

# 6. Coastal hazard adaptation actions

## Ugar

### Community overview

Community	English name	Cluster	Type
Ugar	Stephen	Eastern	Continental volcanic and granitic rock islands

Ugar is part of the eastern island cluster of the Torres Strait. The island is 0.4 km<sup>2</sup> and has a population of around 69 people (ABS, 2021). It is a volcanic type island and therefore is relatively elevated with the majority of the island 20 to 30 m above sea level. Ugar is situated within a large reef system just over 25 km<sup>2</sup> in size, which provides protection from significant waves and currents, mitigating the wave energy that reaches the shoreline.

While the majority of the island is over 5 m above sea level, including the sites where the school, health centre and services are located, there are a number of buildings including the IBIS store, church, and barge ramp located on the north eastern facing beach.

Key infrastructure on Ugar includes::

- Helipad
- Regional council office
- State school (years pre-prep to year 7)
- Guest house (5 rooms)
- Barge ramp
- Pier (small craft and passengers)
- Council workshop/compound
- Sporting facilities – indoor and outdoor multipurpose courts
- IBIS store
- Anglican Church
- Water facility
- Health centre
- Telstra phone tower
- Ergon power facility
- Landfill site
- TSIRC units (three units) include the school, health centre, helipad, and public utilities infrastructure (electricity, water, waste).



## Risk

The Ugar community is currently considered low to medium risk from coastal hazards, with the risk not significantly increasing within the planning horizon of this strategy. The risk from erosion is expected to increase to high with the effects of a groyne potentially causing downdrift erosion to the west of the barge ramp. There are also some culturally significant sites such as the old cemetery that have experienced erosion and are at higher risk.




### Coastal hazards risk profile for Ugar from present day to 2100

Ugar Risk Profile	Present Day	2050	2100
Open coast erosion	Medium	Medium	High
Tidal inundation	Low	Low	Medium
Storm tide inundation	Low	Medium	Medium

## Adaptation response

A strategic adaptation response has been developed for Ugar to guide decision making over multiple planning horizons from present day to 2100. Based on the risk assessment and risk profiles for each hazard across the planning horizons, the adaptation response for Ugar is to “monitor” through observing changes to individual asset’s capacity to withstand hazards and reviewing risk, with the approach being implemented in the present day and into 2050. By 2100, increased risk will trigger the adaptation response to actively manage identified risks, through a range of initiatives including education, nature based and structural engineering solutions.

### Adaptation response profile for Ugar

Present day	2050	2100
<b>Monitor (look and learn)</b> 	<b>Monitor (look and learn)</b> 	<b>Actively manage</b> 

## Adaptation pathways and priority actions

Key Management Areas (KMAs) have been defined based on which areas are most at risk, as well as feedback from community leaders and are mapped below. Tailored adaptation pathways for each key management area on Ugar are presented in the following pages.

Building on the outcomes of the risk assessment, adaptation response, and input from community leaders, specific priority adaptation actions have been developed to protect and enhance assets and coastal values in the Ugar community, as well as enhance community stewardship and improve decision-making. These actions are designed to progress the community along its adaptation pathways.



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### FRONT BEACH

#### Overview of assets and values at risk

- This has the barge landing, an IBIS store, church and a residence on the low coastal fringe.
- Due to the apparent longshore movement of sand from east to west around the island, the bay in front of the church is eroding as it is down drift of the groyne at the western end of the barge ramp facility.
- It is unknown whether the dredged section of the reef flat has caused any changes to the island.
- Known protection works on the island include:
  - Rock groynes at barge ramp
  - Seawall of unknown origin in front of some structures along the main beach
- At this stage, there are no planned works.



#### Pathway description

In the Front Beach area of Ugar, the adaptation pathway starts with maintaining existing coastal protection and dune management. As trigger points are reached, the community can actively manage erosion by importing sand for beach nourishment, or constructing new seawalls or revetments. Decisions will be made at each trigger point to determine the best course of action, which may involve developing a more detailed action plan or relocating assets. Throughout the process, ongoing custodianship and monitoring should be maintained, avoiding new development in hazard-prone areas.

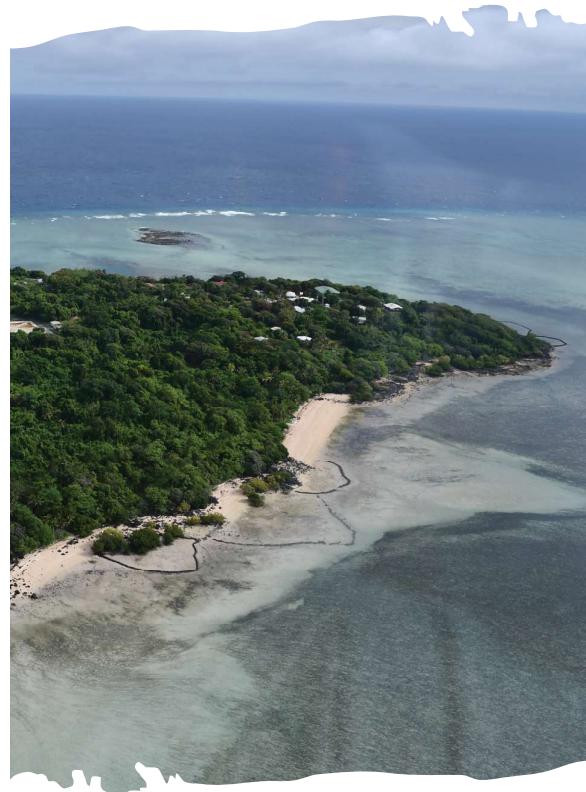
Ugar – Front Beach

			Present Day	2050	2100
— Prepare	Ongoing monitoring and review	Pause and review adaption actions	Monitor (look and learn)	Monitor (look and learn)	Actively manage
→ Implement	Trigger for an additional action	Abandon existing action and seek alternative pathway			
⋮ Transition	Start implementing				
Key management area adaptation actions and pathway					
Nature based coastal management		Dune management			
		Beach nourishment			
Coastal engineering		Maintain existing seawall			
		New seawall or revetment			
Transition		Relocate assets			
		Redesign for resilience			

## BACK BEACH

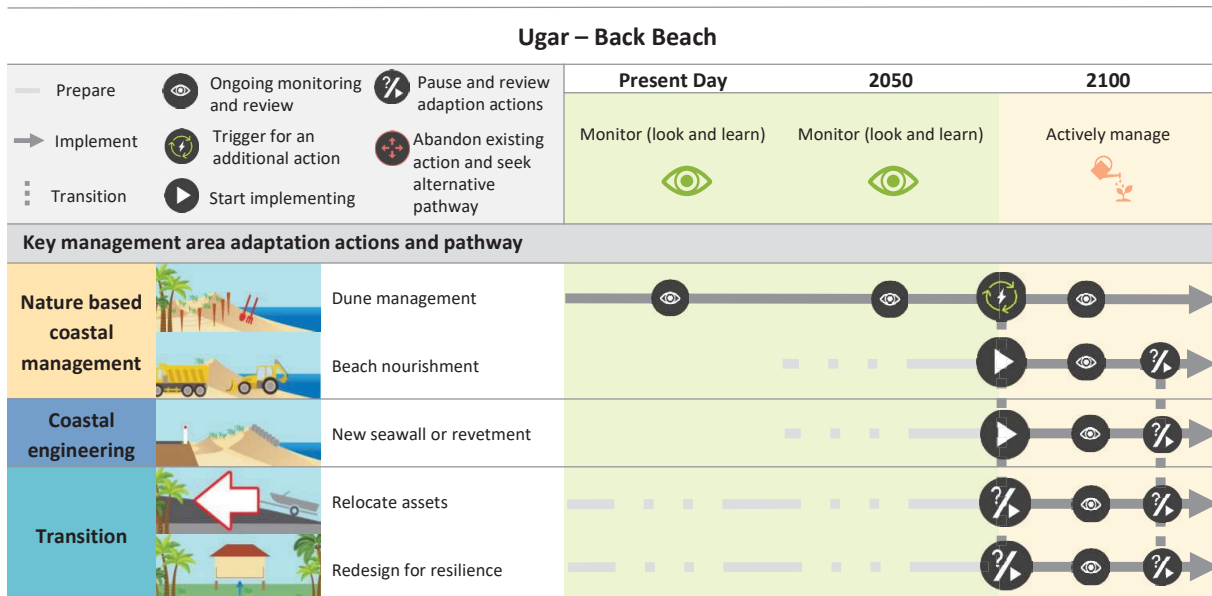
### Overview of assets and values at risk

- Facing the southeast there is one house and an old cemetery located on the coastal fringe.
- The residents of the house have experienced erosion in the past, and efforts to mitigate this have been made by using available materials in an informal attempt at mitigating erosion (i.e. tyres and large logs).
- The old cemetery is a culturally significant site. Local residents say it has previously been disturbed by erosion that has exposed graves.
- There are no formal erosion control measures on the back beach, and none are planned currently.



### Pathway description

For the Back Beach area of Ugar, the initial adaptation pathway involves dune management to protect the areas in front of the residential building and cemetery. As the community reaches trigger points, they can actively manage erosion by importing sand for beach nourishment or constructing a new seawall. As time progresses, the community should lead ongoing custodianship and monitoring with the option to revisit the option of relocating or redesigning assets while avoiding new development in hazard-prone areas.



## 6. Coastal hazard adaptation actions

Ugar Community Action Plan		Indicative cost
<b>1. Council-wide initiatives to enhance custodianship (Priority actions to be implemented within 10 years, and ongoing)</b>		
1.1. Community stewardship		
Ugar1.1a	See Council wide actions. Consider how these actions can be effectively used in Ugar.	
1.2. Education and knowledge sharing		
Ugar1.2a	See Council wide actions. Consider how these actions can be effectively used in Ugar.	
1.3. Monitoring		
Ugar1.3a	See Council wide actions. Consider how these actions can be effectively used in Ugar.	
Ugar1.3b	Undertake targeted monitoring of rocky cliffs around the island. This can be aligned with action C1.3a and C1.3b.	\$
<b>2. Planning updates (Priority actions to be implemented within 10 years, and ongoing)</b>		
2.1. Land use planning		
Ugar2.1a	See Council wide actions. Consider how these actions can be effectively used in Ugar.	
Ugar2.1b	Consider establishment of a stone quarry to provide materials for coastal protection throughout the Torres Strait	\$\$
2.2. Disaster planning		
Ugar2.2a	See Council wide actions. Consider how these actions can be effectively used in Ugar.	
<b>3. Resilient built environment (Priority actions to be implemented within 10 years, and ongoing)</b>		
3.1. Maintaining and improving infrastructure		
Ugar3.1a	See Council wide actions. Consider how these actions can be effectively used in Ugar.	
<b>4. Nature based coastal management (see adaptation pathways for timing)</b>		
4.1 Dune, mangrove and reef protection and enhancement		
Ugar4.1a	Identify degraded dunes in all Key Management Areas. Protect and enhance them using local knowledge and Zaget Torateti, including the use of native dune plants, and other stabilising vegetation. Manage access for an appropriate time period to allow vegetation to establish.	\$
4.2 Living shorelines		
Ugar4.2a	Explore feasibility of an artificial reef to enhance fringing reef resilience, bolstering natural sediment supply and dissipating wave energy.	\$\$
4.3 Beach nourishment		
Ugar4.3a	Monitor beach profiles in the Front Beach KMA and, if extensive erosion occurs, consider small scale beach nourishment or sand scraping to enhance degraded dunes in front of key assets. Supplement with dune restoration and access management, see action Ugar4.1a	\$\$
<b>5. Coastal engineering (see adaptation pathways for timing)</b>		
5.3 Last line of defence structures		
Ugar5.3a	Continue to monitor and maintain existing coastal protection structures and develop plan to upgrade where needed.	\$\$



## 6. Coastal hazard adaptation actions

Adaptation theme	Adaptation option	Action ID	2023 Priority strategic actions (completed within 5 – 10 years)	Indicative cost	Timing	Priority
1. Council-wide initiatives to enhance custodianship	1.1. Community stewardship	C1.1a	Establish a coastal resilience officer position within Council who will have responsibility over implementing the Zenadth Kes CHAS. This position will support Council's Climate Change Adaptation and Environment Committee and work closely with communities, across council and with other state and commonwealth agencies, streamlining and facilitating collaboration and effective implementation of adaptation actions.	\$\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.1. Community stewardship	C1.1b	Seek co-funding/resources for further initiatives through grants and stakeholder partnerships.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.1. Community stewardship	C1.1d	Promote coastal custodianship in the youth and future generations with community coast care events. These should weave in cultural knowledge and the idea of Zagat Torateti. They can also include art, communication, and science programs focused on coastal resilience.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.1. Community stewardship	C1.1e	Establish and implement a dune and foreshore protection and maintenance program incorporating Zagat Torateti, access management, and community education. Support local communities in implementing this program.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.1. Community stewardship	C1.1f	Develop a dune and wetland vegetation seed bank for vegetation restoration efforts, involving Traditional Owners, Indigenous Land and Sea Rangers and schools.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.2. Education and knowledge sharing	C1.2a	Develop a Zenadth Kes CHAS - Communication and Engagement Strategy. This will support Council in working with communities to raise awareness of and implement their Community Adaptation Plans. This will use creative and innovative communication channels, leveraging emerging community leaders and content creators. It will outline the appropriate level and protocols of engagement and consultation needed for a range of adaptation actions. Ideally, this communication and engagement strategy should not stand alone but be integrated with Council's existing engagement policies and practices so that its relevance for all current and future development and supporting community resilience is continuously acknowledged.	\$	Ongoing	High



Adaptation theme	Adaptation option	Action ID	2023 Priority strategic actions (completed within 5 – 10 years)	Indicative cost	Timing	Priority
1. Council-wide initiatives to enhance custodianship	1.2. Education and knowledge sharing	C1.2b	Develop locally and culturally appropriate educational materials about coastal processes, climate change, monitoring and adaptation with a focus on nature based management and innovative and island-appropriate design and development. Integrate these materials into the implementation of the Zenadth Kes CHAS - Communication and Engagement Strategy (action C1.2a).	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.2. Education and knowledge sharing	C1.2c	Work with organisations like the TSRA, CSIRO, Universities, Non-Profits, and the Torres Strait Climate Centre of Excellence to support further research and innovation into coastal hazard and climate change adaptation.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.2. Education and knowledge sharing	C1.2d	Continue to advance partnerships and collaboration with Traditional Owners to further consider needs and aspirations for Aboriginal and Torres Strait Islander People in coastal hazard adaptation.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.2. Education and knowledge sharing	C1.2e	Promote cross-sector partnerships and initiatives to enhance resilience and strategic adaptation for transport infrastructure, including boating infrastructure.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3a	Develop a tailored integrated monitoring and reporting program to inform future adaptation. Incorporates actions C1.3b-h.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3b	Undertake drone survey (elevation and aerial imagery) monitoring of beaches.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3c	Undertake underwater coral reef surveys to map the extent and condition. Explore the use of photogrammetry to create detailed 3D models of reefs.	\$\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3d	Establish a network of water level gauges throughout the TSIRC regions. Train community members to operate and maintain them.	\$\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3e	Undertake regular coastal protection structure condition assessments.	\$	Ongoing	High

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1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3f	Establish a monitoring program for sites of cultural significance that measures indicators such as spiritual/social value, archaeological value, physical condition, and protection of sites.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3g	Establish a system of Citizen Science photo monitoring points (CoastSnap, Fluker Post or similar) at beaches in the area.	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3h	Create a platform/process with Council for monitoring data storage and management	\$	Ongoing	High
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3i	Undertake detailed sediment supply and transport studies for coral cay islands and lagoons.	\$\$	Within 5 years	Medium
1. Council-wide initiatives to enhance custodianship	1.3. Monitoring	C1.3j	Review and further examine the sediment dynamics around TSIRC communities and the shoreline including: <ul style="list-style-type: none"> <li>· Geomorphic assessment</li> <li>· Hydrodynamic modelling</li> <li>· Shoreline Erosion Management Plan.</li> </ul> Linked to C1.3i	\$	Ongoing	High
2. Planning updates	2.1. Land use planning	C2.1a	Submit updated Erosion Prone Area layers to State Government for formal update to the existing State-wide mapping.	\$	Immediate	High
2. Planning updates	2.1. Land use planning	C2.1b	Use the updated Erosion Prone Area and storm tide mapping and outcomes of the Zenadth Kes CHAS in current and future Planning Scheme and Master Plan updates to inform decisions on development areas and strategic land use planning.	\$	Ongoing	High
2. Planning updates	2.1. Land use planning	C2.1c	Consider implications (within Council) of the Strategy for future development approvals and conditions, including: <ul style="list-style-type: none"> <li>· Approval conditions for lots of undeveloped land, and</li> <li>· Implications for future development approvals and conditions.</li> </ul>	\$	Ongoing	High
2. Planning updates	2.2. Disaster management	C2.2a	Use the updated Erosion Prone Area and storm tide mapping, risk assessment and economic implications to update the TSIRC Local Disaster Management Plan. Ensure local community input is used to inform the updated plan.	\$	Within 5 years	Medium
2. Planning updates	2.2. Disaster management	C2.2b	Review the long-term adequacy of evacuation and shelter facilities and evacuation routes, including evacuation by land and sea.	\$	Ongoing	High

Adaptation theme	Adaptation option	Action ID	2023 Priority strategic actions (completed within 5 – 10 years)	Indicative cost	Timing	Priority
3. Resilient built infrastructure	3.1. Increasing infrastructure resilience	C3.1a	Review at-risk infrastructure (from CHAS data outputs) and embed risks into current asset management plans/Master Plan (this could include 'betterment' at critical asset refurbishment/renewals points).	\$	Ongoing	High
3. Resilient built infrastructure	3.1. Increasing infrastructure resilience	C3.1b	Review access road renewals and upgrades (prioritisation), and upgrade design requirements and timing of upgrades.	\$	Ongoing	High
3. Resilient built infrastructure	3.1. Increasing infrastructure resilience	C3.1c	Produce "Resilient Housing and Development Guidelines and Designs" tailored to the Torres Strait Islands. This should cater to all island types. Community knowledge holders, elders and leaders should be heavily consulted for this process.	\$\$	Ongoing	High
3. Resilient built infrastructure	3.1. Increasing infrastructure resilience	C3.1d	Consult with utility providers on future services and upgrades, and implications of coastal hazard areas.	\$	Ongoing	High
3. Resilient built infrastructure	3.1. Increasing infrastructure resilience	C3.1e	Audit stormwater assets in areas subject to erosion and inundation, and develop plan to upgrade in line with refurbishment/renewals points.	\$\$	Ongoing	High
3. Resilient built infrastructure	3.2. Relocate infrastructure	C3.2a	Develop "Priority Asset Relocation and Redesign Guidelines" to assist communities in developing island specific relocation strategies. Community knowledge holders, Elders, other leaders and young people should be heavily consulted for this process. Factors to consider include:  Approvals Native Title Hazards Master Plan Town Planning	\$	Immediate	High

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4. Nature-based coastal management	4.1. Dune, mangrove and reef protection and enhancement	C4.1a	Support local communities in re-establishing, rehabilitating, or protecting coastal dunes	\$	Ongoing	High
4. Nature-based coastal management	4.1. Dune, mangrove and reef protection and enhancement	C4.1b	Support local communities in re-establishing, rehabilitating, or protecting mangroves	\$	Ongoing	High
4. Nature-based coastal management	4.1. Dune, mangrove and reef protection and enhancement	C4.1c	Support local communities in re-establishing, rehabilitating, or protecting coral reefs	\$	Ongoing	High
4. Nature-based coastal management	4.1. Dune, mangrove and reef protection and enhancement	C4.1d	Scope the feasibility and priority locations for natural reef enhancement activities, requiring comprehensive knowledge of the latest scientific findings and methodologies to ensure effective implementation and multiple benefit outcomes.	\$\$	Within 5 years	Medium
4. Nature-based coastal management	4.2. Living shorelines	C4.2a	Develop a detailed "Living Shorelines Design and Implementation Plan" to prioritise and support the communities where a living shoreline has been determined as a feasible option.	\$\$	Within 5 years	Medium
4. Nature-based coastal management	4.2. Living shorelines	C4.2b	Develop a detailed "Artificial Reef Design and Implementation Plan" to prioritise and support the communities where an artificial reef has been determined as a feasible option.	\$\$	Within 5 years	Medium
4. Nature-based coastal management	4.3. Beach nourishment	C4.3a	Develop a detailed "Beach Nourishment Design and Implementation Plan" to prioritise and support the communities where beach nourishment or sand management has been determined as a feasible option.	\$\$	Within 5 years	Medium

Adaptation theme	Adaptation option	Action ID	2023 Priority strategic actions (completed within 5 – 10 years)	Indicative cost	Timing	Priority
5. Coastal engineering	5.1. Structures to reduce coastal hazards	C5.1a	Continue to implement the Seawall Project.	\$\$\$	Ongoing	High
5. Coastal engineering	5.1. Structures to reduce coastal hazards	C5.1b	Continue to monitor and maintain existing coastal and flood protection structures.	\$\$\$	Ongoing	High
5. Coastal engineering	5.1. Structures to reduce coastal hazards	C5.1c	Audit coastal and flood protection assets, and develop plan to upgrade where needed.	\$	Ongoing	High

