



#### **Minutes:**

# Additional CAP Meeting – Central Adaptation Area: MCDA Scoring of Shortlisted Pathways

#### Date: Wednesday, 11 October 2023

Location: Robin's Nest, Ngā Manu Nature Reserve, 74 Ngā Manu Reserve Road, Waikanae (MS teamslink in invite)

**Time:** 1.30 pm – 4.00 pm

**Attendees:** Jim Bolger (Chair), Donald Day, Martin Manning, Susie Mills, John Barrett, Melanie McCormick, Moira Poutama, Mark Taratoa, Olivia Bird, Kelvin Nixon, Te Rangimārie Williams, Stephen Daysh, Kate MacDonald, Derek Todd, Monique Eade, Iain Dawe, Deanna Rudd, Jason Holland, Sandhira Naidoo, Yvonna Chrzanowska, Alfred Lison, Aastha Shrestha and Abbey Morris

**Observers:** Tim Sutton, Glen Olsen and Sophie Handford

Apologies: Jerry Mateparae, Kris Pervan and Michael Moore

Agenda Item	Comments
Opening &	Opening Karakia by John
Introductions	Welcome by Jim Bolger, Chair
Confirmation of the	Confirmation of the Minutes
Minutes	Jim motioned to move the minutes. Kelvin moved the motion and Olivia seconded it.
Update from ĀkW	Melanie McCormick (ĀkW)
	<ul> <li>Melanie announced her resignation from Ātiawa ki Whakarongotai Trust (ĀkW), which also meant she will be stepping down from her role in CAP. She expressed her gratitude to CAP for their hard work and extended her best wishes to the team.</li> <li>Melanie also shared that ĀkW is reviewing the final draft of the Atiāwa Climate Change value statement and will be able to share it with CAP shortly. This statement includes important korero from their people, which provides a mandate for ĀkW's position in the forum.</li> <li>She informed CAP that they are in the process of reviewing the final draft of risk assessment for CAA.</li> </ul>
Project Update	Abbey Morris (KCDC)
	<ul> <li>Abbey provided an update to CAP about the new CAP work programme which will be updated shortly.</li> <li>She discussed the internal work being done by the Coastal Project team at the Council to create a new Takutai Kāpiti website making it more user-friendly. FAQs are being rewritten to help with the understanding of the CAP process.</li> <li>Abbey informed CAP that an email would be sent to ratepayers about the project, the role of the CAP and where to learn more.</li> <li>She mentioned that the venue for the Paekākāriki Community Values Workshop on 7<sup>th</sup> November has been confirmed, so it will be advertised next week. There will be an RSVP system in place, with priority given to Paekākāriki residents given that the workshop is for the Paekākāriki Adaptation Area. A venue for a second workshop is still to be confirmed if there is enough interest from the Paekākāriki community.</li> <li>Abbey also informed CAP that the Chief Executive at Council has written to the MfE and the DoC seeking clarification on guidance for coastal adaptation.</li> </ul>



	Discussion:										
	<ul> <li>Susie enquired about any further engagement planned for Raumati.</li> <li>Abbey responded that the Raumati values community workshop and online survey has been completed, and through this approximately 1100 comments from Raumati have been received. This feedback will be summarised in the RAA Values report. Further engagement with Raumati will be when the CAP share their draft recommendations.</li> <li>Tim informed CAP that the Raumati Community Board (RCB) had written to the chair (Jim) suggesting small group meetings with managed areas to discuss various pathways developed by TAG and CAP to help the community understand how the scorings are done and what they entail. The goal is to engage with the community members, unpack the processes, and help the community understand CAP's discussions and how they can be involved.</li> <li>Tim shared that Kris responded to the RCB, and a meeting with Council staff is scheduled for 26<sup>th</sup> October to discuss this further.</li> </ul>										
Multiple Criteria	Stephen Daysh (Mitchell Daysh) with support from Kate MacDonald (Jacobs)										
Decision Analysis	Focusing on the Effectively manages the risk of coastal erosion criterion (New										
(MCDA)	Commentary)										
Assessment of Shortlisted Pathways for Central Adaptation Area (CAA) Facilitated discussion session resulting in CAP	<ul> <li>Abbey commented that the purpose of the session is to reconfirm that CAP are comfortable with what TAG have done, by way of pre-scoring.</li> <li>Stephen requested Kate to provide a rundown of the pathways based on their technical effectiveness for managing the risks.</li> <li>Kate explained the rationale for each pathway to CAP, to assess if they were satisfied with the scores.</li> <li>Stephen suggested going through scoring erosion Management Units by going unit by unit.</li> </ul>										
decision required	Discussion:										
	For Erosion Unit 5A – Waikanae:										
	<ul> <li>Kelvin asked why some pathways scored the same even with different options. In unit 5A, PW2 and PW4 scored the same, and the same was observed for PW3 and PW5. Derek explained that the scoring reflects some of the risks associated with hard engineering. He noted that pathways with hard engineering options may not score as high as those without. As such, the lower score (for PW3 and PW5) reflects the uncertainty on the effectiveness of detached breakwaters.</li> <li>Jim asked why the option of detached breakwaters were included alongside seawall options. Abbey clarified that CAP had requested the inclusion of detached breakwater options within the pathways so they could explore the effectiveness of different options. This holistic approach allows for a broad evaluation of the available options to address different MCDA criteria.</li> <li>Jim asked Kate why they ranked seawall differently from detached</li> </ul>										
	<ul> <li>breakwater. Kate responded that a seawall is a more predictable and engineered solution for effectively managing erosion and holding the line. However, detached breakwaters sit offshore, and their effectiveness can vary in the Kāpiti Coast environment due to uncertainties and challenges. There is no detailed modelling available yet to determine precisely how detached breakwaters would respond. She highlighted that there are uncertainties in the different options in terms of how they would manage the risk of erosion.</li> <li>Stephen asked if Kate was indicating that based on technical criteria, detached breakwaters positioned under the sea are considered less certain in their effectiveness compared to seawalls, leading to their lower scores. Kate responded that was an accurate summary.</li> </ul>										



	<ul> <li>lain added that a detached breakwater can add some benefit that a seawall doesn't as it can trap sand behind it providing some additional benefits to the beach in a way that a seawall can't. But, there are some uncertainties regarding its effectiveness.</li> <li>Susie asked about the scoring of 5 for PW6 in the context of effectively managing erosion risks through retreat. Derek clarified that this scoring reflects the effectiveness of retreat in managing the assets at risk.</li> <li>Olivia asked if this consideration is limited to properties and assets rather than the natural environment. Derek affirmed that it primarily focuses on the effectiveness of managing built environments at risk. He further explained that when considering other criteria such as natural character, ecology, and social values, the impact of managed retreat might score lower. However, in the context of managing coastal erosion to reduce risks to built environments, this is what the score reflects.</li> </ul>
	For Inundation Management Unit 5B - Waikanae:
	<ul> <li>Stephen clarified that the current discussion is based on the scoring done by Kate and Derek as technical subject matter experts. He asked Kate and Derek if they were satisfied with their scoring. They confirmed that they are and noted that these scores are relative to the other pathways considered in the scoring.</li> <li>Olivia commented that the scores make sense from a relativity perspective.</li> </ul>
	For Waikanae Estuary combined Management Unit (6A and 6B):
	Kate provided the rationale behind the scoring for unit 6A and 6B
	<ul> <li>Susie asked why PW2 and PW3 rated the same considering one starts with status quo and the other starts with enhance. Kate responded that the scores are the same (4) because currently and in the short-term, the risks around the estuary edges are fairly low.</li> <li>Stephen asked Kate to clarify the logic of relativity and whether she was suggesting that PW2 might drop while PW3 might go up. Kate responded that</li> </ul>
	<ul> <li>she thinks PW3 going up is probably relative to the proportion of risk. She wouldn't drop PW2 down because it's still a good option given the current and short-term risks.</li> <li>Stephen commented that there is no problem with scoring 5 for both as they are both good options given the context of that upit, to which Kate agreed</li> </ul>
	<ul> <li>CAP agreed the scoring for PW3 as 5 but to not change PW3.</li> </ul>
	For Erosion Management Unit 8A – Paraparaumu:
	<ul> <li>Kate explained the scoring rationale for 8A.</li> <li>Kelvin asked why the PW6 scoring for Waikanae Unit 5A is not the same as the one for Paraparaumu Beach (Unit 8A - PW6: Enhance, Enhance, Retreat)</li> <li>Derek clarified the reason why Paraparaumu was scored 4 as opposed to 5 is due to the uncertainty whether the enhance option in the short-term can deal with the current erosion in the southern part of the adaptation area. That's the only differentiator, whereas in Waikanae, no part of that area is currently eroding.</li> </ul>
	For Inundation Management Unit 8B - Paraparaumu:
	<ul> <li>Kate provided the rationale behind the scoring for Unit 8B.</li> <li>No further CAP comment</li> </ul>
Multiple Criteria	Stephen Daysh (Mitchell Daysh) with support from Damian Debski (Jacobs)
Decision Analysis (MCDA)	Focusing on the <b>Effectively manages the risk of coastal inundation</b> criterion (Reissued Commentary)
Assessment of Shortlisted	• Derek took the lead in the absence of Damian who is overseas. He informed CAP that Damian prepared the initial scoring.



Pathways for Central Adaptation Area (CAA) Facilitated discussion session resulting in CAP decision required	<ul> <li>Erosion Management Unit 5A – Waikanae:</li> <li>Stephen asked Derek to explain why there are 2 scores in Management Unit 5A – only scores of 1 or 2. Derek responded that anything related to enhancement or dune reconstruction increases the dune height, thereby reducing the inundation risk. So, if the dune height is increased in bulk for erosion purposes, there is also a small trade-off in inundation defence. These pathways are developed for erosion and they are not expected to be effective for inundation because that wasn't their purpose.</li> <li>Stephen commented that some of these pathways do have certain residual benefits from an erosion aspect.</li> <li>Martin commented that when the report shows only the numbers, the prescored sheets may create an impression that CAP have already discussed and agreed upon the scores. He expressed concerns about potential conflicts in the language used in the report. Stephen responded to Martin's concern that the report should show the interconnectedness of different coastal processes, with two different hazards (erosion and inundation). He noted that actions taken for erosion management may have collateral residual benefits for addressing inundation, and vice versa. This interconnectedness focuses the complex and interrelated nature of coastal management, which might not be immediately evident when looking solely at the numerical scores in the report.</li> </ul>
	<ul> <li>Stephen emphasised the need for the report to provide a clear explanation of these interconnected aspects.</li> </ul>
	Unit (6A and 6B) - Waikanae Estuary.
	<ul> <li>Derek explained that the ratings are relative to each other, based on technical knowledge and subjectivity. He added that retreat would always be a more effective option than, for instance, bank protection or other works in terms of certainty in removing risks.</li> <li>John asked about the potential impacts of changing the river mouth, on both erosion and inundation, particularly in the short or medium term. Iain added that river mouths react differently to erosion and inundation. The connection with inundation is stronger than with erosion, resulting in more uncertainty regarding how the river mouth interacts with coastal processes in terms of erosion.</li> </ul>
	• Kelvin further commented that if the river mouth was altered that would affect what CAP are discussing, potentially around the estuary area. Yvonna noted that Council does not have jurisdiction over Waikanae River mouth, and that decisions related to river cutting work is likely GWRC, and DoC. Suggested CAP could look at how it includes recommendations or commentary in their recommendation report.
	• Iain commented that there is a recognition that river mouth cutting is expensive and has ecological impacts. There are natural processes during flooding that cut the channel anyway.
	• Jim commented that maintenance programme should be from GWRC, but it often comes down to costs. Iain added costs and more so the ecological impacts.
	<ul> <li>Kelvin commented that human domain should be given equal consideration to the ecological domain in scoring, as it is a significant issue. He raised the question of what should take precedence. Yvonna explained that as part of the multi-criteria decision-making process, CAP members, who have various areas of interest, will determine the scoring of different aspects of criteria e.g. social, ecological, etc.</li> </ul>
	• Stephen asked about the permitted activity status in the Regional Coastal Plan. Iain explained that there are specific triggers that must be reached to



	<ul> <li>alter the river mouth without needing consent. Stephen then asked if this was the current status quo situation, to which lain confirmed, at the moment it is, but it didn't use to be, until a recent plan change became operative.</li> <li>Derek commented that those triggers mentioned by lain, are around water levels driven by pluvial and fluvial river flows rather than coastal inundation from large seas. Iain confirmed most of the drivers for cutting the mouth are around fluvial flooding rather than coastal inundation. He added that widening the river mouth opens the opportunity for a larger volume of water in periods of high tide storm surge, to enter and contribute to inundation.</li> <li>Derek emphasised that appropriate mechanisms must be used when dealing with coastal flooding as it is different from river flooding.</li> <li>Jim commented that general public might not understand the technical differences between river or coastal flooding, CAP needs to take realistic approaches to these concerns rather than delving into technicalities.</li> <li>Jason suggested a way that CAP, in their report to the Council, can raise those concerns about issues, e.g. technical differences between river or coastal flooding, etc, and could state that during the CAP process, they felt uncomfortable separating certain issues. The report could include CAP commentary to Council, on issues are outside of CAP's designated scope. He acknowledge that in a perfect world there would be no boundaries and separate jurisdictions which could allow for a wholly integrated approach to coastal adaptation, instead of these artificial barriers.</li> <li>Kelvin concurred with Jason's suggestion, noting that it would be a logical approach to acknowledge and mention these issues that have come up during the discussions, which could potentially impact the scoring in the future.</li> <li>John suggested having a footnote in the report to acknowledge the discussion where the scoring at hove the would affect the effectivenees of the actions put</li></ul>
TEA BREAK	
Multiple Criteria	Stonbon Daveh (Mitchell Daveh) with sunnart from Monique Eade (Jessha)
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Central Adaptation	<ul> <li>Stephen Daysh (Mitchell Daysh) with support from Monique Eade (Jacobs)</li> <li>Focusing on the <u>Regulatory consenting and policy risk</u> criterion (Reissued Commentary)</li> <li>Monique explained the rationale behind the scoring for all Management Units. She pointed out that the long-term options often revolve around protection measures, which means there are requirements for consenting and can add complexity. This is why secret are lower for some bard engineering actions.</li> </ul>
Area (CAA) continued	<ul> <li>She commented in general, pathways that align with the Status Quo or Enhance options are currently supported by the policy/ consenting framework,</li> </ul>



Facilitated discussion session resulting in CAP decision required	<ul> <li>and generally involve fewer consenting requirements, resulting in higher scores. Everything other than that tends to have a neutral or lower score.</li> <li>Monique noted that as a starting point, soft engineering pathways typically receive a score of around 3, due to being favoured by the consenting framework/ policy framework. However, she acknowledged that there are concerns from affected parties, including mana whenua, who may not support soft engineering. There might be some ways to mitigate this through options like co-design. So, some pathways with soft engineering options scored 2.</li> <li>For <i>Waikanae Estuary Combined Management Unit – 6A and 6B</i>, the scoring for Bank Protection is 3, noting that the works are usually within the existing footprint.</li> </ul>
	<ul> <li>Monique commentary</li> <li>Monique commented that although currently there is no policy framework for Retreat, the policy direction at this stage is that Retreat is going to be enabled by the future framework.</li> <li>She further commented that there are two notable exceptions to where retreat is not scored 3.</li> <li>The first is Waikanae Estuary Management Unit because retreat relates to infrastructure and recreation assets and not private properties, so retreat scores more highly.</li> <li>Where pathways identify managed retreat in the medium-term, it has been scored harder than if retreat is identified for the long-term. This is because currently the policy framework would require regional and district plan changes to implement retreat, and likely to face some opposition.</li> <li>Pathways containing seawalls are generally scored a 2 because the policy framework does not encourage it. But as CAP discussed earlier, the negative effects related to seawalls would need to be worked through during a consenting process, in order to mitigate these effects.</li> <li>Pathways with the detached breakwater option has scored 1. The difference between a detached breakwater and a seawall is that there's an additional layer of unknowns. Also, in the Regional Plan, the coast is identified as sites of significance to mana whenua. There is also a significant surf break off the Waikanae coast. Therefore, it's not just a matter of dealing with the coastal effects but also the on-land effects.</li> </ul>
Multiple Criteria Decision Analysis (MCDA) Assessment of Shortlisted Pathways for Central Adaptation Area (CAA)	<ul> <li>Stephen Daysh (Mitchell Daysh)</li> <li>Stephen went over the ecology values from previous CAP meeting, and asked CAP for individuals scores. CAP agreed a final score and checked relativity of final scores as a group.</li> <li>The completed scoring for all MCDA criteria can be found in Appendix 1 of these minutes.</li> </ul>
Next Steps	<ul> <li>Abbey Morris (KCDC)</li> <li>Abbey shared that the CAA MCDA scoring of Te Ao Māori values will be scored by mana when up and will be shared with the CAP area completed.</li> </ul>
Closing Karakia	By John





Updated CAA High-level Menu of Pathway Options

CAA Shortlisted Pathways for MCDA Assessment Presentation

**CAA Shortlisted Pathways with MCDA Commentary for Risks of Coastal Erosion** – *already prescored by the TAG (new)* 

**CAA Shortlisted Pathways with MCDA Commentary for Risks of Coastal Inundation** – already prescored by the TAG (re-issued)

CAA Shortlisted Pathways with MCDA Commentary for Regulatory Consenting and Policy Risk already pre-scored by the TAG (re-issued)

CAA Shortlisted Pathways with MCDA Commentary for Ecology – CAP to score (re-issued)





Appendix 1: Partially Completed CAA MCDA Scoring Sheet

				MCDA Criteria/Weight	ing		
CAP Weighting	Ecology	Landscape	Te ao Mãori values	Community Social and Economic Wellbeing	Public Access and Recreation	Regulatory consenting and policy risk	Effectively manages
	3	2	3	3	3	1	

			Follow		Te ao Mãori	WICDA Criteria/Weight		Bandatan a	Effectively many seats states for	Effectively menors the side of	-	
		CAP Weighting	Ecology	Landscape	values 3	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	Weightings TBC by	CAP
Pathways for Waikanae	Beach					MCDA Scoring		1				
Management   Init	Pathways Pathway Descript	tions	Ecology	Landscape	Te ao Mãori	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:
Wanagement Ont	Short term Medium term	n Long term	Score Notes	Score Notes	Score Notes	Score Notes	Score Notes	Score Notes	Score Notes	Score Notes	_	
	Enhance - Dune and wetland resilience, Soft Engineering community Dune education and reconstruction emergency management	- Soft Engineering - Beach renourishment	3 and the second sec	Intra- entailection to durine alloweed and areas with maintain existing operation stand beach and vegetated durine context and associated natural haracter and open cosstal edge. <ul> <li>Community education may reinforce recognition of indicators of a healthy environment and and its contribution to natural character and sense of place.</li> <li>Origing implementation of soft engineering would continually disrupt natural patterns and processes, but otherwise maintain an open dynamic coastline influenced existing settlement with little change in context of present day.</li> </ul>	by 4	<ul> <li>In treasing but retaining to wind term anys with standard community values. If community is actively included in implementation, it could promote social and economic wellbeing, as well as enhance social cohesion 8 health outcomes.</li> <li>Over medium-long term, the community may need further information on dure reconstruction option (e.g. exidence of suitability, effectiveness, costs &amp; engagement) before supporting.</li> <li>In the long term, the ongoing beach monitoring required to assess the ongoing success of beach renourishment, could potentially be done at the local/community level, if they are given appropriate training and technology.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	Soli term fudine testencte win Hainitain the initial an animetity and Indicape values of the costal environment.     Origoing dune maintenance and protection in medium and longer term is likely to thref benefit ecosystems, foster nature appreciation & supports community values.     • Both the medium (Dune reconstruction) and long term options (beach renourishment) may temporarily impact access during construction, but overall, public access to the coastal environment will be maintained.     • Recreation that damages dunes needs to be restricted to protect ecosystems & encourage dune stability.     Beach renourishment can result in changes to the beach profile and increased swimmer injuries, eg. steeper, more dangerous shore break.	<ul> <li>Costain if solution and eminatement is enclosinged under the present regulatory framework and will note any major consenting hurdles in the short term.</li> <li>Soft-engineering in the medium and long term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.</li> </ul>	Buile entitatement and reconstruction are boint effective measures that are proportionate to the nature and scale of risk over the short-medium term. If designed and manage properly, islikely to effectively manage impacts under lower SLR scenarios. Design would be informed by best practise. Forme uncertainty around the effectiveness of renourishment in the long term under higher SLR scenarios, as would require significant sand source input. Would not exacerbate ension issues in adjacent areas, southward transport of sediment used for renourishment would have added benefit to Paraparaumu Beach.	<ul> <li>Praintey's incluent to aubress induction shall be a set of the s</li></ul>	5 59	23
	Enhance - Dune and wetland resilience, resilience, community education and education and energency management AND Soft Engineering. Dune reconstruction renourishment	Protect - Hard Engineering - Sea D wall	<ul> <li>Enhancement of existing native populations will likely initially promote ecology and provide greater habitat and resources for flora and fana. Community education will also increase knowes;</li> <li>Bart and Sama (Sama) equation of a solution of a sol</li></ul>	Dune and wetland enhancement combined with soft engineering will initially maintain existing open sand bead and vegetated dunc contex along the costal ledge but with ongoing disruption to natural patterns and processes which will likely reduce attorn may reinforce recognition of indicators of a healthy environment and its contribution natural character and sense of place. • Centual introduction of seavall will modify the existing open beach profile and dune sequence and reduce natural character, resulting in potential longer term adverse landscape effects.	a h h h	<ul> <li>Over the short and medium term, increasing dune resilience aligns with stated community values. If community is actively included in due resilience/enhancement activities, it will promote social and economic wellbeing, as well as enhance social cohesion &amp; health outcomes. Community may need further information on dune reconstruction option (eg. evidence of suitability and effectiveness, costs and suitability of the Beach renourishment and long term; seawall options, prior to acceptance and/or implementation.</li> <li>The origing baach monitoring required to assess the success of Deach renourishment, and potentially be done at the local/community level, if they are given appropriate training and technology.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	This short-med term dune resilience & dune reconstruction option will maintain the natural appeal of the coastal environment. Ecosystem protection could enhance community values and foster nature appreciation.     Public access to the coastal environment will be maintained. Recreation that damages dunes may need to be restricted to protect ecosystems. & encourage dune stability.     The long term seawall option may contribute to beach narrowing which may restrict gublic access to beach thigh tides. However, seawall could potentially be designed to incorporate amenity / recreations value.     Ouring seawall construction, public access to beachfront may be temporarily restricted.	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting indrules in the short term.</li> <li>Soft-engineering in the short and medium term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Hard-engineering an the long term will have some consenting requirements and may be challenged.</li> <li>Hard-engineering ange to have they can have on the environment.</li> <li>Consenting a new structure is likely to be more challenging than upgrading an existing structure.</li> </ul>	<ul> <li>Dune enhancement and reconstruction are both effective measures that are proportionate to the nature and scale of risk over the short-medium term.</li> <li>Some uncertainty around the effectiveness of renourishment in the medium term under higher SLR scenarios, as would require significant and source, but combined with planting and dune management could be effective.</li> <li>Hard engineering would be effective at preventing further retract of the short-fine in the long term.</li> <li>Over the long term, hard engineering may exacerbate the erosion hazard directly to the north and south of the wall due to end effects.</li> <li>Design would be informed by best practise to reduce these effects but there will be environmental impacts and charges to the beach nacrowing and loss of volume).</li> </ul>	Pathway is not chosen to address inundation hazard.     A designed crest elevation of an eventual hard structure would result in a reduction of the overtopping hazard, but would not effectively manage the wider inundation risks up river and inlet pathways.	48	18
4	Enhance - Dune and wetland realience, community education and emergency management AND Soft Engineering Dune reconstruction enorthing for the second	Protect - Hard Engineering - Detached D Breakwater -	<ul> <li>Enhancement of existing native populations would likely promote ecology and provide greater habitat and resources for flora ad fana. Community education will able increase leaders.</li> <li>Date mechanism and the protection of due and wetland backs.</li> <li>Date mechanism and able of none specific for present due to the flora and fana to migrate and allow for increased distinct habitat, topographic variability and increase direction.</li> <li>Back resourchment projects have found negative ecosystem effects on terrential communities following resources the the second banding species.</li> <li>Back resourchment projects have found negative ecosystem effects on terrential communities following resources the the second means of mean means the the second provide second the distingt mean and wetlet with the the the second second the second s</li></ul>	Dune and wetland enhancement combined with ongoing disruption resulting through soft engineering will generally maintain existing open snad beach and vegetated dune context with a slight reduction in natural character. Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place. Detached breakwater would likely extend sense of modification into presently open coastal marrine areas and disrupt present-day open and unmodified coastal views. Th design of the breakwater could potentially reduce the ioverall scale of effects.	ne 3	<ul> <li>Over the short and medium term, increasing dune resilience aligns with stated community values. If community is actively included in dune resilience/enhancement activities, it will promote social and economic wellbeing, as well as enhance social cohesion &amp; health buctomes.</li> <li>Community may need further information on dune reconstruction option (ng. evidence of subalitily and effectiveness, cost &amp; engagement) before supporting.</li> <li>The community may need further information re: beach renourishment and long term detached breakwater options (effectiveness, cost, etc.) prior to supporting.</li> <li>The ongoing beach monitoring required to assess the success of beach renourishment, could potentially be done at the local/community level, if they are given appropriate training and technology.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	This short-med term dune resilience and reconstruction option will maintain the natural appeal of the costal environment. Ecosystem protection could enhance community values and foster nature appreciation.     Public access to the costal environment will be maintained. Recreation that damages dunes may need to be restricted to protect ecosystems & encourage dune stability.     The long term breakwater option may change beach condition, eg. beach narrowing (may restrict public access to beach at high tides).     Ouring Ibreakwater construction, public access to beachfront nay be temporarily restricted.     2	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Soft-engineering in the short term.</li> <li>Soft-engineering in the short term.</li> <li>Hard-engineering in the short soft memory.</li> <li>Hard-engineering in the gene multiple soft memory.</li> <li>Hard-engineering in the gene multiple soft memory.</li> <li>Hard-engineering an the gene multiple soft memory.</li> <li>Hard-engineering an the gene soft multiple soft memory.</li> <li>Hard-engineering and the soft memory and the soft memory of the soft memory.</li> <li>Hard-engineering and soft soft memory and the soft memory of the soft memory of the soft memory.</li> <li>Consenting a new structure is likely to be more challenging than upgrading an existing structure.</li> <li>Onsenting an offshort structure is in recogniced as a site of significance for mana when and there is greater uncertainty in the effects of the structure.</li> <li>Parts of Waiknare Beach and school doe in the Natural Resources Plan for the Wellington Region as containing sites of significance for mana when.</li> </ul>	Dune enhancement and reconstruction are both effective measures that are proportionate to the nature and scale of risk over the short term.     Some uncertainty around the effectiveness of renourishment in the medium term under higher SLR scenarios, as would require significant and source, but combined with planting and dune management could be effective.     • Detached breakwater in the nearshore would reduce wave energy approaching the beach, and could be effective at reducing rosion risk in Walkanae Beach.     • However, the breakwater will likely result in morphological changes to the beach due to reduction in wave energy, and could have some lee-side erosion effects downdrift of the breakwater eq. Peraparaumu) as a result of sediment trapping.     • The scale and nature of the works required to effectively manage the risk is unlikely to be proportionate to the scale of the hazard.     • Design would be informed by best practise.	Pathway is not chosen to address inundation hazard, and would not effectively manage any relevent source of flooding for Waikanae Beach Depending on design, potential for breakwater to increase water level setup at shoreline which may exacerbate inundation	40	15
Waikanae Unit 5.	Enhance - Dune and wetland resilience, community education and emergency management AND Soft Engineering - Sea wal Soft Engineering - Sea val	a Retreat	Enhancement of existing native populations will likely initially encourage positive ecological benefits. Community education will also increase knowledge and support for protection of dume and wetfand spaces.     User exconstruction can allow for more space for present dure flora and fauna to migrate and allow for increased distinct habitast, togographic variability and increased root mass for sand binding species.     Onging saw all protection however has the potential to reduce ecology by damaging beach, dume, and estuary ecology, and overall may support lower biolidiversity and prevent the natural migration of habitats.     Retrat while allowing for the natural migration of biodiversity, is going to be occurring in an already altered environment following the placement of as awall and present dense urbanisation. This would likely not allow for naturally occurring positive ecological benefits and this would need heavy management.	Dune and wetland enhancement combined with soft engineering will generally maintain existing open sand beach and vegetated due context along the coastal edge but with some engoing disruption to natural patterns and processes.     Communy education may reinforce recognition of indicators of a healthy environment and its contributions to ratural character and sense of place.     Onging engineering and introduction of hard structures including a sea wall has potential reduction in natural beac profile which would likely reduce natural character and more result in adverse landscape effects in context of an increasingly modified coastal environment with likely ongoing sense of modification and reduction in natural character.	, , , , , , , , , , , , , , , , , , ,	<ul> <li>Over the short term, increasing dune resilience aligns with stated community values. If community is actively included in dune resilience? enhancement activities, it will promote social and economic wellbeing, as well as enhance social cohesion &amp; health outcomes. Community may need further information on dune reconstruction option [eg. evidence of suitability and effectiveness, costs &amp; equagement) before supporting.</li> <li>In medium term, the community may reguire further information on the seawall option(eg. effectivenes, cost and suitability, etc), prior to acceptance and/or implementation.</li> <li>In long term, the community may reguire assurance and further information on the seawall option(eg. sects will be assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	This short term dune resilience & dune reconstruction option will maintain the natural appeal of the castal environment. Ecosystem protection could enhance community values and foster nature appreciation. While public access to the coastal environment will be maintained, if may be temporarily restricted while dune reconstruction works are being done. Recreation that damages dunes may need to be restricted to protect ecosystems & encourage dune stability. The medium term seawall option may be designed to incorporate amenity value/ recreational access. Douring usawall construction, public access to beach thigh tides. However, seawall could potentially be designed to incorporate amenity value/ recreational access. During usawall construction, public access to beachfront will be temporarily restricted.     2	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting landles in the short term.     Soft-engineering in the short term will have some consenting requirements and may be challenged ut is aligned with the current statutory framework.     Hard-engineering in the modium term will have some consenting requirements and may be challenged.     Hard-engineering and the modium term will have some consenting requirements and may be challenged.     Hard-engineering approach to the stringern to consenting requirements and may be challenged.     Hard-engineering approach to the stringern consenting requirements and are discouraged under the N2CPS and RPS because of the adverse effects they can have on the environment.     Consenting a new structure is likely to be more challenging than upgrading an existing structure.     If managed retreat is done well, is should have limited (or positive) effects on the environment.     Coursently there is on astical direction or precedent on how to undertake managed retreat however, this is likely to be rectified prior to be required.     Anaged retreat currently requires regional and district plan changes to implement.	<ul> <li>Dune enhancement and reconstruction are both effective measures that are proportionate to the nature and scale of risk over the short term.</li> <li>As awall in the medium term will hold the shoreline seaward of private proterties and effectively manage the risks.</li> <li>Hard engineering would be effective at preventing further retreat of the shoreline in the medium term, will be the medium term, but any seacerbate the encions hazerd directly to the north and south of the wall due to end effects.</li> <li>Design would be informed by best practise to reduce these effects but there will be environmental impacts and charges to the beach associated with this option (i.e. beach ansrowing and loss of volume).</li> <li>Retreat in the long term will remove all risk from the encision hazard to private property; however the saw will in the medium term would have modified the costal environment, and therefore either continued matterance of the saw will would be engired, or significant rehabilitation to reform the dunes would be required to re-establish protection.</li> </ul>	<ul> <li>Pathway is not chosen to address inundation hazard.</li> <li>A designed crest elevation of an eventual hard structure would result in a reduction of the overtopping inundation risks up river and nile pathways.</li> <li>Only a small amount of properties retreated from the erosion hazard in the long term may alo have been impacted by inundation hazards.</li> </ul>	42	16
	Enhance - Dune and wetland realience, community divication and emergency Dane reconstruction Protect - Hard Engineering - Detached Breakwater	Retreat	Schancement of existing native populations will likely initially encourage positive ecological benefits. Community education will also increase knowledge and support for protection of duna and welfand spaces. Dune reconstruction can allow for more space for present due file or and faunt to unigrate and allow for increased distinct habitats, topographic variability and increased root mass for sand binding species. Most ecological effects from detatched breakwaters would corrit the marine environment (Li, disturbance and species mortality during installation), however could promote artificially provery for present codlogy. Retreat frowars ecological restoration by providing habitats for projects to recolonise neighbouring areas that may become destroyed.	Dune and wetland enhancement combined with soft engineering will generally maintain existing open sand beach and vegetated dure context along the coastal edge but with some ongoing disruption to natural patterns and processes which will likely reduce natural character. Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place. Detached breakwater would likely extend sense of further disrupt existing unmodified views. Petrate would occur in the context of an increasingly modified coastal environment with likely ongoing sense of modification and reduction in natural character.	2	<ul> <li>The option to increase dune resilience over short term aligns with stated community values. If community is actively included in dune resilience / enhancement activities, it will promote social and econic wellbeing, as well as enhance social cohesion &amp; health. Community may need further information on dune reconstruction option (eg. evidence of subalbility and effectiveness, costs &amp; engagement) before supporting.</li> <li>In medium term, the community may require further information on the detached breakwater option(eg. effectiveness, costs and suitability, etcl., prior to acceptance and/or imgementiation.</li> <li>In the long term, the community in more likely to support extract if they are assured that suitable land is available to relocate to, and suitability of effection assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	This short term dune resilience and reconstruction option will     maintain the natural appeal of the coastal environment. Ecosystem     protection could enhance community values and foster nature     appreciation.     "While public access to the coastal environment will be     maintained, it may be temporarily restricted while dune     reconstruction works are being done. Recreation that damages     dunes may need to be temporarily restricted while dune     reconstruction works are being done. Recreation that damages     dunes may need to be restricted to protect ecosystems &     encourage dune stability.     The med-term threatwater option may change beach conditions,     rgb. beach narrowing (may restrict public access to beach front may     be temporarily restricted.     Toing term retreat may offer opportunities for ecological     restoration of the foredunes and opportunities for managed public     access & recreation.	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Soft-engineering in the short term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Hard-engineering approaches trigger more stringent consenting requirements and are discouraged under the XCCS and RPS because of the adverse effects they can have on the environment.</li> <li>Consenting an exituative is likely to be more challenging than a saw and as the whole cost is recognised as a site of significance for mana whenua and there is greater uncertainty in the effects of the structure.</li> <li>Parts of Weikense Bacch are scheduled in the Natural Resource Plan for the Weilington Rejon as containing sites of significance for mana whenua. The area has also been identified as having a significant surf break.</li> <li>If managed retreat is done well, it should have limited (or positive) effects on the environment.</li> <li>Currently there is on analous and farction on prescedent on how to undertake managed retrack.</li> </ul>	Dune enhancement and reconstruction are both effective measures that are proportionate to the nature and scale of risk over the short term. Detached breakwater in the nearshore would reduce wave energy approaching the bosch, and could be effective at reducing erosion risk in Walkanae Beach. However, the breakwater will likely result in morphological changes to the beach due to reduction in wave energy, and could have some less-ide erosion effects downdrift of the breakwater (eg. Paraparauruu) as a result of sediment trapping. The scale and nature of the works for the detached breakwater to effectively mange the risk is unlikely to be proportionate to the scale of the hazard in the medium term. elesign would be informed by best practite. Retreat in the long term will remove all risk from the erosion hazard to private property.	Pathway is not chosen to address inundation hazard, and would not effectively manage any relevent source of flooding for Wainane Beach. Only a small amount of properties retreated from the erosion hazard in the long term may also have been impacted by inundation hazards. Degending on design, potential for breakwater to increase relievel stup at shoreline which may exacerbate inundation	40	15

Management Unit Pathway	S Charac	Pathway Descriptions	Ecology	Landscape	Te ao Mãori 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	Score:	Score:
Waikanae Estuary Pathwa	ays					I					MCDA Total	RAW MCDA Total
4 5	Enhance existing inundation and/or wetland community education and emergency management Enhance existing inundation protection, dune and/or wetland resilience, and community education and emergency management	Accommodate - Elevate floor levels of buildings and infrastructure     Retreat     4       Protect - Additional Hard Protection - e.g. stopbanks, Culverts and Pump stations     Retreat     2	<ul> <li>extending existing inundation protection, removing strady existing spaces.</li> <li>a protection.</li> <li>a the traduction of accommodating for hazards is bitly to existing protection of accommodating for hazards is bitly to exist protection.</li> <li>a the traduction of accommodating for hazards is bitly and the single to form the single strate is followed in the single strate is the single strate is followed in the single strate is the sis that is the single strate is the single stra</li></ul>	Accommodating buildings and invastructure in flood prone areas would occur in context of existing modification with likely localized indixecup impacts.     Accommodating buildings impacts and promote beneficial landscape outcomes in the longer term.     Setrast may offer ability to restore natural character and promote beneficial landscape outcomes in the longer term.     Accommodation and the longer term of existing inundation protection plus wetland and dure resilieve occurs in context of existing modification with limited consequent change to natural character.     Community education may reinforce recognition of indicators of a baility environment and its contribution to natural character and sense of plus.     I Had protection in the form of stoppanks, culverts and pumpitations would likely reduce natural elements, patterna and processes and reduce natural elements.     Pattern and processes and evolve landscape outcomes in context of increased modification.		at risk and undertake proactive accomodation efforts to reduce risks to heath and safety.     - In the medium term Accomodate allows homeowners to plan for and choose effective fload miniption mesures relative to affordability of whether they have continued access to making & critical infrastructure.     - effective fload miniption genues relative to affordability of personal assets will be determined by insurance companies (based on own site specific risk assessment).     - In the short term, enhanced inundation protection & improving dure and/or wettand realines aligns with community values, and has personalized access to or reduce first and undertake protection & improving dure and/or wettand realinese aligns with community values, and has potential social and/or economic herefits. This option cuid provide the community with some assurance.     - Orging community education and increased awareness of risk will ensure emergency preparedness. E.g. Landowners may need to be supported to know how to respond to fload risk at to heling and safety.     - In the medium term additional hard protection align provide for the community with some assurance.     - The medium term additional hard protection align provide for the term of fload wetts and additional for the support to k now how to respond to fload risks to heling that safety.     - In the medium term additional hard protection and in provide for the term of fload to exect and advice that and undertake protection advice that and the set of fload events and allow bomeowners time to plan for and/or choose other effective avoiding metal results planning level of infrastructure services, etc.).	In the short term, public access to some public areas while works are being undertaken.     To maintain goodwill and support the community will need to be informed on changes to public access and why.     In the indem term, most <b>Accomodate</b> options are unlikely to impact public access and recreation.     In the indem term, most <b>Accomodate</b> options are unlikely to impact public access and recreation.     In the indem term, most <b>Accomodate</b> options are unlikely to impact public access and recreation.     In the indem term, most <b>Accomodate</b> options are unlikely to impact public access and recreation.     In the indem term, most <b>Accomodate</b> option areas will continue subject to any public access for recreation areas will continue subject to any public access to recreation areas will continue subject to any public access to some public areas while works are being undertaken.     To maintain goodwill and support the community will need to be informed on changes to public access and wareness of risk will ensure community programes.     In the inductive protection will ensure are being down.     To maintain goodwill and support the community will need to be informed on changes to public access and wareness of risk will ensure community programes.     In the indium term, additional hard protection options are may impact public access and evertex may provide opportunities for land to be autimated for accellar estoration or managed public access for low impact recreation.	Insturally with the turnover of buildings. Consenting hundles     are not anticipated.     If managed retrast is done well, it should have limited (or     positive) effects on the environment.     Currently there is no national direction or precedent on how     to undertake managed retrast across regional and district plan     changed retrast currently requires regional and district plan     changes to implement.     Costatal restoration and enhancement is encouraged under     the present regulatory framework and will not face any major     consenting hundles in the short term.     Stopbank, floodgates, pump station and culverts trigger the     NPS-FM and NES-F and may trigger the N2CPS depending on     location.     If managed retrast currently is should have limited (or     positive) effects on the work more challenging     than used thereas is structure is likely to be more challenging     than used retrast is structure.     If managed retrast currently requires regional and district plan     expanding an existing structure.     If managed retrast is done well, it should have limited (or     positive) effects on the environment.     Currently there is no national direction or precedent on how     to undertake managed entrest is done well, its flood thave limited     requirements and may be challenged.     Namaged retrast is done well, its flood thave limited     requirements managed retrast is northored.     Namaged retrast is more than been term	2       • Pathway not designed to address the erosion hazard, and would not effectively manage the erosion hazard.       a         2       • Only a small number of houses that were retreated for flood hazard would also be impacted by erosion hazard.       a         2       • Pathway not designed to address the erosion hazard, and would not effectively manage the erosion hazard, and would not effectively manage the erosion hazard, of house shat were retreated for flood hazard would also be impacted by erosion hazard.       a	the risk over this timeframe. <ul> <li>Baing floor levels in the medium term will reduce the risk to dwellings, but will not resolve access issues caused by flooding.</li> <li>The number of dwellings that will require raising will likely be very significant, and therefore the scale of works required may not be proportionate to the hazard especially if retract is anticipated in the long term.</li> <li>Retract will remove all residual risk to impacted private properties.</li> </ul> <li>Short term response is proportionate to the scale of the risk over this timeframe.</li> <li>Short term mesponse is proportionate to the scale of the risk over this timeframe.</li> <li>Order to some exacerbation of risks in other areas as with additional structures, however likely to use best protective to use best properties.</li>	e 51 50	20
Waikanae Unit 5B	Enhance - Enhance existing inundation protection, due and/or wetland resilience, and ccommunity education and emergency management	Enhance - Enhance existing inundation and/or wetland comunity education and comunity education and management arrive for the state of buildings and infrastructure	Community education may increase awareness of issues and existing ecology but will not directly positively impact without action.     Enhancement of existing stopharks in Walkanee will provide limited ecological benefit and likely to cause negative impacts on ecology as dire thanks are further attend and more vegetation may be likely to be removed to make room for protection works.     Vestand realisment through planning may have some positive ecological benefits however this could be limited when coupled with increasing or extending existing species.     The introduction of accommodiating for hazards is likely to nesting expected.     The introduction divident with can allow for natural migration of existing species.     Community education may increase awareness of issues and existing species.     Community education may increase awareness of issues and existing esological benefit and likely to cause negative impacts to existing species.     Community education may increase awareness of issues and existing species.     Community education may increase awareness of issues and existing esological benefit and likely to cause negative impacts to existing species.     Community education may increase awareness of issues and existing esological benefit and likely to cause negative impacts to existing species.	Enhancement of existing inundation protection plus wetland and dure resilience occurs in context of existing modification with limited consequent charge to natural character.     Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     Accommodating buildings and infrastructure in flood prone areas would occur in context of existing modifications with likely localised landscape impacts.     Enhancement of existing inundation protection plus wetland and dure resilence occurs in context of existing modification with limited consequent change to natural character.     Community education may reinforce recognition of indicators of a healthy environment and its contribution to indicators of a healthy environment and its contribution to		<ul> <li>In the short-medium term, enhanced inundation protection aligns with community values. Inundation protection could provide the community values may assurance. Improving date and/or economic benefits.</li> <li>Ongoing community education and increased awareness of risk will ensure community with some size and the properties to know how to resport to boll on the size to the size of the size</li></ul>	In the short-nedlum term, public access to recreation areas will continue subject to any public safety issues, eg. health risks or flood events. Enhanced innuction protection or required infrastructure maintenance, may restrict a access to some public areas will evorts are being undertaken.     To maintain goodwill and support the community will need to be informed on changes to public access and will.     Ongoing education and increased awareness of risk will ensure community programenses.     In the long term, most Accomodate options are unlikely to impact public access and recreation.	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.     elevating buildings and flood proofing will have building consent (and possibly resource consent) equirements. Given the anticipated timeframe of this action this may occur naturally with the turnover of buildings. Consenting hurdles are not anticipated.     elevating buildings and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.     elevating buildings and flood proofing will have building consent (and possibly resource consent) equirements. Given a second the short term.     elevating buildings and flood proofing will have building consent (and possibly resource consent) equirements. Given the anticipated timeframe of this action this may occur and the short term.	Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.	Short-medium term response is proportionate to the scale of the risk over these timeframes, excepcially under lower SR scenarios.     Taking floor levels over the long term will reduce the risk to develings, but will not resolve access issues to the properties.     The number of develings that will require raising will likely be very significant; and therefore the scale of works required may not be proportionate to the hazard     Short term response is proportionate to the scale of the development of the scale of t	e 53	22
2	Status Quo AND Community Education and Emergency Management	Enhance - Enhance existing inundation protection, dure resilience, and education and emergency management	<ul> <li>Current ecological systems are presently under threat and may decide in the short term under stratus qual.</li> <li>Ling term enhancement of existing stopbarks in Wakkness will provide the short term under stratus qual.</li> <li>Ling term enhancement of existing stopbarks in Wakkness will provide the short existing stopbarks and the short existing stopbarks and the short existing stopbarks and the stopbarks and the short existing stopbarks and the stopbark existing and the stopbark existing and the stopbark existing and the stopbark existing stopbarks existing and the stopbark existing and the stopba</li></ul>	<ul> <li>More frequent flooding would likely extend coastal environment linkar da dirxyte existing more modified landscape values within the present day coastal cortext.</li> <li>Communy enduction may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.</li> <li>Inhancement of existing inundation protection plus dune and wettand enhancement occurs in context of existing modification with limited consequent change to natural character.</li> <li>Introduction of hard structures and bank protection may reduce natural character with adverse landscape effects in context of existing settlement.</li> </ul>		<ul> <li>In the short term, maintaining existing dures and current infrastructure aligns with community values. However, with 10% of Waikness properties likely sequest of innuitation with 0.2m RSR ("by 2050 at SPRS.), a Status Gue approach may not be tolerated by the community, engagement on medium term status que approach may be needed.</li> <li>Orgoing education and increased awareness of risk will ensure community engagement to medium term status que approach undertate proactive efforts on dwellings at risk from invadation and to undertate proactive efforts on dwellings at risk from end/or weltand resilience aligns with community values, with potential social and/or economic benefits. In the long term, add/cmail hard probaction may provide the community with turber assurance during flood events.</li> <li>Isuanzility of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	<ul> <li>In the short-medium term, infrastructure will be maintained &amp; public access to recreation areas will continue subject to any public safety issues, eg. due to required maintenance, health risks or flood events.</li> <li>To maintain goodwill the community will need to be informed on changes to public access and why.</li> <li>Ongoing education and increased awareness of risk will ensure community preparedness and reponse during flood events.</li> <li>In the long term, additional hard protection may restrict access to some areas while works are being undertaken.</li> </ul>	Coastal restoration and enhancement is encouraged under the present regulatory finamework and will not face any major consenting hurdles in the short term.     Sophank, floogdates, yump station and culverts trigger the NYS-FM and NIS-FS and may trigger the NZCIPS depending on location.     Israd-engineering in the long term will have some consenting requirements and may be challenged.     Consenting a new structure is likely to be more challenging than upgrading an existing structure.	Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.	Short-medium term response is proportionate to the scale of the risk over these timeframes, expecially under lower SLR scenarios. Additional protection in the long term likely to effectively manage the inundation risks. • Codd be some escent battor of risks in other areas as water may be diverted from Waikanee into other areas with additional structures, however likely to use best practise to avoid this impact as best as possible.	41	16
1	Status Quo AND Community Education and Emergency Management	Enhance - Enhance existing inundation Status Quo AND Community Education and Education and Emergency Management Management	<ul> <li>A significant amount of ecology across the Walkanse area is presently at risk under flooding scenarios and with the status quo will continue to deline. Community education may increase awareness of issues and existing ecology but will not directly positively impact without action.</li> <li>I ong term enhancement of existing stopbants in Walkanse will provide limited cological benefit and likely to cause negative impacts on ecology as nert banks are further altered and more vegetation mays talkely to be ennoted to make room for protection works.</li> <li>Wethan deallers the likely to be instead when coupled with in creating existing packets.</li> <li>Maintenance of dynamic may horogo it stopbants causing the removed in media of paratine may and signify ner- menove examines that for migratory and spanning fish species, and nesting habitats for migratory and spanning fish species, and nesting habitats for migratory backs.</li> </ul>	More frequent flooding would likely extend coastal environment inland and disrupt existing more modified landscape values within the present day coastal context. I community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     - Enhancement of existing inundation protection plus dure and wettain enhancement cours in context of existing modification with limited consequent change to natural character.		<ul> <li>In the short and medium term, maintaining existing dunes and current infrastructure aligns with community values. However, with 10% of Valianae properties likely exposed to fundation with 0.2m RS.R.(*) 2083 at SSPR.S.), a Status Quo approach may not be tolerated by the community - engagement on medium term status quo approach may be needed.</li> <li>Ongoing education and increased awareness of risk will ensure community reparadense. E.g. Landowners may need to be supported to identify dwellings at risk from inundation and to undertake proachue efforts on dwellings to accomodate risks to health and safety. Likely to be made on a case-by-case basis.</li> <li>In the long term, enhanced inundation provide the community with some assurance. Improved Guo and/or wettaind resilience aligned with community values, with potential social and/or economic herefits.</li> <li>Insurability of personal assets will be determined by insurance companies (Based on own site specific risk assessment).</li> </ul>	<ul> <li>In the short-medium term, infrastructure will be maintained &amp; public access to recreation areas will continue subject to any public safety issues, eg. due to required maintenance, health risks or flood events.</li> <li>To maintain goodwill and support for adaptation options, the community will need to be informed on changes to public access and why.</li> <li>Ongoing education and increased awareness of risk will ensure community preparedenss.</li> <li>In the long term, increased inundation protection may restrict access to some areas while works are being undertaken.</li> </ul>	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.	Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.	<ul> <li>Short-medium term response is proportionate to the scale of the risk over these timeframes, exspecially under lower SIA scenarios.</li> <li>Som residual risk over the short-medium term by undertaking no action.</li> <li>Avoids the exacerbation of risk in other areas.</li> </ul>	41	18
	Enhance - Dune and wetland resilience, community education and emergency management ANC Soft Engineering Dune reconstruction	Retreat 4	<ul> <li>characement of existing native populations will likely initially encourage positive cological benefits. Community education will also increase knowledge and support for protection of dame and wetland paces.</li> <li>Dune reconstruction can allow for more space for present dune floar and fauna to migrate and allow for increased distinct habitst, topographic unability and increased root mass for sand binding species.</li> <li>Alterat favous ecological retoration by providing habitats for species to recolonise neighbouring areas that may become decroyed however this will be occurring in an already highly urbanised environment so may take sufficient time and require active management as this is unlikely to occur naturally.</li> </ul>	Oure and wetland enhancement combined with oft engineering will generally maintain existing open said bach and vegetated dure context along the costal edge but with some organic gitruption to natural alotterns and processes which will likely reduce natural character.     Community education may reinforce recognition of indicators of a healtly environment and its contribution to natural character and sense of place.     Retrast would occur in the context of adjoining dure restoration and within more modified urban environment with potential ongoing opportunities to restore natural character.		<ul> <li>The option to increase dura resilience over short term aligns with stated community values. I community values, I community values, I community values (I combasse values) included in dura economic wellbeing, as well as enhance coal cohesion. B health. Community may need further information on dune reconstruction option (e.g. exidence of suitability and effectiveness, costs &amp; engagement) before supporting.</li> <li>In medium-long term, the community is more likely to support retreat if they are assured that suitable land is available to relocate to, &amp; are aware of any financial implications.</li> <li>Abo, important to ensure that support is in place to promote social and economic wellbeing, and enhance social cohesion &amp; health outcomes.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	<ul> <li>This short term dune enhancement options will maintain the natural appoal of the costal environment and ecosystem protection could enhance both community and environmental values and foster nature apportanticed while dune reconstruction works are being done.</li> <li>Mhile public access to the costal environment will be maintained, it may be temporarily restricted while dune reconstruction works are being done.</li> <li>Recreation that damages dunes may need to be restricted to protect ecosystems &amp; encourage dune stability.</li> <li>The med-long term option for retreat could allow opportunities for land to bincorporated into public space. This could allow for continued ecological restoration, and recreation and public access could be planned for (prior to the actual relocation of affected properties).</li> </ul>	Costal restoration and enhancement is encouraged under the present regulatory finamework and will not face any major consenting hurdles in the short term.     Soft-engineering in the short term.     Soft-engineering in the short term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.     "If managed retrate its look dave limited (or positive) effects on the environment.     "Ourently there is no ancional direction or precedent on how to undertake managed retreat this could make managed retreat more challenging in the medium term.     "Managed retreat currently requires regional and district plan changes to implement.	Effectively manages the risks of coastal erosion over time, and takes actions in the short term to reduce risks over that period and increase the timeframe before retreat would be required.     Enhancement and dune reconstoring will be proportionate to the scale of risk in the short term.     There will be no esacerbation of erosion risks on adjacent areas from short term actions in this pathway.     There will be bachfront properties would result in total removal of risk to the individual form erosion, and would be proportionate to the nature and scale of the risk to those impacted.     Construction	<ul> <li>Option is not chosen to address inundation hazard.</li> <li>By raising the dune crest devation by planting and dune reconstruction, the risk of overtopping decreases and can be added to responsively as a result of storm erosion.</li> <li>However main source of flooding in Walkanae Beach from low hying pathways from the Walkanae River, which dune reconstruction and planting will not address - Unlikely to be proportionate to the nature and scale o is kof inundation.</li> <li>Only a small amount of properties retreated from the erosion hazard in the long term may also have been impacted by inundation hazards.</li> </ul>	s 55 f	21

1	Status Quo ANI Community Education and Emergency Management	Enhance - Dune and wetland resilience, community education and emergency management	Enhance - Dune and wetland resilience, community education and emergency management	4	<ul> <li>Continuing with the status quo in the short term may see threfe loss of species in the Walance Estuary. There is a risk that migratory and visiting bird species, as well as migratory fish and spawning fish may change their behaviour patterns in response to erosion and inundation events if nothing further is done.</li> <li>The eventual enhancement of existing native populations will likely promote ecology and provide greater habitat and resources for flora and futura. Community education will also increase knowledge and support for protection of dune and wetland spaces.</li> </ul>	4	• Ontinuing with the status quo in the shot term may see further loss of natural character through increasing impacts of erosion and inundation events. • The enhancement of natural elements, patterns and processes, including native vegetation and associated dure and wetland habits has potential to restore natural character in the medium and longer term. • Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.		2	<ul> <li>Continuing with status goo in the short term aligns with current community values. However, monitoring of flood events (e.g. frequency, social impact, etc) may be needed to align with changes to community toterance levels.</li> <li>Ongoing community education could focus on ecosytem protection and the role of wetafacts and estuarise; ecological benefits, etc.</li> <li>Education to increase awareness of risk to public safety will ensure emergency preparedness. E.g. particulary if road/ footbridge access around the estuary, caudid submits and footbridge access around the estuary. Could support community wetlbaring and connection to place.</li> <li>Emergency management efforts will need to continue to be bolistered over time to protect public safety, as flood and/or erosion risks increase.</li> </ul>	2	<ul> <li>In the short term, status que allows for continued public access terceration activities in the estary of and Otainapa) area. Access may be restricted during maintenance or for safety reasons.</li> <li>Recreation that negatively impacts dunes or wettands may need to be restricted.</li> <li>In the med-long term, more frequent flood events may restrict public access to the estuary, due to public safety concerns or track maintenance.</li> <li>Existing receation facilities and tracks may need to be relocated to allow continued public access.</li> <li>Opportunities for nature appreciation eg, tird watching, could be impacted. This depends on the conditions.</li> </ul>	р : S	<ul> <li>Coatal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> </ul>	3	Increasing wetland resilience by planting and management is likely a proportionate response to the cale of hazar within the estuary.     Wetland planting and management likely to help stabilite banks and reduce retreat, but could get washed out in large fluxial events.     Avoids the exacerbation of risk in other areas.	Proportionate to the scale of hazard in the wetland.     Avoids exacerbation of the flood hazard in other areas	55	23
2	Status Quo ANI Community Education and Emergency Management	Enhance - Dune and wetland resilience, community education and emergency management	Protect - Bank protection	2	<ul> <li>Continuing with the status gool in the short term may see further sost of species in the Walkane Estuary. There is a risk that migratory and visiting bird species, as well as miscory fish and species in some.</li> <li>There is a risk that is the status of the status law promote cooling and provide gravity and provide size that provide cooling and provide gravity that and incorress trowledge and support for protection of due and wetland spaces.</li> <li>Status provide cooling and provide gravity exolutions will adjust a status of the protection of due and wetland spaces.</li> <li>Status protection of the protection of due and wetland spaces.</li> <li>Status protection in the form of stoppanks, culverts and pumpstations may have negative ecological impacts as engineering flood defines: typically consoling and stranger inverses in place creating deteriorating ecological value, removing the natural adaptive capacity of waterways.</li> <li>Culverts and flood gates can delay or prevent the natural migration by rive dwelling and using previses in gates are closed/only periodically operiod.</li> <li>Increased Indrive waids loog inverse and streams can deter migratory and spawning floh from these sites due to na natural migratory and spawning floh from these sites due to na natural migratory and spawning floh from these sites due to na natural migratory and spawning floh from these sites due to na natural migratory and spawning floh from these sites due to na natural migratory and spawning floh from these sites due to na natural migratory and spawning floh from these sites due to na natural migratory sensitive to.</li> </ul>	2	<ul> <li>Ontinuing with the status quo in the short term may see further loss of rotarial character through increasing impacts of erosion and inundation.</li> <li>The enhancement of natural elements, patterns and processes, including native wegetation and associated dune and wetland habits has potential to restore natural character in the medium and longer term.</li> <li>Ommunity elevation may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.</li> <li>Introduction of hard structures and bank protection may reduce natural character with adverse landscape effects in context of existing settlement.</li> </ul>		2	<ul> <li>Continuing with status goo in the short term aligns with current community values. However, monitoring of flood events (e.g. frequency, social impact, etc) may be needed to align with changes to community toterance levels.</li> <li>Ongoing community education could focus on ecosytem protection and the role of wetlands and esturaries, ecological benefits, etc.</li> <li>Education to increase awareness of risk to public safety will ensure emergency preparedness. E.g. particulary if road / footbridge access around the esturary area by the community, could support their wellbeing and provide connection to place.</li> <li>In the long term, Bank Production at Wailanage properties (exp to 50% inkely be exposed to inundation under 1.15m RSIR, by 2130).</li> </ul>	3	<ul> <li>In the short term, status quo allows for continued public access terceration activities in the estuary (and Otalianga) area. Access may be restricted during maintenance or for safety reasons.</li> <li>Recreation that negatively impacts during or witamois may need to be restricted.</li> <li>In the medium term, more frequent flood events may restrict public access to the estuary, due to public safety concerns or remedial track maintenance. Over time, existing recession facilities and tracks, may need to be relocated to allow continued public access.</li> <li>In the long term, the design of bank protection solution may provide opportunities to maintain recreational access and/or more durate surface.</li> <li>Opportunities for nature appreciation eg, bird watching, could be impacted. This depends on the ecologial response from animal populations to changing estuarine conditions.</li> </ul>	3	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>e ank protection is likely to require consent however it may be easier to consent given the works would be within the same or similar footprint to existing inundation protection.</li> </ul>	4	Increasing wetland resilience by planting and management is likely a proportionate response to the cale of hazard.     Vetland planting and management likely to help stabilize banks and reduce retreast of the shoreline.     H-shard protection in the long term will be effective at reducing the shoreline retreat around the estuary banks.     Iong term action may backer the erosion risks immediately around the ends of the wall (end effects). Will also result in coastal squeeze of the wetland, reducing markings plants which act as wave attenuation protection.	Over the short-medium term the actions are proportionate to the scale of harard in the wetland.     Bank protection is not provided to deal with the inundation harard.     • Avoids exacerbation of the flood hazard in other areas	49	19
3	Enhance - Dune and wetland resilience, community education and emergency management	Enhance - Dune and wetland resilience, community education and emergency management	Protect - Bank protection	3	<ul> <li>The enhancement of existing native populations will likely promote codogy and provide greater habitat and resources for flora and fauna. Community education will also increase toxeledge and support for protection of dane and wetland spaces over the short - medium term.</li> <li>Hard protections in the form of stopbanks, culvets and pumptations may have negative ecological impacts as engineering flood defences typically confine and strangle removing the natural adaptive capacity of waterways.</li> <li>Culverts and flood gates can delay or prevent the natural migration by river dwelling and using species if gates are closed/only periodically opened.</li> <li>Increased hard walls along rivers and strange can deter instrayt shady habitat present along banks, and can result to about habitat present along banks, and can result so which native fish are particularly sensitive to.</li> </ul>	3	The enhancement of natural elements, patterns and processes, induring native vegetarion and associated dune and wetland habitats has potential to restore natural character in the medium and longer term.     Ormmunity education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     The introduction of hard structures and bank protection may prevent ingration of welland structures and bank protection character in confined context of estuary which remains in the longer term.		3	<ul> <li>In the short -medium term, enhancement of dunes and wetland areas around here struary area by the community could support their wellbeing and provide connection to place.</li> <li>Ongoing community ducation could focus on ecotypem protection and the role of wellands and esturaries, ecological benefits, etc.</li> <li>Education to increase awareness of risk to public safety hearant emergency preparedness. Eg. particulary if road / footbridge access around the estuary is at risk, or poses a public safety hearant provide enough protection for Disilnangs properties (e.u.p to 50% inkely be exposed to inundation under 1.15m RSIR, by 2130).</li> </ul>	4	<ul> <li>In the short-medium terms, dune &amp; wetland resilience allows for continued public access to recreation activities in the stury (and Catalmaga) area. Community involvement in enhancement activities is likely to support community wellbeing and provide connection to place.</li> <li>Public access may be restricted at any time during remedial maintenance, track construction, or for safety reasons.</li> <li>Recreation that negatively impacts dunes or wetlands may need to be restricted.</li> <li>In the medium term, existing receation facilities and tracks, may need to be relocated to allow continued public access.</li> <li>In the long term, the design of bank protection solution may provide opportunities to maintain accession access and/or more durable surfaces.</li> <li>Opportunities for nature appreciation eg. bird watching, could be impacted. This depends on the ecological response from animal populations to changing estuarine conditions.</li> </ul>	3	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Bank protection is likely to require consent however it may be easier to consent given the works would be within the same or similar footprint to existing inundation protection.</li> </ul>	5	<ul> <li>Increasing wetland resilience by planting and management is likely a proportionate response to the scale of hazard.</li> <li>Starting the wetland planting earlier will increase the imeframes it is effective for.</li> <li>Wetland planting and management likely to help stabilise banks and reduce retreat of the shoreline.</li> <li>Hard protection in the long term will be effective at reducing the shoreline retreat around the estuary banks.</li> <li>Long term action may exacerbate the erosion risk immediately around the ends of the wall (end effects). Additional environmental impacts will include costal squeeze of the wetland, reducing marshlands plants which act as wave attenuation protection.</li> </ul>	Over the short-medium term the actions are proportionate to the scale of haard in the wetland.     Eank protections not provided to deal with the inundation haard.     • Avoids exacerbation of the flood haard in other areas	63	24
4	Enhance - Dune and wetland resilience, community education and emergency management	Protect - Bank protection	Protect - Bank protection	1	The initial enhancement of oxiciting native populations will likely promote scology and provide grates habitst and resources for flora and fauna. Community education will also increase knowledge and support for protection of due and wetland spaces over the short - medium term. • However long term hand protection in the form of stopbanks, culverts and pumpitations may have negative ecological impacts an enjoinent fill definess stypically confine and strangle rivers in place crasting defines stypically confine and strangle rivers in place crasting defines stypically confine and strangle rivers in place crasting defines to stypical value, removing the nitural adaptive capity of waterways. • Culverts and fload gales can delay or prevent the natural costed/only periodically operiod. • Protection of banks when engineered may likely influence for distance to top returning to the area, shere is less vegetated shelf for spawning and feeding by animali, and less natural bank space for plants to three. • Increased hard wails along mers and streams can deter migratory and spawning fish from these sites due to no natural shady habitst present along banks, and can result in abrupt shifts aparticularly sensitive to.	2	The enhancement of natural elements, patterns and processis, including native vegation and associated dune and wetlind habitats has potential to restore natural character in the medium and longer term. Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sence of place. The engoing implementation of hard structures and bank protection would likely reduce natural character and result in adverse landscape effects in confined context of estuary which remains.		3	In the short-medium term, enhancement of dunes and wetland revers around hes stuary area by the community could support their wellbeing and provide connection to place. • Ongoing community education could focus on eccoytem protection and the role of wellands and estuaries, ecclogical benefits, etc. • Education to increase awareness of risk to public safety will ensure emergency preparedness. E.g. particulary if road / focuting access around the estuary is a trick, or poses a public safety haard. • In the med-long term, bank protection at Waikane estuary may not provide enough protection for Otalianga properties (le.up to 50% offlikely be exposed to inundation under 1.25m RSUR, by 2130).	4	In the short-medium terms, <b>dune &amp; wetland resilience</b> allows for continued public access to recreation activities in the seturary (and Otahanga) area. Community involvement in enhancement activities is likely to support community welleling and provide connection to place. * Public access may be restricted at any time during remedial maintenance, track construction, or for safety reasons. * Recreation that negatively impacts dunes or wetlands may need to be restricted. * In the med-long term, existing receation facilities and tracks, may event to be relocated to allow continued public access. • Opportunities for nature appreciation eg. bird watching, could be impacted. This depends on the ecological response from animal populations to changing estuarine conditions.	, f 3	Costal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.     * Bank protection is likely to require consent however it may be easier to costent jown the works would be within the same for similar footprint to existing inundation protection.	3	Increasing wetland resilience by planting and management is likely a proportionate response to the scale of hazard. However, medium term bank protection is unlikely to be proportionate to the scale of hazard. • Starting the wetland planting earlier will increase the timeframes it is effective for. • Wetland planting and management likely to help stabilite banks and reduce retreat of the shoreline, however could get washed out in large fluvial events. • Hard protection in the medium-hong term will be effective at reducing the shoreline reteat around the estuary banks. • Bank protection may exacerbate the ensuion risks immediately around the ends of the wall (end effects). Additional environmental impacts will include costal squeeze of the wetland, reducing marshlands plants which act as wave attenuation protection.	Over the short-medium term the actions are proportionate to the scale of haard in the wetland.     Eank protection is not provided to deal with the inundation hazard.     Avoids exacerbation of the flood hazard in other areas	49	19
5	Enhance - Dune and wetland resilience, community education energency management	Retreat - retreat recreational infrastructure to make way for wetland migration	Retreat - retreat recreational infrastructure to make way for wetland migration	5	<ul> <li>The enhancement of existing native populations will likely promote ecology and provide greater habitat and resources for flora and fauna. Community education will also increase knowledge and support for protection of dune and wetland spaces over the short - medium term.</li> <li>Retrest following wetland realismes and enhancement provide opportunity for further ecological restoration, and nanaged correctly could provide hether and habitat for fish and bird species while allowing for natural wetland and river migration and variability under erosion and flooding events.</li> </ul>	5	<ul> <li>The enhancement of natural elements, patterns and processes, including native vegetation and habitats has potential to restore natural character.</li> <li>Community elevation may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of pales.</li> <li>Retreat of recreation infrastructure following enhancement provides opportunity to restore natural character, allowing for natural wetland and river migration in presently modified areas.</li> </ul>		2	<ul> <li>In the short term, enhancement of dunes and wetland areas around the estuary area by the community could support their wellbeing and provide connection to place.</li> <li>Origoing community education could focus on ecosytem protection and the role of wetlands and estuaries, ecological benefits, etc and role of retestar in restoration.</li> <li>Education to increase awareness of risk to public safety will ensure emergency argenetienss. E.g. particulary if road / footridige access around the estuary is at risk, or poses a public safety haard, in the med-long term, reterat of recessional infrastructure at Walkanae estuary, may not necessarily signify a loss of a valuable public recreation asset, as there may be opportunities to relocate / redesign amenities to minimise impact and retain public access.</li> </ul>	3	In the short-medium terms, dune & wetland resilience allows for continued public access to recreation activities in the extuary (and Otaihanga) area. Community involvement in enhancement activities is likely to support community wellbeing and provide connection to place. Public access may be restricted at any time during remedial maintenance, track construction, or for safety reasons. • Public access may be restricted at any time during remedial maintenance, track construction, or for safety reasons. • In the med-long term, retreat of recreational infrastructure at Walkane estuary, may not necessarily signify a loss of a valiable bublic recreation tasset, sinter may be opportunities to relocate / redesign amenities to minimise impact and retain public access. • Opportunities to mainte approximation e, bird watching, could be impacted. This depends on the ecological response from animal populations to changing estuarine conditions.	4	<ul> <li>Costal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>The area is a marine reserve and retreating recreational infrastructure to make way for wetland migration is consistent with the purpose of the reserve.</li> </ul>	5	<ul> <li>Increasing wetland resilience by planting and management is likely a proportionate response to the scale of hazard and would increase the timeframe before needing to retreat.</li> <li>Vetland planting and management likely to help stabilise banks and reduce retreat of the shoreline, but could be washed out in a large fluxial event.</li> <li>Retreat of assets around the edges will allow for room for the wetland to migrate and continue to provide protection. This will remove risks, and therefore retreat will effctively manage the risks.</li> <li>This approach is proportionate to the scale of hazard.</li> </ul>	Pathway is proportionate to the scale of hazard in the wetland.     Avoids exacerbation of the flood hazard in other areas	71	28
it Pathw	ays	Pathway Descripti	ons		Ecology		Landscape	Te ao Mãori values		Community Social and Economic Wellbeing		Public Access and Recreation		Regulatory consenting and policy risk	Eff	ectively manages the risks of coastal erosion	ffectively manages the risks of coastal inundation	MCDA Total Score:	RAW MCDA Total Score:
	Short term	Medium term	Long term	Score	Notes • Continuing with the status quo in the short term may see further loss of species in Otalhanga. There is a risk that miratory fish and may change their behaviour	Score	Notes  • More frequent flooding would likely extend coastal mainteenet inland and diment using the second s	Score Notes	Score	Notes  • Short term: Continuing with status quo aligns with current	Score	Notes  In the short term, status quo ensures existing infrastructure will be maintained & exhibit account in account in a status of the status	Score	Coastal restoration and enhancement is encouraged under the present result top foremuch and in the restoration of the second secon	Score	Notes Scor	e Notes		
1	Status Quo ANI Community Education Energency Management	Enhance - Enhance existing inundation protection, duen and/or wetter and/or wetter community education and emergency management	Protect - Additional hard protection (e.g. stopbanks, culverts and pump stations)	2	parties in Rooming induces a solution of constant and existing enabling the solution of the solution of constant and existing enabling enabling the induces of existing respinsion. Ordinary will provide time de conjugation enabling a sound of the existing enablish the Walkara enablish and the sound of the existing enablish the Walkara enablish and enablish and the sound of the existing enablish the sound of the existing and profection works an II label is cause any enablish to existing a sound and existing enablish and and the existing enablish and and and existing enablish and and the existing enablish and with the existing of the existing enablish and the existing of enablish the clanse, and enablish the existing enabling existing enablish the clanse, and enablish the existing enablish and energy with the clanse, and enablish the enablish of the enablish of enablish the clanse, and enablish the enablish of the enablish one enablish the clanse, and enablish and any enablish and any enablish enablish the clanse, and enablish and the enablish of the enablish one enablish the clanse, and enablish the enablish and any enablish and angular enablish the clanse, and enablish the enablish and angular enablish the clanse, and enablish the solution of enablish the clanse, and enablish and the enablish and angular enablish the clanses and enablish where and and the enablish and the enablish and the enablish and angular enablish and the enablish and the enablish and the enablish and angular enablish and the enablish and the enablish and the enablish and angular enablish and the enablish and the enablish and angular enablish and the enablish and the enablish and the enablish and angular enablish and the enablish and the enablish and the enablish and angular enablish and the enablish and the enablish and the enablish is not enablish and the enablish and the enablish and the enablish and the enablish and and the enablish and the enablish and the enablish the anglish and the enablish and the enabl	3	Inanscipe values within the green day ostatio cortext.     The enhancement of inundation protection alonguide duration and the enhancement of inundation protection alonguide duration and wetland residenci has listed potential charge to natural character in the context of increased modification.     • Or munity deduction may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     • The implementation of hard structures and teach the protection would likely reduce natural character and result in adverse landscape effects in the longer term.		3	Iommunity values. However, with 23% of Otalhanga properties likely exposed to inundation with 0.24 m 58.(1+ by 050 at SVPs 5), this approach may not be tolerated by the community. Monitoring of flood events (e.requency, social ingract, etc) & engement may be needed to align with changes in community tolerance levels. Orogoing community ductation and increasist rick avareness (of properties & infrastructure at risk) will ensure emergency preparedness. Efforts in this area to be increased over time. I andowners may need to be apported to respond to load risk and take proactive accomodation measures to reduce risks to health and take proactive accomodation measures to reduce risks to health and provide the community with assurance, along with continued community preparedness. I long neurs additional hard protection at Otalhanga could protect the up to 50% of Otalhanga properties likely be exposed to inundation under 1.25m RSR (PV 230).	3	subject to any public safety issues, e.g., due to required maintenance, health risks or flood events. I or maintain goodili the community will need to be informed on changes to public access and why. O regoing education and increased awareness of risk by local community (and recreation user) to ensure preparedness and emergency response during flood events, e.g. road, risingle & recreation track access. Medium term: Enhancement of exisiting inundation protection may restrict access to some area while works are being undertaken. Long term: construction of additional had protection may restrict access to some areas while works are being undertaken.	2	<ul> <li>Stopbank, floodgates, pump station and units included all million stoppank, floodgates, pump station and culverts trigger the MPS-FM and NeSF and may trigger the N2CPS depending on location.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Consenting a new structure is likely to be more challenging than upgrading an existing structure.</li> </ul>	1	•There is no erosion hazard in the Otalhanga area, and this pathway was not developed to manage the erosion hazard. All pathways in this management unit are scored 1 to reflect this and be relative to one another.	Pathway responses across timeframes are proportionate to the scale of the risk, exspecially under lower SIX scanarios.     Additional protection in the long term likely to effectively manage the increased inducation risks.     There is a current flood risk which is not dealt with through this pathway, but over time could be alleviated with increased protection.     Could be some acceleration of risks in other areass as water may be diverted from Otahanga with structures linkely to use best practise to avoid this impact as best as possible.	41	16

Management Unit	Pathways		Pathway Descriptic	ins		Ecology	Landscape				Community Social and Economic Wellbeing	Public Access and Recreation			Regulatory consenting and policy risk	Effe	ctively manages th
management onit		Short term	Medium term	Long term	Score	Notes	Score	Notes	Score Notes	Score	Notes	Score	Notes	Score	Notes	Score	
	1	Status Quo AND Community Education and Emergency Management	Enhance - Enhance existing inundation protection, dune and/or wetland community education and emergency management	Protect - Additional hard protection (e.g. stopbanks, culverts and pump stations)	2	<ul> <li>Continuing with the status upon in the hort term may see further load optically behaviour. The set is not term into the status of the status of terms of the status of the status of the sthe status of the status of the sthe stat</li></ul>	3	<ul> <li>More frequent flooding would likely extend coastal environment linkan and disrupt existing more modified landscape values within the present day coastal context. The enhancement of inundation protection alonguide dune and wetland resilience has limited potential change to natural character in the context of increased modification.</li> <li>Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.</li> <li>The implementation of hard structures and result in adverse landscape effects in the longer term.</li> </ul>		3	<ul> <li>Short term: Continuing with status quo aligns with current community values. However, with 23% of Otalinanga properties likely exposed to inundation with 0.20% RSI (*1) y0305 st398.5), this approach may not be tolerated by the community. Monitoring of flood events (perceparty, social ingract, etc) &amp; engegement may be needed to align with changes in community tolerance levels.</li> <li>Orogoing community ducation and increased rick awareness (of properties &amp; infrastructure at risk) will ensure emergency regrarendess: Effost in this area to be increased or waverness (of properties &amp; infrastructure at risk) will ensure emergency regrarendess: Effost in this area to be increased or wet time.</li> <li>Landowners: may need to be supported to respond to flood rick and take proactive accomodation messures to reduce risks to health and takeproactive accomodation messures to reduce risks to health and takeproactive accomodation messures to reduce risks to health and takeproactive accomodation protection at Otalinanga could protect the up to 50% of Otalhanga properties. Nety be exposed to inundation under 1.25m RSR (Pp 2130).</li> <li>Instructive 1.25m RSR (Pp 2130).</li> </ul>	3	<ul> <li>In the short term, status que ensures existing infrastructure will be maintained &amp; public access to recreation areas will continue, subject to any public affects to recreation areas will continue, subject to any public affects the community will need to be informed on changes to public access and why.</li> <li>Ongoing education and increased awareness of risk by local community (and recreation users) to ensure preparedness and emergency response during flood events, ge. road, hridge &amp; recreation track access.</li> <li>Medium term: Enhancement of existing inundation protection may restrict access to some area while works are being undertaken.</li> <li>Iong term: Construction of additional hard protection may restrict access to some areas while works are being undertaken.</li> </ul>	2	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Stogbark, Brodgetes, pump station and culverts trigger the NSFAH and NESF and may trigger the NZCPS depending on location.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Concenting a new structure is likely to be more challenging than upgrading an existing structure.</li> </ul>	1	•There is no erosion this pathway was n hazard. All pathway 1 to reflect this and

Waikanae Estuary Unit 6A and B

Pathways for Ot

	2	Enhance - Enhance exiting inundation protection, dura resilience, and community education and emergency management	Enhance - Enhance existing inundation protection, dune and/or weilance, and community education and emergency management	smmodate - ate floor levels uidings and g proofing dings and structure	Community education may increase awareness of issues and existing ecology but will not directly positively impact without action.     Inhancement of existing stopbanks in Otalianaga will provide limited ecological benefits a most of the ecology in this area surrounds the Walkanae river, and protection works are likely to cause negative impacts on ecology as rive banks are further altered and more vegetation may be likely to be removed to make room for protection works.     I vetfaind realience through planting may have some positive ecological benefits however this could be limited when coupled with increasing or extending existing linundation protection, removing already existing species.     I valation ce of nparina margin through stopbanks causing the removal of meander bends can narrow and simplify river morphology, increase the flow and energy within the channel, and remove natural habitat for migratory and spawning fish species, and nesting habitats for migratory birds.     The introduction of accommodating for hazards i likely to neither positively or negatively impact flows and faunal if best	The enhancement of inundation protection alongside du and wetland resilence has limited potential to restore natural character in the context of areas of increased modification.     Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     Accommodating buildings and infrastructure in flood prone areas would occur in context of existing modificatio and likely result in localised landscape impacts	n	<ul> <li>In the short-medium term, enhanced inundation protection aligns with community values. Inundation protection could provide the community with some assurance, given that 30% of Orahanga properties are likely exposed to inundation with 0.2m RSIR ("by 2050 at SSPR.5.)).</li> <li>Origoing community education and increased community awarteness of risk will ensure emergency preparedness and to identify dwellings at risk.</li> <li>Long term: Accomodate allows time for homeowners to plan and choose effective flood mitigation measures. Also to consider affordability &amp; gauge faces to roading &amp; circlai Infrastructure can be continued. High risk to properties (SOK of Otalianga properties are likely exposed to inundation with 1.25mm RSIR."-by 2130 at SSPR.5.).</li> <li>Londowners may meet to be supported to know how to respond to flood risk and an duricitale practive accomodation efforts to reduce risks to health and safety.</li> <li>Insurability of personal assess will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	In the short-medium term, public access to recreation areas will continue subject to any public safety issues, eg. health risks of flood events. Enhanced mundation protection or required infrastructure maintenance, may restrict access to some public areas while works are being undertaken.     To maintain goodwill and support the community will need to be informed on charges to public access and why.     Ongoing education and increased local community awareness of risk will ensure appropriate emergency preparedness.     Long term: most Accomdate options occur on private properties & are unlikely to impact public access and recreation.	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.     elevating buildings and flood proofing will have building consent (and possibly resource concert) requirements. Given the anticipated timeframe of this action this may occur naturally with the turnover of buildings. Consenting hurdles are not anticipated.     S	<ul> <li>There is no erosion hazard in the Otaihanga area, and this pathway was not developed to manage the erosio hazard. All pathways in this management unit are scor l to reflect this and be relative to one another.</li> </ul>	Pathway will address some of the present day flood risk, and increasing risk over the medium term.     Log term redicual risk dealt with through raising floo levels of dwellings, however this will only protect the properties and will still usual tracks to these properties.     Risks to flooding are very high in the long term, and as a result raising houses may not be a proportionate response to miligizing the risks.     Pathways will avoids the exacerbation of risk in other areas.	53	22
Otaihanga Unit 7B	3	Enhance - Enhance existing irundation protection, dune and/or wetland resilience, and community education and emergency management	Accommodate - Elevate floor levels of buildings and flood proofing buildings and infrastructure	est 4	<ul> <li>Community education may increase awareness of issues and existing ecology but will not directly positively impact without action.</li> <li>Enhancement of existing stopbanks in Otahanga will provide limited ecological benefit and likely to cause negative impacts on ecology as it with relaxis are further altered and more vegetation may be likely to be removed to make room for protection works.</li> <li>Vetical ecological benefits and likely to cause negative interaction of protection works.</li> <li>Vetical ecology are strained and the strained and more vegetation may be likely to be removed to make room for protection, works in the creating or extending existing invadation protection, removing alteryle visioning species.</li> <li>The introduction of accommodating for hazards is likely to nether positively or negatively impact flor and floam if best practice is followed which can allow for natural migration of species.</li> <li>Retreat favours ecological restoration by providing habitats for species to recolarise neighbouring areas that may become destroyed. This has limited application in O tahanga for existing flora and floam as there is limited ecology areards. However could allow for more species to find home and refuge in this area.</li> </ul>	Chhancement of existing inundation protection plus dun and wetland resilince occurs in context of ongoing modification with limited reduction in natural character. Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place. Accommodating buildings and infrastructure in flood prome areas would occur in context of existing modificatio with likely localised landscape impacts Actext of flers limited ability to restore natural character and promote positive landscape unconses incontext of ongoing modification in the longer term.	n	<ul> <li>In the short term, enhanced inundation protection aligns with community values. This option could provide the community with some assurance, given that 30% of traihanga properties are likely reposed to inundation with 0.2 m SRI (+70 205 at 55% 5).</li> <li>Origoing community education and increased awareness of dwellings at risk to ensure community preparedness.</li> <li>Lindowners may need supported to know how to respond to flood risk and and undertake proactive accompation how to train to the staff.</li> <li>Medium term: Accompate allows homeowners to plan for and choose effective flood homeowners and councils can plan for Reteast (eg. relocatable homes, spatial planning, level of infrastructure maintenance, etc).</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	<ul> <li>In the short term, public access to recreation areas will continue subject to any public address to recreation areas will continue to any public address to any public areas while works are being undertaken.</li> <li>To maintain goodwill and support the community will need to be informed on charges to public access and why.</li> <li>Ongoing education and increased awareness of risk will ensure community preparedness.</li> <li>In the medium term, most Accomdate options are unlikely to impact public access and ercreation.</li> </ul> 2	Coastal restoration and enhancement is encouraged under the present regulatory finamework and will not face any major consenting hurdles in the short term.     elevating buildings and flood proofing will have building consent (and possibly resource consent) requirements. Given the anticipated timeframe of this action this may occur naturally with the turnover of buildings. Consenting hurdles are not anticipated.     If imanaged retreat is done well, it should have limited (or posible) effects on the environment.     • Currently three is no antional direction or precedent on how to undertake managed retreat to wever, this is likely to be rectified prior to be required.     • Managed retreat currently requires regional and district plan changes to implement.	•There is no erosion hazard in the Otaihanga area, and this pathway was not developed to manage the erosion hazard. All pathways in this management unit are scor 1 to reflect this and be relative to one another.	Pathway will address some of the present day flood risk, and increasing risk over the medium term.     Long term residual risk is dealt with through retreat, which will remove all risk to impacted properties.     Risks to flooding are very high in the long term and as result retreat is likely to be a proportinate response to the scale of hazard.     Pathways will avoids the exacerbation of risk in other areas.	a 45	18
	4	Protect - Additional hard protection (e.g., stopbanks, culverts and pur stations)	Enhance - Enhance new inundation protection, dune and/or wetland resilience, and community education and emergency management	reat 3	<ul> <li>Herd protection in the form of tapbanks, culters and pumptations may have negative ecological impacts as an genereing fload difference styncally confine and strangle rises in place creating dieteriorating ecological value.</li> <li>Herd and adaptive capacity of waterways.</li> <li>Community education may increase awareness of subust and existing period.</li> <li>Community education may increase awareness of subust and existing ecological value in directly capacity impact without action.</li> <li>Frahaccement of existing stopbanks in Calahange will provide limited ecological value rises of a subust and existing ecological value rises of the subust of the subust of the removal to make room for protection works.</li> <li>Vetation eristing inurdation protection and following protection works, removing afreadly existing intracial stopbanks (capacity exist) in value room for protection works.</li> <li>Vetation eristing inurdation protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing inurdation protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing invalues in protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing invalues in protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing invalues in protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing invalues in protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing invalues in protection and following protection works, removing afreadly existing specific.</li> <li>Vetation eristing invalues in protection in original angle for any remaining flora and flana in the long term as three is already limited scoling present, ad more had guinetation in Grandman is likely to remain flow protection of franan angl</li></ul>	v     v     i Hand protection in the form of stopbanks, culverts and     pumptations would likely reduce nature character and     reduce existing natural landscape values within the more     modified coastal context.         Community education excurs in context of ongoing     modification with a further likely reduction natural     character.         Community education may reinforce recognition of     indicators of a healthy environment and its contribution to     indicators of a healthy environment and its contribution to     context of increased modification.     Setters of first more limited ability to restore natural     character and promote positive lindscape outcomes in     context of increased modification.		In the short term, additional hard protection is not consistent with community values. However given that 30% of Orainarg properties are likely exposed to incunstation with O-BKI Pby 2050 at 55P8.5), the option could be further tested with the local community. Origoing community declaration to increase awareness of properties and infrastructure at risk to ensure emergency preparedness. Also allows landowners to take proactive measures a declaration to the oracle state and wellings. Medium term: costs associated with new inundation protection measures may need to understood for this option to gain support. a Long term: affected homeowners and Councils can plan for Retreat [og: rolicatable homeo, statial planning, level of infrastructure maintenance, etc.). insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).	Short term, public access to recreation areas may be restricted temporarily during construction of additional infrastructure and/or required maintenance.     To maintain goodwill and support the community will need to be informed on changes to public access and why.     Orgoing education and increased awareness of risk will ensure community preparedness.     In the medium term, new inundation protection works are likely to temporarily impact public access to recreation areas.     In the long term, retrast may provide opportunities for land to be aquired for ecological restoration or meaning public access for impact recreation. May require removal of existing built structures as part of restoration efforts.	Stopbank, floodgetes, pump station and culverts trigger the NPS-FM and NES-F and may trigger the NZCPS depending on location. I ard-engineering in the long term will have some consenting requirements and may be challenged. Consenting a new structure is likely to be more challenging than upgrading an existing structure. If managed retrars is done well, it should have limited (or positive) effects on the environment. Contentike manager forterat however, this is likely to be rectified prior to be required. Namager terterat currently requires regional and district plan changes to implement.	•There is no erosion hazard in the Otaihanga area, and this pathway was not developed to manage the erosion hazard. All pathways in this management with are scor 1 to reflect this and be relative to one another.	<ul> <li>Short term actions to mitigate current risks would reduce the impact on properties.</li> <li>Maintaining this additional infrastructure over the medium term, and retreating over the long term would be an effective way of managing the risks over time.</li> <li>Pathway is proportionate to the scale and risk over time.</li> <li>Could be some exacerbation of risks in other areas as water may be diverted from Oraliahaga with structures line other areas with additional structures, however likely to use best practise to avoid this impact as best as possible.</li> </ul>	47	18
	5	Enhance - Enhance existing inundation protection, dune and/or wetlance, and community education and emergency management	Protect - Prot Additional hard hard protection (e.g. (e.g. stopbanks, culverts culv and pump stations) stati	tect - Additional protection stopbanks, 1 erts and pump ons)	<ul> <li>Community education may increase awareness of suses and existing ecology to will used devicely observe impact without action.</li> <li>Enhancement of existing stopbanks in Challmage will provide limited ecological leveling of likely to case any equivient pacts or exceedings an iner- tion make room for protection works.</li> <li>Wettand erelinese through planning may be likely to be remove to make room for protection works.</li> <li>Wettand ereling inuration protection, enrowing already existing species.</li> <li>Maintonia and a stopping may have some positive ecological benefits however this could be limited when coupled with increasing or extending existing inuration protection, enrowing already existing species.</li> <li>Maintonia bandy can any maxima with any the stopping increase the flow and energy within the channel, and remove natural habitat for improtecting understop protection exists as engineering distor- tions.</li> <li>Long term hand protection in the form of stopbanks, culverts and pumpatations may have engine ecological impacts as engineering distor- tions.</li> <li>Avarts and flood pates can delay or prevent the antaral inagistation pro- ting data yand using species' lages are cossid/only periodically opened.</li> <li>Increase that walks along river and streams can dater migratory and spanning fish from these site due to no natural habitat present community within the data and stopp carries and therming storbus pro- removement within the site due to no natural habitat present community within the data and and transition to provide antary and spanning fish from these site due to no natural habitat present communities within the exist due to no natural habitat hybitat transition.</li> </ul>	Chhancement of existing immutation protection plus dur and wetland resilience occurs in context of ongoing modification with limited reduction in natural character. Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place. Ongoing implementation of hard protection in the form stopbanks, culverts and pumpations would likely reduce natural elements, patterns and processes and reduce natur character over the longer term.     3	e of ral	<ul> <li>In the short term, enhanced innurdation protection aligns with community values. This points could provide the community with some assurance, given that 30% of Chahanga properties are likely reposed to innuctions with 0.2 mrSRI (* 1920 SD at SSR 51).</li> <li>Ongoing community education to increase awareness of properties and infrastructure at risk to ensure engroy preparedness. Also aliss indowners to take further proactive measures (accomodate / avxid) to reduce risks to health, safety and dwelling.</li> <li>Meel-long term: the community may need better understanding of long term costs and effectiveness of Additional hard protection measures in order to support this option.</li> </ul>	<ul> <li>In the short term, enhanced immediation protection may restrict access to some public arreas while works are being undertaken.</li> <li>Public access to recreation areas likely to continue subject to any public affety issues, e.g. flood events, health risks, or required infrastructure maintenance.</li> <li>To maintain goodwill and support the community will need to be informed on changes to public access and why.</li> <li>In the med-long term: additional hard protection options may impact public access and revisan are likely to allow for continued public access for recreation activities.</li> <li>Hard engineering measures are likely to change the natural feel of the Walkanse river area. Amenity &amp; aesthetic values could be incorporated into hard engineering solutions.</li> </ul>	Costal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.     Sogback, floodgates, pump station and culverts trigger the NS-FM and NES-F and may trigger the NZCPS depending on location.     Hard-engineering in the long term will have some consenting requirements and may be challenged.     Consenting a new storuce is likely to be more challenging than upgrading an existing structure.     2	•There is no erosion hazard in the Otaihanga area, and this pathway was not developed to manage the erosio hazard. All pathway in this management with are scor 1 to reflect this and be relative to one another.	Pathway likely to effectively manage the flood risk over the short-long term.     Isk's very high over the long term for flooding, and therefore significant works may be required that may not be proportionate to the risks.     Ocud be some exacertation of risks in other areas as water may be diverted from Oralinanga with structruses into other areas with additional structures, however likely to use best practise to avoid this impact as best as possible.	47	18
Pathways for P	Paraparaumu		Pathway Descriptions		Follow.		Te ao Mãori	formula for the offerent Wells do	Deblic Assessed Descention	Bandaharan and a Bandah	Fff all all and an and a state of		_	RAW MCDA Total
Management U	nit Pathway	Short term	Medium term	Long term Scor	re Notes	Score Notes	values	s Score Notes	Score Notes	Score Notes	Score Notes	Score Notes	MCDA Total Score:	Score:
	1	Enhance - Dune and/or wetland resilience, community education and emergency management	Protect - Soft Engineering - Dune Reconstruction Rend	ixct-Soft ineering - 3 ourishment	Enhancement of existing native populations will likely initially promote ecology and provide greater habitat and resources for from and fausa. Community education will also increase knowledge and support for protection of due and wetland outcome to the second second second second second second second second second second second second second second habitats, topographic variability and increased erots and second binding seccies. 3 off engineering through beach renourishment and dura reconstruction however may disrupt bind habitats and shellfah inopulations but can modify and hance habitats in the form of enhanced dures for beach flora and faura. 3 Beach removes there full sections on general second effects on terrestrial communities following renourishment in the short and medium term due to the stress on species from the repetitive nature of infiling, and any cascading impacts up the food web from mortality associated with sediment fili.	Initial enhancement of dunes and wetland areas will maintain existing open sand beach and vegetated dune context and associated natural character along cuspate foreland and open costal edge.     Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     Ongoing implementation of soft engineering including dune restoration and beach nourshment would disrupt natural patterns and processes, but otherwise maintain ar open dynamic coastline influenced by existing settlement.		Increasing dune resilience over short term aligns with stated community values. If community is actively included in implementation, it could promote social and economic wellbeing, as well as enhance social colosion 8 health uncomes. • Over medium-long term, the community may need further information on dune reconstruction option (e.g. widence of suitability, effectiveness, costs & engagement) before supporting • In the long term, the comprish back monoting required to assess the ongeting success of back neourishment, could potentially be training and technology. • Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).	Short term dune resilience will maintain the natural amenity and landscape values of the coastal environment.     Orgoing dune maintenance and protection in medium and longer term is likely to turber benefit cosystems, foster nature appreciation & supports community values.     Both the medium (Dune reconstruction) and long term options (beach renourishment) may temporarily impact access during construction, but overall, public access to the coastal environment will be maintained.     Recreation that dumages dunes needs to be restricted to protect ecosystem & encourage dune stability.     Beach renourishment inpuries, eg. steeper, more dangerous shore break.	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term. • oft-engineering in the medium and long term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.	Dure enhancement and reconstruction are both effective measure that are proportionate to the nature and scale of risk over the short-medium term for most Paragrarum Beach. If designed and managed properly, is likely to effectively manage impacts under lower SI Scenarios Design would be informed by best practise. Design would be informed by best practise. Design would be informed by best practise. Seach renourishment likely to be effective around th shoreline north of Tikotu Stream in the wave shadow of Kapit Island. I altwarw will not effectively manage the risks to the built environment south of the Tikotu Stream where some service assets are alredayd at risk. Beach renourishment has been trialed at this end of the shoreline before and was not successful.	Option is not chosen to address inundation hazard.     By raising the dune crest elevation by planting and dune reconstruction, the risk of overtopping decreases and can be added to responsively as a result of storm erosion.     However main source of floading in Paraparaumu Beach is from low lying pathways from the Waikanae River, which dune reconstruction and planting will not address.     Unlikely to be proportionate to the nature and scale o risk of inundation.	f 59	23
	2	Enhance - Dune and/or wetland resilience, education and emergency management Au Protect - soft engineering - Dune reconstruction	Enhance - Dune and/or wetland resilience, community education and emergency management AND Protect - soft engineering - Beach Renourishment	ect - Hard meering - Sea 1	Enhancement of existing native populations will likely initially promote ecology and provide greater habitat and resources for fora and fauxa. Community education will also increase inspects.     a Dura reconstruction for protection of dura and weetlind spece.     unaver econstruction can allow for more space for present dure from and fauxa to migrate and allow for increase distinct habitats, topographic variability and increased root mass for sand     and expecting the end of the end	Initial enhancement of dunes and wetland areas will maintain existing open and bacch and vegetated dune context and associated natural character along cospate foreland and open coastal edge.     Community education may reinforce recognition of indicators of a healthy emirorment and its contributions to natural character and sense of place.     Orgoing implementation of soft engineering including dune restoration and beach nourishment would disrupt matural patterns and processes, but downer wisting settlement.     Community coasting in structures including as an all disrupt character and sense of place.     Community and the structure including as a wall would likely reduce natural beach profile and reduce natural character and result in advense landscape effects in control of existing open beach adjoining existing settlement.	, , , , ,	Over the short and medium term, increasing duee realience aligns with stated community values. If community is activity included in dure realienced/enhancement activities, it will provely included in economic wellbeing, as will a enhance social cohesion & health outcomes. Community may need further information on dure reconstruction option (ge: evidence of subality) and effectiveness, costs & engagement) before supporting. <ul> <li>In ediumi-long term, the community may require further information on effectiveness, costs and suitability of the beach reconstrument and the term seawed points, prior to acceptance and/or implementation.</li> <li>The engoing beach monitoring required to assess the success of beach resourchament, could potentially be done porporties training and technology.</li> <li>Issubility of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	This short-med term <b>duse resilience &amp; duse reconstruction</b> option will maintain the natural appeal of the costal environment. Ecosystem protection could enhance community values and foster nature appreciation. Public access to the costal environment will be maintained. Recreation that damages dunes may need to be restricted to protect ecosystems & encourage duse stability. The leng term aewayd option may contribute to beach narrowing which may restrict public access to beach thigh tides. However, seavall could potentially be designed to incorporate amenity / recreational value. During seavail construction, public access to beachfront nay be temporarily restricted.	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting handles in the short and medium term will have some consenting requirements and may be challenged but is aligned with the current statutory framework. + Hard-engineering in the long term will have some consenting requirements and may be challenged. + Hard-engineering approaches trigger more stringent consenting requirements and are discouraged under the N2CPS and RFS because of the adverse effects they can have on the environment. 2      • Consenting a new structure is likely to be more challenging than upgrading an existing structure.	Dune enhancement and reconstruction are both effective measures that are proportionate to the natur and scale of risk over the short-medium term. Some uncertainty around the effectiveness of renourishment in the medium term under higher SLR scenarios, as would require significant sain source, bu combined with planting and dune management could effective. Hard engineering would be effective at preventing further retreat of the shoreline in the long term, especially at the southern end of Marine Prande and at the northern end of Marine Prande and the encion harard directly to the north and south of the wall due to end effects. Peign would be informed by best practise to reduce these effects but there will be environmental impacts and changes to the beach associated with southon over the longer term (i.e. beach narrowing and loss of volume).	Option is not chosen to address inundation hazard.     A designed crest elevation of an eventual hard structure would result in a reduction of the overtopping harard, but would not effectively image the wider inundation risks up river and inlet pathways.	48	18

	Pathwaye		Pathway Descripti	ions	Ecology		Landscape		Te ao Mãori values			Community Social and Economic Wellbeing		Public Access and Recreation	Regulatory consenting and policy risk			Effectively manages th	
Management Unit	Patriways	Short term	Medium term	Long term	Score	Notes	Score	Notes	Score No	otes	Score	Notes	Score	Notes	Score	Notes	Score		
	1	Enhance - Dune and/or wetland resilience, community education and emergency management	Protect - Soft Engineering - Dun Reconstruction	Protect - Soft Engenering - Benach Renourishment	3	Enhancement of existing native populations will likely initially promote ecology and provide greater habitat and resources for flora and funa. Community education will also increase knowledge and support for protection of due and wetlind spaces. Duer reconstruction can allow for more space for present dune from and funa to migrate and allow for increased distinct. Soft engineering through beach renourishment and duen reconstruction boweer may dirugs the habitats and duellfuh populations but can modify and enhance habitats in the form of enhanced dunes for beach flora and funa. Beach renourishment projects have found negative ecosystem Enstruction and ending spaces. Beach renourishment projects have found negative ecosystem entruction ending and mance habitats in the form of enhanced dunes for beach flora and funa. Beach renourishment projects have found negative ecosystem protection ending and enhance thabitats of the function ending spaces. Beach renourishment projects have found negative ecosystem for our entities on present form the short and medium term due to the stress on species from the ford web from mortality associated with sediment fills.	4	<ul> <li>Initial enhancement of dunes and wetland areas will maintain existing open sand beach and vegetated dune context and associated natural character along cuspate foreland and open costal edge.</li> <li>Community education may reinforce recognition of indicators of a health wenvironment and its contribution to natural durarcter and ensex of place.</li> <li>Ongoing implementation of soft engineering including dune restoration and basch nourishment would divugit natural patterns and processas, but Otherwise maintain an open dynamic coastline influenced by existing settlement.</li> </ul>		4		<ul> <li>Increasing dune resilience over short term aligns with stated community values. If community is actively included in implementation, is could promote social and economic wellbeing, as well as enhance social cohesion 8, health outcomes.</li> <li>Over medium-long term, the community may need further information on dune reconstruction option (e.g., evidence of statishilty: effectiveness, costs &amp; angement) before supporting.</li> <li>In the long term, the company back monitoring required to assess training and technology.</li> <li>In the long term, the company back monitoring required to assess training and technology.</li> <li>In the local/community level, if they are given appropriate training and technology.</li> <li>In the local/community level, if they are given appropriate training and technology.</li> </ul>	4	Short term dune resilience will maintain the natural amenity and landscape values of the costal environment.     Ongoing dune maintenance and protection in medium and longer term is likely to further benefit ecosystems, foster nature appreciation & supports community values.     Both the medium (Dune reconstruction) and long term options bearb renourishment) may temporarily impact access during construction, but overall upolic access to the coastal environment will be maintained.     Recrutation that damage dunes needs to be restricted to protect ecosystems & encourage dunes stability.     Beach renourishment can result in changes to the beach profile and increased swimmer injuries, eg. steeper, more dangerous shore break.	3	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Soft-engineering in the medium and long term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.</li> </ul>	3	Dune enhanceme effective messure and scale of risk op Paraparaum Bæs I designed and re flessigned and re desagt would be besign	
	2	Enhance - Dune and/or wetland resilience, community education and emergency management ANL Protect - soft Protect - soft Dune reconstruction	Enhance - Dune and/or wetland resilience, community education and emergency management AND Protect - soft Protect - soft Renourishment	Protect - Hard Engineering - Sea wall	1	Enhancement of existing native populations will likely initially promote ecology and provide greater habitat and resources for flora and fauna. Community education will also increase thorwiselge and support for protection of due and wettind spaces. Duen reconstruction can allow for increased faunts habitats, tooggamus variabitity and neurosed root mass for sand habitats, tooggamus variabitity and neurosed root mass for sand habitats, tooggamus variabitity and neurosed root mass for sand habitats, tooggamus variabitity and neurosed root mass for can find and the hach resourcithment and dure econstruction may disorate thick habitats and shelfits populations function may disorate the habitatis and habitatily populations function may disorate the habitatis and habitation theory function may disorate the habitatis and habitation theory flects on retreation communities following renourishment in the short and medium term due to the stress on species from the repartition and finang. A gradity protection however, that the optential to reduce cology further by damaging beach, dune, and estuary ecology, and overall may support lower biodivensity and prevent the natural migration of habitats.	2	<ul> <li>Initial enhancement of dunes and wetland areas will maintain existing open sand beach and vegetated dune context and associated natural character along cuspate foreland and open costal edge.</li> <li>Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.</li> <li>Ongoing implementation of soft engineering including dune restoration and beach numbinent would disrupt natural patterns and processes, but otherwise maintain an open dynamic costile influenced by existing settlement.</li> <li>Introduction of hard structures including a character and result abeach profile and reduce natural character and result in adverse landscape effects in context of existing open beach adjoining existing settlement.</li> </ul>		4		<ul> <li>Over the short and medium term, increasing dune resilience aligns with stated community lasticets? identifying a serial sensitives, it will promote social and commod velocities, as well as enhance social cohesion of health outcomes. Community may need further information on discontective social and cohesion of subbility and effectiveness, social social social cohesion of a subbility of the beach renourthement and long term seawall options, prior to acceptance and/or implementation.</li> <li>The ongoing beach monitoring required to assess the success of local/community level, if they are given appropriate training and technology.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	3	<ul> <li>This short-med term dure resilience &amp; dure reconstruction option will maintain the natural appeal of the costal environment.</li> <li>Ecosystem protection could enhance community values and foster nature appreciation.</li> <li>Public access to the costal environment will be maintained.</li> <li>Public access to the costal environment will be maintained.</li> <li>Recreation that damages duses may need to be restricted to protect ecosystems &amp; encourage dune stability.</li> <li>The long term seawed logiton may contribute to beach narrowing which may restrict public access to beach at high tides.</li> <li>However, seawall could potentially be designed to incorporate amenity / recersoidan value.</li> <li>During seawall construction, public access to beachfront nay be temporarily restricted.</li> </ul>	2	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Soft-engineering in the short and medium term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Hard-engineering approaches trigger more stringent consenting requirements and are discouraged under the NZCPS and RPS because of the adverse felts they can have on the environment.</li> <li>Consenting a new structure is likely to be more challenging than upgrading an existing structure.</li> </ul>	4	<ul> <li>Dure enhanceme effective measures and scale of risk ow - Some uncertainly renourishment in thi scenarios, as would combined with plan effective.</li> <li>+ fard engineering further retreat of thi especially at the so the northern end of - Over the long tern the erosion hazard wall dus to end effi</li> <li>Design would bei hese effects but hand changes to the over the longer ten volume).</li> </ul>	

3	Enhance - Dune and/or wetland resilience, community education and emergency management AND Protect-silon Protect-silon Dune reconstruction	Enhance - Dune and/or wetland resilience, community education and emergency D management AND <b>Protect - soft</b> <b>Protect - soft</b> <b>Bach</b> Renourishment	Protect - Hard Engineering - 2 Detached Breakwater	<ul> <li>Enhancement of existing native populations would likely promote ecology and provide greater habitst and resources for flor and dhuan. Community deutation will also increase innovedge and support for protection of dhuan and wetland space.</li> <li>• Oune reconstruction can allow for more space for present due flor and wetland in the migrate and allow for increase distinct habitats, topogenic workshift and increased root mass for sand distinct to migrate and allow for increase distinct habitats, topogenic workshift and increased root mass for sand effects on terrestrial communities following reconstituent in the thort and medium term due to the stress on species from the repetitive nature of infiling, and any cascading impacts up the food web from mortality associated with adjument fill.</li> <li>• Poreign material fill if is in ot of similar site and composition of local material can affect the presed animal which habit an areas, disrupt nesting brids, and encourage invasive species.</li> <li>• Not a cological effects from detact/ded previoue artificially protected conditions that provide a calm moritorment constrome which can facilitate planting rebublikation and recovery for present ecology.</li> </ul>	<ul> <li>Dune and wetland enhancement combined with soft engineering will generally maintain existing open and beach and wetland due to the soft of the soft of the soft beach and wetland due to the soft of the soft of the soft beach and wetland due to the soft of the soft of the soft beach and wetland the soft of the soft of the soft of the processes with will likely extend soft of the soft of the indicators of a bealthy environment and its contribution to natural character and sense of place.</li> <li>Detached breakwater would likely extend sense of modification into presently open coastal marine areas and further disrupt existing open and unmodified coastal views. The design of the breakwater could potentially reduce the overall scale of effects.</li> </ul>	3	Over the short and medium term, increasing <b>dune resilience</b> aligns with stated community values. If community is actively included in dune resilience/enhancement activities, it will promote social and economic wellbeing, as well as enhance social cohesion & health outcome.     Our of the social cohesion as the social cohesion as enough the social cohesion and the social cohesion as enough the social cohesion and the social cohesion as the community may need further information re: beach renourshament and long term detached breakwater options (effectivenes; costs, etc) prior to supporting.     The congoin beach monitoring requires to assess the success of beach renourshament, could potentially be done at the local/community evel, if they are given appropriate training and technology.     Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).	2	This short-med term <b>dune resilience and reconstruction</b> option Will maintain the natural appeal of the coastal environment. Ecosystem protection could enhance community values and foster nature appreciation. • Jubic access to the coastal environment will be maintained. • Dubic access to the coastal environment will be maintained. • Dubic access to the coastal environment will be maintained. • Dubic access to the coastal environment will be maintained. • Dubic access to the coastal environment will be maintained. • The long term <b>detached breakwater</b> option may change beach conditions, eg. Beach narrowing (may restrict public access to beach at high iteds). • During breakwater construction, public access to beachfront nay be temporarily restricted.     1	ı	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major concenting hurdles in the short art medium term will have some consenting in the short and may be challenged but is aligned with the current statutory framework.</li> <li>Hard engineering in the log term will have some consenting requirements and may be challenged.</li> <li>Hard engineering approaches trigger more stringent consenting engruprements and are discouraged ounder the NZCPS and NPS because of the adverse effects they can have on the environment.</li> <li>Consenting any and shorts structure is likely to be more challenging than a sea wall as the whole coast is recognised as a site of significance for mana whenua and there is greater uncertainty in the effects of the structure.</li> <li>Onsenting an existing structure.</li> <li>Parts of Paraparaum Beach are scheduled in the Natural Resources Plan for the Wellington Region as having sites of significance for mana whenua.</li> </ul>	<ul> <li>Dune enhancement and reconstruction are both effective measures that are proportionate to the nature and scale of risk over the short-medium term.</li> <li>Some uncertainty around the effectiveness of reconstructions are to the nature and scale of risk over the short-medium term under higher SIA scenarios, as would require significant and source, but combined with glaning and data meangement could be effective. It has been trialled once at the southern end of marine parade and was not successful.</li> <li>Detached breakwater in the neurshore would reduce wave energy approaching the beach, and could be effective. It has been trialled once at the volume of norther at reducing resion risk in Paraparanum Beach.</li> <li>However, the breakwater will hiely result in morphological changes to the beach due to reduction in wave energy, and could have some lee-side erosion aresult of softment trapping, where the erosion hazard is already high.</li> <li>The scale and nature of the works required to effectively manage the risk is unlikely to be propertionate to the scale of the hazard.</li> <li>Design would be informed by best practise.</li> </ul>	Option is not chosen to address inundation hazard, an would not effectively manage any relevent source of flooding for Paraparaumu Beach over the long term. Depending on design, potential for breakwater to increase weit real setup at shoreline which may exacerbate inundation	40	15
a	Enhance - Dune and/or wetland resilience, community education and emergency management AND Protet - Source engineering - Dune reconstruction	Protect - Hard Engineering - Sea wall	Retreat 2	Portain the setting native populations will likely initially exprouse positive coordigical benefits. Community education will also increase knowledge and support for protection of due and wetland spaces.     Usure reconstruction can allow for more space for present due for and faunta to might and allow for increased distinct habitats, topographic variability and increased root mass for and binding space.     Organize saw all protection however has the potential to reduce todograph damaging besch, due, and eastury recology vid amaging besch, due, and eastury and prevent the natural migration of habitats.     Portext while allowing for the natural migration of biodiversity, is going to be occurring in an already altered environment following the placement of a saw all and present dinease wall and present dinease wall and present dense urbanisation. This would likely not allow for maturally couring positive cological benefits and this would need heavy management.	Ourse and wetland enhancement combined with oil engineering will generally maintain existing posts and beach and vegetated dure context along the coastal edge but with some ongoing disruption to natural patterns and processes.     Community education may reinforce recognition of indicators of a healthy environment and its contribution to entarial character and sense of pales.     Orgoing engineering and introduction of hard structures including a sea wall has potential reduction in natural basch profile which would likely reduce natural character and may result in adverse landscage effects in context of existing settlement.     Hertest would occur in the context of an increasingly modified costal environment with likely ongoing sense of modification and reduction in natural character.	2	<ul> <li>Der the short term, increasing dune resilience aligns with stated community values. If community a circley includes in dune resilience / enhancement activities, it will promote social and economic willbeing, as well as enhance social coherois &amp; health outcomes. Community may need further information on dune reconstruction option (e.g., evidence of suitability and effectiveness, costs &amp; engagement) before supporting.</li> <li>In medium term, the community may require three information on the seswell option(eg. effectiveness, costs and suitability, etc), prior to acceptance and/or implementation.</li> <li>In long term, the community may require assurance and further information on managed retreat</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	2	<ul> <li>This short term due resilience &amp; due reconstruction option will maintain the natural appear of the coastal environment. Ecosystem protection could enhance community values and foster nature appreciation. While public access to the coastal environment will be maintained, it may be temporarily restricted while due reconstruction works are being done.</li> <li>accruation that damages dures may need to be restricted to protect ecosystem. 8 encourage due stability.</li> <li>The medium term seawall option may contribute to beach narrowing which may restric public access to be achieved the stability of the stability.</li> <li>During seawall could potentially be designed to incorporate amenity value/ recreational access.</li> <li>During seawall could potentially be designed to incorporate amenity value/ recreational access.</li> <li>Long term recard may offer opportunities for ecological restoration of the foredunes and opportunities for managed public access &amp; nervention.</li> </ul>	2	- Costal restoration and enhancement is encouraged under the present regulatory framework and will not face any major concenting hurdles in the short term. - Soft-engineering in the short term will have some consenting requirements and may be challenged but is aligned with the current statutory framework. - Hard-engineering in the long term will have some consenting requirements and may be challenged. - Hard-engineering approaches trigger more stringent consenting requirements and are discouraged under the NCCPS and RPS because of the adverse effects they can have on the environment. - Consenting environment. - If managed retreat is done well, it should have limited (or positive) effects on the environment. - Currently there is on askinal direction or precedent on how to undertake managed retreat however, this is likely to be recified prior to be required. - Managed retreat currently requires regional and district plan changes to implement.	Dune enhancement and reconstruction are both effective measures that are proportionate to the nature and scale of risk over the short-medium term.     A sea wall in the medium term will hold the shortline seaward of private proterties and effectively manage the risks.     Hard engineering would be effective at preventing further retract of the shortline in the medium term, but may exacethate the evolution harard directly to the north and south of the wall due to end effects.     Design would be informed by best practice to reduce these effects but there will be environmental impacts and charges to the beach associated with this option (i.e. beach narrowing and loss of volume).     evering intermoving and loss of volume).     evering and the protective auxiliary the casual     in the medium term would have modified the casual     environment, and therdore either continued     maintenance of the saw all would be required, or     significant rehabilitation to reform the danes would be     required to re-establish protection.	<ul> <li>Option is not chosen to address inundation hazard.</li> <li>A deigened crest elevation of an eventual hard structure would result in a reduction of the overtoppin hazard, but would not effectively manage the wider inundation risks or inver and intel pathways.</li> <li>Only a small amount of properties retrasted from the erosion hazard in the long term may also have been impacted by inundation hazards.</li> </ul>	42	16
5	Protect - Hard Engineering - Sea wall	Protect - Hard Engineering - Sea wall	Retreat 2	<ul> <li>Implementing sea wall protection has the potential to reduce ecology by damaging besch, due, and estuary ecology, and overall may support lower blookversity and prevent the natural migration of habitats.</li> <li>Retreat while allowing for the expansion of blookversity through increased habitats space, is going to be occurring in an already aftered environment following the placement of a sea wall and present dense urbanisation. This would likely not allow for naturally occurring positive ecological benefits and this would need the accompanied with heavy community education and increased environmental efforts to retain any remaining ecological value along the Paraparaumu coastline.</li> </ul>	Introduction of hard structures including a sea wall would likely reduce entural bech profile and reduce natural draracter and result in adverse landscape effects in context of existing open beach adjoining existing settlement. Retreat would occur in the context of an increasingly modified coastal environment with likely ongoing sense of modification and reduction in natural character.	1	<ul> <li>In the short-medium term, a teawail at southern end of Paraparaum banch could be accordate to the community - it would involve informing the community of the pro and cons and associated costs over the lifetime of the seawail.</li> <li>orgoretriss in this area will have more assurance that they will confine to recive essential infrastructure services (But - relies on regular maintenne &amp; has costs).</li> <li>In the long term, the community is more likely to support retreat if they are savere of any financial implications. Also, important to ensure that support is inplace for those affected, to promote social and economic wellbeing, and enhance social cohesion &amp; health outcomes.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	1	<ul> <li>In the short term, public access to the southern end of Paraparanum bach may be retricted duing the construction of the seawall, and during periods of ongoing maintenance.</li> <li>It may be possible to incorporate public access on/ around the seawall depending on the final design.</li> <li>Itely that visual impacts of seawall may deter from the natural feel of the costline.</li> <li>seawall could result in back access being more restricted during mid to higher tides.</li> <li>In the long term, if ongoing maintenance continues, the seawall may provide safe public access if the area experiences retreat.</li> </ul>	2	Hard-engineering in the long term will have some consenting requirements and may be challenged     Hard engineering approaches trigger more stringent consenting requirements and are discouraged under the N2CPS and RPS because of the adverse effects they can have on the environment. Consenting a new structure is likely to be more challenging than upgrading an existing structure. If managed retreat is done well, it should have limited (or positive) effects on the environment. Currently there is in an anional direction or precedent on how to undertake managed retreat however, this is likely to be rectified prior to be required. Managed retreat currently requires regional and district plan changes to implement.	<ul> <li>Sea wall will effectively manage the erosion risks over the short-medium term. Retreat will remove the risks over the long term.</li> <li>Sea wall in the short to medium term is only proportionate to the scale of the risk at the southern end of the adaption area. Along the rest of the adaptation area shoreline, a seavail is not proportionate 2 to the scale of the hazard.</li> <li>There would likely be an exacerbation of the erosion risks at the ends of the walls (end effects) and other environmental impacts such as beach narrowing in front of the wall.</li> </ul>	<ul> <li>Option is not chosen to address inundation hazard.</li> <li>A deigned crest elevation of an eventual hard structure would result in a reduction of the overtopoint hazard, but would not effectively manage the wider inundation risks up river and inite pathways.</li> <li>Only a small shows the original structure would be applied by the erosion hazard in the long term may also have been impacted by inundation hazards.</li> </ul>	33	13
6	Enhance - Dune and/or wetland resilience, community education and emergency management AND Protect - State engineering - Dune reconstruction	Retreat	Retreat 4	<ul> <li>Initial enhancement of existing native populations would likely improve existing ecology and promote greater habitat and resources for first and fauss. Community education will also increase knowledge and support for protection of dure and wettand space.</li> <li>Oune reconstruction can allow for more space for present dure first and faunts to migrate and allow for increased distinct habitats, topographic variability and increased root mass for stand binding species.</li> <li>Retreat favours ecological restoration by providing habitats for species to recolosine engloburing areas that may be scome destroyed however this will be occurring in an already highly urbanised environments om any take sufficient time and require active management as this is unlikely to occur naturally.</li> </ul>	Dune and wetland enhancement combined with soft engineering will generally maintain existing open and beach and vegtated dune context along the costal edge but with some ongoing disruption to natural patterns and processes which will likely evolve natural character. Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place. Retreat would occur in the context of a modified coastal environment with ongoing opportunities to restore natural character.	1	<ul> <li>The option to increase dune resilience over short term aligns with stated community values. If community is actively included in dune resilience / enhancement activities, it will promote social and economic wellbeing, as well as enhance social cohesion &amp; health. Community may need further information on dune reconstruction option (eg. evidence of suitability and effectiveness, costs &amp; engagement) before supporting.</li> <li>In medium-long term, the community is more likely to support retreast if they are assured that suitable land is available to relocate to, &amp; are aware of any financial implications.</li> <li>Also, important to ensure that support is in place to promote social and economic wellbeing, and enhance social cohesion &amp; health outcomes.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	2	This short term dune resilence & dune reconstruction options will maintain the natural appeal of the coastal environment and coxystem protection could enhance both community and environmental values and foster nature appreciation. • While public access to the coastal environment will be maintained, it may be temporarily restricted while dune reconstruction works are being done. • Recreation that damages dunes will need to be restricted to protect ecosystems & encourage dune stability. • The med-long term option for retreat could allow opportunities for land to be incorporated in to public space. Includes activities that promote continued ecological restoration, and public access managed to allow for lower impact recreation uses. Could be planned for prior to the actual relocation of affected properties.	2	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Soft-engineering in the short term will have some consenting requirements and may be challenged but is aligned with the current statutory framework.</li> <li>If managed retract is some well, it should have limited (or positive) effects on the environment.</li> <li>Currently there is no national direction or precedent on how to undertake managed retract this could make managed retreat more challenging in the medium term.</li> <li>Managed retract currently requires regional and district plan changes to implement.</li> </ul>	Effectively manages the risks of castal erosion over time, and lakes actions in the short term to reduce risks over that period and increase the termframe before retreat would be required.     Enhancment and dune reconforming will be proportionate to the scale of risk in the short term.     There will be no exacerbation of revision risks on adjacent areas from short term actions in this pathway.     Retreat of beachfront properties would result in total removal of risk to those individuals from evision. It would be proportionate to the nature and scale of the risk to those impacted to retreat.     Ehance and dune reconstruction is unlikely to be effective at managing the erosion risk is already high in the short term.	<ul> <li>Option is not chosen to address inundation hazard.</li> <li>By raining the dure crest elevation by planting and dune reconstruction, the risk of overtoppin decreases and can be added to responsively as a result of storm erosion.</li> <li>However main source of flooding is from low lying pathways from the Wilainase Rev. which dune reconstruction and planting will not adress.</li> <li>Unlikely to be proportionate to the nature and scale o risk of immatian.</li> <li>Only a small amount of properties retracted from the erosion hazard in the long term may also have been impacted by inundation hazards.</li> </ul>	49	19
1	Status Quo AND Community Education and Emergency Management	Status Quo AND Community Education and Emergency Management	Enhance - Enhance existing inundation and/or wetland resilience, and community education and emergency management	Current ecological systems are presently under threat and may decline in the under status quo. Community education may increase awareness of tasses and existing ecology but will not directly positively impact without action.     enhancement of existing task positively and task positively in provide limited ecological benefit and likely to cause negative impacts on ecology as river banks are further altered and more vegetation may be likely to be removed to make room for protection works.     Wetland resilience through planting may have some positive ecological benefits however this could be limited when coupled with incresing or extending existing iundation protection, removal as can arrow and simplify river morphology, increase the flow and energy within the channel, and remove network labitat for migratory and spawning fish species, and nesting habitats for migratory birds.	More frequent flooding would likely extend coastal environment inland disrupt existing more modified landscape values within the present day coastal context.     Community education may reinforce recognition of indicators of a halthy environment and its contribution to natural character and sense of place.     Infancement of existing mundation protection plus dune and wetland realince occurs in context of existing modification with limited consequent change to levels of natural character.	2	<ul> <li>In the short and medium term, maintaining existing dunes and current infrastructure aligns with community values. However, with 207 (4% of Paraparumu properties) likely exposed to inundation with 0.2m RSLR (*by 2050 at SSP8.5), a Status Quo approach may not be toierated by the community- engagement on medium term status quo approach may be needed.</li> <li>Ongoing education and increased awareness of risk will ensure community preparedness. Eg. Landowners could be supported to identify dwellings to accomodate risks to health and safety. Likely to be made on a case-by-case basis.</li> <li>In the long term, enhanced inundation protection may provide the community with some assurance</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	1	<ul> <li>In the short-medium term, infrastructure will be maintained &amp; public access to recreation areas will continue as status quo, subject to any public safety susse, eg. due to required maintenance, health risks or flood events.</li> <li>To maintain gooding and support for adaptation options, the commanity will meet be informed on charges to public access and why, and impacts to other values eg. ecology.</li> <li>Ongoing education and increased awareness of risk will ensure community wire target admenses of risk will ensure community wire microaread mutation protection may restrict access to some areas while works are being undertaken. Enhanced dure and/or wettand resilince may provide community with opportunities to appreciate nature, foster wellbeing &amp; social cohesion.</li> </ul>	5	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> </ul>	Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.	Short-medium term response is proportionate to the scale of the risk over these timeframes, expecially under lover Sta Scenarios.     Some residual risk over the short-medium term by undertaking no action.     Avoids the exacerbation of risk in other areas.	38	17
2	Status Quo AND Community Education and Emergency Management	Enhance - Enhance existing inundatior protection, dune and/or wetland resilience, and community education and emergency management	Protect - Additional hard protection (eg. stopbanks, i culverts and pump stations)	<ul> <li>4-context excluding dispersions are presenting under break and may achies in the scale state space. Community dispersions may increase the states and nothing excluding bala will not directly positively impact without action.</li> <li>6-hancement of excluding stophamics in Paragramum will provide limited excluding all states and limits or sengitive impacts on cooling with re- bands are further altered and more segretation may be likely to be momental without a set further altered and more segretation may be likely to be momental and further altered and more segretation may be likely to be momental and the state and more segretation may be likely to be momental and states and more segretation may be likely to be momental and states and more segretation may be likely to be momental and states and more segretation may be likely to be momental and an antipole states and an antipole states and states are further altered by the states and states resolution of the states and more segretation may be resolution and states and states and states are considered with confine and stategin forms in place crucing detectionating excluding values, removing the notice altered and states are considered with integration may be removed and introduces of lists are considered with altered and removed and using states and bases or constrain altered bases provided by present.</li> <li>• Alverts and flood gates can delay or present the natural inigration by meriden and stategin forms in glace crucing detates are considered by present.</li> <li>• Alverts and flood gates can delay or present the natural inigration by meriden and stateging constrain altered bases are constrained by altered and using states are constrained by blace presents altered bases and bases and the nature and alter heat states are constrained bases and altered and altered and the states and altered and the constrained bases and altered and altered and altered and altered and altered and altered and altered altered and altered and altered and al</li></ul>	More frequent flooding would likely extend coastal environment inland disrupt existing more modified landscape values within the present day coastal context.     Community education may reinforce recognition of indicators of a halthy environment and its contribution to natural character and sense of place.     Instructures of existing mundation protection plus dure and wetland resilience occurs in context of ensisting modification of haird structures and bank protection may reduce natural character with adverse landscape effects in context of existing settlement.	2	<ul> <li>In the short term, maintaining existing dunes and current infrastructure aligns with community values. However, with 10% of Waikane properties likely exposed to inundation with 0.2m RSLR ("by 2050 at SSP8.5), a Status Que approach may not be tolerated by the community- enaggement on medium term status que approach may be needed.</li> <li>Ongoing deuzation and increased awareness of risk will ensure community preparedness. E.g. Landowners may need to be supported to identify dwellings at triaf from inundation and to undertake proactive efforts on dwellings to accomodate risks to health and safety. Likely to be measurance. In the long term, additional hard protection may provide the community with further assurance during flood events.</li> <li>Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).</li> </ul>	2	<ul> <li>In the short term, infrastructure will be maintained at Status quo &amp; public access to recreation areas will continue subject to any public safety issues, e.g. due to required maintenance, health risks or flood events.</li> <li>To maintain goodwill the community will need to be informed on changes to public access and why.</li> <li>Recreation that damages dunes may need to be restricted to protect ecosystems &amp; encourage dune stability.</li> <li>Med term: enhancing dune and/or wetlands provides community with opportunities to appreciate nature, forter wellbeing &amp; social cohesion. Ongoing education for community on benefits of ecology protection. Increasing awareness of risk will ensure community preparedness and response during flood events.</li> <li>In the long term, additional hard protection may restrict access to some areas will evolvs are being undertaien. Opportunity to potentially integrate recreasion &amp; amenity values into infrastructure design.</li> </ul>	2	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting hurdles in the short term.</li> <li>Stopbank, floodgates, pump station and culverts trigger the NS-FM and NS-F and may trigger the N2CPS depending on location.</li> <li>Hard-engineering in the long term will have some consenting requirements and may be challenged.</li> <li>Consenting a new structure is likely to be more challenging than upgrading an existing structure.</li> </ul>	Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.	<ul> <li>Short-medium term response is proportionate to the scale of the risk over these timeframes, expecially under lower SIX scenarios.</li> <li>Additional protection in the long term likely to effectively manage the inundation risks.</li> <li>Culd be some exacerbation of risks in other areas as water may be diverted from Paraparaum into other areas with additional structures, however likely to use best practise to avoid this impact as best as possible.</li> </ul>	38	15

aumu unit 8A

Parapar

3 Enhance - Enhance - Enhance - Enhance - Enhance - Sisting inundation protection, dure and/or wetland resilience, and community education and emergency management	Accommodate - Sevate floor levels of buildings and Jouldings and Infrastructure	Community education may increase awareness of sisses and existing ecology but will not directly positively impact without action.     Inhancement of existing stopbanks in Paraparaumu will provide limited ecological benefit and likely to cause negative impacts on ecology as river banks are further altered and more vegetation may be likely to be removed to make room for protection works.     Wetland resilience through planting may have some positive ecological benefits however this could be limited when coupled with incressing or extending existing iundation protection, removing a leady existing species.     Maintenance of riparian margin through stopbanks causing the removal of meander bends can narrow and simplify river morphology, increase the flow and energy within the channel, and remove natural hablats for migratory birds.     The introduction of accommodating for hazards is likely to netther positively on gattion and fusual filesy to practice is followed which can allow for natural nigration of contendendendendendendendendendendendendende	Enhancement of existing mundation protection occurs in context of existing molfication with more limited change in natural character.     Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.     Accommodating buildings in restored natural character may enable greater alignment between humans and natural elements, patterns and process within coastal context.	3	<ul> <li>In the short -modium term, enhanced inundation protection 6 dune maintenance aligns with community values. Inundation protection could provide the community with some assurance, given that 10% of Walkanee properties are likely exposed to inundation with 0.2 mr.Rstl. (Pry 2050 at 25% at 25\% at 25\%</li></ul>	<ul> <li>In the short-medium term, public access to recreation areas will continue subject to any public safety issues, epi-hath risks or flood events. Enhanced inundation protection or required infrastructure maintenance, may restrict access to some public areas while works are being undertaken.</li> <li>Enhancing dune and/or wetlands provides community with opportunities to appreciate nature, floater wellbeing &amp; social cohesion. Ongoing education for community on benefits of ecology protection. Increasing awareness of risk will ensure community proparedness and response during flood events.</li> <li>To maintain goodwill and support the community with ensures on changes to public access and wy.</li> <li>Recreation that damages dunes may need to be restricted to protect coxystems. &amp; encourage dune stability.</li> <li>In the long term, most accomodate options are unlikely to impact public access and recreasion.</li> </ul>	Costal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting burdles in the short term.     elevating buildings and flood proofing will have building consent (and possibly resource consent) requirements. Given the anticipated timeframe of this action this may occur naturally with the turnover of buildings. Consenting hurdles are not anticipated.	<ul> <li>Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.</li> </ul>	Short-medium term response is proportionate to the scale of the risk over these timeframes, especially under lower S.R. Scenario.     So Statement of the scale of the sc
A Enhance - Enhance existing Irundation protection, dure effort and/or wetland resilience, dure education and emergency management A Commodate - Elevate floor levels of buildings and infrastructure	ketreat 4	<ul> <li>Community elacitation may increase awarehess of slues and existing ecology but will not enterly possiblely impact without action.</li> <li>Infrancement of existing stopbanks in Paraparaumu will provide limited e single-basistit and likely to cause negative impaction of the single-basistit and likely to cause negative impaction on the single-basistit and likely to cause negative impaction on the single-basistit and likely to cause negative impact ecologia benefits however this could be limited when coupled with increasing or extending existing impactions unclus- nerwork and analy activity agrecies.</li> <li>Maintenance of rigrarian margin through stopbanks causing the removal and meander bends: approximation protection, removing already existing species.</li> <li>Maintenance of rigrarian margin through stopbanks causing the removal and meander bends: approximation and remove morphology, increase the flow and energy within the channel, and remove neural habitat for migratory bids.</li> <li>The introduction of accommodating for hazards is likely to neither positively on negatively impact flora and fauna if best practice is followed which cau allow or natural margination of existing species.</li> <li>Retard knows ecological restoration by providing habitats for species to recolorie neighbouring areas that may become destroyed, however this is going to coccr in an alter the healty</li> </ul>		2	In the short term, enhanced inundation protection & dune maintenance aligns with community values. This option could provide the community with some assurance, given that 10% of Wailance properties are likely exposed to inundation with 0.2m KSIA ("by 2000 XS 598.5). • Oragoing community values and increased avaireness of risk will ensure community preparedness. E.g. Landowners may need to be upported to how how to respond to flood risk and to learthly dwellings at risk and undertake procedure accomodation efforts to reduce risks to hashin and alief. A comodate allows homeowners to plan for and choose effective flood mitigation measures nearbuilty duellings whether they have continued access to reading & critical infrastructure in the long time directed homeowners and Councils can plan for Reteaset the instruction of personal astex will be determined by Insurance companies (based on own site specific risk assessment).	In the short term, public access to recreation areas will continue subject to any public safety issues, epi- halth risks of flood events. Enhanced inundation protection or required infrastructure maintenance, may restrict access to some public areas while works are being undertaken.     Ishancing dune and/or wetlands provides community with opportunities to appreciate nature, foster wellbeing & social cohesion. Ongoing education for community on benefits of ecology protection. Increasing awareness of risk will ensure community preparedness and response during flood events.     Is Revents that damages dunes may need to be restricted to be informed on changes to public access and why.     Io Tomaintain goodwill and support the community will need to be informed on changes to public access and why.     Io Opping education and increased awareness of risk will ensure community preparedness.     Is determined the experiment of the support access and recreation.     Isong term: most Accomdate options are unlikely to impact public access and recreation.     Isong term: retreat may provide opportunities for land to be aquired for ecological restoration or managed public access for low interview.	Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting burdles in the short term.     elevating buildings and flood proofing will have building consent (and possibly resource consent) requirements. Given the anticipated timeframe of this action this may occur naturally with the turnover of buildings. Consenting hurdles are not anticipated.     If managed retreat is done well, it should have limited (or positive) effects on the environment.     • Currently there is no national direction or precedent on how 2 to undertake managed retreat however, this is likely to be rectified prior to be required.     • Managed retreat currently requires regional and district plan changes to implement.	<ul> <li>Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.</li> <li>Only a small number of housse that were retreated for flood hazard would also be impacted by erosion hazard.</li> </ul>	<ul> <li>Short term response is proportionate to the scale of the risk over this timeframe.</li> <li>Raising floor levels in the medium term will reduce the risk to dwelling, but will not receive access issues caused by flooding.</li> <li>The number of dwellings that will require raising will keep be very significant; and therefore the scale of works required may not be proportionate to the hazard, especially if retreat is anticipated in the long term.</li> <li>Retreat will remove all risk to private properties.</li> </ul>
5 Enhance - Enhance existing Inundation protection, dure and/or wetland community education and emergency management	Netreat 2	<ul> <li>unbanised area and is unlikely to naturally periodic ecological - economy detection my broken assession of transition detains ecological - economy detains of the economy of the economy of the economy of - economy detains and layer to care assession of transition strains economy - economy detains and layer to care assession of transition economy of the - economy detains and layer to care assession of transition economy of the - economy detains and layer to care assession assession economy of the - economy detains and layer to care assession assession economy of the - economy detains and layer to care assessing as and the - economy detains and layer to care assessing economy detains - economy detains and layer to care assessing economy detains - economy detains and layer to care assessing as and the - economy detains and layer to care assessing as and the - economy detains and layer to care assessing and care assessing - economy detains and layer to care assessing debat detains as any - economy detains and purposed assessing debat detains approximation and - economy detains as any - economy detains any - economy detains as any - economy detains any - economy detains as any - economy detains any - economy and ec</li></ul>	<ul> <li>Enhancement of existing inundation protection occurs in context of existing modification with limited consequent change in context of reduced levels of natural of haracter.</li> <li>Dune and wetland resiliance will have limited innitial benefit.</li> <li>Community education may reinforce recognition of indicators of a healthy environment and its contribution to natural character and sense of place.</li> <li>Additional hard protection in the form of stopbanks, colverts and pungtations would likely reduce natural elements, patterns and processes and reduce natural character.</li> <li>Retrast would occur in the context of an increasingly modified costal context which provides more limited opportunity to improve natural character.</li> </ul>	3	In the short term, enhanced inundation protection & dune maintenance aligns with community values. This option could provide the community values assurance, given that 10% of Waikanae properties are likely exposed to inundation with 0.2m BSIR († by 2003 at SSP8.5). Orgoing community education and increased awareness of risk will ensure emergency preparedness. E.g. Landowners may need to be supported to know how to respond to flood risk and to identify dwellings at risk and undertake practive accommodation efforts to reduce risks to health and safety. In the medium term additional hard protection will provide further reasurance in the even of flood events and allow homeowners time to plan for and/or choose other effective avoidance measures. In the long term affected homeowners and Councils can plan for Retrate (gr. effoctable homes, spatial planning, level of infrastructure services, etc).     Insurability of personal assets will be determined by insurance companies (based on own site specific risk assessment).	<ul> <li>In the short term, public access to recreation areas will continue subject to any public safety issues, e.g. health risks or flood events. Enhanced inundation protection or required infrastructure maintenance, may restrict access to some public areas while works are being undertaken.</li> <li>Enhancing dune and/or wetlands provides community with opportunities to appreciate nature, foster wellbeing &amp; social cohesion.</li> <li>Accreation that damages dunes may need to be restricted to protect coxystems &amp; encourage dune stability.</li> <li>To maintain goodwill and support the community will need to be informed on changes to public access and why.</li> <li>Ongoing education and increased awareness of risk will ensure community preparedness.</li> <li>In the medium term, additional hard protection options are may impact public access and recreation while works are being done. Opportunity to potentially integrate recreation &amp; amenity values into informed ne cological restoration or managed public access for low impact done cological restoration or managed public access for low impact public access and restoration or managed public access for low</li> </ul>	<ul> <li>Coastal restoration and enhancement is encouraged under the present regulatory framework and will not face any major consenting burdles in the short term.</li> <li>Elevating buildings and flood proofing will have building consert (and possibly recource consent) requirements. Given the anticipated innerframe of this action this may occur naturally with the turnover of buildings. Consenting hurdles are not anticipated.</li> <li>Stopbank, floodgates, pump station and culverts trigger the NFS-FM and NES-F and may trigger the NEZFS depending on location.</li> <li>Hard-engineering in the long term will have some consenting than upgrading an existing structure.</li> <li>If manged retrats is done well, it should have limited (or positive) effects on the environment.</li> <li>Currently there is no national direction or precedent on how to undertake managed retrat however, this is likely to be rectified prior to be required.</li> <li>Managed retrast courset, priored.</li> </ul>	<ul> <li>Pathway not designed to address the erosion hazard, and would not effectively manage the erosion risk.</li> <li>Only a small number of houses that were retreated for flood hazard would also be impacted by erosion hazard.</li> </ul>	Short term response is proportionate to the scale of the risk over this timeframe.     Protection through additional hard portection in the medium term will effectively manage the hazard.     • Could be some exacerbation of risks in other areas as water may be diverted from Paraparanum into other areas with additional structures, however likely to use best practise to avoid this impact as best as possible.     • Retreat will remove all risk to private properties.