



# EXPLORING OPTIONS FOR RETREAT

**Hurunui District Council**

**October 2022**

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## Contents

1	Introduction .....	3
1.1	Purpose .....	3
1.2	What is managed retreat? .....	3
1.3	A changing approach.....	3
1.4	Applicability and limitations of the report.....	4
2	Managed retreat options.....	4
2.1	Option 1 – Property acquisition.....	4
2.2	Option 2 – Planning provisions .....	5
2.3	Option 3 – Signalling .....	6
3	Triggers for retreat.....	7
3.1	Option 1 – Pondering issues.....	8
3.2	Option 2 – Maintenance of coastal protection works .....	8
3.3	Option 3 – Stormwater or wastewater issues .....	9
3.4	Option 4 – Access issues .....	9
3.5	Option 5 – Insurance retreat.....	9
3.6	Option 6 – Major event.....	9
4	Who retreats? .....	9
4.1	Option 1 – Whole of settlement retreat.....	9
4.2	Option 2 – As individuals cannot tolerate the risk.....	9
4.3	Option 3 – Partial retreat .....	10
5	What happens if someone does not want to leave? .....	10
5.1	Option 1 – Allow the property owner to stay with limited services.....	10
5.2	Option 2 – Prohibit activity on the site .....	10
5.3	Option 3 – Acquire the property.....	10
6	Where could people go?.....	10
6.1	Option 1 – Ad hoc retreat .....	10
6.2	Option 2 – Land swap to safer land nearby .....	11
6.3	Option 3 – Mixed approach retreat .....	12
7	Financial considerations.....	13
7.1	Limiting the cost of retreat .....	13
7.2	Opportunities to generate income .....	13
8	Who will pay?.....	14
8.1	Option 1 – Local Government – District Council.....	14
8.2	Option 2 – Local Government – Regional Council .....	15

8.3	Option 3 – Property owners.....	15
9	Implementing managed retreat.....	15
9.1	Stage 1 – Community engagement.....	16
9.2	Stage 2 – Planning and preparing .....	16
9.3	Stage 3 – Enabling investment.....	17
9.4	Stage 4 – Active retreat.....	18
9.5	Stage 5 – Clean-up and repurposing.....	18
10	Property and infrastructure at risk .....	18
10.1	Amberley Beach .....	19
10.2	Leithfield Beach.....	22
10.3	Gore Bay.....	25
10.4	Motunau Beach.....	27
11	What needs to happen .....	30
12	Bibliography .....	31

# 1 Introduction

In 2020 Hurunui District Council (HDC) started a project assessing the current coastal hazards that affect the Hurunui's coastal settlements and how these hazards might change over a 30-, 50- and 100-year period. The project follows the dynamic adaptive pathways approach set out in the Ministry for the Environment's Coastal Hazards and Climate Change Guidance.<sup>1</sup>

The project has four phases:

- Phase 1 – What is happening?
- Phase 2 – What matters most?
- Phase 3 – What can we do about it?
- Phase 4 – How can we implement the strategy?

In 2022 HDC commenced Phase 3 of the project looking at the various adaptation options that were available to the individual communities. For some of the Hurunui's coastal settlements managed retreat is a viable and realistic option.

## 1.1 Purpose

This report seeks to set out what managed retreat is, how this could be implemented, and what it might cost. This information can then be used to discuss managed retreat as an option alongside the engineering options when developing adaptive pathways.

## 1.2 What is managed retreat?

Managed retreat is a coastal management strategy that allows the shoreline to move inland, instead of attempting to hold the line with structural engineering.<sup>2</sup> Managed retreat usually involves moving human activity out of areas at high risk of coastal hazards pre-emptively and permanently. This could involve relocation within the same property, relocation within the same settlement or relocation outside the settlement. Managed retreat may be required due to one particularly high-risk hazard, such as erosion, or the risk of multiple different hazards such as the combined flood risk from coastal, rainfall and river flooding events. The exposure to risk is likely to increase over time with sea level rise.

Abandonment or gradual voluntary movement of people away from an area is considered unmanaged retreat.<sup>3</sup>

## 1.3 A changing approach

Historically there has been a tendency to fund short-term protection works. Such works can provide a false sense of security and increase public demand for protection even if the technical viability and/or long-term utility is questionable.<sup>4</sup> This approach is increasingly being questioned because of the high ongoing cost, the adverse effects on the coastal environment (including on other parts of the coastline), and the feasibility of continuing protection works across long stretches of coastline.<sup>5</sup>

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<sup>1</sup> (Bell, Lawrence, Allan, Blackett, & Stephen, 2017)

<sup>2</sup> (Pennsylvania State University, n.d.)

<sup>3</sup> (Lawrence, et al., 2020)

<sup>4</sup> (Lawrence, et al., 2020)

<sup>5</sup> (Turbott, 2006)

## 1.4 Applicability and limitations of the report

This report sets out the information required to help decide on the viability of managed retreat. It does not make a recommendation as to whether managed retreat is the best option.

There is no legal requirement for central or local government to purchase any properties. Nor is there a legal requirement to provide access to existing properties.

This report provides a snapshot of the benefits, costs and challenges as they stand in 2022. It does not seek to anticipate the changes that might occur past this date.

## 2 Managed retreat options

Managed retreat can occur in conjunction with, or separate to, other adaptation options. There are several different ways that managed retreat could be undertaken. The viable options are discussed below.

### 2.1 Option 1 – Property acquisition

This option involves a public entity acquiring private properties at risk. This could occur immediately, or land could be designated for future acquisition preventing the land being sold to any other party.

#### 2.1.1 Buyouts

This involves a government agency acquiring at risk land to reduce the exposure to risk. The dwellings can then be demolished, and the land reserved as public space or leased for temporary use.

This land could also be purchased by a government agency, covenants placed on the property and then the property sold on. This could include provisions such as the need to remove the dwelling and remediate the site when a certain trigger point is reached.

Managed retreat in New Zealand has primarily happened retrospectively. The one notable example is Project Twin Streams in Waitākere. The city purchased 81 dwellings located within the 100-year flood plain in a bid to restore 56 kilometres of the Waitākere Stream.<sup>6</sup>

Managed retreat was also used in Matatā. In 2005 a destructive debris flow destroyed 27 homes and caused over \$20 million in damage in Matatā. As a result, 34 properties in private ownership have been retreated. The Whakatane District Council lodged a Plan Change with the Bay of Plenty Regional Council to extinguish existing rights on this land. Property owners were offered current market rate for their property and a contribution towards legal fees, relocation costs and mortgage break fees.<sup>7</sup>

Buyouts are expensive for governments, and it is unlikely the government will compensate all coastal retreat in New Zealand.

#### 2.1.2 Leasebacks

Leasebacks involve the acquisition of at-risk land with provision for this to be leased back to the original owner or a third party. The former owner then pays rent to use the land but no longer owns it. This enables continued use until such a time that retreat is necessary. The revenue generated from the leases can then be used to pay for maintenance costs, alternative land, or disestablishment costs.

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<sup>6</sup> (Project Twin Streams, 2022)

<sup>7</sup> (Project Twin Streams, 2022)

### 2.1.3 Land banking and/or land swaps

Land swaps involve property owners of high-risk land being offered the opportunity to swap their title for a similar parcel of lower risk land. The original sections are then used as reserve land or in some situations can provide space for coastal renourishment works to protect the remaining development. Land swaps can enable communities to relocate to a lower risk area together.

There are opportunities to purchase this land well in advance of needing the land and leasing this land until it is required. If in the future retreat was determined not to be the best approach the land can then be sold on.

## 2.2 Option 2 – Planning provisions

Planning provisions can be used to help signal and facilitate retreat. They can be used as an effective mechanism to prevent further investment in an area. Some of the possible approaches are set out below. All of these approaches will require a plan change to either the District or Regional Plan to implement.

Property specific planning options are discussed in detail in HDC's report *Planning Options for Coastal Communities 2022*.<sup>8</sup> This report looks more generally at how planning can be used as part of an adaptation approach and does not specifically address how planning can be used to facilitate retreat.

### 2.2.1 Spatial or structure planning

Spatial planning is a strategic approach to manage where and how future growth should occur. Through the spatial plan process the projected level and demographics of future growth is quantified to indicate the number and type of households to be planned for. The suitability and feasibility of land for development is considered in terms of the ability and cost to service, transport links, risk of natural hazards and other constraints such as highly productive land and indigenous biodiversity.

Using this information, growth scenarios can be modelled, leading to a preferred outcome that identifies the most appropriate and feasible land for future development and expansion of townships. Within this process areas suitable for coastal areas to retreat to can be identified and planned for.

### 2.2.2 Time limited land use consents

Land use consents are generally granted in perpetuity acknowledging that the building is not going to be readily removed. There is the option to include a time limit on resource consents and/or include trigger conditions for when an assessment of risk or relocation is required.<sup>9</sup> The use of triggers accounts for future uncertainties and helps to give effect to an adaptive plan.

This could be implemented by requiring all properties within a certain risk zone to obtain a resource consent. The activity could have a controlled activity status which requires Council to grant the resource consent provided sufficient information addressing the risk is provided. A controlled activity status provides certainty to the landowner that consent will be granted but enables Council to ensure the development is appropriate and the risks are suitably managed. Limited term consents enable the site to be enjoyed for as long as possible while acknowledging that the location may not be viable forever.

For example, Christchurch City Council granted an eight-lot subdivision consent which not only specified that the dwellings were to have a minimum floor height but also required that the dwellings

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<sup>8</sup> (Hurunui District Council, 2022)

<sup>9</sup> (Lawrence, Allan, & Clarke, 2021)

were relocatable and that all buildings, fences and structures were to be removed from the sections (at the owner's expense) within 12 months of sea level rise reaching a specified point.<sup>10</sup>

### 2.2.3 Extinguishing existing use rights

Section 10 of the RMA enables land to be used in a manner that contravenes a District Plan if it was lawfully established before the plan was notified and the effects of the use are the same or similar in character, intensity, and scale to those of which existed before the rule became operative. The District Plan can promote the use of adaptative planning options but in many cases, it cannot enforce them. Even if existing use rights are strictly applied the best a District Council can do is maintain the existing level of exposure, noting the risk is already increasing in most situations with climate change.

Regional and District authorities have some overlapping responsibilities in terms of managing coastal hazard risk, but the two authorities have different legislative capacities. Regional councils can extinguish existing use rights through their regional plans. Such a rule could prevent the redevelopment of a site or require any redevelopment to be relocatable or adaptable. The implementation of such a rule could be delegated to the District Council to administer.

This has only been tested in New Zealand recently at Matatā. In May 2005 a storm triggered a debris flow of approximately 300,000m<sup>3</sup> in the catchment of the Awatarariki Stream at the western end of the settlement at Matatā. This storm was initially thought to have a return period of around 200-500 years but was recalculated as being 40-80 years. Whakatane District Council lodged a plan change with the regional council to extinguish existing use rights based on the significant risk. This plan change made the use of 18 parcels of land a prohibited activity from 31 March 2021. This status had the effect of terminating existing use rights after that date. The decision of the Hearing Panel was appealed but the appeal was resolved before the hearing commenced.<sup>11</sup>

### 2.2.4 Environment Court declarations

Councils can apply to the Environment Court requesting that proposed rules have immediate effect. This can be used where the new rules are to be more prohibitive, and developers could seek to push resource consents through under the more lenient existing rules.

This approach was adopted by the Tasman District Council regarding Plan Change 22 to the Tasman Resource Management Plan. Plan Change 22 addressed the significant need to respond to the combined risks of coastal erosion, coastal inundation, and freshwater flooding. It made changes to the Coastal Hazards Area rules, the subdivision rules, and the building construction rules for Mapua/Ruby Bay.<sup>12</sup>

## 2.3 Option 3 – Signalling

Both Councils and Insurance Companies can signal that retreat is required.

### 2.3.1 Council signalled retreat

This can be achieved through Council limiting the money it invests in an at-risk area. For example, Council could maintain the roading network to a lower standard or decide that it would not undertake costly work on stormwater or wastewater infrastructure. This would not force residents to leave their properties but would signal that the level of service they can expect from Council is reducing. Decisions

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<sup>10</sup> (Christchurch City Council, 2021)

<sup>11</sup> (Awatarariki Residents Incorporated v Bay of Plenty Regional Council & Whakatane District Council, 2020)

<sup>12</sup> (Tasman District Council, 2011)

about reducing the levels of service are made through the Long Term Plan process which the public are able to submit.

Land use and planning changes can also help create more certainty for property owners and enable them to anticipate change.<sup>13</sup>

### 2.3.2 Insurance retreat

Council is not able to control insurance retreat, but insurance companies play a key role in signalling areas of high risk. Insurance companies can raise premiums or excesses, not insure against certain hazards or stop insuring a property altogether.

This has implications for mortgages and the level of risk landowners must take on.

## 3 Triggers for retreat

The dynamic adaptive pathway approach is based on the notion that an action does not occur until it is required. This requires a series of signals and triggers to be identified. A signal is an agreed indicator we are watching to measure the increasing risk. The trigger is the agreed point when that risk is no longer tolerable. If managed retreat is the option to be adopted, the trigger needs to be sufficiently early to ensure that new land is purchased, and new dwellings are built prior to the existing sections being uninhabitable.

Some of the best signals might not be publicly visible. For example, the number of times a stormwater drain needs clearing might be a better signal than the number of times a street is flooded. The maintenance signal might give earlier warning that a new pathway needs to be considered.

The diagram below shows an adaptation pathways map. The various actions or options are identified with various trigger points enabling a shift between the options.

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<sup>13</sup> (Tonkin & Taylor Ltd, 2022)



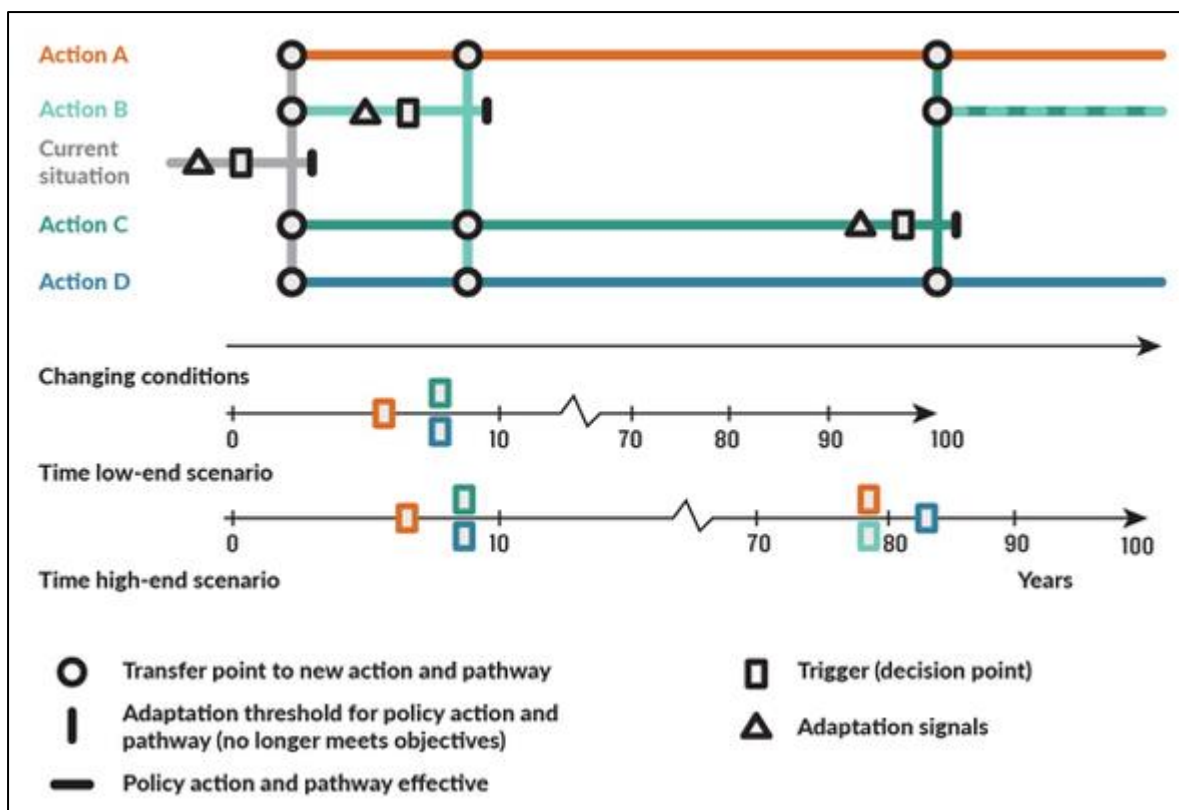


Figure 1: An adaptation pathways map<sup>14</sup>

The signals and triggers need to be unique to each individual settlement. Some potential options are provided below.

### 3.1 Option 1 – Ponding issues

The coastal settlements are low lying with limited fall between the settlement and the sea. The high groundwater table means that the water has limited opportunity to infiltrate the soils and drain away. Properties may also experience groundwater rising to the surface causing ponding. The groundwater table will continue to rise in conjunction with sea level rise therefore further reducing drainage opportunities. This may mean there are extended periods where stagnant water sits on residential properties. Even before this adversely effects house or road foundations this may have a nuisance or amenity effect.

The signal could be the ponding of water with the trigger being a certain number of days in a 12-month period where ponding is present.

### 3.2 Option 2 – Maintenance of coastal protection works

Coastal protection works might be able to provide temporary relief to the increasing risk. These works might be able to buy property owners more time at a particular location. There may come a time when the cost of maintaining the structure is no longer viable. When these works are decommissioned, or maintenance of the structure is reduced, the risk to property owners might suddenly increase significantly.

The signal could be when the cost to individual property owners exceeds a set annual threshold.

<sup>14</sup> (Bell, Lawrence, Allan, Blackett, & Stephen, 2017)

### 3.3 Option 3 – Stormwater or wastewater issues

Council undertook a survey to determine what the community valued about their settlement and property. One of most important values was the ability to maintain water services to the property. If there is an indication that this could no longer be delivered this might be a trigger for retreat.

### 3.4 Option 4 – Access issues

Access into the settlement is an issue at both Amberley Beach and Gore Bay. Access to and from the settlement is a priority for residents and ensures they have a safe evacuation route. If this route is closed periodically this might be acceptable to the community. However, there may be a frequency of road closures that is no longer acceptable to the community. A trigger could be the number of times a road is closed or the duration of the road closure.

### 3.5 Option 5 – Insurance retreat

Many property owners require insurance as a condition of their mortgage. If there is an indication that insurance retreat is imminent, property owners may be forced to retreat in advance of this.

### 3.6 Option 6 – Major event

While the focus of this work is on proactive retreat there is a chance that retreat will still be required after an unforeseen event. In the case of a major event, property owners may be paid out for the damage by insurance and may be able to utilise this money to move elsewhere. The planning rules can support this by preventing redevelopment in an area.

A major event could be used as a trigger for retreat.

## 4 Who retreats?

Managed retreat could involve a whole settlement relocating at a given time, a staged approach or only part of a community retreating.

### 4.1 Option 1 – Whole of settlement retreat

A settlement may choose to relocate all together within a certain timeframe. This limits the assets that need to be maintained and enables demolition and rehabilitation to happen on multiple sites at once. The approach prevents the old settlement being left with sporadic development which could make the old settlement a less desirable place to live.

If the settlement is relocating to the same area, it may help to make the new area feel more established and maintain a sense of community.

### 4.2 Option 2 – As individuals cannot tolerate the risk

Some properties are at greater risk than other properties. Those higher risk properties may want to, or be required to, relocate earlier. Those on higher land or set back further from the coastline might wish to wait until a trigger is reached that is individual to their own property.

There may also be a time when the remaining residents are unable to afford the maintenance costs of protection works. Not maintaining these works may significantly increase the risk to the properties that had previously been at lower risk.

### 4.3 Option 3 – Partial retreat

It is also possible to proactively retreat from only part of a settlement. The new vacant area can be used to help manage the flood risk to the remainder of the settlement or create space for protection works.

## 5 What happens if someone does not want to leave?

Council has no legal obligation to protect private property from natural hazard risk.<sup>15</sup> Nor does Council have a legal obligation to maintain the roading network. Sections 130-134 of the Local Government Act 2022 enables the closure of small water services, but it does put significant restrictions on doing so.<sup>16</sup> These legal requirements may change with the Three Waters Reform Programme,<sup>17</sup> the Future of Local Government Review<sup>18</sup> and the Resource Management Act Reform.<sup>19</sup>

### 5.1 Option 1 – Allow the property owner to stay with limited services

It is possible to do retreat on a voluntary basis. If a property owner or group of owners do not wish to leave it would be possible to lower levels of service to an appropriate standard for the number of remaining dwellings. These property owners may enjoy being surrounded by farmland or public land.

However, it is possible that as the risk to the settlement increases the owners may not be eligible for insurance. This would be a risk the individual owners would need to take on. As there is no liability on Council to protect private property the loss of the property in future could be the responsibility of the owner. There is also a risk that the settlement becomes abandoned or derelict.

### 5.2 Option 2 – Prohibit activity on the site

By extinguishing existing use rights, as explained in section 2.2.3 above, Council can effectively make using the site a prohibited activity. Doing so would not change the ownership of the property but it could place significant restrictions on the enjoyment or functionality of the site. As the ownership would not change the redevelopment of the area would have to work around these sections. Extinguishing existing use rights while technically feasible needs to pass a rigorous assessment. In New Zealand it has only been used in conjunction with a buyout.

### 5.3 Option 3 – Acquire the property

Council has powers under the Public Works Act 1981 to purchase properties where required for public works. It is possible a similar provision will be included in the Climate Adaptation Act with future restrictions included about when and how this power can be used.

## 6 Where could people go?

If managed retreat is the option adopted there needs to be some consideration as to where people will retreat to.

### 6.1 Option 1 – Ad hoc retreat

This involves property owners leaving their existing property and moving to a new location of their choice. The benefit of this option is that everyone gets to choose where they move to.

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<sup>15</sup> (Local Government New Zealand, 2018)

<sup>16</sup> (Simpson Grierson, 2018)

<sup>17</sup> (Department of Internal Affairs, 2022)

<sup>18</sup> (Department of Internal Affairs, 2022)

<sup>19</sup> (Ministry for the Environment, 2022)

This approach has several shortfalls:

**1. Social cost of retreat**

Amberley Beach and Leithfield Beach have a high proportion of permanent residents. Some of these residents have lived at the beach their entire lives and have built their social network around the local area. Relocation risks isolating those people who may not have a large network outside their immediate surrounds.

**2. Abandoned properties**

Properties may be abandoned when they are no longer habitable if there is no funding or insurance pay out to assist in the removal of the property and the remediation of the site. This risks an environmentally valuable area being abandoned. Council may end up being burdened with the cost of removing these dwellings and rehabilitating the area.

**3. Inability to retreat**

Many of the beach dwellings are old baches. These are as small as 40m<sup>2</sup> with many being less than 100m<sup>2</sup>. With a high retired population many of residents are on fixed incomes. Even if these owners were paid market value for their dwelling, they may still struggle to afford to purchase a dwelling elsewhere. The ability to relocate many of these dwellings may be limited by the age and construction of the dwellings.

## 6.2 Option 2 – Land swap to safer land nearby

One option would be for Council to purchase now, on behalf of the community, a piece of land suitable to relocate the entire settlement. Assuming land prices continue to rise this would be a good investment for Council, even if in future it was decided not to use it for relocation.

Council could look to rezone this land through the next plan review process and undertake the subdivision when required. This approach would provide each property owner a piece of land they could retreat to when the time came. It is recognised that not all property owners will wish to move to a new subdivision, but such an approach would ensure all property owners had some equity in a piece of a land. It would be up to the property owner whether they wished to construct a dwelling on this land or sell their new section and relocate elsewhere.

There are several benefits of this option.

**1. Affordability of land**

The Hurunui is fortunate that there is still relatively cheap land available for subdivision. If Council was to purchase the land and complete the subdivision the savings could be passed on to the property owner.

**2. Protected equity**

In this option all property owners would own a piece of freehold land. Council could debt fund the purchase of this land which would enable property owners to secure this land at today's rates instead of the inflated cost of the land when it is required.

Any external funding available could contribute to the shared cost of land purchase, subdivision costs or remediation of the vacated settlement area. If no funding was available this section could be paid off through a targeted rate.

**3. Economies of scale**

There are economies of scale in undertaking one larger subdivision. These savings can then be passed onto the individual property owners as the Council would not look to make a profit on the subdivision like a commercial developer would. For example, a 700-800m<sup>2</sup> section in Amberley is currently on the market for around \$250,000-\$280,000.<sup>20</sup> The estimated cost of land purchase and subdivision per property in a large subdivision is under \$100,000.

This means that property owners could buy into the subdivision for \$80,000 (or less) and have an asset that they could then on sell for \$250,000 or more. While this would not fully compensate the property lost it would provide a significant contribution. If this land is purchased soon the rising land value might increase this potential profit margin for landowners.

An alternative option to help reduce costs further is for Council to undertake a larger subdivision and sell the extra sites at market value. The profit can then offset the cost of the sections being retreated to.

#### **4. Opportunity for place making**

With a proactive settlement retreat new residents can contribute to the layout and design of the settlement. This could include developing new public spaces, reserves and community facilities. Being part of the development might help strengthen community relationships and foster a sense of belonging.

#### **6.3 Option 3 – Mixed approach retreat**

Alternatively, retreat could occur as a mixture of the two approaches above. This could also include sections being made available in new local subdivisions to enable those retreating somewhere to retreat to.

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<sup>20</sup> (Real Estate, 2022)

## 7 Financial considerations

Regardless of who pays the cost of retreat is high.

### 7.1 Limiting the cost of retreat

#### 7.1.1 Option 1 – Capped purchase price

If property owners know they will be bought out at market rate in a few decades there is no disincentive for them to stop investing in the property. This drives up the cost of buying out properties. If a buyout scenario was to be adopted as an adaptive pathway the purchase price could be capped based on the current RV. This would not prevent property owners from maintaining and improving their residence but would mean that the landowner would not be compensated for this improvement.

#### 7.1.2 Option 2 – Relocatable development

Provision could be made for relocatable buildings to enable development to continue while limiting the loss should retreat occur. This would ensure that when the time came property owners can retain some equity from their investment.

### 7.2 Opportunities to generate income

Council's standard way of generating income is through the collection of rates. The Hurunui has a small rating base of approximately 8,600 and therefore the opportunities to socialise the cost of retreat is limited.

There are some ways that the cost of managed retreat could be offset.

#### 7.2.1 Option 1 – Land banking

Land is cheaper today than it will be tomorrow, or in a few decades. If Council were to purchase this land and hold it until it is required, the money saved will help contribute to the cost of retreat.

#### 7.2.2 Option 2 – Earning money through running the subdivision process

Most subdivisions are completed for financial gain. If Council was to undertake this subdivision on behalf of the community the money saved could be passed onto the community.

#### 7.2.3 Option 3 – Buy, covenant and sell

Central or local government could purchase the properties, put covenants on these properties and resell. These covenants could require no further development on the site, that the dwelling is removed, and the site remediated when a trigger point is reached.

This option would allow those who reside at the beach currently to be paid out at market rate. The new owner would buy knowing the risk and understanding that the property has a limited life. Properties could be resold to the existing owner.

#### 7.2.4 Option 4 – Buy and lease

Central or local government could purchase these properties and rent them back to the current owners. The rent received would help offset the cost of the purchase.

This option might cost more than it would make due to the Healthy Homes Standards. The new "landlord" would be required to bring the property up to standard. Some of the older homes may require significant work to do so and the benefit of doing the work might not justify the cost.

### 7.2.5 Option 5 – Selling or leasing the land once the properties have been removed

Once the properties have been removed there will be the opportunity to use this land for another more suitable activity. This could be for public recreation or alternatively it could be leased to a private operator where the activity is not as vulnerable to coastal erosion or inundation.

### 7.2.6 Option 6 – Targeted rates

Council can start collecting rates now so there is a pool of money available when it is required. Alternatively, targeted rates could be used to pay down a debt funded purchase like land banking. Council can borrow money more readily, and at a cheaper rate than the community.

## 8 Who will pay?

A Climate Adaptation Act is currently under development which will address some of the complexities of managed retreat. It is not anticipated that there will be a fully funded coastal retreat fund. Based on this it can be assumed that most, if not all, of the cost will need to be funded by the property owner or Council. As such, options are being considered on the basis that there is no funding available and any funding that becomes available will be a bonus.

### 8.1 Option 1 – Local Government – District Council

Council can set rates for a variety of reasons but is bound by the Local Government Act 2002. Section 101(3) requires Council to consider:

- (b) *In relation to each activity to be funded, -*
  - (i) *the community outcomes to which the activity primarily contributes; and*
  - (ii) *the distribution of benefits between the community as a whole, any identifiable part of the community, and individuals; and*
  - (iii) *the period in or over which those benefits are expected to occur; and*
  - (iv) *the extent to which the actions or inaction of particular individuals or a group contribute to the need to undertake the activity; and*
  - (v) *the costs and benefits, including consequences for transparency and accountability, of funding the activity distinctly from other activities; and*
- (c) *the overall impact of any allocation of liability for revenue needs on the current and future social, economic, environmental, and cultural well-being of the community.*

The Hurunui District has a very small rating base which limits the number of parties to socialise the costs between.

#### Public good verse private good

Council must consider who benefits from a piece of work prior to setting a rate for it. The only coastal protection works within the District protecting private property is the Amberley Beach bund. The Amberley Beach community have paid a targeted rate for this work since 2003. This rate covers the cost of the construction and maintenance of the bund. The rate is the same for all properties within Amberley Beach and as a property owner Council pays the rate on its properties. Council does not contribute any additional funding to the bund.

Council has five coastal communities each with their own unique problems that need solving. There are also inland communities that are going to need to adapt to increasing droughts and floods. These solutions are also likely to be costly. Council is committed to a consistent approach across the District.

This means if your solution is funded by a districtwide rate, you will be expected to fund other community's solutions too.

### Intergenerational equity

Amberley Beach prefer not to go into debt for their bund. They try (successfully so far) to build up the money prior to undertaking the works and their rates increase to ensure there will be enough money for the next renourishment.

Given the complexities and long lead times for retreat there may be merit in debt funding some of this cost and paying the cost off over time. For example, Council could purchase a piece of land on behalf of the community now utilising Council's ability to borrow money and then property owners could pay this off over a period of years or decades.

## 8.2 Option 2 – Local Government – Regional Council

The Regional Council is bound by the same legislation as the District Council. However, they collect rates from a much greater area. The same legal considerations apply.

## 8.3 Option 3 – Property owners

As stated above any public funding for managed retreat is likely to be limited. Individual property owners will face some if not the majority of the cost. There are strategies that can be put in place now to help limit the losses.

# 9 Implementing managed retreat

There are significant challenges in implementing managed retreat even if it is agreed managed retreat is the best or only long-term option. Olufson sets out the stages of managed retreat.

Table 1: Stages of retreat<sup>21</sup>

	Grouping	Components
Community engagement	Community engagement	<ul style="list-style-type: none"> <li>Community engagement/consultation on adaptation options and implementation of managed retreat</li> </ul>
Planning and preparing	Planning	<ul style="list-style-type: none"> <li>Plan/rule changes</li> <li>Planning for a reduction in infrastructure Levels of Service</li> <li>Rebuilding and development restrictions</li> </ul>
	Monitoring	<ul style="list-style-type: none"> <li>Monitoring</li> <li>Establishing trigger points</li> </ul>
Enabling investment	Property acquisition	<ul style="list-style-type: none"> <li>Property acquisition offers and negotiations</li> <li>Development of covenants on property</li> </ul>
	New community investment	<ul style="list-style-type: none"> <li>Acquisition of alternative land for relocation</li> <li>Development of new community facilities</li> </ul>

<sup>21</sup> (Olufson, 2020)



	Public infrastructure Levels of Service reduction	<ul style="list-style-type: none"> <li>Reducing maintenance of public infrastructure</li> </ul>
Active retreat	Public infrastructure and structures relocation	<ul style="list-style-type: none"> <li>Replacement/redevelopment of public infrastructure elsewhere</li> <li>Relocation of critical-facility structures (schools, hospitals etc.)</li> <li>Relocation/replacement of community facilities (community halls, parks etc.)</li> </ul>
	Privately owned infrastructure	<ul style="list-style-type: none"> <li>Private companies begin to reduce/remove/relocate their infrastructure</li> </ul>
	Covenants on property activated	<ul style="list-style-type: none"> <li>Covenants on property activated</li> </ul>
	Private property relocation / abandonment	<ul style="list-style-type: none"> <li>Relocation/abandonment of residential and commercial property</li> <li>Providing temporary housing</li> </ul>
	Removal of marine structures	<ul style="list-style-type: none"> <li>Removal of marine structures</li> </ul>
Clean-up and repurposing	Clean-up	<ul style="list-style-type: none"> <li>Demolition</li> <li>Land rehabilitation and maintenance</li> <li>Repurposing and zoning land-use</li> </ul>

## 9.1 Stage 1 – Community engagement

Council commenced its programme of coastal engagement in 2020. Retreat or relocation has been discussed since early in the project due to the complexity and expense of coastal protection options. Over this time the ideas around how retreat could be implemented have grown but are still developing.

Not everyone in the community wants to relocate and there are differing tolerances for risk within the community. It is unlikely a unanimous decision will ever be reached.

## 9.2 Stage 2 – Planning and preparing

The existing legislative and planning framework is not well set up for managed retreat. This is expected to change as part of the Climate Adaptation Bill expected to be introduced mid-2023.

### 9.2.1 Plan changes and rebuilding restrictions

The Regional Coastal Environment Plan manages land use activities within the Coastal Hazard Zones. The Hurunui District Plan manages land use landward of the Coastal Hazard Zones. Both plans contain objectives, policies and rules to control which activities can take place. Changes will be required to enable managed retreat.

#### Introducing rules to support adaptation

The Regional Coastal Environment Plan became operative in 2005. It includes rules which place significant restrictions on properties within the Coastal Hazard Zone.

Rule 9.3 makes it a prohibited activity to erect a habitable building with a floor area greater than 25 square metres, except as provided for in rules 9.1(a) and 9.1(b). A prohibited activity means that consent cannot be applied for. Rule 9.1 has the effect of protecting existing use rights and includes the ability for small extensions. This rule has been effective in limiting new development at risk of coastal erosion.

The purpose of an adaptation plan is to enable an activity to occur for as long as possible and have a pathway to transition to a new future. For example, there is a current dwelling located within the Coastal Hazard Zone that is going to be more expensive to renovate than to rebuild. The owner would like to rebuild a marginally bigger dwelling on the site due to the amazing views and proximity to the coast. The owner would like to construct this further back on the site and make the dwelling relocatable to protect their equity. Under the existing rules the owner can rebuild on the site but only if the floor area is not increased. The rules do allow the owner to extend the existing dwelling by 25 square metres. These rules have a perverse outcome given we know a dwelling in that location is not viable long term.

An alternative rule would be to make all activities with this Zone require a resource consent as a controlled activity where medium-term retreat was considered necessary. This would provide assurance to the property owner that a dwelling could be constructed but ensure the risk is sufficiently managed. Where retreat might be more imminent it could be a restricted discretionary activity to enable consent to be declined. Both options would allow the full suite of adaptation measures to be considered prior to making a decision.

#### Existing use rights

Section 9 places restrictions on the use of land. There is a significant difference in the legislation between the roles of the regional and district councils. Land can only be used in a manner that contravenes a regional rule if it is expressly allowed by a resource consent. However, land can only be used in a manner that contravenes a district rule if it is expressly allowed by a resource consent or is allowed by Section 10.

Section 10 of the RMA enables land to be used in a manner that contravenes a District Plan if it was lawfully established before the plan was notified and the effects of the use are the same or similar in character, intensity, and scale to those which existed before the rule became operative. Section 10 does not apply if the activity is controlled by the regional council (section 10(4)). This difference is important as regional rules can in effect extinguish existing use rights.

#### 9.2.2 Long Term Planning

The Council is required to develop a Long Term Plan every three years looking ahead for at least ten years. This sets Council's direction including documenting an agreed level of service and associated funding stream. If an adaptation plan determines that retreat is to occur in the short-medium term, Council may need to consider any significant infrastructure spends within this area.

Provision also needs to be made to monitor any agreed trigger points and provide feedback on these.

### 9.3 Stage 3 – Enabling investment

Stage 3 effectively gets everything ready for active retreat.

### 9.3.1 Acquisition of new land (and existing land)

New land needs to be acquired to provide a location to retreat to if a land swap is to occur. In most instances this will involve subdividing the land to get it ready for residential activity. New infrastructure and community facilities need to be planned to support the new development.

### 9.3.2 Reduction of maintenance

Any existing public infrastructure and community facilities may face reduced levels of services in preparation for relocation. This ensures money is not invested into an asset that might only last a couple of years. Money saved can be redistributed to the creation of new public infrastructure and community facilities.

## 9.4 Stage 4 – Active retreat

The Hurunui coastal settlements are significantly smaller than what Olufson anticipated in his table above and therefore less steps are required.

### 9.4.1 Replacement of public infrastructure and community facilities

New roads and water infrastructure will need to be constructed prior to the relocation of a settlement. This could also involve planting the streetscape and reserves to give residents a sense of belonging in their new place. New reserves can be developed in preparation for the new community. This could include the development of playgrounds, public toilets, or any sporting facilities.

### 9.4.2 Private property relocated

The relocation of private property is likely to occur over several years. There will be limitations on the number of new dwellings that can be constructed annually, and individual property owners will need to be in a financial position to fund a new dwelling. Any relocatable buildings from the existing settlement may be able to be moved first.

It is anticipated that some property owners may choose not to move to a new subdivision and owners may choose instead to sell their section.

### 9.4.3 Coastal protection works or marine structures decommissioned

Once the individual properties have retreated, any coastal protection works, or marine structures may need to be decommissioned and removed. This would need to be considered on a case-by-case basis depending on the purpose of the structure or works.

## 9.5 Stage 5 – Clean-up and repurposing

It is likely that the Climate Adaptation Act will provide guidance on what will happen to land that has been retreated from. This is likely to include removing the existing dwellings and infrastructure and undertaking some form of land remediation.

The coastal land is a significant asset for the district and there will be opportunities for this land to be used by activities that are not as sensitive to coastal inundation or erosion. For example, some of the land may be suitable for farming, quarrying, temporary sports grounds or a regional reserve.

As part of the land rehabilitation the land will need to be rezoned if it has not been already.

## 10 Property and infrastructure at risk

Jacobs have prepared an Options Explorer tool to compare the costs, benefits, and effectiveness of various options. The explorer is unique to each individual settlement and allows residents to turn on

and off various options to create their own pathways. It provides immediate feedback on the option or combination of options.

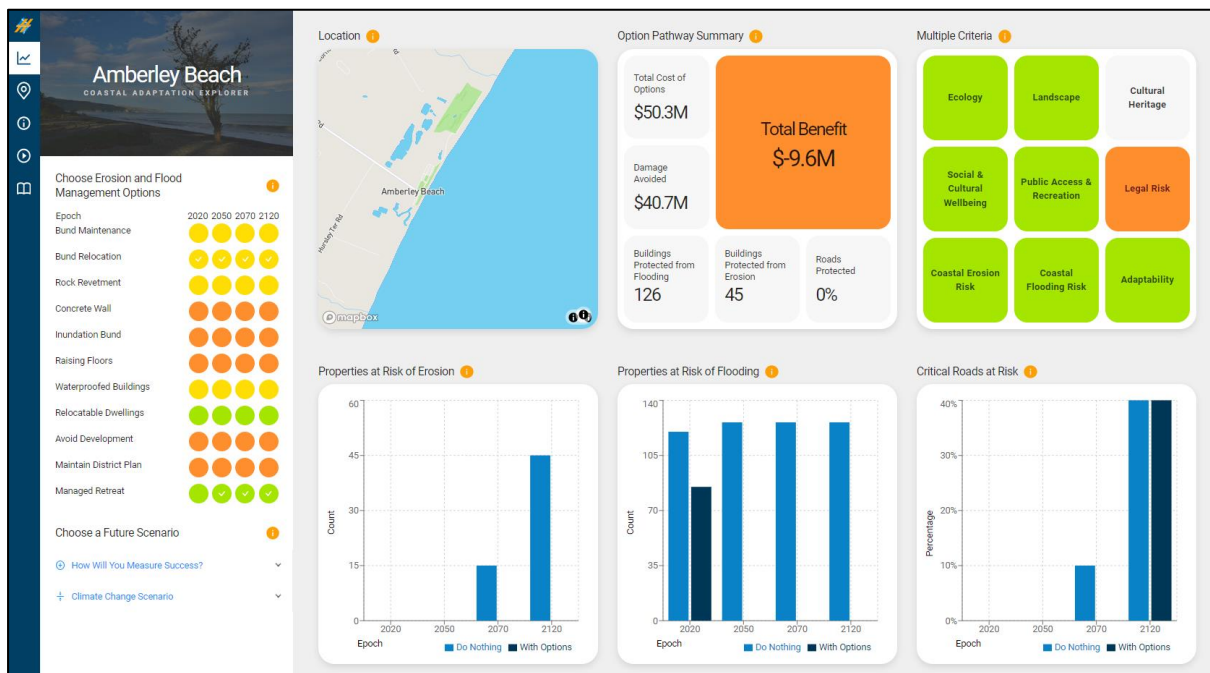


Figure 2: Screenshot of the Options Explorer for Amberley Beach

Managed retreat is an option for all the coastal settlements in the Hurunui District. The below sets out some potential options for how this could be implemented in each of the settlements. In most cases one option is selected for use within the Options Explorer. This allows managed retreat to be considered alongside the engineering and planning options.

The managed retreat option used for each settlement in the Options Explorer represents one option for managed retreat. It does not recommend that this is the way managed retreat should be undertaken in any of the settlements. Instead, it aims to identify a realistic option which reflects the true cost of retreat so that it can be considered sufficiently against the other options.

Managed retreat might not be the best strategy for each settlement. This is explored through the Options Explorer.

## 10.1 Amberley Beach

Amberley Beach currently has 109 dwellings with a total rateable value of \$33.3 million (approximately \$9 million is attributed to the land value). Originally the settlement was primarily coastal baches used sporadically by their owners. Over the last few decades there has been a shift to more people residing at the beach permanently. Its origins as a bach settlement mean that most of the dwellings are small and many have a floor area of less than 100m<sup>2</sup>. There are a few dwellings with significantly greater footprints of over 200m<sup>2</sup> and these dwellings tend to have been constructed, or heavily renovated, more recently.

Properties in Amberley Beach are affordable due to their age and modest size. Many of the permanent residents are retired and on a fixed income limiting their ability to purchase elsewhere.

### 10.1.1 Hazard

Amberley Beach is subject to coastal inundation and coastal erosion. Currently, one kilometre of bund protects the settlement from inundation events and helps to limit the rate of erosion. The settlement

is also exposed to fluvial and pluvial sources of flooding. The map below shows the current day flood risk to Amberley Beach in a 1% AEP event and the 30-, 50- and 100- year projected shoreline position.

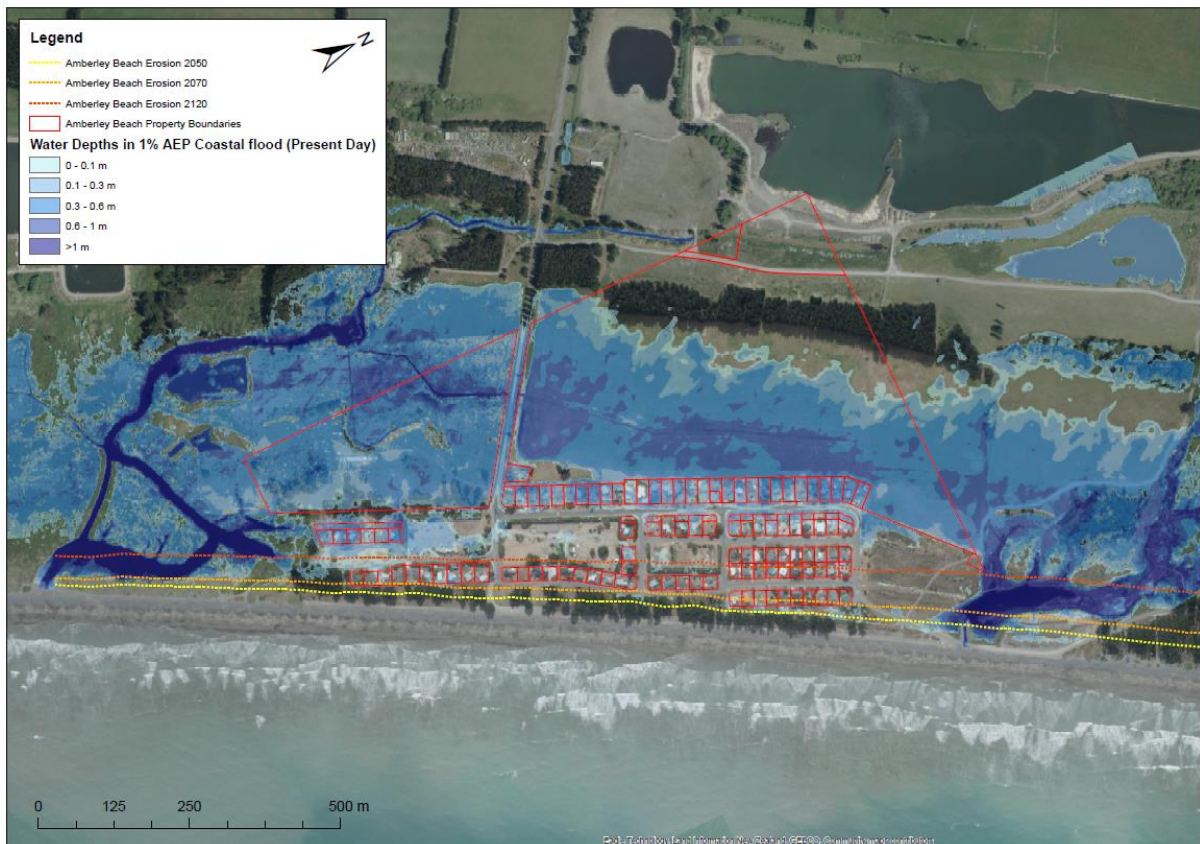


Figure 3: Map showing current flood risk to Amberley Beach in a 1% AEP event and the projected shoreline position in 30, 50 and 100 years

### 10.1.2 Risk profile

All properties within the settlement do not face the same level of risk within the same timeframes. Properties located on Chamberlain Avenue and South Crescent are the most vulnerable to coastal erosion and coastal inundation in the short term. Coastal erosion is a harder hazard to adapt to as once the land is gone it is gone.

The properties to the west of the settlement on Grierson Avenue are most vulnerable to pluvial and fluvial flooding events. These properties experience ponding in current day events. Inundation events can be adapted to by raising floor heights or diverting the water away. However, these strategies have their limitations including gaining access to the property.

The key infrastructure at risk is Golf Links Road which services the Golf Course and the Waipara River Mouth. This road does not provide access to the dwellings within the settlement and therefore is not considered further.

### 10.1.3 Proposal for retreat

#### Option 1 – Land swap

Currently the bund offers protection to the settlement from coastal inundation events. With its current design it is thought to have a lifespan of approximately 20-30 years. Maintenance costs of the bund have increased over the previous 20 years and are likely to continue to do so. The pluvial and

fluvial flood risk is also likely to increase. This option assumes that when the bund stops being maintained the risk starts to increase for everyone and relocation could commence.

The total residential footprint of Amberley Beach is 7.29ha, this excludes any Council-owned land. Existing residential properties range in size between 327m<sup>2</sup> and 1,011m<sup>2</sup> with an average property size of 669m<sup>2</sup>. Properties have an average rateable value of \$307,000. It is assumed that new sections will need to be a minimum of 700m<sup>2</sup> to comply with the Residential 1 rules of the District Plan. It would be possible to put a different zoning on this land should the community want smaller or larger sections. The land would be rezoned to residential at the next District Plan review to minimise overall costs with the subdivision consent completed closer to the time when the land was required. Sections could be allocated at random, or property owners could choose with the more favourable sections costing a little more.

In this option land is purchased now by Council with property owners paying off their share of the costs over the next 30 years. This ensures land is obtained for the cheapest possible rate. Further development of existing properties is then restricted to limited life structures by planning rules. Levels of service would be gradually reduced.

Most dwellings within the settlement are modest and have a floor area of less than 100m<sup>2</sup>. The cost of building new 120m<sup>2</sup> dwellings has been included in the overall costs. This allows for a like for like replacement. Some people may wish to build a smaller or larger dwelling and some existing dwellings may be able to be relocated. This would impact on the cost. The existing dwellings and structures would also need to be demolished and removed.

If a significant insurance event happened prior to planned retreat the timeframes for retreat could be bought forward to allow people to use insurance money to help them relocate.

Some preliminary costs were obtained for a managed retreat of the 109 dwellings at Amberley Beach. This estimates that the cost of retreat is approximately \$50 million if undertaken today. These costs are indicative only and do not address who pays.

	<b>Indicative cost</b>
Purchase of suitable land	\$1,000,000
Subdivision of land through to title based on 109 sections of minimum of 700m <sup>2</sup>	\$7,630,000
109 new 120m <sup>2</sup> dwelling	\$39,240,000
Demolition and disposal of existing dwellings	\$2,180,000

These costs do not include the following:

- The redevelopment of the old settlement land.
- The cost of the plan change process. It assumes this will be completed as part of the spatial planning project or implemented at the new plan review.
- Any money saved through the relocation of existing dwellings.
- Any money generated from the leasing of land.

Possible ways to share the costs:

1. **Purchase of land, rezoning and subdivision.** Council can purchase and hold the land until it is required. Property owners could then pay their share off as a lump sum or through their rates over the next 30 years. This land will need to be rezoned, subdivided and services installed. It is anticipated the cost of this is up to \$80,000 per property. New sections in Amberley are currently on the market for \$250,000. This means property owners could have a \$250,000 asset for the cost of \$80,000. They could then choose whether they wanted to build on the section or on sell it.
2. **Building new dwellings.** This could be responsibility of the property owner. Build costs are currently estimated to be approximately \$3,000 per square metre in North Canterbury. There could be the option to build significantly smaller dwellings to save on costs.
3. **Undertake a larger subdivision.** Instead of seeking to replace only the 109 properties, Council could look to undertake a 200-lot subdivision. The additional sections could be sold at market rate with the profits being used to offset the costs of those retreating to the subdivision. It is estimated that this could bring the cost of a section down to approximately \$10,000.

#### Option 2 – Buy out or value loss

A buyout of properties could be an option if money was to be made available for a retreat at national or regional level. Properties have an average rateable value of \$307,000. The limitation of a buyout is there are few other locations where a new house can be purchased for this amount. For some residents the money received might not even buy them a section of land.

The estimated cost of purchasing the properties at Amberley Beach and demolishing the existing dwellings is \$35,691,000. A buy out could happen as required or it could occur upfront with properties purchased, covenanted and sold back to the original owner at a discounted rate. This would put restrictions on the future uses of the land including when the dwelling needed to be removed.

If no money is available this figure can be considered the value lost to be worn by individual residents.

#### 10.1.4 Option Explorer

Option 1 has been used in the Option Explorer. Given the low value of current development in Amberley Beach and the significantly higher cost of development elsewhere it represents a truer cost of managed retreat than simply buying out the existing properties.

### 10.2 Leithfield Beach

Leithfield Beach currently has 235 dwellings with a total rateable value of \$69.7 million (approximately \$26 million is attributed to the land value). Originally the settlement was primarily coastal baches used sporadically by their owners. Over the last few decades there has been a shift to more people residing at the beach permanently. Its origins as a bach settlement mean lots of the dwellings are modest in size, however a number of the dwellings have also been significantly extended to make them more comfortable as a permanent residence. There are also several newer dwellings within the settlement. Some of these are noticeable as you drive into the settlement given their elevated floor height.

#### 10.2.1 Hazard

Leithfield Beach is subject to flooding primarily from fluvial and pluvial sources in the short term. The settlement currently has a double dune system that protects the settlement from coastal inundation. No properties are seaward of the 100-year projected shoreline. However, as the dunes erode their ability to protect the dwelling from coastal inundation diminishes.

The map below shows the current day flood risk to Leithfield Beach and the 30-, 50- and 100- year projected shoreline position.

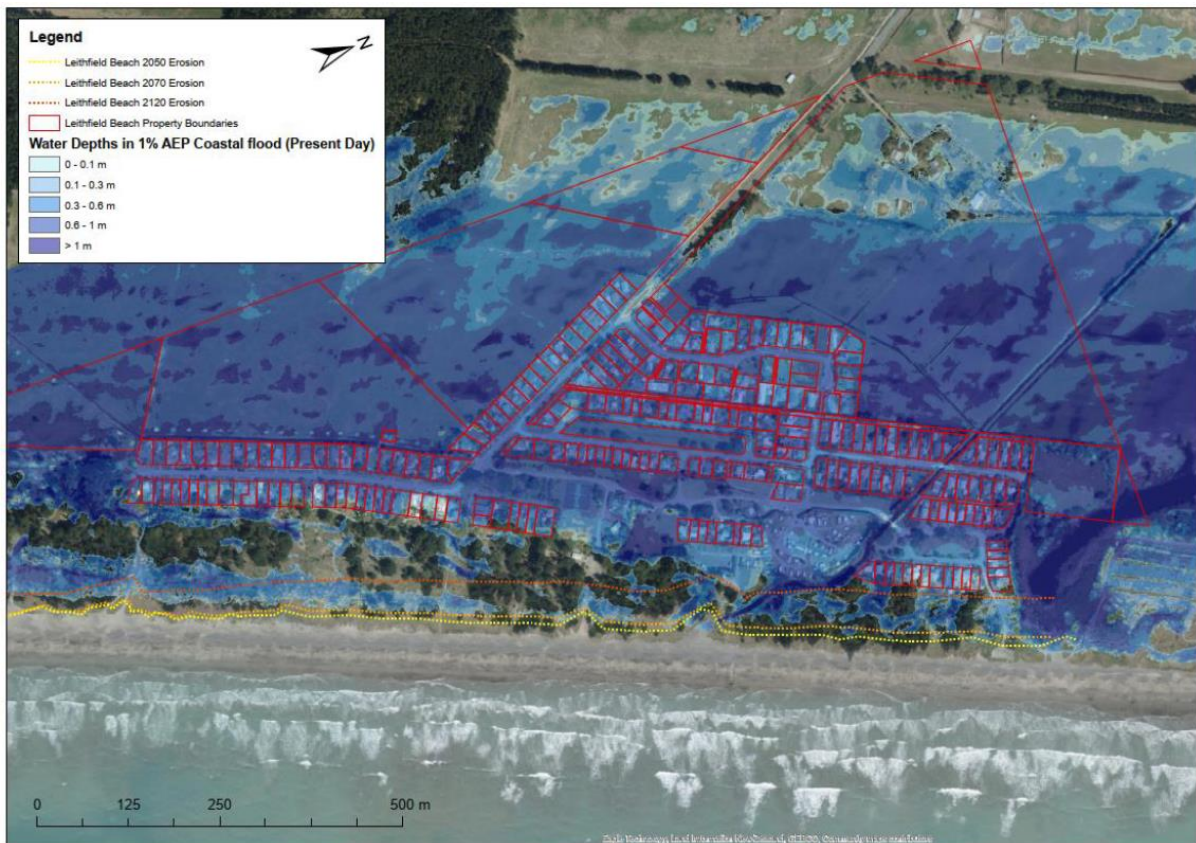


Figure 4: Map showing current flood risk to Leithfield Beach in a 1% AEP event and the projected shoreline position in 30, 50 and 100 years

### 10.2.2 Risk profile

The whole settlement is currently at risk in a 1% AEP coastal flood. The risk to individual properties varies depending on the floor height of the dwelling and the individual topography of the property. The dwellings on the northern side of Elizabeth Square are most vulnerable from the eroding dune system which will increase the flood risk.

### 10.2.3 Options for retreat

Inundation and erosion are substantially different hazards. From a planning perspective, erosion can be considered a high-risk hazard as when land is eroded it is gone. Inundation can be treated as a moderate risk hazard as inundation events occur periodically and are easier to adapt to or tolerate. Once the water subsides the property still exists. The thresholds for retreat are likely to be different for the different hazards.

Leithfield Beach is primarily affected by inundation, given this the urgency to retreat is likely to be lower. However, over time the depth of flood water will increase, and flooding events will become more regular. There is likely to come a point where flood depths cause damage to dwellings or the frequency of nuisance flooding is too regular to tolerate. The map below shows that in 2070 a 1% AEP event would cause over 0.6m of flood water throughout the settlement.



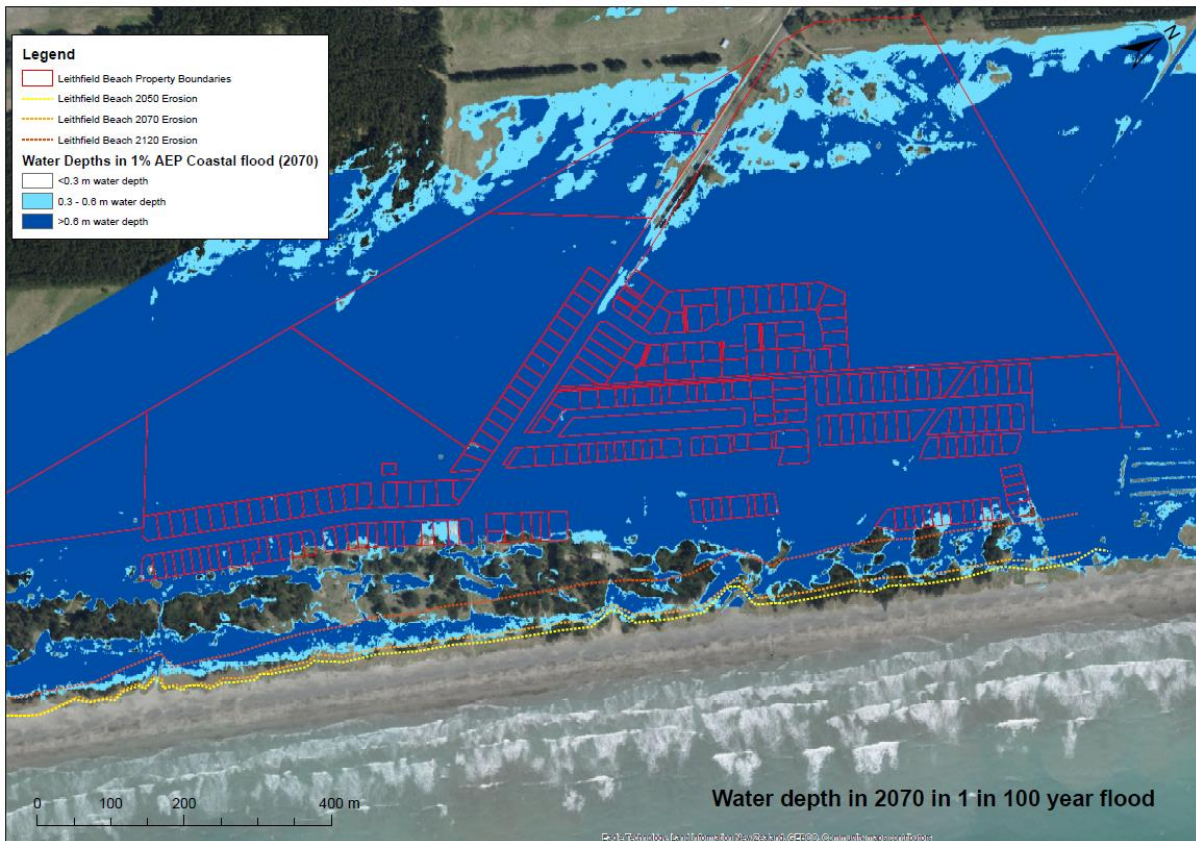


Figure 5: Water depths in 1% AEP coastal flood in 2070

### Option 1 – Land swap

The total residential footprint of Leithfield Beach is 13.6ha, this excludes any Council-owned land. Existing residential properties range in size between 307m<sup>2</sup> and 1,294m<sup>2</sup> with an average property size of 579m<sup>2</sup>. The larger sites within the settlement are all amalgamated sites. Properties have an average rateable value of \$297,000.

It is assumed that new sections will need to be a minimum of 700m<sup>2</sup> to comply with the Residential 1 rules of the District Plan. It would be possible to put a different zoning on this land should the community want smaller or larger sections. The land would be rezoned to residential at the next District Plan review to minimise overall costs with the subdivision consent completed closer to the time when the land was required. Sections could be allocated at random, or property owners could choose with the more favourable sections costing a little more.

In this option land is purchased early by Council with property owners paying off their share of the costs over a 30-year period. It is assumed that purchasing land sooner is going to be cheaper than purchasing the same land in 30 years' time. Once land is purchased further development of existing properties is then restricted to limited life structures by planning rules. Levels of service would be gradually reduced with any money saved redirected to establishing infrastructure at the new location.

The older dwellings within the settlement are modest and many have a floor area of less than 100m<sup>2</sup>. The cost of building new 120m<sup>2</sup> dwellings has been included in the overall costs. This allows for a like for like replacement. Some people may wish to build a smaller or larger dwelling and some existing dwellings may be able to be relocated. This would impact on the cost. The existing dwellings and structures would also need to be demolished and removed.

If a significant insurance event happened prior to planned retreat the timeframes for retreat could be bought forward to allow people to use insurance money to help them relocate.

Some preliminary costs were obtained for a managed retreat of the 235 dwellings at Leithfield Beach. This estimates that the cost of retreat is approximately \$107 million if undertaken today. These costs are indicative only.

	<b>Indicative cost</b>
Purchase of suitable land	\$2,000,000
Subdivision of land through to title based on 235 sections of minimum of 700m <sup>2</sup>	\$16,450,000
235 new 120m <sup>2</sup> dwelling	\$84,600,000
Demolition and disposal of existing dwellings	\$4,700,000

These costs do not include the following:

- The redevelopment of the old settlement land.
- The cost of the plan change process. It assumes this will be completed as part of the spatial planning project or implemented at the new plan review.
- Any money saved through the relocation of existing dwellings.
- Any money generated from the leasing of land.

#### Option 2 – Buy out or value loss

If money was to be made available for a retreat at a national or regional level, a buyout of properties could be an option. Properties have an average rateable value of \$297,000. The limitation of a buyout is there are few other locations where a new house can be purchased for this amount. For some residents the money received might not even buy them a section of land.

The estimated cost of purchasing the properties at Leithfield Beach and demolishing the existing dwellings is \$74,443,000. A buy out could happen as required or it could occur upfront with properties purchased, covenanted and sold back to the original owner at a discounted rate. This would put restrictions on the future uses of the land including when the dwelling needed to be removed.

If no money is available this figure can be considered the value lost to be worn by individual residents.

#### 10.2.4 Option Explorer

Option 2 has been used in the Option Explorer. The primary risk at Leithfield Beach is inundation. Some properties will experience the effects of this before others and accordingly some properties may wish to retreat earlier or later than others.

### 10.3 Gore Bay

Gore Bay currently has 93 properties with a total rateable value of \$42.7 million (approximately \$22 million is attributed to the land value). The settlement is a popular holiday destination and known for its surfing. Almost all the dwellings are second homes with most of the owners living in Greater Christchurch. The dwellings range in age and there is a mixture of single and two-storey dwellings with the later maximising their opportunity for a sea view.

The total residential footprint of Gore Bay is 12.47 ha which excludes any Council owned land. The sections range in size between 400m<sup>2</sup> and 12,208m<sup>2</sup>, with the larger sections including a section of the steep cliff behind Moody Street. Most sections are around 800m<sup>2</sup>.

### 10.3.1 Hazard

Gore Bay is affected by coastal erosion along the length of the settlement. Coastal inundation affects those properties at the northern end of Gore Bay with water coming in through the combined mouth of the Jed River and Buxton Creek. Gore Bay fluctuates between periods of erosion and accretion. In more recent times the coast has been accreting steadily and is relatively stable.

The map below shows the current day flood risk to Gore Bay and the 30-, 50- and 100- year projected shoreline position.

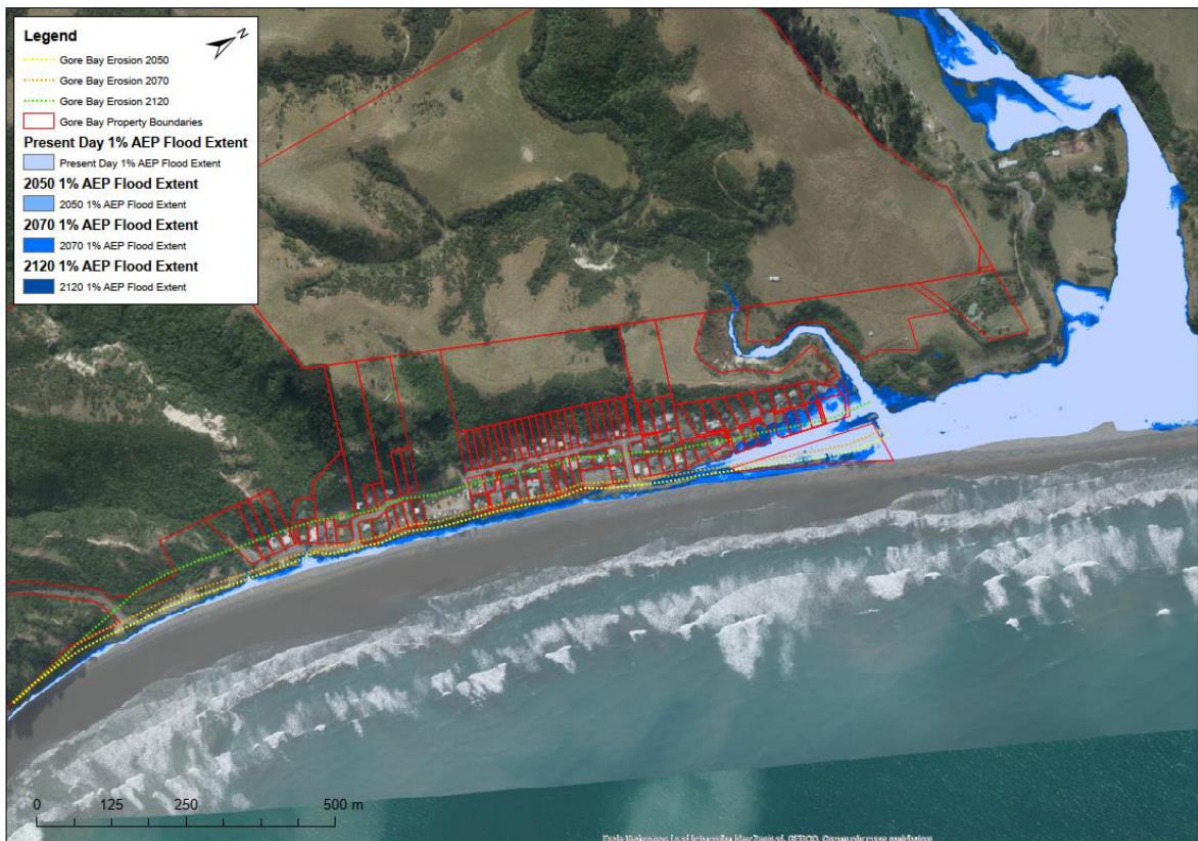


Figure 6: Projected shoreline position and flood extent in a 1% AEP event for present day, 30-year, 50-year and 100-year

### 10.3.2 Risk profile

All properties within the settlement do not face the same level of risk within the same timeframes. Of key concern is the access roads to the north and the south of the settlement. Both roads are currently seaward of the 50-year projected shoreline position. If these roads are lost there will be no way to access the settlement by vehicle. Properties at the northern end of the settlement are most vulnerable to flooding events.

### 10.3.3 Proposal for retreat

There are two separate issues that might trigger retreat within the settlement. The first is the erosion of the shoreline immediately adjacent to private property seaward of Moody Street. This could mean the occupation of some individual properties is no longer viable. The second issue is access into the settlement. If the roads are not protected or relocated the whole settlement may require relocation.

Given most properties are second dwellings only a buyout option has been priced. This recognises that most property owners have somewhere else to live and if they wish to retain a holiday home, they can look to purchase one elsewhere at a location of their choosing.

#### Option 1 – Relocation of whole settlement

When the vehicle access is no longer available into the settlement the whole settlement may need to retreat. A buyout of properties could be an option if money was to be made available for a retreat at national or regional level. Properties have an average rateable value of \$460,000. The estimated cost of purchasing the properties at Gore Bay and demolishing the existing dwellings is \$44.5 million. A buy out could happen as required or it could occur upfront with properties purchased, covenanted and sold back to the original owner at a discounted rate. This would put restrictions on the future uses of the land including when the dwelling needed to be removed.

If no money is available this figure can be considered the value lost to be worn by individual residents.

	<b>Indicative cost</b>
Total rateable value of properties at Gore Bay	\$42,715,000
Demolition and disposal of existing dwellings	\$1,860,000

These costs do not include the following:

- The redevelopment of the old settlement land.
- The cost of the plan change process. It assumes this will be completed as part of the spatial planning project or implemented at the new plan review.
- Any money saved through the relocation of existing dwellings.
- Any money generated from the leasing of land.

#### Option 2 – Relocation of at-risk properties

Twenty-three properties are at risk of erosion by 2070, and a total of 60 properties are at risk of erosion by 2120. It would be possible for these properties to relocate independently as required. A buy out of these properties would be significantly cheaper than a settlement-wide buyout and may create more space for coastal processes or coastal protection works.

#### 10.3.4 Option Explorer

Both options have been included in the Options Explorer. This recognises that if the road is protected the majority of the settlement would not need to retreat.

### 10.4 Motunau Beach

Motunau Beach currently has 138 dwellings with a total rateable value of \$49.7 million (approximately \$25 million is attributed to the land value). The settlement is a popular holiday destination and known for its fishing. Almost all the dwellings are second homes with most of the owners living in Greater Christchurch. The dwellings range in age with some of the original old fishing cottages remaining and some new larger dwellings.

The total residential footprint of Motunau Beach is 11.4 ha which excludes any Council owned land. The sections range in size between 402m<sup>2</sup> and 2,583m<sup>2</sup>, with the larger sections including a section of the Motunau cliff. Most sections are around 800m<sup>2</sup>.

### 10.4.1 Hazard

Motunau Beach is subject to cliff collapse. The rate of erosion is not uniform across the length of the cliff with the high cliff adjacent to Pegasus Crescent eroding most rapidly. The cliff loses material annually but is also affected by large coastal storms. During a particularly stormy year it is considered that the cliff could erode up to 6 metres over a single year.

The properties located along The Parade are subject to inundation events. The extent of this hazard is not fully understood as the modelling only considers the threat of coastal inundation. These properties are also subject to flooding from the Motunau River. A multi-flood hazard assessment could be undertaken to determine if the combined flood hazard is greater than the single source flood hazard.

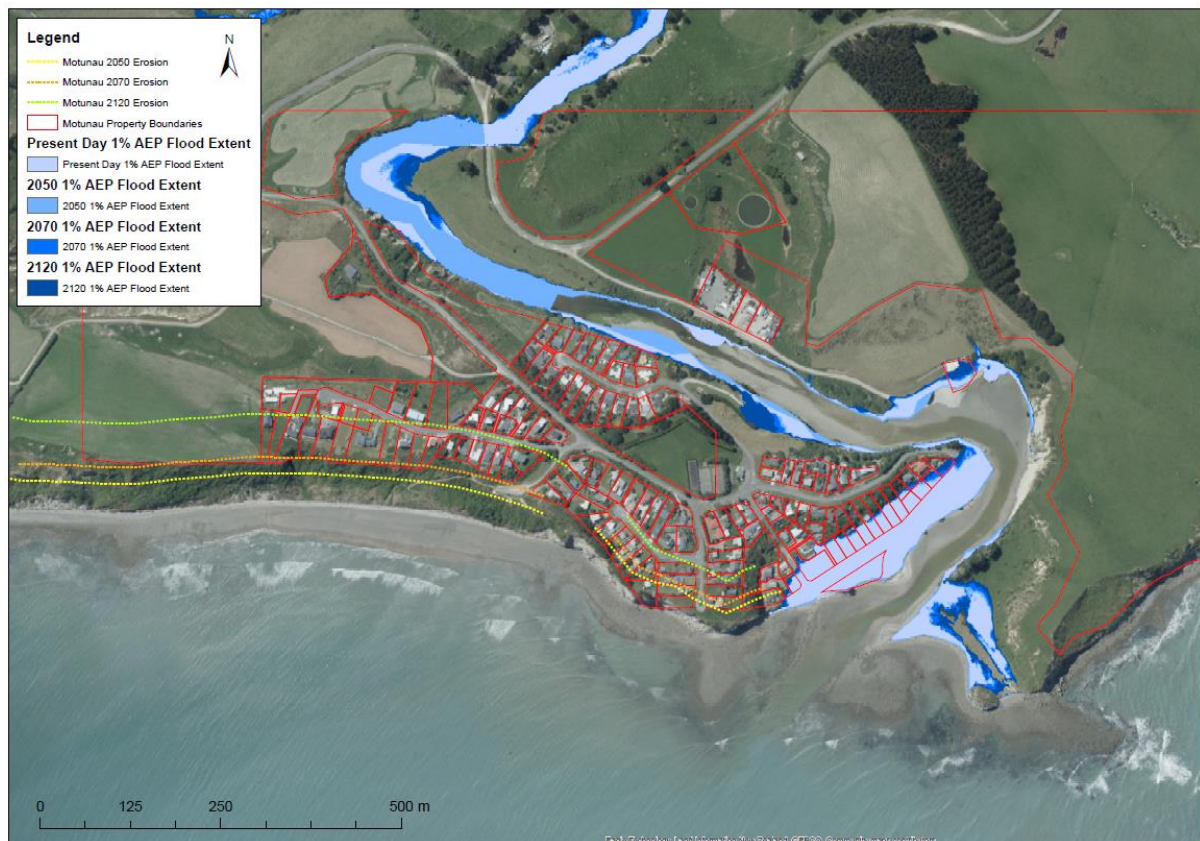


Figure 7: Projected shoreline position and flood extent in a 1% AEP event for present day, 30-year, 50-year and 100-year

### 10.4.2 Risk profile

The risk to properties differs across the settlement with only about half of the settlement exposed to coastal erosion or coastal inundation. Approximately 11 properties are subject to cliff collapse in the next 50 years with a further 29 vulnerable within 100 years. All of the properties on The Parade are subject to an increasing flood hazard.

Engineering works may help slow the erosion of the cliff; however, the cliff will continue to erode until it finds a stable slope. Even if engineering works are undertaken approximately 11 properties will still be required to retreat. It is harder to determine the effect of the protection works on the other properties vulnerable to cliff collapse.

### 10.4.3 Proposal for retreat

Option 1 – Land swap

Motunau Beach is known for its fishing opportunities. Because of this there might be interest in relocating to a new piece of land near to the existing settlement. It is anticipated that 11 properties will be required to relocate within 50 years. Other properties may be required to retreat in the 50–100-year timeframe however due to the uncertainties regarding the rate of erosion into the future these have not been included at this time.

It is hard to quantify the size of these sections as they are losing land each year due to erosion. However, we can assume that any new sections need to be at least 700m<sup>2</sup> to comply with the Residential 1 rules of the District Plan. It would be possible to put a different zoning on this land should the community want smaller or larger sections. The land would be rezoned to residential at the next District Plan review to minimise overall costs with the subdivision consent completed closer to the time when the land was required.

In this option land is purchased early by Council with property owners paying off their share of the costs over a 30-year period. It is assumed that purchasing land sooner is going to be cheaper than purchasing the same land in 30 years' time. Once land is purchased further development of existing properties is then restricted to limited life structures by planning rules. Levels of service would be gradually reduced with any money saved redirected to establishing infrastructure at the new location.

Some preliminary costs were obtained for a managed retreat of the 11 most vulnerable properties at Motunau Beach. This estimates that the cost of retreat is approximately \$5.6 million if undertaken today. These costs are indicative only.

	<b>Indicative cost</b>
Purchase of suitable land	\$500,000
Subdivision of land through to title based on 12 sections of minimum of 700m <sup>2</sup>	\$880,000
11 new 120m <sup>2</sup> dwelling	\$3,960,000
Demolition and disposal of existing dwellings	\$220,000

These costs do not include the following:

- The redevelopment of the old settlement land.
- The cost of the plan change process. It assumes this will be completed as part of the spatial planning project or implemented at the new plan review.
- Any money saved through the relocation of existing dwellings.
- Any money generated from the leasing of land.

Possible ways to share the costs:

- **Purchase of land, rezoning and subdivision.** Council can purchase and hold the land until it is required. Property owners could then pay their share off as a lump sum or through their rates over the next 30 years. This land will need to be rezoned, subdivided and services installed. It is anticipated the cost of this is up to \$126,000 per property. If Council undertook this process any savings could be passed onto the property owners.
- **Building new dwellings.** This could be the responsibility of the property owner. Build costs are currently estimated to be approximately \$3,000 per square metre in North Canterbury. There could be the option to build significantly smaller dwellings to save on costs. It is also noted that

most of the dwellings at risk are older dwellings and have seen limited investment due to the increasing risk to the property.

- **Undertake a larger subdivision.** Instead of seeking to replace only the 11 properties, Council could look to undertake a bigger subdivision to help distribute costs. These sections could be offered via land swap to those vulnerable over the 100-year time period or they could be sold on the open market.

#### Option 2 – Buy out or value loss

If money was to be made available for a retreat at national or regional level a buyout of properties could be an option. Properties have an average rateable value of \$379,000. As they are primarily second dwellings the money could be used to relocate to a location of their choice.

The estimated cost of purchasing the 11 vulnerable properties at Motunau Beach and demolishing the existing dwellings is \$4.4 million. A buy out could happen as required or it could occur upfront with properties purchased, covenanted and sold back to the original owner at a discounted rate. This would put restrictions on the future uses of the land including when the dwelling needed to be removed.

If no money is available this figure can be considered the value lost to be worn by individual residents.

#### 10.4.4 Option Explorer

Option 1 has been used in the Option Explorer. Motunau Beach is well known for its fishing and the majority of the property owners purchased in this settlement for this reason. There are currently no properties for sale within Motunau Beach suggesting that there is demand for land in this area. The creation of new sections would enable those relocating to stay in the area or sell their new section to help offset the costs of retreat.

## 11 What needs to happen

This report sets out some of the options and limitations of managed retreat. This information can be used to discuss managed retreat with the coastal communities to determine if retreat should form part of their adaptive pathways. If managed retreat is a preferred pathway, further discussions with the individual community will be required to determine how retreat should be undertaken.

## 12 Bibliography

- Awatarariki Residents Incorporated v Bay of Plenty Regional Council & Whakatane District Council, ENV-2020-AKL-000064 (Environment Court December 15, 2020).
- Bell, R., Lawrence, J., Allan, S., Blackett, P., & Stephen, S. (2017). *Coastal Hazards and Climate Change Guidance for Local Government*. Wellington: Ministry for the Environment.
- Christchurch City Council. (2021). *Catalogue of Coastal Hazard Adaptation Options*. Christchurch: Christchurch City Council.
- Department of Internal Affairs. (2022). *Three Waters Reform Programme*. Retrieved from Te Tari Taiwhenua: <https://www.dia.govt.nz/Three-Waters-Reform-Programme>
- Department of Internal Affairs. (2022). *The Future of Local Government*. Retrieved from Te Tari Taiwhenua: <https://www.dia.govt.nz/Future-for-Local-Government-Review-Terms-of-Reference>
- Hurunui District Council. (2022). *Planning Options for Coastal Communities*. Amberley: Hurunui District Council.
- Lawrence, J., Allan, S., & Clarke, L. (2021). *Using current legislative settings for managing the transition to a dynamic adaptive planning regime in New Zealand*. Wellington: Resilience to Nature's Challenges National Science Challenge - Enabling Coastal Adaptation Programme.
- Lawrence, J., Boston, J., Bell, R., Olufson, S., Kool, R., Hardcastle, M., & Stroombergen, A. (2020). *Implementing Pre-Emptive Managed Retreat: Constraints and Novel Insights*. Current. Retrieved from Retrieved from: <https://doi.org/10.1007/s40641-020-00161-z>
- Local Government New Zealand. (2018). *Provision of services infrastructure in areas affected by climate change*. Wellington: LGNZ.
- Ministry for the Environment. (2022). *Resource Management System Reform*. Retrieved from Ministry for the Environment: <https://environment.govt.nz/what-government-is-doing/areas-of-work/rma/resource-management-system-reform/>
- Olufson, S. (2020). *Managed Retreat Components and Costings in a Coastal Setting*. Wellington: Victoria University of Wellington. Retrieved from <http://hdl.handle.net/10063/8359>
- Pennsylvania State University. (n.d.). *Coastal Processes, Hazards, and Society*. Retrieved from Pennsylvania State University: <https://www.e.-education.psu.edu/earth107/node/701>
- Project Twin Streams. (2022). *Facts and Figures*. Retrieved from Project Twin Streams: [www.projecttwinstreams.com](http://www.projecttwinstreams.com)
- Real Estate. (2022). *Amberley, Hurunui Homes and Real Estate for Sale*. Retrieved September 9, 2022, from [realestate.co.nz: https://www.realestate.co.nz/residential/sale/canterbury/hurunui/amberley](https://www.realestate.co.nz/residential/sale/canterbury/hurunui/amberley)
- Simpson Grierson. (2018, February 13). *Ability to stop or limit the provision of services infrastructure and potential liability consequences*. Retrieved from Local Government New Zealand: <https://www.lgnz.co.nz/climate-change-project/supporting-documents/>
- Tasman District Council, Decision No. [2011] NZEnvC47 (Environment Court February 28, 2011).



Tonkin & Taylor Ltd. (2022). *Hawke's Bay Coastal Strategy: Implementation approaches and indicative costs for planned retreat*.

Turbott, C. (2006). *Managed Retreat from Coastal Hazards: Options for Implementation*. Hamilton: Environment Waikato.