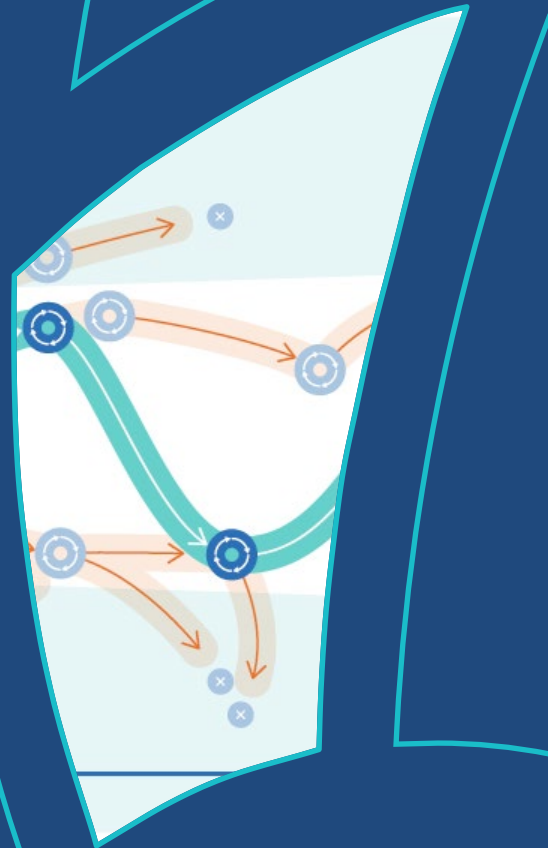




Victoria's Resilient Coast: Adaptation Pathways Templates

Department of Energy, Environment and
Climate Action (DEECA)
20 December 2023
A12538

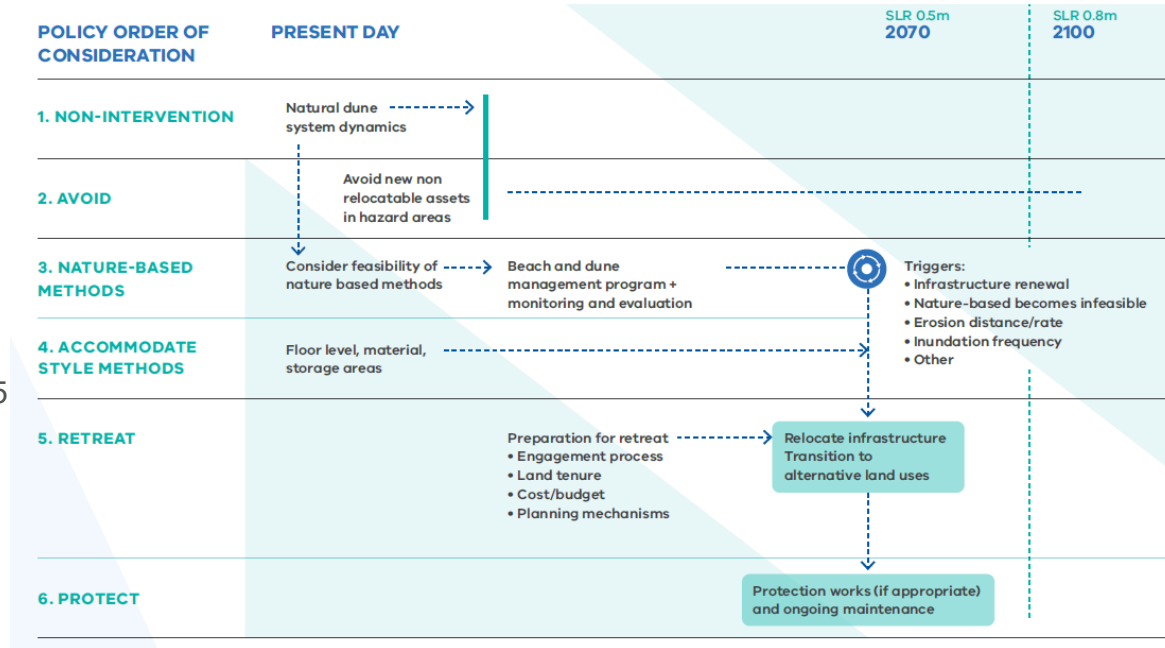


Document Control

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Reviewer	Christian Taylor
Project Manager	James Mason

Introduction

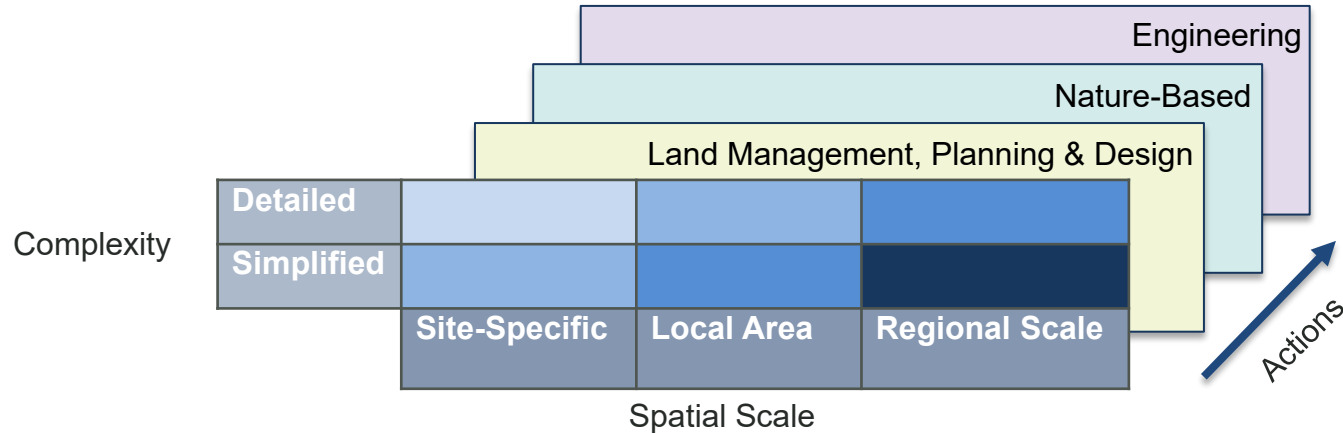
- DEECA engaged BMT to develop a set of example Adaptation Pathways Templates to support coastal hazard adaptation planning in Victoria.
- A pathways approach provides a ‘road map’ for adaptation from present day to a long-term planning horizon. It enables a range of feasible actions to be identified, and their relative sequence, timing, and triggers for implementation in reducing current and emerging coastal hazard risk.
- An adaptation pathways approach forms Stage 5 of the Victoria's Resilient Coast (VRC) Guidelines¹, in accordance with the Marine and Coastal Policy² (MACP).
- The example adaptation pathways should be considered and applied with reference to the Adaptation Actions Compendium³. The compendium provides detail on the range of adaptation actions that can be included in a pathway.



Example Adaptation Pathways from Victoria's Resilient Coast Guidelines – Adapting for 2100+¹

Range of Adaptation Pathways Templates

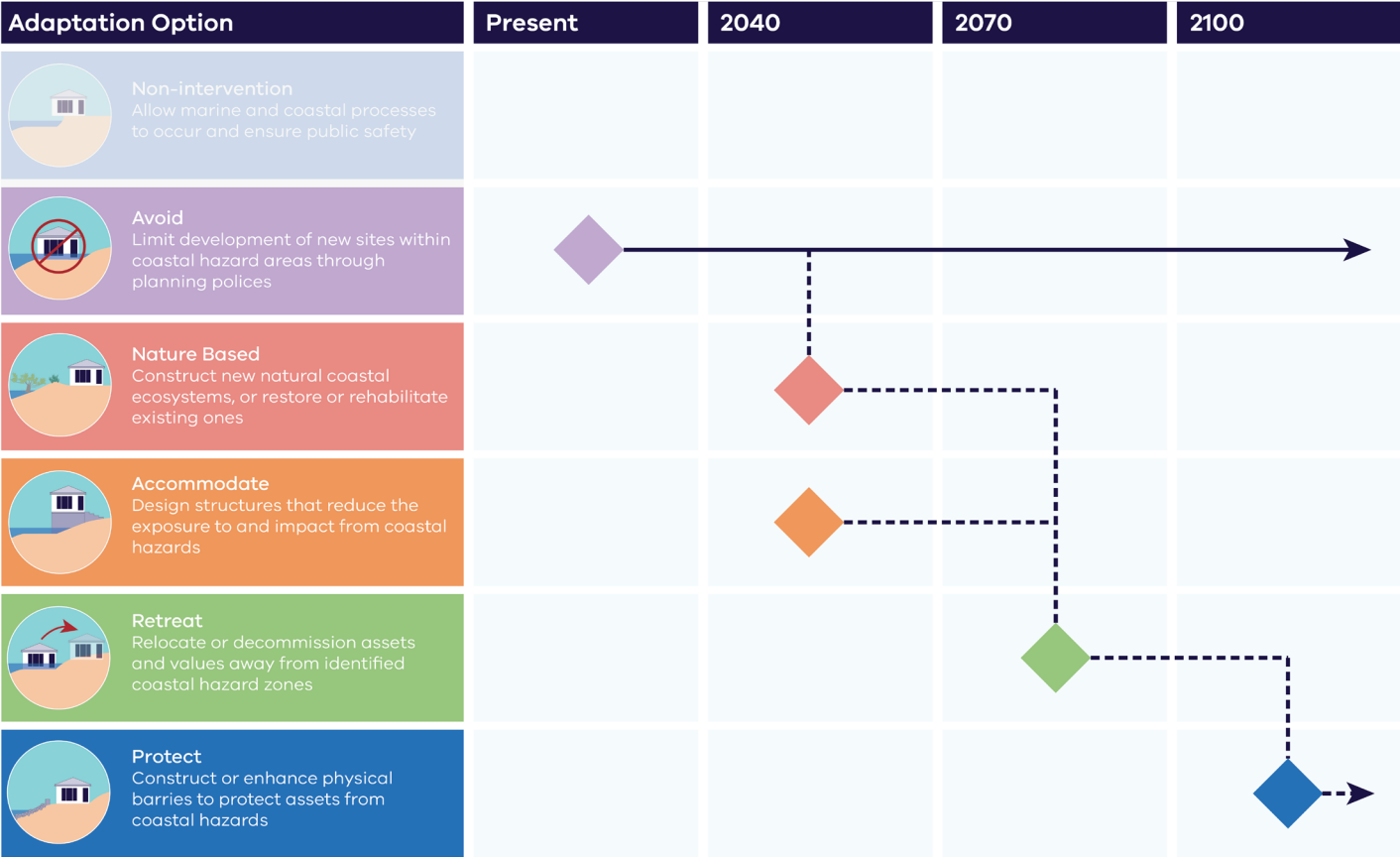
- Adaptation pathways can be developed and presented in various ways for different management contexts.
 - This can range from simple pathways focused on site specific needs or regional planning concepts, to more complex pathways that include a diversity of actions, details and triggers for change. This is illustrated in the “Range of Applicability” Matrix below.



- From this matrix, seven adaptation pathways templates, all varying in complexity, scale and actions have been created.
 - Elements from any example template are encouraged to be added and used interchangeably between templates, to suit the needs of specific projects.

Template 1

Template 1 is designed to be simplistic both visually and conceptually. Pathways and timelines are straightforward, and the adaptation options maintain generic descriptions in line with MACP hierarchy and are supported with graphics to further describe them. Trigger points and risk levels are not included to maintain simplicity, though could be detailed separately. The template is ideal for presentation to community and land managers, showing the options considered and the sequence and timing that actions may occur.



LEGEND

 Action commences

 Recommended adaptation pathway

 Alternative adaptation pathway

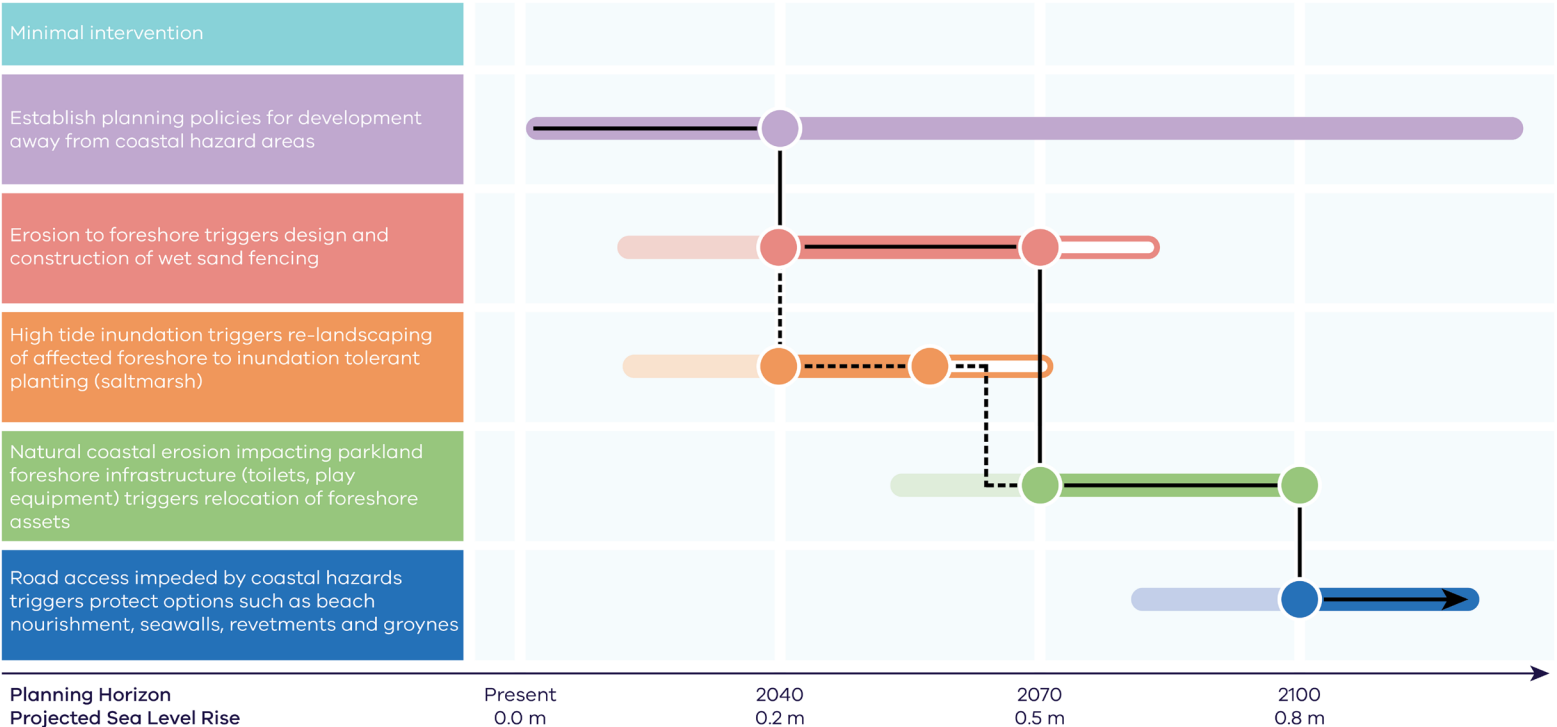
Template 2

Template 2 adds features like alternative pathways, decision points, and preparation and effectiveness time frames though remains high level describing the adaptation options and triggers. Wording becomes more concise and specific, and not as visually dependent as Template 1, with the removal of the graphics. The inclusion of a summary adaptation pathway textbox provides opportunity to outline the preferred adaptation pathway.

Adaptation Option
Minimal intervention
Establish planning policies for development away from coastal hazard areas
Erosion to foreshore triggers design and construction of wet sand fencing
High tide inundation triggers re-landscaping of affected foreshore to inundation tolerant planting (saltmarsh)
Natural coastal erosion impacting parkland foreshore infrastructure (toilets, play equipment) triggers relocation of foreshore assets
Road access impeded by coastal hazards triggers protect options such as beach nourishment, seawalls, revetments and groynes

Adaptation Pathway Summary

The recommended adaptation pathway is continuing to avoid placing new uses and development in current and projected coastal hazard areas. Where development has occurred, construction of wet sand fencing and resilient foreshore vegetation should commence by 2040. From 2070, likely increased risk to coastal inundation will require staged relocation of parkland and foreshore infrastructure away from hazard zones. By 2080, planning should commence for construction of hard engineering structures to protect critical (non-relocatable) road access from erosion risk and be implemented by 2100.



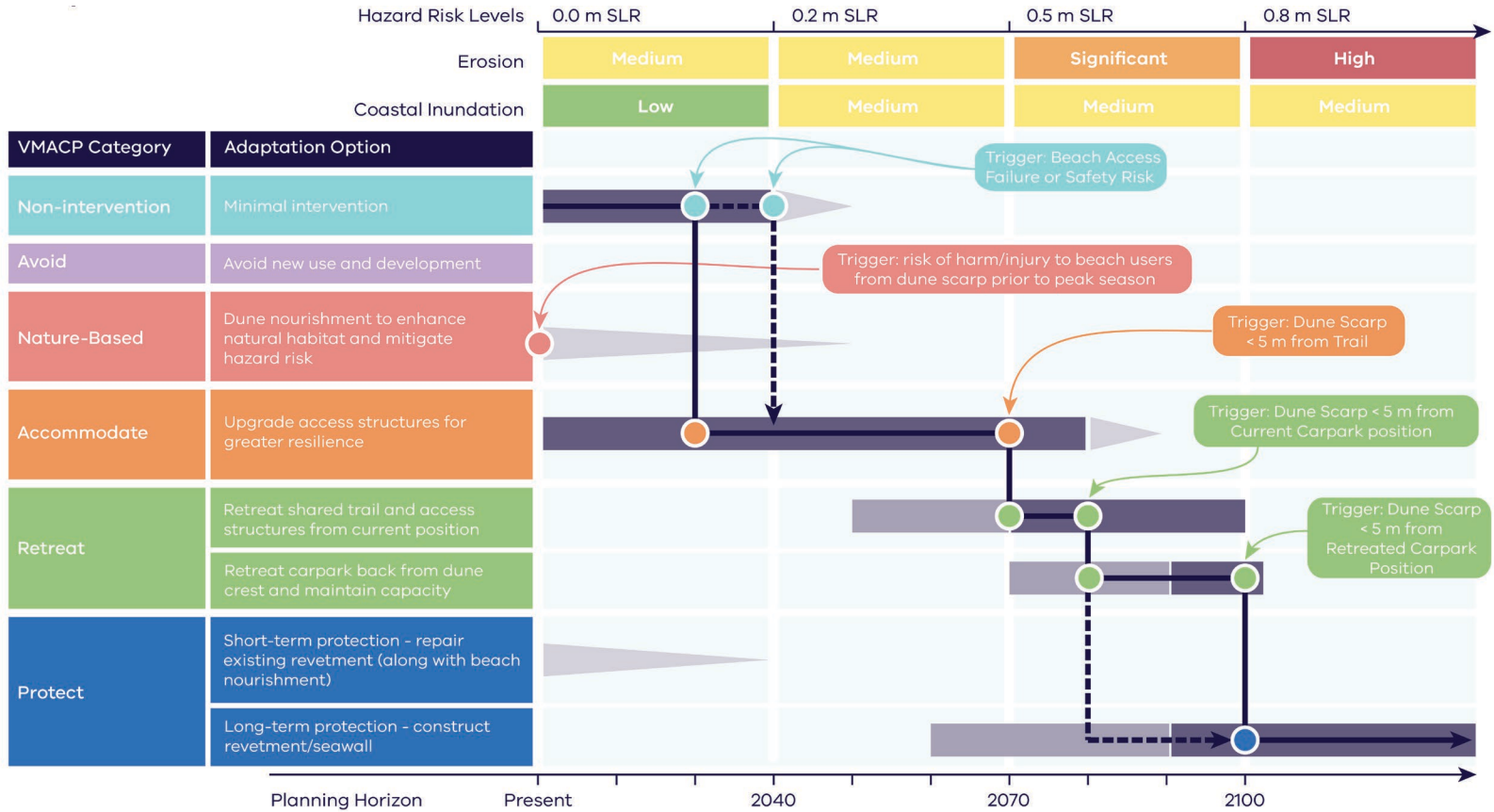
Planning Horizon
 Projected Sea Level Rise: Present (0.0 m), 2040 (0.2 m), 2070 (0.5 m), 2100 (0.8 m)

LEGEND
 ● Decision point (when trigger value is reached)
 — Recommended adaptation pathway
 - - - Alternative adaptation pathway
 — Option preparation time
 — Option effective timeline
 — Option reducing in effectiveness
 ■ Non-intervention
 ■ Nature Based
 ■ Accommodate
 ■ Avoid
 ■ Retreat
 ■ Protect



Template 3

Template 3 adds further complexity and features with multiple options within the MACP hierarchy and multiple pathways, as well as triggers to explain decision points. Risk levels are also included alongside the planning horizons and projected sea level rise to show the vulnerability to coastal hazards with time. This template is intended for use on a local scale with a focus on actions and decision making.



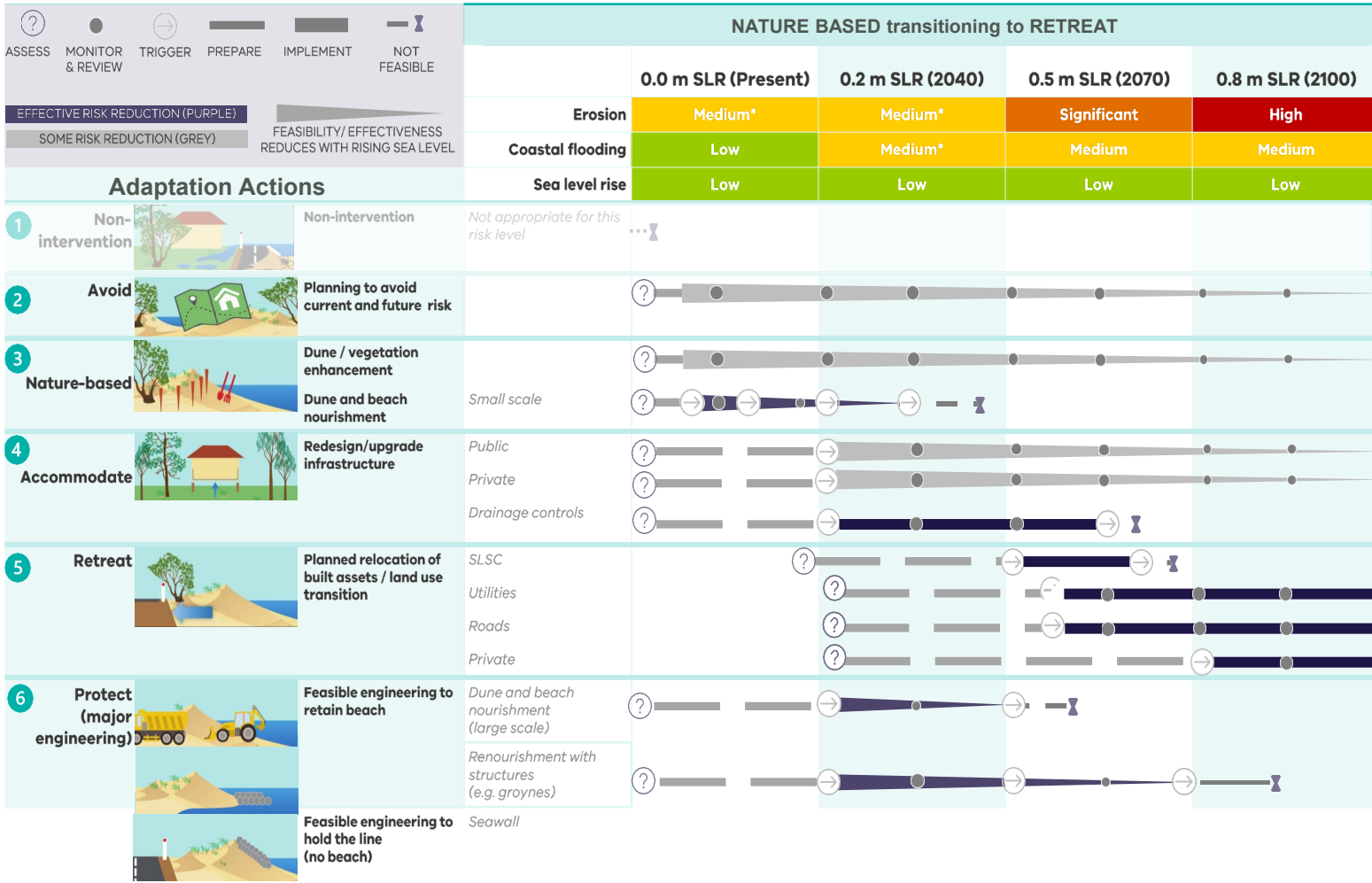
LEGEND

- Non-intervention
- Avoid
- Nature Based
- Retreat
- Accommodate
- Protect
- Necessary option preparation time
- Approximate option effective lifetime
- Time when option is reducing in effectiveness
- Recommended adaptation pathway
- Alternative adaptation pathway
- Decision point (when trigger value is reached)



Template 4¹

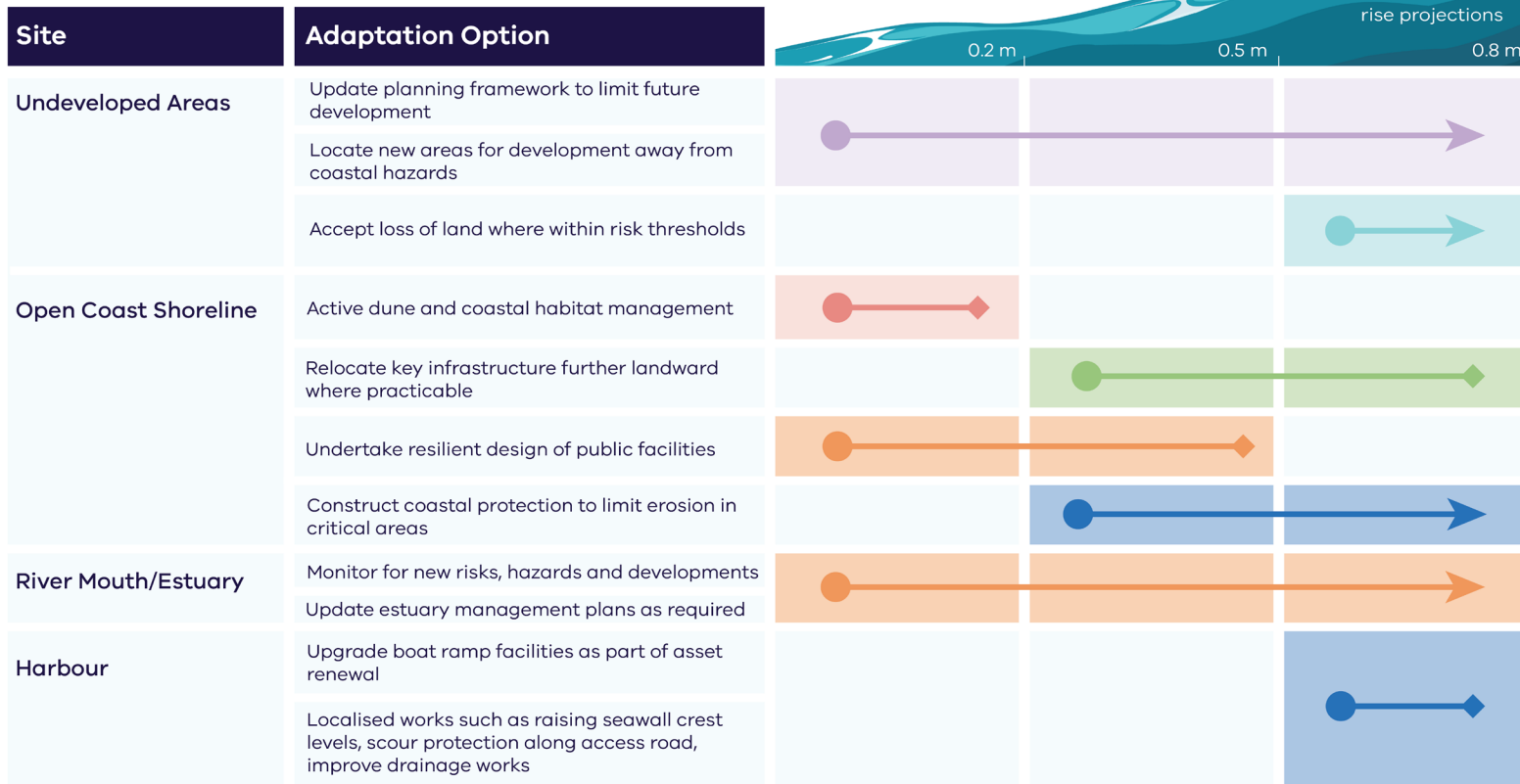
Template 4 is a combination of Template 3 and Template 1 blending the complexity of the pathway's options with clarity through visual design and graphics. The template includes the risk scale, multiple options with multiple pathways, and preparation and effectiveness time. The template limits wording around triggers or the preferred adaptation pathway to maintain the presentation theme. This style is useful for working through the detail with collaborative project partners.



¹Example template provided by Alluvium Consulting

Template 5

Template 5 groups the adaptation options by site, rather than by option, and is intended for regional studies with many sites of interest. Adaptation pathways are presented within each site and can be made as detailed or as simplistic as needed. The template can include details on triggers, decision points, and option effectiveness for a larger study.



LEGEND

Non-intervention
Avoid

Nature Based
Accommodate

Retreat
Protect

●→ Option continues effectiveness
●→ Option is no longer effective



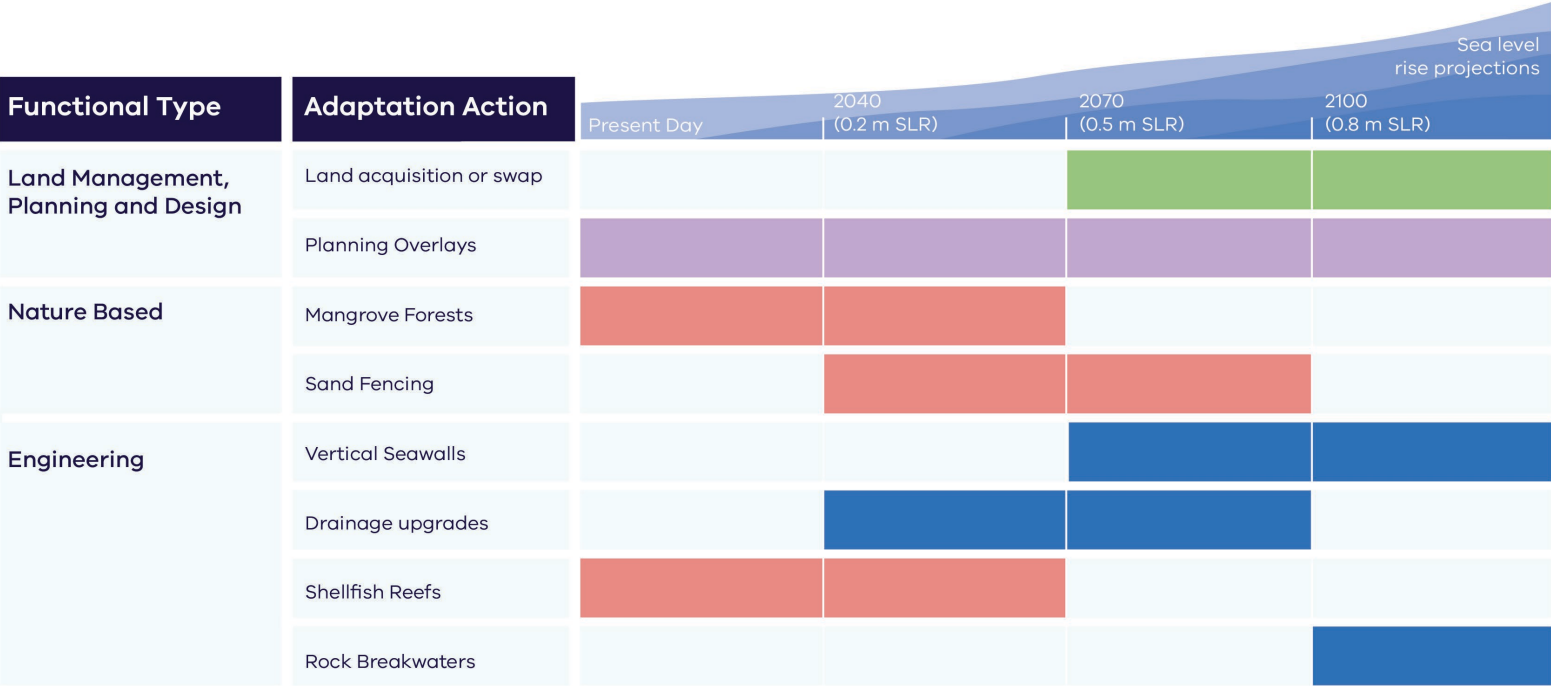
Template 6

Template 6 sorts options by Functional Type as per the VRC Guidelines and the Adaptation Actions Compendium. The template is designed to allow more details on more options of varying planning horizons and is ideal for regional scale discussions.

Functional Type	Present Day	2040 (0.2 m SLR)	2070 (0.5 m SLR)	2100 (0.8 m SLR)
Land Management, Planning and Design	Prepare a special area adaptation plan for the foreshore including options for relocation/ modification of built foreshore assets in the erosion hazard areas (lifesaving club, cafe, other assets)		Review road access viability for disaster management purposes	
		Review planning provisions and conditions for areas vulnerable to coastal hazards		
Nature Based	Undertake dune protection and enhancement		Maintenance of nature based approaches where implemented	
		Plant seagrass meadows and mangrove forests		
Engineering	Undertake beach nourishment	Monitor beach widths and levels	Undertake beach nourishment	
	Implement drainage upgrades			Design and construct buried seawall aligned to access road

Template 7

Template 7 is an alternative to Template 6, where descriptive text is removed and replaced with colour codes based on the MACP Adaptation Option hierarchy. The template is designed to list many adaptation actions under each Functional Type, along with their timeline feasibility and map out an Adaptation Pathway, making it an ideal use in a preliminary options analysis stage.



LEGEND

- Non-intervention
- Nature Based
- Retreat
- Avoid
- Accommodate
- Protect





Level 5
99 King Street
Melbourne
VIC 3000
Australia
+61 (0) 3 8620 6100

Registered in Australia
Registered no. 010 830 421
Registered office
Level 5, 348 Edward Street,
Brisbane QLD 4000 Australia

For your local BMT office visit www.bmt.org

Contact us

enquiries@bmtglobal.com
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