



LEITHFIELD BEACH COASTAL ADAPTATION PLAN

Draft for Engagement October 2023

EXECUTIVE SUMMARY

The community have worked towards building adaptation pathways to respond to the changing coastal hazard risk to Leithfield Beach. Options considered included no or low intervention approaches through to hard engineering and proactive relocation.

Short term options

There are several things that can be done now to help reduce the risk and help reduce the urgency to adapt in future.



Dune Planting and Maintenance

The dunes provide vital coastal inundation protection to Leithfield Beach. As the dunes erode so to does the protection they offer. By protecting and enhancing the dunes you are protecting your key flood defence.



Stormwater Management

Leithfield Beach is very low-lying, and it is difficult to remove ponding stormwater from the settlement completely however, we can continue to explore ways to divert water away from dwellings.



New dwellings raised

Raising new dwellings does not reduce the risk for current dwellings but it helps limit the amount of development in harm's way.

Medium term options

If we identify future actions, we can start working towards implementing them before they are required.



Site specific inundation protection

Some properties at Leithfield Beach are at greater risk of floodwater than others. There are measures that can be taken by individual property owners to reduce this risk.



Inundation bund

An inundation bund and pump system could be constructed around the back of the settlement to prevent overland flooding and remove water ponding within the bund walls.

Long term options

Leithfield Beach is very low-lying with a high groundwater table. As sea level rises it is going to be increasingly difficult to keep water out of the settlement. proactive relocation may be the only long-term option.

Adaptation thresholds for Leithfield Beach

Adaptation thresholds describe a situation whereby community values are no longer being protected. We have identified a range of trigger points which determine when we will move from short term options to medium term options.

Three flooding events with depths of more than 0.2 m in any 12-month period

Most dwellings at Leithfield Beach have a finished floor height of at least 0.3 m. A trigger point is reached when there are three events in any one 12-month period with a depth of flooding greater than 0.2 m. This could trigger at risk properties to take site specific action or if the cause of flooding is fluvial flooding it may trigger the construction of an inundation bund and pump system.

A major event requires over 30 dwellings to rebuild

Should a significant hazard event require over 30 dwellings to rebuild a trigger point is reached. This may be the result of any hazard. At this point careful consideration needs to be given to the cause of the disaster, and where and how the dwellings are rebuilt. There is never going to be a cheaper time to adapt than after an event with the assistance of insurance money.

First dwelling loses flood insurance

Insurance is important to property owners for financial security, but in many cases, it is also a condition of the mortgage on the property. A trigger is reached when the first dwelling loses insurance due to flood risk. Depending on the circumstance of the insurance withdrawal this could trigger a few select properties to undertake site specific works to provide greater protection to their properties or it could trigger settlement-wide action to ensure more dwellings do not lose insurance.

Significant capital works are required

It is not anticipated that any infrastructure at Leithfield Beach will require significant capital works in the next 30 years. If significant capital works are required a trigger point is reached. At this point the community and Council will need to decide if investing in the works is a good investment for the community.



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1 INTRODUCTION

We live on a long narrow island with an abundant coastline. Coastal hazards are part of our reality. The Leithfield Beach community have developed this Coastal Adaptation Plan (the Plan) to take control of their future. It sets out how they will adapt to the changing risk over the next 100 years.

1.1 Purpose

This Coastal Adaptation Plan seeks to develop a planned response to coastal hazard risk at Leithfield Beach out to the year 2120. In doing so it responds to the following hazards:

- Coastal erosion
- Coastal inundation
- Rising groundwater
- Fluvial flooding
- Pluvial flooding

The community have agreed on an approach for managing this risk. This document outlines the information that informed this discussion, including why particular decisions were reached and how the Plan is to be implemented.

1.2 Background

In 2020 Hurunui District Council (Council) started a project assessing the current coastal hazards that affect the Leithfield Beach community and how these hazards might change over a 30-, 50- and 100- year period.

The project was based off the Ministry for the Environment's Coastal Hazards and Climate Change Guidance 2017 (the MfE Guidance) [1] but was scaled down to an appropriate size for Leithfield Beach. The project had four phases:


- What is happening?
- What matters most?
- What can we do about it?
- How can we implement the strategy?

This project is now complete, and the focus moves to implementing the plan.

1.3 Developing an adaptive plan

The MfE Guidance recommends the use of dynamic adaptive pathway planning. An adaptive plan allows us to prepare for the future despite the future being uncertain. It works by preparing multiple pathways that are designed to be dynamic or flexible. This allows the decisions to be revisited as new and improved information becomes available.

The Plan is trigger-based, not time-based. These triggers are agreed points where we will revisit our approach or change course. A trigger-based approach means that we don't act until we need to, but we are well prepared to act when we do.



The Plan sets agreed signals and triggers so we can monitor the change that is occurring and can respond appropriately.

A preferred course of action can be identified now to help guide future investment decisions, but the aim is to leave as many options open as possible. Care needs to be taken when implementing options now that might prevent an alternative option being adopted in future.

1.4 Changing information

The maps and information in this plan are derived from the information available in 2020. Since then, there has been regular updates to the scientific information and national guidance. This information has been reviewed throughout the project and does not significantly change the projected hazards.

Doing nothing until we have certainty is not a viable option. By the time we have certainty it will be too late to adapt. An adaptive plan is designed to be agile and accommodate new information as it arises. The information and guidance will continue to be updated. This will be periodically reviewed, and the Plan will be amended as required.

[1] (Ministry for the Environment, 2017)

2 WHAT IS HAPPENING?

Properties at Leithfield Beach are low-lying. Most properties are located between 2 m and 3 m New Zealand Vertical Datum (NZVD) 2016. Leithfield Beach is currently at risk of coastal erosion and multiple sources of flooding. These hazards and the risk they pose are summarised below. If you want more detail on any of the hazards, the methodology, or the risk the following reports are available:

- Hurunui District Coastline Hazard and Risk Assessment[2]
- Hurunui District Multi Hazards: Coastal Inundation Modelling[3]

2.1 Uncertainty

We need to plan for an uncertain future. The rate of sea level rise is uncertain. The MfE (2017) Guidance identified four sea level rise scenarios, shown in Figure 1. These are:

- RCP2.6 – low/reduced emission

- RCP4.5 – moderate then declining emissions
- RCP8.5 – continuing status quo high emissions
- RCP8.5+ – continuing status quo high emissions and possible instabilities in the polar ice sheets

Each RCP pathway predicts a different climate future depending on the volume of Green House Gases emitted in years to come. The Hazard and Risk Assessment considered how the hazards might change over a 30-, 50- and 100- year period under the RCP 8.5 and RCP 8.5+ emission scenarios.

As time increases the uncertainty in sea level rise increases. We can be fairly certain about the rate of sea level rise over the next 30 and 50 years; there is only a small difference between the highest and lowest sea level rise scenarios. There is much greater uncertainty when looking out 100 years or further.

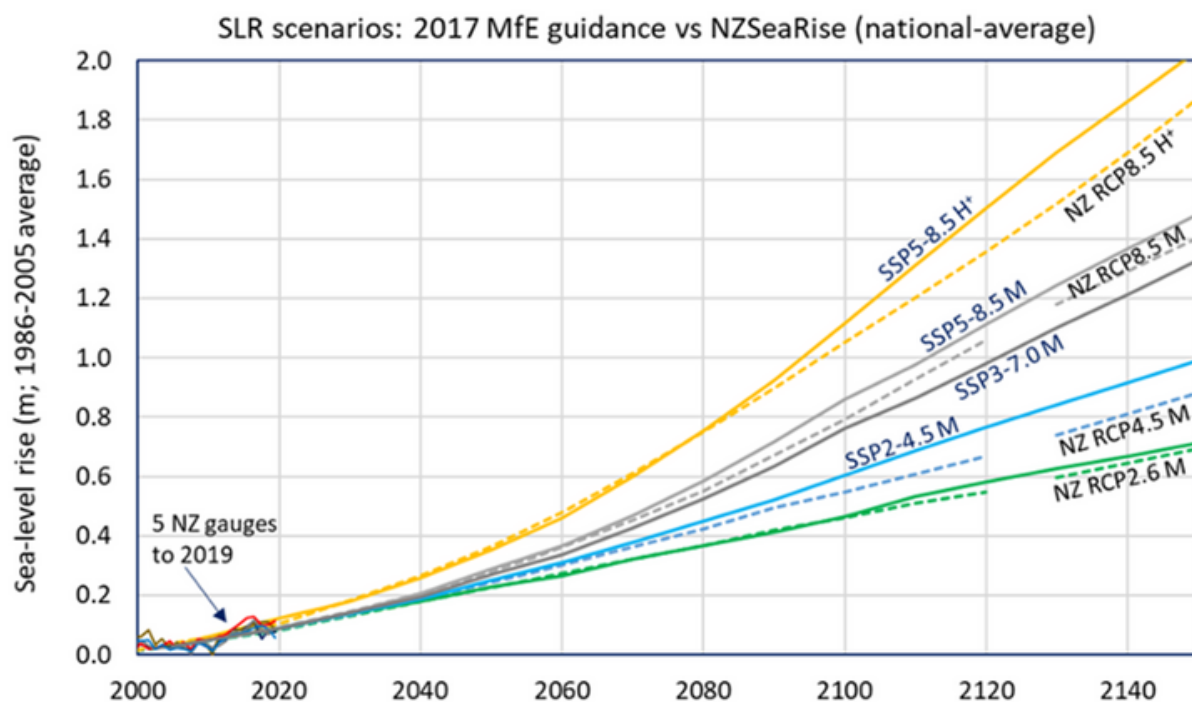


Figure 1: Sea Level Rise scenarios (Ministry for the Environment, 2022)

[2] (Jacobs, 2020)

[3] (Jacobs, 2022)

2.2 Coastal erosion

The coastal erosion assessment considered where the shoreline might be in 2050, 2070 and 2120. The assessment considered the historical shoreline trend, the effects of accelerated sea level rise, and the short-term erosion rate.

The shoreline is not projected to intercept any private properties until 2120. However, the dunes currently provide inundation protection to the settlement. As the dunes erode the ability of the dunes to protect the settlement from inundation events decreases and therefore properties will be more susceptible to flooding.

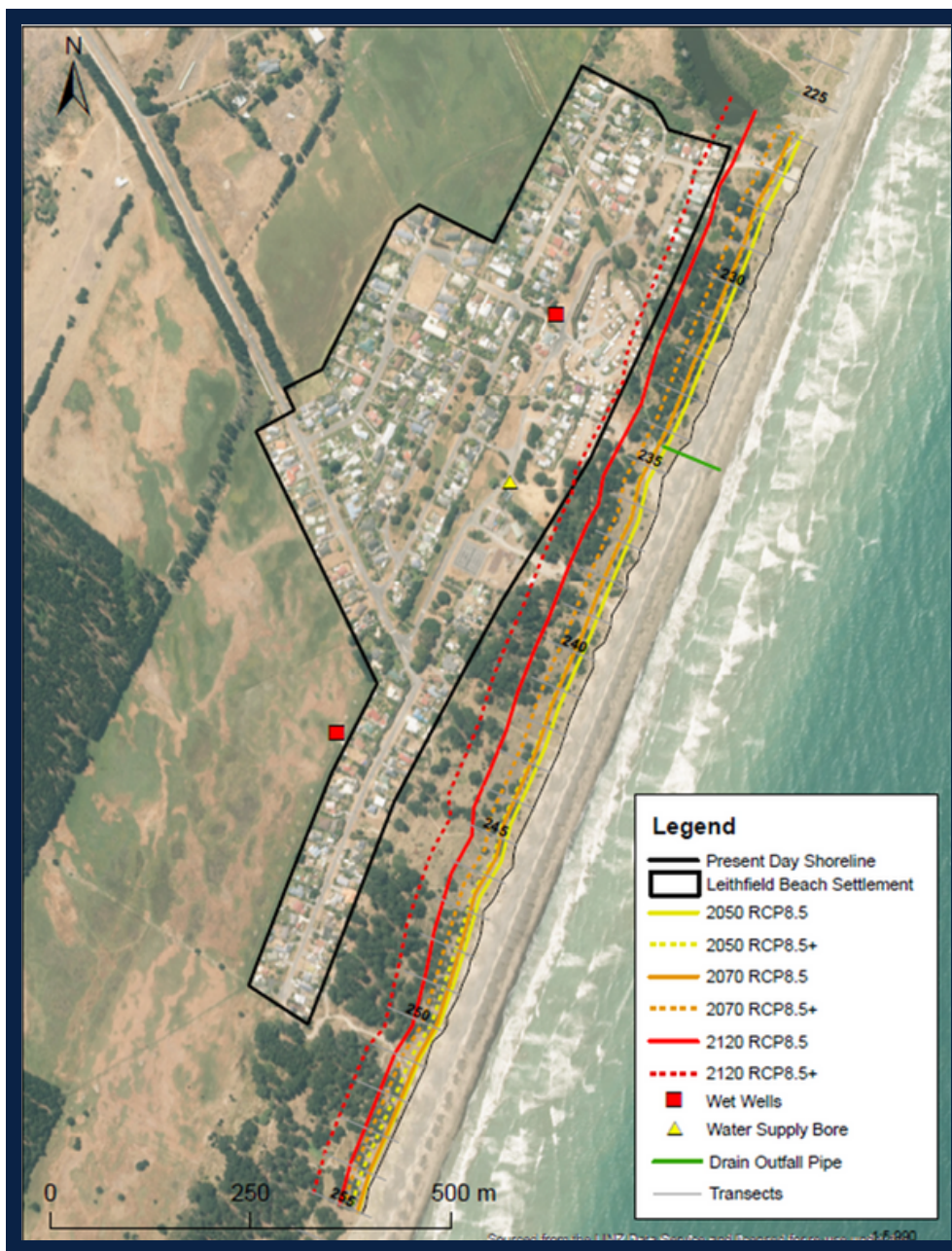


Figure 2: Projected Shoreline Positions in 2050, 2070 and 2120



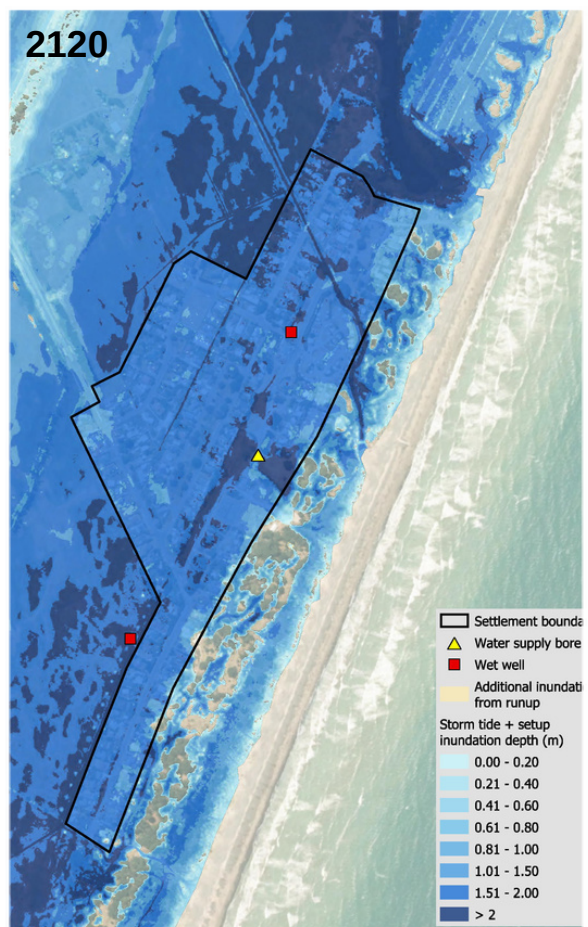
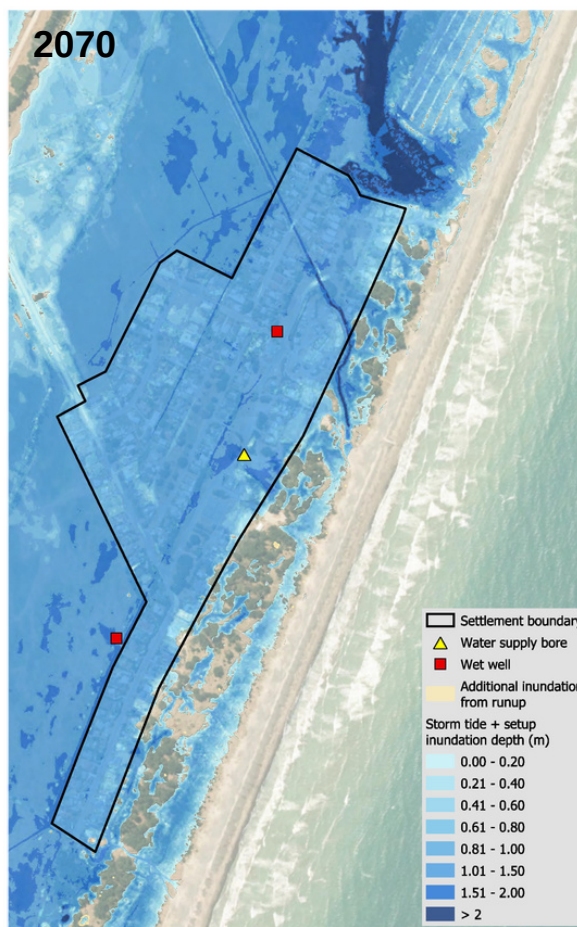
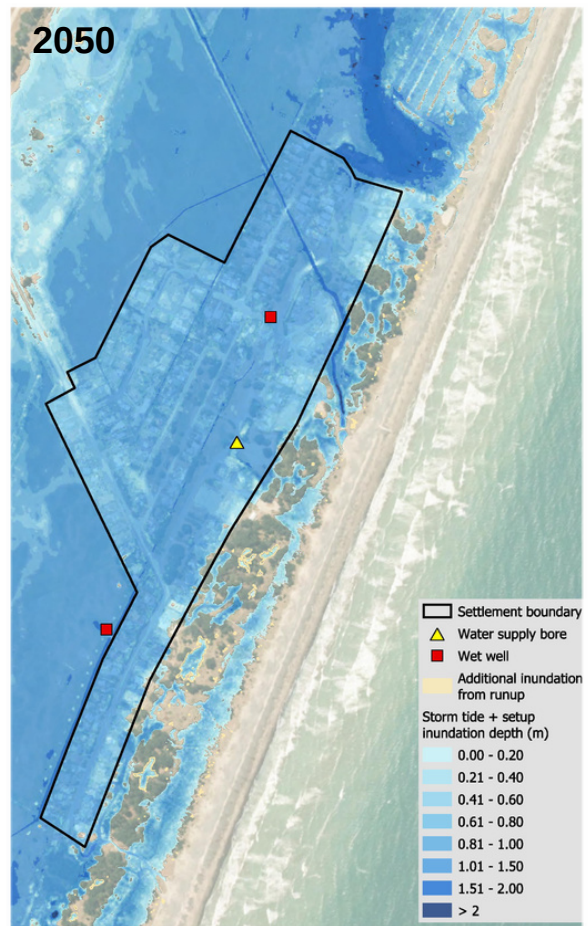
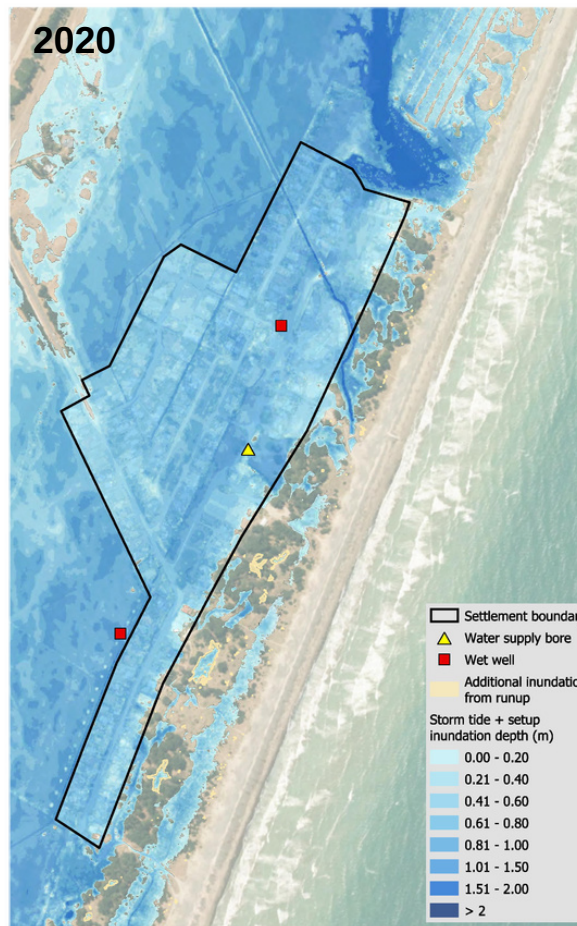
2.3 Coastal inundation (or coastal flooding)

Leithfield Beach is currently at risk from coastal inundation in large events. The coastal inundation assessment considered a 1% AEP (annual exceedance probability) coastal flood. A 1% AEP event means there is a 1% chance of that event happening in any year (also referred to as a 1 in 100-year event). The water can overtop the dunes in large events, although the majority of the water overtops the lowered beach ridge at the coastal lagoon to the north of the settlement from the north.

The first map shows the current hazard footprint. This is where we would expect to find water if we had a significant event today.

Approximately 99% of the settlement would be inundated with potential inundation depths of around 0.5 m. By 2050 after 0.28 m of sea level rise the anticipated water depths increase to around 0.8 m.

By 2070 almost the entire settlement will be inundated. Most of the settlement will experience between 1.2 m and 1.4 m of flooding. By 2120 flooding depths could increase to 1.8 m to 2 m.



Figures 3a, b, c and d: Coastal Inundation in 1 in 100-year event under RCP 8.5 in 2020 and 2050, 2070 and 2120

2.4 Rising groundwater

Shallow groundwater has the potential to affect house foundations and infrastructure. A high groundwater table also limits the ability for the water to drain away following a large rainfall or flood event. In the present day approximately half of the settlement has groundwater levels shallower than 1 m below ground level (BGL).

By 2070 the majority of the settlement is predicted to have average groundwater levels shallower than 1 m BGL. By 2120 about 40% of properties are expected to have groundwater levels shallower than 0.5 m BGL.

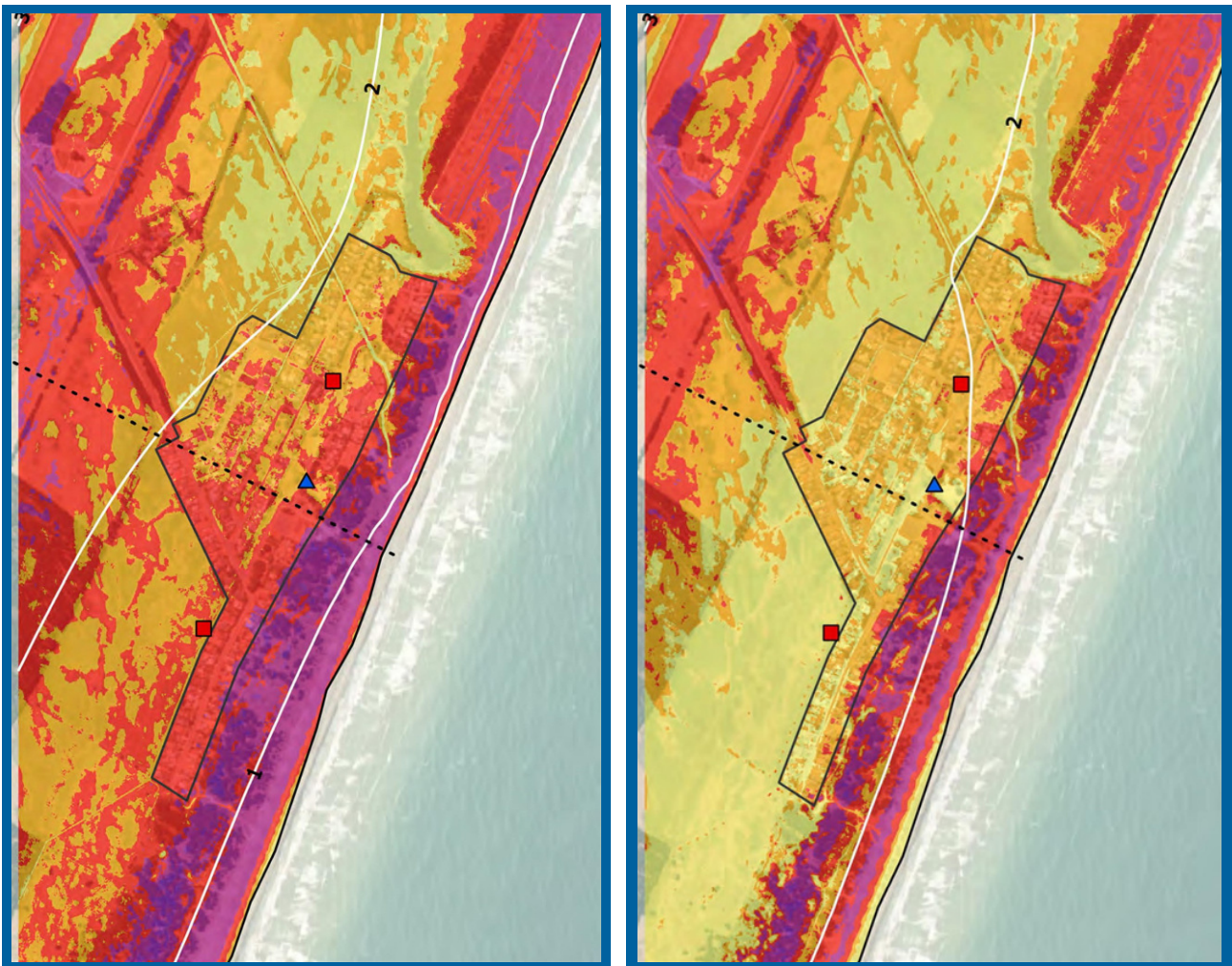
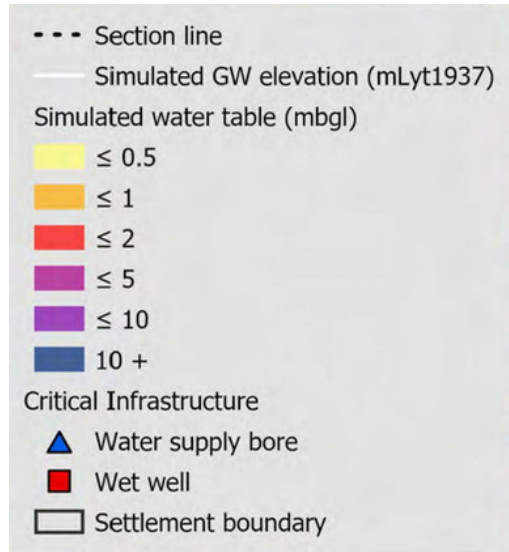


Figure 4a and b: Indicative Average Groundwater Depths under RCP8.5+ in 2020 and 2120

2.5 Fluvial (river) and pluvial (rainwater) flooding

Leithfield Beach is subject to flooding from the Kowai River, and runoff from the local catchment via the adjoining paddocks. In large rainfall events water can also pond with limited drainage ability.

A multi-hazards assessment[4] was completed to investigate the impact of large rainfall events when they coincide with coastal storms. It was considered unlikely that an extreme coastal storm would coincide with an extreme rainfall event. The report therefore looked at one smaller event coinciding with one larger event.

The assessment found that in the present day the flooding is worse from large river flooding events. This will change with sea level rise and large coastal events will have more of an impact. Smaller more frequent foods will continue to be more fluvially dominated even with sea level rise.

Ten scenarios are assessed in the report. The map below shows a 1 in 50-year coastal event combined with a 1 in 5-year rain event, with 0.5 m of sea level rise.

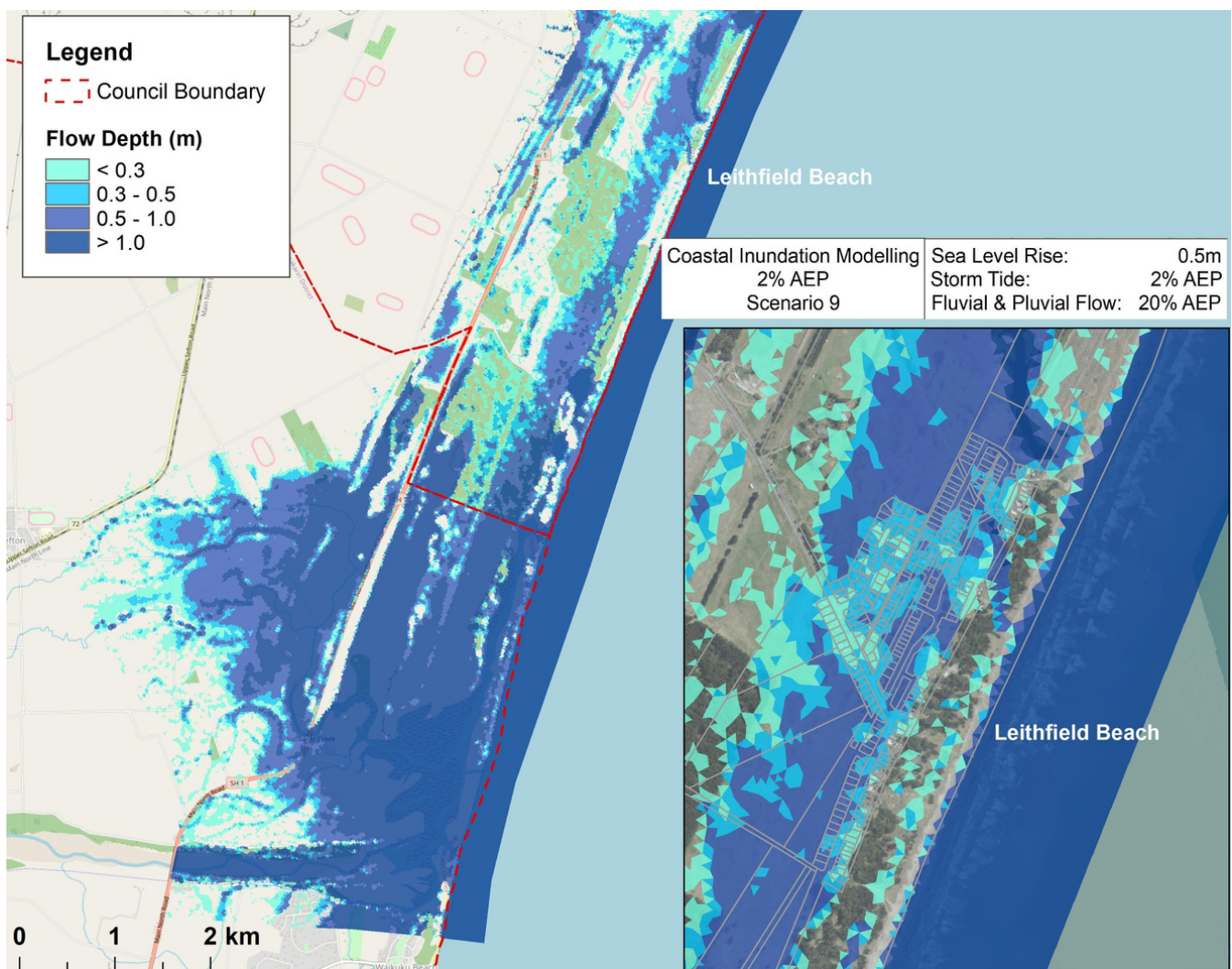


Figure 5: 1 in 50 year coastal event combined with 1 in 5 year rain event after 0.5 m of sea level rise

[4](Jacobs, 2022)

2.6 Changing risk profile

This risk also changes over time. We know that we are expecting 1 in 100-year events to occur more frequently as sea levels rises. What we consider a 1 in 100-year event today could occur every 40-50 years by 2050, every 15-30 years by 2070 and every 1-5 years by 2120.

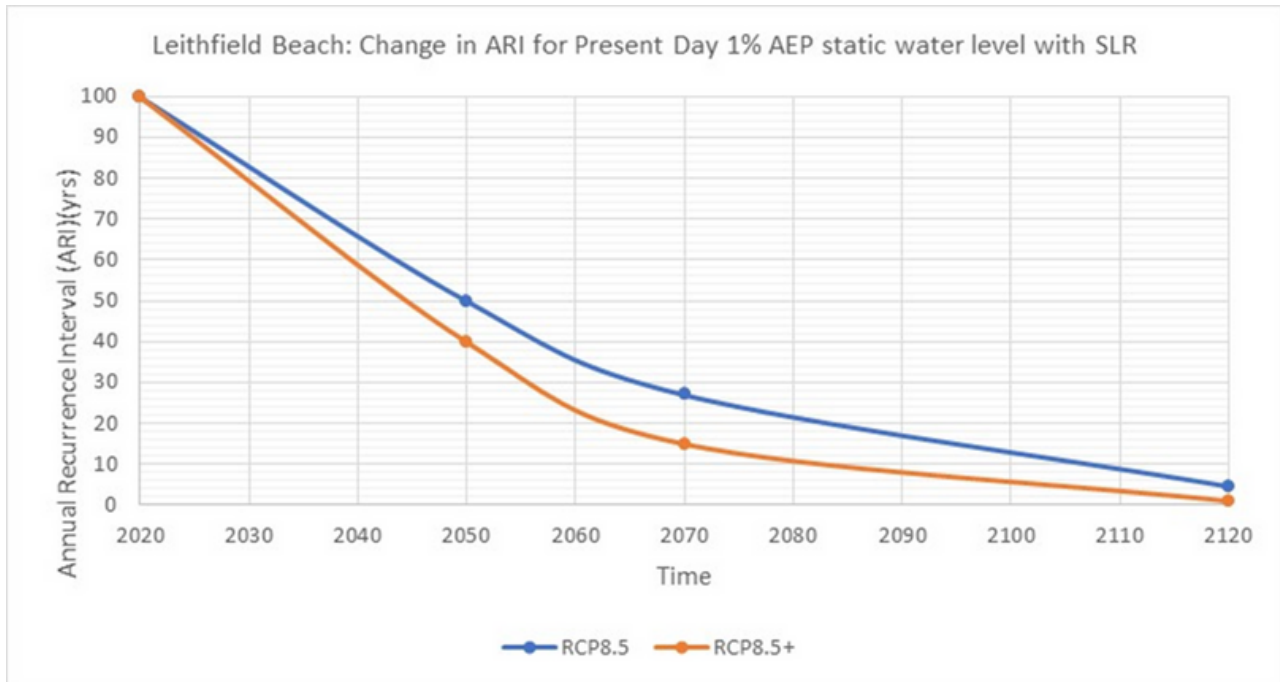


Figure 6: Graph showing the change in frequency of large events





3 WHAT MATTERS MOST?

Leithfield Beach is important to everyone for different reasons. Once we understand what these values are, we can use them to build a decision-making framework – effectively those values become the lens in which we look through when assessing various options. They help ensure that what is important to the community remains the priority.

To understand what matters most to the community Council undertook a survey asking residents to identify what they valued most.

The following objectives were developed from the feedback received:

- Ensure houses are kept free from water and remain insurable and serviceable.
- Retain the authentic and original feel of Leithfield Beach.
- Maintain a well-functioning coastal dune system and continue to promote biodiversity.

4 WHAT CAN WE DO ABOUT IT?

A long list of possible options was developed which was then narrowed down to a short list of feasible adaptation options that would be suitable to address the hazards at Leithfield Beach. The feasibility assessment included how effective, affordable, and consentable options are. The following reports are available:

- Hurunui District Coastal Adaptation Short Listed Options[5]
- Planning Options for Coastal Communities[6]
- Leithfield Beach: Dune Planting Concept Plan[7]
- Exploring Options for Retreat[8]

The short-listed options were included in the Coastal Adaptation Explorer which we used in a community workshop in October 2022, see Box 1 for more information.

From the discussion at the workshop and subsequent meetings the following options have been included as part of the possible adaptation pathways.

4.1 The options

Dune planting

The dune system provides protection from coastal inundation events. As the dunes erode the protection they offer decreases. Continued planting of the dunes and limiting access over them can help maintain the health of the dune system which will in turn preserve their longevity. Dune maintenance and enhancement will not prevent the need for other options in the future, but it is a low-cost option which will help to delay the need to adapt in other ways.

A Planting Concept Plan [7] was prepared to record some of the ways in which this could be undertaken.

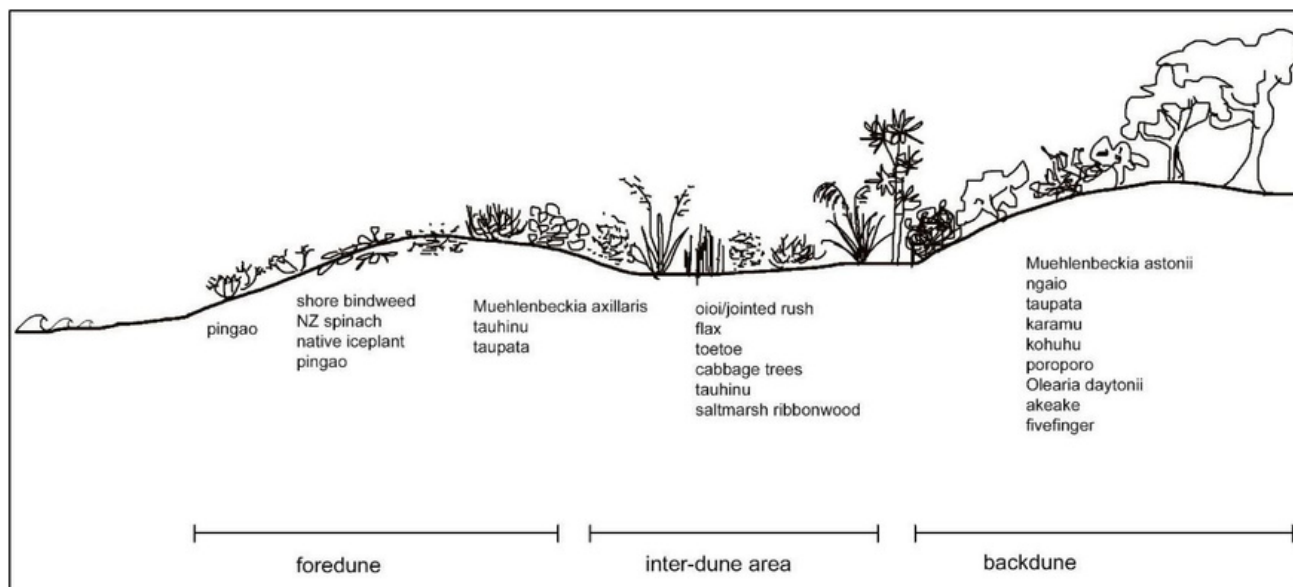


Figure 7: Vegetation sequence for Leithfield Beach

[5] (Jacobs, 2022)

[6] (Hurunui District Council, 2022)

[7] (Hurunui District Council, 2023)

[8] (Hurunui District Council, 2022)

Additional Stormwater management

Leithfield Beach is low-lying with limited opportunities for water to drain away after flood events. This project focused on the larger irregular events that could put people or dwellings in harm's way. However, the community have raised concerns with some of the more regular localised flooding as well and asked that this issue be addressed separately to the coastal inundation issues.

New dwellings are required to retain stormwater onsite for events up to and including a 1 in 50-year rainfall event. However much of the development within Leithfield Beach predates this requirement. There is an option to undertake a review of stormwater in Leithfield Beach and consider both the maintenance requirements and any new stormwater projects desired. New stormwater projects could be reviewed by the community and the community can make a decision on if there are projects they wish to fund.

Maintain / enhance planning provisions

The current planning provisions require new houses to be built to a minimum floor height 400 mm above the 1 in 200-year flood event. The rules also currently restrict or prohibit development within the Coastal Hazard Zone. These provisions help reduce the risk for new development in this area. There are opportunities to improve the provisions to better provide for adaptive planning.



Inundation bund

An inundation bund could be constructed around the settlement to prevent floodwaters entering the settlement from behind. It is anticipated the bund would need to be approximately 1.2 m high and 1.9 km long. It could have a gentle gradient and be grassed over to look more natural.

The installation of an inundation bund around the settlement would have the adverse effect of trapping water inside the settlement. This water could be the result of water overtopping the bund or the result of heavy rainfall within the settlement

The low-lying position of the settlement coupled with the high groundwater table means there is limited ability to remove this water naturally. A pump or pumps would likely be required to ensure water could be removed if required.

Other inundation protection options explored include bunding only the north and south of the settlement or stopbanks on the Lower Kowai River. These are detailed in the Short-Listed Options report [9].

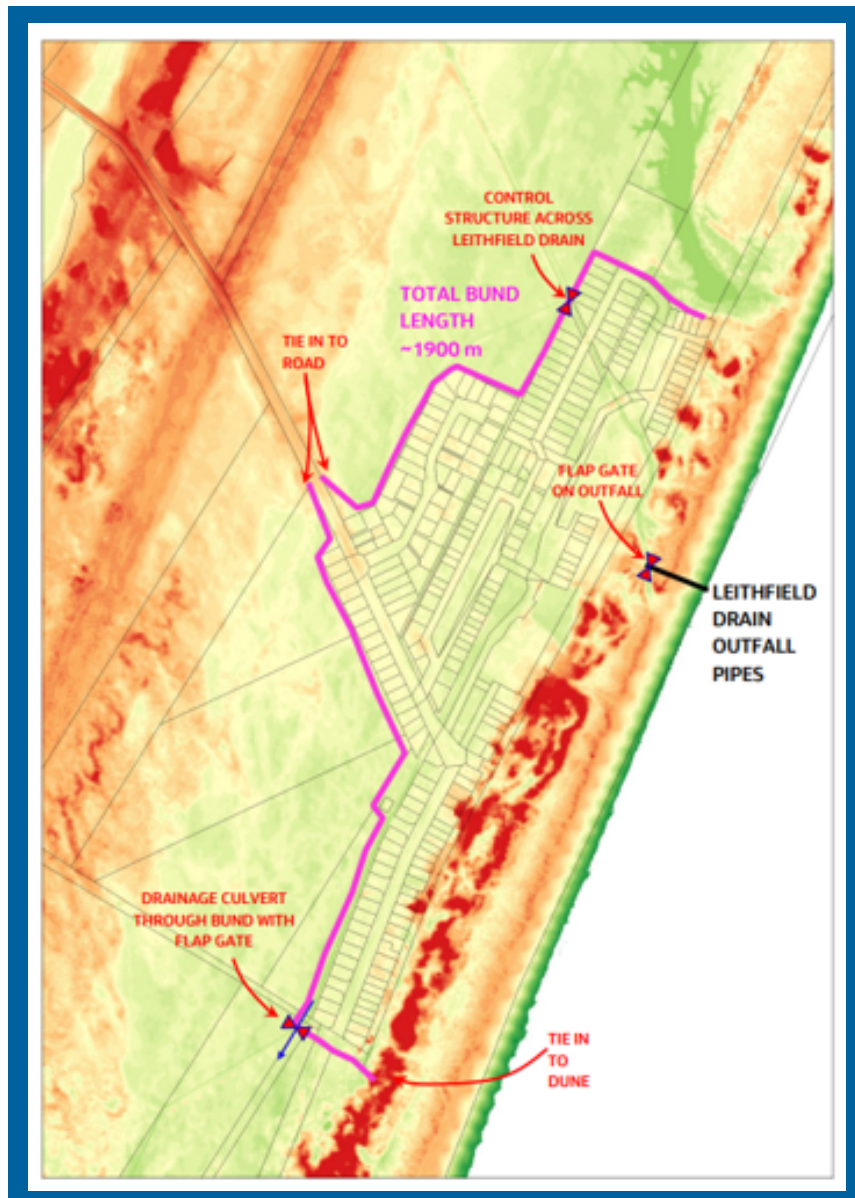


Figure 8: Location of inundation bund

[9] (Jacobs, 2022)

Beach scraping

Beach scraping is a short-term soft engineering approach which involves using a bulldozer to relocate beach sediment from the foreshore to build up the dunes. This would need to occur every 5-10 years and could slow down the rate of erosion.

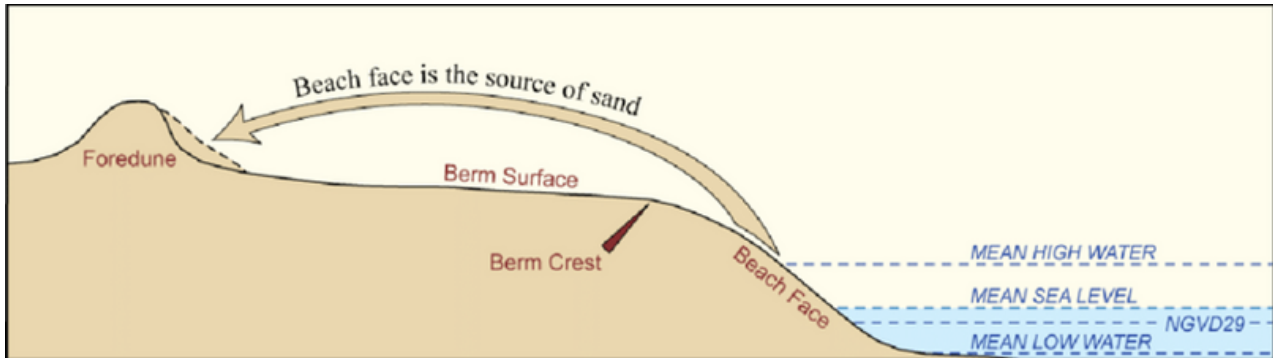


Figure 9: Beach scraping diagram (Silverira and Psuty 2008)

Site specific inundation protection

Leithfield Beach is primarily at risk of flooding. This can be mitigated at a site-specific level through various options including:

- Raising the floor height
- Waterproofing the dwelling
- Stormwater retention tanks
- Small bunds diverting water away from the dwelling.

Not all properties at Leithfield Beach face the same risk and therefore site-specific protection may ensure the risk is tolerable at all sections within the settlement without having to fund larger scale works.

Proactive relocation

proactive relocation is an approach to reduce or eliminate exposure to intolerable risk. It enables people to relocate assets, activities, and sites of cultural significance, away from areas at risk from climate change and natural hazards proactively.

There may come a time at Leithfield Beach whereby flooding occurs too regularly, the high groundwater table is unable to be sufficiently managed, or the risk of a life-threatening flood event is too great. Relocating development from the settlement at this time may be the most appropriate option. It is not anticipated that relocation would be required in the next 30 years and therefore reviewing how proactive relocation could be undertaken at Leithfield Beach has not been considered.



Box 1: The Coastal Adaptation Explorer

The Coastal Adaptation Explorer allowed those in the workshop to turn on various options and get real time feedback on the costs, benefits, and effectiveness of an option, or combination of options.

The Explorer works by turning on different options on the lefthand side. Options could be turned on now, in 2050, 2070, or 2120. Multiple options could be turned on concurrently or as one option was no longer effective a different option could be turned on at a later timeframe to provide an additional level of protection.

The graphs at the bottom of Figure 10 show the effectiveness of the option compared to the do-nothing option.

For Leithfield Beach this looked at the ability to protect private property from erosion and flooding, and the ability to protect critical roads.

The box in the centre-top shows the financial costs or benefits of an option. The box on the top-right is based on a multicriteria analysis that considers whether the option, or combination of options, would have a positive effect on a series of criteria relative to the do-nothing option. The criteria were based on some of the values the community had provided as part of Phase 2 of the project. It also considers some more practical issues such as whether an option would be able to be consented and whether an option could be adapted in future.

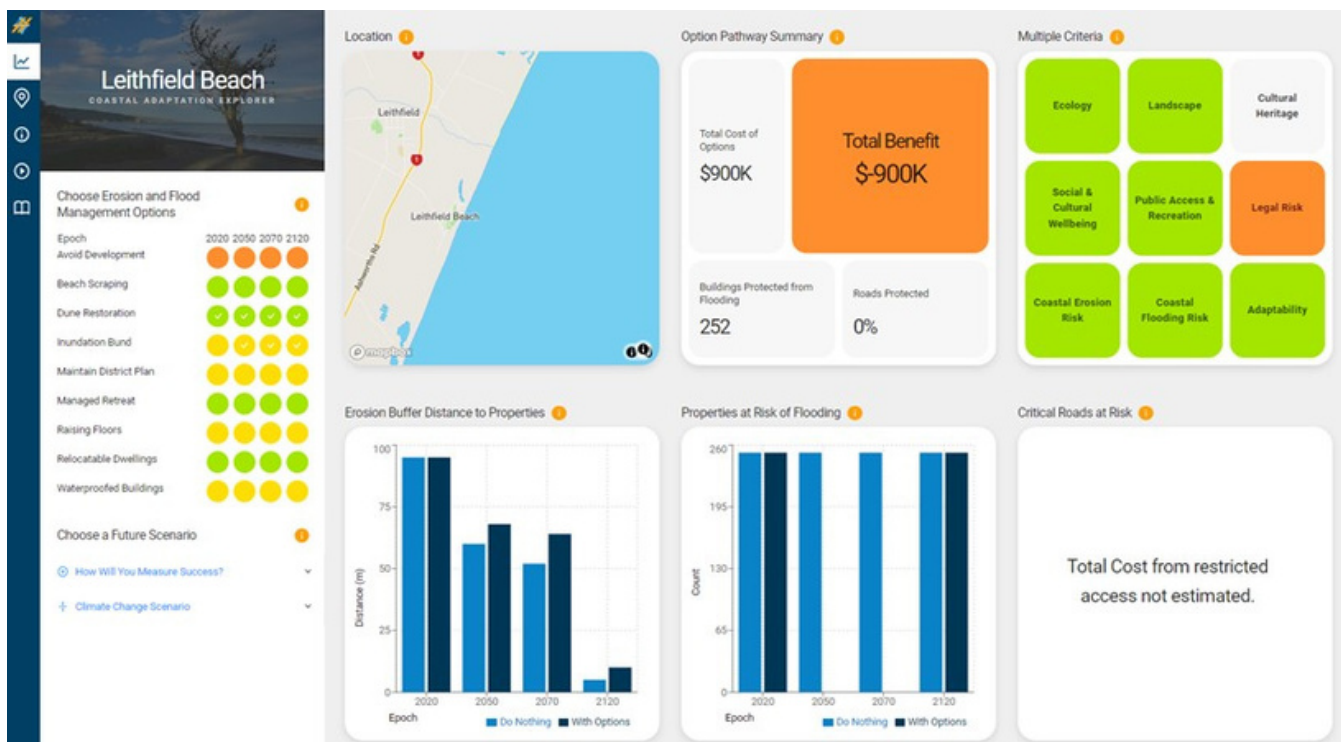


Figure 10: Snapshot of the Options Explorer used to discuss the viability of options with the community

4.2 The pathways

Figure 11 shows the pathways that have been identified using the options set out in Section 4.1 above.

There are several options that can be undertaken immediately, or as money allows, to help reduce the risk or limit the increasing risk. These are:

- Maintaining a healthy dune system
- Undertaking a review of the current stormwater maintenance
- Ensuring new dwellings are constructed with appropriate floor heights

In the medium term there is the option to install an inundation bund around the settlement. This would help manage the flood risk from upstream sources. The community have indicated that this is something they may be interested in and willing to start contributing funding towards.

Unless a new affordable engineering solution is developed proactive relocation may be the only long-term option for managing the risk at Leithfield Beach. Looking out over 50 years there is too much uncertainty to predict exactly when this might be required.

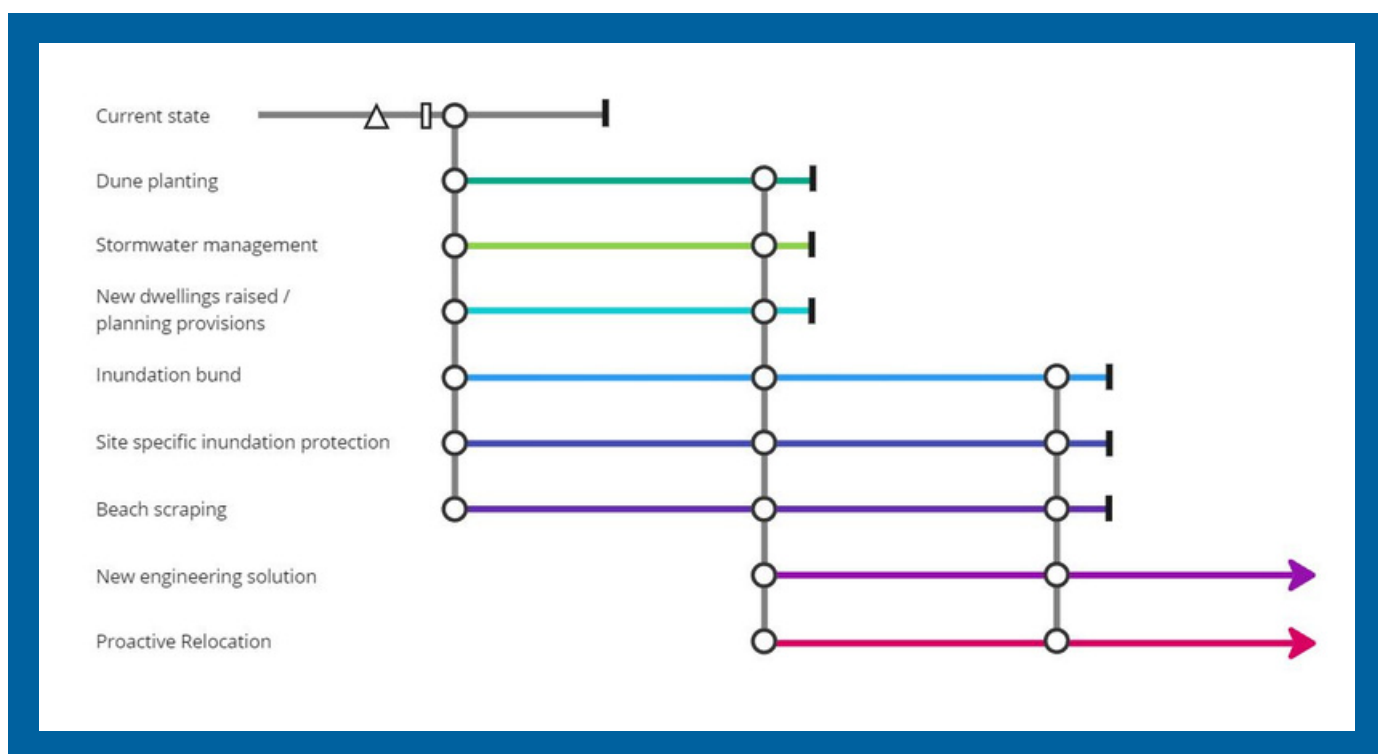


Figure 11: Pathways map for Leithfield Beach

5 HOW CAN WE IMPLEMENT THE PLAN?

5.1 Triggers for change

The community has established an adaptation threshold through the development of their community objectives. This is the point where the status quo is no longer tolerable, and change is required before we reach this point.

Trigger points have been developed to determine when we need to act. These are based on the lead time to implement various options. The trigger needs to be activated in plenty of time to ensure we have time to adapt prior to the threshold being reached.

The lead time to consent and construct an inundation bund could be around three years. Similarly, the lead time to undertake site specific works may also be around three years. If proactive relocation were to be undertaken in future a much greater lead in time would be required.

The most significant risk to properties at Leithfield Beach is inundation from various sources. Given the uncertainty in the frequency, source, and severity of flooding events it is difficult to identify the right triggers. The right triggers will differ depending on the option to be pursued.

Four triggers are proposed to capture the various elements of the risk profile and ensure the robustness of the decision-making process. When the first of the four trigger points is reached Council will initiate a conversation about the next steps. No action may be required at this point, or there might be small actions that can be taken to help reduce the interim risk. When two triggers are reached a formal decision on next steps will be made, if not already required by trigger one.

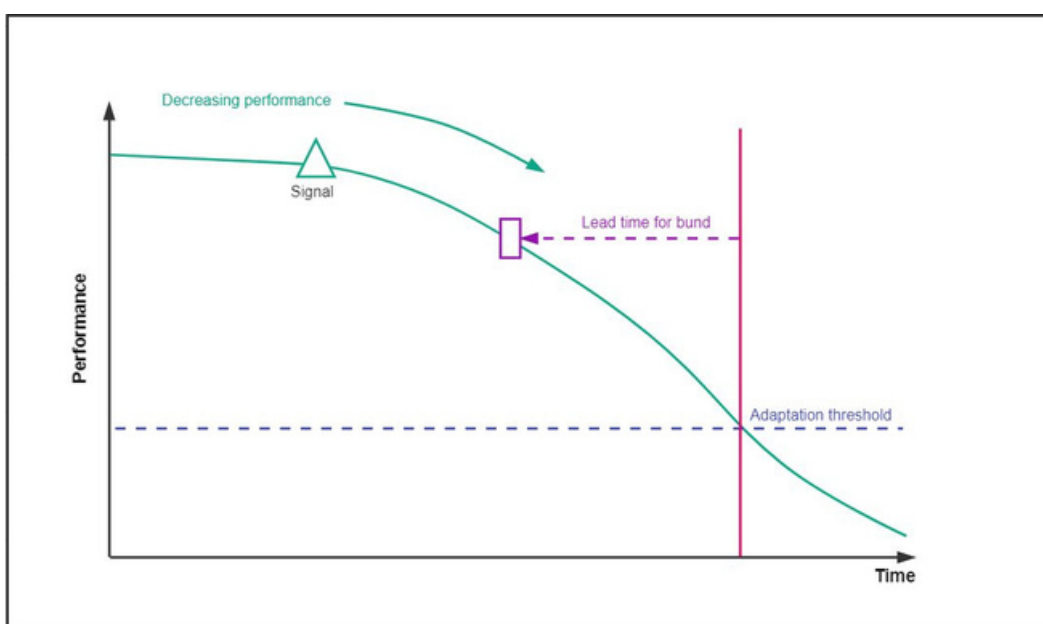


Figure 12: Graph showing the lead time for options relative to the decreasing performance of options. Adapted from (Ministry for the Environment, 2017)



Trigger: Three flooding events with depths of more than 0.2 m in any 12-month period

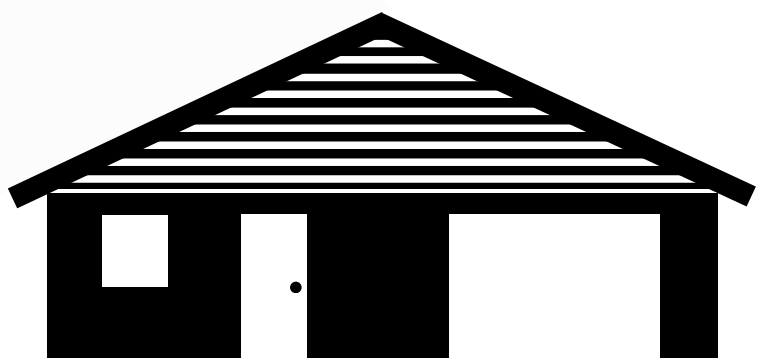
Most dwellings at Leithfield Beach have a finished floor height of at least 0.3 m. The newer dwellings have a floor height significantly higher than this. A trigger point is reached when there are three events in any one 12-month period with a depth of flooding greater than 0.2 m.

This could trigger at risk properties to take site specific action or if the cause of flooding is fluvial flooding it may trigger the construction of an inundation bund and pump system.

Indicator marks will be made on the street signs at the following intersections:

- Kowai Street and Elizabeth Square
- Kings Road and Lucas Drive
- Penfold Square and James Avenue

The risk to individual dwellings will differ from the points where the depth of water is being measured. Property owners may want to, or need to, act sooner.



Trigger: Significant capital works are required

It is not anticipated that any infrastructure at Leithfield Beach will require significant capital works in the next 30 years. If significant capital works are required, a trigger point is reached. At this point the community and Council will need to decide if investing in the works is a good investment for the community. This trigger applies to three waters, roading and other Council infrastructure including reserves but doesn't include any voluntary stormwater upgrade the community decide to undertake as part of a proposed stormwater management review.

“Significant” includes any construction or placement of any new long term assets or works above and beyond maintenance or minor improvements.

Trigger: A major event requires over 30 dwellings to rebuild

Should a significant hazard event require over 30 dwellings to rebuild a trigger point is reached. This may be the result of any hazard including, but not limited to, wildfire, earthquake, flood, or tsunami. At this point careful consideration needs to be given to the cause of the disaster, and where and how the dwellings are rebuilt.

There is never going to be a cheaper time to adapt than after an event with the assistance of insurance money. If dwellings are to be rebuilt in the same position, adapting might involve building relocatable dwellings to enable further adaptation in future.



Trigger: First dwelling loses flood insurance

Insurance is important to property owners for financial security, but in many cases, it is also a condition of the mortgage on the property. A trigger is reached when the first dwelling loses insurance due to flood risk. Depending on the circumstance of the insurance withdrawal this could trigger a few select properties to undertake site specific works to provide greater protection to their properties or it could trigger settlement-wide action to ensure more dwellings do not lose insurance.

There are instances in the Hurunui District where sheds and garages are unable to obtain insurance already. The loss of insurance to sheds and garages, the increase in premiums or excesses can be treated as signals of eventual insurance withdrawal.

5.2 Supporting information

The following additional triggers have been identified. They are not proposed as triggers due to the lack of current information or the annual variation in the data. This information is considered valuable to assist decision makers in confirming that a new action should be taken.

Rising groundwater trends

There is limited groundwater monitoring data available. If continuous or regular groundwater level monitoring was undertaken there is the opportunity to monitor the changing trend or lack thereof. The major limitation of this is it would take some time to establish the existing state and determine a trend. No groundwater trigger is proposed but there is an opportunity to consider any information alongside the trigger points in a decision-making process.

Sea level rise rises 0.11 m (from 2020)

Sea level varies from year to year; a midpoint is used to average out the variations. We can continue to follow the rate of sea level rise to help determine which sea level rise scenario we should be using for decision making. Due to the year-to-year fluctuation, as well as uncertainties in beach response, it is not considered a suitable trigger on its own.



Half of property owners request action sooner than planned

The triggers aim to capture the various elements of risk to ensure we all agree on when change is required. As the risk increases there may come a time when the community is no longer comfortable with the level of risk. If the community are no longer comfortable with the risk, they may choose to write to Council requesting that this plan be implemented sooner.

It is difficult to determine what the right number of property owners is. Absentee owners may be more ignorant of the increasing risk or there may be property owners that will never engage in a process. A request from the community may trigger a review of the Plan.

Civil Defence emergency response capacity impacted

Civil Defence Emergency Management have several roles but most visibly they are the lead agency when disaster strikes. Their work helps minimise the risk to the community through helping with evacuations if required and supporting recovery. If proactive evacuations are occurring regularly or their capacity to respond and assist in a disaster is limited, the risk profile to the community changes. This may trigger a discussion about the need to do things different or earlier.

6 REQUIRED ACTIONS

Action: Dune planting

Maintaining a healthy dune system is key to reducing the rate of erosion. A significant amount of planting has already occurred in and around the Leithfield Beach settlement. As time and funding permits this work is to be extended.

WHO: Northern Pegasus Bay Coast Care Group

FUNDED BY: Northern Pegasus Bay Coast Care Group and external funding parties

STATUS: Ongoing

Action: Shoreline monitoring

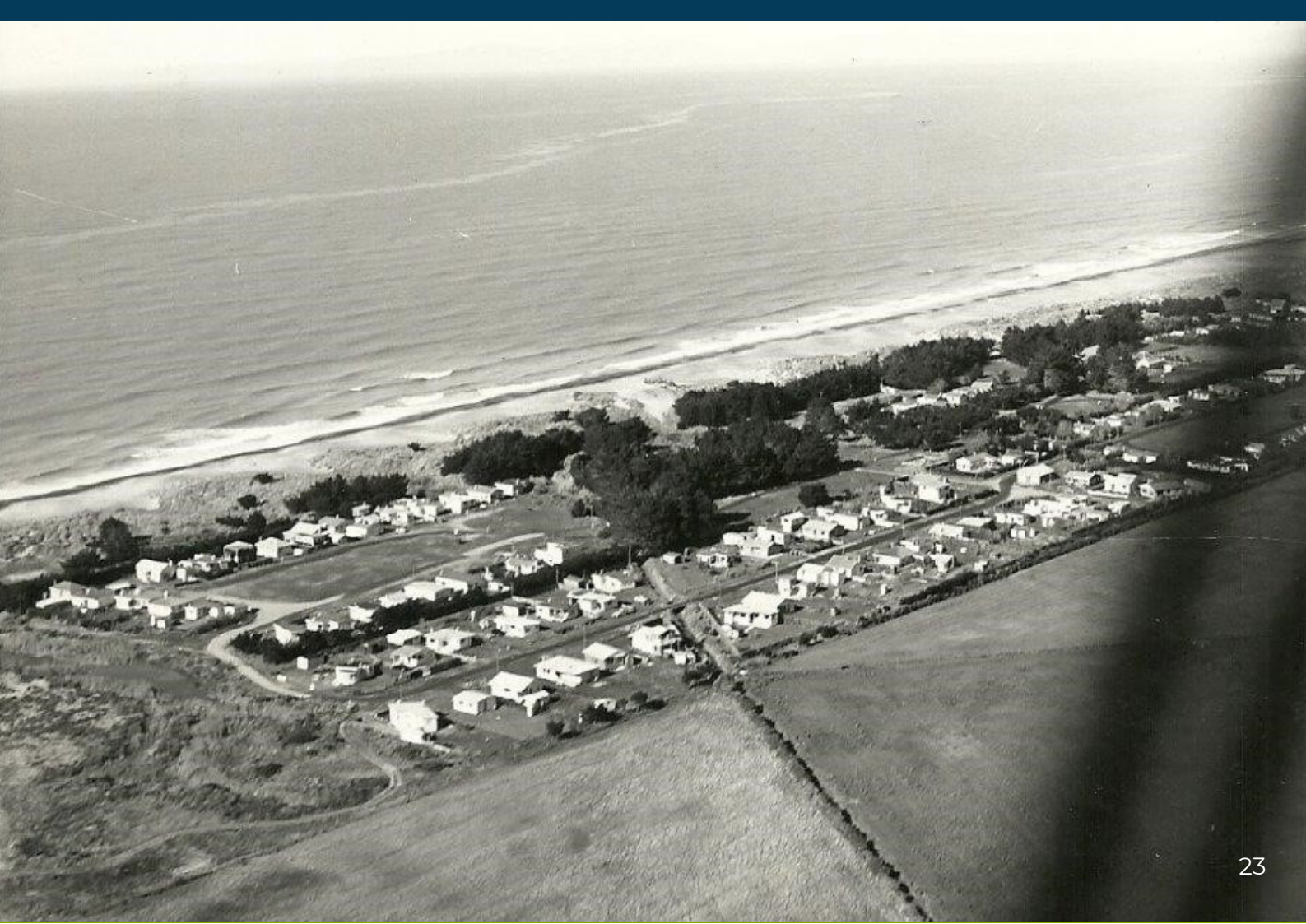
Environment Canterbury currently undertake annual State of the Environment monitoring. This currently includes annual shoreline profiles. There is an opportunity to compliment this with a topographical drone survey of the Leithfield Beach to better understand the success of dune planting and maintenance.

WHO: Environment Canterbury

FUNDED BY: Environment Canterbury

STATUS: Committed to

Leithfield Beach 1957; Photo credit: John McCaskey



Action: CoastSnap monitoring

CoastSnap is a community monitoring program where people can use their mobile device to take a photo of the beach state from a fixed point. The observations can be used to track changes in the shoreline. A stand was installed at the north and central points of the settlement in November 2022.

To use the CoastSnap stands anyone can place their phone sideways in the cradle and take a photo. These can be uploaded on the CoastSnap app, shared via social media with the hashtag #CoastSnapLeithfield or emailed to coastal@hurunui.govt.nz.

Photos gathered will be compiled to form a time lapse where we can view and measure the change over time.

WHO: Hurunui District Council
FUNDED BY: Hurunui District Council
STATUS: Installed

Action: Holistic review of Leithfield Beach stormwater

Stormwater management has been identified by the community as an outgoing issue at Leithfield Beach. The community has said they would like to address stormwater maintenance issues separately to the coastal hazards risk. Council's staff and community members have undertaken a site walk over to identify key areas of concern within the settlement. These projects are being scoped and will be put to the community to identify which projects they would like to fund.

WHO: Hurunui District Council
FUNDED BY: Hurunui District Council and Letifield Beach community
STATUS: Projects being scoped

Action: Review new information and update this Coastal Adaptation Plan

The future is uncertain. This Plan has been developed using the best information available at the time of preparing the Plan. The information this Plan relies on is constantly being refined and updated. It is appropriate that the content of this Plan is periodically reviewed to ensure it remains fit for purpose. This may include:

- Considering updated sea level rise predictions, their impact on coastal hazards and the need to adapt.
- Updating possible options if new technologies or legislation emerge.

WHO: Environment Canterbury (science) and Hurunui District Council (policy and engagement)

FUNDED BY: Environment Canterbury (science) and Hurunui District Council (policy and engagement)
STATUS: Committed to

Conditional Action: Changes to the Long-Term Plan

The community have indicated they are keen to start putting money aside to enable the construction of an inundation bund when this is required. A small, targeted rate to fund the capital works is to be included in the Long-Term Plan. This rate will be consulted on as part of the Long-Term Plan engagement in May/June 2024.

PREPARED BY: Hurunui District Council
FUNDED BY: Hurunui District Council
STATUS: Awaiting completion of adaptation planning

7 REFERENCES AND ADDITIONAL INFORMATION

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