

Coastal Hazard Risk Management and Adaptation Plan Online Workshop Outcomes Summary

WORKSHOP OVERVIEW

Two online community scenario workshops were held on Wednesday 23 February 2022 and Saturday 26 February 2022.

The purpose of the workshop was to work with attendees to identify important assets, understand the consequence of these assets from coastal hazards, prioritise the assets and understand tolerance for adaptation options. The agenda for the workshop is below.

Introductions and Welcome
Project Introduction
Workshop Agenda/Housekeeping
Project Background
Task One: Coastal Assets Identification
Consequence Scale Overview
Task Two: Consequence Scale
Preliminary Adaptation Options Presentation
Task Three: Adaptation Strategy
Wrap up and Next Steps

Task One: Coastal Assets Identification

Task one required participants to identify the assets along the coast that were of importance to them. Assets were identified in three categories: social/cultural, natural/environmental and economic/built. Participants were also required to state *why* these assets were important.

Figure 1 Coastal asset tags from Jamboard (online tool)



Task Two: Consequence Scale

Following a brief presentation around the consequence scale and the impact of erosion on assets, participants were then asked to examine the assets they had identified in Task One and give a rating from 'insignificant' to 'catastrophic' of the consequence that erosion would have on that asset. Due to the nature of the activity, some participants gave an 'emotional' rating, rather than a rating informed by the table below.

Figure 2 Consequence scale

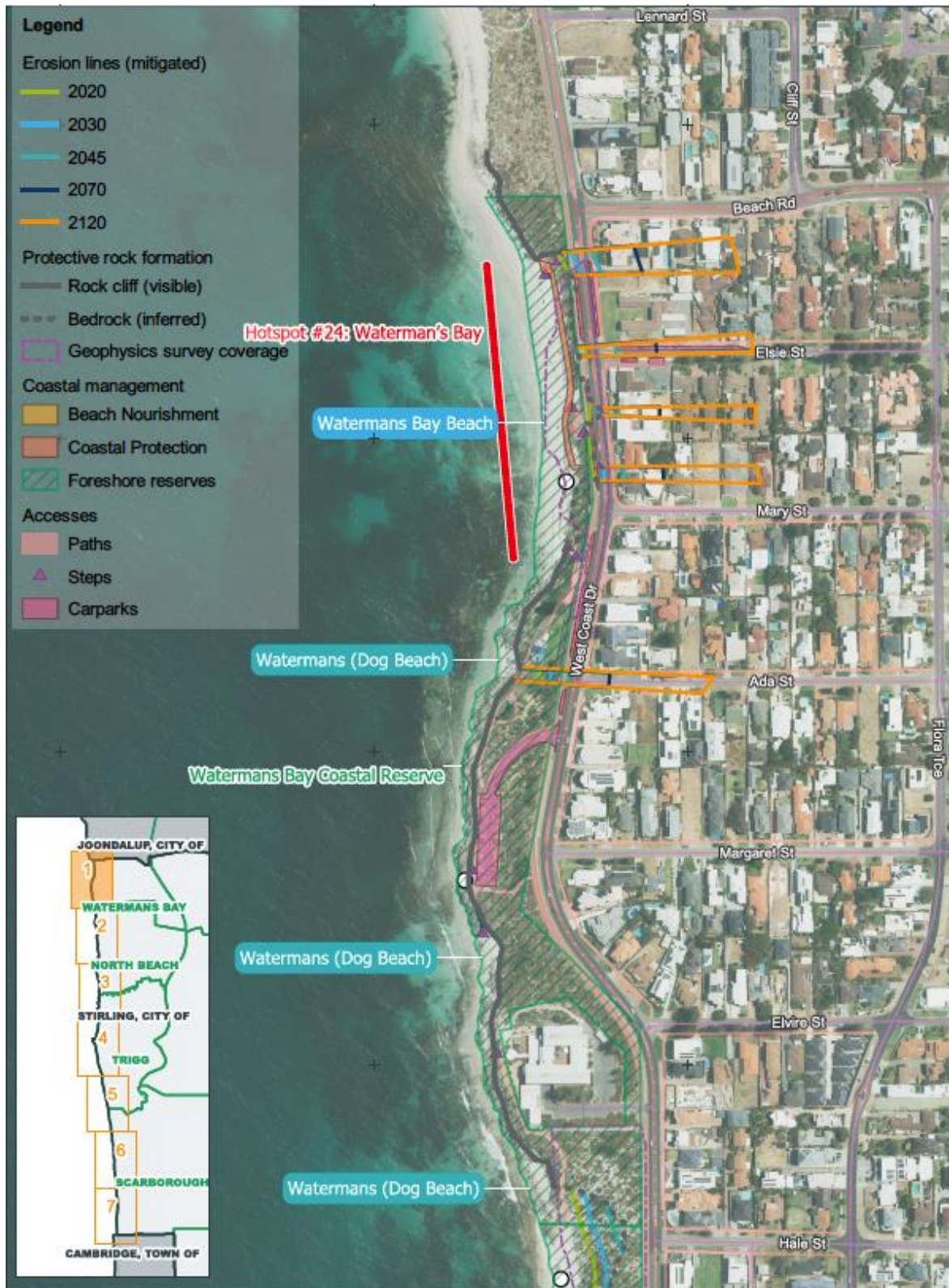
Insignificant	Permanent loss or damage <\$20k	Negligible to no loss of flora and fauna – strong recovery	Minimal short-term inconvenience <\$5% of community affected
Minor	Permanent loss or damage \$20k - \$200k	Short term loss of flora and fauna – strong recovery	Small to medium disruption of function <10% of community affected
Moderate	Permanent loss or damage \$200k - \$2 million	Medium term loss of flora and fauna – recovery likely	Minor long term or major short-term loss of function <25% of community affected
Major	Permanent loss or damage \$2 million - \$5 million	Long-term loss of flora and fauna – limited chance of recovery	Medium term or permanent loss of function <50% of community affected
Catastrophic	Permanent loss or damage >\$5 million	Permanent loss of flora and fauna – will not recover	Long-term or permanent loss of function >75% of community affected

Figure 3 Consequence scale 'stickers' from Jamboard (online tool)

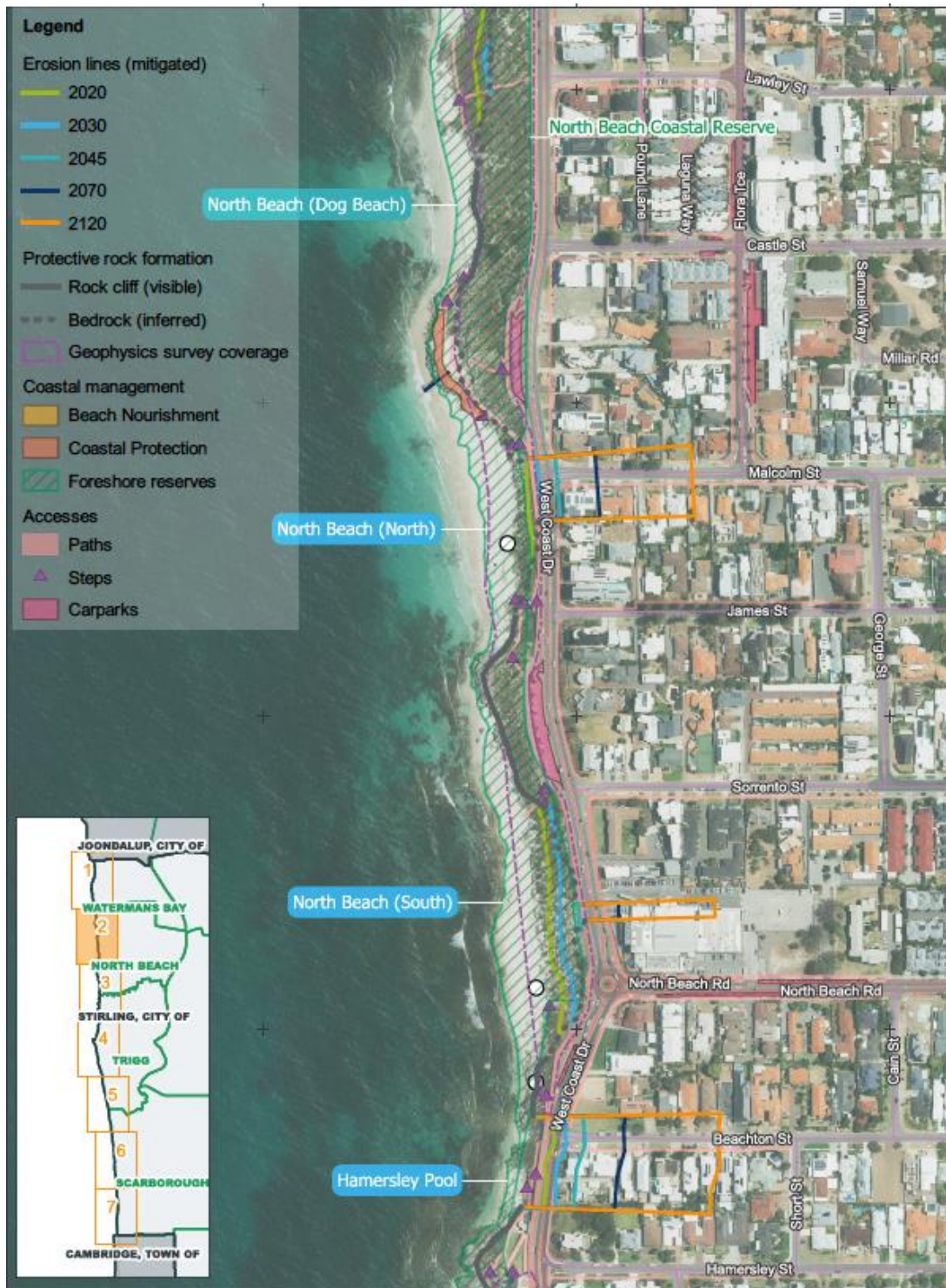


RESULTS FROM ACTIVITIES 1 AND 2

Zone 1



Asset	Asset Type	Why Important	Consequence
			E
Castle street	Environmental	Scenic and historic value	5
Narrowing beach	Environmental		5
Scenic views	Environmental	Locals and tourism	4
Public toilets on Watermans Beach	Environmental	At risk of erosion	4
Watermans Bay Beach	Environmental	Due to erosion half working well but other half not protected	5
Extended sand pillows to cover whole Watermans beach dune	Mix		5
Tourist benefits	Mix	Better looking with power lines dropped all along coast	4
West Coast Hwy	Economic asset	Because I drive there every day	5
Footpath	Economic asset	Cracking near Mettams pool	3
Surfing point/break	Social asset		
Coastal dune, limestone cliff	Environmental	Remnant natural vegetation	4
GSC seawall	Economic asset		3
West Coast Hwy	Economic asset		5
Waterman's Bay	Environmental	Loss of beach through sand erosion	3
Shared path is a problem	Social asset	Bike riders who do not observe protocols	3
Car park	Economic asset		3
Dual use path	Social asset		3
Consider managed retreat for pathways and carparks	Economic asset		
Sandbag protection priority	Economic asset		4
Car parking facilities	Economic asset	As I am about 10kms from the beach so require a place to park my car. I often bring other family members with me so we all arrive in the one car.	4
Sand on beach	Social asset	Like to walk on sand and build sandcastles	5
Indoor showers and toilets	Social asset	As a swimmer, I like to have a shower afterwards and remove my bathers to change into dry clothes, external showers don't allow me to do this	4
Natural reef	Environmental	I like to snorkel and look at the reef, fish, seaweed, shells, etc. it adds interest to swimming in the ocean	5
Sea water	Environmental	Swimming in sea water is highly valued, whilst i do like the Scarborough beach pool, i prefer to swim in sea water	5
West Coast Hwy	Economic asset	Drive there everyday	4
Dune revegetation and sand trapping	Environmental		5
Playground	Environmental		4
Foreshore reserve with grassed area	Environmental	So I can have a picnic in the evening and not have to sit on the sand. Current reserve is enough area	4
Habitat values prioritized all along Stirling coastline	Environmental		5



Asset	Asset Type	Why Important	Consequence
			E
Infrastructure - services underneath footpath	Economic asset		5
Exposed reefs	Environmental	Abalone	5
Hamersley Pool	Social asset	Popular swimming	5
Jetty	Social asset	Used regularly by community	3
Shared path	Social asset	Problem with bike riders who do not observe protocols	3
Beach access	Social asset		4
Hamersley Pool change rooms	Social asset	Valued community asset	4
Sand on beach	Social asset	Nice to lay on sand, as well as entering the water via the sand without tripping on rocks	4
Sand on beach	Social asset	Hamersley is such a small beach, it is great just to get in the water when the waves are too high at other beaches or when Mettams is eroded	
Indoor shower facilities	Social asset	Hamersley has a small protected shower for women, would like this to be maintained. Possibly add a privacy cover as the shower is a bit exposed	4

Zone 3



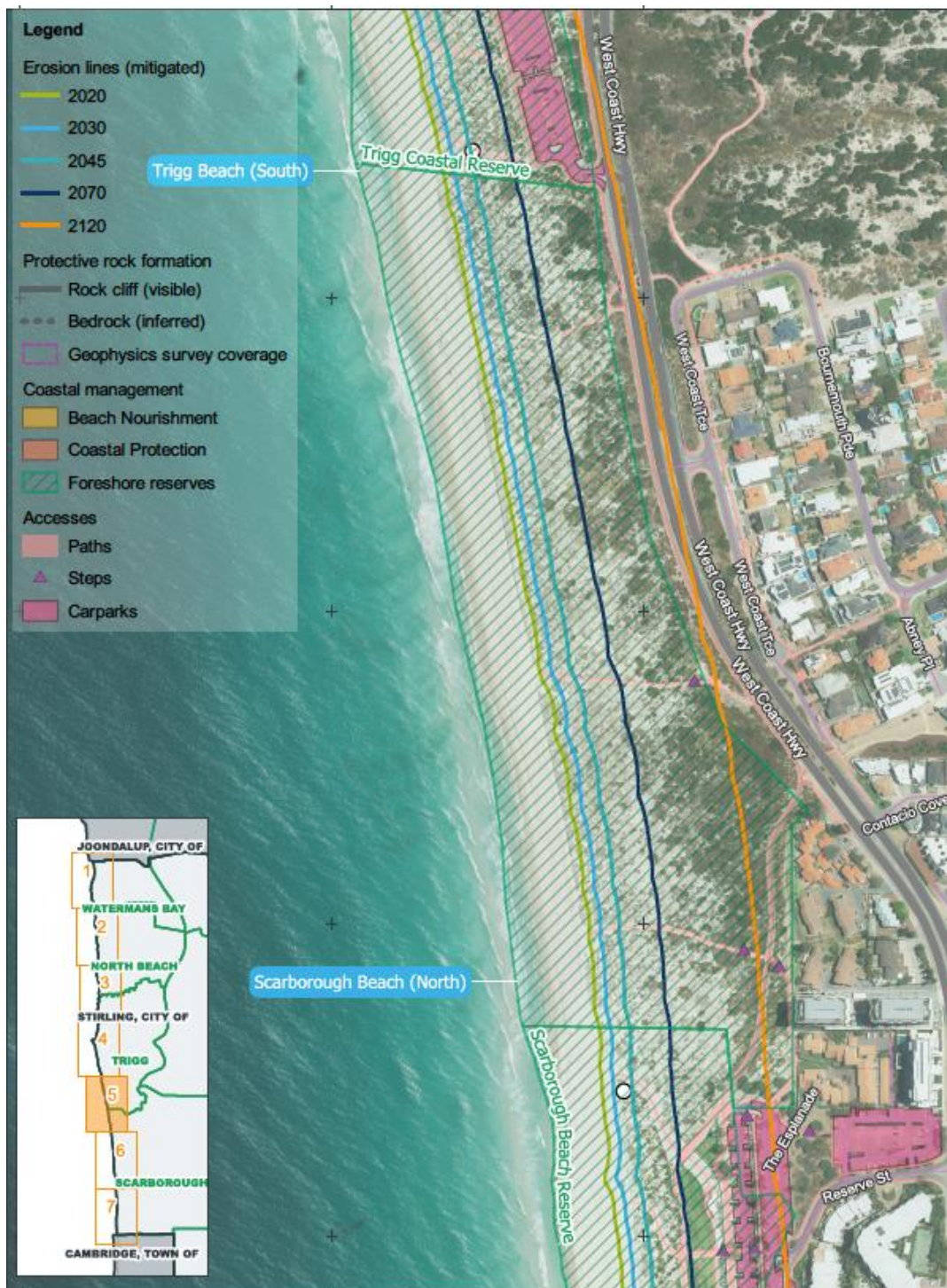
Asset	Asset Type	Why Important	Consequence
			E
Mettams Pool	Environmental	Protected for future generations	5
Exposed reef under marine area, reef underlying sand	Environmental		4
Mettams Beach dune erosion and vegetation loss plus rock exposure	Environmental	High risk to personal safety, noting profile of young families and older people	4
Mettam Beach stair and ramp access	Social asset	Not disability compliant	4
Shared path	Social asset	Problem with bike riders who do not observe protocols	3
Sandbag protection	Environmental		
Mettams pool area	Environmental	For children learning how to swim	5
Access to pool	Social asset	I swim here every day through the whole year, the reef stops (most of the time) large dumping waves, so you can swim here any time	5
Carpark	Economic asset	I travel to Mettams every day via car as i live 10kms away, going by public transport is difficult as it takes too long.	3
Shower and toilet facilities	Social asset	Mettams, the current facilities (indoor) are excellent and I don't think these need changes. I like to have a shower and remove my bathers as you get covered in seaweed and it is itchy, so being able to access an indoor shower is essential	4
Natural environment	Environmental	Want the natural environment retained at Mettams, i like seeing the lizards and snakes, the birds etc they add to the beauty of the area, I dont think any further infrastructure is required	5
Rock	Environmental	Don't mind rocks at Mettams as probably only thing stopping whole beach eroding, would just like method of getting into water safely when beach is eroded. The old ramp was good - bit slippery at times but ramp needed ladder to get into water	3
Food and drink	Economic asset	Casual access to reasonably priced food and drink that can be consumed at the premises or taken away. Yelo meets this requirement, when the high rise takes over this location, would like a similar.	3

Zone 4



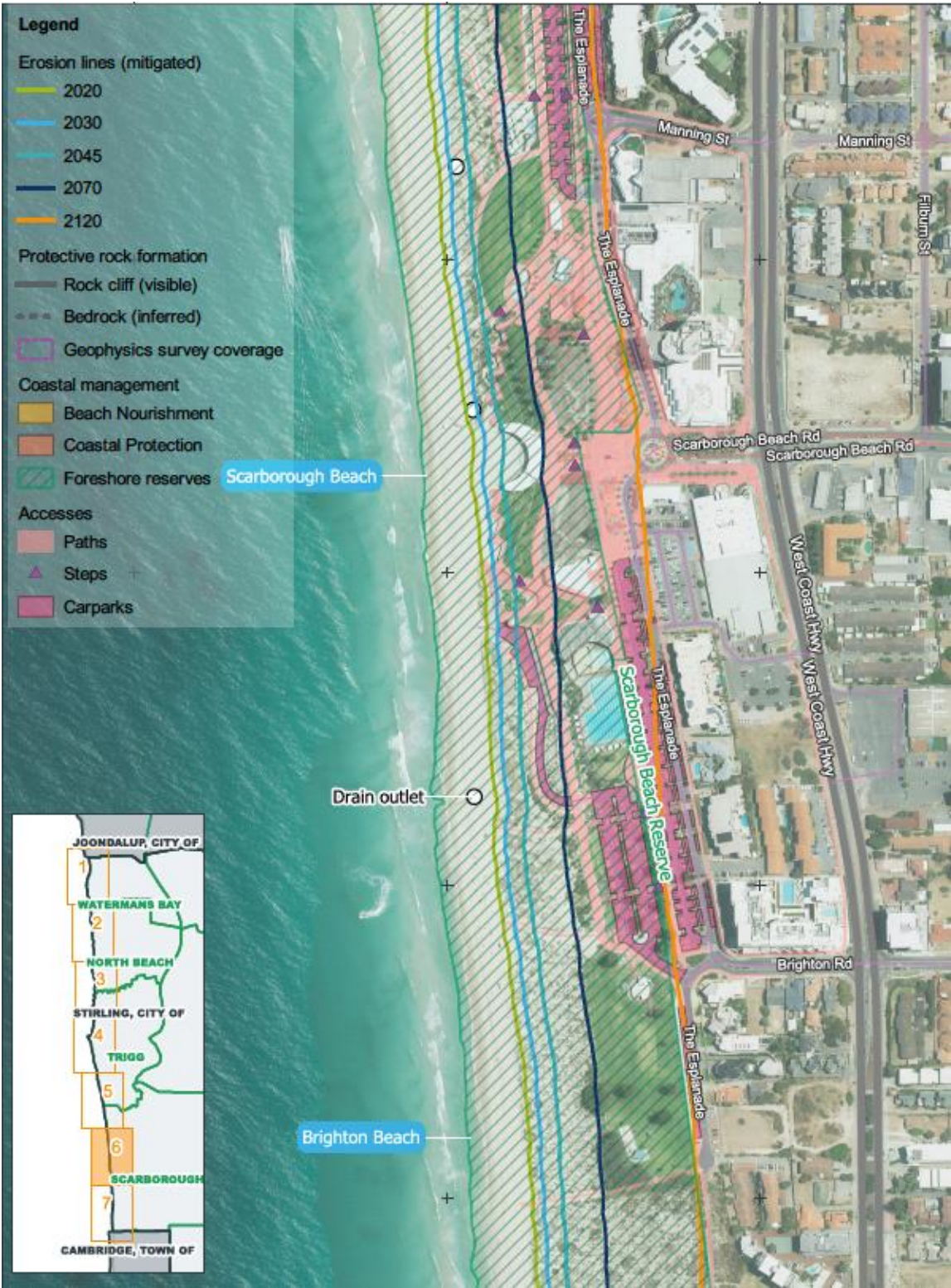
Asset	Asset Type	Why Important	Consequence
			E
Trigg lifesaving/café and park area	Economic asset	Valued to all	5
Marine Park	Environmental		5
Sand between Trigg and Scarborough vulnerable	Environmental	Protect vegetation	5
Social value of beach and tourism	Social asset		5
Economic values, Scarborough Beach	Economic asset		5
Limited parking but need to limit hard stand area	Economic asset	Allow opportunities for nearby parking to minimise impact on coast	
Shared path	Social asset	Problem with bike riders who do not observe protocols	3
Surf club	Social asset		4
Retail	Economic asset		4
Surf beach	Environmental		5
Path	Social asset		4
Carpark	Economic asset		4
Surfing WA	Social asset		4
Beach, sand	Environmental		5
Beach, sand	Social asset	Mental health etc.	5
Sand on beach	Social asset	Walking on beach	5

Zone 5



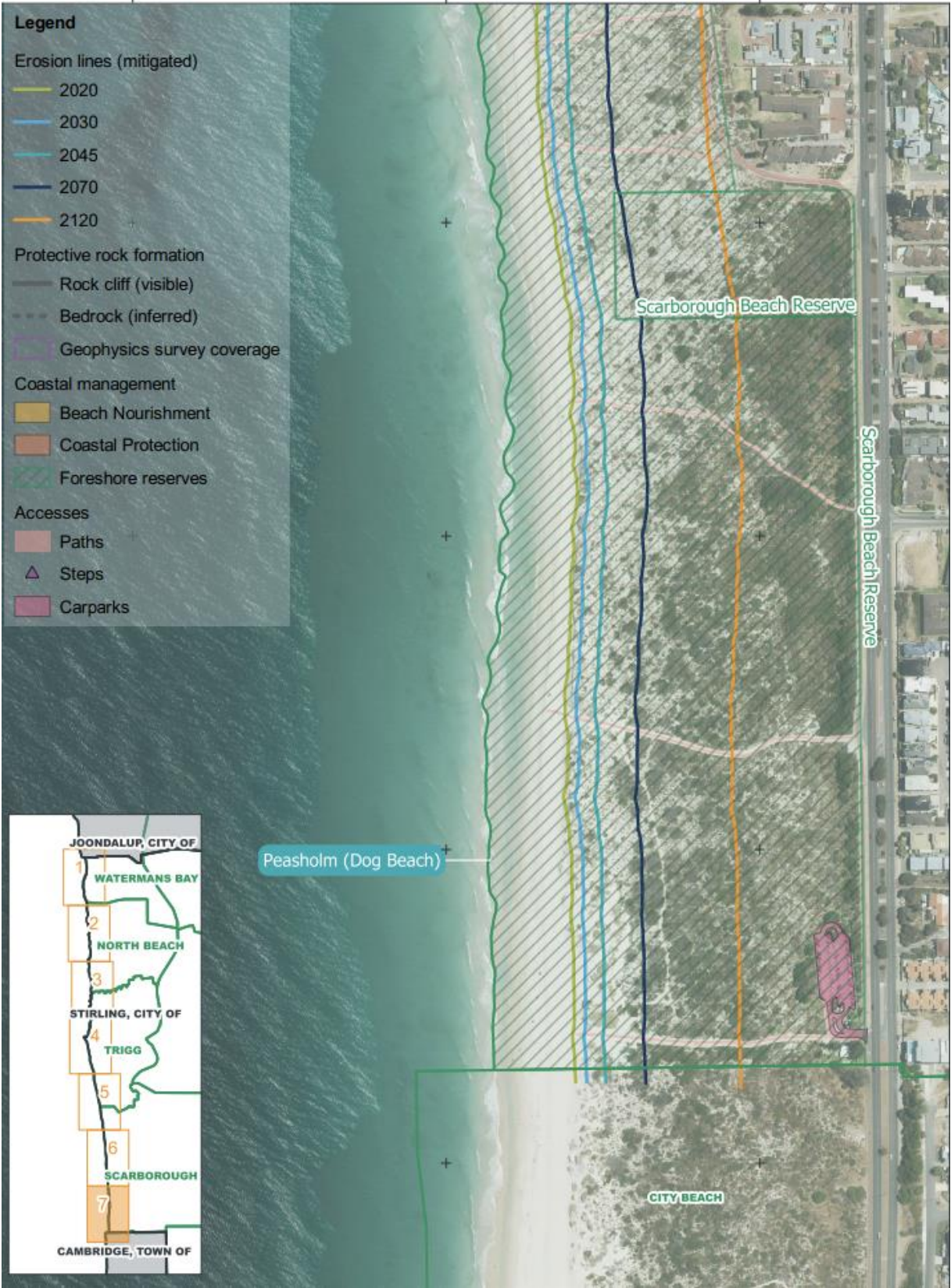
Asset	Asset Type	Why Important	Consequence
			E
Carpark	Economic asset		4
West Coast Highway	Economic asset		5
Shared path	Social asset	Problem with bike riders who do not observe protocols	
Surf beach	Environmental		5
Foreshore reserve	Environmental		5
Beach access	Social asset		1
Carpark	Economic asset		5
Rock pools of Trigg	Environmental	Recreation for family	5
Dunall vegetation	Environmental		5
Carparks	Economic asset	Accessibility to areas	3
Walkways and car parks	Economic asset	Propose purchase of land east side of road	4

Zone 6



Asset	Asset Type	Why Important	Consequence
			E
All new facilities are part of foreshore redevelopment	Social asset	Focus on core area of Scarborough Beach	
Parking	Economic asset	Reconsider where these areas are to minimise impact on sand dunes	4
All public facilities need to be protected	Economic asset	Tourist and local drawcard	5
Park and foreshore reserve	Environmental		5
Shopping centre	Economic asset		
Beach showers	Social asset		4
Pool	Social asset		5
The Esplanade	Economic asset		5
Carpark	Economic asset		4
Surf Beach	Environmental		5
Park and foreshore reserve	Environmental		5
Lawn areas for recreation	Social asset		5
Critical ecosystem, fauna habitat, Bush Forever site	Environmental		5
Sand on the beach	Social asset	Like to walk along the beach, access to the water via sand, laying on the sand, building sandcastles, taking grandchild to the beach and enjoying playing on the sand.	5
Family infrastructure	Social asset	Safe area for families, recreation, mental health	4
Tourist activities	Economic asset	Carefully designed infrastructure that protects dune system	4
	Economic asset	Protect what's there now, however don't allow new major assets that will be vulnerable	
Indoor toilets and showers	Social asset	Ability to access indoor facilities is important so that I can get changed	4

Zone 7



Asset	Asset Type	Why Important	Consequence
			E
Foreshore reserve	Environmental		5
Shared path	Social asset	Problem with bike riders who do not observe protocols	3
Dual use path	Social asset		4
Foreshore reserve	Environmental		3
Dog beach	Social asset		4
Dual use path	Social asset		1
Vegetation and dunes	Environmental	Retain areas and beach, walk along beach from Scarborough	5
Dune system	Environmental	Health, pigface, spinifex, biodiversity value, protecting other up dune assets, bird life, coast line/water edge - awareness of coastal values	5

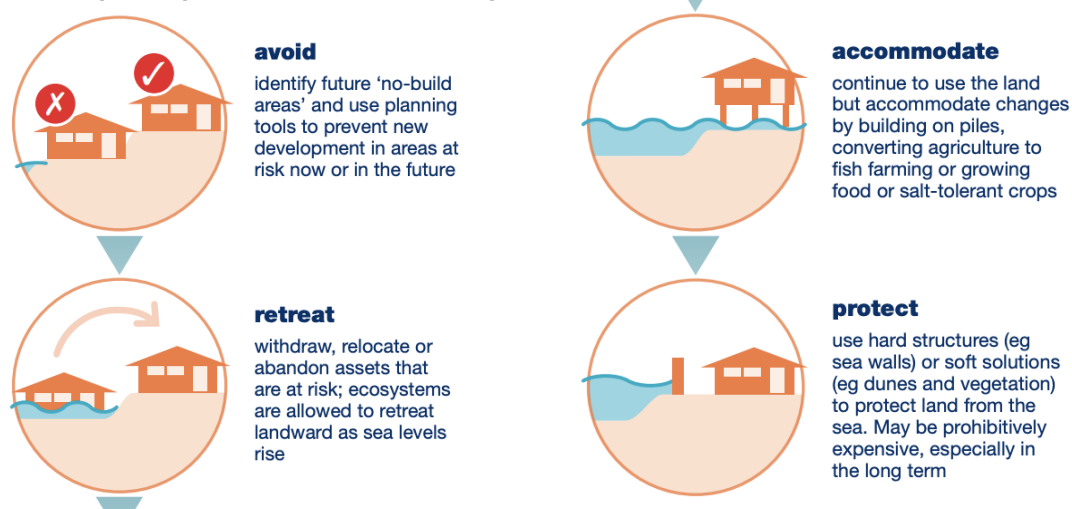
Task Four: Adaptation Strategy

The final workshop task involved developing adaptation strategies and preferred options for prioritised assets. Adaptation approaches and examples were presented to assist with this task, although it was made clear participants could also suggest other adaptation strategies.

The first step was for participants at the table to identify the priority asset/s (the one with the most dots) and then identify which of the four adaptation strategies they wanted to implement to mitigate the risk of erosion and inundation.

They then had to identify an adaptation option or idea they preferred be implemented. They could either choose one of the options presented or develop their own.

Adaptation options presented at the workshop



Workshop results

Asset / location: Foreshore Reserve (Zones)	
Type of asset	Environmental
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> Sand nourishment/revegetation of dunes Groynes Sea wall as a last resort option

Asset / location: West Coast Drive / shared path	
Type of asset	Social Economic/infrastructure
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> Protect via a sea wall or a break water

Asset location: Scarborough Foreshore (Zone)	
Type of asset	Environmental Social Economic/infrastructure
Preferred adaption strategy	Accommodate Protect

Adaption management option ideas	<ul style="list-style-type: none"> • The use of groynes to protect the natural assets / coastline • Multi-function use - protect, visual appeal, habitat for wildlife (fish) • Accommodate new development through design (stilts) • Artificial reef to reduce impact of storm surge/waves
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Asset / location: Mettams indoor shower, toilet and change room

Type of asset	Social
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Retain current facilities

Asset / location: Beach / natural reef (Zone 1)

Type of asset	Environmental
Preferred adaption strategy	Accommodate Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Physical intervention - beach nourishment • Explore alternative measures, subject to further investigations (i.e. groynes / breakwaters) • Improved beach access - especially in winter

Asset / location: Swimming area (Zone 3)

Type of asset	Environmental
Preferred adaption strategy	Accommodate Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Beach nourishment or replenishment • Groynes • Offshore breakwater • Accommodate a ramp with ladder for accessibility

Asset / location: Foreshore reserve (All zones)

Type of asset	Environmental
Preferred adaption strategy	Avoid
Adaption management option ideas	<ul style="list-style-type: none"> • No further development of foreshore reserve • Erosion line up to private properties - major concern/urgency

Asset / location: Scarborough Surf Life Saving Club

Type of asset	
Preferred adaption strategy	Planned or managed retreat
Adaption management option ideas	<ul style="list-style-type: none"> • First established in a way that will allow them to be relocated/re-built inclusive of facility services

Asset / location: Trigg Surf Life Saving Club

Type of asset	Social Economic/infrastructure
Preferred adaption strategy	Planned or managed retreat
Adaption management option ideas	No response

Asset / location: Scarborough Beach (Zone 6)	
Type of asset	Environmental Social
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Breakwater/groynes • Priority is to protect Scarborough

Asset / location: Scarborough Beach	
Type of asset	Environmental Social
Preferred adaption strategy	Shipwreck offshore
Adaption management option ideas	<ul style="list-style-type: none"> • Considerable sand movement along this area • Groins have been used, however impact on the down wave zone • Take into consideration the whole area, don't impact on areas north and south

Asset / location: Exposed reef area, some reef under permanent	
Type of asset	Environmental
Preferred adaption strategy	No response
Adaption management option ideas	<ul style="list-style-type: none"> • Ensure clarity of information is first provided and then make decision (City says have funding for coastal monitoring onshore and offshore)

Asset / location: Change rooms, public toilets, showers	
Type of asset	Social Economic/infrastructure
Preferred adaption strategy	Accommodate
Adaption management option ideas	<ul style="list-style-type: none"> • Design assets to withstand coastal hazards

Asset / location: Services and infrastructure under	
Type of asset	Economic/infrastructure
Preferred adaption strategy	Protect Retreat
Adaption management option ideas	<ul style="list-style-type: none"> • Big question mark about this, not enough people providing thoughts • Consider volumes etc north south

Asset / location: Beach access (Zones 1-4)	
Type of asset	Social
Preferred adaption strategy	Planned or managed retreat Accommodate
Adaption management option ideas	<ul style="list-style-type: none"> • Designs to withstand coastal processes (engineering solution) • Access ramps integrated with sandbags - integrated solution • Removing assets where beach access is less appealing, and the asset is no longer sound/safe

Asset / location: West Coast Highway	
Type of asset	Economic/infrastructure
Preferred adaption strategy	Accommodate Managed

Adaption management option ideas	<ul style="list-style-type: none"> • One-way direction, part time or full time • Future recreational access • Accidents associated with footpath
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Asset / location: Mettams Beach (Zone 2)

Type of asset	Environmental
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Protecting accessways

Asset / location: West Coast Drive (All zones)

Type of asset	Economic/infrastructure
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Protect natural environment (dunes, foreshore reserve) through artificial structures and natural treatments (i.e. breakwater, beach nourishment, revegetated dunes, etc.).

Asset / location: Sand pillows Waterman Beach

Type of asset	Environmental
Preferred adaption strategy	Protect
Adaption management option ideas	<ul style="list-style-type: none"> • Reconsider stormwater runoff and their impacts (erosion) • Water run off pathways into built walls and down the slope • Extending the sand pillows down the beach