MCDA CRITERIA – RAA ECOLOGICAL VALUES

Notes for coastal erosion options (9A & 10A):

• Due to the shape of the coast, there is a reduced sediment supply to the Raumati foreshore

• This means that the beach and dune systems are not replenished and move inland with erosion

• Ad hoc public and private coastal protection structures (seawalls) have been constructed since at least 1955

• Hence there is little opportunity for indigenous species habitat, other than the northern part of the Raumati adaptation area (Paraparaumu beach bird habitat), Raumati Beach dunes north of Matatua Road at the mouth of the Wharemauku Stream, the Wharemauku Stream, people's gardens and the beach during lower tides

• It is assumed that connectivity of the Wharemauku Stream to the sea is maintained throughout, and some sort of stream estuary is maintained - if not all scores would be reduced by 1 point

• It is assumed that there will be no adverse effects on Raumati Beach dunes - if not all scores would be reduced by 1 point

• Scoring is relative and confined to within the options provided. From an ecology perspective, the best (but admittedly unrealistic) outcome would be to remove all human infrastructure on the dunes and re-establish dune forest and wetlands. If this unrealistic option were available, then all other options would reduce by 1 or 2 points.

Management Unit	Pathway	Pathway Description			Ecological values	
		Short term	Medium term	Long term	Score	Notes
	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 sea wall[9] (Retreat & Protect)		• In the short and medium terms, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • In the longer term, a setback seawall may enable the foredunes to take on a more natural form and if assisted by planting and weed management could provide indigenous habitat. • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further.
	2	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)		• In the short and medium terms, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • However, a reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a setback is required (e.g. unable to remove all hard structures) • In the longer term, a setback seawall may enable the foredunes to take on a more natural form and if assisted by planting and weed management could provide indigenous habitat. • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further.

Management Unit 9A: Raumati (North of Wharemauku Stream) Erosion Unit	3	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	Re-establish the line with a setback sea wall[9] (Retreat & Protect)	Enhance Sea wall[12] (Protect – Hard Engineering)		• In the short term, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity with status quo. • A reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a setback is required (e.g. unable to remove all hard structures) • In the medium term a setback seawall may enable the foredunes to take on a more natural form and if assisted by planting and weed management could provide indigenous habitat • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further. • This could be negated in the longer term by a new hard engineering seawall, and ongoing coastal erosion due to lack of sand supply

Ecological Values

	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)	Beach renourishment[10] (Protect – Soft Engineering)		• In the short term, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • A reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a setback is required (e.g. unable to remove all hard structures) • In the medium term a setback seawall may enable the foredunes to take on a more natural form • Dune reconstruction will an important part of this, especially if assisted by planting and weed management which could provide indigenous habitat • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further. • This could be negated in the longer term by a new hard engineering seawall, but the ongoing coastal erosion due to lack of sand supply would be moderated by beach nourishment. • Beach nourishment will assist with retaining and re-establishing coastal foredunes, especially after storm events.
	5	Sea wall[12] (Protect – Hard Engineering)	Enhance sea wall[12] (Protect – Hard Engineering)	Enhance sea wall[12] (Protect – Hard Engineering)		• Very little opportunity for indigenous fauna, flora or habitats in short, medium, or long term
	6	Sea wall[12] (Protect – Hard Engineering)	Re-establish the line with a setback sea wall[9] (Retreat & Protect)	Enhance sea wall[12] (Protect – Hard Engineering)		• In the short term, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • A reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a setback is required (e.g. unable to remove all hard structures) • In the medium term a setback seawall may enable the foredunes to take on a more natural form and if assisted by planting and weed management could provide indigenous habitat • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further. • This could be negated in the longer term by a new hard engineering seawall, and ongoing coastal erosion due to lack of sand supply

Ecological Values

Management Unit 10A: Raumati (South of Wharemauku Stream) Erosion Unit	1	Status Quo[1] (Current new seawall as outlined in LTP) 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)		• Very little opportunity for indigenous fauna, flora or habitats in short, medium, or long term
	2	Status Quo[1] (Current new seawall as outlined in LTP) 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)		• In the short and medium terms, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • However a reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a set back is required (e.g. unable to remove all hard structures) • In the longer term, a setback seawall may enable the foredunes to take on a more natural form and if assisted by planting and weed management could provide indigenous habitat. • Dune reconstruction will an important part of this, especially if assisted by planting and weed management which could provide indigenous habitat • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further.
	3	Status Quo[1] (Current new seawall as outlined in LTP) and Community Education and Emergency Management[4]	Sea wall[12] (Protect - Hard Engineering)	Enhance sea wall[12] (Protect - Hard Engineering)		• Very little opportunity for indigenous fauna, flora or habitats in short, medium, or long term
	4	Status Quo[1] (Current new seawall as outlined in LTP) and Community Education and Emergency Management[4]	Re-establish the line with a setback sea wall[9] (Retreat & Protect)	Enhance sea wall[12] (Protect - Hard Engineering)		• In the short term, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • A reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a setback is required (e.g. unable to remove all hard structures) • In the medium term a setback seawall may enable the foredunes to take on a more natural form and if assisted by planting and weed management could provide indigenous habitat • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further.

Ecological Values

Management Unit 10A: Raumati (South of Wharemauku Stream) Erosion Unit						• This could be negated in the longer term by a new hard engineering seawall, and ongoing coastal erosion due to lack of sand supply
	5	Status Quo[1] (Current new seawall as outlined in LTP) and Community Education and Emergency Management[4]	Re-establish the line with a setback sea wall[9] & Dune reconstruction[11] (Retreat & Protect)	Beach renourishment[10] (Protect - Soft Engineering)		• In the short term, the reinforced seawall will be a hard engineering structure within a dynamic coastal environment and indigenous species and habitats retain low opportunity status quo. • A reinforced seawall could further reduce habitat opportunities, cause temporary fauna and habitat disturbance, and limit restoration opportunities when a setback is required (e.g. unable to remove all hard structures) • In the medium term a setback seawall may enable the foredunes to take on a more natural form • Dune reconstruction will an important part of this, especially if assisted by planting and weed management which could provide indigenous habitat • A natural dune system will assist with protecting human infrastructure in the long-term, however the lack of sand supply could see the dunes erode further. • This could be negated in the longer term by a new hard engineering seawall, but the ongoing coastal erosion due to lack of sand supply would be moderated by beach nourishment. • Beach nourishment will assist with retaining and re-establishing coastal foredunes, especially after storm events.

Ecological Values

Notes for inundation area (9B):

• There are more (compared to the coast) ecologically significant sites, habitat and indigenous species, and areas of managed open space (indicating values that need protection)

• The Wharemauku Stream is an important asset that has had some restoration work already guided by a restoration group

• The dune landscape extends as least as far inland as SH1

• Because there are more ecological values, there is greater chance of adaptation measures overlapping with these values

Management Unit	Pathway	Pathway Description			Ecological values	
		Short term	Medium term	Long term	Score	Notes
Management Unit 9B: Raumati AA Inundation Unit	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)		• Potential to use water sensitive urban design principles to reduce inundation risk and create indigenous habitat where space allows • Provided that the enhanced inundation protection does not overlap with current ecologically valuable sites then the outcomes for terrestrials ecosystems will be neutral • More information would be needed on the effects on waterways - these could be negative (e.g. undergrounding streams) or positive (e.g. providing more riparian flood areas to reduce downstream flood events or heights) • Long-term hard engineering structures could have long-lasting effects, especially on connectivity between habitats
	2	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] and/or Elevate floor levels of buildings[7] (Accommodate)		• Potential to use water sensitive urban design principles to reduce inundation risk and create indigenous habitat where space allows • Provided that the enhanced inundation protection does not overlap with current ecologically valuable sites then the outcomes for terrestrials ecosystems will be neutral • More information would be needed on the effects on waterways - these could be negative (e.g. undergrounding streams) or positive (e.g. providing more riparian flood areas to reduce downstream flood events or heights) • Unlikely that flood-proofing and elevation of buildings would affect ecological aspects
	3	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)		• Provided that the enhanced inundation protection does not overlap with current ecologically valuable sites then the outcomes for terrestrials ecosystems will be neutral • More information would be needed on the effects on waterways - these could be negative (e.g. undergrounding streams) or positive (e.g. providing more riparian flood areas to reduce downstream flood events or heights) • Long-term hard engineering structures could have long-lasting effects, especially on connectivity between habitats

Ecological Values