

Cooks Beach Coastal Erosion Management Strategy : Part I – Strategy

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▪ report

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1 Introduction and Background to Project

Introduction

Environment Waikato (EW) and Thames Coromandel District Council (TCDC) have identified coastal erosion as being a significant hazard risk to Coromandel properties¹.

Projected sea level rise over the next 100 years is estimated to lead to another 15-20 metres of erosion along beaches on the eastern Coromandel, putting approximately 920 properties at risk².

Approximately 920 Coromandel peninsula properties, with an estimated market value of almost \$1 billion, may be affected by coastal erosion within the next 100 years.

EW and TCDC are working together to address the hazard, beginning with two priority sites – Buffalo and eastern Cooks Beach. The Beca led team (with Eco Nomos Ltd and Covec as subconsultants) have been commissioned by the two authorities to identify issues and options at the sites and select the most technically feasible and cost effective mitigation options that promote sustainable management of the coastal area. Appendix C provides a discussion on provisions of regional and district statutory documents that relate to sustainable management of the coast. The draft strategy produced by the project team will be used as part of a wider consultation programme with the community and other stakeholders to guide the selection of a preferred coastal erosion strategy for eastern Cooks Beach.

Part I of the Coastal Erosion Management Strategy (CEMS) should be read in conjunction with Part II – Technical Appendices to provide further details of CEMS development.

Background to Project

This site specific CEMS for Cooks Beach lies within a wider joint Coastal Erosion project



EW and TCDC are currently working on. The wider project is considering District-wide issues associated with coastal erosion. The project purpose is twofold, namely to develop a joint agency approach to managing coastal erosion hazards on the Coromandel Peninsula and to develop an associated funding system for the management of coastal erosion issues.

¹ Environment Waikato, 2002. Coromandel Beaches. Coastal Hazards & Development Setback Recommendations Summary Report. Environment Waikato Technical Report.

² Coastal Erosion Project Overview Strategic and Economic Components, Draft Report for Discussion, Environment Waikato Environmental Economist, June 2004.

This site-specific project will provide information and tools to assist EW, TCDC, the community and tangata whenua in the decision-making process when addressing coastal erosion at Cooks Beach³.

1.1 Assumptions and Limitations of Study

- The boundaries of the Cooks Beach Erosion Management Strategy are between 165 Captain Cook Road and 105 Captain Cook Road to the west.
- The assessment was based around a 50-year planning horizon to incorporate sustainable development principles and future generations needs.
- For the purposes of this project no fieldwork was undertaken and so analysis was based on existing technical information provided by EW and TCDC as well as project team knowledge and experience.
- EW and TCDC will undertake community and iwi consultation as a separate project; therefore no community or stakeholder consultation was undertaken in this strategy development. It is anticipated that the preferred option(s) will be further refined through this consultation.
- No specific design work was undertaken therefore construction and maintenance costs are estimates for generic structures (e.g. seawall).
- A number of economic assumptions have been made. For further details see Appendix F.

2 Methodology

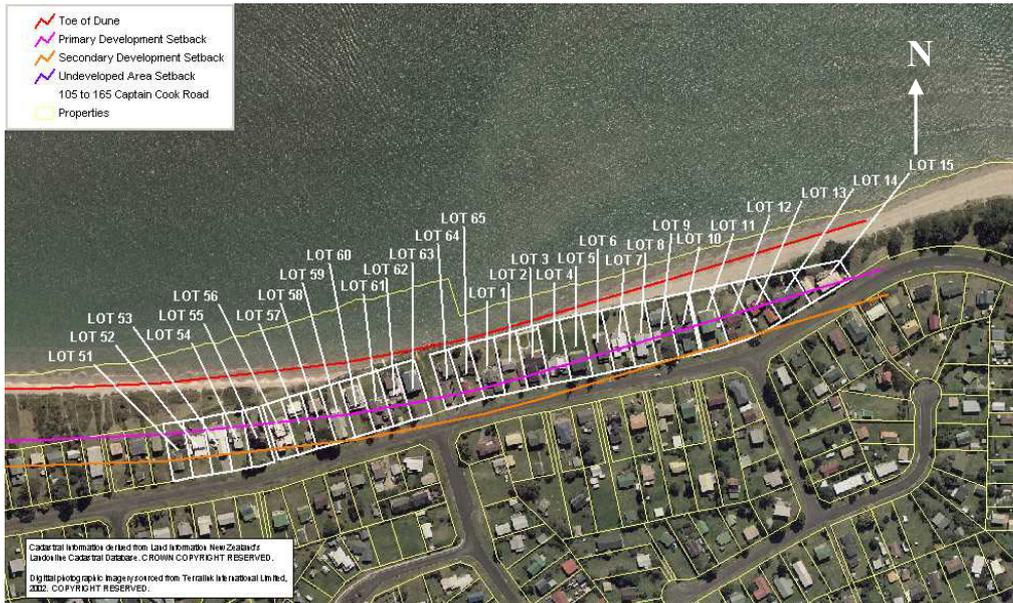
The Cooks Beach Erosion Management Strategy study area was defined by EW and TCDC as *“the area between 165 Captain Cook Road (Lot 15 in Figure 1) and 105 Captain Cook Road (Lot 51, Figure 1) to the west where the TCDC reserve extends approximately 20 metres between the property boundary and the coastal marine area”*.

This section of Cooks Beach is most at risk from coastal erosion due to the level of residential development in close proximity to the foreshore. The undeveloped and hence less at risk sections of Cooks Beach are likely to suit management options recommended for the undeveloped mid section of Buffalo Beach (see the Buffalo Beach Coastal Erosion Management Strategy⁴) and have not been included as part of this strategy.

³ Environment Waikato Contract 921518 Coastal Erosion Management Strategies for Cooks and Buffalo Beaches, 2004.

⁴ Buffalo Beach Coastal Erosion Management Strategy, 2004. Environment Waikato Contract 9215918 prepared by Beca,

Figure 1: Cooks Beach Strategy Area as defined by EW and TCDC.



The preferred options for Cooks Beach were determined by considering the economic, social and environmental issues to achieve triple bottom line outcomes⁵ for the long-term sustainable development of this beach. The following approach was used:

- a. The background to the coastal erosion problem was researched, including investigations into whether there is a coastal erosion hazard at Cooks Beach, and a draft strategy 'vision' developed.
- b. A list of potential options was produced for the Cooks Beach strategy area based on available literature sources, the knowledge and experience of the project team and a constraints and opportunities workshop.
- c. The potential options were screened for any 'fatal flaws' that made some options technically unfeasible. Justifications were given as to why these options were not considered viable options for further assessment.
- d. The options that passed the screening were then qualitatively assessed against various environmental, social and economic impact categories (multi-criteria analysis) and assigned an impact grade depending on their estimated level of effects. Selection of impact categories was based on previous research undertaken by EW on sustainable development criteria used in international studies, remodelled to reflect the New Zealand situation.

The preferred options for Cooks Beach were determined by considering the economic, social and environmental impacts of options and selecting those that are most likely to a achieve triple bottom line outcomes.

⁵ See Glossary in Appendix L for definition of triple bottom line outcomes
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- e. Each option was quantitatively assessed using cost-benefit analysis techniques to measure the overall well-being (or welfare) impacts of the different options for coastal management and macro-economic techniques to measure impacts on the size of the local economy.
- f. A number of preferred coastal erosion management options were identified using an evaluation matrix and the results of the economic analysis. These options are considered the most likely to achieve the strategy vision over a 50 year-time period.
- g. A number of actions were identified to assist EW and TCDC to further refine the strategy vision and options to progress the CEMS into the next stage.
- 8. The Cooks Beach CEMS was then externally peer reviewed.

The background to the project and the methodology used to develop the Cooks Beach CEMS is detailed in Appendix A.

3 Description of Cooks Beach

Cooks Beach is a relatively sheltered, crescent-shaped, fine sand beach, approximately 3km long, located along the southern shoreline of Mercury Bay. A small intertidal harbour, Purangi Estuary, is located at the eastern end of the beach. A large and predominantly intertidal bar formed at the entrance of this estuary, known as an ebb tide delta, lies adjacent to the easternmost 500m of the beach

The beach faces the north-north-east and is oriented almost parallel to the long axis of Mercury Bay. The beach is composed of fine sands. The sediments are contained between the headlands at the eastern and western end and there appears to be little to no sand exchange with adjacent beaches. However, the affected shoreline lies adjacent to the ebb tide delta and there are strong dynamic links between the ebb tide delta and the beach. For instance, the pattern of net sediment circulation over the ebb tide delta involves sediments being moved seawards by ebb tidal flows and then recirculated landwards towards the beach and entrance by wave action and the influence of flood tidal flows.

Cooks Beach is sheltered from easterly waves by the large headland at the eastern end of the beach (though waves do refract around this headland onto the beach) and from north and north-north-east wave directions by the Kuaotunu Peninsula. However, the beach is moderately exposed to waves from the northeast – with most severe coastal erosion tending to be associated with waves from this direction.



Cooks Beach is primarily a holiday resort, with approximately 79% of the 845 ratepayers being absentee owners⁶. The majority of the absentee owners are from the Auckland (55%) and Waikato (34%) regions.

Cooks Beach was ranked among the top 10 beaches visited by respondents to a recent beach survey in the Waikato Region⁷. Local attractions include Shakespeare Point and the cove of Lonely Bay at the western end of the beach, and Purangi Estuary at the eastern end. The beach is also only a short distance from Ferry Landing, with various interesting walking tracks, elevated views and a regular ferry service to Whitianga. The Hahei Marine Reserve and Hotwater Beach, very popular visitor destinations, are also relatively short drives (10-15 minutes) from Cooks Beach.

The background to Cooks Beach and the coastal erosion problem is detailed further in Appendix B.

4 Is there a Coastal Hazard at Cooks Beach?

4.1 Natural Erosion Mechanism

The available evidence indicates the erosion at Cooks Beach is primarily related to dynamic shoreline fluctuations rather than permanent shoreline retreat. The dynamic shoreline

The erosion is primarily related to dynamic shoreline fluctuations rather than permanent shoreline retreat

fluctuations⁸ appear to be related both to climate cycles and to the influence of the adjacent ebb tide delta⁹. There may also have been some transfer of sand from eastern to western ends of the beach – with central and western areas of the beach experiencing a general trend for accretion over the period since 1944. Analysis of historical shoreline changes and beach profile data suggests that, in the absence of shoreline

protection measures, the worst likely storm erosion could potentially cut 25-30m into many sections, though 5-15m is more likely for most properties in the study area.

4.2 What is at Risk?

The subdivision at the eastern end of Cooks Beach was undertaken in the 1960's and early 1970's, and involved the levelling of some parts of the foredune. As a result, development in the Cooks Beach study area is located close to the sea and has experienced ongoing problems with coastal erosion. Over the last 50-60 years, the eastern end of Cooks Beach has experienced at least two periods of severe beach and dune erosion – the first from about 1967/68 to 1978, and the second since the mid 1990's. The most severe erosion was experienced in the storm of July 1978 when several properties were impacted and the sea

⁶ Lesley McCormick, Area Manager, TCDC Whitianga, pers comm., July 2004

⁷ Environment Waikato, 2003

⁸ A state of the shoreline where the beach profile undergoes periods of erosion and accretion, usually associated with climatic events.

⁹ Dahm and Munro, 2002
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threatened eight dwellings. The only remaining areas of Council reserve between the houses and the sea are small strips of land located at either end of the Cooks Beach study area as any small dune areas that may have existed in front of private properties have eroded away over the years.

- At present, there are 35 properties and 27 dwellings that could potentially be impacted in the absence of shoreline protection works. These properties have a combined capital value of about \$20 million, though the market value of the properties is probably closer to \$30 million or more.
- In the longer-term future, erosion may be further aggravated by projected sea level rise and changing weather patterns. Present best estimates suggest potential for complete loss of most properties in the affected area by 2100. At present there are 57 properties and 49 dwellings within the area potentially impacted. These properties have a combined capital valuation of \$33 million, though the present market value is probably closer to \$50 million.
- Small areas of reserve land at either end of the Cooks Beach study area are also vulnerable to coastal erosion.

5 Strategy Vision and Objectives

To facilitate the assessment of options for the Cooks Beach CEMS a draft strategy vision and objectives were developed to identify desired outcomes over the next 50 years. Consultation with the community and stakeholders is a key part of developing a vision and objectives for any strategic planning such as this, but was not undertaken as part of this project. The draft vision and objectives were developed based on community consultation undertaken as part of both the EW and TCDC Long Term Council Community Plan (LTCCP) processes and also the experience gained from past strategic studies undertaken by the project team. It is expected that this vision and objectives will be further refined through consultation with the community.



Objectives:

- ✓ Take a sustainable approach to shoreline management based on an assessment of economic, environmental and social impacts of options for coastal defence.
- ✓ Proactively reduce the level of risk on coastal communities from current and future coastal hazards by using appropriate management techniques.
- ✓ Increase the awareness of property owners and the wider community of the natural and dynamic coastal system through education on the potential risks associated with coastal protection.
- ✓ Facilitate a co-ordinated approach to managing coastal hazard risks between property-owners, communities, tangata whenua and key stakeholders.

6 How were Options Screened?

There were a number of possible options available for the management of the Cooks Beach coastal erosion hazard. However, some options were impractical for Cooks Beach. Factors that made some options impractical included technical design issues such as an incompatibility between the structure being considered and the site conditions or an unacceptable level of risk caused by some options (such as navigational hazard). These factors are called “Fatal Flaws” and it was necessary to conduct a screening level assessment before suitable options were investigated further for environmental, economic and social impacts. This was achieved via a checklist approach where each option was looked at for technical feasibility and either ticked for further assessment or discarded with a justification provided on why that particular option was not considered further.

Refer to Checklist in Appendix D for the initial screening of options

7 What Options were Assessed?

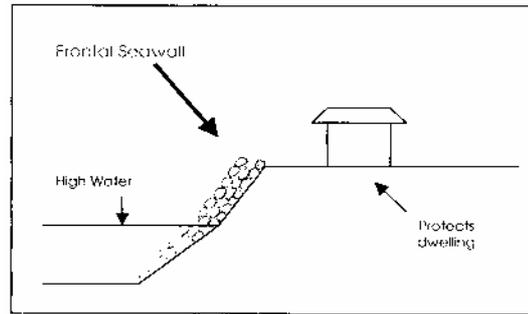
Following the screening assessment of all options, a number of options were identified as being technically or practically viable and were taken through to the next stage for full assessment. These options are described briefly below. The diagrams provided below are generic structures intended to assist with an understanding of the options but do not provide any design specifics, scale, etc. For further details refer to Appendix E.

Status Quo: This option is essentially a continuation of the existing situation that has been established for the last 25-30 years and involves maintenance of existing structures.

Living with Coastal Erosion: Involves living with coastal erosion, managing use and development of the land to minimise risk to dwellings. This option does not provide protection to dwellings and those dwellings that can be setback on their properties would likely require relocation as part of this option.

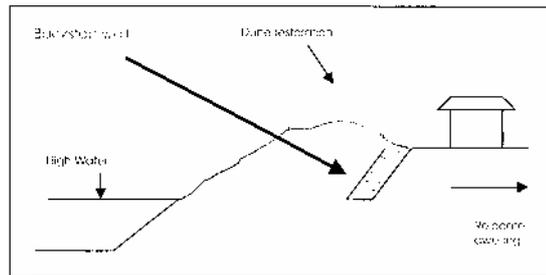
Purchase of beachfront properties and rezone: This option involves purchase of affected properties at current market value, removal of dwellings, removal of existing coastal structures, restoration of the natural dune (both front and back dune) and designation of the area as a reserve (i.e. Open Space).

Frontal Seawall: Seawalls are constructed parallel to the coastline. The primary purpose of a seawall is to protect the land behind from wave and current action. They maintain the coastline in a fixed position, similar to a headland. The seawall would be an engineered structure, probably constructed of rock. While seawalls protect the land behind them the beach in front of them is often lost.

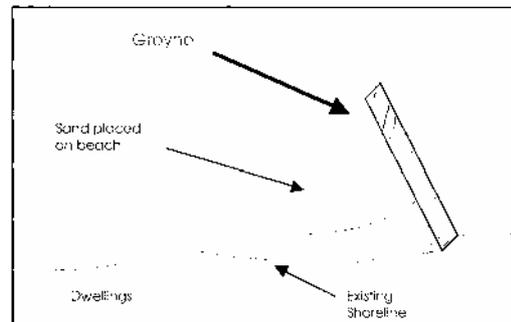


Backstop wall, relocation and land swap:

This option involves the construction of an engineered wall located sufficiently far enough landward (approx. 10-20m) so that the wall is buried and only exposed in extreme storm events. The sand in front of the backstop wall provides a natural dune buffer to protect relocated properties and maintains an exposed beach. Relocation or replacement of some of the existing houses further landward (on the existing sections) to create room for wall would be required.

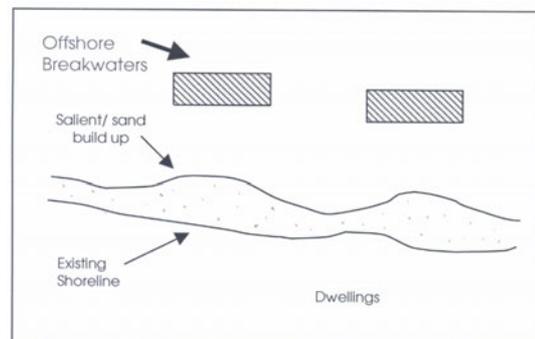


Groyne(s) plus nourishment: Groynes are narrow structures constructed perpendicular to the coastline. At Cooks Beach there is strong net longshore transport to the east along the foreshore adjacent to the ebb tide delta - associated with the pattern of net sediment recirculation over the ebb tide delta. Therefore, a groyne placed in this area will trap longshore moving sand and a beach will be formed on the western (i.e. updrift) side.



Offshore Breakwater and renourishment:

Offshore breakwaters are structures usually built parallel and offshore to the coast. Wave energy is either dissipated, reflected, refracted or diffracted resulting in reduced wave energy environment in lee of the breakwater. The breakwater can be built either to be submerged or emerging at low tide. It would also require placement of sufficient sand to assist the build up of salient.



8 How were Social, Environmental and Economic Impacts Evaluated?

Once feasible options were selected from the initial screening level checklist, the selected options received a thorough assessment against a range of indicators (impact categories) separated under the three broad categories of environmental, social and economic analysis.

What do the Indicators Mean?

A whole series of indicators were developed to assess the impacts of each option against and these are described briefly in the table below. Each option was graded in terms of the impacts (either positive, negative or both) and the level of this impact (low, medium and high) in promoting sustainable development of Cooks Beach and achieving the strategy vision. For some indicators the positive or negative impact was considered to be not applicable. Further details on the descriptions of each indicator and their gradings are provided in Appendix G.

The indicators cover a range of potential impact categories including items stated as matters of national importance in the RMA (e.g. public access, historic heritage, natural character etc), matters considered important for beachfront property owners (e.g. protection of private property, private capital, capital costs) and values that may be important for the wider community (e.g. natural character and beach amenity). There are also categories of importance to stakeholders such as the Department of Conservation (e.g. biodiversity, environmental footprint) and the local authority (e.g. impact on Council, policy/statutory compliance).

Selected Social Impacts	Policy Compliance	The degree to which the management option complies with existing national, regional and district policies/provisions/guidance.
	Beach Amenity Values	Refers to peoples 'sense of place, visual aesthetics of the option, public access and recreational impacts such as cycling, walking running, surfing, boating, etc.
	Public Access	Public access is considered to be access both to and along the coast. This is a matter of national importance in the RMA.
	Construction Nuisance	Refers to disruptions, interference and noise levels impacting on residents, local community and visitors from any construction works (temporary placement or on-going maintenance).
	Public Safety	The level of impact on public safety from the option, such as navigation safety, accident caused by construction activities and injury/life risk to property owners.

	Impact on Council	The extent to which the option relieves, maintains or increases pressure and/or Council liability to undertake coastal protection works to safeguard private property. Pressure may be compounded by increasing number of properties at risk. Also refers to level of commitment required by council in the long-term in regards to maintenance, resources, etc.
	Uncertainty	The level of uncertainty the option has for property owners on the extent of protection afforded against future erosional events, i.e. loss of, or damage to, property.
	Public Resistance	Refers to the expected resistance levels, public perceptions and disagreements within the community as a result of a proposed action.
	Cultural Values	Includes consideration of the impact on values important to tangata whenua. This category has not been assessed as the information on this can only be obtained through consultation with tangata whenua.
	Historic Heritage	Refers to natural and physical resources that contribute to an understanding and appreciation of NZ's history and cultures. Includes a broad assessment of potential impacts on both recorded and unrecorded archaeological sites. This is a matter of national importance in the RMA.
	Equity	Assessment of the balance of benefits to be gained between the wider community and private beachfront property owners, etc.
Selected Environmental Impacts	Biodiversity	Refers to the impact of the option on indigenous species and habitats including endangered and threatened species within the coastal environment.
	Natural Character	Refers to the extent of impact on natural landforms, ecosystems and natural processes. Defined as a matter of national importance in the RMA.
	Coastal Processes	The extent of the impact on natural coastal processes such as wave action, currents and resulting sediment movement.
	Coastal Flooding	Refers to the effect of the option on coastal flooding risk. It includes wave overtopping, storm surge, wave run-up, etc
	Climate Change	How will the option face future expected climate change and the effects of global warming, associated sea level rise and effects on coastal erosion.
	Environmental Footprint	Refers to the degree of impact on environmental resources (such as type of resources needed, amount, etc). It refers to how we might quantify our use of nature and compare with the carrying capacity of our environment.

	Reversibility of option	How easy is the option to reverse and restore the affected area back to its original state prior to when the option was implemented?
Selected Economic Impacts	Structure Construction, Works and Maintenance Costs	Initial capital costs associated with construction of engineered structures and maintenance/works associated with the option over a 50-year timeframe.
	Capital Costs (property costs only)	Refers to the cost of property relocation or purchase associated with some options.
	Local Economy	Refers to the contribution and spill over effects the option has on the local economy, i.e. the potential for increased local employment, spending and other economic activities in the local community.
	Transaction Costs	Refers to the efforts and hence the costs that go into organising, negotiating, entering into contracts and the implementation of the option (e.g. resource consents).
	Tourism	The contribution of the option towards local tourism in terms of visitor numbers, tourist spending, etc
	Private Capital	The extent to which the option affects both private capital and equity gain such as an increase or decrease in property values, both the adjacent beachfront properties and wider community. Includes cost of property relocation or purchase if required by an option.
	Protection of Public Infrastructure	Refers to how likely the option will provide protection for assets such as roads, public reserves, water, sewerage, electricity, gas and impacts on the costs to the council to relocate or restore this infrastructure and services.

Cultural values have been added as an indicator against which options must be assessed to demonstrate their importance in the consideration of any option. Although consultation with tangata whenua was not undertaken as part of this project, EW and TCDC have advised that a consultation programme is planned as part of the wider joint coastal erosion project and cultural values will be investigated at that stage.

Qualitative and Quantitative Assessment

All options were qualitatively assessed (through a multi-criteria analysis) against the indicators based on a time frame of 50 years¹⁰ and the impact the option would have over that period. The assessments were based around the idea of a beach that would represent the strategy vision. Each option was assessed against the indicator and given a High, Medium or Low (H, M or L) positive or negative grading (depending on whether the impact of the option on that indicator is positive or negative in achieving the ideal beach state representative of the strategy vision). The assessment of each option against the indicators is shown in the matrix on the following page.

In addition to the above qualitative assessment an economic analysis of each option was also undertaken to quantitatively assess the level of impact the option will have. The economic analysis utilised cost-benefit analysis techniques to measure the overall well-being (or welfare) impacts of the different options for coastal management and macro-economic techniques to measure impacts on the size of the local economy. The economic analysis is detailed in Appendix F.

No specific design work was undertaken as part of this study and therefore structure construction, works and maintenance costs used in the assessments are estimates for generic structures (e.g. seawall).

9 How did the Options Stack Up?

Once the options were assessed against each indicator in the tables in Appendix H then the grading assigned to each category was inserted into a matrix table for evaluation. The following is the final matrix developed for Cooks Beach.

The qualitative assessment has been based on the consensus view of the project team. The views of the public play an important part in strategy development and implementation. These will be assessed through the consultation programme planned by EW and TCDC.

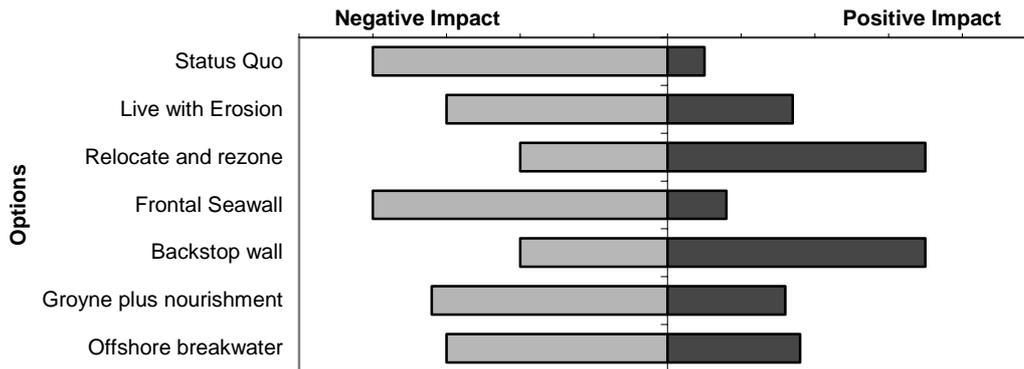
¹⁰ Environment Waikato Contract 921518 Coastal Erosion Management Strategies for Cooks and Buffalo Beaches, 2004.
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How to use the Matrix: Each option along the top of the matrix has been assessed against the indicators down the left hand side of the table based on whether or not it will have a positive or negative impact (red represents negative impact, green is a positive impact). The length of the bar indicates the degree of impact. Long bars represent a significant impact (either positive or negative) and short bars indicate minor impacts. No bar indicates that there is no impact (except for Cultural Values which have not been assessed in this study and therefore have no bars shown).

		Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7			
		Status Quo	Living with coastal erosion	Council purchase + relocation + rezoning	Seawall	Backstop Wall + reloc + land swap	Groyne + nourishment	Offshore breakwater			
Selected Social Impacts	1	Policy/Statutory Compliance	█	█	█	█	█	█			
	2	Beach Amenity Values	█	█	█	█	█	█		Key	
	3	Public Access	█	█	█	█	█	█	█		Positive Impact
	4	Construction nuisance (e.g., noise levels, durations, times)	█	█	█	█	█	█	█	█	Negative Impact
	5	Public safety (accidents/navigation hazards)	█	█	█	█	█	█	█		
	6	Impact on Council (Council liability, pressure on Council, Council commitment)	█	█	█	█	█	█	█		
	7	Uncertainty	█	█	█	█	█	█	█		
	8	Public resistance	█	█	█	█	█	█	█		
	9	Cultural values									
	10	Historic Heritage	█	█	█	█	█	█	█		
	11	Equity	█	█	█	█	█	█	█		
Selected Environmental Impacts	12	Biodiversity - Species and Habitats	█	█	█	█	█	█	█		
	13	Natural Character	█	█	█	█	█	█	█		
	14	Coastal Processes	█	█	█	█	█	█	█		
	15	Coastal Flooding	█	█	█	█	█	█	█		
	16	Climate Change	█	█	█	█	█	█	█		
	17	Environmental Footprint (resource type and use)	█	█	█	█	█	█	█		
	18	Reversibility of Option	█	█	█	█	█	█	█		
Selected Economic Impacts	19	Structure Construction, Works and Maintenance Costs	█	█	█	█	█	█	█		
	20	Capital Costs (property costs only)	█	█	█	█	█	█	█		
	21	Local Economy	█	█	█	█	█	█	█		
	22	Transaction Costs	█	█	█	█	█	█	█		
	23	Tourism	█	█	█	█	█	█	█		
	24	Private Capital	█	█	█	█	█	█	█		
	25	Protection of Public Infrastructure	█	█	█	█	█	█	█		

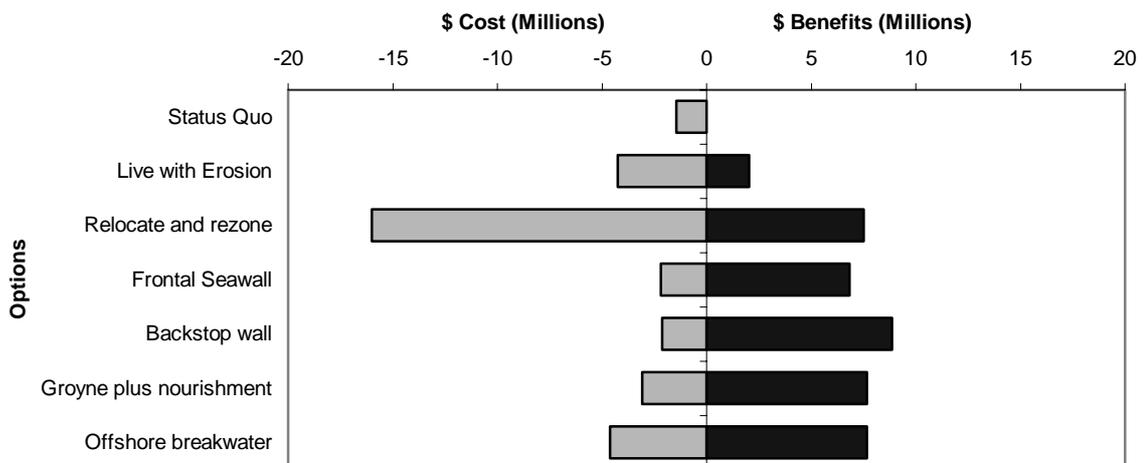
The graph below shows, in summary form, the results of the matrix. The results show that the options of “Relocate and Rezone to Open Space” and a “Backstop Wall” have the most positive impacts and least negative impacts of all options assessed. A Frontal Seawall is the least preferable option based on the qualitative analysis.

COOKS BEACH COASTAL EROSION MANAGEMENT STRATEGY - QUALITATIVE ANALYSIS SUMMARY



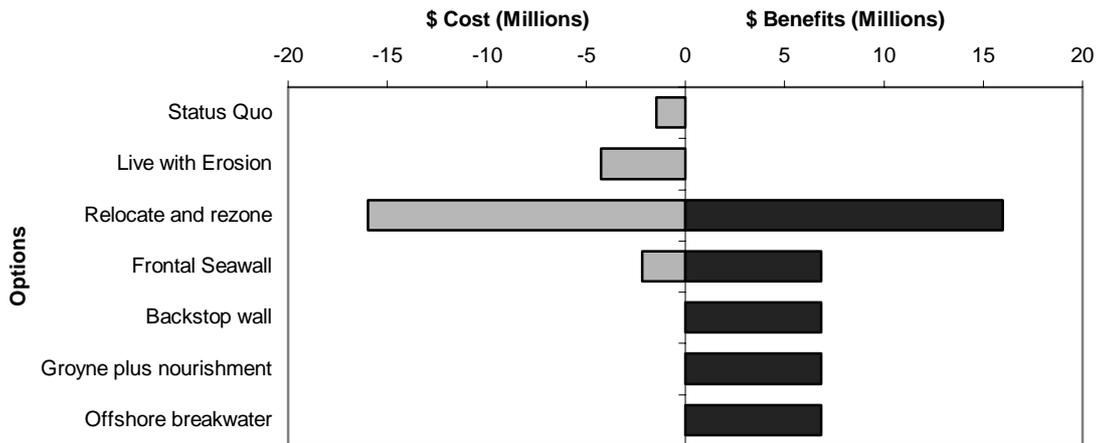
The economic analysis considered the capital costs, property loss/gain, naturalness gains and the net economic benefit/costs of each option for society as a whole and also separately for the individual beachfront property owners and the wider community. The quantitative analysis summary graph (below) shows that a “Backstop Wall” is the most preferable option over the planning horizon of 50 years for the society as a whole, followed closely by a “Frontal Seawall” and “Groyne plus Nourishment”.

COOKS BEACH COASTAL EROSION MANAGEMENT STRATEGY - COST BENEFIT ANALYSIS (Whole Society)



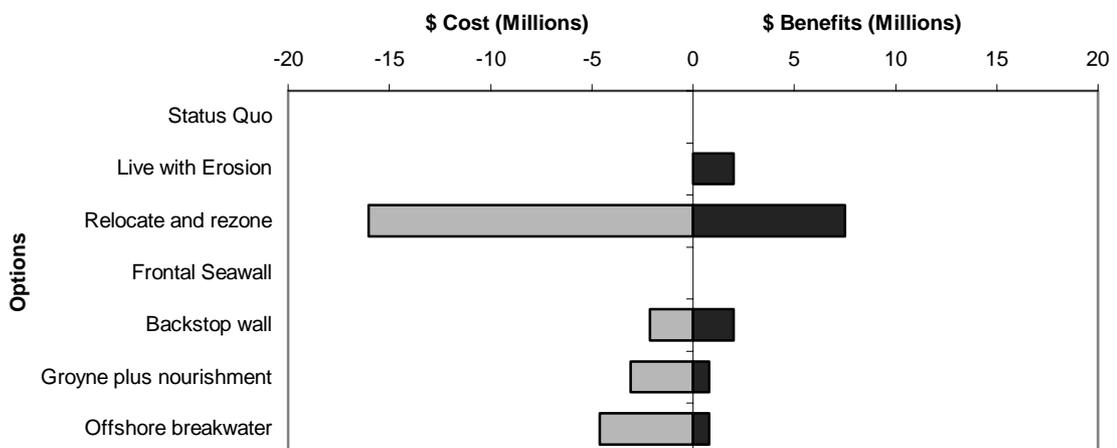
The following summary graph shows the net economic benefit/costs of each option for the individual beachfront property owners only. The graph shows that although the relocate and rezone option has the greatest economic benefits for individual property owners, it also comes with the greatest costs over the planning horizon of 50 years. The options of “Backstop Wall”, “Groyne plus Nourishment” and “Offshore Breakwater” all have benefits and no costs for individual beachfront property owners.

COOKS BEACH COASTAL EROSION MANAGEMENT STRATEGY - COST BENEFIT ANALYSIS (Beachfront Owners)



The following summary graph shows the net economic benefit/costs of each option for the wider community only (excluding beachfront property owners). The graph shows that although the “Relocate and Rezone” option has the greatest economic benefits for the wider community, it also comes with the greatest costs over the planning horizon of 50 years. The “Live with Coastal Erosion” option has benefits and no costs for the wider community (excluding beachfront property owners).

COOKS BEACH COASTAL EROSION MANAGEMENT STRATEGY - COST BENEFIT ANALYSIS (Wider Community)



Summary of Results

From the qualitative assessment matrix (multi-criteria analysis) and the quantitative economic assessment (cost benefit analysis), the options that are most likely to achieve triple bottom line outcomes (therefore the most likely to be a sustainable solution over the next 50 years and achieve the strategy vision) can be selected.

The results from the two assessments indicate that a backstop wall is the option most likely to achieve the strategy vision and provide a sustainable solution over the next 50 years for management of the coastal erosion hazard at Cooks Beach. This option has been assessed as having the most positive and the least negative impacts in the qualitative analysis and the highest economic benefit over the longer term (50 years) in the quantitative analysis.

The economic analysis has assessed costs and benefits from the perspective of society as a whole as well as separating the analysis into beachfront property owners only and the wider community (excluding beachfront property owners) only.

The economic analysis for individual beachfront property owners indicates that a backstop wall, groyne plus nourishment and offshore breakwater all have significant benefits, albeit that the costs are paid for by the public purse. For the wider community (excluding beachfront property owners), "living with erosion" is the best option over a planning horizon of 50-years. However, this has significant costs for beachfront property owners.

The external peer review undertaken supports the outcomes of the Cooks Beach CEMS.

10 Action Plan and Recommendations

The qualitative results show that the options of “Relocate and Rezone to Open Space” and a “Backstop Wall” have the most positive impacts and least negative impacts of all options assessed. The quantitative analysis results show that a “Backstop Wall” is the most preferable option over the planning horizon of 50 years, followed closely by a “Frontal Seawall” and “Groyne plus Nourishment” options. Therefore, in the case of Cooks Beach and when considering both assessments, a “Backstop Wall” is the most favourable option to achieve the strategy vision. Whilst a “Backstop Wall” appears to have the most benefits, a combination of options for the management of the coastal erosion hazard at Cooks Beach could also be considered.

The following provides a summary of those actions recommended to assist EW and TCDC further develop the Cooks Beach CEMS. Further details are provided in Appendix J.

- **Investigative and Design Work (pre-consultation).** This study identified the need for further investigative or pre-feasibility work into selected options such as sensitivity analysis and preliminary design for engineered options to confirm costs and impacts, etc.
- **Feasibility Study (post-consultation).** Following identification of the most preferred option or combination of options (once community consultation has been completed) the option(s) will require further feasibility assessments (including field investigations and specific design) to make sure the options are viable and practical to implement. For example, the backstop wall option, which requires the relocation of some houses back on the property, will require a feasibility assessment to confirm it is viable to relocate the dwellings.
- **Funding Policies.** Investigations to identify the allocation for funding, and where the costs should fall for the selected options.
- **Consultation.** To further develop the CEMS for Cooks Beach by taking the selection of options presented in this report to tangata whenua and the community for comment and discussion as well as to increase awareness and understanding of the CEMS at a local and regional level.
- **Monitoring Plan.** To review and further develop the CEMS following community consultation, to monitor physical processes and to undertake community surveys to monitor changing values.
- **Implementation Plan.** Develop an implementation plan for the preferred option(s) and include a timeframe of actions.
- **Structure Plan.** Community and stakeholder consultation may result in many differing values and wants for different parts of the Cooks Beach strategy area being identified. If this is encountered then it is recommended that a local structure plan be developed that can address site-specific combinations of options at each section of the study area at a more detailed level and an integrated approach provided.
- **Resource Consents.** Proceed with appropriate resource consent applications for the preferred option(s) identified from consultation.

[This is the first part of a 3 part report. Continued in part 2.](#)