PAA MCDA CRITERIA – ECOLOGY

Notes for all options:

- Kapiti Coast District Council is unable to affect what actions are taken along the shoreline of Queen Elizabeth Park as this area is managed by GWRC. The footbridge across the mouth of the Wainui Stream was destroyed in a 2018 storm and has not been replaced. A 2019 Draft coastal restoration plan (PAOS 2019) set out options and GWRC voted in October 2019 to undertake a gradual coastal retreat and withdraw existing visitor facilities and infrastructure that lie within the 40metre erosion zone and restore foredunes. A wetland has been reported along the Wainui Stream within Queen Elizabeth Park. Effects this wetland could be somewhat mitigated by creating and planting up areas expected to be flooded and including some of the more saline tolerant species. This aspect will not be further considered as it will need to be decided by GWRC.
- Effects on penguins from hard engineering structures could be somewhat mitigated by including penguin nesting areas/structures above the expected flood/inundation/storm-surge heights. Northern blue penguins are • known to use cavities in rock revetment seawalls.
- Edge effect where hard structures finish could result in greater erosion of adjacent unprotected areas including Queen Elizabeth Park and Ames Street Reserve. •
- "Re-establish the line with a setback protection structure" is interpreted as construction of Ecoreef Coastal Erosion Protection. Assumptions include that this structure is part of a continuous "sea wall" and that provision is made to include penguin nesting boxes, penguin access tracks, and plant with suitable plant species above expected inundation height, that wave splashed parts of the reef will self-colonise with suitable plant and algae species or that lower parts will be covered with sand. If dog can be excluded from penguin nesting areas (e.g. only accessible from the sea) and other predators trapped then effects on penguins could be mitigated or potentially even provide a benefit.
- For sea wall (protect hard engineering) it is assumed that the sea wall is extended throughout the length of the entire erosion unit. Not doing so would reduce the effectiveness of the seawall and potentially enable erosion behind the seawall from either end.

Management Unit	Pathway	Pathway Description			Ecology values	
		Short term	Medium term	Long term	Score	Notes
	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)		 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion. Medium term - Very little opportunity for indigenous fauna, f Long term - potential to include penguin nesting areas and re the effects.
	2	Status Quo ¹ and Community Education and Emergency Management ⁴	Sea wall ¹³ (Protect – Hard Engineering)	Enhance Sea wall ² (Protect – Hard Engineering)		 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion. Medium and long term - Very little opportunity for indigenou penguins, as this could mitigate some of the effects).

and habitats remain similar to what is there

lora or habitats.

-establish native flora could mitigate some of

and habitats remain similar to what is there

is fauna, flora or habitats (but see note re

(Erosion Unit)	3	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)	 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion. Medium term - the Ecoreef may provide opportunities to incl species. Sand may accumulate at the foot to take on a more na animal species may establish on wave-splashed areas of the str Long term - Retention of biodiversity could be negated in the structures and ongoing coastal erosion due to lack of sand supp can be retained or enhanced
Management Unit 11A: Paekākāriki	4	Status Quo ¹ and Community Education and Emergency Management ⁴	Re-establish the line with a setback protection structure ¹⁰ and Dune reconstruction ¹¹ (Retreat & Protect)	Beach renourishment ¹⁰ (Protect – Soft Engineering)	 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion. Medium term - the Ecoreef may provide opportunities to incl species. Sand may accumulate at the foot to take on a more na animal species may establish on wave-splashed areas of the str Medium term - A natural dune system will assist with protect however the lack of sand supply could see the dunes erode furt Long term - Beach nourishment may enable dunelands to per

and habitats remain similar to what is there

clude penguin friendly habitat and plant native atural dune form or coastal plant or sedentary tructure.

e longer term by additional hard engineering oply, or maintained if existing biodiverse areas

and habitats remain similar to what is there

clude penguin friendly habitat and plant native atural dune form or coastal plant or sedentary tructure.

ting human infrastructure in the long-term, rther.

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Management Unit 12A: Paekākāriki (Erosion Unit)	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)	 Short and medium term - the coastal environment and indig what is there presently, or reduce as a consequence of increas flora and fauna to adapt over time Long term - the Ecoreef may provide opportunities to includ species. Sand may accumulate at the foot to take on a more n animal species may establish on wave-splashed areas of the st
	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)	 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion ar Medium term - Hard engineering structure could limit flora a Long term - There is no guarantee that additional plant and a re-established with a setback, or that animals would (be availathan just a hard engineering seawall.
	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)	 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion ar Medium term - the Ecoreef may provide opportunities to increase. Sand may accumulate at the foot to take on a more n animal species may establish on wave-splashed areas of the structures and ongoing coastal erosion due to lack of sand sup can be retained or enhanced.
	4	Enhance existing protection structure ² , Community Education and Emergency Management ⁴ (Enhance)	Re-establish the line with a setback protection structure ¹⁰ and Dune reconstruction ¹² (Retreat & Protect)	Beach renourishment ¹⁰ (Protect – Soft Engineering)	 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion. Medium term - the Ecoreef may provide opportunities to ind species. Sand may accumulate at the foot to take on a more n animal species may establish on wave-splashed areas of the st Medium term - A natural dune system will assist with protect however the lack of sand supply could see the dunes erode further term - Beach nourishment may enable dunelands to perform the store of the store of
	5	Sea wall ¹³ (Protect – Hard Engineering)	Enhance Sea wall ² (Protect – Hard Engineering)	Enhance Sea wall ² (Protect – Hard Engineering)	 Very little opportunity for indigenous fauna, flora or habitats penguins)

Ecology

genous species and habitats remain similar to sed erosion. More gradual change may allow

de penguin friendly habitat and plant native natural dune form or coastal plant or sedentary tructure.

es and habitats remain similar to what is there nd/or modifications to existing structures.

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animal habitat could be created once the line is able to) recolonise. But potentially more positive

es and habitats remain similar to what is there nd/or modifications to existing structures. clude penguin friendly habitat and plant native natural dune form or coastal plant or sedentary tructure.

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cting human infrastructure in the long-term, Irther.

ersist and provide habitat for dune species. s in short, medium, or long term (but see note re

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)	 Short and medium term - the coastal environment and indige what is there presently, or reduce as a consequence of increase Short and mid-term there is potential to retain some biodiversit Long term - Very little opportunity for indigenous fauna, flora could mitigate some of the effects)
7	Status Quo ¹ and Community Education and Emergency Management ⁴	Sea wall ¹³ (Protect – Hard Engineering)	Enhance Sea wall ² (Protect – Hard Engineering)	 Short term - the coastal environment and indigenous species presently, or reduce as a consequence of increased erosion. Medium and long term - Very little opportunity for indigenous penguins, as this could mitigate some of the effects)

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Management	Pathway	Pathway Description			Ecology values		
Unit		Short term	Medium term	Long term	Score	Notes	
Management Unit 11B: Paekākāriki (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)		 Short and medium term - the coastal environment and indigenous is there presently, or reduce as a consequence of increased flooding Long term - hard structures could affect biodiversity in riparian a and stream connectivity. Hard structures in dune areas could pote Stream is known to have high ecological values from the mouth to reported to have high values. (Refer to note re wetland) 	
	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)		 Short and medium term - the coastal environment and indigenous is there presently, or reduce as a consequence of increased floodir Long term - elevation of floor levels etc. will have little effect on 	
	3	Status Quo ¹ and Community Education and Emergency Management ⁴	Additional Hard Protection (e.g. Stopbanks ¹⁴ , Pumpstations ¹⁵) (Protect)	Enhance Existing Inundation Protection ³ (Enhance)		 Short term - the coastal environment and indigenous species and presently, or reduce as a consequence of increased flooding. (Refe Medium and long term - hard structures could affect biodiversity passage and stream connectivity. Hard structures in dune areas co Wainui Stream is known to have high ecological values from the m not reported to have high values. 	
	4	Enhance Existing Inundation Protection ³ and Community Education and Emergency Management ⁴ (Enhance)	Additional Hard Protection (e.g. Stopbanks ¹⁴ , Pumpstations ¹⁵) (Protect)	Enhance Existing Inundation Protection ³ (Enhance)		 Short term - the coastal environment and indigenous species and presently, or reduce as a consequence of increased flooding and e Medium and long term - hard structures could affect biodiversity passage and stream connectivity. Hard structures in dune areas co Wainui Stream is known to have high ecological values from the m not reported to have high values. 	
	5	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)		 Short term - the coastal environment and indigenous species and presently, or reduce as a consequence of increased flooding and e Long term - elevation of floor levels etc. will have little effect on Long term - hard structures could affect biodiversity in riparian ar stream connectivity. Hard structures in dune areas could potential is known to have high ecological values from the mouth to the heat to have high values. 	

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areas, and could pose issues for fish passage entially increase dune erosion rates. Wainui o the headwaters. Ames Street stream is not

us species and habitats remain similar to what ng. (Refer to note re wetland)

biodiversity

d habitats remain similar to what is there er to note re wetland)

in riparian areas, and could pose issues for fish ould potentially increase dune erosion rates. nouth to the headwaters. Ames Street stream is

d habitats could remain similar to what is there enhancement of existing structures.

in riparian areas, and could pose issues for fish ould potentially increase dune erosion rates. nouth to the headwaters. Ames Street stream is

d habitats could remain similar to what is there enhancement of existing structures.

biodiversity

reas, and could pose issues for fish passage and Ily increase dune erosion rates. Wainui Stream adwaters. Ames Street stream is not reported