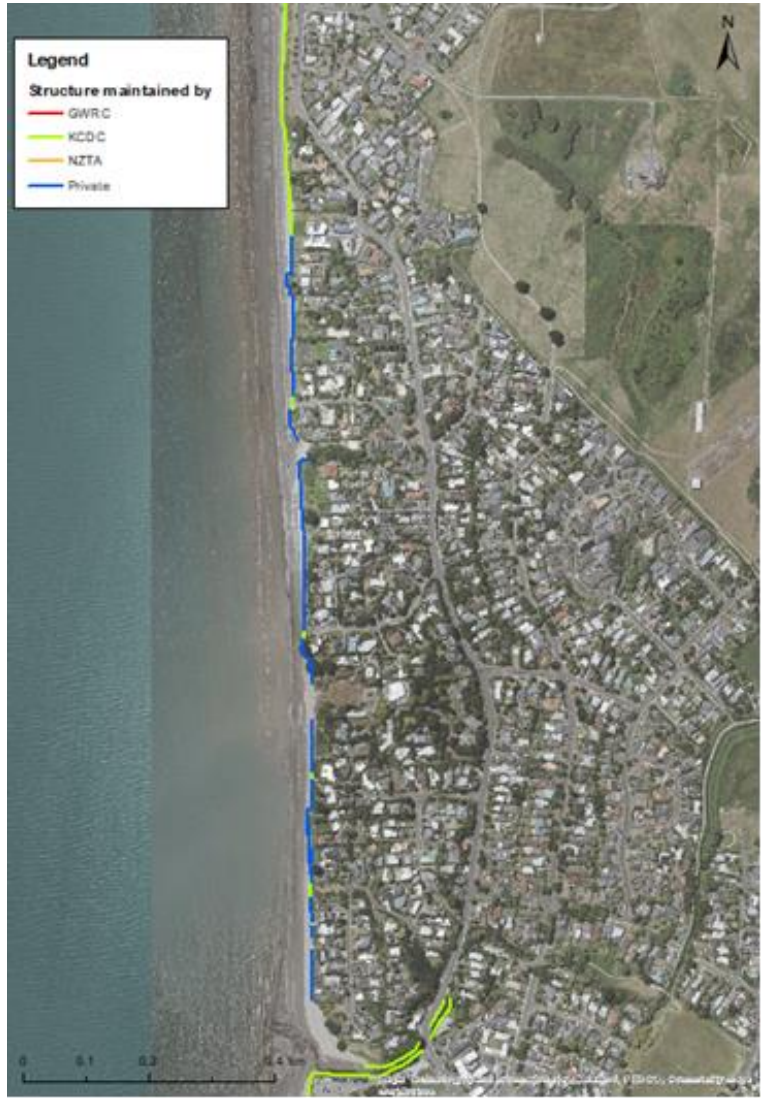
3. 9B Raumati (inundation management unit)

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

- The **erosion management** units have been split into two units based on general ownership/maintenance responsibilities of existing structures – where north of the Wharemauku stream there is generally a single line of private structures that are maintained privately. South of the Wharemauku Stream, KCDC generally maintain the primary structures (e.g. Raumati sea wall), with private structures located further landward being privately maintained (see next slide)

Raumati Coastal Protection Structures

North of Wharemauku Stream



South of Wharemauku Stream

Kāpiti Coast DISTRICT COUNCIL

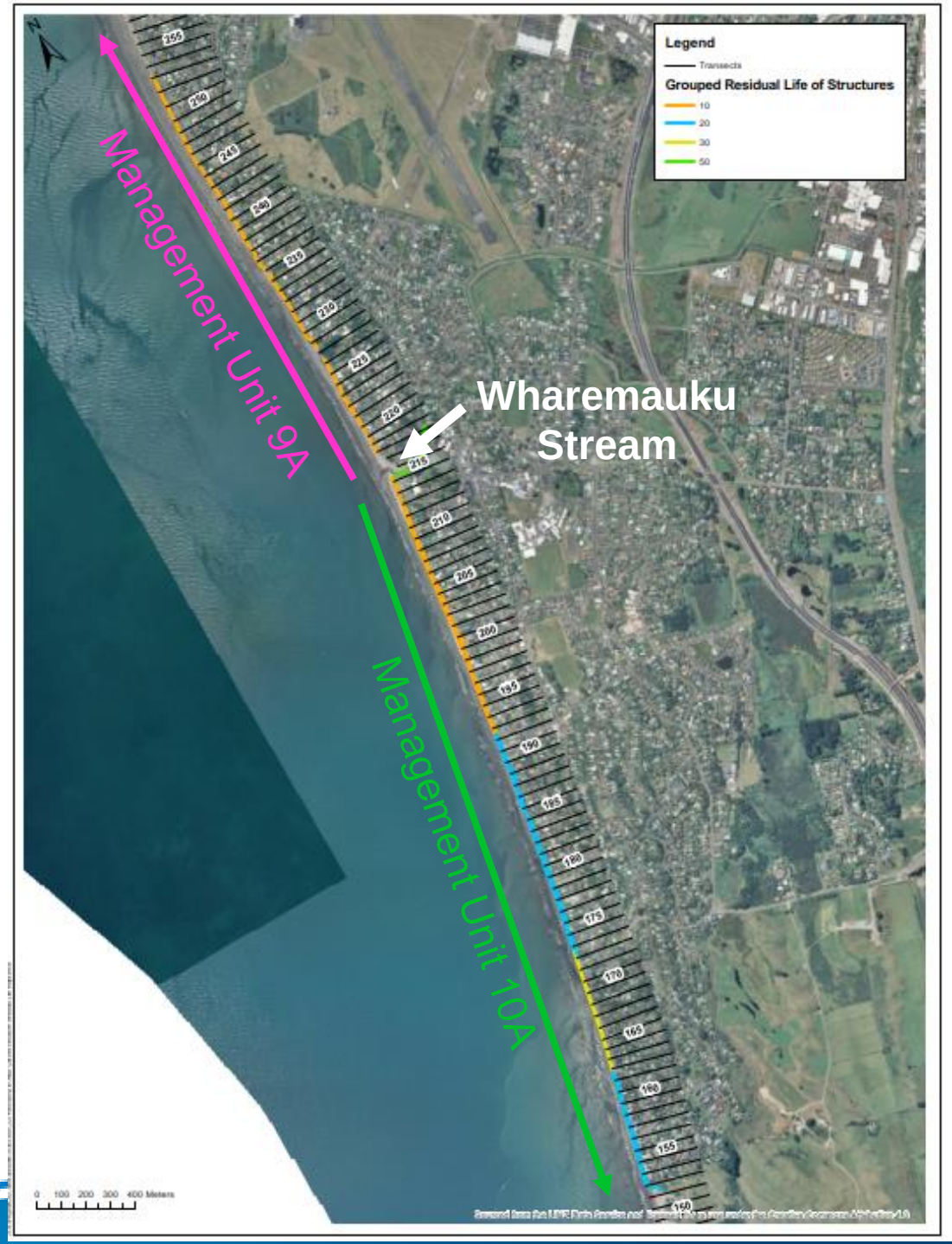
Residual life of existing structures (e.g. status quo)

This map shows the average residual life of structures in the Raumati area from a Tonkin + Taylor (2017) condition survey.

This shows that generally:

- Structures north of the Wharemauku Stream have a residual life of 10 years;

- Structures 1km south of the Wharemauku Stream have a 10-year residual life, and at the southern end of Management Unit 10A residual life of structures is between 20-30 years.



Element	Coastal Erosion						Coastal Inundation					
Climate Change Scenario	Both		SSP2-4.5		SSP5-8.5		Both		SSP2-4.5		SSP5-8.5	
	Present	2050	2070	2130	2070	2130	Present	2050	2070	2130	2070	2130
Built Environment												
Properties - Whole Adaptation Area	M	M	M	M	M	M	L	L	L	L	L	L
Properties - Raumati Beach*	E	E	E	E	E	E	L	L	L	L	L	L
Properties - Raumati South*	E	E	E	E	E	E	L	L	L	L	L	L
Water Supply Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Wastewater Infrastructure	M	H	H	E	H	E	L	L	L	L	L	L
Stormwater Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Roads and Bridges	L	L	L	H	L	H	L	L	L	L	L	L
Electrical Transmission and supply infrastructure	L	L	L	M	L	M	L	L	L	L	L	L
Natural gas supply mains	L	M	M	H	M	H	L	L	L	L	L	L
Natural Character												
CTA2: Paraparaumu and Waikanae	M	M	M	H	M	H	L	L	L	L	L	L

*For erosion assessment, this considers beachfront properties only.

Properties Exposed in Raumati Adaptation Area				
	Coastal erosion		Coastal flooding*	
	SSP2-4.5	SSP5-8.5	SSP2-4.5	SSP5-8.5
0m SLR ~2020	249	249	54	54
0.2m SLR ~2050	280	280	75	75
0.35-0.45m SLR ~2070	320	345	96	114
0.85-1.25m ~2130	590	629	223	458

Number of properties impacted by coastal flooding in RAA appears high, however these numbers are largely made up of beachfront properties where the edge of the boundary intersects with the hazard, or where flooding is generally very shallow. This is reflected by the 'low' risk to properties in the risk assessment from coastal flooding.

OPTIONS

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
				

ACTIONS

- Enhance existing erosion protection structures
- Enhance existing inundation protection
- Enhance access and ramps
- 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
- Flood gates
- Stopbanks
- Earth bunds
- Pump stations

- Retreat
- Re-establish the line with a setback sea wall

- Raising minimum floor levels of new builds
- Reduce further intensification or development
- Trigger-based or time limited land use consents
- Zoning and setback controls

Draft Adaptation Pathways for each Management Unit

Management Unit:
9A Raumati (North of Wharemauku Stream)

Properties Exposed in Management Unit Raumati 9A		
	Coastal erosion	
	SSP2-4.5	SSP5-8.5
0m SLR ~2020	65	65
0.2m SLR ~2050	85	85
0.35-0.45m SLR ~2070	86	95
0.85-1.25m ~2130	138	149

	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	M	L	L	L	L	L	L
Properties - Raumati Beach*	E	E	E	E	E	E	L	L	L	L	L	L
Properties - Raumati South*	E	E	E	E	E	E	L	L	L	L	L	L
Water Supply Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Wastewater Infrastructure	M	H	H	E	H	E	L	L	L	L	L	L
Stormwater Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Roads and Bridges	L	L	L	H	L	H	L	L	L	L	L	L
Electrical Transmission and supply infrastructure	L	L	L	M	L	M	L	L	L	L	L	L
Natural gas supply mains	L	M	M	H	M	H	L	L	L	L	L	L
Natural Character												
CTA2: Paraparaumu and Waikanae	M	M	M	H	M	H	L	L	L	L	L	L

Pathways Template

Sub-area: 9A Raumati (North of Wharemauku Stream)

Management Unit	Pathway	Short term	→	Medium term	→	Long term
Management Unit: 10A Raumati (North of Wharemauku Stream) 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)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 2	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 sea wall[9] (Retreat & Protect)
	Pathway 3	Status Quo[1] and Community Education and Emergency Management[4]	→	Sea wall[12] (Protect – Hard Engineering)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 4*	Status Quo[1] and Community Education and Emergency Management[4]	→	Beach renourishment[10] (Protect – Soft Engineering)	→	Beach renourishment[10] (Protect – Soft Engineering)
	Pathway 5	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Sea wall[12] (Protect – Hard Engineering)	→	Re-establish the line with a setback sea wall[9] (Retreat & Protect)
	Pathway 6	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Re-establish the line with a setback sea wall[9] (Retreat & Protect)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 7	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	→	Re-establish the line with a setback sea wall[9] & Dune reconstruction[11] (Protect – Soft Engineering)	→	Beach renourishment[10] (Protect – Soft Engineering)
	Pathway 8	Sea wall[12] (Protect – Hard Engineering)	→	Sea wall[12] (Protect – Hard Engineering)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 9	Sea wall[12] (Protect – Hard Engineering)	→	Re-establish the line with a setback sea wall[9] (Retreat & Protect)	→	Sea wall[12] (Protect – Hard Engineering)

TAG does not believe this is an appropriate option for the RAA

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 by existing use rights. For re-development, this is dependent on the "turn-over" of building stock.**

Management Unit:
10A Raumati (South of Wharemauku Stream)

Properties Exposed in Management Unit Raumati 10A		
	Coastal erosion	
	SSP2-4.5	SSP5-8.5
0m SLR ~2020	184	184
0.2m SLR ~2050	195	195
0.35-0.45m SLR ~2070	234	250
0.85-1.25m ~2130	452	480

	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	M	L	L	L	L	L	L
Properties - Raumati Beach*	E	E	E	E	E	E	L	L	L	L	L	L
Properties - Raumati South*	E	E	E	E	E	E	L	L	L	L	L	L
Water Supply Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Wastewater Infrastructure	M	H	H	E	H	E	L	L	L	L	L	L
Stormwater Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Roads and Bridges	L	L	L	H	L	H	L	L	L	L	L	L
Electrical Transmission and supply infrastructure	L	L	L	M	L	M	L	L	L	L	L	L
Natural gas supply mains	L	M	M	H	M	H	L	L	L	L	L	L
Natural Character												
CTA2: Paraparaumu and Waikanae	M	M	M	H	M	H	L	L	L	L	L	L

Pathways Template

Sub-area: 10A Raumati (South of Wharemauku Stream)

Management Unit	Pathway	Short term	→	Medium term	→	Long term
Management Unit: 10A Raumati (South of Wharemauku Stream) 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)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 2	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 sea wall[9] & Dune reconstruction[11] (Retreat & Protect)
	Pathway 3	Status Quo[1] and Community Education and Emergency Management[4]	→	Sea wall[12] (Protect – Hard Engineering)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 4	Status Quo[1] and Community Education and Emergency Management[4]	→	Re-establish the line with a setback sea wall[9] (Retreat & Protect)	→	Sea wall[12] (Protect – Hard Engineering)
	Pathway 5	Status Quo[1] and Community Education and Emergency Management[4]	→	Re-establish the line with a setback sea wall[12] & Dune reconstruction[11] (Protect – Soft Engineering)	→	Beach renourishment[10] (Protect – Soft Engineering)
	Pathway 6*	Status Quo[1] and Community Education and Emergency Management[4]	→	Beach renourishment[10] (Protect – Soft Engineering)	→	Beach renourishment[10] (Protect – Soft Engineering)

TAG does not believe this is an appropriate option for the RAA

The proposed works for the Raumati seawall upgrade will have a design life of 25 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 next 25 years.

- **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 by existing use rights. For re-development, this is dependent on the "turn-over" of building stock.**

Management Unit:
9B Raumati (Inundation unit)

Properties Exposed in Management Unit Raumati 9B		
	Coastal flooding	
	SSP2-4.5	SSP5-8.5
0m SLR ~2020	54	54
0.2m SLR ~2050	75	75
0.35-0.45m SLR ~2070	96	114
0.85-1.25m ~2130	223	458

	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	M	L	L	L	L	L	L
Properties - Raumati Beach*	E	E	E	E	E	E	L	L	L	L	L	L
Properties - Raumati South*	E	E	E	E	E	E	L	L	L	L	L	L
Water Supply Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Wastewater Infrastructure	M	H	H	E	H	E	L	L	L	L	L	L
Stormwater Infrastructure	L	L	L	H	L	H	L	L	L	L	L	L
Roads and Bridges	L	L	L	H	L	H	L	L	L	L	L	L
Electrical Transmission and supply infrastructure	L	L	L	M	L	M	L	L	L	L	L	L
Natural gas supply mains	L	M	M	H	M	H	L	L	L	L	L	L
Natural Character												
CTA2: Paraparaumu and Waikanae	M	M	M	H	M	H	L	L	L	L	L	L

Pathways Template

Sub-area: 9B Raumati (Inundation unit)

Management Unit	Pathway	Short term	→	Medium term	→	Long term
Management Unit B: Raumati 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[13] , Culverts[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[7] (Accommodate)
	Pathway 3	Status Quo[1] and Community Education and Emergency Management[4]	→	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	→	Flood proofing buildings and infrastructure[5] (Accommodate)
	Pathway 4	Status Quo[1] and Community Education and Emergency Management[4]	→	Additional Hard Protection (e.g. Stopbanks[13] , Culverts[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[13] , Culverts[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[7] (Accommodate)	→	Elevate floor levels of buildings[7] (Accommodate)
	Pathway 7	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	→	Flood proofing buildings and infrastructure[5] (Accommodate)	→	Flood proofing buildings and infrastructure[5] (Accommodate)

- **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 by existing use rights. For re-development, this is dependent on the "turn-over" of building stock.**