

Coastal Adaptation Pathway: Kuaotunu West

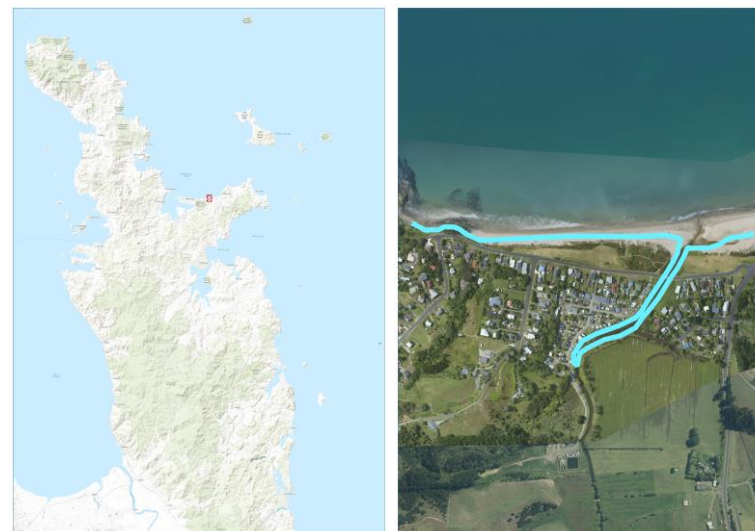
Policy Unit 84, Management Area E4

Introduction

Kuaotunu West is a sandy pocket beach, approximately 1200 m in length, with a relatively large frontal foredune. In the past, the area has been subject to extensive sand extraction, however dune restoration and stream mouth management has improved dune health. The Pitoone Stream outlet is relatively fixed in the centre of the beach due to the regular clearing of sediment in the stream mouth and the placement of the material of the stream mouth's eastern side.

Bluff Road runs through the Policy Unit along the landward side of the foredune. Landward of the road, there is the low-density residential development of Kuaotunu West.

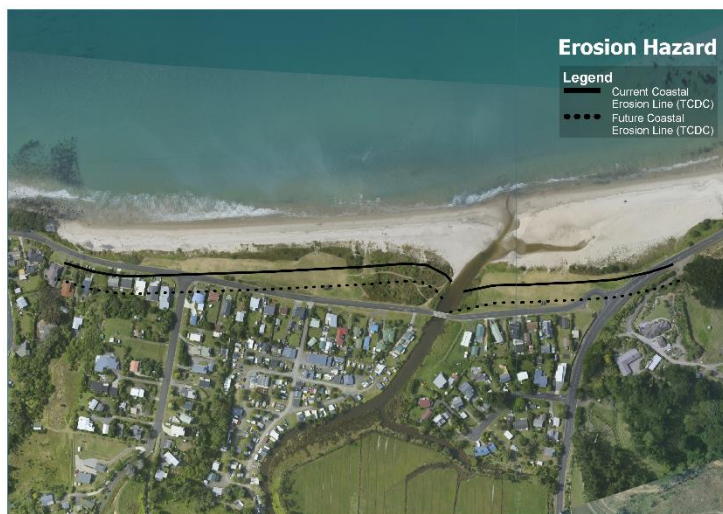
Inundation information is available via WRC's Coastal Inundation Tool, and the District Plan's Current and Future Coastal Erosion Lines are also available. Kuaotunu Campground and properties on Hildale Crescent are low-lying and are particularly susceptible to multiple hazards (e.g., the July 2008 coastal inundation event, and the September 2019 river flooding event). The erosion lines indicate that Bluff Road may be susceptible to erosion.



The Hazards



Sea Level Scenario		Sea Level (MVD-53)
Present Day	MHWS	1.2m
	Max Tide	1.4m
	Lower Storm Tide Range (Estimate)	1.5m
	Upper Storm Tide Range (Estimate)	2.2m
Future Projected 0.5m Sea Level Rise	MHWS	1.7m
	Max Tide	1.9m
	Lower Storm Tide Range (Estimate)	2.0m
	Upper Storm Tide Range (Estimate)	2.7m
Future Projected 1.0m Sea Level Rise	MHWS	2.2m
	Max Tide	2.4m
	Lower Storm Tide Range (Estimate)	2.5m
	Upper Storm Tide Range (Estimate)	3.2m



In addition to the coastal inundation and erosion hazards shown, this location is exposed to river flooding. The combined influence of coastal inundation and river flooding during storm events is likely to mean that the hazard illustrated for coastal inundation underestimates the risk of exposure.



(River hazard zone, WRC, 2013)

The Risk

Type	Year/SLR	Storm	Exposure	Vulnerability	Consequence
Erosion	2020	1% AEP	Moderate	High	Major
Erosion	2120	1% AEP	Moderate	High	Major
Inundation	0 m SLR	1% AEP	Low	Moderate	Minor
Inundation	1.2 m SLR	1% AEP	Moderate	High	Moderate

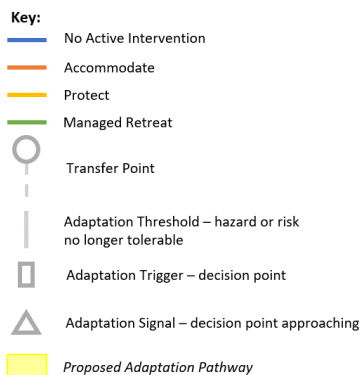
The Response

At the option assessment stage, the following adaptation options were considered:

Policy	Option
Be Prepared	Provide regular information to affected stakeholders on hazards, risks and management measures.
Be Prepared	Implement hazard warning systems and prepare emergency response plans.
Accommodate	Maintain natural defences through dune management; maintenance of sediment supply; maintaining foreshore vegetation and wetlands; and managing stock access to the foreshore.
Accommodate	Retrofit (including raising) buildings and infrastructure.
Managed Retreat	Relocate assets.
Managed Retreat	Provide accommodation space (e.g. space for habitats).

On further examination, the 'Protect' option relating to the implementation of soft-engineering was also considered.

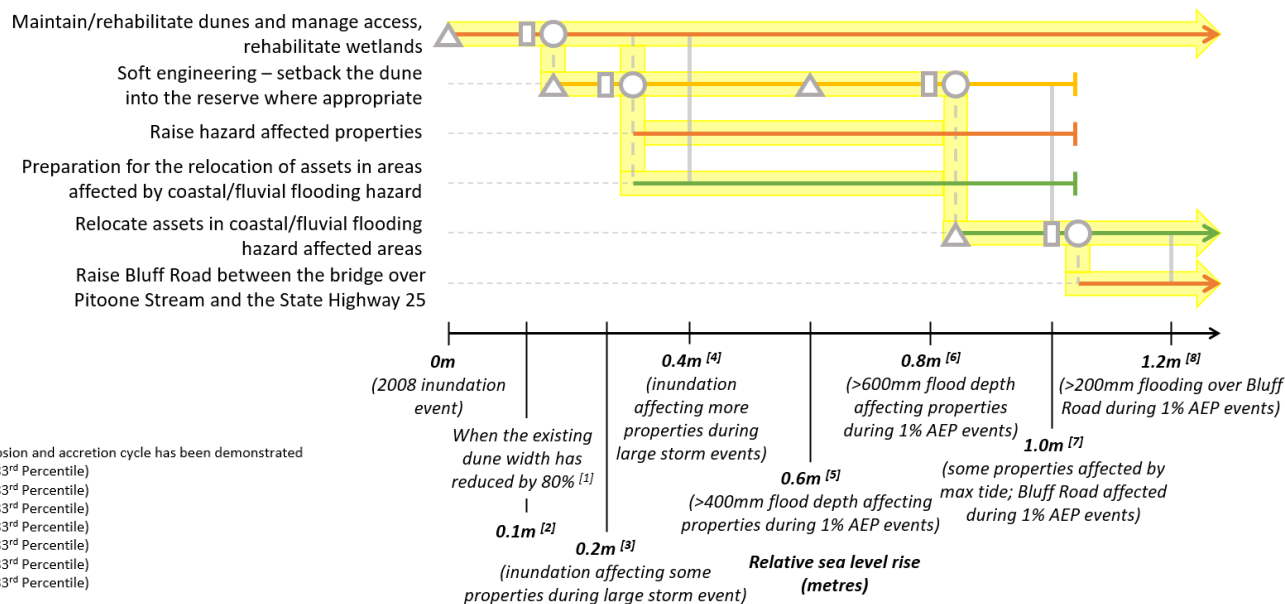
Adaptation Pathway



Strategy

In the short term the adaptation pathway advocated for Kuaotunu West involves maintaining the health of the dunes, through planting and management of the stream entrance. It is also proposed that the wetland habitats that line the estuary are rehabilitated. With climate change this is not expected to be sufficient to limit erosion on its own. Therefore, if 80% of the dune width is eroded and maintenance is ineffective, soft engineering measures should be implemented; setting the dune back into the reserve and undertaking dune planting. Measures such as these may require management and potentially continued push-ups, planting and even reprofiling over time.

In addition, in time, there may be a requirement to raise properties at enhanced risk of coastal flooding. In the longer term, with 0.8m of sea level rise, it is predicted that significant depths of flood water could affect some properties in large storm events and that they will need to be relocated. With 1.0m of sea level rise, it is predicted that Bluff Road, between the bridge over Pitoone Stream and SH25, could be affected by flood water during large storms, and that this section of road will need to be raised.



¹ and a recessionary trend outside the normal erosion and accretion cycle has been demonstrated

² Approx. 13 years into future based on RCP8.5 (83rd Percentile)

³ Approx. 24 years into future based on RCP8.5 (83rd Percentile)

⁴ Approx. 43 years into future based on RCP8.5 (83rd Percentile)

⁵ Approx. 57 years into future based on RCP8.5 (83rd Percentile)

⁶ Approx. 71 years into future based on RCP8.5 (83rd Percentile)

⁷ Approx. 84 years into future based on RCP8.5 (83rd Percentile)

⁸ Approx. 97 years into future based on RCP8.5 (83rd Percentile)