Takutai Kāpiti.

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Minutes:
Extended CAP Meeting – Paekākāriki Adaptation Area:
MCDA Scoring of Shortlisted Pathways

Date: Wednesday, 6 March 2024

Location: Robin's Nest, Ngā Manu Nature Reserve, 74 Ngā Manu Reserve Road, Waikanae

Time: 1.00 pm – 5.00 pm

Attendees: Jim Bolger (Chair), Jerry Mateparae, Donald Day, Martin Manning, Susie Mills, John Barrett, Moira Poutama, Kelvin Nixon, Stephen Daysh, Derek Todd, Monique Eade, Damian Debski, Rhys Girvan, Danielle Johnson, Paula Blackett, Astrid Dijkgraaf, Iain Dawe, Jason Holland, Sandhira Naidoo, Alfred Lison, Heather Patterson, Abbey Morris.

Observers: Mayor Janet Holborow

Apologies: Mark Taratoa, Olivia Bird, Tim Sutton, Glen Olsen, Sophie Hanford, Sean McKinley and Michael Moore.

Agenda Item	Comments
Opening & Introductions	**Karakia** by **John Barrett** **Welcome** by **Jim Bolger, Chair** Jim extended welcome to Mayor Janet Holborow and asked if she wanted to say anything. Mayor Janet Holborow thanked the CAP for the work that has gone on and wished the CAP all the best for the next phase.
Confirmation of the minutes	**Jim Bolger, Chair** *30 November 2023 CAP meeting minutes* Jim asked for comments on the minutes – none were raised. Jim motioned to move the minutes from the 30th November 2023 CAP Meeting be accepted. Don supported the motion to move the minutes and Kelvin seconded the motion. *9 February 2024 CAP meeting minutes* Jim asked for comments on the minutes. Don requested a minor wording amendment with no objections from the CAP. Don supported the motion to move the minutes and Jerry seconded the motion.
Project Update	**Abbey Morris (KCDC)** • Stephen and Abbey met with CAP ahead of the CAP meeting to discuss the CAP recommendation report and community engagement timeline. • At this previous meeting CAP confirmed that they wish for Mitchell Daysh to provide writing support to the CAP for their recommendation report. This will be done between CAP and Mitchell Daysh, with no involvement from Council. • The CAP requested that Abbey and Stephen create a timeline for report milestones and community engagement pop-ups – this was tabled. • Jim asked the CAP if they were comfortable with the timeline. CAP agreed.

	• Abbey shared that Olivia had shared her scores with Abbey due to not being able to attend the CAP meeting. Abbey shared she would share Olivia's scores with the CAP as they go throughout the scoring process today. **See Appendix 1 to these minutes for tabled timeline.**
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Paekākāriki Adaptation Area	**Stephen Daysh, Mitchell Daysh with support from Derek Todd, Jacobs** *Focusing on the 'Effectively manages the risks of coastal erosion' criterion.* • Abbey asked CAP if they wanted to be walked through the prior reading material or if they felt they had reviewed the documents enough ahead of the meeting to go into the scoring. CAP agreed to hear a high-level summary from TAG before moving onto MCDA scoring for the criteria. • Derek gave a summary of the pathways for Management Unit 11a and provided rationale behind the difference in his scores. The full rationale can be found in **Appendix 2 to these minutes**, and he added that: ○ PW 1 is scored at 5 as it meets all the factors to effectively manage coastal erosion, particularly because of the 'Re-establish the line with a setback protection' option in the long term. He continued by explaining that coordinated approaches (such as coordinated seawalls) score higher and ones that have a setback requirement also score high because they can adapt to the risk. Derek added that the pathway holds the current seawall line for as long as feasible, before moving it back to a safer position. Derek also added that he scored these pathways whilst also looking at how CAP scored similar pathways in Raumati to ensure consistency, but this pathway did not appear for Raumati. ○ PW 2 is scored slightly lower at a 4 due to the pathway not including moving the seawall and only enhancing the new seawall to be built in the same position as the current one, resulting in less confidence that the seawall will be proportionate to the scale of the hazard in the long term without relocating it back. ○ PW 3 was scored at a 5 as it includes moving the seawall line back in the medium term instead of the long term, and then enhancing that new hard protection structure in the new location in the long term. Derek added that this the most effective option for managing coastal erosion. Jim highlighted this to CAP, noting this as important to remember when CAP engages with the community. ○ PW 4 was scored lower at a 3 due to uncertainty around effectiveness and cost of maintenance of dune reconstruction, although the dune will provide some buffer in front of the setback hard protection structure. Derek added that the dune reconstruction and beach renourishment may not deliver what it set out to without high maintenance costs. • John asked if anywhere in this process has consideration around levels of hazard if the Paris Agreement is achieved. Derek replied that the different scenarios of climate change and sea level rise do not affect what actions are taken, rather when they are taken. Adding that you only move from the first action in the pathway to the second action in the pathway if the current action is no longer working – aka signals, triggers, and thresholds. • Kelvin asked for the justification behind giving PW 4 a 3 instead of a 2. Derek responded that if the hard protection structure is built with the assumption that the dune reconstruction and beach renourishment will work then that presents some risks.

	• Susie asked if the new line would be reestablished where there are currently houses on The Parade. Derek responded that a reasonable distance is yet to be defined, adding that 20 metres setback has been used for costing in the economic report which would allow enough space. Derek also added that in the case of the re-establish the line with protection structure and dune reconstruction a measure of 30 metres has been used to allow the dune to have enough room in front. Jim said that Derek sounds correct, because if you are going to make a dune that is going to last you have got to give it a proper slope and space. • Abbey added that Derek's measurements have only been done for theoretical economic calculation purposes for CAP to consider the cost impact of their draft pathways. There have been no plans nor designs drafted to implement this option as it is not within the scope of the project to do this extra work. It would be up to Council (Elected Members) post the CAP's recommendation report, and the CAP recommended it, if Council wished to explore this option further. Further community consultation would also be required before this option could be explored. • Jim asked Mayor Janet if Council has been engaged in discussing what kind of support can be offered to those who are in the houses that would have to move in this scenario. Mayor Janet replied no. She further added that Council would support practically as much as reasonable but would be looking to Central Government for that support, also adding that this is an issue that Council needs to start considering. Jim noted that none of the ratepayers, members of Council, or even a former prime minister (referring to himself) will be around in the long term when the possible hard protection structure in this pathway would likely be built, but CAP still needs to be able to answer the questions and concerns of the community in present day. • Stephen clarified that reestablishing the line in Paekākāriki would likely impact that first row of houses behind the Parade. • Kelvin asked how the economic costing for retreat is calculated, considering that land for people to retreat to needs to be purchased. Derek responded that the calculation for the cost of retreat is the average property value with a 2.5x multiplier, based on previous work done to calculate this in the Hawkes Bay done by Tonkin and Taylor. This cost covers the demolition, relocation, and reconstruction, which includes the land to buy. None of the work done for the economics covers who would pay for such costs. • Don queried the description of the criteria, particularly where it says, "effectively manages coastal erosion", saying that if he was someone who had to move as part of a managed retreat, he would not agree that the erosion hazard was effectively managed. Don added that considering this he does not believe that any pathways that include retreat can be scored highly as that is not managing the erosion hazard. Derek replied that retreat would effectively manage the erosion hazard because the infrastructure that is at risk of being eroded would be moved away from the hazard. Derek added that managed retreat is a very effective way of managing the hazard, but there are large costs associated with it – both financially and socially. Abbey clarified that these MCDA criteria were set up to assess how each pathway will have an impact on specific elements individually, but there are a lot of other elements to be considered through the other criteria which will build a larger holistic picture when the scoring for each criterion are brought together.

- Derek acknowledged Don's point that managed retreat does have a significant impact on the human domain, but that is a criterion which is being considered later in the meeting. Jim referred to television coverage about Hawkes Bay and the damage caused by the floods which showed that the impact of hazards is never felt equally across communities.
- Stephen asked if CAP had any further questions. There were no further questions.

Stephen invited Derek to discuss pathways for Management Unit 12a.

- Derek gave a summary of the pathways for Management Unit 12a and provided rationale behind the difference in his scores. **The full rationale can be found in Appendix 2 to these minutes**, and he added that:
    - PW 1 is scored as a 3 because of the uncertainty in the effectiveness of and the ability to maintain the different ad hoc structures that are currently in place. Abbey noted for information that PW 1 includes a mini retreat in the long-term to be able to allow space for an effective structure.
    - PW 2 is scored higher (4) than PW 1 as it allows for enhancement of the existing piecemeal structures straight away, then moving into a coordinated approach seawall before a mini retreat. The reason PW 2 did not score a 5 is due to uncertainty of how effective the piecemeal structures can be even with the enhancement in the short-term. Mayor Janet emphasised the wording around "allowing enhancement" of the current private ad hoc structures, as Council will not be the ones enhancing them as Council does not pay to protect private assets – only Council infrastructure. Derek agreed that the pathway doesn't specify that it is Council doing the enhancement, but it is allowing people to do those enhancements themselves through planning frameworks. Jim agreed that the key word is "allowing", with Mayor Janet adding that it needs to be very clear for the community who read these reports. Susie suggested that the CAP's report should note that there is no assumption that Council will be funding these projects. Stephen agreed.
    - PW 3 is scored highest (5) due to the reestablishment of the line in the medium term, then enhancement of the new line in the long term. This pathway will have the best outcome in terms of managing erosion risks.
    - PW 4 is scored lower (3) than the previous pathway, even though they are similar, due to the uncertainty in effectiveness of beach renourishment in the long term.
    - PW 5 also scored a 3 because although a coordinated approach to managing coastal erosion is best practice, the line does not move back even into the long term. There is uncertainty around how appropriate it may be to hold that line long term and the negative impacts that may have.
    - PW 6 scored a 1 because the coordinated protection scheme would come in the long term and would also not be moved back. Whilst there is a sea wall built in the long term, the beach line may have already eroded further already from that line. Jim noted that could mean a sea wall being built out in the ocean. Susie added that movement from different pathway stages happens based on triggers, so even though the seawall is technically in the long term you could still hit the trigger for it far sooner than expected. Derek confirmed Susie is correct. Stephen replied that

	indicates the pathway is not going to be effective over the next hundred years if the trigger for the long-term action could happen too soon. ○ PW 7 scored a 3 because the hard protection is being built much earlier, but this is not as effective as relocating the sea wall. ○ Kelvin asked why PW 5 and 7 are both scored at 3 even though there is a significant difference between the two. Derek replied that both pathways have a sea wall built but the sea wall for PW 5 is much sooner, offering greater protection. Derek added that Kelvin is correct in his observation, so if one of the scores were to go down to reflect that then PW 7 could be downgraded to a 2, or PW 5 up to a score of 4 as this is how the same pathway was scored for Raumati. Stephen asked if CAP would like this to be reflected in the final TAG scoring. CAP agreed on Derek's suggestion to change the scoring of these two pathways. Derek moved onto explaining his scoring for Management Unit 11b. • Derek explained that all pathways have scored 1 as none of them are effective in managing the coastal erosion risk, and this unit is an inundation unit therefore the short-listed pathways for this unit are focused on managing the inundation risk. This is consistent with how TAG have scored for this criterion in other adaptation areas and management units. **TAG's scoring of these pathways against this criterion can be found in Appendix 2 to these minutes.**
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Paekākāriki Adaptation Area	**Stephen Daysh, Mitchell Daysh with support from Damian Debski, Jacobs** *Focusing on the 'Effectively manages the risks of coastal inundation' criterion.* • Stephen introduced Damian to discuss his commentary on the criterion. • Damien explained that all pathways were scored in relation to how effective they are in managing the risk of coastal flooding, how proportionate they are to the scale of the risk over time, whether they avoid exacerbation of risks in other areas, and how the pathways follow best practice. • Damian gave a summary of the pathways for the two erosion management units (11a and 12a), explaining that because the pathways are designed to manage the risks of coastal erosion, they score low in their effectiveness of managing the risks of coastal flooding. He explained that the inundation risk in these units is low due to the elevation of the area and the limited pathways for inundation. • Susie asked why PW 4 on 11a was not scored higher, since beach renourishment helps with preventing wave runup. Damian stated that all pathways that include beach renourishment or set-back line reestablishment have been scored slightly higher, because dunes and beaches held stop wave runup and setting back the line will pull it back further away from the risk. • Jerry noted that most of the properties in Management Unit 11a are elevated on the hill where they won't be at risk of inundation, whereas the area more at risk of inundation is in Management Unit 11b which is lower lying behind the hill, therefore Jerry could not see how scoring them both units similarly for inundation will be effective and he was concerned it would unfavourably pull down a pathway option when the scoring was all pulled together. ○ Derek replied that pathways that are designed to deal with inundation could have some co-benefits for areas where the risk is erosion rather than inundation.

	○ Jerry responded in agreement with Derek, however, the units where there have been co-benefits have included low-lying areas, but Management Unit 11a does not. ○ Martin added that this seems to be downgrading options for no reason. ○ Jim noted that there seems to be some confusion amongst CAP in unit boundaries between erosion and inundation units, adding that the CAP will need to be clear on the purpose of these when they go out to talk to the community to avoid confusion, especially if CAP go out to the community and try to tell them that they are at risk of coastal inundation only for them to reply that they are on a hill. ○ Damian replied that there is low lying land right along the shorefront at the Waikakariki Stream with its flow-path up to Ames Street. Stephen clarified that there is no overlap between erosion and inundation units. ○ Derek clarified for the CAP that TAG have assessed these pathways with the knowledge that there are some lower-lying areas, even in units where erosion is the main hazard, so the scoring has reflected how effective these pathways would be on managing the risk of coastal inundation. Derek added that this is consistent with how all the other pathways in all the adaptation areas have been scored where the pathways were not designed to deal with the main coastal hazard of the area but showing that there can be some co-benefit against the other hazard type. Derek clarified that Damian's scoring is reflective of this, where 11a PW 2 has been scored as 1 because there is minimal co-benefit, whereas PW 3 has been scored as 2 because there is very limited co-benefit. He continued by explaining with an example that if we were on a low part of the coast and built a big seawall it would score high for both erosion and inundation as there is more co-benefit due to the hazard being removed. ○ Martin replied that the scoring is negative. Derek responded that there are no negative scorings, just less or more effective pathways. ○ Jason explained to the CAP that this method of scoring has been consistent with all other pathways in all other areas when scoring against the erosion/inundation hazard criterion that is not the main hazard for the unit, and that consistently low scores across PWs will mean this criterion will make little difference to final scoring. ○ Derek replied that TAG debated whether or not to only score erosion units against the erosion criterion and only score inundation units against the inundation criterion. But it was decided that it was better to score them all against both hazard criterion and score lower when there was no co-benefit or co-effectiveness. ○ Stephen clarified that it was the CAP that decided to score the pathways against all criterion, which is what has been done throughout this process. Stephen added that it was during a long workshop/meeting where the CAP made a lot of decisions regarding the scoring process. ○ Martin said he remembered the discussion going the opposite way and will need to look into the minutes for that meeting. Stephen invited him to do so for review as that was a key session. ○ Jim discussed his concerns for CAP being able to explain this process to the community when there is still disagreement in understanding between the CAP itself. ○ Abbey added that the CAP may wish to explain this process clearly in their report for ease of the reader's understanding. Jim agreed.

	○ Jerry replied that the recommendations report should outline that these pathways provide very little impact on the inundation in the hill areas and that is why they all score low, however, there are some other pathways that the TAG have noted as being even less useful in managing the coastal inundation. ○ Stephen returned to Damian's scoring, stating that he believes it is fair and reasonable considering. ○ Jim brought up an issue with interpretation of 're-establishing the line', because it could mean someone leaving their property or moving their property back. Derek noted that he doesn't like the word retreat because it leaves a lot open for interpretation, but for the sake of scoring it has been assumed that the people would leave the property. Kelvin replied that 'planned relocation' would be better. ○ Jerry offered an explanation by saying the pathways overall in terms of inundation in 11a provide very little benefit for inundation therefore the scoring is 1, but there are a few instances where the pathway is slightly more beneficial, so the scoring has gone up slightly. • Jim requested that CAP clarify wording for answers to frequently asked questions to ensure the community receive a consistent message. *CAP NOTED TO HAVE A CLEAR EXPLANATION OF MCDA SCORING, ESPECIALLY BETWEEN INUNDATION AND EROSION, IN DRAFT RECOMMENDATIONS REPORT.* Stephen moved onto the inundation Management Unit 11b, and requested Damian explain his scoring for these pathways. • Damien explained that the overall inundation risk for this unit is low, so the CAP need to keep that in mind when scoring. Damian continued by explaining that the pathways for this inundation unit contain elements which are specifically designed to manage inundation, and the difference between the pathway scores are around how soon into the future those elements are brought in, which then relates to how proportionate these pathways would be against the level of the hazard. Damian also added that all these pathways score higher in terms of inundation because they are specifically designed to address the inundation hazard. Damian explained that the first two pathways scored highest (5) due to them being effective but also proportionate to the projected risk, noting that there is little to no risk in the short term so there is little justification for a lot of extra investment. ○ Jerry clarified with Damian that part of his scoring included how necessary the actions in the pathway are, and that Damian has indicated that creating new infrastructure early will have no extra benefit. Damian confirmed this and noted that this is one of the scoring criteria. Jerry responded that he considers building the structures you may need ahead of time seems more beneficial to him than waiting until they are needed. ○ Stephen added that the signals, triggers, and thresholds will be in place to give early indication that new protection will be needed and will give enough time to action the new protection. Damian added that we do not know when the short, medium, and long term will occur, but they are trying to identify what responses will be beneficial against the hazards present into the future, also noting that we may never reach the trigger for the long-term action so it would not be proportionate to the hazard

	to build the infrastructure too early when we may not need it. It would be a disproportionate response to do actions in the short term that we may not need in the long term. ○ Mayor Janet added that it seems the scoring is based on how 'efficient' the pathways are and clarified that an action that could be the best option for managing the hazard may be scored lower due to it being 'overkill'. TAG agreed with this clarification, with Derek also adding that proportionality can go both ways because an option could also be undersupplying protection in contrast to oversupplying protection, and in this case, it would also be scored lower. ○ Jerry noted concerns that the scoring should be based upon the efficacy of the pathway to provide protection against coastal inundation without being downgraded just because the scale might not be needed. ○ Jerry wanted to note in the minutes that there is disagreement for the use of the word 'proportionate' in the MCDA scoring criteria. ○ Kelvin pointed out that PW 2 for 11b is scored higher (5) than an identical pathway in Raumati (4). Damian responded that there is more risk of coastal inundation in Raumati in the medium-term than Paekākāriki, therefore the medium-term action would be less effective in Raumati than Paekākāriki. **TAG's scoring of these pathways against this criterion can be found in Appendix 2 to these minutes.**
Tea break	
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Paekākāriki Adaptation Area	**Stephen Daysh, Mitchell Daysh with support from Monique Eade, Jacobs** *PAA Shortlisted Pathways with MCDA Regulatory consenting and policy risk commentary* Jim welcomed Monique and invited her to begin a summary of her commentary for regulatory consenting and policy risk. • Monique began by reminding CAP that the scoring of this criteria is considerate of whether the option fits in with the current policy framework and how it fits with the direction of policy change without the ability to see into the future and know for certain. ○ Monique continued that there is little difference between status quo and enhance from a consenting perspective because the status quo of our consenting framework already allows for a certain amount of enhancement. However, if we are doing significant enhancements that could be considered a new seawall. New seawalls require resource consent, and the current policy is not very supportive of seawalls but given the area already has a lot of seawalls it likely would be easier. ○ Monique reminded CAP that alternative management approaches will need to be considered as part of those resource consents, but that is what is being done here as part of the process by considering the wide range of options. ○ Pathways with seawalls generally score a 3. The exception being if there is only one action in the pathway that would require resource consent, because it would be easier to enact the pathway instead of having to go through the resource consent process several times.

	○ The other options get scored 2 because they include reestablishing the line, which is far harder than just a seawall, include plan changes, and there is no current active framework to enact a retreat. • CAP began their discussion and scoring for Management Unit 11a ○ Kelvin asked if reestablishing the line would be in the framework for the long-term plan. Jason replied that there is not yet any framework from Central Government for councils to go through the process of a managed retreat. Monique is only able to look at the current regulatory requirements which could be different in 5 years. Jim noted that CAP should include this point of limitation in their report. • Monique summarised her commentary for scoring of Management Unit 12a. The CAP did not have any further questions. • Monique moved onto summarising her scoring and commentary for Management Unit 11b. The CAP did not have any further questions. **TAG's scoring of these pathways against this criterion can be found in Appendix 2 to these minutes.**
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Paekākāriki Adaptation Area	**Stephen Daysh, Mitchell Daysh with support from Danielle Johnson and Paula Blackett, NIWA** *PAA Shortlisted Pathways with MCDA commentary for Community Social and Economic Wellbeing* Paula gave a high-level observation for the 'Community Social and Economic Wellbeing' criteria. Paula explained that this is a difficult criterion to score due to how the impacts of these hazards vary across different groups of people, as there are people directly affected and then there are those that are not affected, so there is a different distribution of benefits and costs. She continued that the scores attempt to reflect the complexity of the entire community and the diversity of views seen in the Paekākāriki Community Values Report. Paula discussed how someone is affected no matter what pathway is chosen, it is just a matter of who and when. Communities are not all the same, there is complexity and heterogeneity. • Danielle gave a summary of the pathways for the erosion Management Unit 11a. Notably adding that: ○ Most of the pathways take a hard engineering approach, whilst PW 4 is mixture of soft and hard approaches. Danielle reiterated that she has offered several perspectives of potential impact in her commentary. ○ Most of the scores are middle of the road. ○ In PW 1 and 3 there is a mixture of holding the line and re-establishing/retreating the line, and hard engineering solutions like seawalls and retreating the line can be contentious for communities. ○ Whilst the scoring is largely pinned upon impacts to social cohesion, other elements also include insurability of homes, certainty about the future, discretions on who must pay for the adaptation and who will get the most benefit from it – especially when considering possibility of increase in rates. Danielle explained how there are many sources of possible tensions. ○ Danielle also discussed that the Paekākāriki Community Values Report showed how important the beach is to the community, so any pathways that include seawalls will negatively impact those people from the loss of the beach with a seawall. • CAP began discussion and scoring for Management Unit 11a.

	• Don commented that he was struggling to score any pathway above 2 as he did not believe any of them met all the factors that define the community, social, and wellbeing criterion scoring table.
	  ○ Jerry disagreed with Don. Stephen proposed none of the pathways could score above a 3, which Jerry agreed with, but reiterated his disagreement that it did not meet community expectations or meet the criteria.
	  ○ Abbey asked Danielle and Paula if they thought any of the pathways would be better for the community, or if it was middle of the road all the way. Paula replied that it is an aggregate of two different perspectives; there are those who are directly affected by the hazard and need this protection to keep their insurability, then there are those who are not affected by the hazard that could lose their beach to a seawall and must help pay for it. This is why the scores are largely middle of the road.
	• Stephen asked Derek if a sandy beach would be maintained if nothing is done, as this is a part of the coastline that gets steep quite quickly. Derek replied that it would maintain a sandy beach as the erosion would continue pulling sand from the sand dune where there is the road and houses. Stephen then asked Derek if there would be a sandy beach in front if the line was retreated, and Derek confirmed this.
	CAP moved on to Management Unit 12a.
	• Danielle share that the main difference between 11a and 12a is that 12a is predominately private seawalls, whilst 11a has the Council seawall. Danielle explained that this can cause tension due to social inequities to maintain them, resulting in concerns over insurability and uncertainty about the future.
	• Danielle continued that there could be tensions around moving from an uncoordinated to a coordinated approach, as some may feel they are having to pay twice for protection after already maintaining their own seawall. She added that conversely there may also be a positive effect on social cohesion, as having a uniform degree of protection could have implications on insurability and leave people feeling that they are equally as protected as their neighbours.
	  ○ Kelvin asked what coordinated meant in the context of a seawall, letting the community come together to decide what to do or will the Council be taking over and doing it? Derek responded that the degree of coordination is the Council could set the criteria for design specifications but there is no plan about who would fund it as part of the option.
	  ○ Stephen commented that he recently visited the area and noted how many different seawall designs there were.
	• Abbey reminded the CAP of the PAA community values as this was the area that included a lot of different values; some valuing equity highly, others wanting to be self-reliant, and others concerned about the impact if they build their own protection when their neighbour does not.
	• The CAP moved onto scoring the pathways for Management Unit 12a. Abbey shared that Olivia noted in her pre-scoring that the PAA community values indicate a seawall, so her scores reflect that.
	• When discussing PW 5 being scored at 2, Jerry commented that he believed it should be a 1 but was happy to compromise to 2. Jerry explained that the community also values the beach, and this pathway would remove it in the short term. Susie added that she was walking along the beach as high-tide was coming and witnessed that much of the beach has already been lost in the high-tide. Jerry reiterated he believed it should be scored 1 but was happy with 2.

CAP moved onto scoring for inundation Management Unit 11b.

- Danielle gave a summary of her commentary, reiterating that there are a lot of different costs and benefits for different people which could potentially affect community cohesion.
- Danielle discussed how, due to the erosion hazard being much more present that inundation in Paekākāriki, only a few people will benefit from inundation actions like stop banks and pump stations and may resent having to pay for these works to happen. On the other hand, those who need it will feel more secure and certain about the future.
- Danielle added that inequities will also show through raising floor level adaptation as some households may be able to afford the works and others may not.
- Kelvin asked about the costs of pump stations compared to sea walls. Derek replied that he does not have the figures for that yet as that will be in the upcoming economics report, but they are both expensive. Derek added that there are very few people at risk from inundation compared to the number at risk from erosion.

PAA Shortlisted Pathways with MCDA commentary Public Access and Recreation

Paula began the discussion with a high-level summary of the criterion for public access and recreation.

- Paula explained that whenever there is a wall or high structure established, the beach will respond. The high tide beach will likely disappear and there will be a flat beach, with the time available to access that beach will minimise with the sea rise. Paula added that public access to the beach will diminish where private properties are directly behind the seawall, unless there is a setback line which gives the beach more space and provides more opportunity for public access to the beach.
- Danielle added that it's a mixed bag of cost and benefits and only other thing to add is if the design of the seawalls and/or set back structures allow for recreation on the top it will improve the public's ability to recreate in that area, especially for those with low mobility who may not be able to access the beach itself.
- Stephen asked Derek where the sand could be sourced from for beach renourishment. Derek responded that there have been no assumptions made on the source of the sand. Paula added to the discussion by saying that there can be unanticipated consequences to communities from sand mining, even if they were not supposed to be impacted due to their distance away, as she has seen this occur to a community before where their beach and ability to gather kai moana was negatively affected. She importantly noted that no matter where the sand is sourced from it will impact someone.

The CAP moved to discuss scoring of pathways for Management Unit 11a.

- Susie expressed that she only slightly favoured PW 4 as it has reestablishment of the line in the medium-term so it would provide space for beach walkers. Abbey noted that reestablishment of the line in the medium term is paired with dune reconstruction. Derek added that there is not currently a sand dune in the area so a large amount of sand would need to be brought in from somewhere else.

	• Danielle reminded the CAP that the PAA values report shows that access to the sandy beach is very highly valued, highlighting the word 'sandy' in comparison to hard structure. The CAP moved to scoring of pathways for Management Unit 12a. • Paula noted similar issues here as 11a. The CAP moved to scoring of pathways for Management Unit 11b. • Danielle noted similar issues here as 11a. • Stephen commented that there are examples of stop banks with public walkways. **CAP's scoring of these pathways against these criteria can be found in Appendix 2 to these minutes.**
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Paekākāriki Adaptation Area	**Stephen Daysh, Mitchel Daysh with support from Rhys Girvan, Boffa Miskell** *PAA Shortlisted Pathways with MCDA Landscape Commentary* Rhys gave a high-level summary of his commentary on the landscape criterion for Management Unit 11a. • Rhys explained that PW 4 looks at reestablishing a setback line and then holding that line with some dune reconstruction and beach renourishment, which is the preferred option from a natural landscape point of view. Whereas options with just hard protection structures do little in the way of enhancing natural character. CAP moved onto scoring of pathways for Management Unit 11a. • Abbey shared as part of her pre-scoring, Olivia asked if an Ecoreef like structure (stepped/stacked) would enhance natural character. Rhys responded that it depends on how nature-based the modification can be, pointing at PW 4 as the preferred option for having space and then utilising it to restore some natural character. Derek added that the ability to maintain planting in a stepped wall would diminish over time as the sea level rises further the structure. Derek also added that it depends on what you fill the structure with as there is a trade-off between what materials will give you the best protection and what materials will help plant growth. • Derek discussed how a vertical seawall has far more wave reflection than a stepped wall, but wave reflection will still be present wherever there is a hard vertical structure to hit which is still included when building a stepped protection structure. CAP moved onto scoring of pathways for Management Unit 12a. • Rhys gave an overview of his commentary. Rhys also noted that the pathways that do not include reestablishing the line, but still include building a seawall, have lower benefits to natural character as there would not be any space created in front of the line for natural processes to occur as well as having a hard engineering edge to the coast.

	CAP moved into scoring of pathways for Management Unit 11b. • Rhys gave an overview of his commentary. He stated that PW 2 stands out as it is not providing anything in terms of enhancing natural character but does allow those natural processes to occur in lieu of hard engineering along the coast. **CAP's scoring of these pathways against this criterion can be found in Appendix 2 to these minutes.**
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Paekākāriki Adaptation Area	**Stephen Daysh, Mitchel Daysh with support from Astrid Dijkgraaf, Astrid.Ecology** *PAA Shortlisted Pathways with MCDA Ecology Commentary* Astrid gave a brief overview of ecology for Paekākāriki, explaining that: • Penguin nesting occurs along this coastline. Where there are holes in the rock revetment walls, penguins climb in to create burrows which are very hard to shift. • Coastal sea birds use the shoreline and estuaries. There are two main streams coming into the area. • The Paekākāriki dunes are some of the higher dunes in the Kapiti Coast. • The erosion hazard and whether we can continue to provide habitat is the main issue. CAP moved to scoring for Management Unit 11a. • Astrid noted that, in terms of the status quo, the species will continue to stay in the area, but the habitat will reduce over time as erosion and storms become more frequent. Astrid added that any adaptation that involves a hard sea wall will significantly impact on the habitat for plants and animals, adding that anything that enables the dunes to be retained or provide more habitat between the sea and the shoreline will be advantageous for animals. CAP moved to scoring for Management Unit 12a. • Astrid commented there is uncertainty around how flora and fauna will react to a stepped-type wall that CAP has been discussing. Astrid gave an overview of ecological impacts from inundation protection pathways for Management Unit 11b. She explained that: • The impact of hard protection structures on ecology will depend on where they are placed in relation to the waterways and whether they result in removing fish passage. • Protections like raising floor levels and buildings will only impact the buildings themselves and not impact flora and fauna. • Pump stations that allow eels etc. to travel through unscathed are more expensive than standard options.
Next Steps	**Abbey Morris, KCDC** Abbey gave a brief of next steps for CAP.

	The next CAP meeting will be a discussion around the strawman thresholds for RAA and PAAA, with opportunity to revisit strawman threshold decisions on NAA and CAA. • Kelvin noted issues with use of the word 'strawman'. Jason offered the word 'indicative' and Jerry offered 'nominal' for more positive connotations.
Closing Karakia	By **John**

ATTACHMENTS
• **PAA Pathways Presentation for MCDA scoring (presentation)** • **PAA Shortlisted Pathways with MCDA Commentary for Ecology** • **PAA Shortlisted Pathways with MCDA Commentary for Landscape** • **PAA Shortlisted Pathways with MCDA Commentary for Public Access and Recreation** • **PAA Shortlisted Pathways with MCDA Commentary for Regulatory Consenting and Policy Risk** • **PAA Shortlisted Pathways with MCDA Commentary for Risks of Coastal Erosion** • **PAA Shortlisted Pathways with MCDA Commentary for Risks of Coastal Inundation** • **PAA Shortlisted Pathways with MCDA Commentary for Community Social and Economic Wellbeing**

Takutai Kāpiti.

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Appendix 1: CAP Recommendation Report and Engagement Timeline

- Monday 11th March 2024:
    - CAP begin compiling their top five additional themes for recommendations on matters additional to the preferred pathways over to Stephen.
    - Mitchell Daysh begins supporting CAP to write their report.
- Friday 15th March 2024:
    - CAP's top five additional themes for recommendations emailed to Mitchell Daysh.
- Wednesday 3rd April 2024:
    - Economic Analysis CAP Meeting – CAP confirm their top pathways per management unit.
- Monday 15th April 2024 – Wednesday 24th April 2024 (engagement pop-ups period – TBC)
- Thursday 18th April 2024: Deadline for first draft of CAP recommendation report.
- Friday 10th May 2024: Final draft to Jim
- Friday 24th May 2024: Jim delivers CAP recommendation report to Council Operations.
- June 2024 – Council Meeting

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Kāpiti Coast DISTRICT COUNCIL
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Appendix 2: MCDA Scoring of Paekākāriki Adaptation Area Pathways

MCDA Criteria/Weighting

	Ecology	Landscape	Te ao Māori values	Community Social and Economic Wellbeing	Public Access and Recreation	Regulatory consenting and policy risk	Effectively manages the risks of coastal erosion	Effectively manages the risks of coastal inundation
CAP Weighting	3	1	3	3	3	1	3	2

MCDA Scoring

Pathways for Paekākāriki Adaptation Area

Management Unit	Pathways	Pathway Descriptions			Ecology		Landscape		Te ao Māori values		Community Social and Economic Wellbeing		Public Access and Recreation		Regulatory consenting and policy risk		Effectively manages the risks of coastal erosion		Effectively manages the risks of coastal inundation		Weighted MCDA Total Score:	RAW MCDA Total Score:
		Short term	Medium term	Long term	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes		
Management Unit 11A: Paekākāriki (Erosion Unit)	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)	3	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	3	• In the short term, maintaining the existing seawall will continue hard engineering within this modified coastal context. • Establishing and reinforcing hard engineering will continue within the context of existing modification. • In the longer terms, setting protection structure back offers more limited ongoing opportunity to restore natural character in context of increasing modification.			3	The mixture of hard engineering options in this pathway generally enhance public health and safety, but may decrease social cohesion and have unpredictable impacts for certainty around the future and insurability of personal assets. •At all stages of the pathway, health and safety of the community is likely to improve due to reduced likelihood of erosion-related collapse events and greater understanding of how to stay safe around erosion-prone areas. Since promenades or pathways along seawalls and setback structures may bring larger volumes of people into closer proximity with the water there is a potential risk to public safety especially during winter when other areas are muddy and storms (and associated overtopping) more common. This is likely to be magnified for users who have limited mobility and would be potentially unable to move out of harms way quickly. Such risks could, however, be controlled through public messaging. •Seawalls are known to be contentious due to the perceived unequal distribution of costs and benefits within communities. Those with beachfront properties are likely to support seawalls since they offer direct benefits including protection of private	3	As the PAA Values Engagement Summary Report makes clear, public access to and recreation on the beach (walking, swimming, fishing, etc) is very important for many residents of Paekākāriki. Echoing research into the salutogenic (health-giving) benefits of coastal environments (and beaches in particular), some Paekākāriki residents quoted in the PAA Values Engagement Summary Report also associate these recreational pursuits with positive mental health and overall wellbeing. •In the immediate future, access to and recreational use of the beach is unlikely to change •However, with the replacement of the existing seawall and further seawall intervention in the short (20 year) and medium term we can expect changes to access and recreation at the coast. •On one hand, public access to the coastal environment may be maintained and improved by seawalls if the adjacent road is protected from erosion and access points and car-parking are integrated into design. Additionally, if the replacement seawall includes pathways along the top (as is planned under current 2017 design)	2	• Planning framework generally provides for maintenance and minor upgrades of seawalls. • Significant upgrades may be considered a new seawall under the Natural Resources Plan. • A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. • Existing environment contains sea walls which may be considered as part of consent. • Plan changes are currently required to implement retreat of private properties.	5	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •A further replacement seawall in the medium term is a proportionate response to the nature and scale of the hazard due to the design life of the initial replacement wall (on advice from KCDC). •A coordinated approach to managing the erosion hazard is best practise and will minimise isolated 'hot spots' of erosion in areas of coast with less resilience. •There is potential for some end effects at the northern and southern ends of the wall alignment if adjoining into the natural shoreline. This is the only reason for a potential downgrade in scoring to 4. •Re-establishment of the line will manage the risks by retreat of the most at risk property and infrastructure and giving the shoreline space to move, with a 'backstop' setback wall as the final line of defence. •The progression of options is sensible and likely to be proportionate to the scale of the hazards. Reestablishment of the line could be triggered earlier than the long term if tracking on a higher trajectory of SLR, or dependent on the design of the seawall in the medium term. •Pathways that include the 're-establish the line' option are scored more favourably because they will provide a higher level of risk reduction, and will make space on the beach.	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**51**	21
	2	Status Quo[1] and Community Education and Emergency Management[4]	Sea wall[13] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	2	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. • Medium and long term - Very little opportunity for indigenous fauna, flora or habitats (but see note re penguins, as this could mitigate some of the effects)	2	• In the short term, maintaining the existing seawall will continue hard engineering within this modified coastal context. • Establishing and reinforcing hard engineering will continue within the context of existing modification. • Holding the line of the existing shoreline with increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification.			3	•This pathway offers a similar set of benefits and costs to pathway 1, however, the substitution of an enhanced seawall for the re-establish the line option in the long term may avoid potential conflict related to retreating properties. •On the other hand, the reliance on seawalls in the short, medium and long term could entrench associated inequities and lead to a doubling down of tension in the community. As the PAA Values Engagement Summary Report demonstrates, a section of the community is opposed to seawalls and similar hard engineering solutions as a long term adaptation strategy.	2	•In the immediate future, access to and recreational use of the beach is unlikely to change •However, with the replacement of the existing seawall and further seawall intervention in the short (20 year), medium, and long term we can expect changes to access and recreation at the coast. •Provided access points (and infrastructural links like roads and pathways) to the beach are maintained, and there are opportunities to walk, cycle or otherwise enjoy leisure activities on/in the vicinity of the seawall, community/district use of, access to, and recreation within the coastal environment is likely to be maintained or increased. •However, the pursuit of seawalls risks loss of the beach, especially at high tide, and could impede associated opportunities for recreation, with further consequences for residents of the community and wider district whom derive health and wellbeing from these activities. Being able to access the coastal environment from atop a promenade would likely restrict the enjoyment that some people gain from spending time at the coast in its current state.	4	• Planning framework generally provides for maintenance and minor upgrades of seawalls. • Significant upgrades may be considered a new seawall under the Natural Resources Plan. • The existing policy framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. • Existing environment contains sea walls which may be considered as part of consent. • Given only one option is being adopted in this pathway, and that there is only one party seeking resource consent, there are the least regulatory processes.	4	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •A further replacement seawall in the medium term is a proportionate response to the nature and scale of the hazard due to the design life of the initial replacement wall (on advice from KCDC). •A coordinated approach to managing the erosion hazard is best practise and will minimise isolated 'hot spots' of erosion in areas of coast with less resilience. •There is potential for some end effects at the northern and southern ends of the wall alignment if adjoining into the natural shoreline. This potential effect is increased by retaining an enhanced wall in the current position in the long-term, particularly at the boundary to Queen Elizabeth Park. •Enhancement of the seawall in the long term could be a viable long term option if the seawall in the medium term is designed in such a way to make this possible; however in order for the structure to provide adequate protection in its current alignment, it will likely need to take up a larger footprint that may impact other amenities/infrastructure (e.g. loss of part of the road). •This pathway scores less than the above pathway as although it will manage the risks to erosion, there is however likely to be adverse effects through design (e.g. very high wall and foundations required) and loss of amenities (e.g. loss of beach) by the seawall remaining in the same alignment as it currently is. • This is consistent with the corresponding pathway in Management Unit 10A: Raumati seawall.	1	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations.	**41**	18
	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)	3	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. • Medium term - the Ecoreef may provide opportunities to include penguin friendly habitat and plant native species. Sand may accumulate at the foot to take on a more natural dune form or coastal plant or sedentary animal species may establish on wave-splashed areas of the structure. • Long term - Retention of biodiversity could be negated in the longer term by additional hard engineering structures and ongoing coastal erosion due to lack of sand supply, or maintained if existing biodiverse areas can be retained or enhanced	3	• In the short term, maintaining the existing seawall will continue hard engineering within this modified coastal context. • In them medium and longer terms, setting protection structure back offers limited ongoing opportunity to restore natural character in context of increasing modification. • Holding the line of the shoreline with increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification.			2	•Like the previous two pathways, this pathway offers a mixed suite of benefits and costs to health and safety, certainty around the future of the community, social cohesion and insurability of assets. •Health and safety is likely to be enhanced (as per description in pathway 1), however the potential for conflict over retreat of homes and associated inequities comes into play sooner (medium term) than in pathway 1. •There may be greater uncertainty over insurability of personal assets overall in this pathway, due to the increased use of setback protection structures and their faster introduction (when compared with pathway 1). Although properties in the vicinity of the setback structure may benefit from enhanced insurability of personal assets with the increased protection this is contingent on how insurance companies regard the setback structure, and if the ecoreef option is selected, this is not yet clear given its limited use within Aotearoa New Zealand to date. Since seawalls are a more widespread form of hard engineering insurance companies may be more likely to insure homes protected by them when compared with an Ecoreef (however this is highly uncertain and it is difficult to access data on insurance due to confidentiality).	3	•This pathway is likely to see a reduction of beach area and associated recreational pursuits earlier than pathway 1 and 2 due to the introduction of the setback protection structure in the medium term. Although retreating the first line of homes may create a slightly larger beach area, it is likely that public access would be impeded by construction/demolition works at the start of the setback process. Additionally, the larger eventual footprint of the protection structure could reduce the beach area available for recreation especially as the structure is enhanced and build out towards the ocean over time into the longer term. •At all stages of the pathway, there are potential gains for public access to and enjoyment of the coastal environment that flow from increased protection of infrastructure such as roads at risk of erosion, and the creation of pathways along the top of the seawall and setback protection structure.	2	• Planning framework generally provides for maintenance and minor upgrades of seawalls. • Significant upgrades may be considered a new seawall under the Natural Resources Plan. • Plan changes are current required to implement retreat of private properties. • A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. • Existing environment contains sea walls which may be considered as part of consent.	5	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •Re-establishment of the line in the medium term with a setback protection structure will manage the risks to erosion by retreat of most at-risk properties and infrastructure and giving the shoreline space to move. •With an appropriate setback distance, Enhancement of the setback protection structure is likely to be effective as there will be space to enable this effectively, as long as the setback seawall is appropriately designed and constructed in the medium term. •A coordinated approach alongshore to managing the risks to coastal hazards is considered to be best practise. •There is some potential for end effects to eventually occur north and south of the setback wall if the shoreline retreats back to this position over the long term, but these will be less relative to maintaining the shoreline in its present day alignment. • This is consistent with the corresponding pathway in Management Unit 10A: Raumati seawall	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**48**	20
	4	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)	4	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. • Medium term - the Ecoreef may provide opportunities to include penguin friendly habitat and plant native species. Sand may accumulate at the foot to take on a more natural dune form or coastal plant or sedentary animal species may establish on wave-splashed areas of the structure. • Medium term - 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. • Long term - Beach nourishment may enable dunelands to persist and provide habitat for dune species	4	• In the short term, maintaining existing seawalls will continue hard engineering influences within the context of existing modification. • In the medium and longer terms, reinstating a coordinated protection structure back from the present day shoreline will continue hard engineering influences within this modified coastal context. • Where successful, restoring natural form and character of dunes in tandem with protection structure offers some ability to contribute to restoring natural character and combine nature based solutions alongside hard engineering orms in this modified coastal context. • In the longer term, beach renourishment will provide some ongoing modification alongside ability to maintain ongoing natural form of beach profile and dunes • Where successful, dunes and beach will occur in context of high levels of existing modification and appear more consistent with existing natural beach profile and form.			2	•The diverse suite of options pursued in this pathway could introduce new sources of tension that threaten social cohesion, and may either reduce or increase certainty around the future and health and safety. •In the short term, health and safety is likely to be enhanced through education and emergency management (as per description in pathway 1) and reduced incidence of erosion-related collapse events due to seawall. In the medium to long term, the persistence of a sandy beach with dune reconstruction and beach renourishment may benefit residents' health due to continued or increased ability to engage in health-promoting activities like walking or running along the beach, or swimming. However, the array of different methods engaged in this pathway could amount to a large increase in rates in order to fund the necessary works. This could result in increased stress for households of limited socio-economic means, and cause other flow on impacts for their health (such as sacrificing household necessities in order to pay rates, or delaying rates payment and accruing further debt or financial penalties). •In addition to the likely tensions associated with the replacement of the seawall, retreat of houses and installation of a setback protection structure, dune reconstruction and beach renourishment in the medium to long term present a series of challenges	4	•This pathway offers the most potential for enhancing use of, access to, and recreation within the coastal environment. •Although the setback protection structure may impede some beach recreation in the short and medium term (reduction in beach area, construction works, larger footprint) and change access from beach use to promenade, in the medium and long term the addition of dune reconstruction and beach renourishment offer the potential to maintain a sandy beach into the future, with associated recreational and wellbeing benefits for residents (especially when combined with all-weather access to the coastal environment through seawall or setback structure promenade). •It should be noted, however, that for dune reconstruction and beach renourishment to take place, sand is generally brought in from other areas. Consideration should also be given to the potential implications for beach users in the region where sand is sourced, since maintaining a beach and recreational opportunities in Paekākāriki could lead to the reduction of such opportunities for community members in the area where sand is sourced.	2	• Planning framework generally provides for maintenance and minor upgrades of seawalls. • Significant upgrades may be considered a new seawall under the Natural Resources Plan. • Plan changes are current required to implement retreat of private properties. • A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. • Existing environment contains sea walls which may be considered as part of consent. • Existing policy framework encourages soft engineering approaches to be considered ahead of hard engineering.	3	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •Re-establishment of the line in the medium term with a setback protection structure will manage the risks to erosion by retreat of most at-risk properties and infrastructure and giving the shoreline space to move. •Dune reconstruction in the medium term is unlikely to effectively manage the erosion hazard by itself, but will provide some buffer in front of the setback seawall, and provide for other amenities. •There is uncertainty about maintaining the reconstructed dune in the long term under high SLR scenarios in a sediment-starved environment, and is therefore likely to result in large costs in maintaining the beach via renourishment. • Scores neutrally because the backstop wall will provide a line of defence in the medium-term, however the design is unlikely to be proportionate to the scale and nature of the hazard in the long-term, and there is uncertainty around the scale and effectiveness of renourishment required in the long-term.	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If the constructed dunes are designed and constructed to high elevations then they will help reduce the runup elevations and reduce wave overtopping. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**49**	21
Management Unit	Pathways	Pathway Descriptions			Ecology		Landscape		Te ao Māori values		Community Social and Economic Wellbeing		Public Access and Recreation		Regulatory consenting and policy risk		Effectively manages the risks of coastal erosion		Effectively manages the risks of coastal inundation		Weighted MCDA Total Score:	RAW MCDA Total Score:
		Short term	Medium term	Long term	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	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 protection structure[10] (Retreat & Protect)	3	• Short and medium term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. More gradual change may allow flora and fauna to adapt over time • Long term - the Ecoreef may provide opportunities to include penguin friendly habitat and plant native species. Sand may accumulate at the foot to take on a more natural dune form or coastal plant or sedentary animal species may establish on wave-splashed areas of the structure.	3	• Establishing and reinforcing hard engineering will continue within the context of existing modification. • In the medium term, existing protection structure to be maintained and enhanced where required, and will appear in the context of existing modification. • In the longer term, setting sea wall back offers limited ongoing opportunity to restore natural character in context of increasing modification.			3	Whilst this pathway likely elevates health and safety overall, there are likely to be inequities between households in terms of insurability of personal assets and levels of certainty around the future, and a number of sources of potential tension that could decrease social cohesion at all stages. •In the short to medium term, education and emergency management combined with seawalls helps reduce direct risks to health and safety by increasing the likelihood that people know how to respond to erosion hazards and reduces possibilities of collapse events and unstable areas. This assumes a minimum design standard for private seawalls such that public health is not at risk. In the long term, retreat of beachfront properties removes a number of households out of harms way, away from the hazard. •In the short to medium term, pursuing the status quo approach and enhancing structures is likely to precipitate a range of feelings around certainty within the community. As the PAA Values Engagement Summary Report demonstrates, some	3	•This pathway offers a mixed set of benefits and costs in terms of access and recreation. •In the short and medium term pursuing the status quo and enhancing existing structures could lead to a reduction of sandy beach for recreation (due to the effect of seawalls), which may impede community and district use of the coastal environment. •On the other hand, if seawalls (and in the longer term, the setback structure) allows for pathways along the top or nearby, opportunities for recreation could be improved, especially for those with limited mobility (since it would be a flat surface), and in the winter, when other areas can be impassable. This could have flow on effects for the wider community and region and enhance use of the coastal environment. •The persistence of privately maintained seawalls into the medium term presents possible challenges for public access to the coastal environment. There is no guarantee that privately maintained structures would allow passage onto	2	•For status quo we have assumed that no one is trying to enhance their existing seawalls. From a consenting point of view there is little difference between the status quo and enhance. The current regulatory framework is reasonably permissive of building resilience into existing structures. •The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. •A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. •Existing environment contains sea walls which may be considered as part of consent. •Plan changes are current required to implement retreat of private properties.	3	•Status Quo approach is unlikely to effectively manage the projected erosion hazard over the short term as residual life of existing structures is in some cases <10 years. Pathways with Status quo in the short term typically score lower as the current structures do not have long residual lives. •A continued piece-meal approach to managing erosion is not best practise, and may lead to exacerbating erosion hazards in unprotected areas (e.g. Ames street reserve). •Enhancing existing protection structures in the medium term will still result in a peiecemeal approach to managing the erosion risks, which is not best practise. •Re-establishing the line with a setback protection structure over the long term will result in a coordinated approach to managing the hazard, and by retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. • Due to the long-term setback protection, the pathway scores as netrual overall. • This is consistent with the corresponding pathway in Managemment Unit 9A: Raumati north of Wharemauku Stream)	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**45**	19

Management Unit 12A: Paekākāriki (Erosion Unit)

Management Unit	Pathways	Pathway Descriptions			Ecology		Landscape		Te ao Māori values		Community Social and Economic Wellbeing		Public Access and Recreation		Regulatory consenting and policy risk		Effectively manages the risks of coastal erosion		Effectively manages the risks of coastal inundation		Weighted MCDA Total Score:	RAW MCDA Total Score:
		Short term	Medium term	Long term	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes		
	2	Enhance existing protection structure[7], 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)	3	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion and/or modifications to existing structures. • Medium term - Hard engineering structure could limit flora and fauna. • Long term - There is no guarantee that additional plant and animal habitat could be created once the line is re-established with a setback, or that animals would (be available to) recolonise. But potentially more positive than just a hard engineering seawall.	3	• Establishing and reinforcing hard engineering will continue within the context of existing modification.While not out of character, this has the potential to reduce natural character. • The addition of increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification. • In the longer term, setting sea wall back offers limited ongoing opportunity to restore natural character in context of increasing modification.			3	•This pathway represents a broadly similar suite of costs and benefits to the community as pathway 1 above. However, the potential tensions related to transitioning from an uncoordinated approach to coordinated approach (seawall) come earlier (in the medium term) than in pathway 1 (whereby this transitions happens in the long term with the setback structure). There is therefore a risk that social cohesion may be reduced in the medium term if those protected by a private seawall in the short term resent having to fund the public seawall in the medium term (since they have already invested in their own protection structures). This group could also feel frustrated over a perceived lack of agency whereby they are no longer able to maintain their own structures and the government takes over control of adaptation. Additionally, tension and resentment could arise if private seawalls are demolished in order to make way for a public seawall. •On the other hand, there may be a reduction of tension around insurance premiums sooner than in	3	This pathway offers a similar profile of benefits/challenges for access and recreation as pathway 1, however the introduction of a coordinated approach in the medium term (seawall) and pursuit of publicly maintained structures in the long term (setback structure) may avert potential barriers to access presented by privately maintained seawalls in the short to medium term in the pathway above.	2	•The current regulatory framework is reasonably permissive of building resilience into existing structures. •The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. •A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. •Existing environment contains sea walls which may be considered as part of consent. •Plan changes are current required to implement retreat of private properties.	4	•Enhancing existing protection structures in the short term will still result in a peicemeal approach to managing the erosion risks, which is not best practise, however will provide a greater level of protection to areas currently protected to help manage the impacts of erosion. •A coordinated seawall approach in the medium term alligns with best practise in terms of physical works to manage the hazard. • There is potential for end-effects from the medium-term seawall, but these may be negated by the setback protection in the long-term. • Re-establishing the line with a setback protection structure over the long term will result in a coordinated approach to managing the hazard, and by retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. • This is consistent with the corresponding pathway in Management Unit 9A: Raumati north of Wharemauku Stream)	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**48**	20
	3	Enhance existing protection structure[7], 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)	3	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion and/or modifications to existing structures. • Medium term - the Ecoreef may provide opportunities to include penguin friendly habitat and plant native species. Sand may accumulate at the foot to take on a more natural dune form or coastal plant or sedentary animal species may establish on wave-splashed areas of the structure. • Long term - Retention of biodiversity could be negated in the longer term by additional hard engineering structures and ongoing coastal erosion due to lack of sand supply, or maintained if existing biodiverse areas can be retained or enhanced	3	• Reinforcing hard engineering will continue within the context of existing modification. While not out of character, this has the potential to reduce natural character. • In the medium and longer terms, retreating the shoreline with a protection structure offers limited ongoing opportunity to restore natural character in context of increasing modification. • Holding the line of the shoreline with increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification.			3	This pathway presents a broadly similar picture to pathway 1 and 2 above, however there is potential that challenges to social cohesion related to retreat and construction of a setback structure will be apparent earlier on (medium term as opposed to long term). It is also difficult to predict how insurability of personal assets would be affected in the medium term with the setback structure. As noted above (pathway 1 and 2) there may be a levelling out of insurance availability and/or premiums with the coordinated approach. Yet it is difficult to predict with certainty how insurance companies will behave, especially given the limited use (and limited proven efficacy) of Ecoreef in Aotearoa New Zealand to date.	3	•Similar to the above two pathways, wider use of the coastal environment and recreation may be enhanced if seawalls and setback protection structures enable access along them and also onto the beach. •In the medium term, the introduction of the setback structure could offer more diverse recreational pathways than the traditional seawall introduced at the same timestamp in pathway 2 (for example, if the structure is colonised by native plants and other species this could offer opportunities for botany/wildlife enthusiasts). •In the short term, the issue of access on and through privately maintained seawalls persists (as above), and the emphasis on hard protection structures throughout the pathway has potential implications for the loss of the beach and associated recreational activities that are highly valued by community members.	2	•The current regulatory framework is reasonably permissive of building resilience into existing structures. •The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. •A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. •Existing environment contains sea walls which may be considered as part of consent. •Plan changes are current required to implement retreat of private properties.	5	•Enhancing existing protection structures in the short term will still result in a piecemeal approach to managing the erosion risks, which is not best practise, however will provide a greater level of protection to areas currently protected to help manage the impacts of erosion. •Re-establishing the line with a setback protection structure in the medium term will result in a coordinated approach to managing the hazard, and by retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. •Enhancement of the setback protection structure over the long term is likely to be effective as there will be space to add onto the structure to provide greater elevations and volumes, as long as the setback seawall is appropriately designed and constructed in the medium term. •There is some potential for end effects to eventually occur at the ends of existing structures in the short term, and north and south of the setback wall if the shoreline retreats back to this position over the medium-long term, but these will be less relative to maintaining the shoreline in its present day alignment. • This is consistent with the corresponding pathway in Management Unit 9A: Raumati north of Wharemauku Stream)	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**51**	21
	4	Enhance existing protection structure[7], 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)	4	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. • Medium term - the Ecoreef may provide opportunities to include penguin friendly habitat and plant native species. Sand may accumulate at the foot to take on a more natural dune form or coastal plant or sedentary animal species may establish on wave-splashed areas of the structure. • Medium term - 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. • Long term - Beach nourishment may enable dunelands to persist and provide habitat for dune species.	4	• In the short term, reinforcing existing seawalls will continue to extend hard engineering influences within the context of existing modification. • In the medium and longer terms, reinstating a coordinated seawall back from the present day shoreline will continue hard engineering influences within this modified coastal context. • Restoring natural form and character of dunes offers some ability to contribute to restoring natural character and combine nature based solutions alongside hard engineering forms in this modified coastal context. • In the longer term, beach renourishment will provide some ongoing modification alongside ability to maintain ongoing natural form of beach profile and dunes • Dunes and beach will occur in context of high levels of existing modification and appear more consistent with existing natural beach profile and form.			3	•This pathway potentially offers greater certainty about the future of the community than do the previous three pathways, although certainty could be offset by reduced social cohesion related to the fracturing of the community around the comparatively large number of different adaptation options pursued in this pathway. •In the short term, some residents who are concerned about coastal hazards may feel more certain about their ability to continue living in the community as they witness enhancement of structures and gain greater knowledge of/develop strategies for living with climate change (via education and emergency management). In the medium to long term certainty may be offset by enhanced through the reconstruction of dunes and beach renourishment which would enable maintenance of a sandy beach/natural character of the community, which many in the area value highly and regard as one of the defining features of living in Paekākāriki. Prolonging access to a beach could also lead to greater health benefits for community members (walking along the beach for example, mental wellbeing), and dune reconstruction may aid natural protection from hazards, and could enhance ability to insure personal assets (although this is highly uncertain). •However, as noted above for pathway 4, sub-area 11A, dune reconstruction and beach renourishment	4	•As with the previous pathways, the mixture of public/private structures and emphasis on hard engineering in the short and medium term may present barriers to recreation and access (but could also enhance use and recreation though pathways along structures). •In the medium to long term, this pathway offers potential gains for recreation and use of the coastal environment by restoring the dunes and nourishing the beach. Paekākāriki residents may enjoy continued ability to recreate on a sandy beach longer than other communities where beaches have eroded. The presence of a beach may also draw in others from the district in the medium and long term and contribute to wider use of the coastal environment. •However, access to the coastal environment may be impeded at times of high use (such as summer) if Paekākāriki experiences an influx of visitors from elsewhere. This may lead to limited parking nearby and congestion on roads in the vicinity of the beach, which could be especially impactful for those with limited mobility who rely on car transport to the coast and have few other options for recreation in a safe and flat environment (such as the promenade).	2	• The current regulatory framework is reasonably permissive of building resilience into existing structures. • The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. • A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. • Existing environment contains sea walls which may be considered as part of consent. • Plan changes are current required to implement retreat of private properties. • Existing policy framework encourages soft engineering approaches to be considered ahead of hard engineering.	3	•Enhancing existing protection structures in the short term will still result in a piecemeal approach to managing the erosion risks, which is not best practise, however will provide a greater level of protection to areas currently protected to help manage the impacts of erosion. •Re-establishing the line with a setback protection structure in the medium term will result in a coordinated approach to managing the hazard, and retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. •Dune reconstruction in the medium term is unlikely to effectively manage the erosion hazard by itself, but will provide some buffer in front of the setback seawall, and provide for other amenities. •There is uncertainty about maintaining the reconstructed dune in the long term under high SLR scenarios in a sediment-starved environment, and is therefore likely to result in large costs in maintaining the beach via renourishment. The backstop wall will ultimately provide a line of defence, however the scale to maintain the natural system is unlikely to be proportionate to the scale and nature of the hazard. • Scores neutrally because the backstop wall will provide a line of defence in the medium-term, however the design is unlikely to be proportionate to the scale and nature of the hazard in the long-term, and there is uncertainty around the scale and effectiveness of renourishment required in the long-term.	2	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If the constructed dunes are designed and constructed to high elevations then they will help reduce the runup elevations and reduce wave overtopping. •Some of the properties that are retreated with the re-establish the line option could also be impacted by wave runup overtopping, and therefore this option would reduce some risk.	**52**	22
	5	Sea wall[13] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	1	• Very little opportunity for indigenous fauna, flora or habitats in short, medium, or long term (but see note re penguins)	2	• Establishing and reinforcing hard engineering will continue within the context of existing modification in the short and medium term. • Holding the line of the existing shoreline in the long term with increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification.			2	•The pursuit of seawalls over the short, medium and long term in this pathway could prove contentious in the community, and may impede health and safety in some ways, but could potentially lead to a levelling out of insurability of personal assets in the short term going forward. •The abrupt shift from a mixed, uncoordinated approach at present to the introduction of a seawall could raise tensions in the community, and may be met with opposition from households currently able to maintain their own protection structures. These households, if expected to fund the creation of a new public seawall (via rates), could feel resentment from having to pay again, when they have already invested significant amounts into a private structure. They may also resent the loss of agency that comes with a coordinated approach, and no longer having the ability to secure their own futures through a private seawall. On the other hand, some households in the area where private seawalls are currently maintained could support the move to a	2	•The emphasis on seawalls throughout all timestamps in this pathway could change the face of recreation in the coastal landscape. If the pursuit of seawalls leads to a reduction in beach area over time, opportunities for recreation on the sand are likely to be severely limited, and it is likely that recreation and access to the coastal environment would shift from use of the beach to use of a seawall promenade. This may not affect some residents who would ordinarily recreate away from the beach but for those who use it daily, it is likely to represent a significant loss. •However, since the pathway does not include the use of privately maintained seawalls, the issues of public access over and through private structures is unlikely to be relevant, and there could be greater access to the coastal environment providing the seawall is designed to accommodate this.	4	•The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. •Existing environment contains sea walls which may be considered as part of consent. •The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. •Given only one option is being adopted in this pathway, and that there is only one party seeking resource consent, there are the least regulatory processes.	3	•A coordinated approach to managing the coastal erosion hazard is best practise, and therefore constructing a new seawall in the short term will be effective in managing the erosion hazard, and is likely to be proportionate to the scale of the hazard. •Depending on the design of the short term seawall, enhancing it in the medium term to provide higher elevations and volumes for protection could be effective in managing the hazard. •Maintaining the shoreline in its current alignment out to the long term will be difficult as pressure increases with SLR. The beach in front of the wall is likely to narrow due to sediment starvation, and therefore the original design of the wall will need to account for the potential future coastal changes out to the 2130 horizon. There will likely be impacts such as end effects and beach lowering/narrowing with SLR. •This pathway scores neutrally as it is good for a coordinated protection approach to be undertaken upfront, however continuing to enhance the wall into the 100 year timeframe may be difficult and will be dependent on how it is initially designed.	1	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations.	**32**	15
	6	Status Quo[1] and Community Education and Emergency Management[4]	Enhance existing protection structure[7], Community Education and Emergency Management[4] (Enhance)	Sea wall[13] (Protect – Hard Engineering)	2	• Short and medium term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. Short and mid-term there is potential to retain some biodiversity. • Long term - Very little opportunity for indigenous fauna, flora or habitats (but see note re penguins, as this could mitigate some of the effects)	2	• Establishing and reinforcing hard engineering will continue within the context of existing modification. • Holding the line of the existing shoreline with increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification. • In the longer term the extinction of hard engineering will further limit natural character.			3	This pathway offers a similar profile of benefits and costs to pathway 1. As opposed to pathway 5 and 6, potential inequities and sources of tension (varied insurability and safety of homes) related to an uncoordinated approach are allowed to persist into the medium term and could lead to challenges to social cohesion. Challenges to social cohesion related to seawalls will remain in the long term.	2	•Over the short, medium and long term, recreational opportunities and access/use of the coastal environment may be supported provided structures allow for members of the public to access the top (e.g. shared use path or promenade). •However, in the short and medium term, the issue of restricted access over and through privately maintained structures remains, and at all timestamps, there is a risk of reduction to the beach area from seawalls, and an associated reduction in beach-based recreation.	3	•For status quo we have assumed that no one is trying to enhance their existing seawalls. From a consenting point of view there is little difference between the status quo and enhance. The current regulatory framework is reasonably permissive of building resilience into existing structures. •The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. •A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. •Existing environment contains sea walls which may be considered as part of consent.	1	•Status Quo approach is unlikely to effectively manage the projected erosion hazard over the short term as residual life of existing structures is in some cases <10 years. •Enhancement of existing structures to provide protection over the medium term is unlikely to be sufficient in providing protection, especially in unprotected areas (e.g. Ames Street Reserve). •An uncoordinated approach to managing the erosion hazard is not best practise, and will lead to some isolated areas of erosion and end effects. •A coordinated approach over the long term by implementing a new sea wall is best practise, and would be proportional to the scale of the hazard at this timeframe. •A seawall in its current alignment could result in end effects, beach lowering and narrowing as there becomes increased pressure on the shoreline with SLR. •This pathway scores low because a continuation of a piecemeal approach into the next 50 years is unfavorable and will perform poorly in managing erosion risks. A seawall in the long term will manage the risks, however having it in the same alignment as the current day will require the design to accommodate the coastal squeeze created in the short-medium term.	1	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations.	**31**	14
	7	Status Quo[1] and Community Education and Emergency Management[4]	Sea wall[13] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	2	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased erosion. • Medium and long term - Very little opportunity for indigenous fauna, flora or habitats (but see note re penguins, as this could mitigate some of the effects)	2	• Maintaining an assortment of hard engineering will continue within the context of existing modification. • In the medium and longer terms, holding the line of the existing shoreline with increased hard engineering provides very limited ongoing opportunity to restore natural character in context of increasing modification.			3	This pathway takes a coordinated approach earlier than pathway 6, which may reduce tension over differing levels of protection, safety and insurability between households in privately maintained and public seawall areas. Many of the same tensions around seawalls described for the pathways above are likely to persist into the long term as the seawall is enhanced.	2	This pathway offers similar benefits and challenges to pathway 6, however, with the introduction of the seawall in the medium term, the potential barriers to public access in areas of privately maintained structures are removed.	4	•For status quo we have assumed that no one is trying to enhance their existing seawalls. From a consenting point of view there is little difference between the status quo and enhance. The current regulatory framework is reasonably permissive of building resilience into existing structures. •The planning framework generally provides for maintenance and minor upgrades of seawalls. Significant upgrades may be considered a new seawall under the Natural Resources Plan. •A new seawall or a setback structure would be considered a hard protection structure under the current regulatory framework. The existing framework discourages hard protection except where it is the only reasonable or practical option having discounted other risk management options. A consenting pathway is available through the rules of relevant regional and district plans. •Existing environment contains sea walls which may be considered as part of consent. •Given only one option is being adopted in this pathway, and that there is only one party seeking resource consent, there are the least regulatory processes.	2	•Status Quo approach is unlikely to effectively manage the projected erosion hazard over the short term as residual life of existing structures is in some cases <10 years. •A coordinated approach over the medium term by implementing a new sea wall is best practise, and would be proportional to the scale of the hazard at this timeframe. •Depending on the design of the medium term seawall, enhancing it in the long term to provide higher elevations and volumes for protection could be effective in managing the hazard. •Maintaining the shoreline in its current alignment out to the long term will be difficult as pressure increases with SLR. The beach in front of the wall is likely to narrow due to sediment starvation, and therefore the original design of the wall will need to accommodate the ability to be enhanced for the potential future coastal changes out to the 2130 horizon. There will likely be impacts such as end effects and beach lowering/narrowing with SLR.	1	•Pathway not designed to deal with the coastal inundation hazard, however potential for increased elevation of future seawalls to reduce the overtopping hazard along the coastline. •If future hard protection structure is not vertical, then there is opportunity for better energy dissipation at the coast to further reduce overtopping and wave runup elevations.	**35**	16

Management Unit 11B: Paekakariki (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[14], Pumpstations[15]) (Protect)	2	• Short and medium term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased flooding. • Long term - hard structures could affect biodiversity in riparian areas, and could pose issues for fish passage and stream connectivity. Hard structures in dune areas could potentially increase dune erosion rates. Wainui Stream is known to have high ecological values from the mouth to the headwaters. Ames Street stream is not reported to have high values. (Refer to note re wetland)	2	• Maintaining and reinforcing hard engineering within the context of existing modification in the short and medium terms will have limited benefit in terms of restoring natural character. • In the longer term additional hard protection will increase the extent of modification evident in affected areas.			3	•This pathway generally enhances health and safety, may have a negligible effect on insurance and certainty, and could potentially introduce challenges for social cohesion. •In the short and medium term community education and emergency management help to reduce the number of people in harms' way and aid people in knowing how to respond to an inundation event. In the long term, additional hard protection could help to reduce potential inundation of homes and other areas where people may be present. However, due to the levee effect, some people may not heed hazard warnings and may feel they are safe in the presence of engineered flood protections, even if the actual situation they are in is risky (e.g. recreating in a location known to flood during bad weather). •In the medium and long term the enhancement and addition of inundation protection and control could help some residents to maintain insurability of personal assets, however this is likely to only apply to those households that are directly at risk of inundation hazards rather than the community as a	3	•It is unclear how the proposed actions in this pathway would interact with use of the coastal environment or access to it. If education includes restrictions on accessing particular hazardous locations this could reduce opportunities for recreation or access but since few areas within the community are likely to fall into this category, it may be a negligible risk. •On the other hand, recreational opportunities could be enhanced if any stopbanks built include pathways along the top. Like seawall promenades, these pathways could provide access to a flat and accessible surface for walking, bike riding, pushing buggies, and so on.	3	•Maintenance of infrastructure is generally a condition of resource consent. •Generally, there is a pathway for consenting new infrastructure or enabling improvements to existing infrastructure. The existing consented infrastructure will be considered as part of the existing environment. •The specific type and location of the infrastructure will determine how challenging this process is.	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.	5	•There is currently very low risk to coastal inundation, and therefore the short-medium term actions are proportionate to the scale of the hazard and risk. •By the long term, additional hard protection in the form of small bundings/stop banking by the Waikakariki Stream would be proportionate to the scale of the hazard and effectively manage the water coming from the sea up the low lying land. •Options considered in this pathway are unlikely to exacerbate the hazard elsewhere.	**42**	19
	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[9] (Accommodate)	3	• Short and medium term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased flooding. (Refer to note re wetland) • Long term - elevation of floor levels etc. will have little effect on biodiversity	3	• Maintaining and reinforcing hard engineering structures in the short and medium term within the context of existing modification provides limited opportunities to restore natural character. • In the longer term, adapting built form will have more limited impacts on natural elements, patterns and processes which may continue to operate.			3	•This pathway offers a similar suite of benefits/costs over the short and medium term to pathway 1. •In the long term, the addition of elevation and flood proofing of buildings and infrastructure could introduce inequities and tensions within the community with consequences for health and safety, insurability and social cohesion. •If residents of flood prone buildings are expected to take sole (financial) responsibility for flood proofing or elevating floor levels this could lead to inequities in the degree to which properties are protected. Some households may not have the financial resources to carry out the necessary works or to complete them to a high standard. Consequently, some households may choose to leave the community (which could affect social cohesion amongst neighbours, albeit on a small scale), whilst others may remain, but have difficulty obtaining/maintaining insurance for their homes/assets, and/or be more exposed to flood damage (which flow on risks to health and safety of occupants). This could set up disparities in the level	3	There is unlikely to be any change to public access and/or use of the coastal environment, or recreation from this pathway.	4	•Maintenance of infrastructure is generally a condition of resource consent. •Generally, there is a pathway for consenting new infrastructure or enabling improvements to existing infrastructure. The existing consented infrastructure will be considered as part of the existing environment. •The specific type and location of the infrastructure will determine how challenging this process is. •No resource consent is required for flood proofing buildings. •Elevating floor levels is permitted by the District Plan but may be subject to other development standards such as height in relation to boundary.	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.	5	•There is currently very low risk to coastal inundation, and therefore the short-medium term actions are proportionate to the scale of the hazard and risk. •By the long term, raising the isolated pockets of houses which could be impacted by flooding would be proportionate to the scale of the hazard. •Raising the floor levels of homes or flood proofing properties could result in some potential exacerbation of hazard to neighbouring properties, however this would likely be dealt with through design and consenting to ensure these impacts were minimised. •Raising floor levels would be effective as most road levels were assessed as being high enough that properties could still be accessed during a significant event.	**47**	22
	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)	2	• Short term - the coastal environment and indigenous species and habitats remain similar to what is there presently, or reduce as a consequence of increased flooding. (Refer to note re wetland) •Medium and long term - hard structures could affect biodiversity in riparian areas, and could pose issues for fish passage and stream connectivity. Hard structures in dune areas could potentially increase dune erosion rates. Wainui Stream is known to have high ecological values from the mouth to the headwaters. Ames Street stream is not reported to have high values.	2	• Maintaining and expanding ongoing hard engineering structures within the context of existing modification provides in the short and medium term will have limited opportunities to restore natural character. • In the longer term additional hard protection will increase the extent of modification evident in affected areas.			3	•Over the short term health and safety may improve through community education (helping people to understand how to stay safe during hazardous conditions/in hazardous locations) •When compared with pathway 1, potential benefits to insurability of personal assets, and potential tensions related to funding of hard protection come into play sooner (medium term). •Enhancing the new inundation protection over the long term could improve health and safety by reducing the extent/magnitude of coastal flooding and therefore the number of homes/people exposed. It may also enhance the ability of residents whose properties are at risk flood to maintain insurance and therefore improve their ability to feel certain about the future of the community. However, the funding of these works could prove contentious (given the small number of households that would benefit) especially if rates are used to fund their continual enhancement, maintenance and running costs (e.g. electricity for pumps).	3	It is unclear how the proposed actions in this pathway would interact with use of the coastal environment or access to it. If education includes restrictions on accessing particular hazardous locations this could reduce opportunities for recreation or access but since few areas within the community are likely to fall into this category, it may be a negligible risk. •On the other hand, recreational opportunities could be enhanced if any stopbanks built include pathways along the top. Like seawall promenades, these pathways could provide access to a flat and accessible surface for walking, bike riding, pushing buggies, and so on.	3	•Maintenance of infrastructure is generally a condition of resource consent. •Generally, there is a pathway for consenting new infrastructure or enabling improvements to existing infrastructure. The existing consented infrastructure will be considered as part of the existing environment. •The specific type and location of the infrastructure will determine how challenging this process is.	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.	4	•There is currently very low risk to coastal inundation, and therefore the short term actions are proportionate to the scale of the hazard and risk. •Installing additional hard protection in the medium term may be disproportionate to the scale of the hazard at that timeframe, however would be effective in managing any potential risks to private property from coastal flooding, especially around the Waikakariki mouth. •The enhancement of the new and existing infrastructure over the long term is proportionate to the scale of the hazard in this area. •This option scores slightly lower than the above pathway because it may not be completely necessary to install additional hard protection in the medium term, and therefore the response is not to scale.	**40**	18
	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)	2	• Short term - the coastal environment and indigenous species and habitats could remain similar to what is there presently, or reduce as a consequence of increased flooding and enhancement of existing structures. •Medium and long term - hard structures could affect biodiversity in riparian areas, and could pose issues for fish passage and stream connectivity. Hard structures in dune areas could potentially increase dune erosion rates. Wainui Stream is known to have high ecological values from the mouth to the headwaters. Ames Street stream is not reported to have high values.	2	• Reinforcing and expanding ongoing hard engineering structures within the context of existing modification provides limited opportunities to restore natural character, and will likely reduce levels of natural character in the short and medium term. • In the longer term reinforcing hard protection will increase the extent of modification evident in affected areas.			3	•This pathway is similar to pathway 3, however given that enhancement of existing inundation protection is introduced in the short term, those households at risk of coastal flooding and people who frequently use or move through flood prone areas near the coast may feel more certain about the future of the community, as they witness efforts to control flooding. •Insurance of personal assets may be maintained for the small number of homes that directly benefit from additional flood protection measures and their enhancement over the medium to long term, however it is unclear how insurability of the wider community would be affected by these measures. •There is still the possibility of tension within the community over the funding of enhancement of existing flood control, and building and enhancing new protection. This could lead to frustration over time and reduce social cohesion, especially as coastal flooding is not the main issue within the community.	3	It is unclear how the proposed actions in this pathway would interact with use of the coastal environment or access to it. If education includes restrictions on accessing particular hazardous locations this could reduce opportunities for recreation or access but since few areas within the community are likely to fall into this category, it may be a negligible risk. •On the other hand, recreational opportunities could be enhanced if any stopbanks built include pathways along the top. Like seawall promenades, these pathways could provide access to a flat and accessible surface for walking, bike riding, pushing buggies, and so on.	3	•Maintenance of infrastructure is generally a condition of resource consent. •Generally, there is a pathway for consenting new infrastructure or enabling improvements to existing infrastructure. The existing consented infrastructure will be considered as part of the existing environment. •The specific type and location of the infrastructure will determine how challenging this process is.	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.	3	•Enhancement in the short term would include installing non-return valves on stormwater outfalls, which could be a low-cost exercise and effectively manage the risks over the short term (even though risks are low). •Installing additional hard protection in the medium term may be disproportionate to the scale of the hazard at that timeframe, however would be effective in managing any potential risks to private property from coastal flooding, especially around the Waikakariki mouth. •The enhancement of the new and existing infrastructure over the long term is proportionate to the scale of the hazard in this area. •This option scores slightly lower than the pathway above which begins with status quo because it may not be completely necessary to undertake any physical works until the long term, and therefore the response is not to scale.	**38**	17
	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[9] (Accommodate)	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)	2	• Short term - the coastal environment and indigenous species and habitats could remain similar to what is there presently, or reduce as a consequence of increased flooding and enhancement of existing structures. • Long term - elevation of floor levels etc. will have little effect on biodiversity •Long term - hard structures could affect biodiversity in riparian areas, and could pose issues for fish passage and stream connectivity. Hard structures in dune areas could potentially increase dune erosion rates. Wainui Stream is known to have high ecological values from the mouth to the headwaters. Ames Street stream is not reported to have high values.	2	• Reinforcing ongoing hard engineering structures within the context of existing modification will further reduce natural character opportunities. • In the medium term, adapting built form will have more limited impacts on natural elements, patterns and processes which may continue to operate. • In the longer term introducing additional hard protection will increase the extent of modification evident in affected areas.			3	•The variety of different adaptation options pursued in this pathway could have mixed results for health and safety, insurability, certainty and social cohesion. •Although health and safety may be enhanced through education (short term) and additional hard protection (long term), there is also the issue in the medium term of potential for disparities in levels of flood proofing/elevation of private properties which could pose safety/health risks for occupants if floors are not raised high enough/flood proofing is not carried out to a high enough degree. As noted above, these risks are likely to be more prevalent for households with limited financial capacity, and could adversely affect groups like asthmatics, children and the elderly who are especially sensitive to damp, cold, and respiratory conditions linked to mould/mildew after flooding. Similarly, insurability of homes not flood proofed/elevated to a high enough level could be limited, and the effects on insurability elsewhere in the community are unpredictable at all stages of this pathway. •Funding of enhancement, construction, maintenance, and running of inundation protection (and potentially elevation/flood proofing of buildings) through rates could also drive tension within the community given the small area and limited number of properties that are at risk of coastal flooding at all timestamps in the area.	3	It is unclear how the proposed actions in this pathway would interact with use of the coastal environment or access to it. If education includes restrictions on accessing particular hazardous locations this could reduce opportunities for recreation or access but since few areas within the community are likely to fall into this category, it may be a negligible risk. •On the other hand, recreational opportunities could be enhanced if any stopbanks built include pathways along the top. Like seawall promenades, these pathways could provide access to a flat and accessible surface for walking, bike riding, pushing buggies, and so on.	3	•Maintenance of infrastructure is generally a condition of resource consent. •Generally, there is a pathway for consenting new infrastructure or enabling improvements to existing infrastructure. The existing consented infrastructure will be considered as part of the existing environment. •The specific type and location of the infrastructure will determine how challenging this process is. •No resource consent is required for flood proofing buildings. •Elevating floor levels is permitted by the District Plan but may be subject to other development standards such as height in relation to boundary.	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.	3	•Enhancement in the short term would include installing non-return valves on stormwater outfalls, which could be a low-cost exercise and effectively manage the risks over the short term (even though risks are low). •By the medium term, raising the isolated pockets of houses which could be impacted by flooding would be proportionate to the scale of the hazard, however it is likely that the number of properties required to be lifted would be small. •Raising the floor levels of homes or flood proofing properties could result in some potential exacerbation of hazard to neighbouring properties, however this would likely be dealt with through design and consenting to ensure these impacts were minimised. •Raising floor levels would be effective as most road levels were assessed as being high enough that properties could still be accessed during a significant event. •By the long term, additional hard protection in the form of small bundings/stop banking by the Waikakariki Stream would be proportionate to the scale of the hazard and effectively manage the water coming from the sea up the low lying land.	**38**	17