



COASTAL CONVERSATIONS

LET'S TALK FLOODING

LEITHFIELD BEACH

Join the discussion

Leithfield Beach Community Hall
7.30pm on 13 February 2023

BACKGROUND

In 2020 Hurunui District Council (HDC) 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. We also looked at the combined risk of coastal flooding and river flooding.

The project has four phases:

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

The project aims to put together a long term approach to managing the flood risk at Leithfield Beach.

Now we know what is happening we need to understand at what point we need to do something about it. Is floodwater on your property ever acceptable to you? Could you tolerate it every few years if it wasn't too deep? Are you happy with waist deep water on your property?

As property owners the decision to do something differently needs to be yours.

PURPOSE

HDC have been invited to attend the Leithfield Beach Residents Association meeting on 13 February 2023.

This document sets out a high level summary of what we know so members of the community have a chance to review the information prior to the session.

All of the information on the project is available at: www.hurunui.govt.nz/coastal



JOIN THE DISCUSSION

Join the Leithfield Beach Residents Association at 7.30pm on 13 February 2023 to find out more about how we can prepare for the future.

Any questions email Monique at coastal@hurunui.govt.nz

PHASE ONE: WHAT IS HAPPENING?

Leithfield Beach is currently at risk of coastal erosion and multiple sources of flooding.

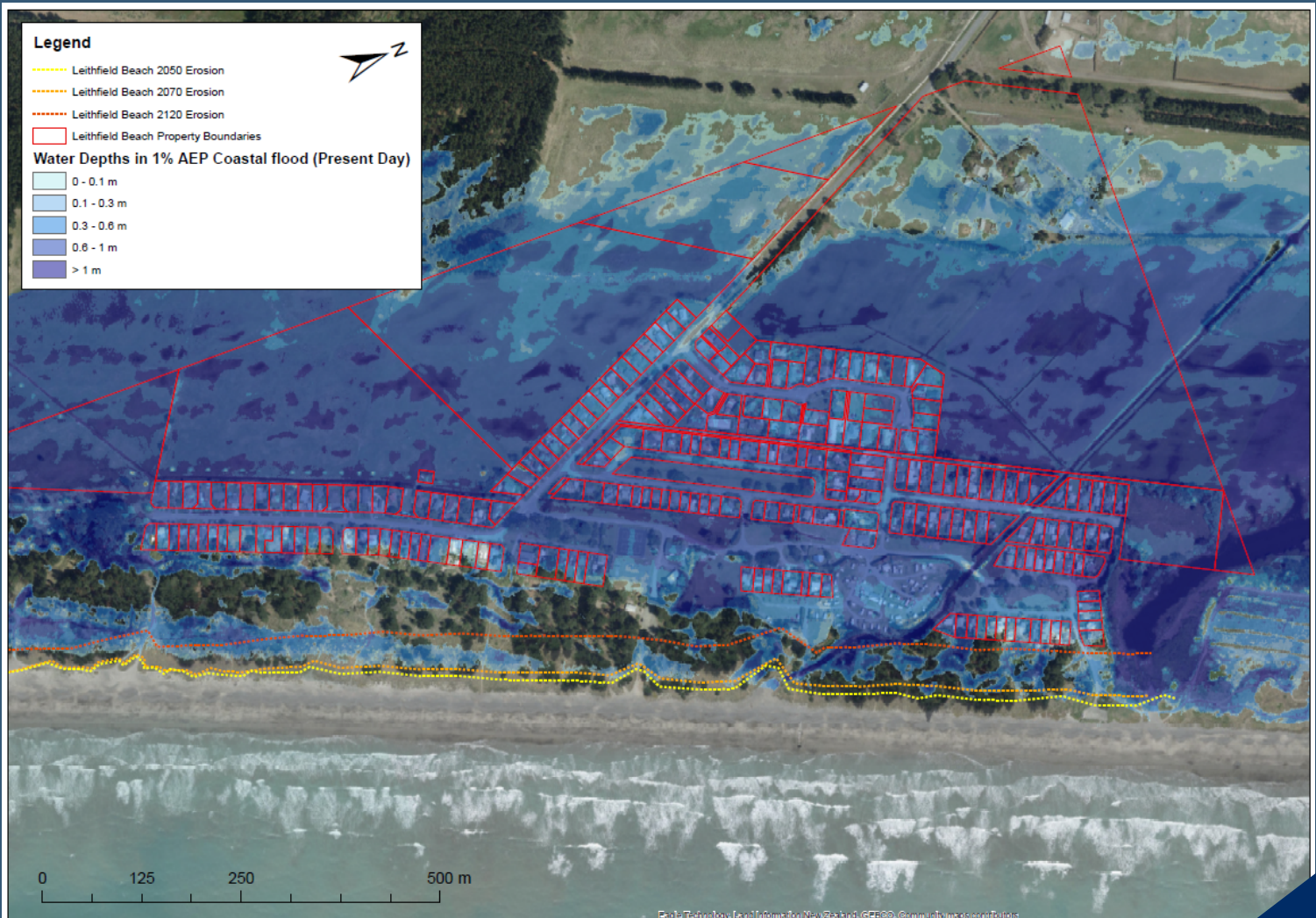
Coastal Erosion

Leithfield Beach is currently well protected by the dune system. Even in 100 years no properties are at risk of erosion based on the information we have. However, as the dune system erodes the dunes lose their ability to protect the settlement from coastal flooding. The yellow, orange, and red lines on the map below show the projected shoreline positions in 2050, 2070 and 2120.

Flooding

The map below shows the water depths in a present day 1% AEP 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). Sea level rise will increase the frequency of these events and by 2120 we can expect events of this size every year.

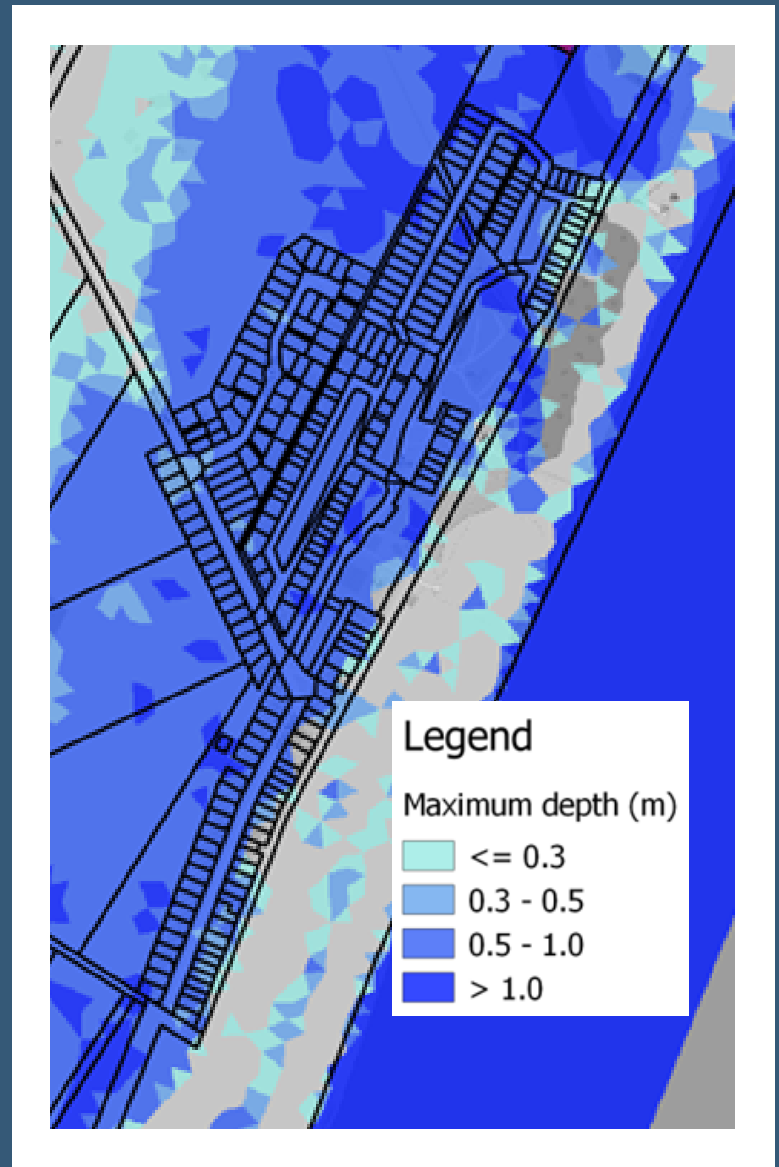
In such an event every property within the settlement can expect at least 30cm of water on their property, with many expecting over 60cm of flooding. The depth of water increases over time and by 2070 all properties within the settlement can expect at least 60cm of water in such an event.



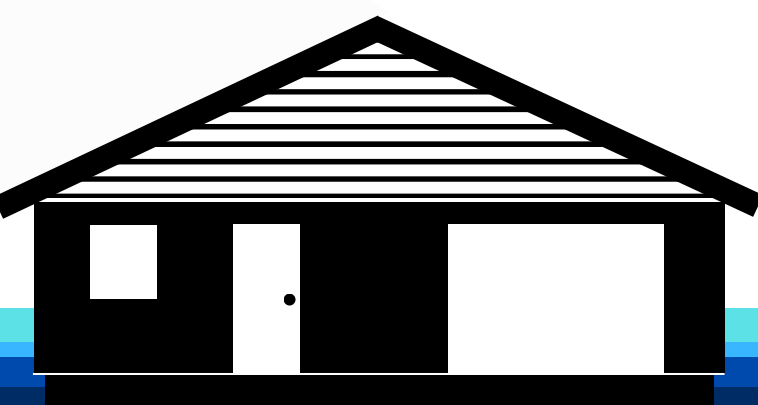
Leithfield Beach is also at risk of river flooding and rainwater ponding. The map to the right shows a 1 in 50 year river flood, combined with a 1 in 5 year coastal flood after 0.5m of sea level rise. The majority of properties within the settlement will experience significant flooding in such an event.

Within the settlement there are slight variations in the ground level of properties. Some dwellings also have higher finished floor levels than others. These factors contribute to the susceptibility of a dwelling to flooding. The depth of flooding affects your ability to evacuate. Over the next few pages the diagrams at the bottom of the page show you what the data looks like at various properties within the settlement.

We also have information on the effects of rising groundwater. A high groundwater table reduces opportunities for water to drain away increasing the chances of ponding. Shallow groundwater can also affect foundations and infrastructure. In 50 years the average depth to groundwater is approximately 1 metre.



The diagram below shows you what 1 in 10 year event will look like today at various properties and the same size event in 50 years time. It also shows you what a 1 in 100 year event looks like at the same time periods. Some houses are higher than others at Leithfield Beach so the foundations and ground levels shown in the diagrams are accurate for those properties measured. The people shown are a 1.75m adult and a 3-4 year old child.



Property on Kowai Street

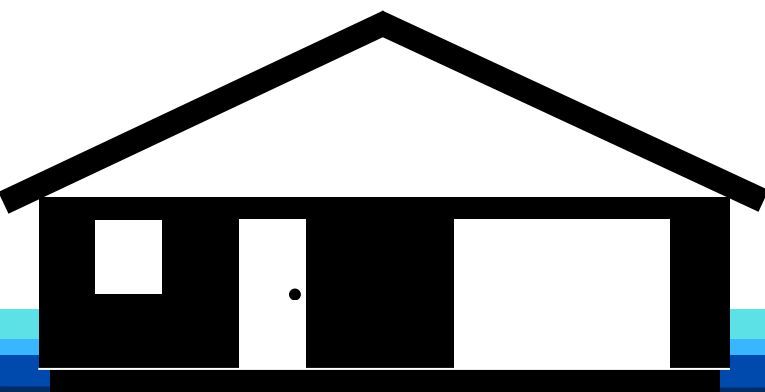
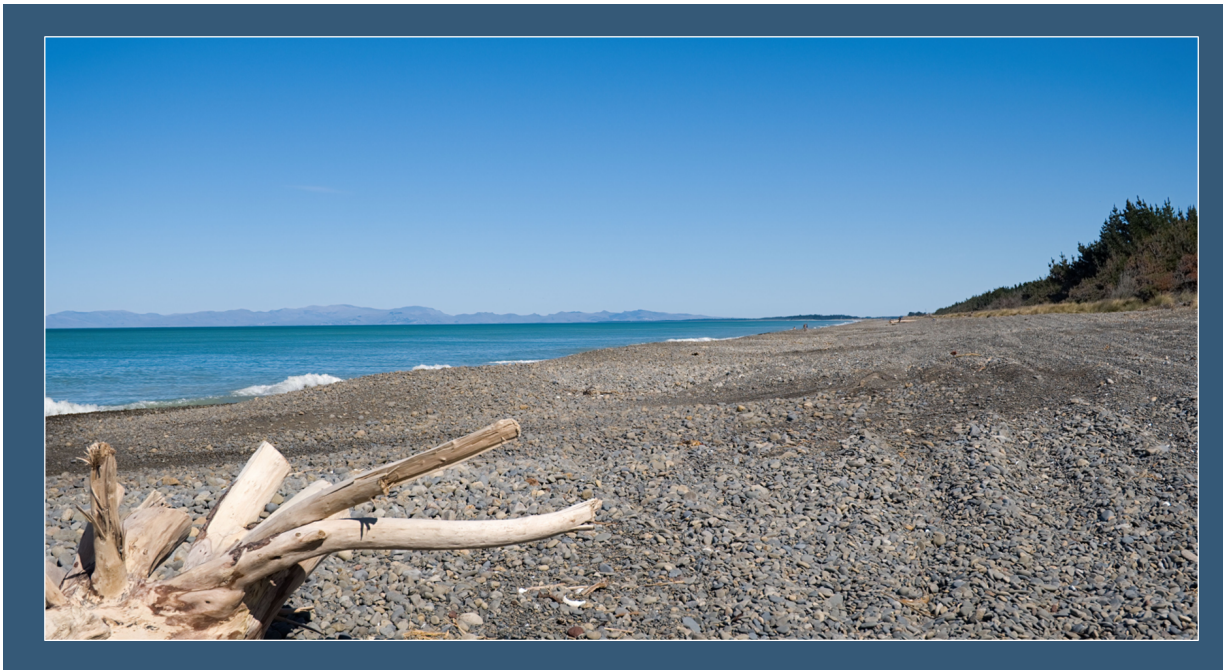
- 1 in 100 year flood depth in 50 years
- 1 in 100 year flood depth today
- 1 in 10 year flood depth in 50 years
- 1 in 10 year flood depth today

PHASE TWO: 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 you remains the priority.

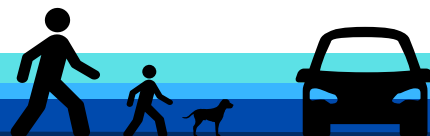
The following objectives were developed from the feedback received:

- 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.



Property on Lucas Drive

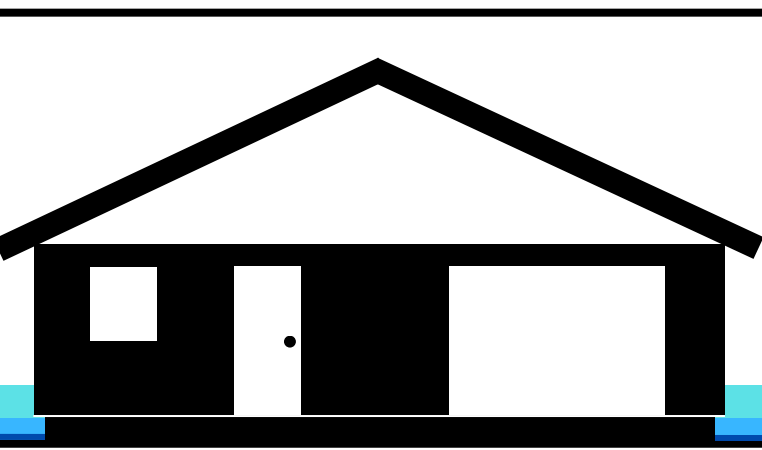
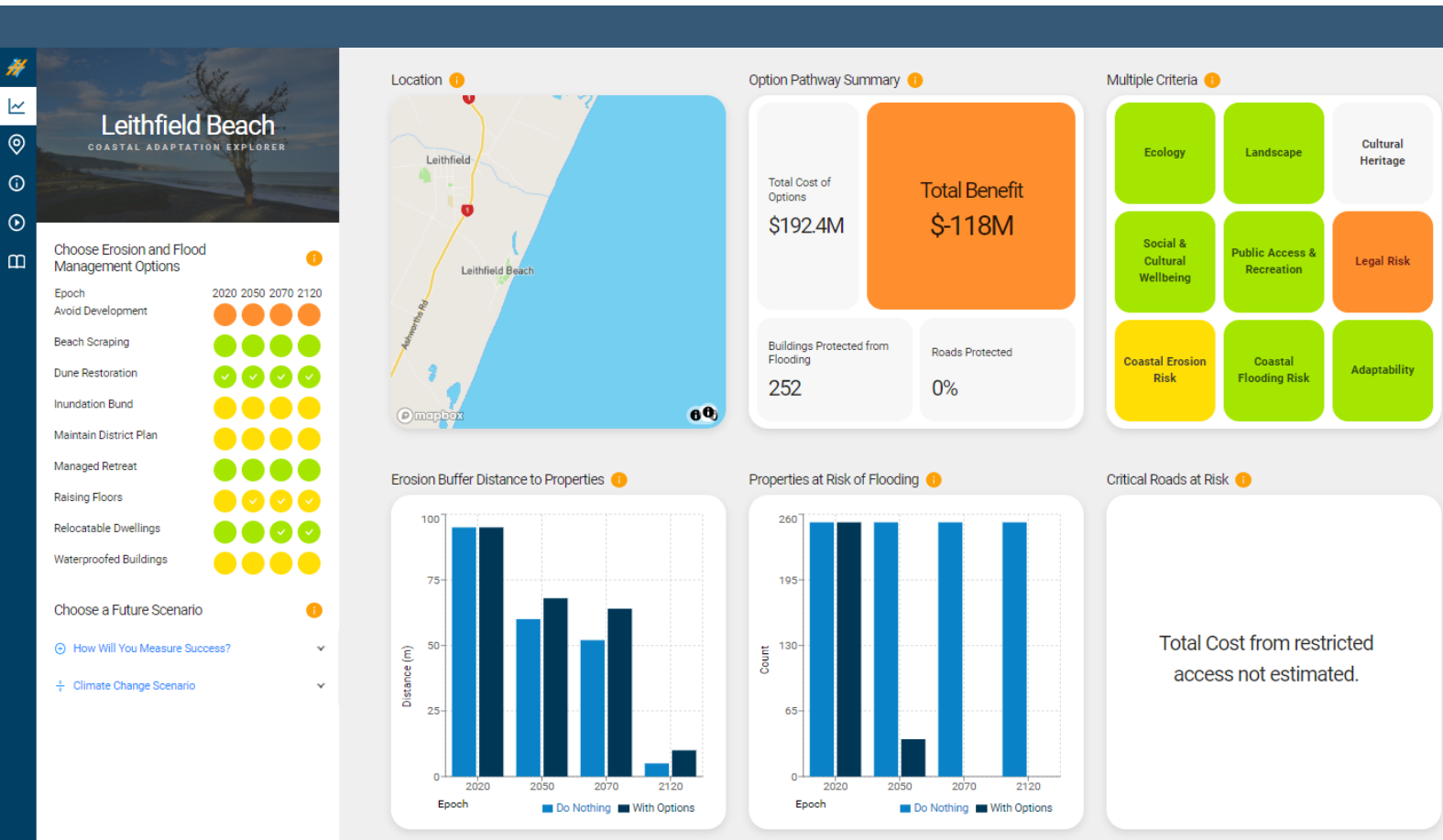
-  1 in 100 year flood depth in 50 years
-  1 in 100 year flood depth today
-  1 in 10 year flood depth in 50 years
-  1 in 10 year flood depth today



PHASE THREE: WHAT CAN WE DO ABOUT IT?

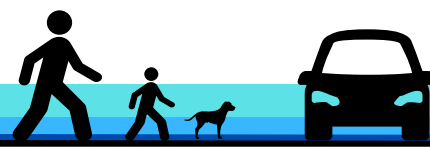
A long list of options was developed which was narrowed down to a short list of options. The short listed options were included in the Coastal Adaptation Explorer which we used in our October workshop.

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.



Property on Elizabeth Square

- 1 in 100 year flood depth in 50 years
- 1 in 100 year flood depth today
- 1 in 10 year flood depth in 50 years
- 1 in 10 year flood depth today



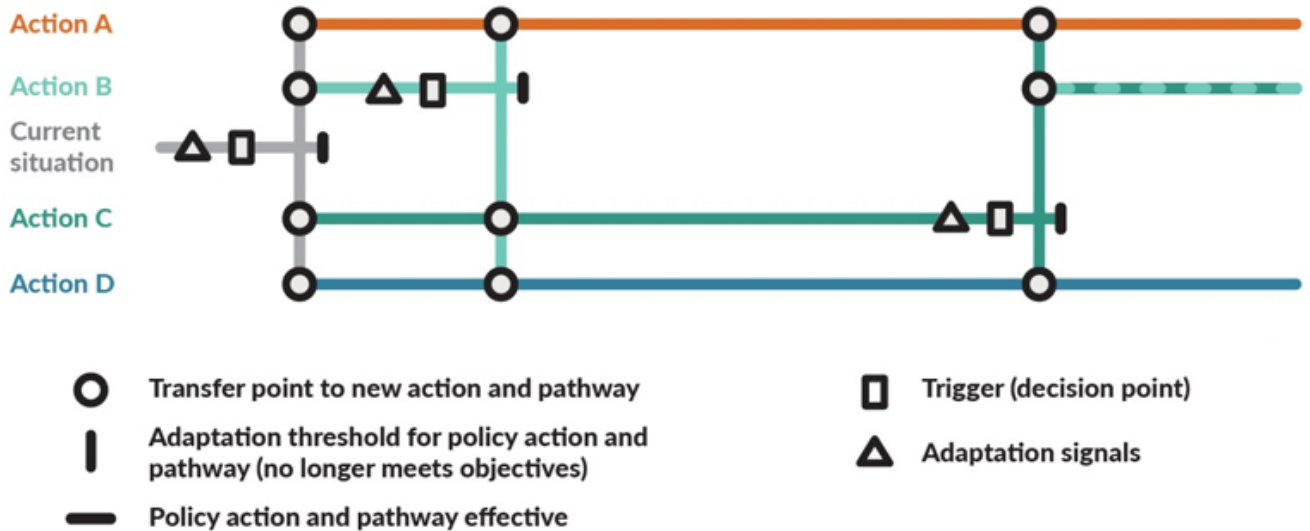
DEVELOPING AN ADAPTIVE PLAN FOR LEITHFIELD BEACH

What is an adaptive plan?

An adaptive plan allows us to prepare for the future despite the future being uncertain. We are adopting a dynamic adaptive pathway planning approach. This has several benefits:

- A preferred course of action is identified now to help guide future investment decisions. Other options are left on the table for future decision-makers to ensure new information can be appropriately considered.
- The plan is trigger-based not time-based. This means we don't implement an action until it is required.
- It sets agreed signals and triggers so we can monitor the change that is occurring and have an agreed point on when to act.
- Decision points are based on a community's threshold for risk.
- It allows us to start saving now so we can afford the solutions tomorrow.

The diagram below shows how there are multiple options available and multiple points where decisions need to be made. It identifies signals that we need to watch to make a decision and trigger points where we need to make a decision.



Property on Kings Road

- 1 in 100 year flood depth in 50 years
- 1 in 100 year flood depth today
- 1 in 10 year flood depth in 50 years
- 1 in 10 year flood depth today

THE OPTIONS - COASTAL PROTECTION

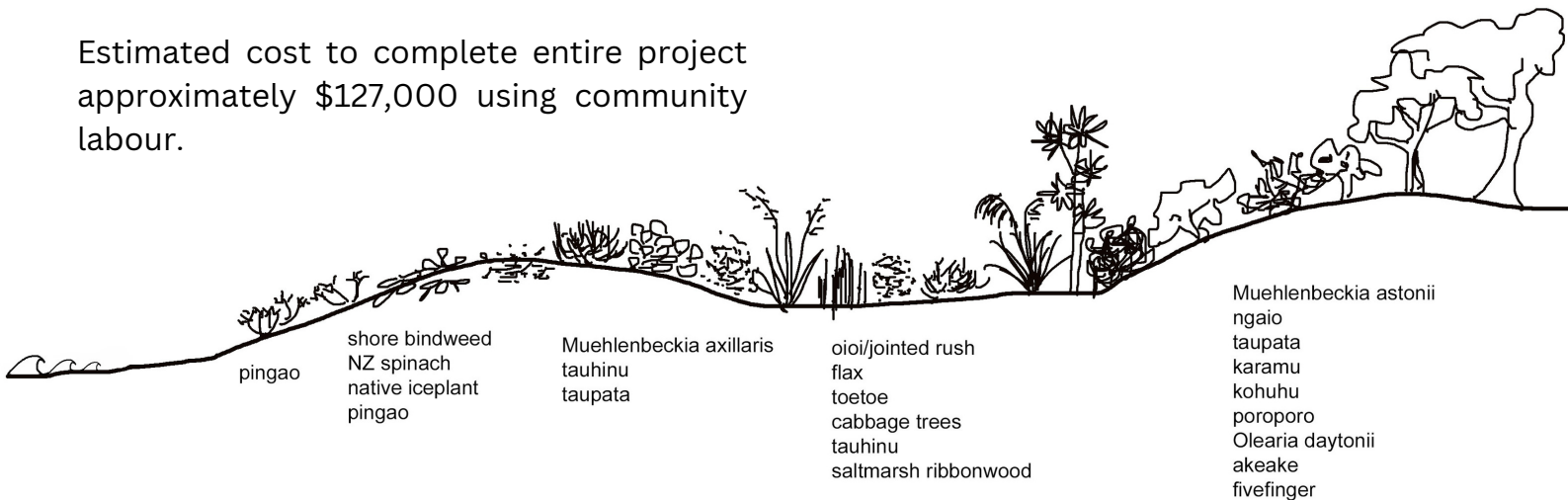
DUNE MANAGEMENT / PLANTING

Dune planting can be undertaken to enhance the existing dunes along the full length of the settlement. This could include the installation of boardwalks over the dunes and signage around vehicle access.

Protecting the dunes will not prevent coastal erosion but it will help to increase the longevity of the dunes and the coastal inundation protection they offer.



Estimated cost to complete entire project approximately \$127,000 using community labour.



BEACH SCRAPING

Beach scraping involves using a bulldozer to move sediment from the lower beach to the dune crest. This could occur along the length of the settlement to help rebuild the dunes.

Beach scraping usually occurs after a big storm to replenish the dunes and would need to occur every 5-10 years to maintain the beach volume.

Estimated cost is approximately \$100,000 every 5-10 years.



From Voice of Byron (2017)

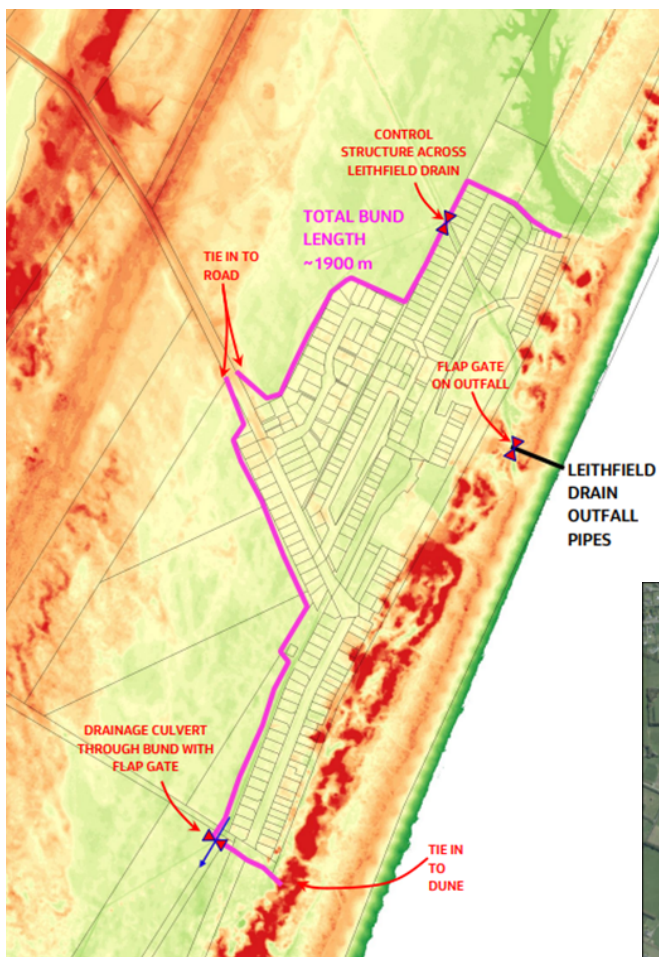
THE OPTIONS - INUNDATION PROTECTION

INUNDATION BUND

An inundation bund could be constructed around the settlement to prevent floodwaters entering the settlement. This would allow water to flood the low lying land to the west of the settlement but not let it enter the settlement. The bund would need to be approximately 1.9km in length and 1.2m high.

It could be grassed over to enable it to blend into the surrounding environment.

Estimated cost is approximately \$740,000.



STOP BANK ON THE KOWAI RIVER

A stopbank could be placed on the true right bank of the Lower Kowai River, as shown on the map below.

A stopbank would need to be engineered to a higher standard than a bund as it needs to retain fast flowing river water compared to the shallow, mostly static ponded water an inundation bund is designed to protect against.

If this was the preferred option more work would need to be undertaken to investigate how long the stopbank needs to be, the potential adverse effects on flooding elsewhere (particularly on the northern side of the river).



THE OPTIONS - PLANNING OPTIONS

RAISING FLOOR LEVELS



The newer dwellings in Leithfield Beach have higher floor levels to provide protection from flooding events.

Floors can be raised retrospectively although in most cases the cost of doing this is prohibitive. Estimated cost about the RV of the dwelling.

WATERPROOFING BUILDINGS

Localised bunds or waterproof materials can be used to manage the flood risk to individual buildings. The image below is of a waterproof coating that can be applied retrospectively.

Estimated cost about \$50,000 per dwelling.



AVOIDING DEVELOPMENT, RELOCATABLE DWELLINGS AND MANAGED RETREAT

There are options to limit new development that occurs within a particular area. This could occur at various scales:

- Prevent new sections being created within an area but allow continued development on existing sites;
- Enabling further development provided it is adaptable or relocatable;
- Limit all further development including that on existing sites;
- Prohibit all new or replacement dwellings.

Managed retreat involves the proactive relocation of dwellings prior to a major event. This might be the relocation of a few particularly vulnerable dwellings or it could involve moving a community in its entirety.

