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Department of Transport

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WA Coastal Erosion Hotspots - Review of Impacts, Management Actions, and Funding 2018/19 to 2024/25

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Prepared for Department of Transport

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1st Draft	Sep 2024	Tim Stead	Draft in prep	LS, LR, FSC, FL, VP
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Rev 0	Dec 2024	Tim Stead	Final report	-
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Amendment record

This guidelines document is reviewed to ensure its continuing relevance to the systems and process that it describes. A record of contextual revisions is listed in the following table.

Page No.	Context	Revision	Date

Cover image: ModiR nourishing Port Beach hotspot on 6th July 2022 through rainbowing; funded by CoastWA and the WA Recovery Plan.

Contents

List of Definitions

Breakwater:	A sloped or vertical structure engineered to protect a body of water in its lee from the combined interactions of waves, currents, and sediment transport.
CAP:	Coastal Adaptation and Protection grants, a grant program for active coastal management or adaptation administered by DoT for CoastWA.
CERMP:	Coastal and Estuarine Risk Mitigation Program, a grant program for mitigating coastal hazard risks administered by the National Emergency Management Agency for the Federal Government.
CHA:	Coastal Hazard Assessment, the component of CHRMAP that identifies risks to the coastline from coastal erosion and inundation hazards.
CHRMAP:	Coastal Hazard Risk Management and Adaptation Plan: a planning document for local coastal managers to guide coastal management and adaptation over discrete planning timeframes.
CMAG:	Coastal Management Advisory Group, a multi-agency group of WA state government entities and stakeholders to oversee strategic coastal zone management in Western Australia.
CMPAP:	Coastal Management Plan Assistance Program, a grant program for coastal planning administered by DPLH for CoastWA.
Coastal Erosion Hazard:	A hazard that physically relocates sand and material at both the nearshore zone and along the shoreline, arising from the combined interaction of waves, water level, wind, and currents.
Coastal Inundation Hazard:	A hazard that creates ocean-borne flooding along both the natural and built coastal environment, arising from the combined interaction of waves, water level, and currents.
CoastWA:	A strategic response to coastal erosion hotspots providing strong state leadership and partnership with local governments in addressing the increasing threat of coastal erosion. This coastal planning and management program is delivered in partnership by DPLH and DoT, overseen by CMAG.
Coastwest:	A grant program for coastal natural resource management administered by DPLH for CoastWA.
DBCA:	Department of Biodiversity, Conservation, and Attractions, a WA state agency and member of CMAG.
DFES:	Department of Fire and Emergency Services, a WA state agency and member of CMAG that also administers DRF grants on behalf of the federal National Emergency Management Agency.
DoT:	Department of Transport, a WA state agency partnering in delivering CoastWA through DoT's Maritime group, focussing on program implementation and technical reporting through engineering and project management officers.
DPLH:	Department of Planning, Lands and Heritage, the lead WA state agency delivering CoastWA through DPLH's Coastal Planning group, focussing on program monitoring, financial reporting, and planning.

DRF:	Disaster Ready Fund, a grant program for disaster planning and adaptation administered by DFES on behalf of the federal National Emergency Management Agency.
FRC:	Fibre Reinforced Composite, a hybrid construction material generally consisting of polymer, metal, ceramic, and/or organic component materials, suitable for use in corrosive/erosive environments.
Groyne:	A sloped or vertical shore-parallel structure engineered to trap sand against the direction of sediment transport to widen the updrift coastline, at the expense of retreated coastline downdrift of the structure.
GSC:	Geosynthetic Sand Container, a construction component comprising polymer nonwoven geotextile fabricated into bags or tubes and filled with sand, suitable for use in building coastal protection structures.
H-CAP:	Hotspot Coastal Adaptation and Protection Major Project Fund, a grant program for coastal adaptation implementation focussed on the most vulnerable coastal areas administered by DoT for CoastWA
HDPE:	High Density Polyethylene, a robust polymer used as structural material in a wide variety of environments, suitable for use in hydraulic applications such as pipelines.
Hotspot:	Where coastal erosion is expected to impact on public and private physical assets, requiring management and adaptation action within 25 years. This is unique from an inundation hotspot, which is specific to ocean-borne flooding and is not the focus of this report.
LGA:	Local Government Area, the government agencies with direct mandate for coastal management and adaptation along their coastline.
MI:	Management Importance (low, moderate, or high), the consequences of erosion with their likelihood over time to inform management needs.
Revetment:	A sloped structure designed to dissipate wave energy and prevent erosion or damage in the structure's lee, commonly mislabelled a seawall which is a vertical structure. A revetment may translate erosion stress to the structure's flanks by inhibiting natural sediment transport
RfR:	Royalties for Regions, a state grant program developing Western Australia's regional areas, occasionally administered by DoT (such as at Broome Town Beach revetment), but external to CoastWA.
Seawall:	A vertical structure designed to reflect wave energy and prevent erosion or damage in the structure's lee, distinct from a revetment which is a sloped structure. A seawall may translate erosion stress to erode sand immediately in front of the structure due to reflected wave energy.
Training Wall:	A structure similar to a groyne, attached to shore for the purpose of hydraulic flow and drainage management.
WA Recovery Plan:	A $5.8 billion state program launched in 2020 to safeguard WA's economy against the economic impacts of COVID-19, administered by various departments including DoT, but external to CoastWA.
WALGA:	Western Australian Local Government Association, a key not-for-profit stakeholder in CoastWA that helps to better collaborate with LGAs.
WAPC:	Western Australian Planning Commission, a government board with state-wide responsibility for land use planning and development.
Watchspot:	Locations placed on a watchlist that do not currently fit the hotspot definition, though justify monitoring and consideration of future changes.

Executive Summary

This report examines changes to coastal erosion hotspots in detail from 2018/19 to 2024/25. This was documented by consulting with local coastal managers, evaluating coastal management actions at existing hotspots or potential new hotspots, and assessing how state government programs have assisted hotspot management with particular focus on the CoastWA program. In summary: the role of CoastWA (plus state-funded adaptation projects by WA Recovery Plan and RfR) was important for managing hotspots, evidenced by fewer hotspots and overall lowered coastal hazard risk compared to seven years ago.

The WA State Government commissioned an *Assessment of Coastal Erosion Hotspots in Western Australia* in 2019 to evaluate the scale and extent of erosion affecting state coastlines (Seashore 2019). 55 locations (15 in metropolitan Perth and 40 in regional Western Australia) were identified as 'hotspots': areas where coastal erosion, expected to impact on public and private physical assets, required management and adaptation action within 25 years. An additional 31 locations were placed on a watch-list, i.e. 'watchspots', for future consideration.

In response to identified hotspots, the CoastWA program was established to enhance existing state coastal programs and implement recommendations from Seashore (2019). CoastWA has been managed as a collaboration between Department of Planning, Lands and Heritage (DPLH) and Department of Transport (DoT), overseen by the multi-agency Coastal Management Advisory Group (CMAG).

Approaching its final year of approved funding, CoastWA required evaluation to determine its effectiveness in managing hotspots, in particular how the Management Importance (MI) of each hotspot has changed since CoastWA began. MI (low, moderate, or high) indicates the combined consideration of erosion consequences and their likelihood of occurring over a given period to inform management needs.

This report documents the impact of the CoastWA program on management of coastal erosion hotspots to guide a future revision of Seashore (2019), by evaluating how hotspots and their associated MI have changed. In addition, program evaluation supports provision of a budget submission for continuation of CoastWA beyond 2025/26. Accordingly, this assessment:

- Collated and interpreted local coastal manager consultation information, CoastWA activities including grants, and adaptation actions at hotspots and watchspots between 2018/19 to 2024/25.
- Updated hotspot MI and undertook a preliminary reranking of hotspots.
- Recommended new hotspot locations and priority actions.

Like Seashore (2019), two component rating systems were assessed to guide overall MI change: physical asset rating and recreation/stakeholder rating. Physical asset rating provides qualitative assessments on criteria for types of public assets susceptible to erosion hazards. Recreational/stakeholder values consider criteria for peak intensity of use, loss of recreation uses, private property interest, and stakeholder interest. Criteria in both ratings were assessed in aggregate to create a score of low, medium, or high for each rating. Ratings are forecast over 0-5 years, 5-25 years, and 25+ years. The difference in approach by this report is that these criteria were assessed in relative terms (increased/decreased etc.) to assess change, rather than the absolute terms (asset number, type etc.) by Seashore (2019).

The findings of this report indicate CoastWA has been successful in reducing overall risk to WA coastlines from coastal erosion at hotspots. One fifth (11/55) of the original 55 hotspots have benefitted from management actions or shifts in coastal hazard risk that justify reclassification from hotspot status down to less severe watchlist status, or removal from active monitoring entirely (Figure 1). Furthermore, almost one third (17/55) of hotspots saw a reduction in MI due to adaptation implementation and/or reduced coastal hazard risks compared to original MI designations from Seashore (2019). This means over half of the original hotspot list has seen a reduction in overall erosion vulnerability over the seven financial

years assessed from 2018/19 to 2024/25. This contrasts original projections by Seashore (2019), which predicted that the number of coastal erosion hotspots in the high MI category could increase to 21 (nearly half of all original hotspots) by as early as 2024.

17 hotspots (31%) in Figure 1 demonstrated similar MI to Seashore (2019), not necessarily from lacking management action, though from a balance of risk outstanding that cannot reduce MI further than originally designated. Importantly, ten hotspots (18%) observed increased MI following elevated coastal hazard threats, despite efforts to manage erosion or otherwise. Further to Figure 1, four new hotspots were identified in consultation with local coastal managers and from internal review. Despite new hotspots arising, active management has seen the overall number of hotspots reduced from 55 down to 48.

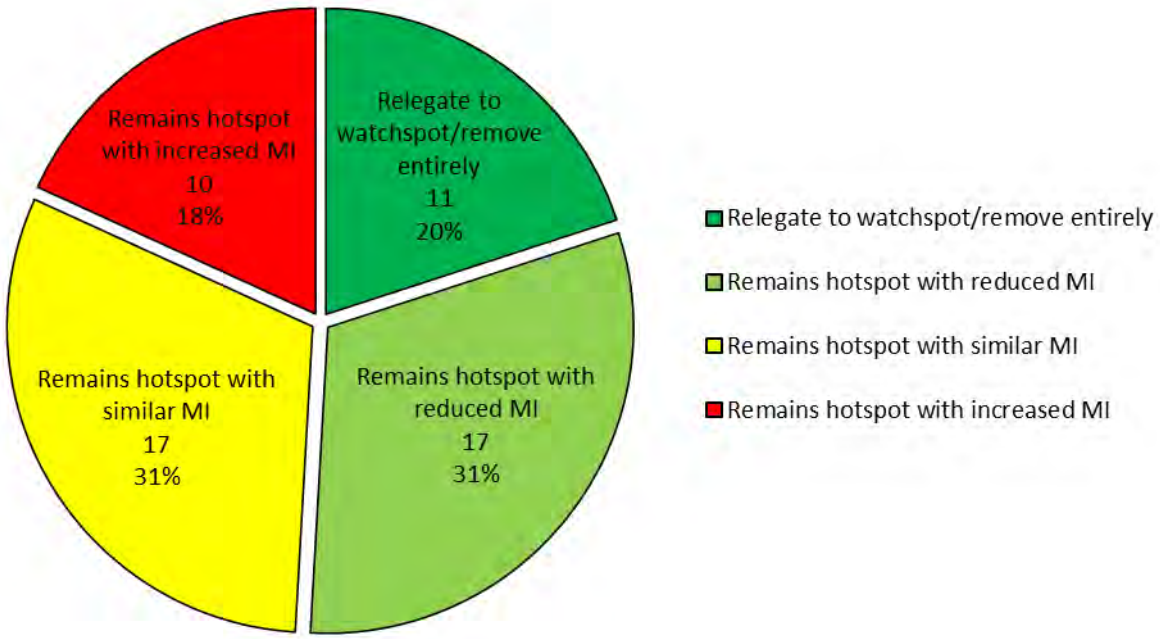

Figure 1: Recommendations for changes in MI for the original 55 hotspots.

The MI review resulted in the original list of 31 watchspots from Seashore (2019) increasing to 46. This ensued from reclassification of eight hotspots to watchspots, plus an additional ten new watchspots identified through comprehensive local coastal manager consultation. Three watchspots were elevated to hotspot status, either as new discrete hotspots or by being absorbed into existing hotspots that were enlarged in size to cover old watchspot locations (refer to Section 3.3 for details).

Table 1 provides MI recommendations across all hotspots. These recommendations comprise the primary guidance towards a formal full review and revision of Seashore (2019), particularly the reduced total from 55 to 48 hotspots. Some hotspots in Table 1 have added notation (*n.b*) to be enlarged beyond their original size to cover adjacent eroding or vulnerable areas, while new hotspots also have added notation of (*n.5*). This approach allowed the original hotspot numbering from Seashore (2019) to be retained for ease of reference.

Five preliminary rankings: low, moderate, high, very high, and severe were assigned to each hotspot (Table 2). These ranks serve to prioritise hotspots based on anticipated need for management and funding intervention at the time of this review. It is noted that ranks could shift rapidly as coastlines dynamically respond to coastal hazards like extreme storm events over time, therefore regular reporting of hotspot updates is recommended to allow for adaptive management and reprioritisation opportunities.

To visualise the final list of hotspots, Figure 2 presents a map with each hotspot location – colour coordinated by each of the five preliminary ranks. Figure 2 is designed for direct contrast and comparison with original infographics from Seashore (2019).

Table 1: MI recommendations for all locations, including recreation/stakeholder rating and physical asset rating; n.b assigns enlarged hotspots and n.5 assigns new hotspots.

Hotspot	Recommendation	Management Importance			Recreation/ Stakeholder rating			Physical Asset rating		
		0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years
1. China Town, Broome	Remains hotspot with similar MI	L	L	H	M	M	H	L	L	M
2.b Broome Town Beach	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	M
2.5 Broome Cable Beach Foreshore	New hotspot	M	H	H	M	H	H	M	M	H
3. Goode St, Port Hedland	Relegate to watchspot	L	L	L	L	L	L	L	L	L
4. Laurentius Point, Port Hedland	Relegate to watchspot	L	L	L	L	L	L	L	L	L
5. Warne St & Yacht Club Exmouth	Remains hotspot with reduced MI	L	M	M	L	M	M	L	L	M
6. Pelican Point, Carnarvon	Remains hotspot with similar MI	L	M	H	L	M	H	L	M	H
7. Monkey Mia	Remains hotspot with reduced MI	L	M	M	L	M	M	L	M	M
8. Denham townsite	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
9. Horrocks Foreshore	Remains hotspot with increased MI	M	M	H	M	M	H	M	M	H
10. Drummond Cove, Geraldton	Remains hotspot with similar MI	M	H	H	M	M	H	M	H	H
11. Sunset Beach, Geraldton	Remains hotspot with reduced MI	L	M	H	L	L	M	L	M	H
12. Beresford, Geraldton	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	H
13. Point Moore, Geraldton	Remains hotspot with increased MI	M	H	H	L	M	H	M	H	H
14.b Grannies Beach, Irwin	Remains hotspot with reduced MI	L	L	M	L	M	M	L	L	M
15. Cervantes	Remains hotspot with increased MI	M	H	H	L	M	H	M	H	H
16. Grey	Relegate to watchspot	L	L	L	L	L	L	L	L	L
17. Wedge	Relegate to watchspot	L	L	L	L	L	L	L	L	L
18. Grace Darling Park, Lancelin	Remains hotspot with similar MI	M	H	H	M	H	H	M	M	H
19. Ledge Point	Remains hotspot with similar MI	M	H	H	H	H	H	L	M	H
20.b Seabird Foreshore, Gingin	Remains hotspot with increased MI	H	H	H	H	H	H	M	H	H
21. Two Rocks northern coast	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
21.5 Yanchep Lagoon	New hotspot	L	M	H	L	M	H	L	M	H
22. Quinns Beach	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
22.5 Pinnaroo Point	New hotspot	M	M	H	M	M	H	L	M	H
23. MAAC Seawall, Joondalup	Remains hotspot with similar MI	L	H	H	M	H	H	L	M	H
24. Watermans Bay, Stirling	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	H
25. Mettams Pool	Remains hotspot with increased MI	H	H	H	H	H	H	M	H	H
26. Floreat Beach	Remains hotspot with increased MI	H	H	H	H	H	H	H	H	H
27. Port Beach	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
28. Rottnest – South Thomson Bay	Remains hotspot with reduced MI	L	M	H	L	L	M	L	M	H
29.b C.Y. O'Connor Beach, Cockburn	Remains hotspot with increased MI	M	H	H	M	H	H	M	H	H
30. Kwinana Waterfront Industrial	Remains hotspot with reduced MI	M	M	H	M	M	H	M	M	H
31.b Kwinana Beach	Remains hotspot with increased MI	M	M	H	L	M	M	M	H	H
32. Rockingham T. Beach to Causeway	Remains hotspot with similar MI	M	H	H	M	H	H	M	H	H
33. N Point Peron (W of Causeway)	Remains hotspot with reduced MI	L	L	M	L	M	M	L	L	M
34. Point Peron (N Shoalwater Bay)	Remains hotspot with similar MI	L	M	H	L	L	M	M	H	H
35.b Waikiki Beach, Rockingham	Remains hotspot with similar MI	M	M	H	M	M	H	M	M	H
36.b Mandurah Northern Beaches	Remains hotspot with increased MI	H	H	H	M	H	H	H	H	H
37. Doddies Beach, Roberts Point	Remains hotspot with similar MI	L	M	H	L	M	H	L	M	H
38. Falcon Bay to Rakoa St	Remains hotspot with reduced MI	L	L	M	L	L	M	L	L	M
39. Binningup Seawall	Remains hotspot with reduced MI	L	L	M	L	M	M	L	L	M
40. The Cut, Bunbury	Remove entirely	L	L	L	L	L	L	L	L	L
41. Koombana Beach	Relegate to watchspot	L	L	L	L	L	L	L	L	L
42. Wonnerup Beach (East)	Remove entirely (merged)									
43.b Wonnerup Beaches	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	H
44.b King St	Remains hotspot with similar MI	L	M	M	L	M	M	M	M	M
45.b Craig St, Busselton	Relegate to watchspot	L	L	L	L	L	L	L	L	L
46.b Abbey, Busselton	Remains hotspot with similar MI	L	M	H	L	M	H	M	M	H
47. Locke Estate	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	M
47.5 Vincent St Foreshore, Dunsborough	New hotspot	M	M	H	M	M	H	M	M	H
48. Gnarabup S	Remains hotspot with reduced MI	L	M	H	M	M	H	L	M	M
49. Windy Harbour Foreshore	Relegate to watchspot	L	L	L	L	L	L	L	L	L
50. Peaceful Bay	Relegate to watchspot	L	L	L	L	L	L	L	L	L
51. Denmark, Ocean Beach	Remains hotspot with reduced MI	L	L	M	L	M	H	L	M	M
52. Emu Pt, Albany	Remains hotspot with increased MI	M	H	H	M	H	H	M	H	H
53. Bremer Bay Fishery Beach	Remove entirely	L	L	L	L	L	L	L	L	L
54. Hopetoun Foreshore	Remains hotspot with similar MI	L	M	H	L	M	H	L	M	H
55. Esperance Town Beach	Remains hotspot with reduced MI	L	L	M	L	M	H	L	L	M

Table 2: Preliminary ranking of all locations according to MI recommendations; n.b assigns enlarged hotspots and n.5 assigns new hotspots.

Hotspot	Recommendation	Ranking	Management Importance			Recreation/ Stakeholder rating			Physical Asset rating		
			0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years
25. Mettams Pool	Remains hotspot with increased MI	Severe	H	H	H	H	H	H	M	H	H
26. Floreat Beach	Remains hotspot with increased MI	Severe	H	H	H	M	H	H	H	H	H
36.b Mandurah Northern Beaches	Remains hotspot with increased MI	Severe	H	H	H	M	H	H	H	H	H
20.b Seabird Foreshore, Gingin	Remains hotspot with increased MI	Severe	H	H	H	H	H	H	M	H	H
52. Emu Pt, Albany	Remains hotspot with increased MI	Severe	M	H	H	M	H	H	M	H	H
29.b C.Y. O'Connor Beach, Cockburn	Remains hotspot with increased MI	Severe	M	H	H	M	H	H	M	H	H
32. Rockingham T. Beach to Causeway	Remains hotspot with similar MI	Severe	M	H	H	M	H	H	M	H	H
2.5 Broome Cable Beach Foreshore	New hotspot	Severe	M	H	H	M	H	H	M	M	H
18. Grace Darling Park, Lancelin	Remains hotspot with similar MI	Severe	M	H	H	M	H	H	M	M	H
10. Drummond Cove, Geraldton	Remains hotspot with similar MI	Severe	M	H	H	M	M	H	M	H	H
19. Ledge Point	Remains hotspot with similar MI	Very High	M	H	H	H	H	H	L	M	H
15. Cervantes	Remains hotspot with increased MI	Very High	M	H	H	L	M	H	M	H	H
13. Point Moore, Geraldton	Remains hotspot with increased MI	Very High	M	H	H	L	M	H	M	H	H
23. MAAC Seawall, Joondalup	Remains hotspot with similar MI	Very High	L	H	H	M	H	H	L	M	H
31.b Kwinana Beach	Remains hotspot with increased MI	Very High	M	M	H	L	M	H	M	H	H
35.b Waikiki Beach, Rockingham	Remains hotspot with similar MI	Very High	M	M	H	M	M	H	M	M	H
22.5 Pinnaroo Point	New hotspot	Very High	M	M	H	M	M	H	M	M	H
9. Horrocks Foreshore	Remains hotspot with increased MI	Very High	M	M	H	M	M	H	M	M	H
47.5 Vincent St Foreshore, Dunsborough	New hotspot	Very High	M	M	H	M	M	H	M	M	H
30. Kwinana Waterfront Industrial	Remains hotspot with reduced MI	Very High	M	M	H	M	M	H	M	M	H
24. Watermans Bay, Stirling	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
43.b Wonnerup Beaches	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
1. China Town, Broome	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
12. Beresford, Geraldton	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
46.b Abbey, Busselton	Remains hotspot with similar MI	High	L	M	H	L	M	H	M	M	H
34. Point Peron (N Shoalwater Bay)	Remains hotspot with similar MI	High	L	M	H	L	L	M	M	H	H
22. Quinns Beach	Remains hotspot with reduced MI	High	L	M	H	L	M	H	L	M	H
21.5 Yanchep Lagoon	New hotspot	High	L	M	H	L	M	H	L	M	H
6. Pelican Point, Carnarvon	Remains hotspot with similar MI	High	L	M	H	L	M	H	L	M	H
37. Doddies Beach, Roberts Point	Remains hotspot with similar MI	High	L	M	H	L	M	H	L	M	H
54. Hopetoun Foreshore	Remains hotspot with similar MI	Moderate	L	M	H	L	M	H	L	M	H
21. Two Rocks northern coast	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	H
27. Port Beach	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	H
8. Denham townsite	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	H
47. Locke Estate	Remains hotspot with similar MI	Moderate	L	M	H	M	M	H	L	M	M
48. Gnarabup S	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	M
11. Sunset Beach, Geraldton	Remains hotspot with reduced MI	Moderate	L	M	H	L	L	M	L	M	H
28. Rottnest – South Thomson Bay	Remains hotspot with reduced MI	Moderate	L	M	H	L	L	M	L	M	H
2.b Broome Town Beach	Remains hotspot with reduced MI	Moderate	L	L	H	L	M	H	L	L	M
44.b King St	Remains hotspot with similar MI	Moderate	L	M	M	L	M	M	M	M	M
7. Monkey Mia	Remains hotspot with reduced MI	Low	L	M	M	L	M	M	L	M	M
51. Denmark, Ocean Beach	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	M	M
55. Esperance Town Beach	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
5. Warne St & Yacht Club Exmouth	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
33. N Point Peron (W of Causeway)	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
39. Binningup Seawall	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
14.b Grannies Beach, Irwin	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
38. Falcon Bay to Rakoa St	Remains hotspot with reduced MI	Low	L	L	M	L	L	M	L	L	M
3. Goode St, Port Hedland	Relegate to watchspot		L	L	L	L	L	L	L	L	L
4. Laurentius Point, Port Hedland	Relegate to watchspot		L	L	L	L	L	L	L	L	L
16. Grey	Relegate to watchspot		L	L	L	L	L	L	L	L	L
17. Wedge	Relegate to watchspot		L	L	L	L	L	L	L	L	L
40. The Cut, Bunbury	Remove entirely		L	L	L	L	L	L	L	L	L
41. Koombana Beach	Relegate to watchspot		L	L	L	L	L	L	L	L	L
45.b Craig St, Busselton	Relegate to watchspot		L	L	L	L	L	L	L	L	L
49. Windy Harbour Foreshore	Relegate to watchspot		L	L	L	L	L	L	L	L	L
50. Peaceful Bay	Relegate to watchspot		L	L	L	L	L	L	L	L	L
53. Bremer Bay Fishery Beach	Remove entirely		L	L	L	L	L	L	L	L	L

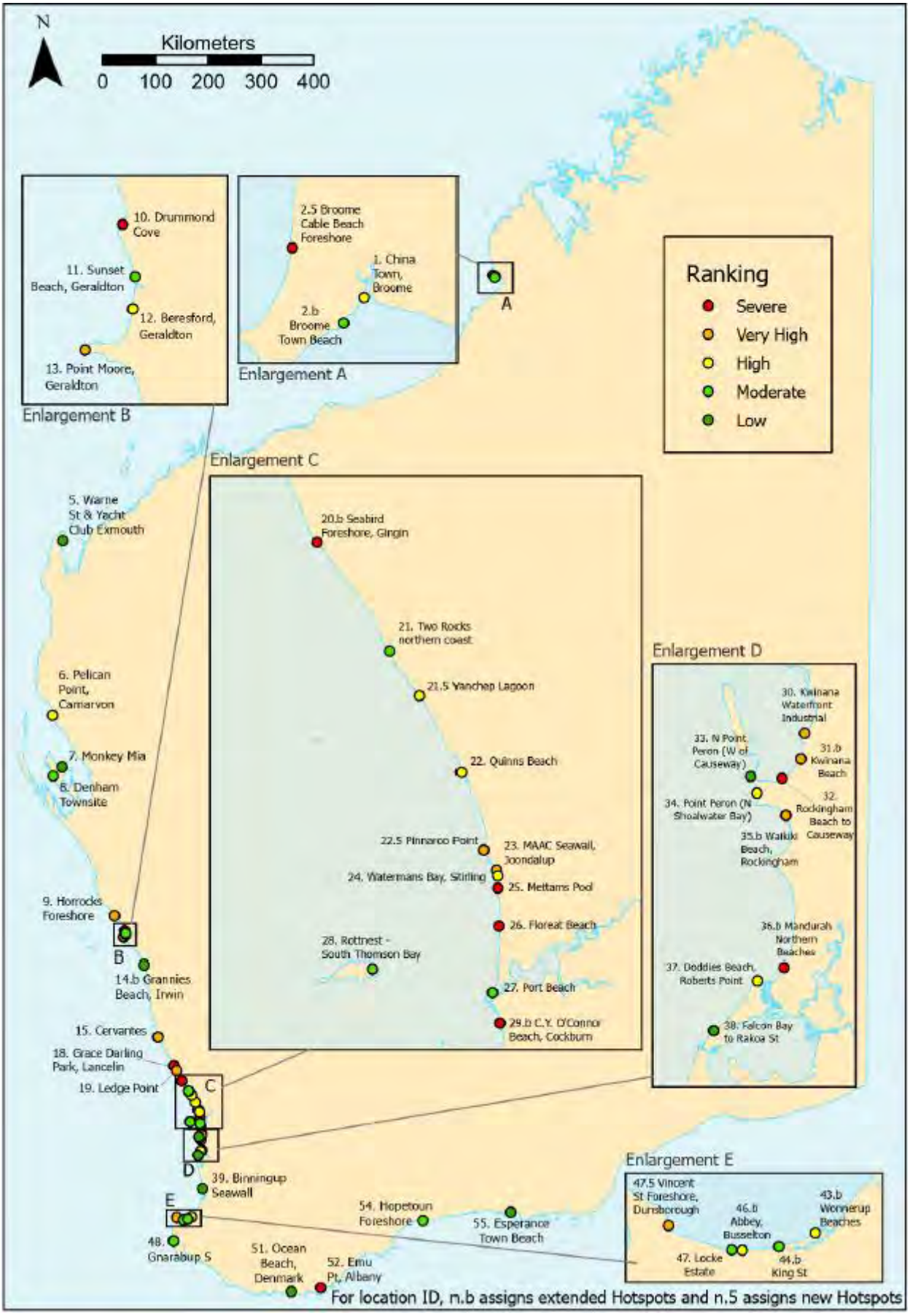

Figure 2: Updated map of coastal erosion hotspots in Western Australia including new MI recommendations; n.b assigns enlarged hotspots and n.5 assigns new hotspots.

In this review, an analysis of demand for funding assistance was undertaken to evaluate the adequacy of financial support provided by CoastWA. CoastWA grants alone provided a total of $20,042,087 in funding assistance to local coastal managers from 2018/19 to 2024/25. According to grant co-contribution requirements, this corresponds to a total capital investment beyond $40M in grant projects, providing a cost-leverage ratio of at least 2:1. The absolute investment total would be even greater, given coastal managers fund many such projects independently without applying for CoastWA grants at all. It is clear financial burdens for coastal management and adaptation are significant.

Importantly, 93% of CoastWA grants funded projects at hotspot LGAs. This was not a result of other locations being unfairly disregarded, but because the overwhelming majority of funding requests came from LGAs containing hotspots (86%). This demonstrates the hotspot framework's importance for coastal management in WA – these locations are evidently the primary areas of coastal management activity.

A grand total of $31,796,633 in funding assistance was awarded to WA coastal managers from 2018/19 to 2024/25. This larger total was due to the additional inclusion of one-off funding allocated to DoT for specific coastal adaptation projects by RfR and WA Recovery Plan. The total shortfall of requested funding over this period was $17,865,898, representing an (over)subscription ratio of 156%. When evaluating demand to CoastWA grants alone without one-off funding, the subscription ratio rises significantly to 189%. This shows significant demand for both CoastWA grants and one-off funding sources for coastal adaptation and management.

It was important to assess the role of projects not only funded by CoastWA which comprises the modern funding model, though also the WA Recovery Plan and RfR that preceded CoastWA, with all three delivered by the same engineering team over the seven-year period. There were 15 key adaptation projects totalling $17,465,357 in awarded funding from CoastWA, WA Recovery Plan, and RfR to successfully reduce hotspot MI and/or reclassify hotspots to watchspot status (refer to Section 4.2 for details). This included coastal protection projects like revetment construction at Rottnest – South Thomson Bay and large-scale beach building via dredge at Port Beach.

With the 15 key adaptation projects comprising 55% of the $31,796,633 in total state funding assistance, the remaining 45% of awarded funding ($14,331,276) was also critical for management of hotspots and occasionally non-hotspots too. This funding focused on data collection/studies to understand coastal hazards, design projects to devise appropriate adaptation options, staffing costs, and ongoing adaptation efforts that maintain the shoreline position such as sand nourishment. Without this wide scope of funded activities, coastal management would present an even greater challenge. Comprehensive funding for the full asset management lifecycle is essential. Planning, design, construction, maintenance, and monitoring must each be funded accordingly to effectively manage coastal hazard risk.

To assess the role of grant funding for assisting local coastal management, information was also briefly evaluated from the 2024/25 DRF application round, a five-year federal program allocating nationwide funding to disaster mitigation projects. 11 WA coastal management and adaptation projects sought funding from DRF in 2024/25, of which slightly more than one third received funding (4 projects). Total requested funding to DRF in 2024/25 for coastal management and adaptation projects from WA was $26,798,390, to which one quarter of this was awarded ($5,469,425). The (over)subscription ratio to DRF for coastal management and adaptation projects was resultantly 490% in 2024/25. This significant funding request to DRF highlights high coastal management funding demand from all levels of government. Furthermore, DRF's low level of funding awarded to WA coastal projects demonstrates that DRF alone cannot substitute or replace state sources like CoastWA. A substantial, reliable, and timely source of funding is required to support WA coastal adaptation projects effectively.

After a thorough review process, recommendations for priority actions were provided in Table 3, some of which could be included in a future CoastWA budget submission. Each action is designed to address one of five key coastal management problems from Table 3, evident from gathered information in this report, whereby actions seek to target the cause of these problems rather than their symptoms.

It is clear from this review that hotspots, their rankings, and watchspots are highly useful tools to provide broad-scale information about the dynamic coastal hazard risks facing WA coastal communities. Nonetheless, these must be considered as guides-only for coastal planning and management, being representative at the time of each review. The latest information will always take precedence alongside extant coastal management priorities as each annual grant cycle commences.

Table 3: Ten proposed Actions for CoastWA beyond 2025/26 to improve management of coastal erosion hotspots.

Problem	Cause	Proposed Actions
Difficulty in funding and implementing coastal erosion adaptation for local coastal managers at some hotspots.	Oversubscription to CoastWA grants, alongside LGA internal capacity and technical expertise being too low to apply, leading to potential projects not being awarded funding and thus not proceeding.	**1.** Increase funding for CoastWA grants and reduce co-contribution requirements from grantees. **2.** Additional engineering and planning staff to provide both technical and project management guidance to local coastal managers.
Ignorance in both coastal hazard risk exposure and to which decisions will be most suitable for coastal adaptation and management.	Lacking knowledge born from information gaps about coastal environments, coastal processes, resourcing requirements, and available opportunities for management/adaptation.	**3.** State bathymetric Lidar program to better understand nearshore bathymetry, which directly affects coastal processes and hazards. **4.** Raw materials investigations to better understand available resources for allocation to coastal adaptation. **5.** Expansion of DoT's wave buoy network to better understand wave climates and their relationship to coastal hazards.
Urgent need for adaptation action at hotspots ranked in the “Severe” category.	Increased Management Importance due to higher actual or perceived risks to physical public assets and recreation/stakeholder ratings from coastal erosion hazards.	**6.** Funding proposal and business case development to implement adaptation at “Severe” hotspots. **7.** Additional senior engineering staff to directly manage design and construction for Action 6 above.
Inconsistent quality of Coastal Hazard Risk Management and Adaptation Planning and associated difficulties in implementing recommendations.	Fragmented knowledge and methods applied at a decentralised level of governance, plus a general inability of consultants and LGAs to cover the multi-disciplinary requirements of CHRMAP needing engineering, planning, economic, and community consultation specialists.	**8.** Expanded capability of CoastWA team to assist local coastal managers through recruiting additional in-house specialists, including an investment planner to assist LGA business cases and economic assessments, a community engagement officer, and coastal hazard assessment specialists. **9.** Updated state guidance on the various disciplines required to undertake Coastal Hazard Risk Management and Adaptation Planning.
Inequality from those who benefit from coastal management and adaptation expenditure compared to the wider public who pays.	Lacking implementation of or adherence to an equitable Benefit Distribution Analysis at coastal erosion hotspots, meaning private beneficiaries do not fairly contribute to coastal management and adaptation costs.	**10.** State guidance for creating Benefit Distribution Analysis documentation, including identification of beneficiary pays funding needs.

1. Report Context, Aim, and Objectives

This section provides a contextual basis for *WA Coastal Erosion Hotspots - Review of Impacts, Management Actions, and Funding - 2018/19 to 2024/25*. The aim and objectives are subsequently established to express desired outcomes.

1.1. Report Context

The WA State Government commissioned an *Assessment of Coastal Erosion Hotspots in Western Australia* in 2019 to evaluate the scale and extent of erosion affecting state coastlines (Seashore 2019). 55 locations (15 in metropolitan Perth and 40 in regional Western Australia) were identified as 'hotspots' where coastal erosion is expected to impact on public and private physical assets, requiring management and adaptation action within 25 years (Figure 3).

Some coastal erosion hotspots are in close proximity to state strategic infrastructure. Many are places of key cultural and social significance to tourism and hence Western Australia's economy. Assets, values, and activities threatened by erosion were identified at each hotspot over three discrete time frames: 0 – 5 years, 5 – 25 years, and 25+ years. In addition to hotspots, 31 sites were placed on a watchlist i.e. watchspots (Figure 4). Watchspots were designated as locations that did not yet fit the definition of a hotspot, though justified monitoring and consideration of future changes.

Hotspots in Seashore (2019) were assigned a rating for relative MI, defined by an aggregate score evaluating risk for both physical assets and recreation/stakeholder values. Physical asset rating provides qualitative assessments on criteria for types of public assets susceptible to erosion hazard, the number of assets exposed, and the monetary value of public assets. Recreational/stakeholder values consider criteria peak intensity of use, loss of recreation uses, private property interest, and stakeholder interest.

In April 2021 WAPC/DPLH and DoT prepared a business case to secure the funds necessary for the State to deliver a strategic response to Seashore (2019), providing strong state leadership and partnership with local government in addressing the increasing threat of coastal erosion. The enhanced overarching State government coastal planning and management program, or coastal erosion hotspots strategic response, was given the name CoastWA.

CoastWA enhances the State's existing coastal planning program by increasing funding allocations to the WAPC's Coastal Zone Management Fund which provides budget for both DPLH and DoT's grant programs to help implement key priority recommendations from Seashore (2019). CoastWA has been managed through existing arrangements between DPLH and DoT, overseen by the multi-agency Coastal Management Advisory Group (CMAG).

In 2022, Department of Transport (DoT) created a report titled, *Coastal Erosion Hotspots - Status Update, 2018 – 2021* (DoT 2022). This report documented hotspot updates three financial years after Seashore (2019) was published. Similar to this report, information was gathered (including novel surveys), assessed, and collated to provide updates for both known and potential new coastal erosion hotspot locations. Location updates were assigned four categories: major, moderate, or no reported change, plus the category of potential new hotspots. Major and moderate changes were determined by considering coastal management actions undertaken to reduce risk, and/or any elevated severity of coastal hazards indicating increased risk. 28 hotspots reported updates and six new hotspot locations were identified. Hotspots with no change had either insufficient information available, or negligible change was identified at that known hotspot location since 2018.

Together, both Seashore (2019) and DoT (2022) provide important context to inform this report; alongside CoastWA actions, grant histories, and surveys. Relevant site-specific investigations, reports, design plans and drawings, etc. were also used as supplementary information where available.

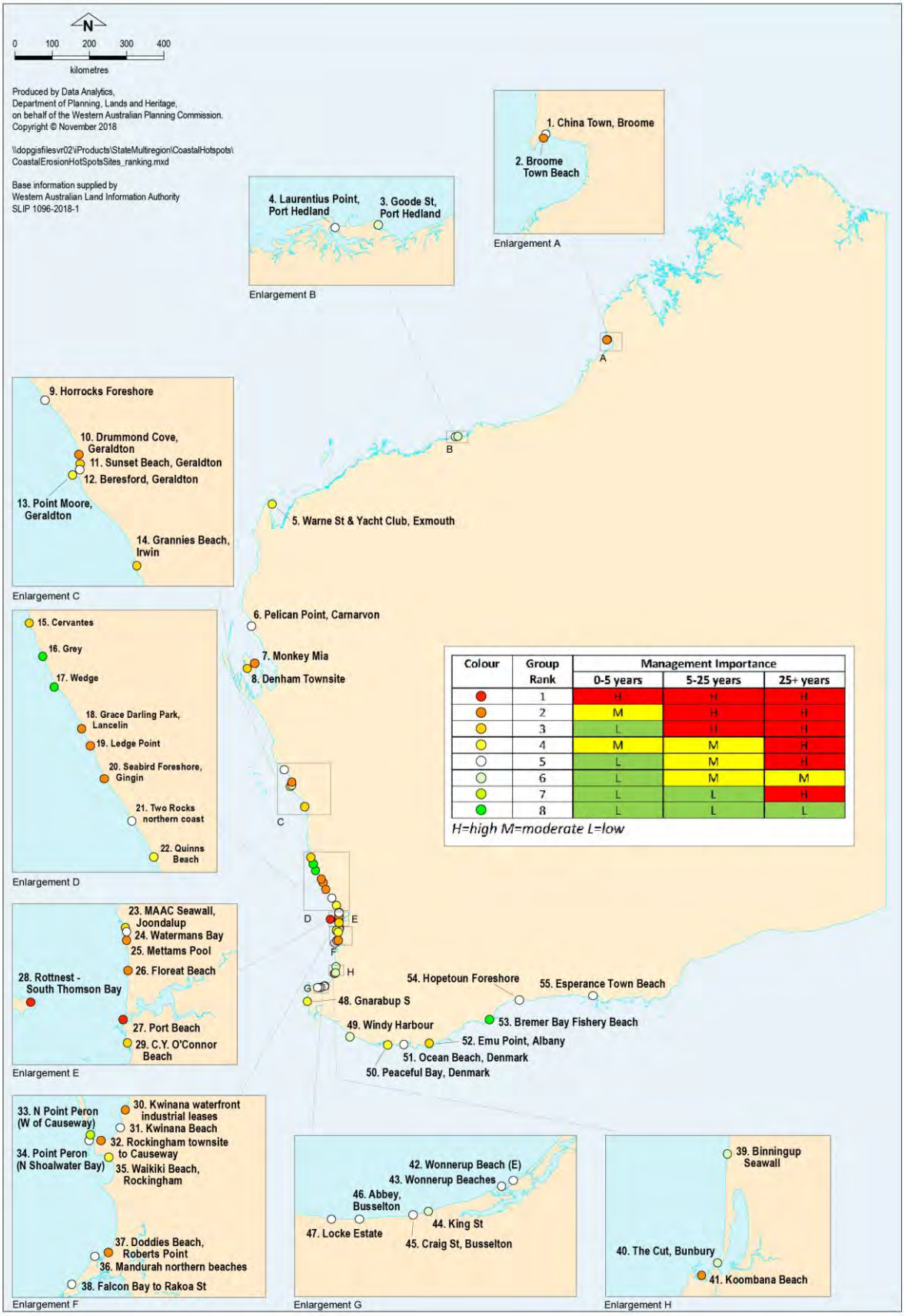

Figure 3: Original map of coastal erosion hotspots in Western Australia (adapted from Seashore 2019).

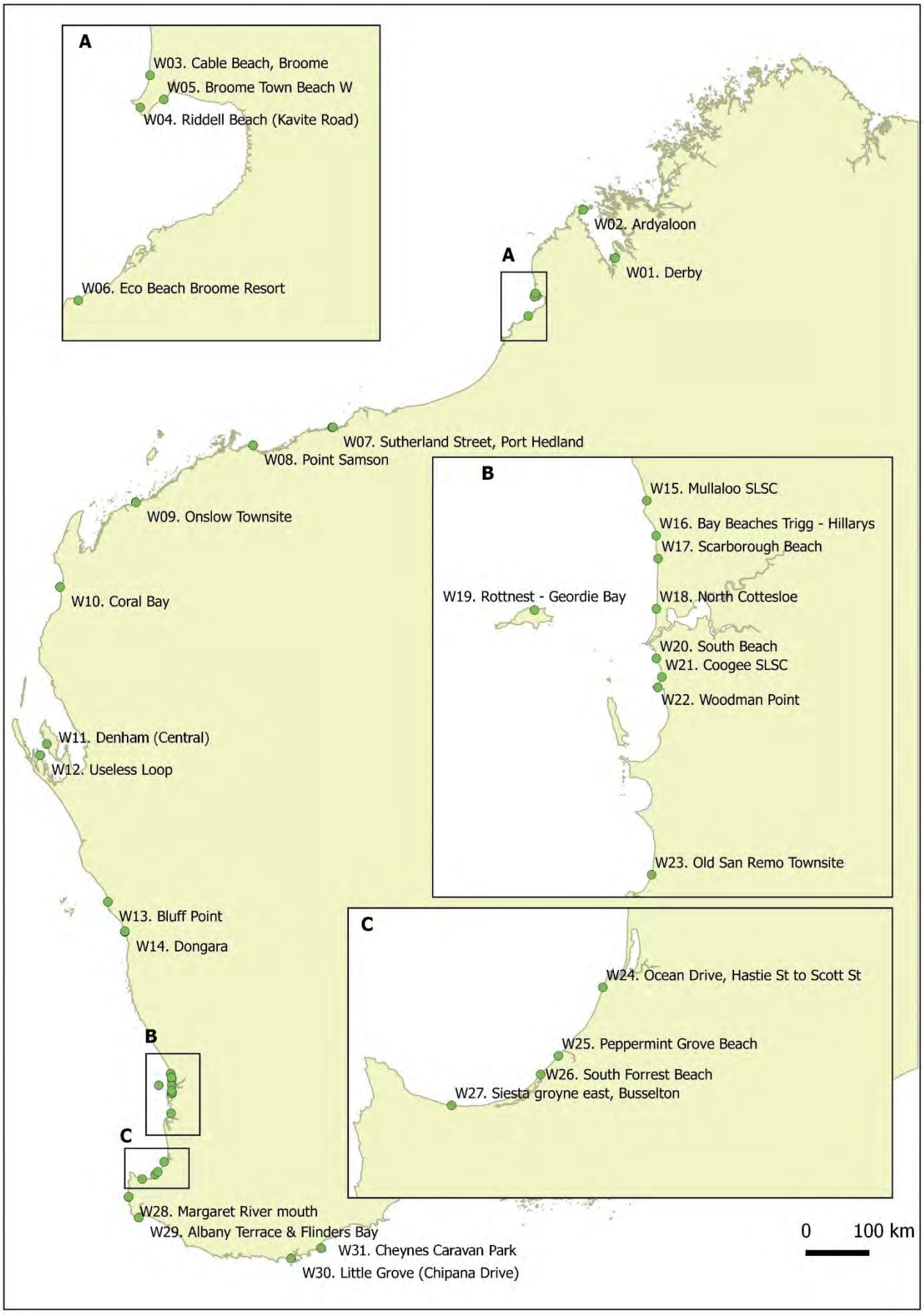

Figure 4:Original map of coastal erosion watchspots in Western Australia (sourced from Seashore 2019).

1.2. Aim

The aim of this report is to evaluate the impact of CoastWA's role in hotspot management, acting as a staged approach prior to a formal full review and revision of Seashore (2019). Incidentally, this work also derives priority actions to inform a program evaluation and support a budget submission for continuation of CoastWA beyond 2025/26.

1.3. Objectives

To achieve the project aim, five objectives are listed below. Like Seashore (2019), these objectives focus on coastal erosion hazards impacting the open coast. Inundation hazards are not included in this report and are to be managed alongside erosion hazards by CoastWA beyond 2025/26 (if funded).

1. Undertake consultation with coastal managers to understand current erosion impacts at existing coastal erosion hotspots, watchspots, and any new locations of concern, their associated management requirements, and estimated costs of management.
2. Review the outcomes of CoastWA program activities to date, coastal management actions, and how these have reduced coastal hazard risk at hotspots.
3. Evaluate how coastal erosion hotspots and watchspots have changed since 2019, focusing on shifts in management importance and future management requirements.
4. Create a recategorized list of hotspots, including new locations that should become hotspots, and existing hotspot locations with reduced coastal hazard risk that no longer require hotspot status. This hotspot recategorization will subsequently inform a 2025 full review and revision of Seashore (2019).
5. Recommend priority actions to guide development of a work program under CoastWA beyond 2025/26 through a budget submission that employs best practise management and funding requirements for coastal erosion hotspots in WA.

2. Approach

This section documents the project approach to achieve desired objectives.

2.1. Coastal manager consultation and information gathering

Collation of relevant consultation is required to provide an update on how coastal erosion hazards have been managed by coastal managers, and how this relates to changes in coastal erosion hotspots and watchspots. Together, this information achieves Objective 1. The two primary forms of consultation for this project included a targeted survey direct to local coastal managers with open ocean coasts through the CoastWA WALGA facilitator, as well as face-to-face consultation undertaken between 2023 to 2024. The latter assessed local government coastal project needs, gathered through an extensive consultation program of individual meetings with 52 of WA's 53 coastal and estuarine local governments.

2.1.1. Coastal manager surveys

A survey direct to coastal managers with open ocean coasts was conducted by the CoastWA local government facilitator, a role hosted by WALGA and funded by CoastWA. Feedback from each respondent was received in August 2024, collated, and reviewed. All pertinent information provided was filtered to focus on existing coastal erosion hotspots and new locations of concern. This information assisted creation of Section 3 and Appendix B. 32 survey responses were collated in total from LGAs managing open ocean coasts, whereby all results relevant to hotspot management were incorporated into this report by the author. A sample of the coastal manager survey is provided in Appendix A.

2.1.2. Coastal manager meetings

Consultation was undertaken between August 2023 to May 2024 to understand coastal manager perspectives on actioning recommendations from their applicable CHRMAP. This consultation therefore provides a snapshot of each coastal manager's anticipated investment into managing coastal erosion hazards over short, medium, and long timeframes. The consultation purpose was to support the preparation of a stage 2 submission to Infrastructure Australia for listing on the National Infrastructure Priority List. DPLH with assistance from DoT, and the CoastWA WALGA facilitator, engaged with coastal managers identified as being impacted by coastal hazards within the next ten years.

While CHRMAP recommendations cover more than hotspots alone, recommended management actions invariably include hotspot management, given these locations are focal points for coastal erosion hazard risk. Therefore, these meetings evaluated the likely future actions to expect at each hotspot. Output from each meeting entailed a revised CHRMAP actions table that the coastal manager anticipates undertaking in the future.

2.2. CoastWA and actions for coastal erosion hotspots

Review of coastal management actions in the context of CoastWA addresses Objective 2. While CoastWA provides state government support and funding for the full WA coast, coastal erosion hotspots are focal points for coastal managers. Subsequently, a majority portion of CoastWA funding ultimately supports management actions at hotspots. The two primary mechanisms for CoastWA assistance are:

1. Funding and support to coastal managers through CoastWA's grant programs, where local projects are managed in partnership between the State and applicant LGAs.
2. Projects and activities directly from the CoastWA work program, managed wholly by the State.

CoastWA was funded for five years from 2020/21 to 2025/26. Its first mechanism (Item A in Table 4 for $19,140,000 over five years) spans the four grant programs administered by DoT and DPLH, plus a WALGA facilitator, to assist local coastal managers with grants and other projects. The second mechanism (Items B - E for $5,855,000 over five years), includes four discrete focus topics for direct management: hotspot ground truthing, studies and reviews, hazard mapping, and community engagement including LGA training. The third and final mechanism (Item F for $7,622,852 over five years) funded additional staff and overheads required to deliver the program.

A ~60% majority of the $33.5M in CoastWA funding from Table 4 was allocated to Item A, CoastWA grant programs to coastal managers. Funding through grants provides increased value for money, as most grants entail at least a 50:50 funding co-contribution from local coastal managers. This leverage typically extends the dollar value by over 2:1, whereby $18.3M funds nearly $40M in coastal adaptation, planning, and natural resource management projects. This $18.3M over five years forms the majority share of grant-specific funding during the seven financial year period since Seashore (2019) was released. Most of this funding was allocated to those LGAs containing coastal erosion hotspots, to be discussed later in this report.

The four focus topics from Items B – E were directly managed by CoastWA to gain improved understanding of coastal hazard issues facing both existing hotspots and future locations of concern. With close to $6M allocated, most of this work entailed monitoring or investigations which expand understanding of hazards rather than direct adaptation which could be achieved through Item A. The outcomes of projects and activities from Items B – E can also inform a future CoastWA budget submission. To that end, one of the key elements in this report supports Item C.3 (refer Objective 4). Other key inputs that inform hotspots changes include ground truthing and monitoring (Item B.1) and individual hotspot management histories (Item D.1). The geotechnical investigations in Item B.1 are of particular importance to understand coastal hazard risk at both existing hotspots and potential new hotspots.

The CoastWA actions primarily used for this report to evaluate changes in coastal erosion hotspots entail Item A, Item B.1, and Item D.1. Alongside consultation and data collated from the approach in Section 2.1, these items collectively form the backbone of data input to this report. At the time of this review (beginning of FY2024/25), two financial years remained in the five-year program, so the allocated budget against these items had not been wholly expended. For the purposes of Item A, grant funding awarded up to FY2024/25 inclusive could be used for reporting, meaning approximately $3M in grant funding allocated to FY2025/26 cannot be included. Furthermore, outcomes from Item B.1 and Item D.1 had not been finalised at the time of this review; early results from each project have instead been used for this report.

While CoastWA provided the majority of overall state hotspot funding, preceding sources of funding need to be acknowledged and included in reporting. This includes a significant Broome RfR project in 2018/19, and the WA Recovery Plan active from 2020 to 2022 which funded four significant coastal adaptation projects by the same team of CoastWA engineers. These important activities were accounted for as one-off funding from non-CoastWA state programs. While identified as one-off funding for this report, a significant project with the dual purpose of boating facility and revetment upgrades in Broome was funded by RfR which is actually not a one-off program. However, RfR cannot be relied upon for consistent coastal adaptation funding purposes so was designated a one-off source by this review.

Other funding also existed but was not quantified in detail, including sole-LGA funded projects, privately funded works, and federal programs such as CERMP and DRF given all these sources were not directed by the state (though have been identified where applicable). High level information about how the five-year DRF program relates to CoastWA was provided in Section 3.1.

Table 4: Summarised five-year CoastWA work program, covering the period from 2020/21 to 2025/26.

Item		Program element	5-yr budget	Lead agency
A	**CoastWA grant programs to coastal managers**		**$19,140,000**	**DoT/DPLH**
	0	WALGA Facilitator	$830,000	**DPLH**
	1	DoT grant programs	$13,445,000	**DoT**
		CAP	*$4,710,000*	
		H-CAP	*$8,735,000*	
	2	DPLH grant programs	$4,865,000	**DPLH**
		Coastwest	*$2,025,000*	
		CMPAP	*$2,840,000*	
B - E	**CoastWA state projects and activities**		**$5,855,000**	**DoT/DPLH**
B	**Hotspots assessment, ground truthing and monitoring**		**$1,960,000**	**DoT**
	1	Ground truthing & monitoring (geotechnical study, land survey, asset register etc.)	$1,400,000	
	2	Coastal monitoring program	$310,000	
	3	Inundation hotspots identification and assessment	$250,000	
C	**Studies and reviews**		**$520,000**	**DoT**
	1	Basic raw materials study for beach renourishment and seawall/groyne construction	$150,000	
	2	Metocean data - two additional offshore wave buoy	$220,000	
	3	Review the hotspot and watchlist locations on a five-yearly basis	$150,000	
D	**Hazard mapping and data acquisition**		**$3,375,000**	**DoT**
	1	Hazard mapping - individual hotspot management histories	$275,000	
	2.1	Hazard mapping - bathymetric LiDAR for south coast and capes	$2,000,000	
	2.2	Hazard mapping - bathymetric LiDAR for Gascoyne coast	$1,000,000	
	3	Hazard mapping - sediment cells identification for south coast	$100,000	
E	**Community Engagement, Training & Education**		**$900,000**	**DPLH**
	1	Coastal values surveys at each hotspot	$600,000	
	2	Community education strategy about coastal processes and CHRMAP	$250,000	
	3	Ongoing training and up-skilling of local coastal managers	$50,000	
F	**Staff and program management**		**$7,622,852**	**DPLH/DoT**
	1	Staffing	$6,312,844	
	2	Staff training	$50,000	
	3	Travel – site visits and local manager meeting	$27,500	
	4	Staff on-costs (including superannuation) and program overheads	$1,232,508	
	5	In-house projects: retreat case study; lease issues; UCL issues	-	
	6	In-house activities: Program management; assistance advice to LGAs; contract management	-	
	Program total		**$33,517,852**	
	Existing funding (WAPC $952,000 & DoT $1,057,000)		**$10,045,000**	
	CoastWA funding		**$23,472,852**	

2.3. Evaluation and recategorization of coastal erosion hotspots

Evaluation and recategorization of coastal erosion hotspots assist Objectives 3, 4 and 5, and also includes accounting for potential new hotspots from either elevated watchspots or previously unidentified locations of concern. A similar, though more high-level approach to Seashore (2019) was used to achieve this goal that focussed on relative changes at each location.

For this report, watchspots were included to assess whether elevation to hotspot status was justified. Conversely, hotspots may also be relegated to watchspot status if coastal hazard risk had reduced significantly since Seashore (2019).

Like Seashore (2019), two component rating systems were assessed at each location: physical asset rating and recreation/stakeholder rating. Physical asset rating provides qualitative assessments on criteria for types of public assets susceptible to erosion hazard, the number of assets exposed, and the monetary value of public assets. Recreational/stakeholder values consider criteria for peak intensity of use, loss of recreation uses, private property interest, and stakeholder interest. Criteria in both ratings are assessed in aggregate to create a score of low, medium, or high scores for each rating. Both ratings are forecast over three different time periods: 0 to 5 years, 5 to 25 years, and beyond 25 years. Finally, a qualitative score is assigned to dictate overall Management Importance (MI) that evaluates both physical asset rating and recreational/stakeholder values. This measure of MI thus informs management needs and their associated urgency. Table 5 provides original MI ratings over the three timeframes. This table formed a baseline to assess how MI changed from 2018/19 to 2024/25.

As discussed in Section 1.1, DoT (2022) documented hotspot updates three financial years after Seashore (2019) was drafted. Location updates were assigned four categories: major, moderate, or no reported change, plus the category of potential new hotspots. Major and moderate changes could be either positive or negative, qualified by aggregating both coastal management actions to reduce risk, and/or elevated severity of coastal hazards indicating increased risk. 28 hotspots reported updates and six new potential hotspot locations were identified. Of the 28 hotspots with updates, 12 entail major updates (22% of all hotspots) while 16 comprise moderate updates (29% of all hotspots). Hotspots with no change entailed either insufficient information available, or negligible change was identified at that known hotspot location since 2018. This category did not necessarily signify that a hotspot location was free of coastal erosion issues, adaptation implementation, and/or had not experienced enhanced chronic or acute erosion since 2018. Rather, it signified that little change was reportable from available information. Changes in hotspots documented by DoT (2022) therefore provide an intermediate input between when Seashore (2019) was drafted and this report.

An updated MI table can be provided by this report from documentation of known changes at each hotspot, incorporation of CoastWA actions/funding, management by local coastal managers, and changes in coastal erosion hazards. An updated table is a key output to inform the CoastWA budget submission for beyond 2025/26 (Objective 1). In addition to the 55 hotspot locations, some watchlist sites and new locations of concern have elevated to hotspot status following increased risk from coastal hazards since 2019. These locations can be included in the updated table.

Following the combined actions of CoastWA, local coastal managers, and changes in coastal hazards, some hotspots observed reduced coastal hazard risk since 2018/2019. Some of these hotspots can therefore be assigned a reduced score for physical asset rating, recreation/stakeholder rating, or both, to reduce overall MI. If MI reduced enough over all three anticipated timeframes, a hotspot may be relegated down to watchspot status entirely – an updated watchlist table is thus also included in this report. All updated tables provide valuable information as to which locations will be potential focus points for future funding support, as well as providing hindsight on the success of CoastWA for management intervention at previously more severe hotspot locations.

Table 5: Original physical asset rating and recreation/stakeholder rating to inform management importance at coastal erosion hotspots; sourced from Seashore (2019).

Hotspot	Physical Asset rating			Recreation/ Stakeholder rating			Management Importance		
	0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years
1. China Town, Broome	L	M	H	M	M	H	L	M	H
2. Broome Town Beach	M	M	H	M	H	H	M	H	H
3. Goode St, Port Hedland	L	M	M	L	M	M	L	M	M
4. Laurentius Point, Port Hedland	L	M	H	M	M	M	L	M	H
5. Warne St & Yacht Club Exmouth	M	M	H	M	M	H	M	M	H
6. Pelican Point, Carnarvon	M	M	H	L	M	H	L	M	H
7. Monkey Mia	M	H	H	M	H	H	M	H	H
8. Denham townsite	M	H	H	L	H	H	L	H	H
9. Horrocks Foreshore	L	M	H	M	M	H	L	M	H
10. Drummond Cove, Geraldton	M	H	H	M	M	H	M	H	H
11. Sunset Beach, Geraldton	M	H	H	L	M	H	L	H	H
12. Beresford, Geraldton	L	M	H	M	M	H	L	M	H
13. Point Moore, Geraldton	M	M	H	M	M	H	M	M	H
14. Grannies Beach, Irwin	L	H	H	M	H	H	L	H	H
15. Cervantes	M	H	H	L	M	H	L	H	H
16. Grey	L	L	L	M	M	M	L	L	L
17. Wedge	L	L	L	M	M	M	L	L	L
18. Grace Darling Park, Lancelin	M	M	H	M	H	H	M	H	H
19. Ledge Point	L	M	M	H	H	H	M	H	H
20. Seabird Foreshore, Gingin	M	H	H	M	H	H	M	H	H
21. Two Rocks northern coast	M	M	H	L	M	H	L	M	H
22. Quinns Beach	M	M	H	M	M	H	M	M	H
23. MAAC Seawall, Joondalup	L	M	H	M	H	H	L	H	H
24. Watermans Bay, Stirling	L	M	H	M	M	H	L	M	H
25. Mettams Pool	M	M	H	M	H	H	M	H	H
26. Floreat Beach	M	H	H	M	H	H	M	H	H
27. Port Beach	M	M	H	H	H	H	H	H	H
28. Rottnest – South Thomson Bay	H	H	H	M	M	H	H	H	H
29. C.Y. O'Connor beach, Cockburn	L	M	H	M	H	H	L	H	H
30. Kwinana waterfront industrial	M	H	H	M	H	H	M	H	H
31. Kwinana Beach	L	M	H	L	M	M	L	M	H
32. Rockingham T. Beach to Causeway	M	H	H	M	H	H	M	H	H
33. N Point Peron (W of Causeway)	L	L	M	L	M	H	L	L	H
34. Point Peron (N Shoalwater Bay)	M	H	H	L	L	M	L	M	H
35. Waikiki Beach, Rockingham	M	M	H	M	M	H	M	M	H
36. Mandurah Northern Beaches	M	H	H	M	H	H	M	H	H
37. Doddies Beach, Roberts Point	L	M	H	L	M	H	L	M	H
38. Falcon Bay to Rakoa St	M	M	H	L	M	H	L	M	H
39. Binningup Seawall	L	M	M	L	M	M	L	M	M
40. The Cut, Bunbury	M	M	M	L	M	M	L	M	M
41. Koombana Beach	M	H	H	M	H	H	M	H	H
42. Wonnerup Beach (East)	L	M	M	M	M	H	L	M	H
43. Wonnerup Beaches	L	M	H	M	M	H	L	M	H
44. King St	M	M	M	L	M	M	L	M	M
45. Craig St, Busselton	M	M	H	L	M	H	L	M	H
46. Abbey, Busselton	M	M	H	L	M	H	L	M	H
47. Locke Estate	L	M	M	M	M	H	L	M	H
48. Gnarabup S	M	M	M	M	M	H	M	M	H
49. Windy Harbour Foreshore	L	M	M	L	M	M	L	M	M
50. Peaceful Bay	M	M	H	M	M	M	M	M	H
51. Denmark, Ocean Beach	L	M	M	M	M	H	L	M	H
52. Emu Pt, Albany	L	M	M	M	H	H	L	H	H
53. Bremer Bay Fishery Beach	L	L	L	L	M	M	L	L	L
54. Hopetoun Foreshore	L	M	H	L	M	H	L	M	H
55. Esperance Town Beach	L	M	H	M	M	H	L	M	H

3. Results

This section provides the outcomes from collation and analysis of management actions, coastal manager information gathering, and CoastWA funding/actions. These results provide guidance towards anticipated shifts in MI for existing coastal erosion hotspots, as well as newly recommended hotspots.

3.1. Management actions and funding by local coastal manager

Management actions were documented to assess each coastal manager's activities at existing hotspots and at new locations recommended to become hotspots, following consideration of review material and coastal manager feedback. Existing hotspots can be categorised by an increased, decreased, or similar level of anticipated MI. To assist this, the following was documented for each hotspot by coastal manager: physical changes at each location (high level), funding assistance from 2018/19 to 2024/25, relevant coastal manager meetings, and the more recent survey consultation. Such information was collated for each location and grouped by local coastal manager into Appendix B.

To provide an overview of past grants preceding the overview of actions, Table 6 enumerates grants and funding support awarded from 2018/19 to 2024/25 inclusive, categorised by local coastal manager. Unsuccessful funding applications are provided as well to indicate a notional value from potential projects that could not be funded. Funding to non-hotspot locations and regional partnerships are also documented for context. One-off funding was identified primarily from WA Recovery Plan and RfR projects that predated the CoastWA program, applying hotspot adaptation by the same engineering team as CoastWA. An important clarification is that funding is assigned at the LGA level here, yet grants may have also included community groups and other stakeholders/contributors. These are assigned under LGA remit for simplicity, and because LGAs are the primary coastal management authority at hotspots.

Table 6 is not exhaustive of all types of possible funding assistance, pertaining to known state funding programs only with the direct purpose of coastal management and adaptation; it thus does not include some other programs such as the federally funded Disaster Relief Fund (DRF). Also not included are separate initiatives from the CoastWA program back in Table 4 (i.e. not grants), as those projects were centred on strategic information gathering rather than adaptation at hotspots with local managers.

Summing the total funding assistance from CoastWA grants in Table 6 provides a total of $20,042,087. According to grant co-contribution requirements, this corresponds to a total capital investment of over $40M towards grant projects for coastal adaptation and management, providing a cost-leverage ratio of at least 2:1. The true investment total would be even higher given coastal managers fund many adaptation projects independently without applying for CoastWA grants at all. It is clear the extant financial burden for coastal management is significant.

A grand total of $31,796,633 in funding assistance was awarded to WA coastal managers over the seven-year period in Table 6. This larger total was due to the additional inclusion of one-off funding allocated to DoT for specific coastal adaptation projects by RfR and WA Recovery Plan. Total shortfall of requested funding over this period was $17,865,898, representing an (over)subscription ratio of 156%. When accounting for demand to CoastWA grants alone without one-off funding, the subscription ratio rises significantly to 189%. This demonstrates significant demand for both CoastWA grant funding and its precedent one-off funding sources.

To assess hotspot-specific funding from the $31,796,633 total, $29,909,974 (93%) was assigned to coastal managers with either existing hotspots or newly recommended hotspots. By contrast, $2,074,867 (7%) was awarded to the combination of projects from coastal managers without existing hotspots/new locations, and to regional partnership projects such as multi-LGA monitoring programs. Note the significant bias towards funding projects at hotspots is not due to non-hotspot locations being unfairly

disregarded in funding allocations, instead it is because the overwhelming majority of funding requests came from LGAs containing hotspots, comprising 86% of all applicant funding requests. This demonstrates the importance of hotspot reporting for coastal management in WA – these locations are evidently the primary areas of coastal management activity in the state.

To provide further context around the role of CoastWA funding for hotspot management, information was evaluated from the 2024/25 DRF application round. Due to this being a five-year federal program not managed by the authoring department, details cannot be provided above high-level figures. It is understood that 11 coastal management and adaptation projects were requested from DRF in 2024/25, of which slightly more than one third received funding (4 projects). Total requested funding to DRF in 2024/25 for coastal management and adaptation projects was $26,798,390, to which one quarter was awarded ($5,469,425). The (over)subscription ratio to DRF for coastal management and adaptation projects in 2024/25 was resultantly 490%.

In relation to the wider DRF funding pool of $200,000,000 available for 2024/25 program, $36,186,000 was awarded to Western Australian applications (18%). Funding to coastal projects in WA therefore accounts for 2.7% of the total DRF funding pool, representing 15% of awarded WA funding. Coastal projects in WA evidently comprise a relatively minor role in the DRF program due to its wide range of categories and nation-wide scope. Such a large funding venture by the federal government is commendable and important to continue, though its wide scope means many critical coastal projects in WA will not receive the funding support and associated technical assistance demanded by local coastal managers.

DRF's low level of funding awarded to WA coastal projects suggests that DRF alone cannot substitute or replace CoastWA. While presenting an important potential pathway for funding, DRF is yet even more oversubscribed, covers a broader range of categories with an inability to incorporate all coastal project needs, and cannot provide the direct project management guidance or oversight critical to coastal projects that CoastWA covers.

Table 6: State funding assistance awarded to coastal managers with hotspots or new locations from 2018/19 to 2024/25 (funding to other locations is also noted at the bottom); n.b assigns enlarged hotspots and n.5 assigns new hotspots.

Hotspot or site	Coastal manager	I.D. (2019)	CHRMAP*	CAP	H-CAP	CMPAP	Coastwest	One-off funding**	Total since 2018/19	Funding shortfall^
1. China Town, Broome	Shire of Broome	H01	2017	$223,238	$1,660,000	$88,000	$106,000	$6,754,546	$8,831,784	$1,998,555
2.b Broome Town Beach		H02								
2.5 Broome Cable Beach Foreshore		W03								
3. Goode St, Port Hedland	Town of Port Hedland	H03	2019	$227,453	-	$50,000	$83,894	-	$361,347	$1,845,049
4. Laurentius Point, Port Hedland		H04								
5. Warne St & Yacht Club Exmouth	Shire of Exmouth	H05	Underway	-	-	$90,000	-	-	$90,000	$50,000
6. Pelican Point, Carnarvon	Shire of Carnarvon	H06	Underway	-	-	$150,000	$69,546	-	$219,546	$70,000
7. Monkey Mia	Shire of Shark Bay	H07	2018	$11,000	-	-	-	-	$11,000	$176,952
8. Denham Townsite		H08	2020							
9. Horrocks Foreshore	Shire of Northampton	H09	2020	$10,020	-	$40,000	-	-	$50,020	-
10. Drummond Cove, Geraldton	City of Greater Geraldton	H10	2019	$164,586	$1,365,000	$40,000	$147,559	$600,000	$2,317,145	$266,990
11. Sunset Beach, Geraldton		H11								
12. Beresford, Geraldton		H12								
13. Point Moore, Geraldton		H13								
14.b Grannies Beach, Irwin	Shire of Irwin	H14	2016	$77,583	-	$40,000	-	-	$117,583	$50,000
15. Cervantes	Shire of Dandaragan	H15	2018	$84,293	-	-	$55,000	-	$139,293	$76,800
16. Grey	DBCA (Shire of Dandaragan)	H16	Underway	-	-	-	-	-	-	-
17. Wedge		H17								
18. Grace Darling Park, Lancelin	Shire of Gingin	H18	2019	$218,790	-	$152,900	-	-	$371,690	$323,028
19. Ledge Point		H19								
20.b Seabird Foreshore, Gingin		H20								
21. Two Rocks Northern Coast	City of Wanneroo	H21	2018	$1,295,060	-	-	$8,200	$500,000	$1,803,260	$1,421,143
21.5 Yanchep Lagoon		-								
22. Quinns Beach		H22								
22.5 Pinnaroo Point	City of Joondalup	-	Underway	$789,263	-	-	$339,181	-	$1,128,444	$396,158
23. MAAC Seawall, Joondalup		H23								
24. Watermans Bay, Stirling	City of Stirling	H24	2023	$470,998	-	$134,734	$248,210	-	$853,942	$540,170
25. Mettams Pool		H25								
26. Floreat Beach	Town of Cambridge	H26	2022	$200,000	-	$111,710	$159,865	-	$471,575	$214,556
27. Port Beach	City of Fremantle	H27	2017	$195,582	$500,000	-	$79,227	$3,250,000	$4,024,809	$454,226
28. Rottnest – South Thomson Bay	Rottnest Island Authority	H28	2022	$25,000	$1,770,000	-		-	$1,795,000	$470,610
29.b C.Y. O'Connor Beach, Cockburn	City of Cockburn	H29	Underway	$373,564	-	$140,000	$146,214	-	$659,778	$466,039
30. Kwinana Waterfront Industrial	City of Kwinana	H30	Underway	-	-	$130,000	-	-	$130,000	-
31.b Kwinana Beach		H31								
32. Rockingham T. Beach to Causeway	City of Rockingham	H32	2019	$303,438	-	-	$81,813	$650,000	$1,035,251	$115,886
33. N Point Peron (W of Causeway)		H33								
34. Point Peron (N Shoalwater Bay)		H34								
35.b Waikiki Beach, Rockingham		H35								
36.b Mandurah Northern Beaches	City of Mandurah	H36	2022	$51,000	-	$215,000	-	-	$266,000	$331,729
37. Doddies Beach, Roberts Point		H37								
38. Falcon Bay to Rakoa St		H38								
39. Binningup Seawall	Shire of Harvey	H39	2016	-	-	-	$88,126	-	$88,126	$121,799
40. The Cut, Bunbury	City of Bunbury	H40	2024	$50,000	-	-	-	-	$50,000	$407,500
41. Koombana Beach		H41								
41.5 Ocean Drive, Bunbury		W24								
42. Wonnerup Beach (East)	City of Busselton	H42	Oct-22	$512,625	-	$150,000	$99,057	-	$761,682	$2,526,920
43.b Wonnerup Beaches		H43								
44.b King St, Busselton		H44								
45.b Craig St, Busselton		H45								
46.b Abbey, Busselton		H46								
47. Locke Estate, Busselton		H47								
47.5 Vincent St Foreshore, Dunsborough		-								
48. Gnarabup S	Shire of Augusta-Margaret River	H48	Underway	$113,750	-	$50,000	51,841	-	$215,591	$232,073
49. Windy Harbour Foreshore	Shire of Manjimup	H49	Underway	-	-	$50,000	-	-	$50,000	$60,000
50. Peaceful Bay	Shire of Denmark	H50	2018	$80,775	$1,140,000	$60,000	$14,000	-	$1,294,775	$275,172
51. Denmark, Ocean Beach		H51								
52. Emu Pt, Albany	City of Albany	H52	2019	$213,643	$230,000	$119,398	$71,937	-	$634,978	$1,976,881
53. Bremer Bay Fishery Beach	Shire of Jerramungup	H53	2018	-	-	-	$98,856	-	$98,856	$57,956
54. Hopetoun Foreshore	Shire of Ravensthorpe	H54	Underway	-	-	$130,000	-	-	$130,000	$61,778
55. Esperance Town Beach	Shire of Esperance	H55	2016	$660,000	$750,000	-	$310,294	-	$1,720,294	$398,838
			Sub-Totals	**$6,351,659**	**$7,415,000**	**$1,941,742**	**$2,258,820**	**$11,754,546**	**$29,721,767**	**$15,386,808**
			Grand Total, includes $2,074,867 funds to regional partnerships/non-hotspot LGAs						**$31,796,633**	**$17,865,898**

3.2. Changes in Management Importance

Existing hotspots and recommended new hotspots have been documented for changes in MI following Appendix B's collation and analysis of physical changes, management actions, CoastWA funding/actions, and coastal manager information gathering. Recommendations for MI changes to the original 55 hotspots are shown in Figure 5. One fifth (11/55) of the original 55 hotspots have benefitted from management actions or shifts in coastal hazard risk that justify reclassification from hotspot status down to less severe watchlist status, or removal from active monitoring entirely. Furthermore, almost one third (17/55) of hotspots saw a reduction in MI due to adaptation implementation and/or reduced coastal hazard risks compared to original MI designations from Seashore (2019). This means over half of the original hotspot list has seen a reduction in overall erosion vulnerability over the seven financial years assessed from 2018/19 to 2024/25.

17 hotspots (31%) in Figure 5 demonstrated similar MI to Seashore (2019), not necessarily from lacking management action, though from a balance of risk outstanding that cannot reduce MI further than originally designated. Importantly, ten hotspots (18%) have observed increased MI following increased threats from coastal erosion despite efforts to manage erosion or otherwise. Further to Figure 5, four new hotspots were identified from consultation and review. The final number of hotspots has therefore reduced from 55 in 2018/2019, down to 48 in 2024/25 according to this review.

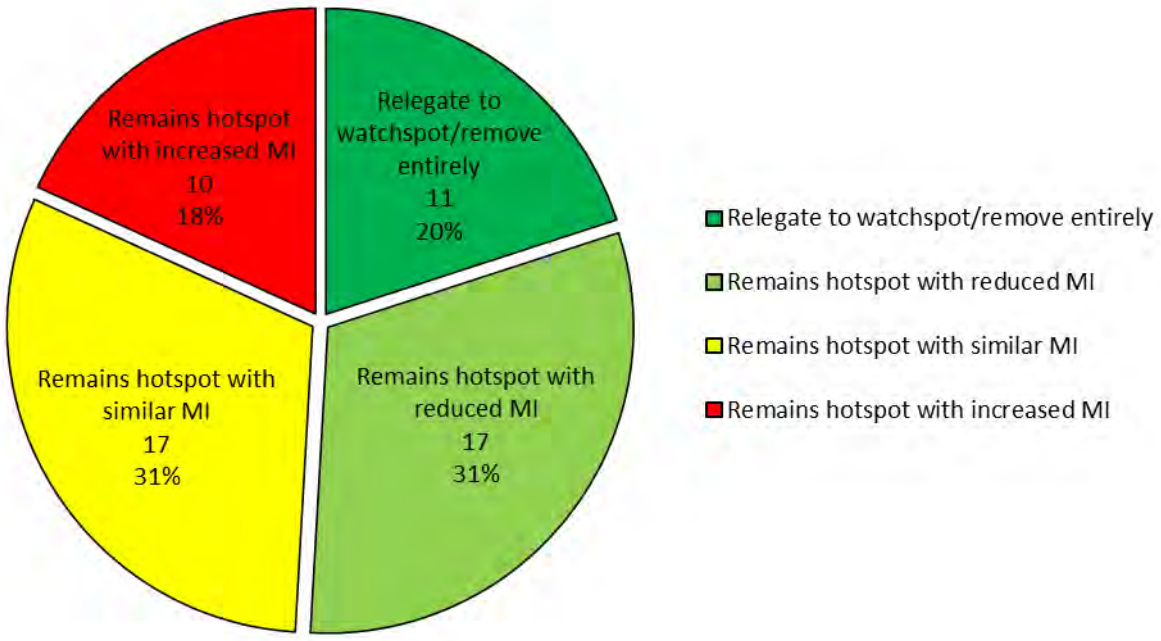

Figure 5: Recommendations for changes in MI for the original 55 hotspots.

3.2.1. Hotspots relegated to watchspot status or removed entirely

Eleven hotspots have been recommended for relegation to watchspot status or removal, summarised in Table 7. Relegation to watchspot status does not signify these locations are no longer important for coastal management, rather the aggregate MI from all available information balances to fall outside of the original hotspot definition. Relegation is a positive sign for coastal management, as it means either reduced pressure from coastal hazards has been reported, or successful adaptation actions were applied to mitigate hazard risk. Also included in this category are locations now considered unnecessary to monitor as either a hotspot or watchspot and are recommended to be removed from the hotspot list.

Table 7: Hotspots recommended to be relegated to watchspot status or removed from active consideration entirely.

Hotspot	Recommendation	Management Importance		
		0–5 years	5–25 years	25+ years
3. Goode St, Port Hedland	Relegate to watchspot	L	L	L
4. Laurentius Point, Port Hedland	Relegate to watchspot	L	L	L
16. Grey	Relegate to watchspot	L	L	L
17. Wedge	Relegate to watchspot	L	L	L
40. The Cut, Bunbury	Remove entirely	L	L	L
41. Koombana Beach	Relegate to watchspot	L	L	L
42. Wonnerup Beach (East)	Remove entirely (merged)			
45.b Craig St, Busselton	Relegate to watchspot	L	L	L
49. Windy Harbour Foreshore	Relegate to watchspot	L	L	L
50. Peaceful Bay	Relegate to watchspot	L	L	L
53. Bremer Bay Fishery Beach	Remove entirely	L	L	L

3.2.2. New hotspots

Four locations of concern flagged by local coastal managers and review material were recommended to become new hotspots, listed in Table 8. MI is forecast for 0-5 years, 5-25 years, and 25+ year intervals.

Table 8: New locations of concern recommended to become new hotspots, including forecast MI timeframes.

Hotspot	Recommendation	Management Importance		
		0–5 years	5–25 years	25+ years
2.5 Broome Cable Beach Foreshore	New hotspot	M	H	H
21.5 Yanchep Lagoon	New Hotspot	L	M	H
22.5 Pinnaroo Point	New Hotspot	M	M	H
47.5 Vincent St Foreshore, Dunsborough	New Hotspot	M	M	H

3.2.3. Hotspots with increased management importance

Ten hotspots were recommended for an increase in MI, listed in Table 9. MI is forecast for 0-5 years, 5-25 years, and 25+ year intervals. All hotspots with increased MI now occupy a medium to high priority across each assessed timeframe. Increased MI does not mean all aspects of hotspot management have increased in priority there, rather the aggregate MI from current available information equates to be higher than what Seashore (2019) reported.

Table 9: Hotspots with a recommended increase in MI, including forecast MI timeframes.

Hotspot	Recommendation	Management Importance		
		0–5 years	5–25 years	25+ years
9. Horrocks Foreshore	Remains hotspot with increased MI	M	M	H
13. Point Moore, Geraldton	Remains hotspot with increased MI	M	H	H
15. Cervantes	Remains hotspot with increased MI	M	H	H
20.b Seabird Foreshore, Gingin	Remains hotspot with increased MI	H	H	H
25. Mettams Pool	Remains hotspot with increased MI	H	H	H
26. Floreat Beach	Remains hotspot with increased MI	H	H	H
29.b C.Y. O'Connor Beach, Cockburn	Remains hotspot with increased MI	M	H	H
31.b Kwinana Beach	Remains hotspot with increased MI	M	M	H
36.b Mandurah Northern Beaches	Remains hotspot with increased MI	H	H	H
52. Emu Pt, Albany	Remains hotspot with increased MI	M	H	H

3.2.4. Hotspots with reduced management importance

17 hotspots were recommended for a reduction in MI, listed in Table 10. MI is forecast for 0-5 years, 5-25 years, and 25+ year intervals. Reduced MI does not mean all aspects of hotspot management have decreased in priority there, rather the aggregate MI from current available information equates to be lower than what Seashore (2019) reported.

Table 10: Hotspots with a recommended decrease in MI, including forecast MI timeframes.

Hotspot	Recommendation	Management Importance		
		0–5 years	5–25 years	25+ years
2.b Broome Town Beach	Remains hotspot with reduced MI	L	L	H
5. Warne St & Yacht Club Exmouth	Remains hotspot with reduced MI	L	M	M
7. Monkey Mia	Remains hotspot with reduced MI	L	M	M
8. Denham townsite	Remains hotspot with reduced MI	L	M	H
11. Sunset Beach, Geraldton	Remains hotspot with reduced MI	L	M	H
14.b Grannies Beach, Irwin	Remains hotspot with reduced MI	L	L	M
21. Two Rocks northern coast	Remains hotspot with reduced MI	L	M	H
22. Quinns Beach	Remains hotspot with reduced MI	L	M	H
27. Port Beach	Remains hotspot with reduced MI	L	M	H
30. Kwinana Waterfront Industrial	Remains hotspot with reduced MI	M	M	H
28. Rottnest – South Thomson Bay	Remains hotspot with reduced MI	L	M	H
33. N Point Peron (W of Causeway)	Remains hotspot with reduced MI	L	L	M
38. Falcon Bay to Rakoa St	Remains hotspot with reduced MI	L	L	M
39. Binningup Seawall	Remains hotspot with reduced MI	L	L	M
48. Gnarabup S	Remains hotspot with reduced MI	L	M	H
51. Denmark, Ocean Beach	Remains hotspot with reduced MI	L	L	M
55. Esperance Town Beach	Remains hotspot with reduced MI	L	L	M

3.2.5. Hotspots with similar management importance

17 hotspots were recommended to retain a similar MI to Seashore (2019), listed in Table 11. MI is forecast for 0-5 years, 5-25 years, and 25+ year intervals. A similar MI does not mean all aspects of hotspot management have remained constant there, rather the aggregate MI from all available information balances to similar to what Seashore (2019) reported.

Table 11: Hotspots with a recommended similar MI to Seashore (2019), including forecast MI timeframes.

Hotspot	Recommendation	Management Importance		
		0–5 years	5–25 years	25+ years
1. China Town, Broome	Remains hotspot with similar MI	L	M	H
6. Pelican Point, Carnarvon	Remains hotspot with similar MI	L	M	H
10. Drummond Cove, Geraldton	Remains hotspot with similar MI	M	H	H
12. Beresford, Geraldton	Remains hotspot with similar MI	L	M	H
18. Grace Darling Park, Lancelin	Remains hotspot with similar MI	M	H	H
19. Ledge Point	Remains hotspot with similar MI	M	H	H
23. MAAC Seawall, Joondalup	Remains hotspot with similar MI	L	H	H
24. Watermans Bay, Stirling	Remains hotspot with similar MI	L	M	H
32. Rockingham T. Beach to Causeway	Remains hotspot with similar MI	M	H	H
34. Point Peron (N Shoalwater Bay)	Remains hotspot with similar MI	L	M	H
35.b Waikiki Beach, Rockingham	Remains hotspot with similar MI	M	M	H
37. Doddies Beach, Roberts Point	Remains hotspot with similar MI	L	M	H
43.b Wonnerup Beaches	Remains hotspot with similar MI	L	M	H
44.b King St	Remains hotspot with similar MI	L	M	M
46.b Abbey, Busselton	Remains hotspot with similar MI	L	M	H
47. Locke Estate	Remains hotspot with similar MI	L	M	H
54. Hopetoun Foreshore	Remains hotspot with similar MI	L	M	H

3.2.6. Results for all locations

Information for individual MI recommendations across all locations is provided in Table 12, including details on recreation/stakeholder rating and physical asset rating. These changes should be viewed alongside original MI results from Seashore (2019), provided back in Table 5. Subsequently, Table 13 is an extension to Table 12, where all locations have been reordered through assigning one of five preliminary ranks between low to severe following MI recommendations. Some hotspots in Table 12 and Table 13 have added notation (*n.b*) to be enlarged beyond their original size to cover adjacent eroding or vulnerable areas, while new hotspots also have added notation of (*n.5*). This approach allowed the original hotspot numbering from Seashore (2019) to be retained for ease of reference.

To visualise the final list of hotspots, Figure 6 presents a map with each hotspot location – colour coordinated by each of the five preliminary ranks. Figure 6 is designed for direct contrast and comparison with original infographics from Seashore (2019)

Table 12: MI recommendations for all locations, including recreation/stakeholder rating and physical asset rating; n.b assigns enlarged hotspots and n.5 assigns new hotspots.

Hotspot	Recommendation	Management Importance			Recreation/ Stakeholder rating			Physical Asset rating		
		0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years
1. China Town, Broome	Remains hotspot with similar MI	L	L	H	M	M	H	L	L	M
2.b Broome Town Beach	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	M
2.5 Broome Cable Beach Foreshore	New hotspot	M	H	H	M	H	H	M	M	H
3. Goode St, Port Hedland	Relegate to watchspot	L	L	L	L	L	L	L	L	L
4. Laurentius Point, Port Hedland	Relegate to watchspot	L	L	L	L	L	L	L	L	L
5. Warne St & Yacht Club Exmouth	Remains hotspot with reduced MI	L	M	M	L	M	M	L	L	M
6. Pelican Point, Carnarvon	Remains hotspot with similar MI	L	M	H	L	M	H	L	M	H
7. Monkey Mia	Remains hotspot with reduced MI	L	M	M	L	M	M	L	M	M
8. Denham townsite	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
9. Horrocks Foreshore	Remains hotspot with increased MI	M	M	H	M	M	H	M	M	H
10. Drummond Cove, Geraldton	Remains hotspot with similar MI	M	H	H	M	M	H	M	H	H
11. Sunset Beach, Geraldton	Remains hotspot with reduced MI	L	M	H	L	L	M	L	M	H
12. Beresford, Geraldton	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	H
13. Point Moore, Geraldton	Remains hotspot with increased MI	M	H	H	L	M	H	M	H	H
14.b Grannies Beach, Irwin	Remains hotspot with reduced MI	L	L	M	L	M	M	L	L	M
15. Cervantes	Remains hotspot with increased MI	M	H	H	L	M	H	M	H	H
16. Grey	Relegate to watchspot	L	L	L	L	L	L	L	L	L
17. Wedge	Relegate to watchspot	L	L	L	L	L	L	L	L	L
18. Grace Darling Park, Lancelin	Remains hotspot with similar MI	M	H	H	M	H	H	M	M	H
19. Ledge Point	Remains hotspot with similar MI	M	H	H	H	H	H	L	M	H
20.b Seabird Foreshore, Gingin	Remains hotspot with increased MI	H	H	H	H	H	H	M	H	H
21. Two Rocks northern coast	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
21.5 Yanchep Lagoon	New hotspot	L	M	H	L	M	H	L	M	H
22. Quinns Beach	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
22.5 Pinnaroo Point	New hotspot	M	M	H	M	M	H	L	M	H
23. MAAC Seawall, Joondalup	Remains hotspot with similar MI	L	H	H	M	H	H	L	M	H
24. Watermans Bay, Stirling	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	H
25. Mettams Pool	Remains hotspot with increased MI	H	H	H	H	H	H	M	H	H
26. Floreat Beach	Remains hotspot with increased MI	H	H	H	H	H	H	H	H	H
27. Port Beach	Remains hotspot with reduced MI	L	M	H	L	M	H	L	M	H
28. Rottnest – South Thomson Bay	Remains hotspot with reduced MI	L	M	H	L	L	M	L	M	H
29.b C.Y. O'Connor Beach, Cockburn	Remains hotspot with increased MI	M	H	H	M	H	H	M	H	H
30. Kwinana Waterfront Industrial	Remains hotspot with reduced MI	M	M	H	M	M	H	M	M	H
31.b Kwinana Beach	Remains hotspot with increased MI	M	M	H	L	M	M	M	H	H
32. Rockingham T. Beach to Causeway	Remains hotspot with similar MI	M	H	H	M	H	H	M	H	H
33. N Point Peron (W of Causeway)	Remains hotspot with reduced MI	L	L	M	L	M	M	L	L	M
34. Point Peron (N Shoalwater Bay)	Remains hotspot with similar MI	L	M	H	L	L	M	M	H	H
35.b Waikiki Beach, Rockingham	Remains hotspot with similar MI	M	M	H	M	M	H	M	M	H
36.b Mandurah Northern Beaches	Remains hotspot with increased MI	H	H	H	M	H	H	H	H	H
37. Doddies Beach, Roberts Point	Remains hotspot with similar MI	L	M	H	L	M	H	L	M	H
38. Falcon Bay to Rakoa St	Remains hotspot with reduced MI	L	L	M	L	L	M	L	L	M
39. Binningup Seawall	Remains hotspot with reduced MI	L	L	M	L	M	M	L	L	M
40. The Cut, Bunbury	Remove entirely	L	L	L	L	L	L	L	L	L
41. Koombana Beach	Relegate to watchspot	L	L	L	L	L	L	L	L	L
42. Wonnerup Beach (East)	Remove entirely (merged)									
43.b Wonnerup Beaches	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	H
44.b King St	Remains hotspot with similar MI	L	M	M	L	M	M	M	M	M
45.b Craig St, Busselton	Relegate to watchspot	L	L	L	L	L	L	L	L	L
46.b Abbey, Busselton	Remains hotspot with similar MI	L	M	H	L	M	H	M	M	H
47. Locke Estate	Remains hotspot with similar MI	L	M	H	M	M	H	L	M	M
47.5 Vincent St Foreshore, Dunsborough	New hotspot	M	M	H	M	M	H	M	M	H
48. Gnarabup S	Remains hotspot with reduced MI	L	M	H	M	M	H	L	M	M
49. Windy Harbour Foreshore	Relegate to watchspot	L	L	L	L	L	L	L	L	L
50. Peaceful Bay	Relegate to watchspot	L	L	L	L	L	L	L	L	L
51. Denmark, Ocean Beach	Remains hotspot with reduced MI	L	L	M	L	M	H	L	M	M
52. Emu Pt, Albany	Remains hotspot with increased MI	M	H	H	M	H	H	M	H	H
53. Bremer Bay Fishery Beach	Remove entirely	L	L	L	L	L	L	L	L	L
54. Hopetoun Foreshore	Remains hotspot with similar MI	L	M	H	L	M	H	L	M	H
55. Esperance Town Beach	Remains hotspot with reduced MI	L	L	M	L	M	H	L	L	M

Table 13: Preliminary ranking of all locations according to MI recommendations; n.b assigns enlarged hotspots and n.5 assigns new hotspots.

Hotspot	Recommendation	Ranking	Management Importance			Recreation/ Stakeholder rating			Physical Asset rating		
			0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years	0–5 years	5–25 years	25+ years
25. Mettams Pool	Remains hotspot with increased MI	Severe	H	H	H	H	H	H	M	H	H
26. Floreat Beach	Remains hotspot with increased MI	Severe	H	H	H	M	H	H	H	H	H
36.b Mandurah Northern Beaches	Remains hotspot with increased MI	Severe	H	H	H	M	H	H	H	H	H
20.b Seabird Foreshore, Gingin	Remains hotspot with increased MI	Severe	H	H	H	H	H	H	M	H	H
52. Emu Pt, Albany	Remains hotspot with increased MI	Severe	M	H	H	M	H	H	M	H	H
29.b C.Y. O'Connor Beach, Cockburn	Remains hotspot with increased MI	Severe	M	H	H	M	H	H	M	H	H
32. Rockingham T. Beach to Causeway	Remains hotspot with similar MI	Severe	M	H	H	M	H	H	M	H	H
2.5 Broome Cable Beach Foreshore	New hotspot	Severe	M	H	H	M	H	H	M	M	H
18. Grace Darling Park, Lancelin	Remains hotspot with similar MI	Severe	M	H	H	M	H	H	M	M	H
10. Drummond Cove, Geraldton	Remains hotspot with similar MI	Severe	M	H	H	M	M	H	M	H	H
19. Ledge Point	Remains hotspot with similar MI	Very High	M	H	H	H	H	H	L	M	H
15. Cervantes	Remains hotspot with increased MI	Very High	M	H	H	L	M	H	M	H	H
13. Point Moore, Geraldton	Remains hotspot with increased MI	Very High	M	H	H	L	M	H	M	H	H
23. MAAC Seawall, Joondalup	Remains hotspot with similar MI	Very High	L	H	H	M	H	H	L	M	H
31.b Kwinana Beach	Remains hotspot with increased MI	Very High	M	M	H	L	M	H	M	H	H
35.b Waikiki Beach, Rockingham	Remains hotspot with similar MI	Very High	M	M	H	M	M	H	M	M	H
22.5 Pinnaroo Point	New hotspot	Very High	M	M	H	M	M	H	M	M	H
9. Horrocks Foreshore	Remains hotspot with increased MI	Very High	M	M	H	M	M	H	M	M	H
47.5 Vincent St Foreshore, Dunsborough	New hotspot	Very High	M	M	H	M	M	H	M	M	H
30. Kwinana Waterfront Industrial	Remains hotspot with reduced MI	Very High	M	M	H	M	M	H	M	M	H
24. Watermans Bay, Stirling	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
43.b Wonnerup Beaches	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
1. China Town, Broome	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
12. Beresford, Geraldton	Remains hotspot with similar MI	High	L	M	H	M	M	H	L	M	H
46.b Abbey, Busselton	Remains hotspot with similar MI	High	L	M	H	L	M	H	M	M	H
34. Point Peron (N Shoalwater Bay)	Remains hotspot with similar MI	High	L	M	H	L	L	M	M	H	H
22. Quinns Beach	Remains hotspot with reduced MI	High	L	M	H	L	M	H	L	M	H
21.5 Yanchep Lagoon	New hotspot	High	L	M	H	L	M	H	L	M	H
6. Pelican Point, Carnarvon	Remains hotspot with similar MI	High	L	M	H	L	M	H	L	M	H
37. Doddies Beach, Roberts Point	Remains hotspot with similar MI	High	L	M	H	L	M	H	L	M	H
54. Hopetoun Foreshore	Remains hotspot with similar MI	Moderate	L	M	H	L	M	H	L	M	H
21. Two Rocks northern coast	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	H
27. Port Beach	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	H
8. Denham townsite	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	H
47. Locke Estate	Remains hotspot with similar MI	Moderate	L	M	H	M	M	H	L	M	M
48. Gnarabup S	Remains hotspot with reduced MI	Moderate	L	M	H	L	M	H	L	M	M
11. Sunset Beach, Geraldton	Remains hotspot with reduced MI	Moderate	L	M	H	L	L	M	L	M	H
28. Rottnest – South Thomson Bay	Remains hotspot with reduced MI	Moderate	L	M	H	L	L	M	L	M	H
2.b Broome Town Beach	Remains hotspot with reduced MI	Moderate	L	L	H	L	M	H	L	L	M
44.b King St	Remains hotspot with similar MI	Moderate	L	M	M	L	M	M	M	M	M
7. Monkey Mia	Remains hotspot with reduced MI	Low	L	M	M	L	M	M	L	M	M
51. Denmark, Ocean Beach	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	M	M
55. Esperance Town Beach	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
5. Warne St & Yacht Club Exmouth	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
33. N Point Peron (W of Causeway)	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
39. Binningup Seawall	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
14.b Grannies Beach, Irwin	Remains hotspot with reduced MI	Low	L	L	M	L	M	M	L	L	M
38. Falcon Bay to Rakoa St	Remains hotspot with reduced MI	Low	L	L	M	L	L	M	L	L	M
3. Goode St, Port Hedland	Relegate to watchspot		L	L	L	L	L	L	L	L	L
4. Laurentius Point, Port Hedland	Relegate to watchspot		L	L	L	L	L	L	L	L	L
16. Grey	Relegate to watchspot		L	L	L	L	L	L	L	L	L
17. Wedge	Relegate to watchspot		L	L	L	L	L	L	L	L	L
40. The Cut, Bunbury	Remove entirely		L	L	L	L	L	L	L	L	L
41. Koombana Beach	Relegate to watchspot		L	L	L	L	L	L	L	L	L
45.b Craig St, Busselton	Relegate to watchspot		L	L	L	L	L	L	L	L	L
49. Windy Harbour Foreshore	Relegate to watchspot		L	L	L	L	L	L	L	L	L
50. Peaceful Bay	Relegate to watchspot		L	L	L	L	L	L	L	L	L
53. Bremer Bay Fishery Beach	Remove entirely		L	L	L	L	L	L	L	L	L

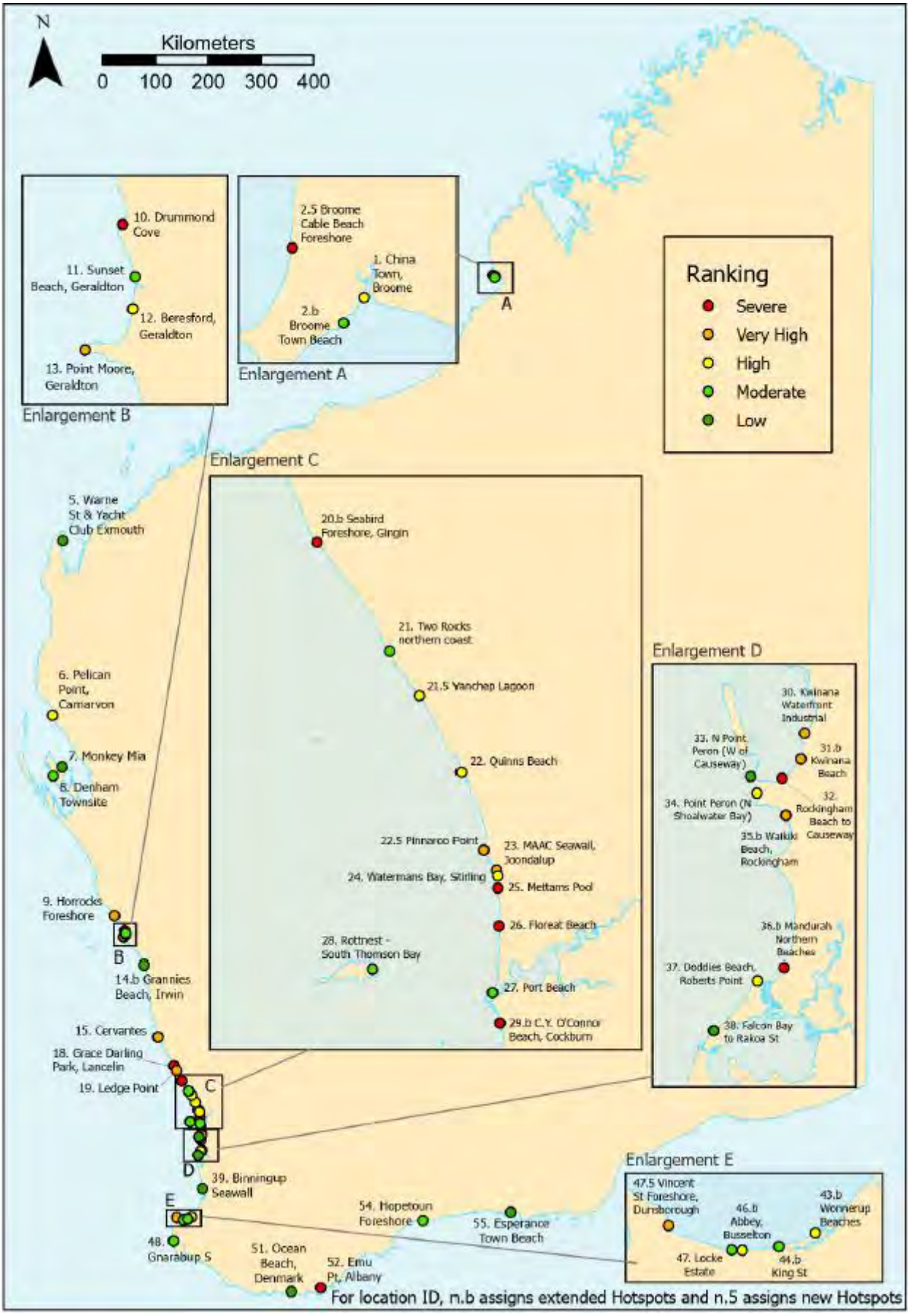

Figure 6: Updated map of coastal erosion hotspots in Western Australia including new MI recommendations; n.b assigns enlarged hotspots and n.5 assigns new hotspots.

3.3. Watchspot Updates

Information gathered for this report has identified changes to the original list from Seashore (2019) back in Figure 4. New watchspots arose from either relegation of a previous hotspot, or new locations identified that don't yet meet the requirements for hotspot status. In addition, a small number of watchspots must be elevated to hotspot status in response to growing coastal management challenges at those locations.

Table 14 provides an updated watchspot list, where each location justifies monitoring and consideration of future changes. Ten new previously unidentified watchspots are evident, plus an additional eight new watchspots added via relegation from previous hotspots. 28 of the original 31 watchspots remain on the list, noting three watchspots were elevated to hotspot status either as new discrete hotspots or by being absorbed into existing hotspots that were enlarged in size to cover old watchspot locations. The net result of all these changes is an expanded list of 46 watchspots in WA. Additional information on updated watchspot locations, such as dimensions/extents and aerial imagery, will be provided in the formal revision of Seashore (2019) planned for 2025.

A further three relegated hotspots were not included in Table 14 due to removal entirely from active consideration. These include The Cut (a waterway management issue), Wonnerup East (merged with Wonnerup hotspot), and Bremer Bay Fishery Beach (no assets under threat). To visualise the final recommended list of watchspots, Figure 7 presents a map with each watchspot location.

With CoastWA and formal hotspot report revisions iterating primarily in 5-year cycles, it is important to include consideration of watchspots for coastal management as physical changes or developments along the coast can create rapid shifts in MI. A watchspot location may occasionally justify becoming a hotspot, yet it cannot be formally recognised accordingly until the next CoastWA reporting and revision cycle. To thus avoid such locations missing out on priority funding, CoastWA grants will always consider the latest information for evaluating funding opportunities. Hotspots, their rankings, and watchspots must therefore all be considered as guides-only for coastal planning and management, being representative at the time of this review. Extant coastal management priorities will take precedence as each annual grant cycle commences.

Table 14: Updated watchspot list relative to Seashore (2019); n.b assigns enlarged watchspots and n.5 assigns new locations.

ID	LGA / Coastal Manager	Watchspot	Note
W01	Shire of Derby - West Kimberley	Derby	Watchspot in Seashore (2019)
W02	Shire of Broome	Ardyaloon	Watchspot in Seashore (2019)
W03	Shire of Broome	Cable Beach, Broome	Elevated to hotspot
W04	Shire of Broome	Riddell Beach (Kavite Road)	Watchspot in Seashore (2019)
W05	Shire of Broome	Broome Town Beach W	Watchspot in Seashore (2019)
W06	Shire of Broome	Eco Beach Broome Resort	Watchspot in Seashore (2019)
W07	Town of Port Hedland	Sutherland Street, Port Hedland	Watchspot in Seashore (2019)
W07.51	Town of Port Hedland	Goode St, Port Hedland	Hotspot relegated to watchspot
W07.52	Town of Port Hedland	Laurentius Point, Port Hedland	Hotspot relegated to watchspot
W08	City of Karratha	Point Samson	Watchspot in Seashore (2019)
W09	Shire of Ashburton	Onslow Townsite	Watchspot in Seashore (2019)
W10	Shire of Carnarvon	Coral Bay	Watchspot in Seashore (2019)
W11	Shire of Shark Bay	Denham (central)	Watchspot in Seashore (2019)
W12	Shire of Shark Bay	Useless Loop	Watchspot in Seashore (2019)
W13	City of Greater Geraldton	Bluff Point	Watchspot in Seashore (2019)
W14	Shire of Irwin	Dongara	Watchspot in Seashore (2019)
W14.51	Shire of Dandaragan / DBCA	Grey	Hotspot relegated to watchspot
W14.52	Shire of Dandaragan / DBCA	Wedge	Hotspot relegated to watchspot
W14.53	Shire of Gingin	Lancelin Lookout	New watchspot
W15	City of Joondalup	Mullaloo SLSC	Watchspot in Seashore (2019)
W16	City of Stirling	Bay Beaches Trigg - Hillarys	Watchspot in Seashore (2019)
W17	City of Stirling	Scarborough Beach	Watchspot in Seashore (2019)
W18	Town of Cottesloe	North Cottesloe	Watchspot in Seashore (2019)
W19	Rottnest Island Authority	Rottnest – Geordie Bay	Watchspot in Seashore (2019)
W20	City of Fremantle	South Beach	Elevated to hotspot
W21	City of Cockburn	Coogee SLSC	Watchspot in Seashore (2019)
W22	City of Cockburn	Woodman Point	Watchspot in Seashore (2019)
W22.5	City of Kwinana	Challenger Beach	New watchspot
W23	City of Mandurah	Old San Remo Townsite	Elevated to hotspot
W23.51	City of Mandurah	Blue Bay	New watchspot
W23.52	Shire of Harvey	Myalup Foreshore	New watchspot
W24	City of Bunbury	Ocean Drive, Hastie St to Scott St	Watchspot in Seashore (2019)
W24.5	City of Bunbury	Koombana Beach	Hotspot relegated to watchspot
W25	Shire of Capel	Peppermint Grove Beach	Watchspot in Seashore (2019)
W26	Shire of Capel	South Forrest Beach	Watchspot in Seashore (2019)
W27	City of Busselton	Siesta groyne east, Busselton	Watchspot in Seashore (2019)
W27.51b	City of Busselton	Craig St, Busselton	Hotspot relegated to watchspot
W27.52	City of Busselton	Marybrook	New watchspot
W28	Shire of Augusta Margaret River	Margaret River mouth	Watchspot in Seashore (2019)
W29	Shire of Augusta Margaret River	Albany Terrace & Flinders Bay	Watchspot in Seashore (2019)
W29.51	Shire of Augusta Margaret River	Blackwood River mouth	New watchspot
W29.52	Shire of Manjimup	Windy Harbour Foreshore	Hotspot relegated to watchspot
W29.53	Shire of Manjimup	Walpole Foreshore	New watchspot
W29.54	Shire of Denmark	Prawn Rock Channel	New watchspot
W29.55	Shire of Denmark	Peaceful Bay	Hotspot relegated to watchspot
W30	City of Albany	Little Grove (Chipana Drive)	Watchspot in Seashore (2019)
W31	City of Albany	Cheynes Caravan Park	Watchspot in Seashore (2019)
W31.51	City of Albany	Emu Point North	New watchspot
W31.52	Shire of Jerramungup	Bremer Bay Foreshore	New watchspot
		Total Watchspots	**46**

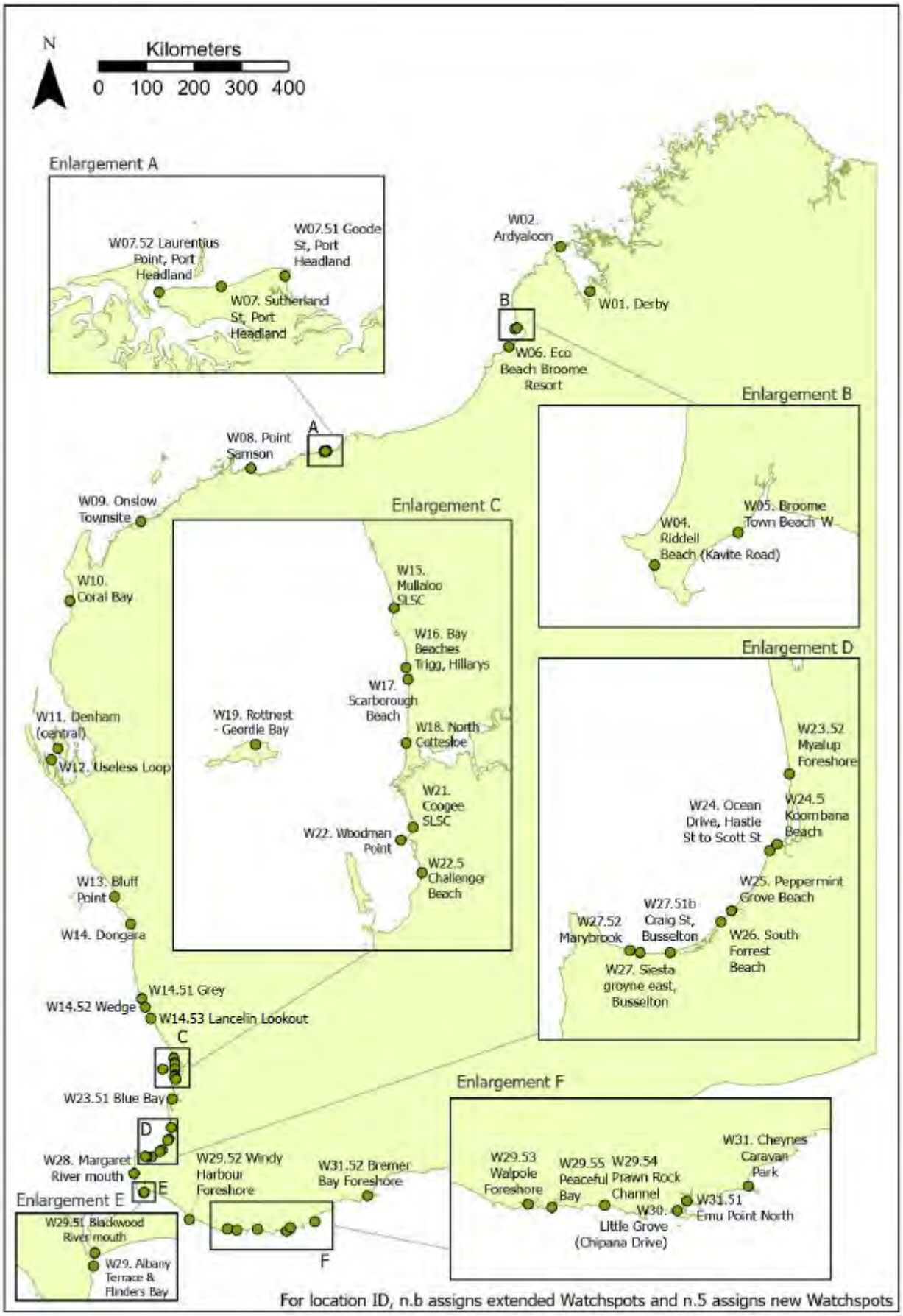

Figure 7: Updated map of recommended coastal erosion watchspots in Western Australia; n.b assigns enlarged watchspots and n.5 assigns new watchspots.

4. Discussion

The aim of this report served a dual purpose of providing information to assist the next revision of an *Assessment of Coastal Erosion Hotspots in WA*, and a program evaluation towards a budget submission beyond 2025/26. This section discusses outcomes from Section 3 and Appendix B through those two goals. Accordingly, reflection on this report's objectives assists discussion of results:

1. Undertake consultation with coastal managers to understand current erosion impacts at existing coastal erosion hotspots, watchspots, and any new locations of concern, their associated management requirements, and estimated costs of management.
2. Review the outcomes of CoastWA program activities to date, coastal management actions, and how these have reduced coastal hazard risk at hotspots.
3. Evaluate how coastal erosion hotspots and watchspots have changed since 2019, focusing on shifts in management importance and future management requirements.
4. Create a recategorized list of hotspots, including new locations that should become hotspots, and existing hotspot locations with reduced coastal hazard risk that no longer require hotspot status. This hotspot recategorization will subsequently inform a 2025 full review and revision of Seashore (2019).
5. Recommend priority actions to guide development of a work program under CoastWA beyond 2025/26 through a budget submission that employs best practise management and funding requirements for coastal erosion hotspots in WA.

Objective's 1, 2, and 3 were achieved through creation of Appendix B to collate coastal manager feedback, review of CoastWA outcomes including grants, and evaluation of how coastal erosion hotspots and watchspots have changed over the seven-year period. Objective's 2, 3, and 4 are also addressed in Section 3 through a holistic view of management actions and funding to local coastal managers, as well as summarising aggregate shifts in MI at hotspots and watchspots. Guidance for the next revision of *Assessment of Coastal Erosion Hotspots in WA* rounds out Objective 4, included in this section alongside key adaptation projects that improved hotspot management. Objective 5 is the final requirement to achieve the overall aim of this report, with priority actions delivered in this section as well.

A key outcome identified by this report is a demonstrated impact of the CoastWA program on coastal erosion hotspots. The overall number of hotspots reduced from 55 down to 48, and of those 48, more hotspots have observed decreases in MI (17 hotspots) than increases in MI (10 hotspots). This signifies the efficacy of CoastWA alongside its precedent programs (RfR and WA Recovery Plan) despite funding constraints, so continuation and expansion of CoastWA is justified to best serve the coastal communities of Western Australia.

4.1. Guidance for a revision of *Assessment of Coastal Erosion Hotspots in WA*

Results from changes to hotspots and watchspots from relative shifts in MI are the primary input to inform guidance for the next revision of *Assessment of Coastal Erosion Hotspots in WA*. A subsequent formal reiteration of the methods and outcomes delivered by Seashore (2019) is critical to provide a holistic overview of how hotspots have changed over time. While this report provides insight through shifts in MI, driven largely by local coastal manager feedback and internal review, a significant body of work is still required to provide added confidence in the preliminary results provided.

A significant difference in approach is that results applied in this report focus on relative shifts in MI for recreation/stakeholder rating and physical asset rating (increased/decreased etc.). The approach from Seashore (2019) instead provides a more thorough absolute rating for these criteria. For example, asset exposure is considered in this report by whether an increased or decreased number of assets are evident

over time, meanwhile Seashore (2019) examined the exact number and characteristics of those assets to provide required levels of detail for confidence in hotspot evaluation. Additional information is thus required to achieve the same level of confidence as the original assessment, summarised as:

1. Defining each hotspot, including history, geographic extent, and active coastal processes
2. Hotspot characteristics including proximity, instability, mitigation, transfer, and community
3. Spatial and chronological scales for MI
4. Nature of coastal erosion hazards
5. Assets susceptible to erosion hazards, including types of public and private assets
6. Management and adaptation options, including time frames, monitoring, and cost estimates
7. Information gaps for coastal erosion assessment
8. Knowledge gaps affecting implementation
9. Coastal management issues, including new consultation with local coastal managers
10. Collation of the above into individual hotspot summaries

It is anticipated that any hotspot carried over from Seashore (2019) will not require the same level of detailed assessment as the initial body of work, though instead will entail review relative to the original assessed criteria in addition to accounting for changes identified by this report and beyond. Any new hotspots will require a complete fresh assessment using the original approach as a baseline. The formal full review and revision will also need to evaluate results provided by this report for veracity and amend any changes, which may include other potential new hotspots or watchspots.

Consideration will also be needed for refining the original approach where improvements might be made to any aspect of hotspot reporting. For example, it may be streamlined to avoid overly granular ranking systems by using only five priority groups (low, medium, high, very high, and severe), rather than the eight group ranks provided by Seashore (2019). Another required task will be renumbering the hotspots according to north/south location, as this report retained original numbering for ease of reference as a holdover notation of *n.b* and *n.5* in-between existing hotspots.

4.2. Key adaptation projects that improved hotspot management

An important recognition is the role of projects not only funded by CoastWA which comprises the modern funding model, though also the WA Recovery Plan and RfR that preceded CoastWA, with all three delivered by the same engineering team over the seven-year period. Such projects demonstrate success towards reducing hotspot MI or for reclassifying hotspots to watchspot status. 15 important adaptation projects totalling $17,465,357 in funding assistance are listed in Table 15, which doesn't include the in-kind contribution costs of CoastWA's experienced engineers and technical staff. This enabled total expenditure of $27,918,406 across these 15 coastal projects. Note underspend occurred for some projects in Table 15 (e.g. Port Beach 2022/23 H-CAP), which led to reallocated funds topping up any other grant projects that encountered overspend.

Projects in Table 15 addressed major management concerns at those hotspots, noting locations such as Port Beach and Rottnest – South Thomson Bay placed in the top group rank from Seashore (2019). Excellent outcomes for improved hotspot management are clear from the information reviewed by this report, with continued funding evidently critical to ensure all hotspots are managed effectively. An essential commentary is that although the $17,465,357 awarded to 15 key adaptation projects in Table 15 tallied to only 55% of $31,796,633 in total state funding assistance, the remaining 45% of awarded funding ($14,331,276) was still critical for management of hotspots and occasionally non-hotspots too. Many projects focus on data collection/studies to understand coastal hazards, design projects to devise adaptation options, and adaptation solutions that maintain the status quo such as sand nourishment. Without such projects, hotspot management would present an even greater challenge likely resulting in ill-informed action with its inherent consequences.

One future concern evident from Table 15 is that key one-off funding sources like WA Recovery Plan and RfR might not be repeated for coastal adaptation purposes, yet those one-off sources represented 64% ($11,154,546) of funding administered by the CoastWA team towards the projects in Table 15. To ensure ongoing effective management at hotspots, CoastWA may need a dedicated project fund beyond 2025/26 outside of the grant framework, as a proxy replacement to sources like the WA Recovery Plan.

Table 15: Key adaptation projects that improved hotspot management since 2018/19; note underspend occurred for some projects (e.g. Port Beach 2022/23 H-CAP), which led to reallocated funds topping up any other grant projects with overspend.

Existing hotspot	Key project inc. funding source	Grant award	Project cost ex GST	Resulting MI change
2. Broome Town Beach	**2018/19: RfR** - Broome Town Beach revetment	$6,754,546	$6,754,546	Remains hotspot with reduced MI
4. Laurentius Point, Port Hedland	**2020/21: CAP** - Protecting Hedland – coastal seawalls project – West End	$227,453	$4,828,488	Relegate to watchspot
11. Sunset Beach	**2022/23: H-CAP** - Sunset Beach – groynes and sand nourishment	$750,000	$1,425,672	Remains hotspot with reduced MI
	2023/24: H-CAP - Sunset Beach stage 2 – GSC groynes and sand nourishment	$615,000	$1,365,683	
14.b Grannies Beach, Irwin	**2022/23: CAP** - Surf Beach nature-based stabilisation	$77,583	$172,634	Remains hotspot with reduced MI
22. Quinns Beach	**2019/20: CAP** - Quinns Beach long term coastal management stage 2 – extension of groyne 3	$300,000	$1,849,870	Remains hotspot with reduced MI
	2020/21: WA Recovery Plan - Quinns Beach long term coastal management - groyne 1 construction	$500,000	$562,384	
27. Port Beach	**2020/21 to 2021/22: WA Recovery Plan** - Large-scale sand nourishment at Port Beach	$3,250,000	$3,250,000	Remains hotspot with reduced MI
	2022/23: H-CAP - Port Beach sand nourishment - Phase 2 dune creation and stabilisation	$500,000	$416,635	
28. Rottnest – South Thomson Bay	**2021/22: H-CAP** - South Thomson revetment - detail design and construction	$1,770,000	$2,168,946	Remains hotspot with reduced MI
33. N Point Peron (W of Causeway)	**2020/21 to 2021/22: WA Recovery Plan** - Construction of the Point Peron Spur Groyne	$650,000	$1,304,069	Remains hotspot with reduced MI
45.b Craig St, Busselton	**2018/19: CAP** - Maintenance of Craig Street groyne and seawall	$125,000	$333,442	Relegate to watchspot
51. Denmark, Ocean Beach	**2021/22: CAP** - Ocean Beach retaining wall maintenance and refurbishment	$55,775	$236,841	Remains hotspot with reduced MI
	2023/24: H-CAP - Ocean Beach Coastal Adaptation	$1,140,000	$1,790,000	
55. Esperance Town Beach	**2022/23: H-CAP** - Esperance Bay - Castletown sand back-passing infrastructure	$750,000	$1,459,196	Remains hotspot with reduced MI

Documentation of adaptation projects reducing hotspot MI enables useful contrast and comparison to expectations of hotspot MI changes forecast by Seashore (2019). Table 16 from Seashore (2019) predicted an increase in the number of hotspots requiring designation to high MI due to increased pressure. This suggests that the number of coastal erosion hotspots in the high MI category could increase to 21 as early as 2024, anticipated from, "*effects of progressive change and projected broad-scale coastal recession*".

MI predictions in Table 16 cannot be directly compared to MI changes documented in this report due to a misaligned reporting window (five year prediction compared to the seven financial years reported on here) and the wide time range for change (twenty years i.e. 2024 – 2044). Nonetheless, the projected increase in hotspots with high MI from Seashore (2019) was evidently interrupted. While some hotspots with increased MI were recognised, this report still documents a **net decrease** in MI across the full hotspot list, with more than half observing decreased MI (refer back to Figure 5) and the overall number of hotspots reducing from 55 down to 48. It is clear the role of state funding assistance and technical support through programs like CoastWA has intervened to limit the projection of hotspot MI increases, demonstrating how critical these programs have been to prevent hotspot management from escalating uncontrollably.

Table 16: 2019 forecast of changing hotspot MI over identified timeframes (sourced from Seashore 2019).

Hotspot management importance	**Timeframe**		
	Imminent (0-5 years)	**Expected (5-25 years)**	**Projected (25+ years)**
Low	35	4	3
Moderate	18	30	5
High	2	21	47

4.3. Ten proposed actions for CoastWA beyond 2025/26

As a final task that addresses Objective 5, proposed actions to inform the CoastWA budget submission for beyond 2025/26 are provided in Table 17. It must be recognised that problems facing hotspots cannot entirely be addressed through the CoastWA framework alone, some hotspot issues arise from wider developmental pressures requiring additional governmental, political, and law-based strategies with shifts in thinking beyond a coastal management context. For example, continued development of public and private assets is occurring in hazard zones along the state's coast through both new and infill development. This leads to an increased number of assets and thus increased asset exposure which can compound both existing and new coastal management pressures.

Instead of focussing on these wider challenges, which are better suited to a CMAG-level approach or higher, Table 17's ten priority actions are targeted for delivery primarily by the CoastWA team. Each action is tailored to address one of five key coastal management problems evident from gathered information in this report, whereby actions seek to target the causes of problems rather than their symptoms.

Table 17: Ten proposed actions for CoastWA beyond 2025/26 to improve management of coastal erosion hotspots.

Problem	Cause	Proposed Actions
Difficulty in funding and implementing coastal erosion adaptation for local coastal managers at some hotspots.	Oversubscription to CoastWA grants, alongside LGA internal capacity and technical expertise being too low to apply, leading to potential projects not being awarded funding and thus not proceeding.	**1.** Increase funding for CoastWA grants and reduce co-contribution requirements from grantees. **2.** Additional engineering and planning staff to provide both technical and project management guidance to local coastal managers.
Ignorance in both coastal hazard risk exposure and to which decisions will be most suitable for coastal adaptation and management.	Lacking knowledge born from information gaps about coastal environments, coastal processes, resourcing requirements, and available opportunities for management/adaptation.	**3.** State bathymetric Lidar program to better understand nearshore bathymetry, which directly affects coastal processes and hazards. **4.** Raw materials investigations to better understand available resources for allocation to coastal adaptation. **5.** Expansion of DoT's wave buoy network to better understand wave climates and their relationship to coastal hazards.
Urgent need for adaptation action at hotspots ranked in the “Severe” category.	Increased Management Importance due to higher actual or perceived risks to physical public assets and recreation/stakeholder ratings from coastal erosion hazards.	**6.** Funding proposal and business case development to implement adaptation at “Severe” hotspots. **7.** Additional senior engineering staff to directly manage design and construction for Action 6 above.
Inconsistent quality of Coastal Hazard Risk Management and Adaptation Planning and associated difficulties in implementing recommendations.	Fragmented knowledge and methods applied at a decentralised level of governance, plus a general inability of consultants and LGAs to cover the multi-disciplinary requirements of CHRMAP needing engineering, planning, economic, and community consultation specialists.	**8.** Expanded capability of CoastWA team to assist local coastal managers through recruiting additional in-house specialists, including an investment planner to assist LGA business cases and economic assessments, a community engagement officer, and coastal hazard assessment specialists. **9.** Updated state guidance on the various disciplines required to undertake Coastal Hazard Risk Management and Adaptation Planning.
Inequality from those who benefit from coastal management and adaptation expenditure compared to the wider public who pays.	Lacking implementation of or adherence to an equitable Benefit Distribution Analysis at coastal erosion hotspots, meaning private beneficiaries do not fairly contribute to coastal management and adaptation costs.	**10.** State guidance for creating Benefit Distribution Analysis documentation, including identification of beneficiary pays funding needs.

5. Conclusion

Through consultation, information gathering, and review of hotspot management funding, actions, and challenges in the context of the original *Assessment of Coastal Erosion Hotspots in WA*, this report provides updated MI for WA's coastal erosion hotspots and watchspots over the seven financial years period between 2018/19 to 2024/25. The role of the CoastWA program in improving hotspot management was evaluated, with this report acting as a staged approach providing recommendations towards a formal full review and revision of Seashore (2019). This work has also derived priority actions to inform a work program and budget submission for CoastWA beyond 2025/26.

A key outcome from this report was documenting the importance of CoastWA and the DoT-managed coastal adaptation projects by RfR and WA Recovery Plan for managing coastal erosion hotspots. The overall number of hotspots has reduced from 55 down to 48, and of those 48, more hotspots have observed decreases in MI (17 hotspots) than increases in MI (10 hotspots). By collaborating with local coastal managers and providing financial and technical support, these state-funded initiatives have contributed towards mitigating erosion and enhancing coastal resilience.

Through analysis and review of information gathered in this report, ten priority actions were developed and targeted for delivery primarily by the CoastWA team. Each action was tailored to address one of five key coastal management problems evident from gathered information, whereby actions seek to target the cause of these problems rather than their symptoms.

It is clear from this review that hotspots, their rankings, and watchspots are highly useful tools to provide broad-scale information about the dynamic coastal hazard risks facing WA coastal communities. Nonetheless, these must be considered as guides-only for coastal planning and management, being representative at the time of each review. The latest information will always take precedence alongside extant coastal management priorities as each annual grant cycle commences.

6. References

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Worley Consulting 2024(d), *Hotspot Management Assessment – C.Y. O'Connor*, report prepared for Department of Transport.

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7. Appendices

7.1. Appendix A – Coastal Manager Survey Sample

"Dear <First Name>

The Department of Transport is seeking to collate information about recent erosion impacts along open coasts, and the implications for management across the State. The information collected will inform:

- An update of the Assessment of Coastal Erosions Hotspots in Western Australia report and the identification of new coastal erosion hotspots across the State.
- A future budget submission for CoastWA 2.0 and work program for when the existing CoastWA program ends.

We invite the <Local Government> to provide information on coastal erosion hazards and management within your local government area. We have identified yourself as the best contact at the <LG title> to provide this information but feel free to pass this request onto others if appropriate. Note we are seeking just one consolidated response per Local Government.

This is a valuable engagement opportunity and I encourage you to provide a detailed response. The identification of an area as a coastal erosion hotspot can influence its priority for future funding and management opportunities so it is important to ensure all potential hotspot locations are identified.

Could you please provide your response to the below questions by return email to lsheehy@walga.asn.au by Friday 9 August 2024. If you have any questions, please contact either myself or coastal.management@transport.wa.gov.au.

Kind Regards

Lucy

Questions for <Local Government with Hotspot(s)>

Please provide a summarised response to the below questions, supporting information can be attached if required.

1) The <Local Government> has the following coastal erosion hotspots <Hotspots>. For each hotspot please describe:
   - Current impacts. *You can provide photos, anecdotal evidence or monitoring results.*
   - Management Requirements. *Past, present, and near-future management requirements.*
   - Management costs. *Estimated recent, current, or future costs for managing these locations*.

2) If you are actively managing a section/s of eroding coast that is not yet a coastal erosion hotspot (i.e. not listed above), please provide their location/s and describe:
   - Current impacts. *You can provide photos, anecdotal evidence or monitoring results.*
   - Management Requirements. *Past, present, and near-future management requirements.*
   - Management costs. *Estimated recent, current, or future costs for managing these locations*.

3) Of the eroding locations listed in questions 1 and 2, what locations (up to 3) are of most concern to the <LG title>. Have you identified a medium to long term approach to managing these locations and what are the potential costs?

4) Have you previously applied for any federal grant program (NDRR, DRF etc.) to fund coastal projects, but were unsuccessful in receiving funding? If so, please provide the proposed project title, requested grant amount, and estimated total project cost.

Questions for <Local Government without Hotspot>

Please provide a summarised response to the below questions, supporting information can be attached if required.

1) If you are actively managing a section/s of eroding coast, please provide their location/s and describe:
   - Current impacts. *You can provide photos, anecdotal evidence or monitoring results.*
   - Management Requirements. *Past, present, and near-future management requirements.*
   - Management costs. *Estimated recent, current, or future costs for managing these locations*.

2) Of the eroding locations listed in question 1 above, what locations (up to 3) are of most concern to the <LG title>. Have you identified a medium to long term approach to managing these locations and what are the potential costs?

3) Have you previously applied for any federal grant program (NDRR, DRF etc.) to fund coastal projects, but were unsuccessful in receiving funding? If so, please provide the proposed project title, requested grant amount, and estimated total project cost."

7.2. Appendix B – Physical changes, funding, and consultation by local coastal manager for each location

This appendix summarises physical changes, funding assistance, coastal manager meeting outcomes, and survey consultation for each location grouped according to the relevant local coastal manager.

7.2.1. Shire of Broome

Physical changes, state funding assistance, and consultation are listed here for Shire of Broome. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes

1. China Town, Broome
No significant changes were observed at this hotspot.
2. Broome Town Beach
DoT RfR funded revetment construction here from tabular Kimberley sandstone as part of a state election commitment, which also included groyne maintenance and foreshore redevelopment (Figure 8); erosion vulnerability has therefore reduced even with the increase in assets at this hotspot. However, Conti foreshore to the south remains less protected and vulnerable to erosion threat.
2.5 Broome Cable Beach Foreshore
Previously Watchspot W03, this new location (Figure 9) entails foreshore redevelopment that will reduce dune cross-sectional area in some areas but addresses scarping and prevents slumping (Figure 10). Increased assets, and therefore asset exposure, also accompany foreshore redevelopment. Shire of Broome plan for ongoing *ad hoc* nourishment to maintain the dune buffer. Foreshore redevelopment has been co-funded by a federal grant from DPIRD as well as H-CAP. The H-CAP grant in 2024/25 funded a hard protection component: construction of a tabular Kimberley sandstone revetment protecting the beach access ramp.

Funding assistance:

Shire of Broome was awarded $8,831,784 over the seven-year period; the Shire applied for an additional $1,998,555 but was not successful. Awarded projects specific to hotspots are shown in Table 18.

Table 18: Shire of Broome state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	1. China Town, Broome	2.b Broome Town Beach	2.5 Broome Cable Beach Foreshore
CAP	•2018/19 to 2023/24: Shoreline monitoring of Broome townsite	•2018/19 to 2023/24: Shoreline monitoring of Broome townsite	•2018/19 to 2023/24: Shoreline monitoring of Broome townsite •2021/22: Cable Beach protection detailed design
H-CAP			•2024/25: Broome Cable Beach rock revetment construction
CMPAP	•2024/25: Broome Townsite CHRMAP review	•2024/25: Broome Townsite CHRMAP review	•2018/19: Environmental and cultural heritage investigations for Cable Beach foreshore adaptation •2024/25: Broome Townsite CHRMAP review
Coastwest	•2022/23: Growing the intertidal community of Broome	•2021/22: Broome Town Beach foreshore management plan	•2022/23: Growing the intertidal community of Broome
One-off funding*		•2018/19: RfR - Broome Town Beach revetment	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Figure 8: Broome Town Beach hotspot, showing 2017 pre-construction (left) and post-construction in 2021 (right).

Figure 9: Cable Beach Foreshore nominated hotspot, showing 2017 (left) and 2024 (right). Erosion at the dune toe can be observed since 2017, particularly around beach access where the 2024/25 H-CAP revetment is planned (highlighted in red).

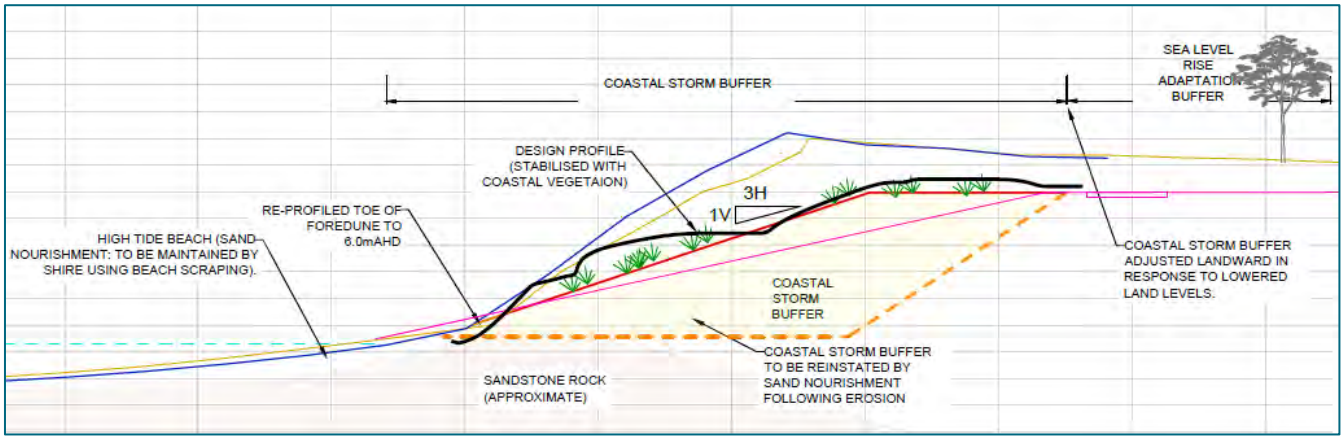

Figure 10: Excerpt from detailed design for Cable Beach foreshore redevelopment plans, showing reduced cross-shore dune area in some sections (sourced from Seashore 2022). Ongoing sand nourishment was proposed to counter the reduced dune here.

Figure 11: Example of dilapidated protection structures at China Town, Broome hotspot; images taken are from Dec 2018 (top left), Feb 2019 (top right), Jan 2020 (bottom left), and Apr 2020 (bottom right) (sourced from Shire of Broome survey).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is Town Beach west foreshore/Roebuck Bay caravan park (Watchspot W05) and Hammersley St, both near Town Beach hotspot. Foreshore management plan has been adopted, also need additional monitoring and hazard accommodation, including replacement of infrastructure e.g. access stairs. Accommodation of hazards expected to cost ~$1.6M, including the coastal path.
- Locations that may worsen in the future include Conti foreshore (both adjacent to Town Beach), which is experiencing erosion, as well as potential exposure along Demco drive private properties

(also Watchspot W05). The Shire flagged a potential H-CAP application around 2025/26 for adaptation along the wider Town Beach area.

- A CHRMAP review was funded by CMPAP in 2024/25 to finish in 2026. New hotspot or watchspot locations may arise from this, such as the potential for Crab Creek Road to become a hotspot given the unpaved road is threatened by erosion and entails the only access for some NBY cultural sites. This location may be more closely considered in the formal revision of Seashore (2019).

Survey consultation:

- The Shire reiterated their concern from the face-to-face meeting that the foreshores southwest and northeast of Town Beach experience erosion issues. The proposed additional management actions (where not already mentioned in the meetings) include refurbishing the dune system, undertaking further monitoring, sand nourishment, and restricting development through planning controls. The Shire reiterated the $1.6M expected costs of coastal management here. In 2021 the Shire applied for a $1.5M H-CAP grant to assist pathway and stair design plus construction, however this application was unsuccessful.
- Cable Beach foreshore redevelopment was detailed further for costs, with Stage 1 forecast at $7.7M for completion in December 2024, and the ongoing management costs estimated at $12.6M NPV over the 50-year planning timeframe.
- China Town has not been assigned any medium to long-term management decision, though the Shire acknowledge that existing coastal protection infrastructure is dilapidated and at ongoing risk of failure (Figure 11). A 2017 estimate suggests that costs of coastal management at China Town will require $13M to amend these issues.

Expected change in MI:

1. China Town, Broome	**Recommendation: Remains hotspot with similar MI**
Ongoing vulnerability is evident from dilapidated protection structures with little intervention evident since Seashore (2019), thus MI appears to remain the same at this hotspot.	
2. Broome Town Beach	**Recommendation: Remains hotspot with reduced MI**
Revetment construction in 2021 justifies reduced MI relative to Seashore (2019), whereby coastal vulnerability remains evident to the south. However, this location requires an enlarged size to the south that encompasses Conti foreshore and the associated management requirements from the Shire. The hotspot may need to be renamed accordingly. Despite existing erosion concerns at Conti foreshore, MI still appears to be lower than the original classification as Conti foreshore appears less vulnerable than Broome Town Beach was, before its revetment was constructed.	
2.5 Broome Cable Beach Foreshore	**Recommendation: New hotspot**
Cable Beach is a new location so cannot be compared to Seashore (2019). The MI for this hotspot is recommended to be in the highest category due to Cable Beach's statewide tourism importance, however H-CAP adaptation in 2024/25 may help to reduce overall severity once constructed.	

7.2.2. Town of Port Hedland

Physical changes, state funding assistance, and consultation are listed here for Town of Port Hedland. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

3. Good St, Port Hedland
The Town built a new granite revetment at this hotspot in 2022/23, following an unsuccessful H-CAP request for $1.45M funding assistance in 2021. The revetment was supplemented by dune rehabilitation and planting in the revetment's lee (Figure 12).
4. Laurentius Point, Port Hedland
A granite revetment was funded by CAP in 2020/21 in-line with CHRMAP recommendations, repairing the existing damaged revetment plus extending hard protection over the rock cobble gap section. Construction finished in early 2022 (Figure 13).

Funding assistance:

Town of Port Hedland was awarded $361,347 over the seven-year period; the Shire applied for an additional $1,845,049 but was not successful. Awarded projects specific to hotspots are in Table 19.

Table 19: Town of Port Hedland state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	3. Good St, Port Hedland	4. Laurentius Point, Port Hedland
CAP		•2020/21: Protecting Hedland – coastal seawalls project – West End
H-CAP		
CMPAP	•2019/20: Port Hedland Townsite Coastal Reserves Management Plan	•2019/20: Port Hedland Townsite Coastal Reserves Management Plan
Coastwest	•2023/24: Port Hedland Coastal Wayfinding	•2023/24: Port Hedland Coastal Wayfinding
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest priority for the Town is new/future development sites requiring hard protection from the onset, such as Stables and extending the new marina's revetments.
- There will be a need for ongoing management at the Spoilbank. This will require liaison with state government stakeholders.
- The Town considers that its CHRMAP requires updating, as its existing hotspots are no longer a management priority anymore. The Town subsequently noted that Port Hedland townsite remains highly vulnerable to coastal hazards and a single severe storm event could reveal new coastal erosion hotspots, demanding renewed funding assistance for remediation.

Survey consultation:

- Town of Port Hedland reiterated the position that neither Goode St or Laurentius Point require significant active management anymore. Some additional details on the implement protection options were shared, including the cost of construction to a total of $3M for Goode St and $5M for Laurentius Point.
- The only ongoing management actions needed at either hotspot were (conservatively) estimated to require $70k/yr at Goode St for intermittent dune revegetation, and $70k/yr at Laurentius for monitoring, maintenance, and reporting. The Town flagged that Goode St may eventually require a southward revetment extension in ~20 years.

- Other sites (where not already mentioned in the face-to-face meetings) for potential coastal management intervention include Kingsmill Street and Sutherland Street. Sutherland St received $3.7M from DPIRD (federal) to construct a revetment in 2021/22, though the Town anticipates it may require eventual expansion to the east. Town of Port Hedland expect a mix of nourishment and protection in the long-term future for Kingsmill Street, costing from $5M to $8M (NPV).

Expected change in MI:

3. Good St, Port Hedland	Recommendation: Relegate to watchspot
The long-term adaptation solution from the revetment constructed in 2022 indicates it does not meet the definition of a hotspot anymore. Good St can be assigned to watchspot status until a significant change occurs here to justify reclassification.	
4. Laurentius Point, Port Hedland	**Recommendation: Relegate to watchspot**
The long-term adaptation solution from the revetment constructed in 2022 indicates it does not meet the definition of a hotspot anymore. Laurentius Point can be assigned to watchspot status until a significant change occurs here to justify reclassification.	

Figure 12: Good St, Port Hedland in 2019 pre-construction (left) and post-construction in 2022 (right).

Figure 13: Laurentius Point, Port Hedland pre-construction in 2019 (top) and post-construction in 2022 (bottom).

7.2.3. Shire of Exmouth

Physical changes, state funding assistance, and consultation are listed here for Shire of Exmouth. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

5. Warne St & Yacht Club Exmouth
No significant changes were observed at this hotspot, mainly because the beach has been kept stable through intermittent DoT campaigns to provide an ongoing buffer against coastal erosion. Sand bypassing is undertaken mechanically via trucking from the southern side of the boat harbour, in addition to back passing from the sand trap on the northern side of the harbour. A total of 12,032m3 was bypassed in the 2021 campaign: 4,656m3 was back passed from North Beach and 7,538m3 was bypassed from South Beach. Spoil from DoT dredging campaigns has also been circulated to the nearshore zone where it replenishes the beach (Figure 14). Disposal of material dredged from the channel to this hotspot totalled 16,550m3 in 2024. Further, CoastWA funded a geotechnical investigation in 2023 at this hotspot to assess protective capacity from rock against erosion. While some areas appear to entail suitably resilient bedrock up to +3mAHD, most of the hotspot's rock was generally too low to avoid erosion threats, with the full extent averaging rock levels to only +0.35mAHD.

Figure 14: Hotspot at Warne St & Yacht Club Exmouth (date unknown) showing sand build up from bypassing (red area) and dredge spoil (yellow area) (sourced from Shire of Exmouth survey).

Funding assistance:

Shire of Exmouth was awarded $90,000 over the seven-year period; the Shire applied for an additional $50,000 but was not successful. Awarded projects specific to hotspots are shown in Table 20.

Table 20: Shire of Exmouth state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	5. Warne St & Yacht Club Exmouth
CAP	
H-CAP	
CMPAP	•2021/22: Exmouth Townsite Coastal Hazard Risk Management and Adaptation Plan
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is finishing the Shire CHRMAP, as this will provide direction and guidance on coastal management pathways.
- Sand supply inhibited by the DoT marina is a concern for the Shire, with long-term solutions needed, though no immediate issues were apparent.
- Complaints from inhibited 4WD access after spoil placement was discussed as an issue for management, indicating erosion is less of a concern than access management.

Survey consultation:

- The Shire response mirrored face-to-face meetings. The hotspot has remained stable, so vulnerability is primarily from latent exposure to severe events like tropical cyclones.
- The Shire is more concerned about erosion at Town Beach foreshore further north, though sand drift from dredge spoil may help to replenish this beach.
- One other area of focus is to the north of Tantabiddi boat ramp. Sand excavated to maintain the boat ramp is stockpiled near the carpark. However, this sand is not supplied to the eroded beach north of the boat ramp due to turtle nesting limiting any nourishment activities here. The Shire is willing to undertake nourishment using this stockpile if requested by DBCA.

Expected change in MI:

5. Warne St & Yacht Club Exmouth	Recommendation: Remains hotspot with reduced MI
An absence of recent or near-term erosion concerns reported by the Shire, lacking applications for grant funding here, and maintained erosion buffers from DoT management actions indicate that MI has reduced at this hotspot relative to Seashore (2019).	

7.2.4. Shire of Carnarvon

Physical changes, state funding assistance, and consultation are listed here for Shire of Carnarvon.

Physical changes:

6. Pelican Point, Carnarvon
Significant physical changes have been observed at this location and the wider Fascine over the seven-year period. The nearby spit at the entrance to the Fascine has grown in volume and lengthened; supported by dredge spoil placement, dune stabilisation, and revegetation works through DoT, the Shire, and Coastwest (Figure 15). These works commenced in August 2023 with dredging and concluded in February 2024 with the stabilised sand spit. The $3 million in dredging works formed part of a wider $7M WA Recovery Plan allocation for the Carnarvon Fascine Entryway and Boat Harbour Pen Project (note: this is separate to the hotspot WA Recovery Plan funding, as it funded the navigation channel and boat pens rather than hotspot adaptation). Despite the above works, the hotspot location has continued to erode along Pelican Point Road. Stabilisation works downdrift have not wholly addressed erosion at the hotspot itself due to a net south direction of sediment supply.

Funding assistance:

Shire of Carnarvon was awarded $219,546 over the seven-year period; the Shire applied for an additional $70,000 but was not successful. Awarded projects specific to hotspots are shown in see Table 21.

Table 21: Shire of Carnarvon state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	6. Pelican Point, Carnarvon
CAP	
H-CAP	
CMPAP	•202/23: Carnarvon and Coral Bay Townsites Coastal Hazard Risk Management and Adaptation Plan
Coastwest	•2022/23: Pelican Point Sand Drift and Erosion •2043/25: Pelican Point Spit Monitoring and Maintenance
One-off funding*	

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority remains to be Pelican Point, with Shire considering a mix of retreat and protect for a possible future H-CAP application pending CHRMAP recommendations.
- Shire's main concerns focus less on erosion (no erosion issues reported at the Coral Bay watchspot for example) and more on access management, including 4wd impacts to the Carnarvon spit and issues of concentrated tourism at Blowholes illegal shacks.
- Shire has also flagged the Carnarvon Prawn Jetty as a potential long-term issue that may eventually be impacted by coastal hazards e.g. cyclones.

Survey consultation:

- Shire of Carnarvon did not provide a survey response.

Expected change in MI:

6. Pelican Point, Carnarvon	**Recommendation: Remains hotspot with similar MI**
Significant works have stabilised the spit as a priority focus, however the ongoing erosion threatening Pelican Point Road and shrinking erosion buffer are yet to be addressed, so MI remains unchanged at this hotspot relative to Seashore (2019).	

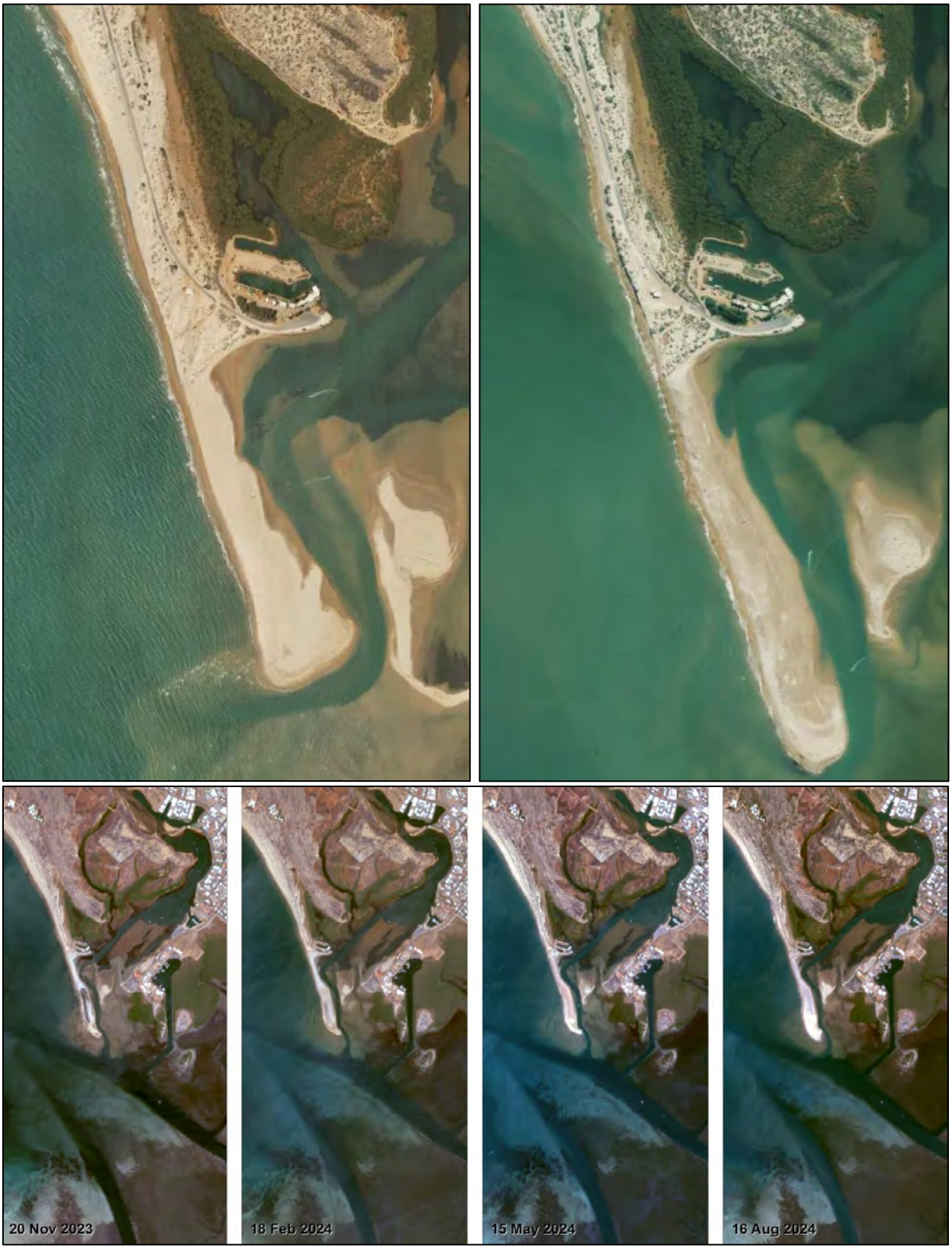

Figure 15: Pelican Point, Carnarvon spit pre-stabilisation works in 2020 (top left) and early 2023 (top right), mid-stabilisation works in late 2023 and early 2024 (bottom left), then post-stabilisation in mid-2024 (bottom right). While the spit has accreted southwards over time, erosion of the coast has continued north of the spit near Pelican Point Road.

7.2.5. Shire of Shark Bay

Physical changes, state funding assistance, and consultation are listed here for Shire of Shark Bay. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

7. Monkey Mia
While erosion continues to threaten built assets, most of these are private assets on leasehold land. There has been a large increase in the size of the caravan park in recent years, thus private assets have increased substantially. Half the caravan park land is vested in the Shire and leased to RAC Tourism, the other half (new development) is crown land with non-vesting and leased to RAC. An abundance of local sand exists presenting a straightforward opportunity for management through small-scale sand nourishment. Private beneficiary contributions should be considered in this case.
8. Denham Townsite
Intermittent nourishment from DoT dredging has assisted in reducing erosion vulnerability at sandy sections of Denham's foreshore. The most recent campaign supplied 23,800m3 in 2021. All spoil material was supplied to the Caravan Park beach 600m northwest of the maritime facility. This supplements 2016 upgrades to Denham's foreshore protection structures and installation of an FRC sheet pile groyne (Figure 16), all funded by DoT (not identified in Seashore 2019). More recently a $2.4M federal grant from CERMP was awarded to the Shire in 2022/23, upgrading existing hard protection in Denham's southeast plus revegetation seaward of the coastal path. This is in addition to repairs and ~20m extension of the foreshore revetment to the northwest by the Shire in 2024/25. Further, CoastWA funded a geotechnical investigation at this hotspot in 2024. Suitably resilient bedrock levels were potentially high enough to avoid erosion hazards in the northwest, with most high value assets like housing entailing rock levels above +2mAHD. The southeastern hotspot extent does not entail this same protection though, with all rock levels reported to be below 0mAHD.

Funding assistance:

Shire of Shark Bay was awarded $11,000 over the seven-year period; the Shire applied for an additional $117,583 but was not successful. Awarded projects specific to hotspots are shown in Table 22.

Table 22: Shire of Shark Bay state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	7. Monkey Mia	8. Denham Townsite
CAP		•2019/20: Denham Coastal Monitoring
H-CAP		
CMPAP		
Coastwest		
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is lacking general resources to apply for grants. Much of the lower cost management has been actioned already, such as raising minimum finished floor level on Knights Terrace, and the creation of a DoT-funded coastal monitoring action plan in 2024/25 (Item B2 back in Table 4).
- The Shire has flagged an extension to Denham's CERMP funded seawall from 2023/24 in the future, estimated at ~$3M. The Shire is hoping to apply for CAP to design the structure, then H-CAP to fund construction.

- Shire of Shark Bay does not consider Monkey Mia a direct priority for management as they only maintain the car park, though they did note the need to confirm lease agreement responsibilities. The Shire agrees with EPA recommendations not to extend hard protection works at this location.

Figure 16: Denham pre-construction in 2015 (top) and 2018 (bottom); showing refurbished revetment at the marine facility foreshore and immediately northwest, plus the added sheet pile groyne immediately southeast of the jetties.

Survey consultation:

- Shire of Shark Bay provided more detail about the hard protection works required at Denham. The federally funded upgrade to Denham's revetment will cost $2M and construction is expected to commence in 2024/25. The upgrades manage both erosion risk and the high priority inundation risk present at Denham.
- An additional $2M (NPV) is required in the near future to continue upgrading Denham's hard protection structures, though this remains unfunded. Notwithstanding, the Shire spends ~$5k/yr on coastal management through redistributing sand trapped accumulated at the sheet pile groyne, assisted by intermittent dredge spoil from DoT activities.
- Denham remains the primary coastal management focus for the Shire, with no other locations considered as regularly significant, and Monkey Mia not being a direct concern for the Shire as per the face-to-face meeting discussion.

Expected change in MI:

7. Monkey Mia	**Recommendation: Remains hotspot with reduced MI**
A low management priority discussed by Shire of Shark Bay, EPA recommendations against protection, and potential ease of adaptation through back passing/bypassing indicate that MI has reduced at this hotspot relative to Seashore (2019).	
8. Denham Townsite	**Recommendation: Remains hotspot with reduced MI**
Ongoing nourishment from spoil undertaken by DoT and recent upgrades to coastal protection structures indicate that MI has reduced at this hotspot relative to Seashore (2019).	

7.2.6. Shire of Northampton

Physical changes, state funding assistance, and consultation are listed here for Shire of Northampton. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

9. Horrocks Foreshore
The main physical change to Horrocks Foreshore has been loss of dune buffer fronting the unprotected carpark, with only 1m – 2m between the scarp and carpark. Occasional erosion has been reported elsewhere, mostly isolated to the boat launching area. During an onsite meeting conducted by M P Rogers in 2024, the Shire noted that access to the properties on Glance Cove recently required managed retreat, being relocated to the rear side of properties to allow a larger erosion buffer (Figure 17). The GSC revetment has been functioning well and remains in a reportedly reasonable condition, though the remaining longevity of this structure remains uncertain. DoT undertook a geotechnical investigation here funded by CoastWA in 2023. Interpreted top of rock substrate on the along-shore transects at Glance Street immediately adjacent to the Horrocks settlement averaged approximately +1mAHD, which may provide some level of protection against erosion hazards (Figure 18). A future coastal engineering investigation could confirm the protective capacity of rock fronting Glance Street.

Figure 17: Glance Cove at Horrocks hotspot, showing pre-relocation of front property access in 2019 (left) and post-relocation in 2023 (right). Also visible in the 2023 image is the appearance of a defined erosion scarp plus lost dune and vegetation.

Figure 18: Interepted level to top of rock (mAHD) from Northampton geotechnical investigation; it is possible that Glance Cove is protected from chronic erosion hazards by natural underlying rock.

Funding assistance:

Shire of Northampton was awarded $50,020 over the seven-year period; all applications by the Shire were awarded funding, with no unfunded projects evident. Awarded projects specific to hotspots are shown in Table 23.

Table 23: Shire of Northampton state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25

	9. Horrocks Foreshore
CAP	•2018/19: Coastal hazard assessment at Horrocks
H-CAP	
CMPAP	•2018/19: Horrocks Coastal Hazard Risk Management and Adaptation Plan
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is lacking general resources in both cash and personnel to apply for grants. DoT assistance through funding the Shire's coastal monitoring action plan may help to address some of the gap and build capacity (Item B2 back in Table 4).
- Only Horrocks appears to present an issue for coastal management with the Shire. Horrocks' GSC structure is functioning well, though concerns were raised regarding its longevity. Some unease remains for Glance Steet's coastal properties at Glance Cove, where a low dune buffer vulnerable to erosion may expose these assets to coastal hazards depending on the protective capacity of rock.
- Shire of Northampton identified that ex-tropical cyclones present the greatest threat, noting potential for acute erosion to occur from events like T.C. *Seroja*. Beyond erosion, coastal access management has also been an issue, for example the Horrocks jetty can become inaccessible depending on tide. Vulnerability from these events is compounded at Horrocks due to the presence of asbestos risk in old fill that is currently under threat from erosion.

Survey consultation:

- Shire of Northampton did not provide a survey response.

Expected change in MI:

9. Horrocks Foreshore	Recommendation: Remains hotspot with similar MI
Due to ongoing erosion threatening Horrocks and a shrinking erosion buffer, particularly fronting Glance Street, MI is anticipated to increase at this hotspot relative to Seashore (2019). Some uncertainty remains regarding the potential for rock to limit erosion and further investigation is required to confirm this, so a conservative MI increase has been applied for the interim.	

7.2.7. City of Greater Geraldton

Physical changes, state funding assistance, and consultation are listed here for City of Greater Geraldton. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

10. Drummond Cove, Geraldton
This location entails ongoing erosion vulnerability, observing significant state support from both CoastWA grants and election commitment projects. One-off funding from the WA Recovery Plan in 2020 assisted repair of the revetment fronting John Batten Community Hall. In 2021, the State committed $3.2 million to progress coastal erosion management and a new recreational area with a boat launching facility at Drummond Cove, though no final pathway has been confirmed.
11. Sunset Beach, Geraldton
Sunset Beach observed significant changes to its coastline, primarily through adaptation investment, with a groyne field supported by two H-CAP grants over two stages for a total of seven GSC groynes constructed (Figure 19). Coastwest has also provided support for dune stabilisation since 2018/19.
12. Beresford, Geraldton
No significant changes were observed at this hotspot.
13. Point Moore, Geraldton
Severe erosion at this hotspot has continued year-on-year, focused on the southwestern end of Point Moore as this large cuspate foreland attempts to migrate from south to north. Retreat of infrastructure occurred on the western side, with the modern marine rescue building demolished in 2024, despite attempts to save the building through sand-bag emergency works in 2023 (Figure 20). Both state and local government infrastructure are threatened by erosion long-term at the southern side at Greys Beach, particularly the railway and road as a state strategic asset: the Geraldton Strategic Transport Corridor. CAP funding in 2022/23 was awarded to investigate a long-term adaptation strategy here in collaboration with Mid West Ports, Port of Geraldton. Like Sunset Beach, this hotspot has received significant support from Coastwest to rehabilitate coastal dunes.

Figure 19: Sunset Beach, Geraldton pre-construction in 2019 (left) and post-construction in 2024 (right).

Figure 20: Point Moore, Geraldton in 2020 (left), with depleted foreshore reserve in 2022 and 2023 (middle and right) requiring emergency works; these rapidly failed resulting in demolition of the marine rescue building in 2024 (sourced from CGG survey).

Funding assistance:

City of Greater Geraldton was awarded $2,317,145 over the seven-year period; the City applied for an additional $266,990 but was not successful. Awarded projects specific to hotspots are in Table 24.

Table 24: City of Greater Geraldton state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	10. Drummond Cove	11. Sunset Beach	12. Beresford	13. Point Moore
CAP	•2018/19: Whitehill Road sand nourishment •2021/22 to 2024/25: Monitoring coastal hotspots	•2019/20: Wave and current data collection at Sunset Beach •2021/22 to 2024/25: Monitoring coastal hotspots	•2021/22 to 2024/25: Monitoring coastal hotspots	•2021/22 to 2024/25: Monitoring coastal hotspots •2022/23: Geraldton Southern Transport Corridor and Greys Beach conceptual coastal protection strategy
H-CAP		•2022/23: Sunset Beach - groynes and sand Nourishment •2023/24: Sunset Beach Stage 2 – GSC groynes and sand nourishment		
CMPAP	•2019/20: City of Greater Geraldton coastal node master planning	•2019/20: City of Greater Geraldton coastal node master planning	•2019/20: City of Greater Geraldton coastal node master planning	•2019/20: City of Greater Geraldton coastal node master planning
Coastwest	•2019/20: Drummond Cove foreshore resilience project	•2018/19: Sunset Beach dune adaptation management •2022/23: Sunset Beach dune stabilisation •2023/24: Sunset Beach dune stabilisation project stage 2		•2019/20: Pages Beach foreshore access management •2020/21: Separation Point coastal dune management •2021/22: Point Moore dune Stabilisation and access control •2022/23: Greys Beach - Point Moore stage 2 •2024/25: Point Moore dune stabilisation stage 3
One-off funding*	•2020/21: WA Recovery Plan - Revetment repair to John Batten Community Hall			

Coastal manager meeting outcomes (where not already identified above):

- With Drummond Cove planning underway, the highest unresolved priority is Bluff Point further south (watchspot W13), whereby an options assessment was underway by the City at the time of this review, though the City also reported that Bluff Point is “relatively stable” at the time of consultation. Long-term trends of ~0.3m erosion/yr at Bluff Point were subsequently provided, indicating an annual sediment deficit between 5,000m3/yr to 10,000m3/yr.
- Funding remains an issue, with Drummond Cove long-term management expected >$10M. CGG is concerned that the community may further shift to demand structures rather than the identified nourishment option, due to perceptions of safety that structures provide.
- Continued retreat is required at Point Moore following the marine rescue demolition, made slightly simpler by leasehold arrangements there. Marine Terrace is the next large retreat project planned, with the lighthouse expected in the future on a trigger-based decision process. Protection of strategic assets at the GST Corridor and Greys Beach will be planned if this trigger is reached,

though will not be funded by CGG. The City is concerned about the Port's impacts on coastal erosion for its wider coastline.

Survey consultation:

- City of Greater Geraldton expanded on similar feedback to the face-to-face meeting, with estimated long-term costs anticipated as $4.5M at Sunset Beach, $2.3M at Beresford, $600K at Point Moore/Greys Beach, and up to $18M at Drummond Cove over a 50-year planning horizon if pursuing a structural adaptation option instead of nourishment.
- Future adaptation pathways were anticipated to be nourishment and retreat at Drummond, nourishment and retreat at Sunset Beach, hard protection and nourishment at Beresford, and managed retreat at Point Moore/Greys Beach. The 2023 Greys Beach Coastal Adaptation Strategy prioritises avoid/retreat first, then protection as the preferred adaptation pathway. Protection will be triggered when horizontal shoreline datum nears 33 metres from the GSTC Corridor's seaward boundary, anticipated within 15 to 20 years.
- The City repeated their concern over Bluff Point and were undertaking an options assessment through CMPAP at the time of review, with houses reportedly at risk on the northern/southern ends of the watchspot. Also flagged were the Southgate dunes, with rapid movement northwards (~13m/yr) since 2018. The mobility of this significant sediment source that provides 31,000m3/yr to 38,000m3/yr for Geraldton's coast adds greater uncertainty to coastal management for City of Greater Geraldton. While not yet included as a hotspot or watchspot at the time of review, this location should be further assessed in the formal revision of Seashore (2019).

Expected change in MI:

10. Drummond Cove, Geraldton	**Recommendation: Remains hotspot with similar MI**
The same erosion issues threatening Drummond Cove will require significant intervention and expenditure in the short to medium term, demonstrating similarly high MI here as in Seashore (2019).	
11. Sunset Beach, Geraldton	**Recommendation: Remains hotspot with reduced MI**
Significant investment in GSC groynes has reduced erosion vulnerability and MI has subsequently decreased at this hotspot relative to Seashore (2019).	
12. Beresford, Geraldton	**Recommendation: Remains hotspot with similar MI**
While ongoing vulnerability from old, low-crested structures is evident, the lack of reported changes indicate MI remains the same at this hotspot relative to Seashore (2019).	
13. Point Moore, Geraldton	**Recommendation: Remains hotspot with increased MI**
Although retreat has reduced exposure and provided foreshore reserve to allow for coastal processes, accelerated erosion has increased vulnerability to assets landward, so overall MI has slightly increased here relative to Seashore (2019).	

7.2.8. Shire of Irwin

Physical changes, state funding assistance, and consultation are listed here for Shire of Irwin. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

14.b Grannies Beach, Irwin
Shire of Irwin have been active to install a novel, low-cost, and nature-based method to protect against erosion of the foreshore reserve (Figure 21), with three stage phases undertaken in 2019, 2021, and 2023 (Figure 22). Each stage extended further north from Grannies, with CAP funding stage 3 at Surf Beach. The design entails sand excavation to underlying rock, mixing in situ beach sand with cement mix to a 10MPa strength, pouring the mix as a square block toe over rock, using mix to create a sloped face, then nourishment and revegetation are added atop the face. Although non-engineered structures, these works encountered severe storm events from T.C. *Seroja* and T.C. *Mangga* without sustaining significant damage (T.C. *Mangga* was internally assessed as a 50-year ARI storm event for this location). Most conventional engineering considerations applicable to these novel structures remain uncertain though, such as design life and an applicable design wave height.

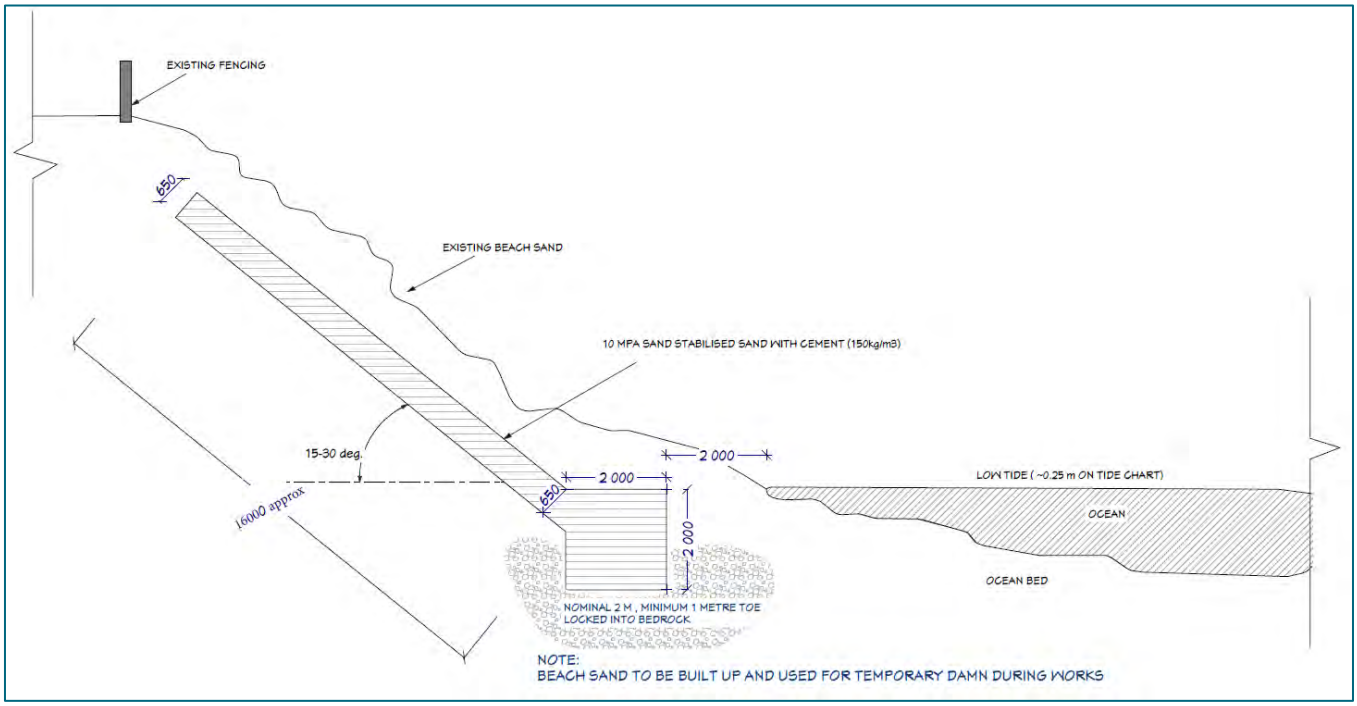

Figure 21: Novel coastal protection design applied at Grannies Beach and Surf Beach (sourced from Shire of Irwin survey).

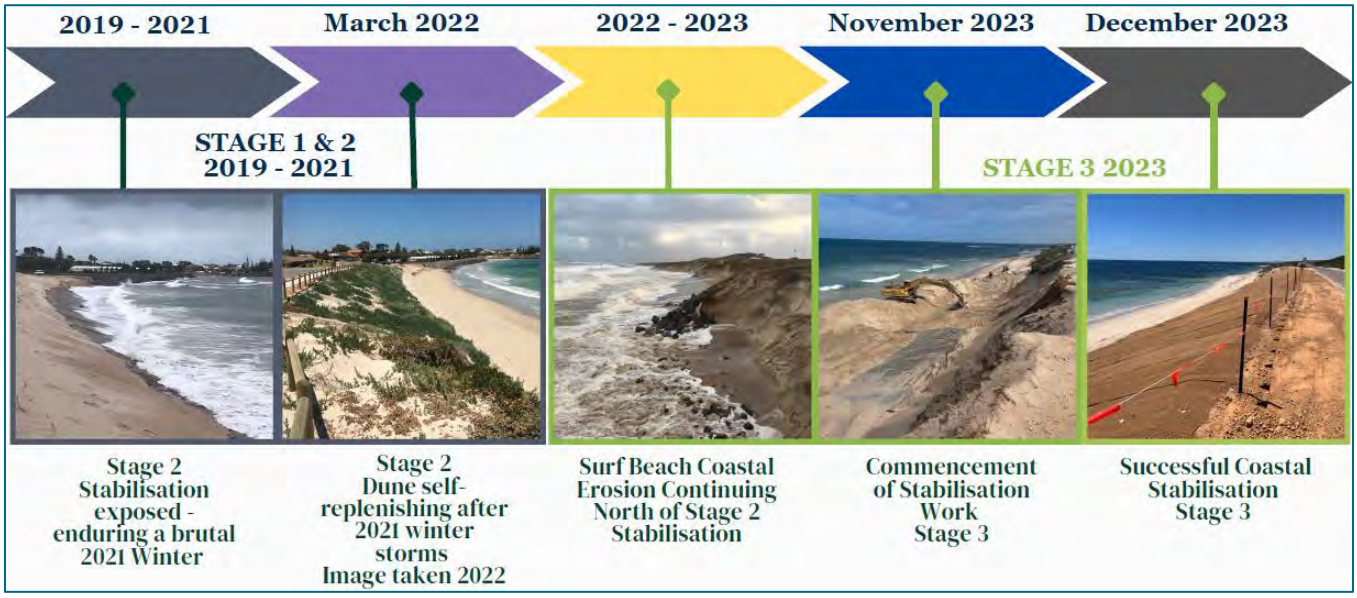

Figure 22: Staged timeline of Grannies Beach and Surf Beach novel protection works (sourced from Shire of Irwin survey).

Funding assistance:

Shire of Irwin was awarded $117,583 over the seven-year period; the Shire applied for an additional $50,000 but was not successful. Awarded projects specific to hotspots are shown in Table 25.

Table 25: Shire of Irwin state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	14.b Grannies Beach, Irwin
CAP	•2022/23: Surf Beach nature-based stabilisation
H-CAP	
CMPAP	•2018/19: Shire of Irwin Coastal Management Plan
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority for Shire of Irwin is a revision of their 2016 CHRMAP, which did not include Knobby Head and Little Mexico. The Shire is concerned about high CHRMAP costs, and intends to seek CMPAP funding to support this action.
- The Shire also raised issues regarding long-term exposure of the local airfield parallel to the coast south of Port Denison, particularly the southwest corner, which is potentially under threat by 2070.
- Like many local coastal managers, this Shire has flagged the high cost of implementing CHRMAP recommendations and the need for additional funding. DoT assistance through funding the Shire's coastal monitoring action plan may help to address some of the gap (Item B2 back in Table 4).

Survey consultation:

- The Shire provided further detail on expanding their novel protection methodology to Nunns Pool, approximately 500m north of the existing Grannies Beach hotspot extent. Erosion at Nunns Pool is expected to require these protection works within ~5 years.
- Erosion inside Port Denison marina has been reported, where the same protection solution at Grannies Beach was used. The works were overtopped and damaged, requiring additional protection at the structure crest.

- The Shire is committed to using its cost-effective protection methodology for the majority of its coastal protection works, quoting a cost of $3,500/m3 compared to $25,000/m3 for a conventional rock revetment. Even where these protection works are damaged or require greater maintenance frequency from a shorter expected design life, they can be readily replaced while remaining the most cost-effective solution. It remains unclear whether these works can be expanded to address all coastal erosion issues, such as near the damaged retaining wall at the southern end of the hotspot (Worley 2024a).

Expected change in MI:

14.b Grannies Beach, Irwin	Recommendation: Remains hotspot with reduced MI
This location requires an enlarged size to the north that encompasses up to Nunns Pool and the associated protection efforts by the Shire. Notwithstanding, the installation of effective coastal protection along this hotspot means Grannies Beach has observed a reduction in MI relative to Seashore (2019), with vulnerable areas now limited to the damaged southern retaining wall.	

7.2.9. Shire of Dandaragan

Physical changes, state funding assistance, and consultation are listed here for Shire of Dandaragan. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

15. Cervantes
This hotspot has observed significant changes, particularly to the south where a sandy cuspate foreland at Thirsty Point continues to accrete and build significant volume (Figure 23). A privately funded upgrade to the rock revetment fronting the Lobster Shack also occurred (date unknown), though it remains unclear how suitable this structure will be to protect against erosion hazards long-term. The Shire was awarded CAP funding to investigate long-term adaptation options at Cervantes in 2023/24 – the preferred option was to use sand from the adjacent cuspate foreland to build a buffer against erosion at exposed sections of foreshore, near the Lobster Shack and DoT jetty (Figure 24). DoT has also undertaken geotechnical investigations here funded by CoastWA, however the average depth to suitably resilient bedrock was found to be too low to reliably protect against erosion hazards.

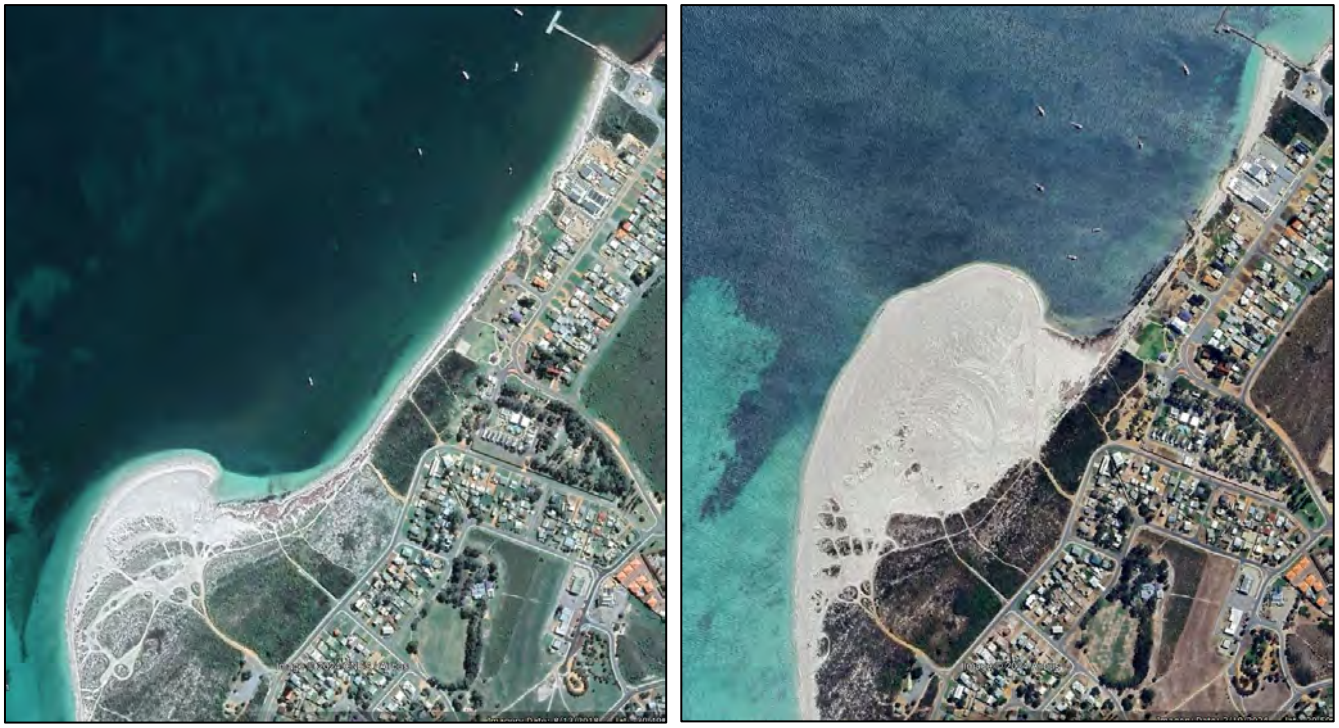

Figure 23: Cervantes hotspot in 2018 (left) and 2024 (right) showing significant growth of the sandy cuspate foreland; this landform may provide a ready source of nourishment sand to address hotspot erosion issues.

Figure 24: Preferred design for Cervantes erosion adaptation using sand from the cuspate foreland for nourishment along the hotspot extent (sourced from Water Technology 2024).

Funding assistance:

Shire of Dandaragan was awarded $139,293 over the seven-year period; the Shire applied for an additional $50,000 but was not successful. Awarded projects specific to hotspots are shown in Table 26.

Table 26: Shire of Dandaragan state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	15. Cervantes
CAP	•2023/24: Cervantes detailed design of coastal management options
H-CAP	
CMPAP	
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is applying the nourishment adaptation option to Cervantes, which will likely require either CAP or H-CAP funding.
- An asset management plan is needed to identify infrastructure and recreational assets in the coastal erosion hazard zone. Following this, a foreshore management plan will be needed for Shire of Dandaragan's coastal settlements.

- The Shire is concerned about the coastline south of Cervantes which required changing a coastal path from concrete to gravel due to erosion. DoT assistance through funding the Shire's coastal monitoring action plan (Item B2 back in Table 4) can help to track how this location changes over time.

Survey consultation:

- Shire of Dandaragan did not provide a survey response.

Expected change in MI:

15. Cervantes	Recommendation: Remains hotspot with increased MI
While a cost-effective adaptation solution has been identified to address high exposure of assets to erosion, this process will be ongoing and in likely need of CoastWA funding/support to implement. MI at this hotspot has thus increased relative to Seashore (2019).	

7.2.10. DBCA

Physical changes, state funding assistance, and consultation are listed here for Department of Biodiversity, Conservation and Attractions (DBCA). Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

16. Grey AND 17. Wedge (managed collectively)
During an onsite meeting conducted by M P Rogers in 2024, DBCA reported that chronic erosion has continued in line with expectations from a 2020 CHA written by WaterTech for these hotspots. DBCA reported they have not undertaken active management, with most of their activities involving monitoring and reporting. If any of the squatter shacks become under immediate erosion threat, the direction is to demolish them on an *ad hoc* basis. It appears the shacks at Wedge are now more exposed to coastal hazards than at Grey (Figure 25), whereby some degree of natural rock protection exists at Grey. Both communities have been permitted to undertake brushing and dune rehabilitation to protect their shacks if desired. The existing policy of removing squatter shacks is expected to be maintained at both Grey and Wedge beaches. While the shacks are illegally constructed and do not comply with conventional planning, building and health requirements, the owners demonstrate significant emotional ties to the shacks and strenuously object to removal programs. In the case of Wedge, over 300 shacks exist in the area and are advocated for by the Wedge Island Protection Association (WIPA). WIPA is an active group comprising shack owners who oppose the shack removal program. WIPA successfully undertook extensive lobbying against State Government to retain their shacks until the coast road was completed. WIPA may again be expected to lobby Government when the matter of shack removal next arises, regardless of physical erosion threats.

Figure 25: Informal shacks at Grey (left) and Wedge (right) during winter 2024; shacks at Wedge are currently more exposed to erosion hazards than Grey (sourced from M P Rogers 2024a).

Funding assistance:

No requests for funding have been made to CoastWA by DBCA, and thus no funding has been provided.

Coastal manager meeting outcomes (where not already identified above):

- Only LGAs were approached for face-to-face meetings. DBCA operates independently of CoastWA.

Survey consultation:

- Only LGAs were approached by survey consultation. DBCA operates independently of CoastWA.

Expected change in MI:

16. Grey AND 17. Wedge (managed collectively)	Recommendation: Relegate to watchspot/remove entirely
With negligible state investment required due to the informal shacks being leasehold, neither DBCA nor any coastal management agency is legally required to protect them. Neither Wedge nor Grey fit the hotspot definition given no obligation for future management requirements are applicable, so they cannot be retained as coastal erosion hotspots going forward.	

7.2.11. Shire of Gingin

Physical changes, state funding assistance, and consultation are listed here for Shire of Gingin. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

18. Grace Darling Park, Lancelin
This hotspot requires ongoing funding support from CAP for adaptation through sand nourishment, having received funding each year for the last four years, supplemented by dredge spoil from DoT intermittent dredging near the jetty. These efforts have continued to maintain the same shoreline position and retain foreshore reserve for public benefit (Figure 26). A CoastWA-funded geotechnical investigation was undertaken at this hotspot in 2023, though suitably resilient rock levels were too low to protect against erosion hazards. Lancelin itself has been the topic of contention for long-term adaptation planning funded by CMPAP, with both council and community passionately debating the feasibility of large-scale retreat, which was proposed to reduce coastal hazard exposure at this low-lying coastal town.
19. Ledge Point
A narrow dune buffer between coastal hazards and private property at the hotspot's south has remained generally stable. Management action will be needed in the future to avoid potential loss of private property, though required contributions of private beneficiaries needs to be clarified through a BDA first. A CoastWA-funded geotechnical investigation was undertaken at this hotspot, though suitably resilient rock levels were too low for most areas to protect against erosion hazards.
20.b Seabird Foreshore, Gingin
The revetment at seabird continues to protect private property at the previously eroded shoreline, however this appears to have been at the expense of coastlines and properties to the north and south due to transferred erosion stress. Undercutting of beach access stairs and the caravan park access ramp from storm erosion necessitated closing off these assets to beach users (Figure 27). Like Ledge Point, required contributions of private beneficiaries needs to be clarified, particularly from those whose properties were protected by public funds that paid for their seawall. A CoastWA-funded geotechnical investigation was undertaken at this hotspot and suitably resilient rock may provide protection to properties north of the seawall, with rock +5mAHD to +10mAHD apparent in most areas. However, pockets of rock below 0mAHD were evident, creating uncertainty around the protective capacity of existing rock substrate if chronic erosion trends continue.

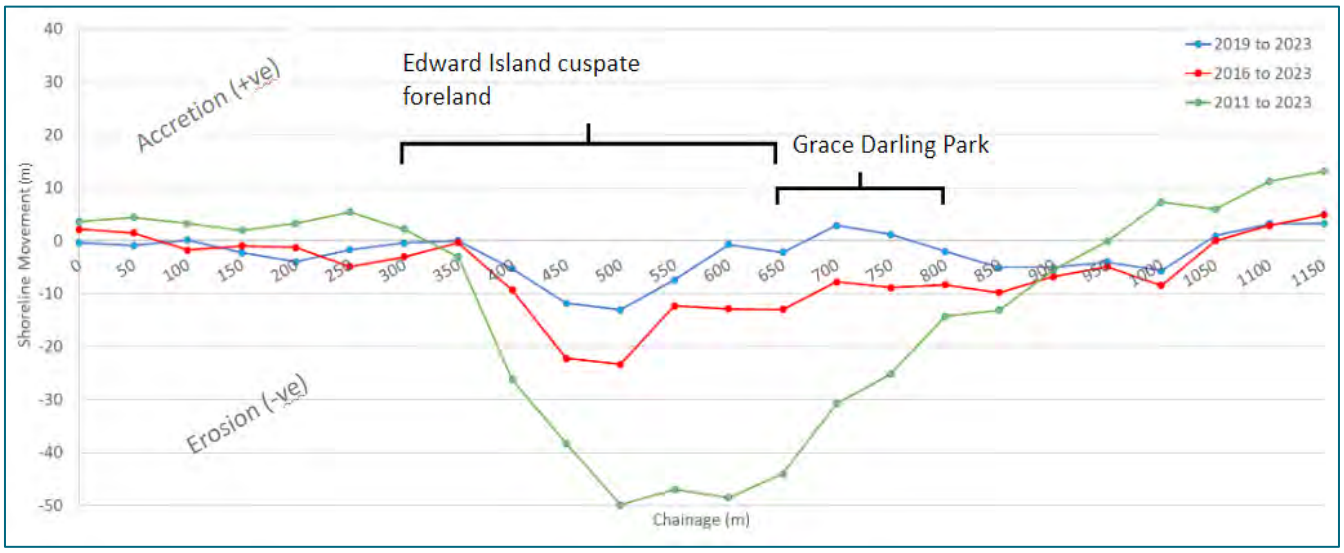

Figure 26: Shoreline movement between 2011 to 2023 at Lancelin; following significant erosion ten years ago, Grace Darling Park has stabilised in recent years (sourced from Worley 2024b).

Figure 27: Erosion north of seabird revetment in winter 2021 showing closed off access at both the stairs (top) and caravan park ramp (bottom) (sourced from DoT 2022).

Funding assistance:

Shire of Gingin was awarded $371,690 over the seven-year period; the Shire applied for an additional $323,028 but was not successful. Awarded projects specific to hotspots are shown in

Table 27.

Table 27: Shire of Gingin state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	18. Grace Darling Park, Lancelin	19. Ledge Point	20.b Seabird Foreshore, Gingin
CAP	•2020/21: Gingin coastal erosion hotspots monitoring project •2021/22: Interim adaptation solution for managing erosion at Lancelin •2022/23 to 2024/25: Sand nourishment - Grace Darling Park to Edward Island Point, Lancelin	•2019/20: Condition assessment of Ledge Point and Guilderton groynes •2020/21: Gingin coastal erosion hotspots monitoring project	•2020/21: Gingin coastal erosion hotspots monitoring project
H-CAP			
CMPAP	•2019/20: Revision Lancelin - strategic town plan •2020/21: Gingin coastal hazard risk management and adaptation plan and inundation study integration •2021/22: Gingin coastal management strategy	•2020/21: Gingin coastal hazard risk management and adaptation plan and inundation study integration •2021/22: Gingin coastal management strategy	•2020/21: Gingin coastal hazard risk management and adaptation plan and inundation study integration •2021/22: Gingin coastal management strategy
Coastwest			
One-off funding*			

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- The highest unresolved priority continues to be long-term planning around Lancelin. The community is divided between a sustainability focus or recreational focus for coastal management. Both Council and the Shire have struggled to meet consensus on the preferred pathway forward. A BDA may assist to improve understanding here about cost beneficiaries.
- It appears the community expect the Seabird rock revetment to be maintained beyond its design life with further protection works added in the form of groynes. However, funding such structures may present a challenge as CoastWA funds projects for public benefit rather than mostly private benefit, unless private beneficiaries can at least co-fund future works.
- Low capacity and high turnover from Shire staff has hampered coastal management effectiveness. For example, negligible coastal data has been collected at Gingin's hotspots despite DoT creating a cost effective and tailored monitoring program for the Shire in 2016. The Shire wants greater state assistance for both funding and technical advice.

Survey consultation:

- The Shire repeated its issues facing Lancelin and Seabird. Some of the Lancelin community have demonstrated denial to impacts reported by the CHRMAP, so the Shire is in a difficult position for directing Lancelin's long-term planning. Meanwhile Seabird's seawall is expected to require increased costs for maintenance and management by ~200% in future years.
- Gingin Shire cited lacking state support in failing to address erosion issues. There is an expectation that state government should take leadership by assigning coastal engineers to assess each hotspot, and report to Shire council on preferred adaptation pathways. This feedback appears at odds with the existing CHRMAP which already serves this purpose, though difficulties experienced for implementing their CHRMAP may motivate such requests.

- With its low rate-base, Shire of Gingin noted it cannot afford coastal management costs alone. However, it appears the Shire has not been applying for significant CoastWA funding assistance in recent years except for Lancelin nourishment. It also appears the Shire has not applied for any federal funding assistance from programs like NDRR or DRF. Lacking funding applications are likely due to co-funding limitations, lacking staff capacity to manage/apply for those projects, conflicting directions for management, or a combination of these factors.

Other:

- While not a direct request from the Shire itself, a new location arose after the first version of this review. This appeared in state media from Shire concerns about an eroding coast at Lancelin, near the Lancelin Lookout and Lancelin Sands Hotel. ~25m of shoreline recession has occurred in less than twenty years, with approximately 30m of foreshore remaining before built assets like the hotel are undermined. Lookout infrastructure is also threatened with the path already destroyed. This location can thus be designated as a watchspot that justifies further investigation.

Expected change in MI:

18. Grace Darling Park, Lancelin	**Recommendation: Remains hotspot with similar MI**
Although ongoing vulnerability is evident, annual works by the Shire have kept this hotspot stable, indicating MI remains the same at this hotspot relative to Seashore (2019).	
19. Ledge Point	**Recommendation: Remains hotspot with similar MI**
A narrow dune buffer between coastal hazards and high value assets has remained relatively stable, though still necessitates the same high MI reported in Seashore (2019).	
20.b Seabird Foreshore, Gingin	**Recommendation: Remains hotspot with increased MI**
This location requires an enlarged size to the north that encompasses transferred erosion updrift of the rock revetment. The transfer of erosion stress following revetment construction, and an imminent need to address its issues, necessitates increased MI here relative to Seashore (2019).	

7.2.12. City of Wanneroo

Physical changes, state funding assistance, and consultation are listed here for City of Wanneroo. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

21. Two Rocks Northern Coast
No significant were changes observed at this hotspot. Outside of the seven-year period though and not discussed by Seashore (2019) was the Two Rocks staircase access, which underwent retreat and accommodation to reduce coastal erosion vulnerability, funded by CAP in 2017/18.
21.5 Yanchep Lagoon
This new location requires hotspot classification due to erosion pressure on a reduced foreshore reserve, threatening both public and private assets (Figure 28). CAP funded a coastal management study in 2024/25 to obtain detailed understanding of coastal processes and assess coastal management options. Wider Yanchep has experienced erosion for most of the seven-year period except 2021 and 2022 (Table 28), whereby Yanchep Lagoon entails the narrowest dune buffer to coastal erosion hazards. CAP-funded nourishment at Yanchep has assisted in creating positive net volume changes for some years, though erosion has been documented to occur in other years regardless.
22. Quinns Beach
Continued works by City of Wanneroo to nourish this location's coastline has occurred in addition to hard protection works (Figure 29), with each receiving significant contributions from CAP and the WA Recovery Plan (Table 29). Not shown in Table 29 was the City's own construction of the Groyne 2 extension in 2018/19, as well as a CAP grant for construction of Groyne 4 in 2017/18 which is not described in Seashore (2019). While erosion presents a residual issue for coastal management, nourishment has kept Quinns' coastline position stable. To reduce hazard exposure, renewal/upgrade to Quinns Beach Carpark is planned to include a setback of ~9m as part of carpark works, relocation of existing rock armour, and a more formalised revetment along its western edge. Funded by CAP, the City has also been investigating more scalable solutions to nourishment sources since 2020/21, and in 2024/25 expanded their scope to include City of Stirling and City of Joondalup as part of the Northern Beaches Alliance (NBA). These incremental investigations are slowly progressing to activate offshore sources of sand for nourishment use along Perth's northern beaches.

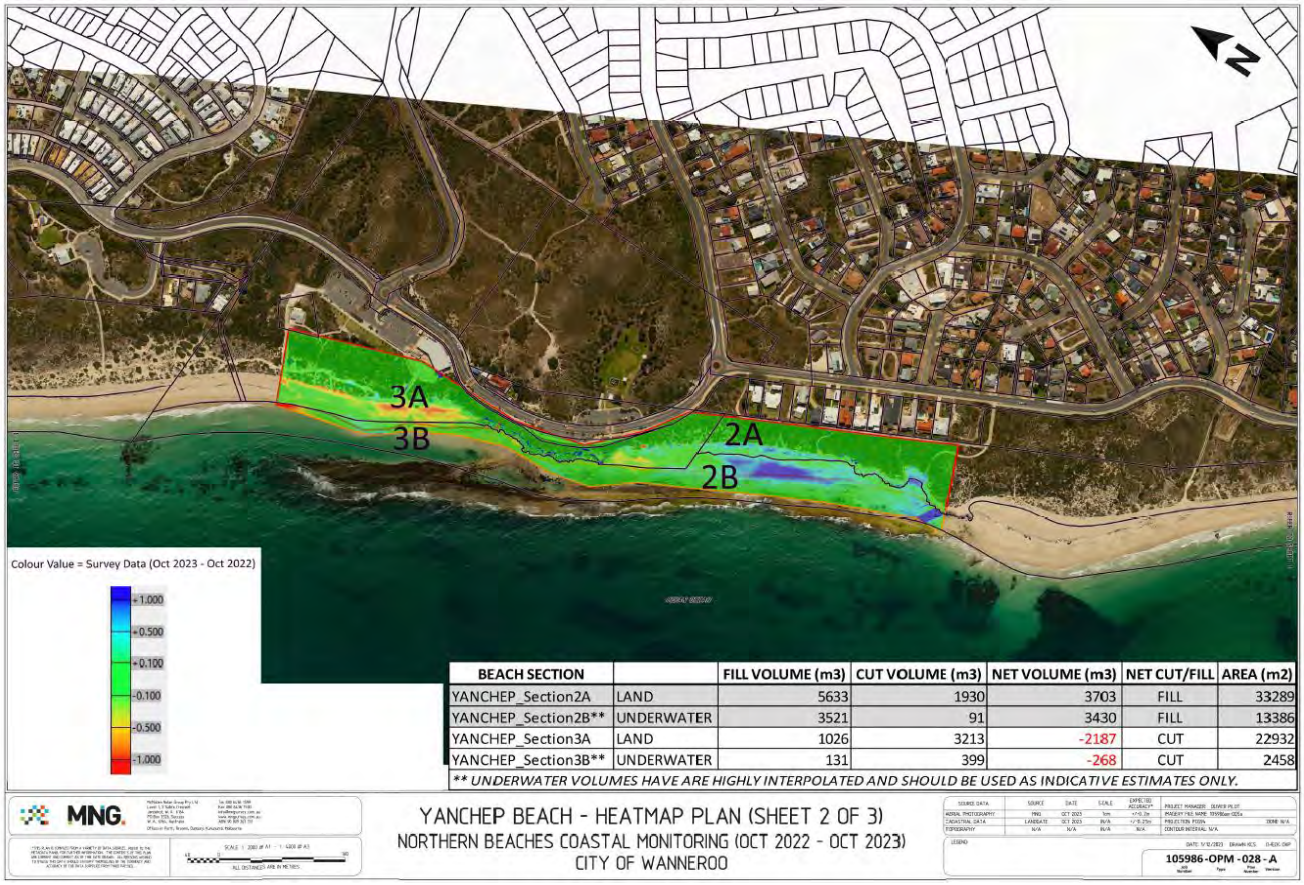

Figure 28: Yanchep Lagoon erosion and accretion trends between 2022 and 2023 (sourced from City of Wanneroo survey).

Table 28: Wider Yanchep erosion and accretion volumes from 2019 to 2023 (sourced from City of Wanneroo survey). The highlighted area entails the proposed hotspot extent for Yanchep Lagoon, encompassing Sections 2, 2B, 3, and 3B.

Section Description	Beach Section	Net Volume Change Oct 20 – Oct 19	Net Volume Change Apr 21 – Apr 20	Net Volume Change Oct 21 – Oct 20	Net Volume Change Apr 22 – Apr 21	Net Volume Change Oct 22 – Oct 21	Net Volume Change Apr 23 – Apr 22	Net Volume Change Oct 23 – Oct 22
South of Fisherman's Hollow Beach Access	Yanchep Section 1	-4,774 m^3	2,732 m^3	-13,200 m^3	-4,240 m^3	+18,862 m^3	+7,284 m^3	-12,371 m^3
	Yanchep Section 1B	N/A	N/A	N/A	N/A	+14,032 m^3	-2,689 m^3	+1,988 m^3
South of Headland, North of Fisherman's Hollow Beach Access	Yanchep Section 2	-138 m^3	-1,873 m^3	-4,204 m^3	-1,301 m^3	+3,004 m^3	+6,747 m^3	+3,703 m^3
	Yanchep Section 2B	N/A	N/A	N/A	N/A	+7,312 m^3	+2,517 m^3	+3,430 m^3
Yanchep Lagoon	Yanchep Section 3	-199 m^3	-196 m^3	-1,881 m^3	-1,500 m^3	+2,816 m^3	+1,393 m^3	-2,187 m^3
	Yanchep Section 3B	N/A	N/A	N/A	N/A	-187 m^3	+3,102 m^3	-268 m^3
South of Capricorn Groyne	Yanchep Section 4	5,110 m^3	4,713 m^3	-11,276 m^3	-7,112 m^3	+7,281 m^3	+1,937 m^3	-8,870 m^3
	Yanchep Section 4B	N/A	N/A	N/A	N/A	+8,469 m^3	-8,570 m^3	-1,235 m^3
North of Capricorn Groyne	Yanchep Section 5	-641 m^3	-2,514 m^3	-9,832 m^3	-5,112* m^3	+6,076 m^3	+7 m^3	-2,853 m^3
	Yanchep Section 5B	N/A	N/A	N/A	N/A	+4,824 m^3	-765 m^3	-639 m^3
Total		-642 m^3	2,862 m^3	-40,393 m^2	-19,265 m^3	+72,489 m^3	+10,963 m^3	-19,302 m^3

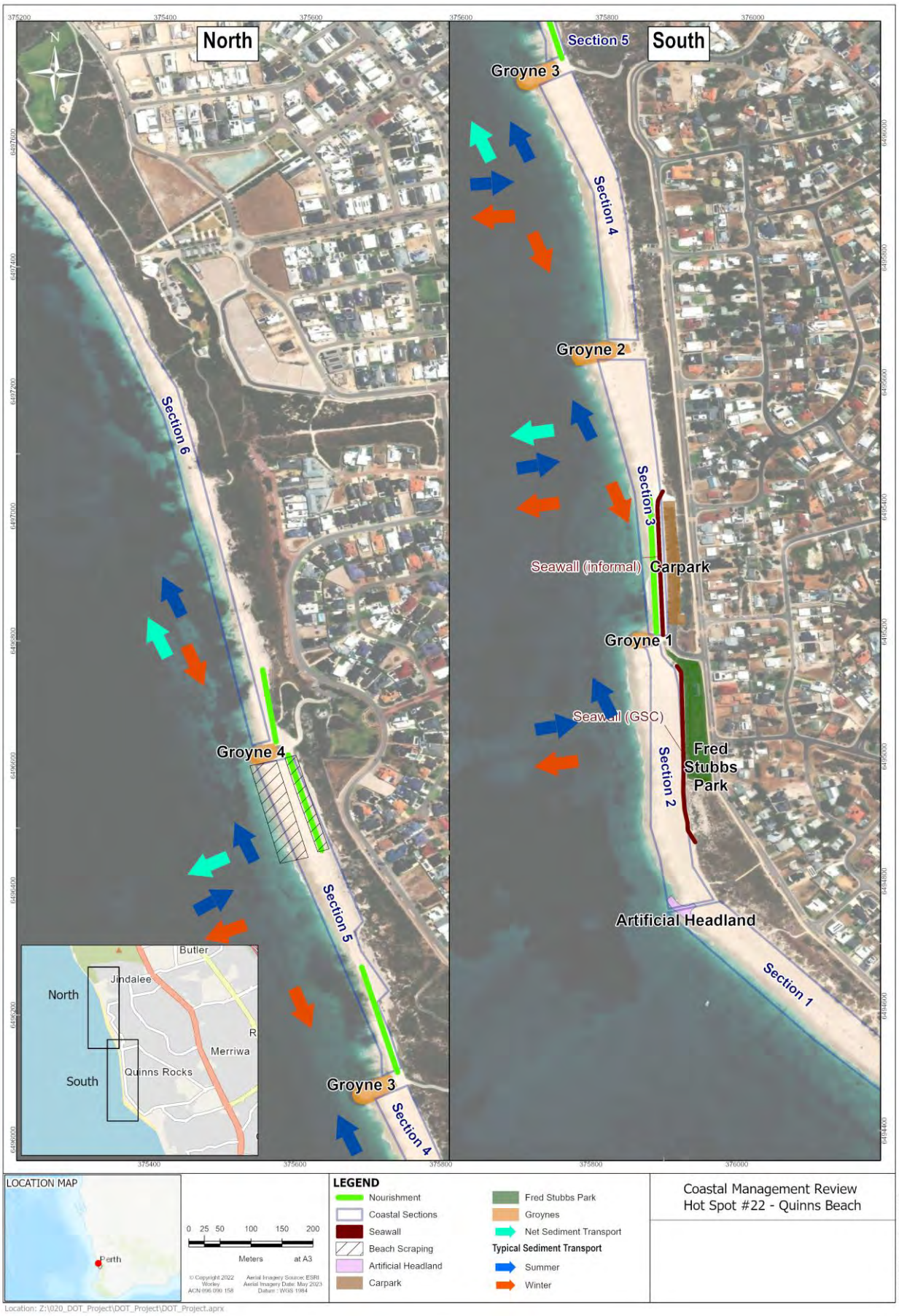

Figure 29: Quinns Beach hotspot showing its heavily engineered coastline (sourced from Worley 2024c).

Funding assistance:

City of Wanneroo was awarded $1,803,260 over the seven-year period; the City applied for an additional $1,421,143 but was not successful. Awarded projects specific to hotspots are in Table 29.

Table 29: City of Wanneroo state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	21. Two Rocks Northern Coast	21.5 Yanchep Lagoon	22. Quinns Beach
CAP	•2019/20 to 2022/23: Aerial survey of beaches and coastal structures •2020/21, and 2022/23 to 2023/24: Offshore sand source investigations •2021/22: Installation of remote monitoring cameras for ongoing coastal monitoring	•2019/20 to 2023/24: Quinns Beach and Yanchep Lagoon sand nourishment •2019/20 to 2022/23: Aerial survey of beaches and coastal structures •2020/21, and 2022/23 to 2023/24: Offshore sand source investigations •2021/22: Installation of remote monitoring cameras for ongoing coastal monitoring •2022/23: Yanchep metocean data collection •2023/24: Quinns Beach and Yanchep wave buoys •2024/25: Yanchep coastal management study	•2018/19: Quinns Beach sand nourishment •2019/20: Quinns Beach long term coastal management stage 2 – extension of groyne 3 •2019/20 to 2023/24: Quinns Beach and Yanchep Lagoon sand nourishment •2019/20 to 2022/23: Aerial survey of beaches and coastal structures •2021/2022: Installation of remote monitoring cameras for ongoing coastal monitoring •2020/21, and 2022/23 to 2023/24: Offshore sand source investigations •2023/24: Quinns Beach and Yanchep wave buoys
H-CAP			
CMPAP			
Coastwest	•2021/2022: Two Rocks sea wrack management		
One-off funding*			•2020/21: WA Recovery Plan - Quinns Beach long term coastal management - groyne 1 construction

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority appears to be long term sources of nourishment sand to cover all of Wanneroo's erosion management needs. Costs and volumes required have escalated, necessitating alternative sources than terrestrial trucking. CAP-funded investigations since 2020/21 have encountered difficulties with approvals due to marine park EPA restrictions. The City has widened the net of potential sources to Joondalup and Stirling, yet those marine waters can also face similar restrictions for sourcing sand.
- City of Wanneroo is expanding their coastal monitoring efforts and focusing on collaboration with neighbouring coastal managers through NBA. Regional partnerships allow scalability efficiencies and capture larger scale processes than conventional, *ad hoc* location-based monitoring.
- The City has flagged high upcoming expenditure requirements for coastal infrastructure in addition to the above coastal management efforts already being undertaken. These including a $400k/yr beach access renewal program, wrack management at Two Rocks, and repairs to Two Rocks northern breakwater/revetment which will require partnering with DoT.

Survey consultation:

- City of Wanneroo provided information on current management costs for existing and proposed hotspots. While no funding is allocated directly at Two Rocks, $150k/yr – $200k/yr is spent at wider Yanchep, and $300k/yr – $400k/yr is spent at Quinns Beach (the City estimates a total of $7M has been spent here since 2017/18). City of Wanneroo also allocates $100k/yr – $150k/yr across its full coastline to coastal surveys, wave buoy management, and coastal engineering consultants.

- Most of the ongoing coastal management costs for the City entail nourishment and dune rehabilitation works at wider Yanchep and Quinns, with hard protection works through groynes not undertaken anywhere since 2020/21.
- Future costs are expected to range from $2M – $5M at wider Yanchep, pending outcomes of the $400k 2024/25 adaptation options investigation and detailed design, with the detailed design expected to be completed around 2025/26. Community consultation and Aboriginal engagement may lengthen this project further still. No maintenance works/costs have been planned yet for the City's existing coastal protective structures, such as those at Quinns. Other future costs include the beach access renewal program identified in the face-to-face meeting.

Expected change in MI:

21. Two Rocks Northern Coast	Recommendation: Remains hotspot with reduced MI
A large foreshore reserve and lack of significant change reported at this hotspot, plus fewer assets exposed with the adapted staircase, indicates a reduced MI relative to Seashore (2019).	
21.5 Yanchep Lagoon	**Recommendation: New hotspot**
Yanchep Lagoon is a new location so cannot be compared to Seashore (2019).	
22. Quinns Beach	**Recommendation: Remains hotspot with reduced MI**
Erosion at this hotspot is being actively managed to keep the foreshore stable, and several hard protection structures were constructed to protect this hotspot's coastline. While active management is needed indefinitely, significant investment in coastal management at this hotspot has helped to slightly reduce MI here relative to Seashore (2019).	

7.2.13. City of Joondalup

Physical changes, state funding assistance, and consultation are listed here for City of Joondalup. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

22.5 Pinnaroo Point
This new location arose from sustained erosion threatening public and private assets north of Hillarys (Figure 30). Despite six years of CAP-funded sand bypassing works undertaken by the City here since 2019/20, this foreshore continues to erode, particularly on the southern side of Pinnaroo Point and at the dog beach carpark (Figure 31). Construction of a playground to the south and Hillarys Beach Club to the north have increased foreshore assets and therefore overall exposure to coastal hazards along this coastline. An options investigation to assess long-term options in relation to bypassing was self-funded in 2024/25.
23. MAAC Seawall, Joondalup
No significant changes were observed at this hotspot, however CERMP funding was awarded here to repair the rock revetment, due by the end of 2025/26.

Funding assistance:

City of Joondalup was awarded $1,128,444 over the seven-year period; the City applied for an additional $396,158 but was not successful. Awarded projects specific to hotspots are in Table 30.

Table 30: City of Joondalup state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	22.5 Pinnaroo Point	23. MAAC Seawall, Joondalup
CAP	•2018/19 to 2022/23: Coastal monitoring program •2018/19 to 2024/25: Sand bypassing program	•2018/19 to 2022/23: Coastal monitoring program
H-CAP		
CMPAP		
Coastwest	•2019/20: Dune rehabilitation at Whitfords Nodes •2021/22: Restoration activities; engage, involve, educate and inspire community coastcare •2023/24: Intensive weed control and rehabilitation of Joondalup's foreshore reserves •2024/25: Ecological restoration and intensive weed control within Joondalup coastal reserves	•2021/22: Marmion/Sorrento coastal foreshore reserve rehabilitation •2021/22: Restoration activities; engage, involve, educate and inspire community coastcare •2023/24: Intensive weed control and rehabilitation of Joondalup's foreshore reserves •2024/25: Ecological restoration and intensive weed control within Joondalup coastal reserves
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Figure 30: Pinnaroo Point in autumn 2018 (left) and autumn 2023 (right); a defined erosion scarp south of Pinnaroo Point and lost dune fronting the carpark is evident in the 2023 imagery.

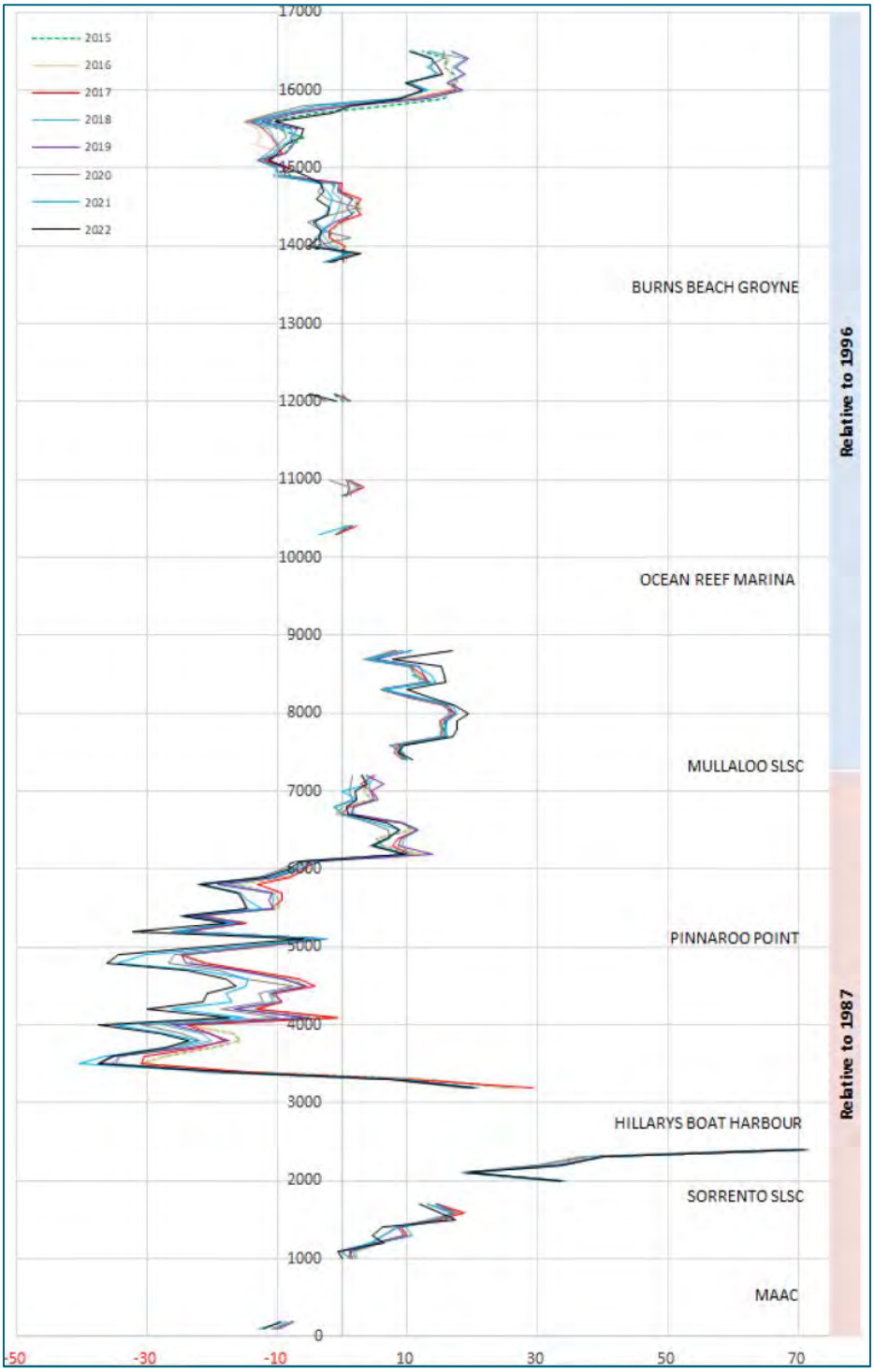

Figure 31: Shoreline movements north of Hillarys demonstrating erosion at Pinnaroo Point (sourced from M P Rogers 2023).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority appears to be long term sources of nourishment sand to cover all of Joondalup's erosion management needs. Costs have escalated and volumes required necessitate alternative sources than terrestrial trucking. Bypassing alone has not resolved the chronic erosion around Pinnaroo Point. City of Joondalup has partnered with Wanneroo and Stirling through the NBA to identify offshore sand deposits as alternative sources for nourishment, yet those marine waters may face resistance for sourcing sand.
- The City manages a significant range of built assets for coastal management purposes including at Sorrento, Marmion, and Mullaloo. Maintenance, repairs, and upgrades to structures at these

locations has been assisted by recent CERMP funding. However, maintenance works will be an ongoing cost into the future and will likely require CoastWA assistance.

- Joondalup also assigns $140k/yr expenditure on coastal conservation related activities including revegetation, weeding, fire mitigation, feral animal control, fencing, and sign maintenance. This has required support from CoastWA funding and the City will continue to need this going forward.

Survey consultation:

- City of Joondalup currently spends ~$5k/yr at the MAAC Seawall hotspot for *ad hoc* works A miniature sediment cell between groynes to the north and reef to the south appears to keep the beach stable. Following the $365k MAAC rock revetment repair in 2025/26, the northern carpark retaining wall will entail the most vulnerable asset. The City will upgrade this to a rock revetment once a trigger point is reached, to an estimated cost of $1.5M – $2M (NPV).
- Pinnaroo Point was confirmed as an upcoming coastal erosion hotspot, comprising the fastest eroding section of coast that Joondalup monitors. Erosion has continued despite annual bypassing from Sorrento to Hillarys, costing ~$300k/yr. The 0m contour has receded by an average of 1.4m/yr since 2015, and up to 40m total since 1987. A chronic erosion trend was present even prior to Hillarys boat harbour construction, with 50m of recession reported between 1942 and 1975. The City anticipates bypassing volumes need to increase to slow erosion trends, with its 2024/25 long-term options investigation to provide a preferred pathway.
- Other locations flagged for continued monitoring include Burns Beach and Iluka, whereby both locations have demonstrated a minor net erosion trend since 2015. As more monitoring data are collected following Ocean Reef marina construction, long term trends can be subsequently identified.

Expected change in MI:

22.5 Pinnaroo Point	**Recommendation: New hotspot**
Pinnaroo Point is a new location so cannot be compared to Seashore (2019).	
23. MAAC Seawall, Joondalup	**Recommendation: Remains hotspot with similar MI**
While ongoing vulnerability is evident, the lack of reported changes indicate MI remains the same at this hotspot relative to Seashore (2019).	

7.2.14. City of Stirling

Physical changes, state funding assistance, and consultation are listed here for City of Stirling. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

24. Watermans Bay, Stirling
No significant changes were observed at this hotspot. Nonetheless, the City independently funded an options investigation in 2023/24 to provide long-term adaptation recommendations in response to the GSC revetment approaching the end of its design life. The results of this investigation were still pending at the time of this review, noting one potential option was strategic sand nourishment with a focus on offshore sources/methods for improved cost and community outcomes compared to conventional trucking.
25. Mettams Pool
This hotspot experienced severe episodic erosion during strong stormy seasons, requiring several CAP-funded nourishment campaigns (Figure 32) through bypassing sand via trucking to Mettams from Trigg to the south. Infrastructure has been managed through the accommodate adaptation pathway, with a CAP-funded disability water access ramp designed to withstand coastal hazards constructed in 2023/24. A CMPAP-funded options investigation in 2023/24 has also been undertaken to provide long-term adaptation recommendations. The results of this investigation were still pending at the time of this review, noting one potential option was strategic sand nourishment with a focus on offshore sources/methods for improved cost and community outcomes compared to conventional trucking.

Figure 32: Mettams Pool pre-nourishment in 2021 (left) and during nourishment in 2022 (right).

Funding assistance:

City of Stirling was awarded $853,942 over the seven-year period; the City applied for an additional $540,170 but was not successful. Awarded projects specific to hotspots are in Table 31.

Table 31: City of Stirling state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	24. Watermans Bay, Stirling	25. Mettams Pool
CAP	•2021/22 to 2022/23: City of Stirling coastal monitoring	•2018/2019: Adaptation plan and defensive works at Mettams Pool, Trigg •2021/22 to 2022/23: City of Stirling coastal monitoring •2021/22 and 2024/25: Mettams sand nourishment •2022/23: Disability water access ramp – detailed design •2023/24: Water access ramp - replacement ramp construction
H-CAP		
CMPAP	•2020/21: City of Stirling coastal hazard risk management and adaptation plan	•2020/21: City of Stirling coastal hazard risk management and adaptation plan •2023/24: Mettams Pool adaptation options assessment
Coastwest	•2023/24: Understanding and enhancing the biodiversity of a coastal dune system	•2023/24: Understanding and enhancing the biodiversity of a coastal dune system
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is funding implementation of the long-term options identified for Mettams Pool and Watermans Bay, whereby Council has allocated up to $750,000 split across management of both hotspots, however this will unlikely cover the required costs without assistance from CoastWA.
- The City has flagged long term sources of nourishment sand to cover its erosion management needs. Costs have escalated and volumes required necessitate alternative sources than terrestrial trucking. Bypassing alone may not resolve the chronic erosion around Mettams. City of Stirling has partnered with Wanneroo and Joondalup through the NBA to identify offshore sand deposits as alternative sources for nourishment, yet those marine waters may face resistance for sourcing sand.
- The City has considered that Scarborough may eventually need to become a coastal erosion hotspot, though the lack of coastal adaptation intervention required here compared to its other hotspots indicates this may be some years away.

Survey consultation:

- City of Stirling provided updates for the status and costs of both hotspots. Watermans Bay and Mettams Pool have observed only minor erosion issues due to the last two years comprising benign winter impacts at these hotspots. Regardless, latent erosion vulnerability will necessitate implementation of long-term solutions, estimated at $10M – $20M, pending options investigations across both hotspots.

- Watermans Bay was reported to have structurally sound GSCs, though with the caveat of increasing maintenance requirements to the base layers during severe storms. The City anticipates the structure will require replacement by 2030 i.e. 20 years since construction. Mettams Pool was noted to be adequately managed through nourishment, though a more formal solution may be needed as early as 2026. The City applied for a ~$4M DRF grant for this purpose but was unsuccessful.
- The City estimates $750k management costs for its non-hotspot coastlines in 2024/25. Rock protection is required at Trigg Island access path and North Beach kitty, plus Kyowa rock bag protection at Hammersley Pool. City of Stirling reiterated its concern about Scarborough Beach requiring increased management attention soon, necessitating a revised CHRMAP, new BDA, and an options investigation in the near future, likely costing up to ~$200k.

Expected change in MI:

24. Watermans Bay, Stirling	**Recommendation: Remains hotspot with similar MI**
Required long-term adaptation planning here from ongoing coastal hazard exposure has been balanced by relative stability at this hotspot since Seashore (2019). MI is therefore anticipated to be similar here to Seashore (2019).	
25. Mettams Pool	**Recommendation: Remains hotspot with increased MI**
Significant adaptation investment requirements, and episodic erosion reducing this hotspot's minimal dune buffer, indicates MI has increased here relative to Seashore (2019).	

7.2.15. Town of Cambridge

Physical changes, state funding assistance, and consultation are listed here for Town of Cambridge. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

15. Floreat Beach
Severe erosion stress has been observed at this hotspot with episodic retreat of dunes following storms (Figure 33). The boardwalk and eroded beach access paths have required intermittent closure due to public safety risks from erosion scarps. The Kiosk café, Floreat Surf Life Saving Club, and Floreat carpark have subsequently become further exposed to coastal erosion hazards (Figure 34). To manage Floreat Beach, the Town has nourished eroded access paths independently, attempted to restore dunes with Coastwest funding, and funded maintenance of the City Beach groynes in 2024/25 with CAP assistance on the southern edge of the hotspot.

Figure 33: Floreat Beach erosion in May 2020 with closed beach access (left) and 6m dune erosion scarps (right).

Figure 34: Floreat Beach on 30th May 2018 (left) and 30th May 2022 (right); the beach and dune has eroded over time such as near the northern City Beach groyne, plus dune/vegetation loss fronting the carpark and Kiosk café.

Funding assistance:

Town of Cambridge was awarded $471,575 over the seven-year period; the Town applied for an additional $214,556 but was not successful. Awarded projects specific to hotspots are in Table 32.

Table 32: Town of Cambridge state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	26. Floreat Beach
CAP	•2024/25: City Beach groyne and vertical wall repair
H-CAP	
CMPAP	•2020/21: Town of Cambridge coastal hazard risk management and adaptation plan •2024/25: Town of Cambridge foreshore management plan
Coastwest	•2018/19: Arresting Floreat dog beach blow outs stage 2 •2018/19: Improving coastal dune monitoring and management using innovative technologies •2020/21: Floreat Beach dune restoration •2021/22: Town of Cambridge helicopter carpark dune restoration •2021/22: Improving coastal dune monitoring and management - phase 2 •2022/23: Floreat dune restoration phase 3 •2023/24: Floreat main beach coastal dunes phase 1 •2024/25: Floreat main beach coastal dunes phase 2
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is the need for an emergency fund in case of a large erosion event impacting Floreat Beach. The Town's operational budget is not structured in a way that allows for creation of a fund like this, and neither are CoastWA grants.
- Town of Cambridge considers the current $50k/yr cost of managing Floreat nourishment and rehabilitation as a considerable cost, assisted by CoastWA funding, but notes this has so far been adequate to maintain the hotspot's status quo (outside of storm events)
- The Shire have flagged a need for additional data including geotechnical information, and then a subsequent options investigation to inform long-term options. Detailed design and construction in the order of $5M – $10M are anticipated for implementation of long-term protection adaptation.

Survey consultation:

- Town of Cambridge provided further details about its management of Floreat Beach hotspot, including its ongoing efforts towards dune rehabilitation and sand nourishment.
- Emergency sand nourishment has been required mainly to repair eroded beach access paths, though also at the toe of dunes and near blowouts. Dune fencing and revegetation areas appear to require constant monitoring and upkeep to repair erosion/blowout issues.
- While winter erosion appears to be the most impactful, there have also been concerns of erosion during summer and from blowouts to necessitate further sand nourishment and scraping along beach access paths, indicating a greater issue regarding overall sediment supply constraints.

Expected change in MI:

15. Floreat Beach	Recommendation: Remains hotspot with increased MI
Due to an anticipated need for significant, unfunded emergency works in the case of a large erosion event(s), in addition to the high anticipated cost of future protection adaptation, the MI of Floreat has increased relative to Seashore (2019	

7.2.16. City of Fremantle

Physical changes, state funding assistance, and consultation are listed here for City of Fremantle. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

27. Port Beach
Port Beach has undergone some of the most significant physical changes from the original hotspot list. Port Beach has been the focus of substantial CAP, H-CAP, and WA Recovery Plan funding to transform the beach from a narrow, eroded scarp to a wide and highly valued public asset (Figure 35). Collaboration between state, local, and port authority stakeholders, plus the wider community, helped define the solution of large-scale nourishment via rainbow dredge (Figure 36). The low cost was approximately 1/3 that of conventional trucking per cubic metre.

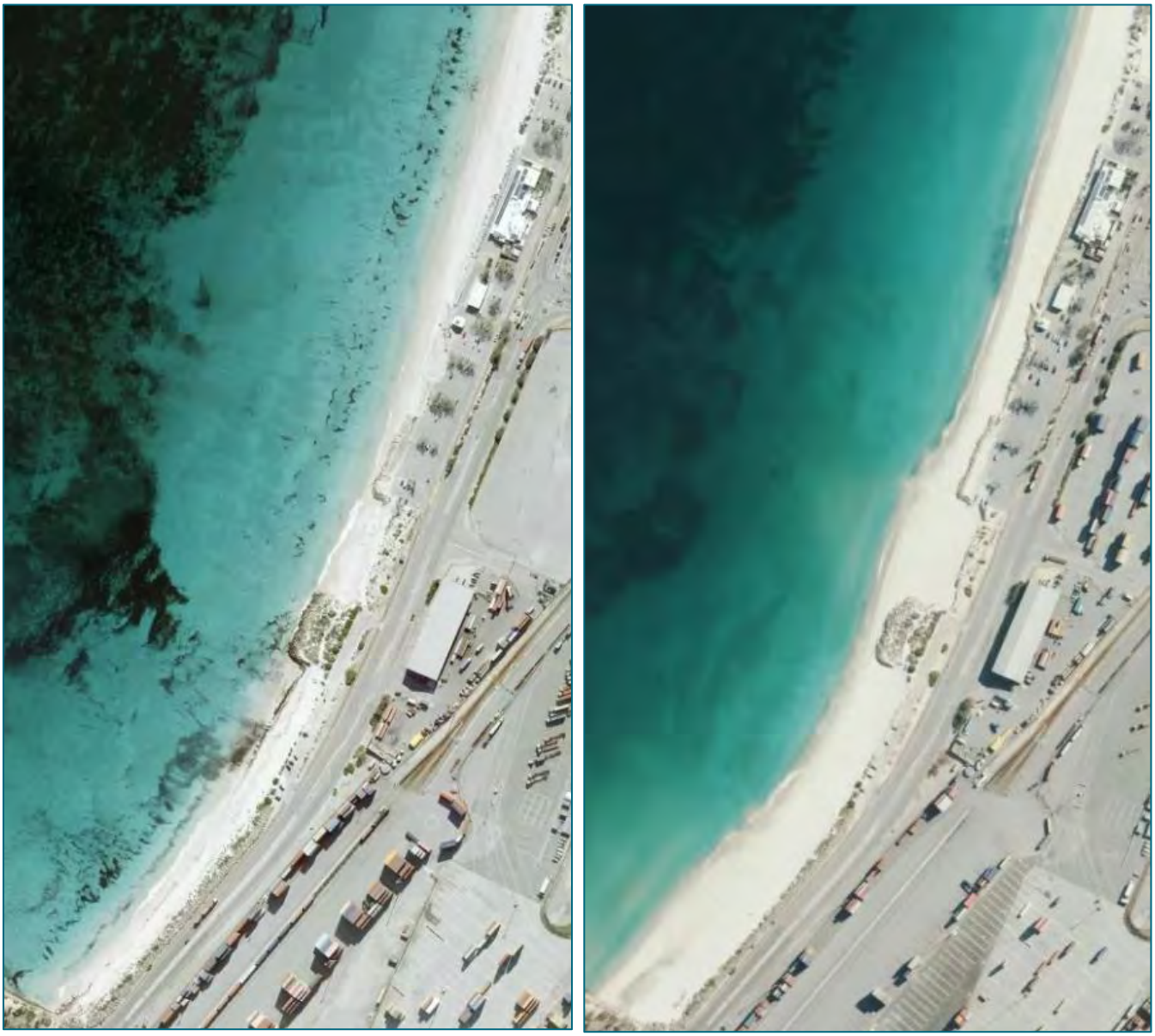

Figure 35: Port Beach hotspot pre-nourishment in Autumn 2021 (left) and 1-yr post-nourishment in Autumn 2023 (right).

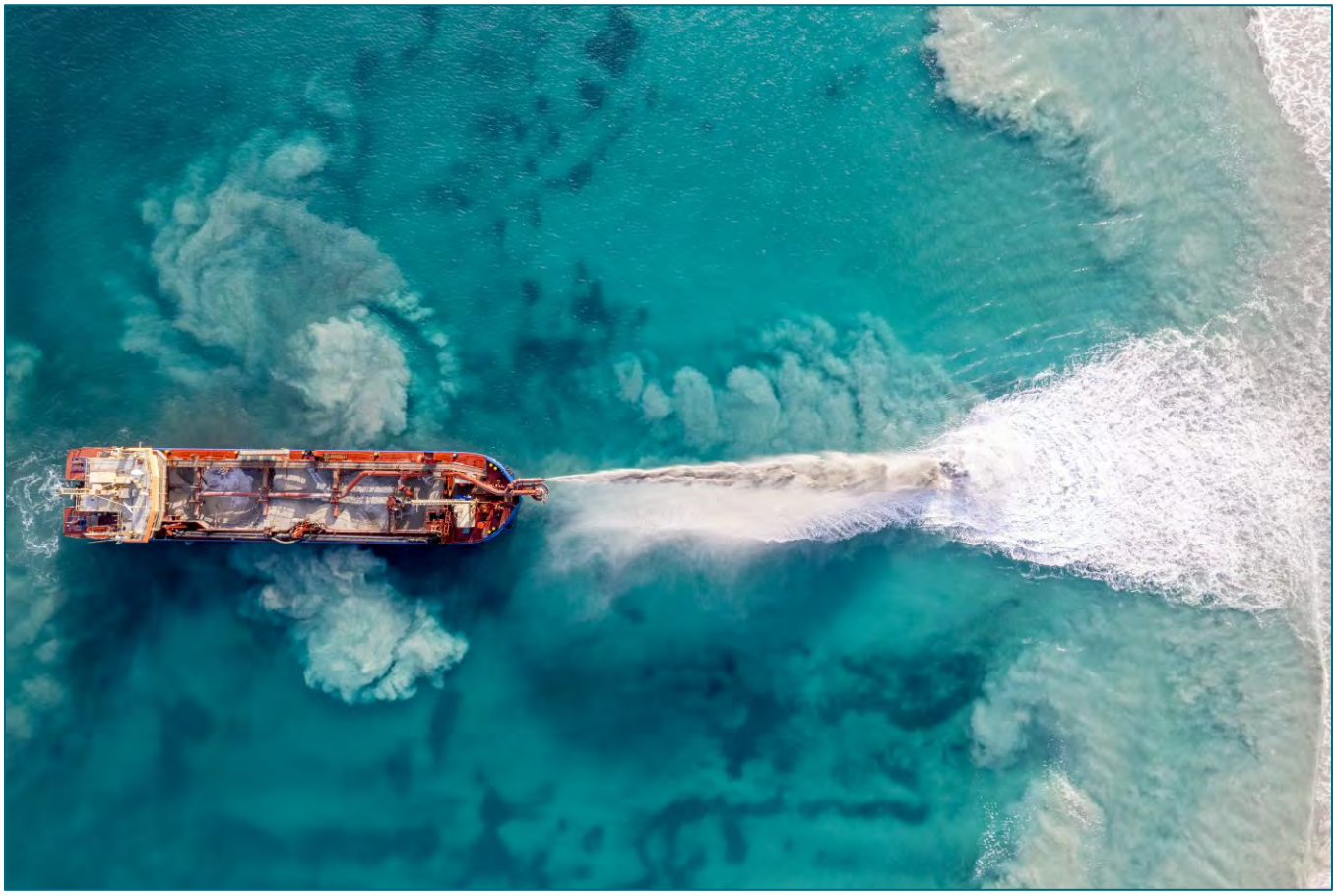

Figure 36: ModiR rainbowing sand to nourish Port Beach in July 2022.

Funding assistance:

City of Fremantle was awarded $4,024,809 over the seven-year period; the City applied for an additional $454,226 but was not successful. Awarded projects specific to hotspots are in Table 33.

Table 33: City of Fremantle state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	27. Port Beach
CAP	•2018/19: Port Beach asset condition assessment, analysis and development of management/maintenance program •2019/20: Port Beach coastal adaptation option design •2020/21: Port Beach coastal adaptation detailed design and report
H-CAP	•2022/23: Port Beach sand nourishment - phase 2 dune creation and stabilisation
CMPAP	
Coastwest	
One-off funding*	•2020/21 to 2021/22: WA Recovery Plan - Large-scale sand nourishment at Port Beach

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority (for erosion) is to review and update the City's CHRMAP to better integrate with strategic plans and local planning strategies, which also require updating themselves.

- Future of Fremantle planning process (MRS amendment underway) will guide the future of decision making at Port and Leighton Beaches. Sand nourishment/dune reconstruction is considered an interim approach ahead of long-term planning solutions. The City has flagged that funding to maintain the dunes and beach for Port Beach hotspot will be exhausted in approximately 5 years.
- Damage to the rock revetment along the South Fremantle coast has been identified and will necessitate repairs/upgrades at some point in the future. No funding has been allocated to this, as while $299k/yr has been reserved for coastal management at South Fremantle, it is allotted to managing inundation impacts which is of greater concern to the City.

Survey consultation:

- City of Fremantle discussed updates to Port Beach since large scale nourishment widened the beach in 2022. Erosion from storms has been reported in July of 2024, mostly linked to interaction of coastal processes with the old rock revetment, with flank erosion and rock drifters evident near the structure (Figure 37).
- The City has undertaken additional erosion control in the form of matting repair works and infill planting with native tube stock, plus fencing repairs, to combat erosion from storms. Sand lost from the system due to longshore drift has been expected at this hotspot following works, so maintenance nourishment was catered for in budget planning, supplemented by monitoring to track long term change. Maintenance nourishment will cost ~$75k.
- South Beach erosion was reported as a new location of concern, particularly at the northern end. Accretion was observed in 2023/24, though a net receding shoreline has existed since 1960 back when dredge spoil was being used to combat erosion. More recently, nourishment, monitoring, and revegetation works have been undertaken here at a cost of ~$70k/yr. This location will be discussed further in Section 7.2.18.

Figure 37: Port Beach in July 2024 with seawall flank erosion (left) and boulder relocation (right) following winter storms (sourced from City of Fremantle survey).

Expected change in MI:

27. Port Beach	Recommendation: Remains hotspot with reduced MI
Large-scale nourishment works, dune rehabilitation, and reserve funds to manage Port Beach indicate that coastal hazard vulnerability and thus MI has reduced here relative to Seashore (2019).	

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7.2.17. Rottnest Island Authority

Physical changes, state funding assistance, and consultation are listed here for Rottnest Island Authority (RIA). Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

28. Rottnest - South Thomson Bay
This hotspot has observed significant changes through the construction of a rock revetment from H-CAP funding in 2021/22 (Figure 38). The revetment toe is founded on rock and expected to provide long-term protection to tourism short-stay assets previously threatened by coastal erosion hazards. Erosion on the revetment flanks may continue to be an issue requiring extension of the structure in future years, though current erosion buffers at these flanks indicate that intervention is not required for some years to come.

Figure 38: Rottnest - South Thomson Bay pre-construction in December 2021 (left) and post-construction (right) in December 2022.

Funding assistance:

RIA was awarded $1,795,000 over the seven-year period; RIA applied for an additional $470,610 but was not successful. Awarded projects specific to hotspots in RIA are in Table 34.

Table 34: RIA state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	28. Rottnest - South Thomson Bay
CAP	•2021/22: Coastal Hazard Assessment for Rottnest Island
H-CAP	•2021/22: South Thomson revetment - detail design and construction
CMPAP	
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Only LGAs were consulted for face-to-face meetings. RIA is a state body, so no information is available here.

Survey consultation:

- Only LGAs were consulted by survey consultation. RIA is a state body, so no information is available here.

Expected change in MI:

28. Rottnest - South Thomson Bay	Recommendation: Remains hotspot with reduced MI
Significant investment through the rock revetment has reduced erosion vulnerability and MI has subsequently decreased at this hotspot relative to Seashore (2019).	

7.2.18. City of Cockburn

Physical changes, state funding assistance, and consultation are listed here for City of Cockburn. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

29.b C.Y. O'Connor Beach
Erosion at this hotspot continues to require active coastal management. A CAP-funded artificial reef was installed in 2022 north of Catherine groyne, with a widened reef required in December 2024 by the City with CERMP funding to provide proper protection against erosion (Figure 39). City of Cockburn also received CAP funding in 2023/24 to investigate environmental considerations from potential use of dredge spoil to nourish this location. Increasing erosion pressures now span north from the existing hotspot extent (Figure 40), up to South Beach at the southern Fremantle boat harbour breakwater. Assets have increased leading to higher asset exposure to coastal hazards north of Catherine groyne e.g. a playground, toilet block, and carpark were constructed in 2017, which was not identified in Seashore (2019). It thus appears necessary to expand the hotspot extent further north to merge with the W20 watchspot (South Beach). Management of this location will thus require close coordination with City of Fremantle.

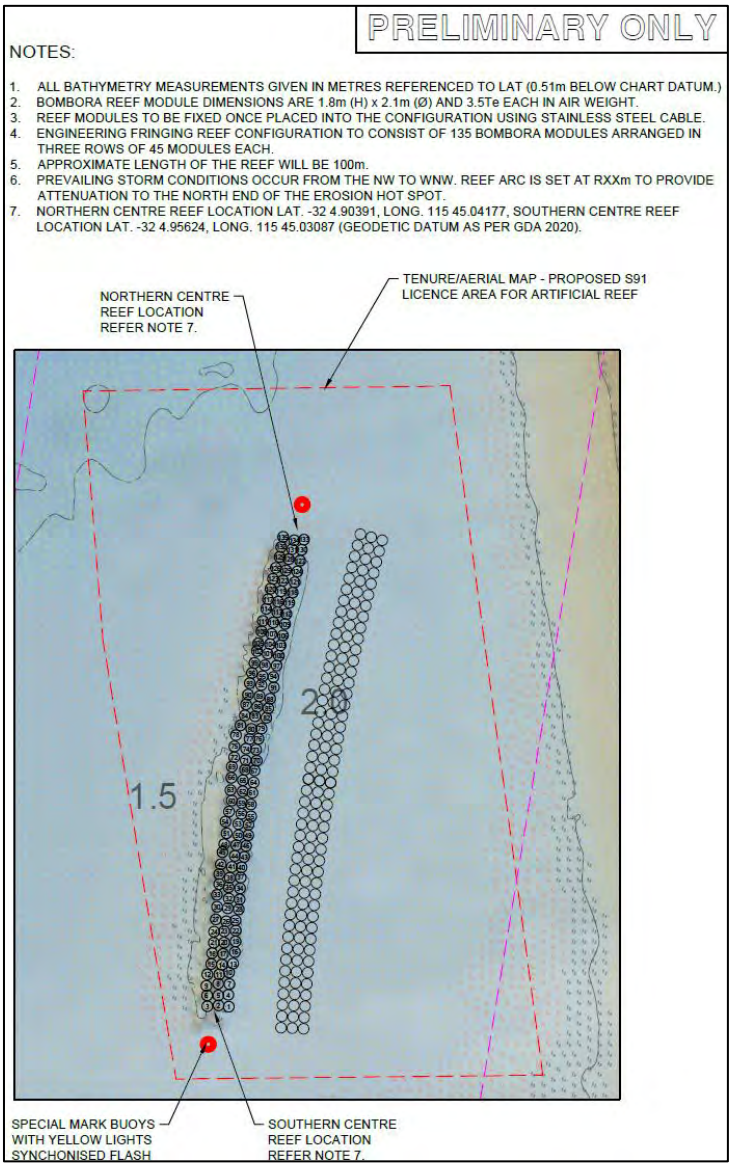

Figure 39: Widened artificial reef to improve its coastal protection capability (sourced from City of Cockburn survey).

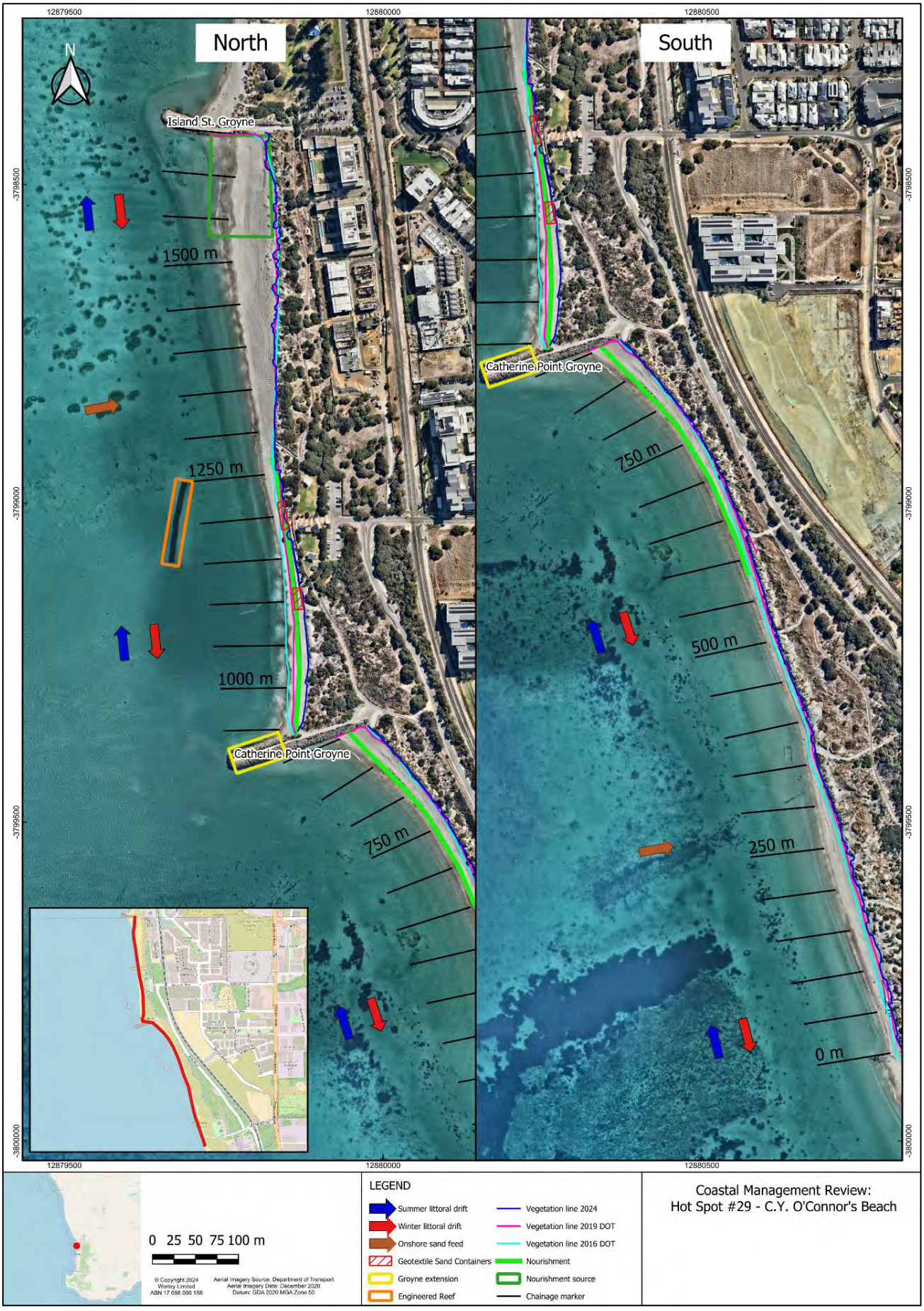

Figure 40: Vegetation line recession around C.Y. O'Connor Beach hotspot to the north (left) and south (right). Erosion both north and south of Catherine groyne is evident. The artificial reef can be observed to the north (sourced from Worley 2024d).

Funding assistance:

City of Cockburn was awarded $659,778 over the seven-year period; the City applied for an additional $466,039 but was not successful. Awarded projects specific to hotspots are in Table 35.

Table 35: City of Cockburn state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	29.b C.Y. O'Connor Beach
CAP	•2018/19: North Coogee (Rollinson Rd) beach nourishment •2020/21: Cockburn Sound coastal survey •2021/22: C.Y. O'Connor beach engineered fringing reef •2023/24: Monitoring the extension of the wave-attenuating engineered fringing reef at C.Y. O'Connor beach •2024/25: Environmental impact assessment studies for nourishment via dredge at C.Y. O'Connor beach
H-CAP	
CMPAP	•2022/23: Cockburn coastal protection benefit distribution analysis •2023/24: City of Cockburn coastal hazard risk management and adaptation plan
Coastwest	•2019/20: Dune rehabilitation at Catherine groyne, C.Y. O'Connor reserve •2020/21: Rehabilitation C.Y. O'Connor beach •2021/22: Stabilisation of C.Y. O'Connor erosion hotspot, Rollinson Road dunes, Cockburn
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is sourcing long-term sand to service the needs of both C.Y. O'Connor beach and Cockburn's other beaches. The City currently uses Chelydra Beach but are uncertain about long-term sustainability of this source. Success Bank is the target to source sand in the nearshore zone, though sourcing sand requires numerous studies and EPA approval. Investigations for this purpose alone are estimated at $200k.
- City of Cockburn highlighted that watchspot W20 (north of Catherine groyne) actually requires greater coastal management attention than the existing C.Y. O'Connor hotspot extent. The City also remains concerned about how Westport may affect these locations and its other beaches.
- The City is monitoring the influence of its artificial engineered fringing reef on its coastline, before the reef is widened in late 2024. A 2023 BDA was completed for the coast in its lee, though no other options have been identified that City of Cockburn wants to immediately pursue. Retreat is still under consideration and is to be included in its future land use master plan.

Survey consultation:

- The City reiterated a higher priority assigned to the beaches north of Catherine Point groyne at watchspot W20. Annual sand nourishment is required there, compared to only two yearly at C.Y. O'Connor hotspot. Other recent adaptation activities include a retreated dual use pathway in 2023, and construction of a GSC revetment (date unknown).
- Nourishment by both trucking and pipeline infrastructure costs the City up to $750k/yr. Other costs were not quantified, though include monitoring and maintenance/potential new construction of coastal protection structures in the form of groynes, GSC revetments, and the artificial reef.
- While the existing hotspot and watchspot receive the majority of nourishment sand, Coogee Beach and Ngarkal Beach also require intermittent nourishment every three to five years.

Expected change in MI:

29.b C.Y. O'Connor Beach	Recommendation: Remains hotspot with increased MI
This hotspot will need significant regular nourishment works in perpetuity, with long term sources remaining uncertain, plus a requirement to expand this hotspot further north. The hotspot may need to be renamed accordingly. Considering a range of coastal protection structures (both planned and existing) also need to be accounted for in regard to maintenance and construction – MI has demonstrably increased relative to Seashore (2019).	

7.2.19. City of Kwinana

Physical changes, state funding assistance, and consultation are listed here for City of Kwinana. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

31. Kwinana Waterfront Industrial
Overall changes at this hotspot are difficult to evaluate owing to its privately managed coastline split across different leaseholders. Evidence of *ad hoc* adaptation is visible, such as formalised revetment construction in 2021 near Kwinana Bulk Terminal (Figure 41), plus ongoing localised revegetation efforts by leaseholders. Numerous structures require maintenance or replacement yet lacking coastal investment is apparent over the seven-year period, possibly due to the proposed Westport footprint covering much of this hotspot (Figure 43). For example, ongoing erosion has been reported at the BP site's dilapidating shore-attached breakwaters. Asset exposure has also increased since Seashore (2019), such as a new Synergy office constructed at the power station adjacent to its dilapidated revetment. Due to the uncertain nature of how Westport will impact coastlines here, conventional hotspot management and intervention from CoastWA needs to be closely evaluated as ensuring long-term cost benefit before actions are undertaken.
31.b Kwinana Beach
Since 2020, erosion has occurred at the beach north and south of the hotspot extent (Figure 42) alongside damage to foreshore infrastructure and gradual decline of the dilapidating revetment south of Kwinana Wreck. The City undertook independent assessment of available adaptation options, in addition to northern structural inspections in 2023. It is evident this hotspot requires extension to the north, encompassing the vulnerable beach and foreshore assets not covered by Seashore (2019). Proposed options include repairing damaged access infrastructure, sand nourishment, revegetation, a GSC revetment to the north, and repair of the existing rock revetment. City of Kwinana applied for DRF funding to assist its coastal management needs but was not successful.

Funding assistance:

City of Kwinana was awarded $130,000 over the seven-year period; all applications by the Shire were awarded funding, with no unfunded projects evident. Awarded projects specific to hotspots are in Table 36.

Table 36: City of Kwinana state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	30. Kwinana Waterfront Industrial	31.b Kwinana Beach
CAP		
H-CAP		
CMPAP	•2024/25: City of Kwinana coastal hazard risk management and adaptation plan review	•2024/25: City of Kwinana coastal hazard risk management and adaptation plan review
Coastwest		
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Figure 41: Formalised rock revetment near BP Bulk Terminal, pre-construction in September 2021 (top) and post-construction in November 2021 (bottom).

Figure 42: Vegetation line recession north (left) and south (right) of Kwinana Beach hotspot (sourced from Worley 2024e).

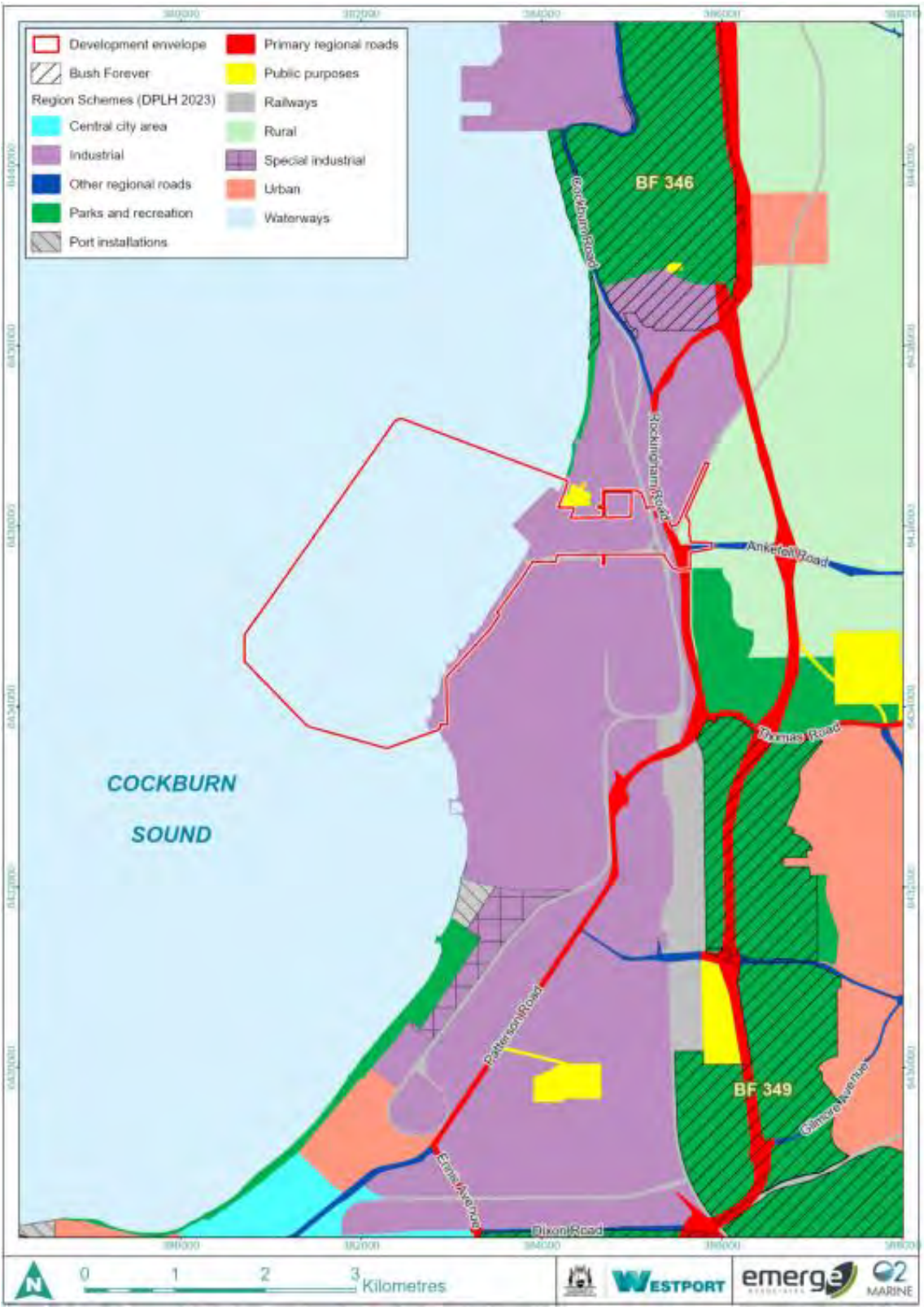

Figure 43: Development envelope for Westport, covering ~half of the existing hotspot extent (Sourced from Westport 2024).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority pertains to erosion (and infrastructure) at the existing hotspot as well as north of Kwinana Wreck. The City could only cite outdated costs from 2016, quoted at $2.9M for revetment repair, nourishment, dune rehabilitation, plus offshore breakwater repair and upgrade to two structures instead of one. Present day costs for these works will likely be significantly higher than $3M.

- The City successfully applied for CMPAP funding for a CHRMAP to guide future planning, and also aims to revive neighbouring LGA consultation through the Cockburn Sound Coastal Alliance (CSCA). DoT assistance through funding the Shire's coastal monitoring action plan may help to address some of the current knowledge gaps (Item B2 back in Table 4).
- City of Kwinana stated they were unaware whether high level coastal management action recommendations proposed by Seashore (2019) has been undertaken or not for Kwinana Waterfront Industrial. The City acknowledged a need for resolving responsibilities there, but this is not within their control.

Survey consultation:

- Shoreline recession north of the current hotspot extent was reported to reach Trigger 2 from the 2016 coastal adaptation plan, with Trigger 3 anticipated to be reached soon. The City noted that more recent erosion south of the southern revetment (i.e. within the current hotspot extent) was also exacerbating issues for the deteriorating structure and dunes.
- Challenger Beach was described as a potential new hotspot location, citing "*a gradual degradation and deterioration of the dune system*". City of Kwinana stated this location presents a knowledge gap and they do not yet comprehend the extent of erosion problems, indicating its suitability as a watchspot site.
- Westport also consulted with the City on potential impacts to Challenger Beach from the Westport development envelope, so the role of Westport and the City for managing this location remains uncertain. Challenger Beach thus appears suitable to designate as a watchspot.

Expected change in MI:

31. Kwinana Waterfront Industrial	**Recommendation: Remains hotspot with reduced MI**
Due to the combination of unknown private management and the Westport development envelope covering much of its extent, uncertainty remains around this hotspot's future. Notwithstanding, the implementation of some adaptation works such as the BP Bulk Terminal rock revetment indicates slightly reduced MI here relative to Seashore (2019).	
31.b Kwinana Beach	**Recommendation: Remains hotspot with increased MI**
Increased erosion has been reported both north and south of Kwinana Wreck, and an urgent requirement remains for managing dilapidated coastal infrastructure and protection structures at the time of this review. MI has thus increased here relative to Seashore (2019), and extension of this hotspot's extent further north and south is justified.	

7.2.20. City of Rockingham

Physical changes, state funding assistance, and consultation are listed here for City of Rockingham. Together these overview management actions at hotspots and/or new locations.

Physical changes:

32. Rockingham T. Beach to Causeway
No significant changes were observed at this hotspot. However, the City reported that while the shoreline has remained stable, this has required ongoing nourishment to maintain. Some foreshore protection infrastructure has also become steadily more degraded including at Palm Beach (where tenure remains uncertain), Hymus Street, and Mangles Bay Fishing Club.
33. N Point Peron (W of Causeway)
Significant changes have been observed, primarily from the construction of a refurbished and extended spur groyne funded by $650,000 from the WA Recovery Plan at the hotspot's eastern flank, and refurbishment of the DBCA rock revetment further west (Figure 44). While this addressed some of the hotspot's management issues, erosion stress remains a problem west of the refurbished revetment and around the GSC groyne, which has become flanked and can intermittently detach from the beach.
34. Point Peron (N Shoalwater Bay)
The old Apex camp site continues to recede, with erosion potentially threatening the road and Water Corp infrastructure in the future. It appears no direction on coastal management has been identified by DBCA, with only CAP-funded monitoring occurring over the seven-year period, requested by the City for its entire coastline.
35.b Waikiki Beach, Rockingham
Significant coastal erosion hazard risk is evident not just at Waikiki, but for much of the coast within Warnbro Sound. CAP-funded nourishment has occurred at Waikiki, though covered more than just the hotspot extent. The City requested Mersey Point be added as a hotspot, but it may be more prudent to expand the Waikiki hotspot extent to cover all of Warnbro Sound from Mersey Point to near Safety Bay, which also required Coastwest-funded dune rehabilitation. Mersey Point has required emergency works and a staged granite seawall between 2021 and 2023 (Figure 45), funded federally by LRCI. The City independently undertook a coastal processes study in 2024 to better understand coastal hazard risks. Future beach nourishment, dune rehabilitation, and additional revetment construction are likely required.

Funding assistance:

City of Rockingham was awarded $1,035,251 over the seven-year period; the City applied for an additional $115,886 but was not successful. Awarded projects specific to hotspots are in Table 37.

Table 37: City of Rockingham state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	32. Rockingham T. Beach to Causeway	33. N Point Peron (W of Causeway)	34. Point Peron (N Shoalwater Bay)	35.b Waikiki Beach, Rockingham
CAP	•2019/20: Coastal monitoring •2020/21: Coastal survey – Cape Peron to Singleton	•2019/20: Coastal monitoring •2019/20: Point Peron spur groyne modification and upgrades [design] •2020/21: Coastal survey – Cape Peron to Singleton	•2019/20: Coastal monitoring •2020/21: Coastal survey – Cape Peron to Singleton	•2019/20: Coastal monitoring •2020/21: Coastal survey – Cape Peron to Singleton •2022/23: Sand nourishment of north-eastern beaches, Warnbro Sound
H-CAP				
CMPAP				
Coastwest				•2019/20: Rehabilitation and care of Kennedy Bay coastal sand dunes •2022/23: Rehabilitation of Safety Bay foreshore reserve •2024/25: Safety Bay foreshore restoration
One-off funding*		•2020/21 to 2021/22: WA Recovery Plan - Construction of the Point Peron Spur Groyne		

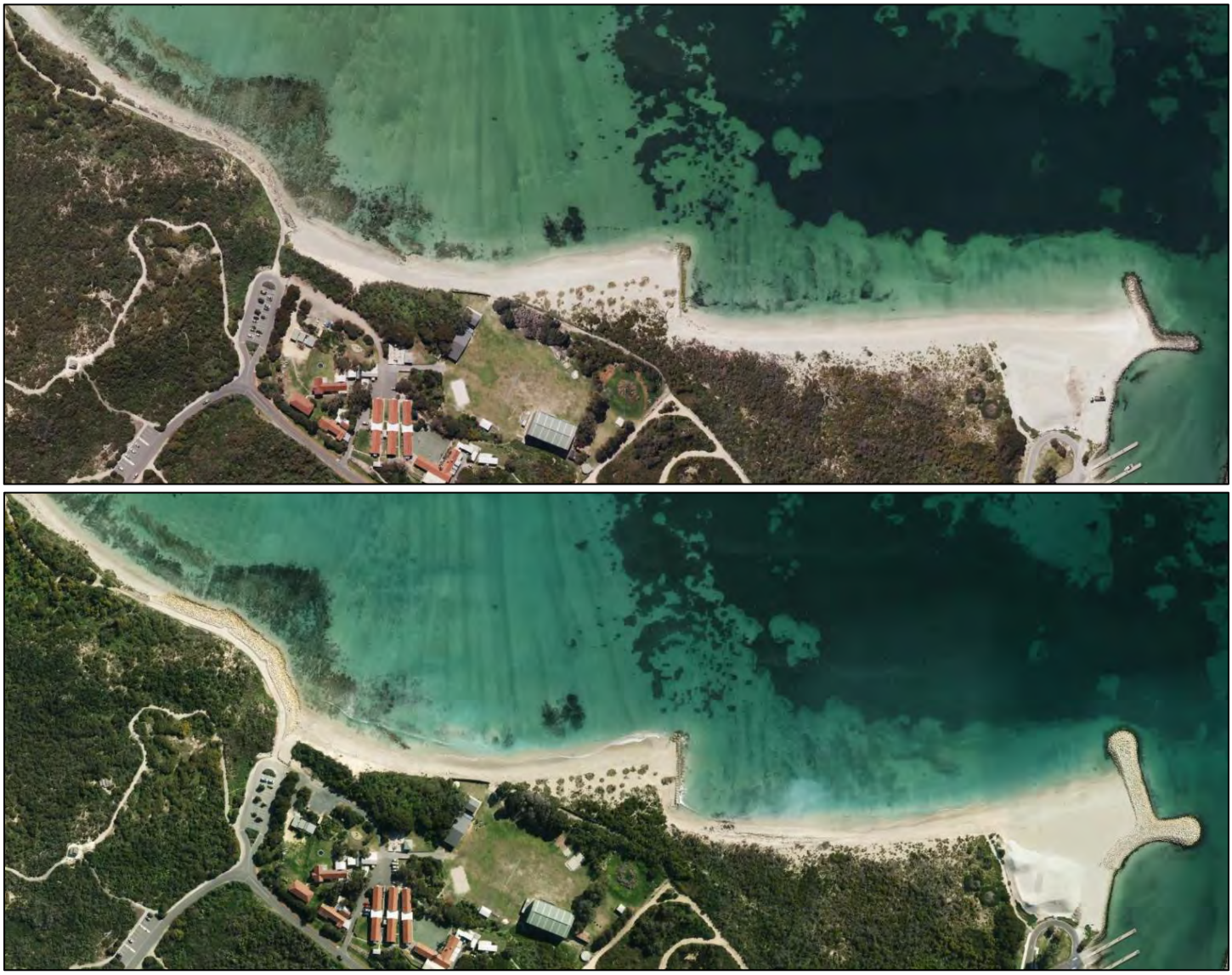

Figure 44: N Point Peron (W of Causeway) pre-construction in Sep 2021 (top) and post-construction in Aug 2022 (bottom). Flanking of the GSC groyne is evident in winter.

Figure 45: Mersey Point erosion and protection works between 2021 and 2023 (sourced from City of Rockingham survey).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is long-term funding for Mersey Point. While $2.9M in federal funding has assisted protection works, there will be continued need for extending these works, undertaking beach nourishment, and rehabilitating eroded dunes. DBCA tenure at Penguin Island has also complicated roles and responsibilities for coastal management at Mersey Point.
- City of Rockingham discussed their efforts to appoint an environmental engagement officer plus a strategic asset management team to better plan and manage their coastline.
- The City also discussed their planning priorities, including executing their CHRMAP recommendations, commencing a future fund for coastal adaptation and management, and preparation of a new local planning strategy. In relation to planning, the City noted that Point Peron (N Shoalwater Bay) is fully within DBCA tenure, not joint as reported by Seashore (2019). The City later noted they cannot justify spending rate payer budget on land vested outside of their tenure, and that DBCA will need to collaborate with Watercorp to address significant coastal hazard risks to upcoming waste water treatment plant upgrades.

Survey consultation:

- There is potential to use sand accreted around Bent Street Boat Ramp to nourish Waikiki Beach long-term and avoid installation of protection structures. However, community pushback has been noted in the past regarding this option. Nourishment from other sources like the Point Peron sand trap is anticipated to cost the City ~$150k/yr (NPV).
- City of Rockingham continues to use the N Point Peron hotspot as a 15,000m3/yr sand source for nourishment campaigns across its wider coastline at a cost of $200,000/yr, though this has been complicated by a need to resolve City and DBCA tenure concerns. Tenure will need to be resolved to address other issues at the hotspot, such as a need to spend ~$1M to replace the flanked GSC groyne. A ~$100k coastal processes study will also be needed to better understand best practise for managing the beach and sand trap.
- Other potential project costs discussed by the City include $2.5M for adaptation works at Mersey Point, $1.5M to replace Flinders Lane GSC revetment, $1.7M to replace Hymus Street revetment, and $2.5M (by DBCA) to plan, design, and implement suitable adaptation options at Shoalwater Bay.

Expected change in MI:

32. Rockingham T. Beach to Causeway	Recommendation: Remains hotspot with similar MI
Although relatively stable, this shoreline has required active nourishment to maintain, and large costs for replacement of old structures have been identified. This hotspot thus retains its same high priority from Seashore (2019).	
33. N Point Peron (W of Causeway)	**Recommendation: Remains hotspot with reduced MI**
Coastal adaptation implementation through the spur groyne construction and revetment refurbishment are balanced by needs for a new GSC revetment and resolution of tenure. Nonetheless, the substantially improved protection structures indicate overall MI has reduced here relative to Seashore (2019).	
34. Point Peron (N Shoalwater Bay)	**Recommendation: Remains hotspot with similar MI**
Management inaction and lacking reporting contrasts the long-term vulnerability of assets under threat from coastal erosion hazards at this hotspot. MI may be kept the same as Seashore (2019) in the face of such uncertainty.	
35.b Waikiki Beach, Rockingham	**Recommendation: Remains hotspot with similar MI**
This hotspot requires expansion to encompass the full range of coastal management challenges facing the coastlines in Warnbro Sound, from Mersey Point to Port Kennedy. Expanding this hotspot will bring its scale more in line with Rockingham's other hotspots like Rockingham Town Beach to Causeway. The hotspot may need to be renamed accordingly, but will demonstrate its same high MI relative to Seashore (2019).	

7.2.21. City of Mandurah

Physical changes, state funding assistance, and consultation are listed here for City of Mandurah. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

36.b Mandurah Northern Beaches
This hotspot encountered significant erosion pressure over the seven-year period, concentrated south of groyne three and north of groyne four (Figure 46). It appears the hotspot extent needs to be lengthened, from Town Beach revetment to Tides Café, with <10m dune buffer fronting Acheron Rd. San Remo and Silver Sands appear to be most impacted from the erosion trend, which was reported to recede at -1.3m/yr despite bypassing rates increasing by +4,000m3/yr on average, with a record 220,000m3 bypassed in 2021. CAP-funded design options from 2023/24 for Town Beach buried seawall have been developed, which may be actioned starting 2025/26.
37. Doddies Beach, Roberts Point
Foreshore asset exposure is evident when the beach erodes to ~10m wide in autumn for this dynamic hotspot, with emergency nourishment required in 2022 at the carpark. DoT undertook a CoastWA-funded geotechnical investigation in 2023, finding that rock up to +3mAHD may provide protection behind Janis St groyne, though most areas remain exposed with only low-lying rock. A 2023/24 CAP-funded options investigation recommended extension to Janis St groyne, a new low-crested GSC groyne, and a new GSC revetment at the car park with sand nourishment (Figure 47).
38. Falcon Bay to Rakoa St
The main physical change at this location was construction of a $700k staged sheet piled seawall in 2018 and 2019 fronting foreshore infrastructure (Figure 48). Other actions have included informal buried rock protection, beach scraping, and access management with dune rehabilitation, though the hotspot has otherwise remained generally stable. The 2023/24 CMPAP-funded Mandurah Southern Beaches CHRMAP will provide improved guidance for managing this hotspot long term. DoT undertook a geotechnical investigation on the eastern edge of the hotspot, funded by CoastWA in 2023. It appears substantial rocks exists at +1mAHD to +2mAHD for much of the hotspots east and further north, though one area of low-lying rock at ~0m AHD did exist behind the cuspate foreland.

Funding assistance:

City of Mandurah was awarded $266,000 over the seven-year period; the City applied for an additional $331,729 but was not successful. Awarded projects specific to hotspots are in Table 38.

Table 38: City of Mandurah state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	36.b Mandurah Northern Beaches	37. Doddies Beach, Roberts Point	38. Falcon Bay to Rakoa St
CAP	•2018/19: Mandurah AWACs and wave buoy data collection review and analysis 2013-2018 •2023/24: Design for upgrade of seashells seawall	•2018/19: Mandurah AWACs and wave buoy data collection review and analysis 2013-2018 •2023/24: Coastal protection options for Doddies Beach	•2018/19: Mandurah AWACs and wave buoy data collection review and analysis 2013-2018
H-CAP			
CMPAP	•2018/19: Mandurah Northern Beaches coastal hazard risk management and adaptation plan		•2023/24: Mandurah Southern Beaches coastal hazard risk management and adaptation plan
Coastwest			
One-off funding*			

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

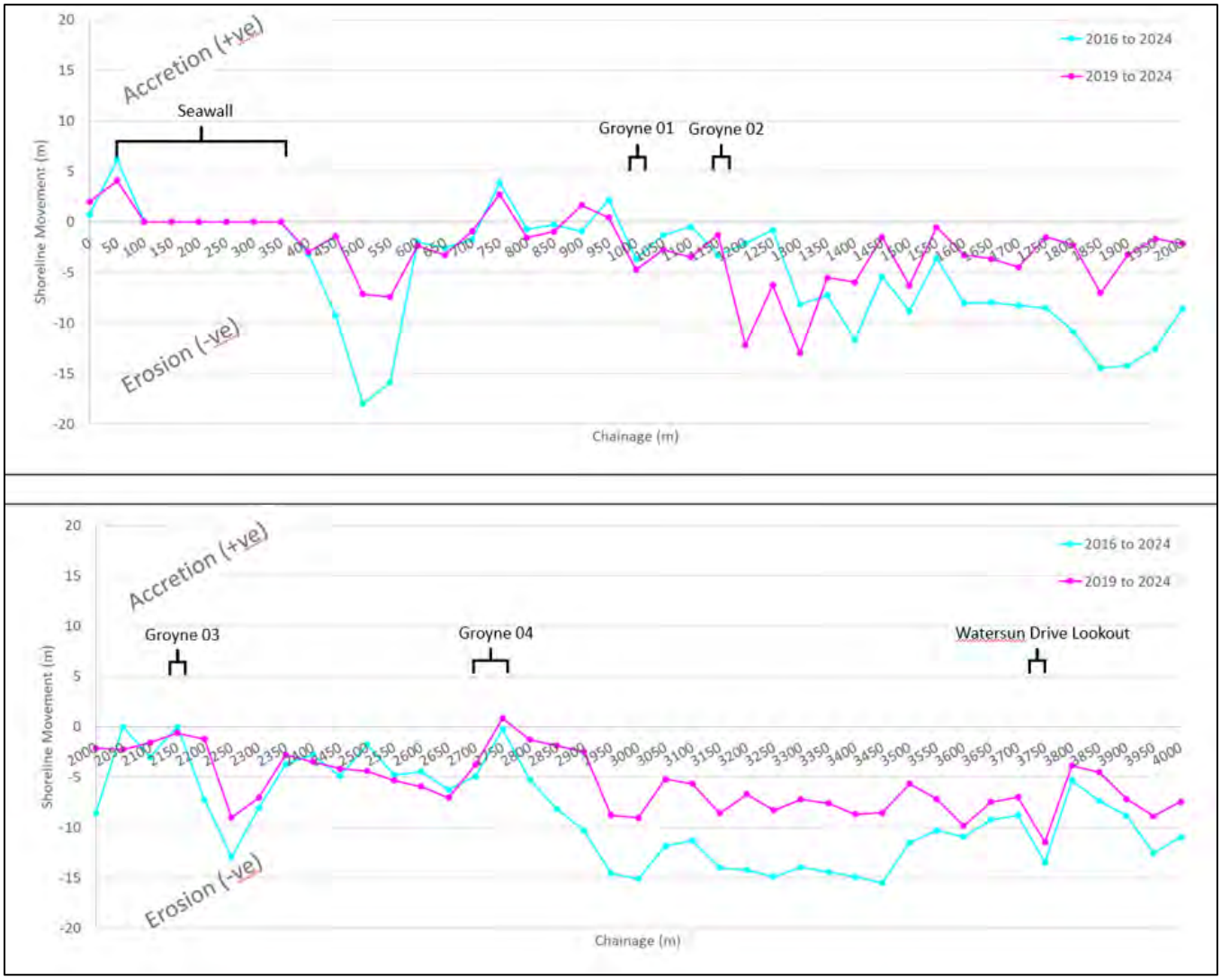

Figure 46: Shoreline change from 2016 to 2024 at Mandurah Northern Beaches hotspot, extending from the southern hotspot extent (top) to the northern hotspot extent (bottom) (sourced from Worley 2024f).

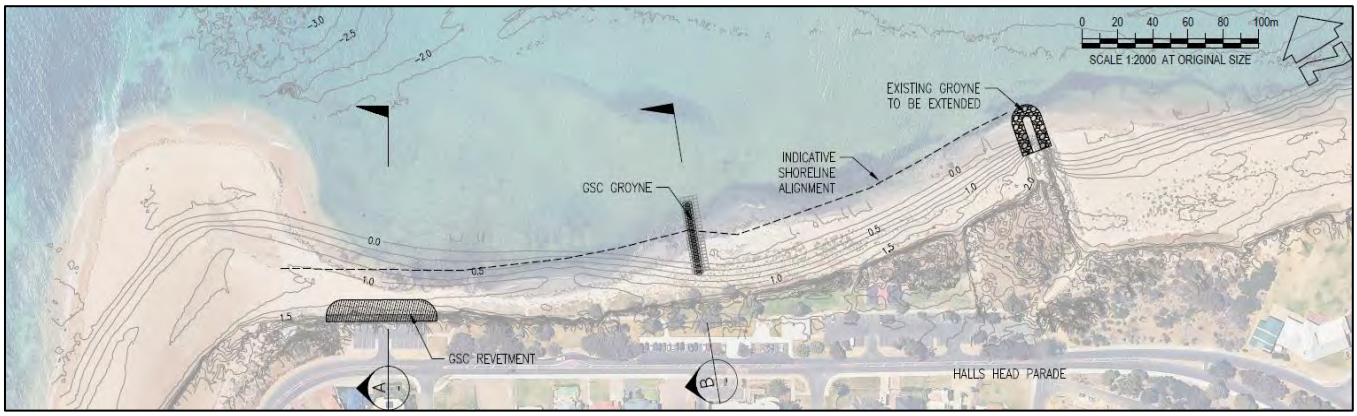

Figure 47: Recommended coastal protection options at Doddies Beach, Roberts Point hotspot (sourced from M P Rogers 2024b).

Figure 48: Construction of sheet piled seawall at Falcon Bay to Rakoa St hotspot, showing stage 1 in 2018 (top) and stage 2 in 2019 (bottom).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is funding the recommended options for its hotspots and other eroding locations, plus parts of the northern beaches not within the current hotspot extent.
- Permanent bypassing infrastructure was discussed; though it appears this will likely require significant state assistance to both fund and operate.
- The City reported on their various CHRMAPs and noted challenges with associated resourcing, staff, and budget requirements. Year 2 actions of the Northern Beaches CHRMAP are being progressed. The Southern Beaches CHRMAP is expected to be finalised mid-to-late 2025. An Estuarine CHRMAP for the Peel Harvey Estuary is planned for 2026 subject to CMPAP funding. The City also completed a smaller CHRMAP for the Western Foreshore Leisure Precinct. All CHRMAPs will require grant funding support to deliver priority projects and actions.

Survey consultation:

- Erosion issues were reported at Blue Bay, south of Doddies. While high value assets are not yet overly exposed, a steepening beach and shrinking dune buffer suggests this may soon become a hotspot, warranting watchspot status until a yet-to-be-defined trigger is reached.

- The City intends to apply for H-CAP funding to implement proposed options at Doddies and Town Beach revetment. City of Mandurah also wants to install permanent bypassing. Timing and council-approved funding for these options are yet to be confirmed.
- Permanent bypassing is expected to cost $9.3M in CapEx and ~$2M/yr OpEx. DRF was applied to fund this cost of bypassing, but the City was unsuccessful. Investigations and approvals are expected to take place between 2024 to 2026 and cost $1.25M. Other costs include upgrading Town Beach buried seawall ($1.1M) and Doddies recommended protection ($2.6M). City of Mandurah expects to spend $150k/yr on monitoring, maintenance, scraping, rehabilitation, and nourishment across its coastline.

Expected change in MI:

36.b Mandurah Northern Beaches	Recommendation: Remains hotspot with increased MI
This hotspot justifies expansion from Seashells up to San Remo (existing watchspot 23) as erosion continues to threaten valuable assets with minimal foreshore reserve, which necessitate significant investment by the City to address. MI has evidently increased relative to Seashore (2019).	
37. Doddies Beach, Roberts Point	**Recommendation: Remains hotspot with similar MI**
A dynamic coast at this hotspot creates difficulty in assessing whether MI should change here. While physical change is difficult to assess, the City and community does consider this a priority location for adaptation, to be reflected by future funding requests. Significant planned expenditure on protection options suggests keeping MI the same as Seashore (2019) until these are implemented.	
38. Falcon Bay to Rakoa St	**Recommendation: Remains hotspot with reduced MI**
Installation of the sheet piled seawall has significantly reduced exposure of foreshore assets to coastal erosion hazard for most of the hotspot extent. MI has therefore reduced relative to Seashore (2019), however continued erosion pressure at the unprotected coast near Rakoa St still requires hotspot status here.	

7.2.22. Shire of Harvey

Physical changes, state funding assistance, and consultation are listed here for Shire of Harvey. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

39. Binningup Seawall
No significant changes were observed at this hotspot. Outside of the seven-year period and not reported in Seashore (2019) was a CAP-funded geotechnical investigation for the hotspot and wider Binningup coast in 2016/17. Suitably resilient rock levels were too deep to provide protection to the hotspot. Rock further north was of mixed depth with some areas up to +3mAHD, while other sections were too low to reliably protect against coastal erosion hazards.

Funding assistance:

Shire of Harvey was awarded $88,126 over the seven-year period; the Shire applied for an additional $121,799 but was not successful. Awarded projects specific to hotspots are in Table 39.

Table 39: Shire of Harvey state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	39. Binningup Seawall
CAP	
H-CAP	
CMPAP	
Coastwest	•2020/21: Binningup Main Beach-building community capacity and protecting coastal values
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Shire of Harvey did not provide a response for the face-to-face meeting request.

Survey consultation:

- Binningup continues to require active management, though primarily through revegetation and rehabilitation of the dunes north and south, which do not have vulnerable assets immediately in their lee. Beach fencing and signage have been retreated to allow room for coastal processes. Other concerns reported relate to impacts from unauthorised 4wd access.
- The Shire notes its open coast CHRMAP recommends retreat for Binningup Seawall, with planning around this estimated to cost ~$100k. Retreat costs of assets remain unclear, though will eventually require removal of coastal vegetation to accommodate carparks, toilets, the surf club, water sports club, a playground, and beach access points.
- Myalup was discussed as a location of concern from Shire of Harvey which was also documented in DoT (2022). A reducing dune buffer fronting the small carpark suggests this asset and the beach access ramp will be susceptible to coastal erosion damage in the future. No other assets appear at risk from coastal hazards yet, though a toilet block will be at risk if the beach access is lost. This location appears suitable to allocate as a watchspot.

Expected change in MI:

39. Binningup Seawall	Recommendation: Remains hotspot with reduced MI
A lack of significant reported damage or funding sought for this hotspot suggest a slightly reduced MI relative to Seashore (2019).	

7.2.23. City of Bunbury

Physical changes, state funding assistance, and consultation are listed here for City of Bunbury. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

40. The Cut, Bunbury
No significant changes were observed at this hotspot.
41. Koombana Beach
The hotspot has remained generally stable, assisted through progressive coastal protection works and beach scraping over the seven-year period. Reported as in the proposal stage only by Seashore (2019): a major milestone was the stage 1 reopening of Dolphin Discovery Centre, reopening in 2019 alongside dune rehabilitation, a vertical retaining wall, and buried rock revetment with a reported 50-yr design life (Figure 49). A 2024/25 CAP funded audit of Bunbury's coastal structures may provide further information on its other design parameters. The other key action comprises a $3.7M 2024/25 DRF grant to the City and DoT for upgrading Bunbury Storm Surge Barrier; part of its scope included repairing Koombana Bay's western groyne, which also forms part of the Transforming Bunbury Waterfront Stage 3 works by DoT (Figure 50).

Funding assistance:

City of Bunbury was awarded $50,000 over the seven-year period; the City applied for an additional $407,500 but was not successful. Awarded projects specific to hotspots are in Table 40.

Table 40: City of Bunbury state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	40. The Cut, Bunbury	41. Koombana Beach
CAP	•2024/25: Coastal Protection structure audit	•2024/25: Coastal Protection structure audit
H-CAP		
CMPAP		
Coastwest		
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is the ongoing management requirement of Back Beach in winter, mostly relating to community perceptions rather than risks from coastal erosion hazards with a stable shoreline evident long-term. This justifies its previous designation as a watchspot in Seashore (2019).
- The City has not yet progressed towards preferred long-term protection options from their CHRMAP, which was originally funded by CMPAP as a multi-LGA CHRMAP from Capel to Leschenault. The City is instead focussed on understanding issues from the onset through its more direct short-term coastal action plan.
- Longer term hotspot actions may include: resolving tenure and protection upgrades at The Cut, an options investigation for coastal protection solutions along Ocean Drive, and retreat of the Café and SLSC at Ocean Drive (though planning for this is not considered a priority by the City). Koombana Bay long-term options appear to not be considered a priority.

Survey consultation:

- The City does not currently undertake sand nourishment for any of its coastline and instead applies beach scraping and *ad hoc* repairs to infrastructure as needed, alongside monitoring with PNP. Current monitoring costs were estimated at $20k/yr.
- City of Bunbury uses a short-term coastal action plan to identify and estimate costs for its priority projects. Future (i.e. not yet underway or completed) actions include: sand and rock source feasibility studies ($124k), emergency evacuation planning ($55k), foreshore management plans ($145k), a coastal management register (no external cost), a foreshore asset audit ($70k), review of the short-term coastal action plan ($25k), staff training (<$5k), and various monitoring through photos, bathymetric data, topographic data, and metocean data ($320k total monitoring cost). The City currently allocates ~$400k/yr for coastal management.
- The City reports that it does not consider erosion impacts at its existing hotspots to be significant. Erosion at Ocean Drive i.e. Back Beach is currently their priority for coastal management. Geotechnical investigations in 2024/25 by CoastWA will improve understanding around this coastline's true exposure to coastal erosion hazards. The 2024/25 CAP-funded protection structure audit also assists this need

Figure 49: Koombana Beach foreshore construction works for at Dolphin Discovery Centre during construction in Nov 2017 (top) and post-construction in Nov 2019 (bottom).

Figure 50: Notional plan of Koombana Bay western groyne upgrade and refurbishment by DoT and the City as part of Transforming Bunbury Waterfront Stage 3, co-funded by DRF in 2024/25. Note design of the groyne head is still under revision at the time of this review, to avoid impacting the adjacent jetty (sourced from Advisian 2024).

Expected change in MI:

40. The Cut, Bunbury	Recommendation: Relegate to watchspot/remove entirely
Tenure and long-term management requirements notwithstanding, erosion threats to The Cut present more of a waterway navigation issue than a coastal vulnerability issue. Conventional hotspots entail risks to the coast from the ocean, whereas the opposite is true for The Cut. This location may be removed from the hotspot list given it does not meet the definition of a hotspot.	
41. Koombana Beach	**Recommendation: Relegate to watchspot**
Significant investment into long-term protection solutions here have significantly reduced risks to assets and values rom coastal hazards. Accordingly, Koombana Beach does not meet the definition of a hotspot anymore. This location can be reassigned to watchspot status until a significant change occurs here to justify reclassification.	

7.2.24. City of Busselton

Physical changes, state funding assistance, and consultation are listed here for City of Busselton. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

42. Wonnerup Beach (East)
Four GSC groynes were constructed independently by the City at this hotspot: two in 2017 (not reported in Seashore 2019) and two in 2020 (Figure 51). The beach subsequently accreted near previously vulnerable assets, namely six properties and sections of narrow foreshore fronting Layman Road, though erosion was later reported in 2024. Merging this hotspot with Wonnerup Beaches may be better for holistic management, given similar protection methods applied at both hotspots.
43.b Wonnerup Beaches
The managed beach has remained stable here for much of the seven-year period. Its groyne field requires maintenance, with most structures in poor condition. Wonnerup nourishment is managed by DoT using bypass sand as well as sand carted rom Bunbury Outer Harbour. Concerns have been raised over the perceived poor aesthetics of nourishment sand by local community members.
44.b King St
This hotspot has become a priority location for City of Busselton, not only the original hotspot extent but immediately east along Geographe Bay Road. Foreshore reserve is narrower here (~10m) than most of Busselton's already thin coastline. Loss of mature vegetation and infrastructure damage have been reported (Figure 52). Required actions included sand nourishment, repairing damage seawalls at GBYC and King St, monitoring, and design and implementation of long-term stabilisation works. The City was awarded CERMP funding for this stabilisation, though it is unclear what residual erosion risk remains.
45.b Craig St, Busselton
This location has been generally stable over the seven-year period. 2018/19 CAP funding assisted refurbishment of Craig Street groyne and the adjoining seawall, completed in 2021 (Figure 53). These works have reduced overall erosion exposure.
46.b Abbey, Busselton
Most of this hotspot has been stable with support by monitoring and CAP-funded nourishment. However, one of the timber groynes failed, requiring replacement with a GSC groyne by the City in spring 2024. Beyond the western hotspot extent, foreshore reserve along Geographe Bay Road is close to 10m at its narrowest and subject to elevated erosion risk. Furthermore, another timber groyne here has been undercut, with beach levels now below timber panelling which will require intervention. It thus appears this hotspot should be enlarged westward to Forth St so that Abbey's most vulnerable coastline is captured accordingly.
47. Locke Estate
No significant changes were observed at this hotspot. The coastline has been stable, supported by nourishment activities, some funded by CAP. The eastern hotspot extent near Buayanyup River outlet continues to remain vulnerable to erosion hazards.
47.5 Vincent St Foreshore, Dunsborough
Another priority location for the City, Vincent St foreshore has been reported to recede by 40m3/m in recent years at the foreshore fronting Glifford Road's medium density housing. (Figure 54). Increasing amounts of sand nourishment have been required since 2020, partly funded by CAP. A shift from soft protection to hard protection is required due to the depleted foreshore reserve, in addition to urgent repairs needed at the dilapidated ironstone revetment further west along Vincent Street. Meanwhile, civil works were completed at the dual use path in 2024. CERMP funding was secured to assist foreshore stabilisation works, though it is still unclear what residual risk remains. Construction delays at the time of writing also cast doubt whether all CERMP funds may be spent.

Figure 51: Wonnderup East hotspot pre-construction in 2016 (top) and post-construction in 2021 (bottom).

Figure 52: King St hotspot and the coastline extending east, showing loss of foreshore reserve and mature vegetation along Geographe Bay Road between November 2017 (top) and October 2023 (bottom).

Figure 53: Craig St, Busselton hotspot pre-construction in 2020 (top) and post-construction in 2021 (bottom).

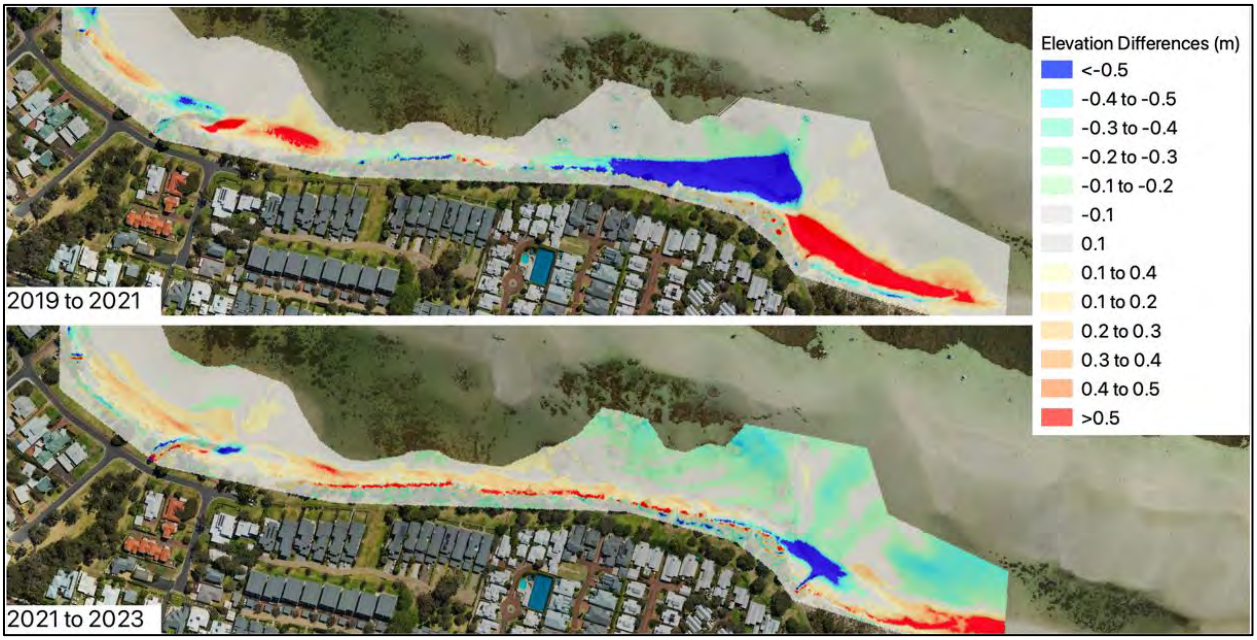

Figure 54: Elevation changes at Vincent St, Dunsborough showing 2019 to 2021 (top) and 2021 to 2023 (bottom); erosion is evident east of Vincent St at the cuspate landform (sourced from City of Busselton survey).

Funding assistance:

City of Busselton was awarded $761,682 over the seven-year period; the City applied for an additional $2,526,920 but was not successful. Awarded projects specific to hotspots are in Table 41.

Table 41: City of Busselton state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	42. Wonnerup Beach (East)	43.b Wonnerup Beaches	44.b King St	45.b Craig St, Busselton
CAP	•2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring	•2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring	•2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring	•2018/19: Maintenance of Craig Street groyne and seawall •2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring
H-CAP				
CMPAP				
Coastwest				
One-off funding*				

	46.b Abbey, Busselton	47. Locke Estate	47.5 Vincent St Foreshore, Dunsborough
CAP	•2018/19: Broadwater Beach coastal adaptation •2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring	•2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring	•2018/19 and 2021/22: Sand nourishment •2018/19 to 2019/20 and 2021/22 to 2022/23: Coastal monitoring •2022/23: Geographe Bay wave and water level monitoring
H-CAP			
CMPAP			
Coastwest			
One-off funding*			

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is executing the City's intent for hard protection along much of its 80km coast. ~$7M has been allocated to coastal management over four budget years. Funding sources have included CERMP and PACP, combined with the City's own Coastal and Climate Adaptation Reserve (CCAR). While federal grants and the CCAR can address priority areas, a significant funding gap exists to cover all required locations.
- City of Busselton flagged a potential need to disconnect its five agricultural drains to mitigate associated coastal hazard vulnerabilities. This needs to be balanced with the needs of RAMSAR wetlands to protect ecological values while maintaining climate resilience. Secondary issues are arising from the impact of coastal hazards on Busselton's environment, such as saltwater intrusion impacting mature Peppermint Trees in dune areas.
- Other ongoing or planned projects include a BDA for Marybrook (which entails a suitable watchspot location), modelling to support major stabilisation works, a new planning scheme to resolve FFL issues for developers, and emergency evacuation planning for significant events e.g. an event analogous to T.C. *Alby*. The City has acknowledged its broadly accepting community towards actioning its CHRMAP.

Survey consultation:

- It appears the original extents of Busselton's hotspots were too small and do not encompass the full erosion threat along its coastline. The City has been reporting on locations as hotspots despite those locations not residing within an existing hotspot extent. Some decisions, such as the Wonnerup split, were made due to mixed management responsibilities between DoT and City of Busselton. However, increasing hotspot scales to capture all problems and enable holistic

management may comprise a preferred pathway forward. This has been the approach at Rockingham as an example.

- City of Busselton flagged its lack of success in receiving CoastWA grants despite the scale of erosion problems it needs to address. For example, it was unsuccessful in receiving a $1M H-CAP grant in 2022/23 for West Busselton coastal stabilisation (groynes and beach scraping/nourishment). This may highlight a wider issue of CoastWA grants not tracking inflation, particularly entailing the significant cost increases evident in engineering works.
- While Vincent St Foreshore Dunsborough and King St are listed as the City's current priority locations for management, it remains unclear what future coastal management requirements exist here. CERMP funding has been allocated to fund stabilisation works at both locations, though the City did not clarify whether future works will be required beyond this.

Expected change in MI:

42. Wonnerup Beach (East)	**Recommendation: Remove entirely**
This small hotspot should be merged with the Wonnerup Beaches hotspot to avoid an overly granular approach, regardless of discrete state/LGA management responsibilities. Holistic management of Wonnerup's coastline may lead to better outcomes for the purposes of reporting, grant applications, and CoastWA actions.	
43.b Wonnerup Beaches	**Recommendation: Remains hotspot with similar MI**
While nourishment activities by DoT have maintained the shoreline with little overall change reported, the need to maintain the groyne field remains. Overall, a similar MI to Seashore (2019) is evident.	
44.b King St	**Recommendation: Remains hotspot with similar MI**
This location requires an enlarged size to the east that encompasses the narrow foreshore fronting Geographe Bay Road. The hotspot may need to be renamed accordingly. Despite an extension to this priority area, stabilisation works funded by CERMP help to address critical threats and reduce erosion risk. Regardless, the ongoing need for active management indicates a similar MI here relative to Seashore (2019).	
45.b Craig St, Busselton	**Recommendation: Relegate to watchspot**
Refurbishment of Craig Street groyne and the seawall have resulted in reduced erosion risk and MI relative to Seashore (2019). This hotspot can be reassigned to watchspot status until a significant change occurs here to justify reclassification.	
46.b Abbey, Busselton	**Recommendation: Remains hotspot with similar MI**
While the current hotspot extent has been stable with a low management requirement evident, extending this hotspot west to Forth Street would lead to an overall MI being similar to Seashore (2019).	
47. Locke Estate	**Recommendation: Remains hotspot with similar MI**
Relative stability at this hotspot is offset by ongoing vulnerability of the eastern flank near the Buayanyup River drain. MI thus appears similar to Seashore (2019).	
47.5 Vincent St Foreshore, Dunsborough	**Recommendation: New hotspot**
This is a new location so cannot be compared to Seashore (2019).	

7.2.25. Shire of Augusta Margaret River

Physical changes, state funding assistance, and consultation are listed here for Shire of Augusta Margaret River. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

48. Gnarabup S
Changes observed at Gnarabup S entail accretion around the hotspot extent, but erosion further north (Figure 55). The accretion trend has been supported by occasional CAP-funded sand nourishment works over the seven-year period, though volumes nourished were too low to fully account for accretion volumes. Despite the accretion trend, proactive planning is underway to potentially relocate White Elephant Café if erosion hazards become intolerable over the next 20 years. Erosion to the north might have provided justification for widening the hotspot extent to eroding areas, however only sparse foreshore assets exist at these eroding sections via sandy access tracks and pathways. Recommended adaptation in the near-term includes retreat through a realigned sand track and new beach access, plus sand nourishment at the existing hotspot as needed (Figure 56).

Funding assistance:

Shire of Augusta Margaret River was awarded $215,591 over the seven-year period; the Shire applied for an additional $232,073 but was not successful. Awarded projects specific to hotspots are in Table 42.

Table 42: Shire of Augusta Margaret River state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	48. Gnarabup S
CAP	•2021/22 to 2022/23: Gnarabup Beach sand nourishment
H-CAP	
CMPAP	•2022/23: Review of Augusta Margaret River coastal hazard risk management and adaptation plan
Coastwest	•2020/21: Strategic protection of the iconic Prevelly/Gnarabup coast •2022/23: Implementation of the Prevelly Gnarabup foreshore management plan
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

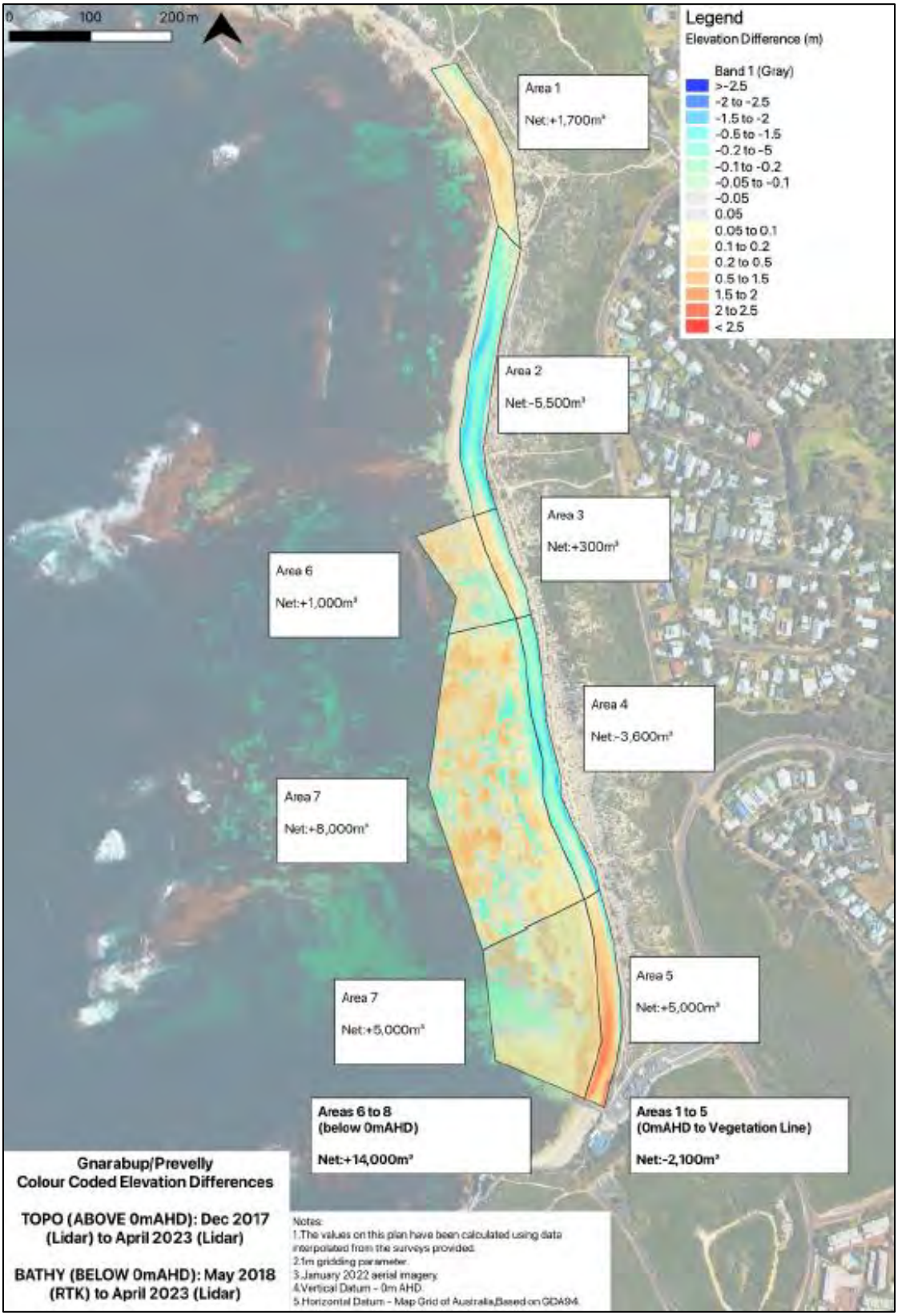

Figure 55: Beach volume change at Gnarabup S and surrounds; the hotspot has observed accretion while beaches further north have eroded (sourced from Shore Coastal 2024).

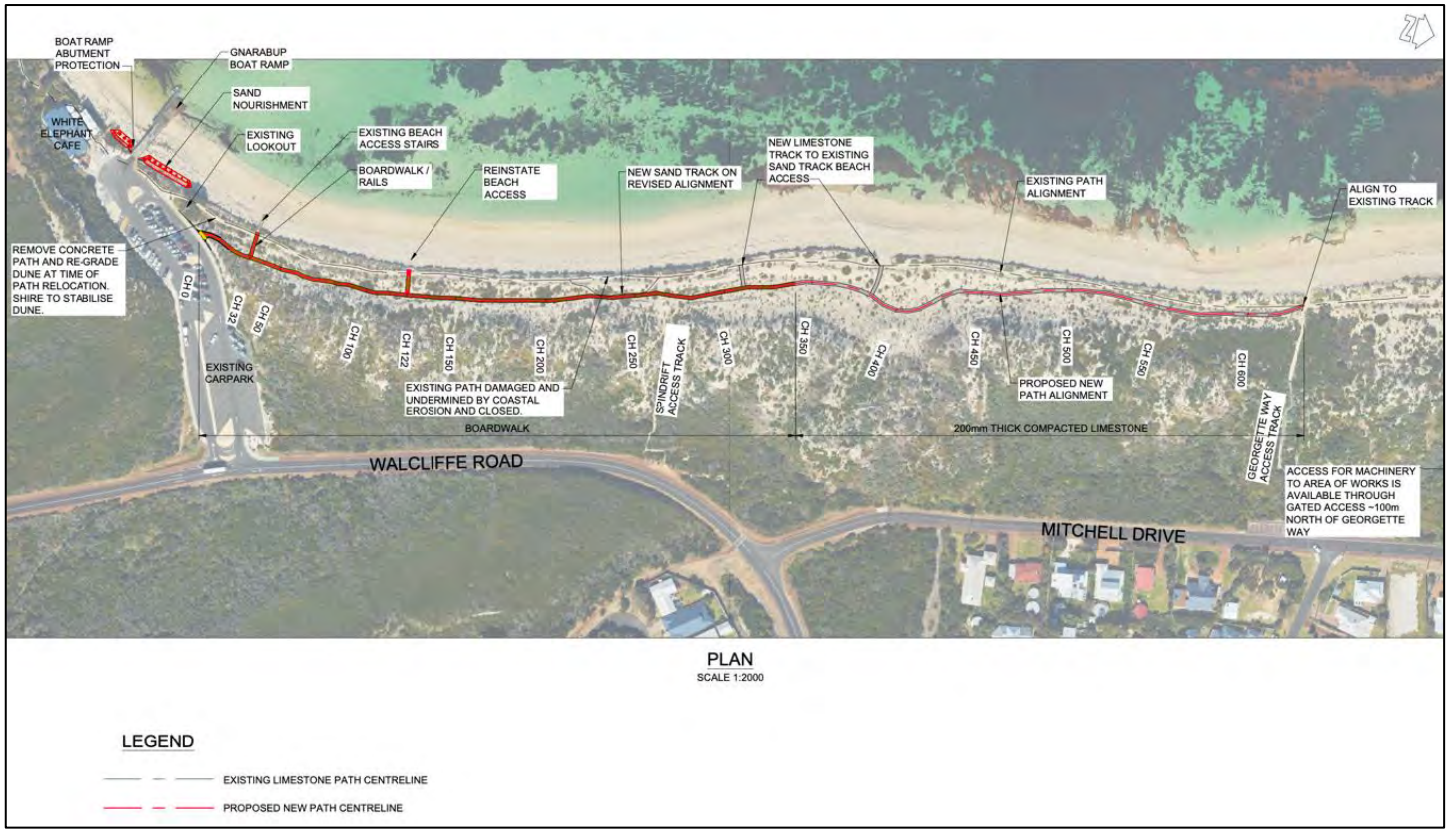

Figure 56: Proposed coastal adaptation at and north of the Gnarabup S hotspot (sourced from Shore Coastal 2024).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is Blackwood River seawall, this was not designed to withstand coastal hazards and will require a redesign and upgrade. This location comprises a suitable watchspot location to monitor and potentially reclassify to a hotspot, if the seawall is not upgraded when required and erosion issues persist.
- The Shire noted that Gnarabup did not necessitate significant management attention since replacement of access stairs, a geophysical study completed in 2022, and occasional nourishment that can now become reactive rather than routine.
- Shire of Augusta-Margaret River also discussed the need to redesign and replace access stairs at South Point, Gracetown, which have come under threat from coastal hazards.

Survey consultation:

- Further detail was provided on Blackwood River entrance: the entrance appears to be shifting east since the river was recut in 2012. Due to this shift the western foreshore is accreting with a widening beach and increased buffer to Albany Terrace. It remains unclear if this trend will continue due to the dynamic nature of reiver entrance geomorphodynamics.
- Leeuwin road revetment construction, funded by CAP, was discussed regarding long-term requirements for this previously eroding coastline. The Shire is unsure whether other long-term options beyond this revetment will be required, and flagged ongoing monitoring and review at this section of coastline.
- The Shire estimates up to $25k/yr has been spent managing Gnarabup S, which may increase if nourishment is expanded to the coastline north of the hotspot.

Expected change in MI:

48. Gnarabup S	Recommendation: Remains hotspot with reduced MI
A large foreshore reserve north of Gnarabup S and the accretion trend reported at the hotspot itself indicates a reduced MI relative to Seashore (2019).	

7.2.26. Shire of Manjimup

Physical changes, state funding assistance, and consultation are listed here for Shire of Manjimup. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

49. Windy Harbour
No significant changes were observed at this hotspot. A CoastWA-funded geotechnical investigation was undertaken at this hotspot, though suitably resilient rock levels were too low to protect against erosion hazards.

Funding assistance:

Shire of Manjimup was awarded $50,000 over the seven-year period; the Shire applied for an additional $60,000 but was not successful. Awarded projects specific to hotspots are in Table 43.

Table 43: Shire of Manjimup state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	49. Windy Harbour
CAP	
H-CAP	
CMPAP	•2021/22: Windy Harbour coastal hazard risk management and adaptation plan
Coastwest	
One-off funding*	•2024/25: State NRM Program - Empowering Community in Managing Threatened Species Habitats [FUNDING UNKNOWN]

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is securing funding for the purposes of coastal management. Grant timing presents challenges in relation to Shire budgeting/cycles.
- Medium term outcomes expected from review of the Windy Harbour Management Plan include development and upgrades of the camping area, which will require engineering design and Aboriginal Heritage assessments before works can commence.
- For the wider area, Shire of Manjimup received State NRM Program funding (amount unclear) over three years for restoration of 11ha and revegetation of 1ha, which encompassed the coastal vegetation of Windy Harbour.

Survey consultation:

- No impacts were specified to Windy Harbour assets beyond minor damage to the boat ramp. No immediate works were anticipated by the Shire beyond completion of its CMPAP-funded CHRMAP in late 2024.
- Two other locations of potential concern include Walpole Foreshore and Camfield, Broke Inlet. Only Walpole Foreshore appears to entail significant threats to assets though, given Broke Inlet's issues mostly pertain to illegal shacks. Potential threats to pathways and public facilities indicate Walpole Foreshore is thus suitable to designate as a watchspot.
- Ongoing photo monitoring in the area of Windy Harbour boat ramp, launching areas, and other assets has been identified by the Shire, costed internally. External costs were estimated to entail up to $650k at Walpole Foreshore for planning, investigation, design, and adaptation of assets; $200k was an estimated requirement for management plan review at Camfield, Broke Inlet.

Expected change in MI:

49. Windy Harbour	Recommendation: Relegate to watchspot
Lacking recent or long-term erosion concerns reported by the Shire indicates this hotspot can be reassigned to watchspot status until a significant change occurs here to justify reclassification.	

7.2.27. Shire of Denmark

Physical changes, state funding assistance, and consultation are listed here for Shire of Denmark. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

50. Peaceful Bay
No significant changes were observed at this hotspot. Planning and implementation for relocation of the Fisherman's leases and the RSL Memorial in 10 years is stated in the Shire's 2018 CHRMAP, though lacking coastal change or apparent erosion indicates the urgency for this relocation may be lower than initially anticipated. A CoastWA-funded geotechnical investigation was undertaken at this hotspot in 2023, though suitably resilient rock levels were too low to protect against erosion hazards.
51. Denmark, Ocean Beach
Significant coastal management action has been undertaken at this hotspot over the seven-year period, all funded by CoastWA. Major storm damage in 2021 necessitated structural intervention. Geotechnical investigations informed design (all CAP-funded) and construction of a new H-CAP funded sheet pile seawall with rebuilt rubble mound revetments in 2023/24 at both the wall and beach access. Protection works were situated further back from coastal hazards to allow a usable beach and included relocation of the old boat shed and ablutions (Figure 57). These works allowed for foreshore redevelopment through a rejuvenated SLSC and new amenities for open space in the structure's lee. Successful management here has mitigated much of the coastal hazard risk, with only *ad hoc* nourishment and revegetation flagged as potential future requirements.

Funding assistance:

Shire of Denmark was awarded $1,294,775 over the seven-year period; the Shire applied for an additional $275,172 but was not successful. Awarded projects specific to hotspots are in Table 44.

Table 44: Shire of Denmark state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	50. Peaceful Bay	51. Denmark, Ocean Beach
CAP	•2018/19: Ocean Beach and Peaceful Bay Coastal Monitoring, Investigation and Adaptation	•2018/19: Ocean Beach and Peaceful Bay Coastal Monitoring, Investigation and Adaptation •2021/22: Ocean Beach retaining wall maintenance and refurbishment
H-CAP		•2023/24: Ocean Beach Coastal Adaptation
CMPAP	•2022/23: Review of Shire of Denmark coastal reserves management plan	•2022/23: Review of Shire of Denmark coastal reserves management plan
Coastwest	•2018/19: Protecting and connecting coastal bushland values with community	•2018/19: Protecting and connecting coastal bushland values with community
One-off funding*		

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

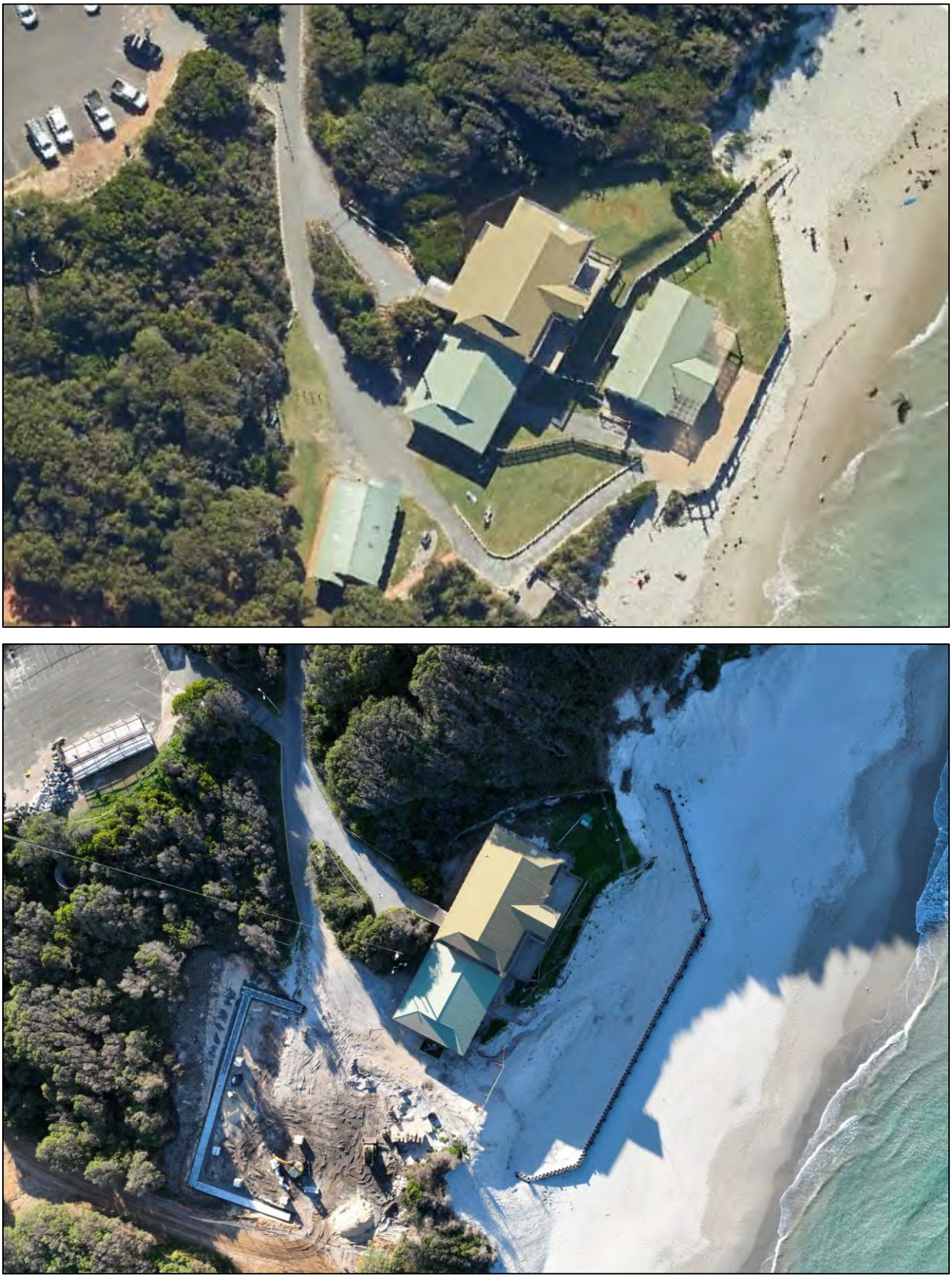

Figure 57: Ocean Beach, Denmark hotspot pre-construction in 2020 (top) and during construction in 2024 (bottom).

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is sourcing funding co-contributions for CoastWA grants, as the 50% grant requirement is perceived as unfair to smaller coastal managers.
- The Shire expressed a desire to better monitor the coastline, particularly through drone and Lidar monitoring. DoT's drone monitoring program has assisted this purpose, though is not Shire-driven. Denmark may benefit from its own CMAP to establish an ongoing monitoring program.
- Prawn Rock Channel was flagged by the Shire as high currents lead to foreshore erosion when Wilson Inlet opens to the ocean. Shire of Denmark anticipate that foreshore infrastructure will require upgrade and replacement accordingly, including ablutions, public open space, replacing the bridge and rock protection structures, plus a potential need to retreat/realign Ocean Beach Road. This location thus justifies watchspot designation.

Survey consultation:

- Shire of Denmark did not provide a survey response.

Expected change in MI:

50. Peaceful Bay	**Recommendation: Relegate to watchspot**
The lack of recent or near-term erosion concerns reported by the Shire indicates this hotspot can be reassigned to watchspot status until a significant change occurs here to justify reclassification.	
51. Denmark, Ocean Beach	**Recommendation: Remains hotspot with reduced MI**
Significant investment in protection works has reduced erosion vulnerability and MI has subsequently decreased at this hotspot relative to Seashore (2019).	

7.2.28. City of Albany

Physical changes, state funding assistance, and consultation are listed here for City of Albany. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

52. Emu Pt, Albany
Erosion issues at this hotspot have worsened over the seven-year period. Historic protections works have failed to address the issue west of the ironstone revetment. The structure has been flanked to both the west and east (Figure 58 and Figure 59), receding by 10m to 30m since 2016. A GSC revetment on the western flank failed and was removed in 2024. Two small GSC groynes to the west have not addressed the erosion issue, and are already flanked, approaching structural failure. The ironstone revetment itself shows evidence of overtopping damage along most of the structure. City of Albany chose to undertake CAP-funded nourishment and monitoring in 2024/25 as a short-term measure ahead of long-term planning. Replacement of the GSC groynes with optimised groyne fields was designed in a project funded by a 2021/22 H-CAP grant (Figure 60), however community concerns about aesthetics and preference for soft protection has delayed pursuing this option further. No clear long-term option has been proposed to address the flanked eastern side of the revetment.

Figure 58: Emu Pt, Albany Hotspot in 2016 (left) and 2021 (right) on the flanked western section of revetment. The 3m tall erosion scarp has receded >10m and failed GSC protection was later removed. Both flanked GSC groynes are also visible.

Figure 59: Emu Pt, Albany Hotspot in 2016 (left) and 2024 (right) on the flanked eastern section of revetment. 30m of shoreline recession and destroyed beach access is evident.

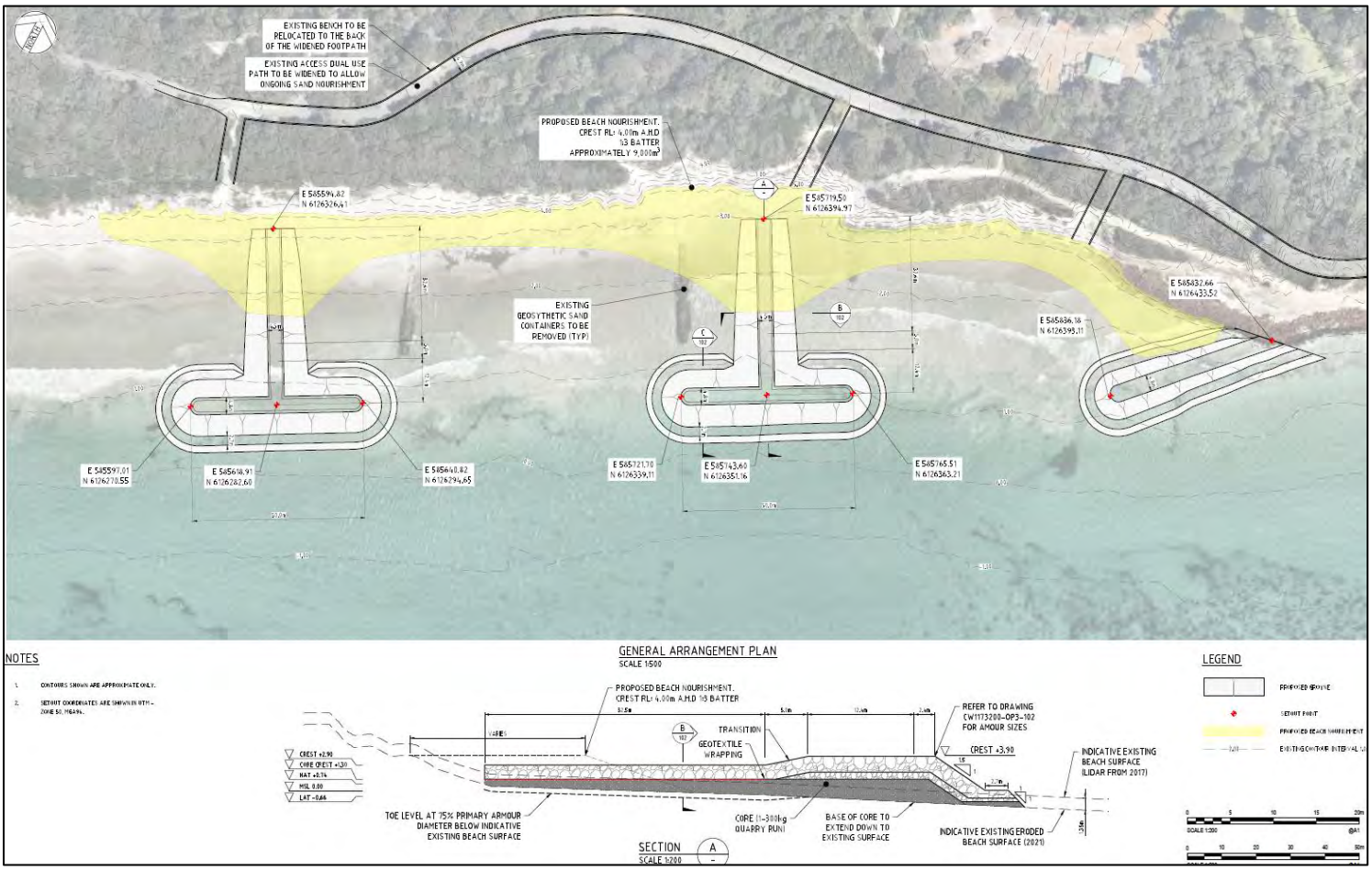

Figure 60: Emu Pt, Albany proposed groyne field west of the existing revetment (sourced from Cardno 2022).

Funding assistance:

City of Albany was awarded $634,978 over the seven-year period; the City applied for an additional $1,976,881 but was not successful. Awarded projects specific to hotspots are in Table 45.

Table 45: City of Albany state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	52. Emu Pt, Albany
CAP	•2018/19 to 2021/22: Emu Point to Middleton Beach coastal adaptation and protection strategy •2024/25: Emu Beach coastal management and adaptation
H-CAP	•2021/22: Emu Point groyne field design optimisation
CMPAP	•2019/20: Emu Beach foreshore management plan
Coastwest	•2018/19, 2020/21, and 2022/23 to 2024/25: Albany Senior High School marine science project
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is the demand on resources for LGA coastal management requirements. City of Albany reports this is challenging to keep up and prioritise. The CHRMAP process attracts significant attention, generating a drain on resources to both create and execute.

- The City were happy with the outcomes at Ellen Cove with community supporting the federally funded surf reef there, though have noted other locations with erosion problems evident now are harder to manage.
- City of Albany intends to better distil information and reengage the community for the Emu Pt hotspot. The caravan park lease boundary was successfully negotiated, and no more studies are anticipated to be necessary. Works and monitoring are the required actions to begin addressing issues at this hotspot. Additional review has also revealed that the foreshore beyond the channel and facing Oyster Harbour entails erosion concerns as well, justifying watchspot designation here.

Survey consultation:

- A DRF grant was submitted to assist CAP-funded nourishment and monitoring in 2024/25. This DRF application was not successful, so the City has had to reduce some scope items and/or undertake more project components internally.
- Further funding is needed to design and construct revetment termination at Emu Pt hotspot (the City did not specify which end, potentially eastern given the western revetment termination has already been designed). The City's operational fund is ~$80k/yr to undertake beach nourishment, monitoring, and maintenance at this hotspot.
- Three other locations of erosion concern were discussed by City of Albany, all in Princess Royal Harbour: Frenchman Bay Rd (undermined path and road), Rushy Point – Little Gove (erosion affecting the boundaries of private property, already known as watchspot W30), and Harbour Esplanade – Little Grove (undermined road). While erosion problems are evident, the City reported low priority/concern at each location. Further review is needed to discern whether these should become a potential watchspot in future years if not already designated accordingly.

Expected change in MI:

52. Emu Pt, Albany	Recommendation: Remains hotspot with increased MI
Increased erosion has been reported both west and east of Emu Pt's revetment, and an urgent requirement remains for managing dilapidated protection structures at the time of this review. MI has thus increased here relative to Seashore (2019).	

7.2.29. Shire of Jerramungup

Physical changes, state funding assistance, and consultation are listed here for Shire of Jerramungup. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

53. Bremer Bay Fishery Beach
No significant changes were observed at this hotspot.

Funding assistance:

Shire of Jerramungup was awarded $98,856 over the seven-year period; the Shire applied for an additional $57,956 but was not successful. Awarded projects specific to hotspots are in Table 46.

Table 46: Shire of Jerramungup state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	53. Bremer Bay Fishery Beach
CAP	
H-CAP	
CMPAP	
Coastwest	•2018/19: Bremer Bay community foreshore and estuary protection project
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority over the long term is not Fishery Beach, but Bremer Bay foreshore along Wellstead Estuary. When the estuary is open, coastal processes can influence the foreshore and cause erosion issues.
- The Shire noted minor erosion to Fishery Beach at the base of dunes, though it remains contained and is not causing a risk to infrastructure. Beach user access can present a safety concern, so closure of certain areas is applied when needed.
- Shire of Jerramungup expressed a desire to undertake a CHRMAP to better plan for and manage their coastal locations, particularly around Wellstead Estuary.

Survey consultation:

- More information was provided on coastal erosion experienced at the foreshore within Wellstead Estuary. Its most recent opening was in June 2021 for approximately two years, in which time the Bremer Bay foreshore was subject to coastal processes and the coastline responded in dynamic ways, with erosion concerns evident. This location can thus be designated as a watchspot.
- Management actions have included barrier fencing at dune blowouts, interim beach closures, and public warnings when foreshores are eroded. While no significant infrastructure has been lost to date, the Shire is wary that Bremer Bay foreshore remains exposed to coastal hazards.
- The Shire of Jerramungup has not identified any major costs for foreshore protection, restoration, or mitigation of coastal erosion problems at the time of this review.

Expected change in MI:

53. Bremer Bay Fishery Beach	Recommendation: Remove entirely
A lack of reported change, minimal management intervention required, and no significant assets under threat indicate this location does not satisfy the hotspot definition. This location should therefore be removed as a coastal erosion hotspot.	

7.2.30. Shire of Ravensthorpe

Physical changes, state funding assistance, and consultation are listed here for Shire of Ravensthorpe. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

54. Hopetoun Foreshore
No significant changes were observed at this hotspot. However, significant developments in the planning space are evident which have implications for how this hotspot may evolve in future years. It is understood Shire of Ravensthorpe secured funding (funding source unknown) for planning stages around the boat ramp facility. It is unclear whether this forms part of the wider 2024/25 CMPAP funded foreshore precinct planning or pertains to additional work. Regardless, DoT investigations in 2019 provided several options for boating facility upgrades to improve operability (Figure 61). Each option impacts the hotspot shoreline, with option four performing best on a coastal hazard basis yet also the most expensive at $7.8M from P90 estimated costs, priced by DoT in 2020. DoT also undertook a geotechnical investigation on the eastern edge of the hotspot, funded by CoastWA in 2023. Suitably resilient rock levels were too low to mitigate coastal hazard risk at this hotspot.

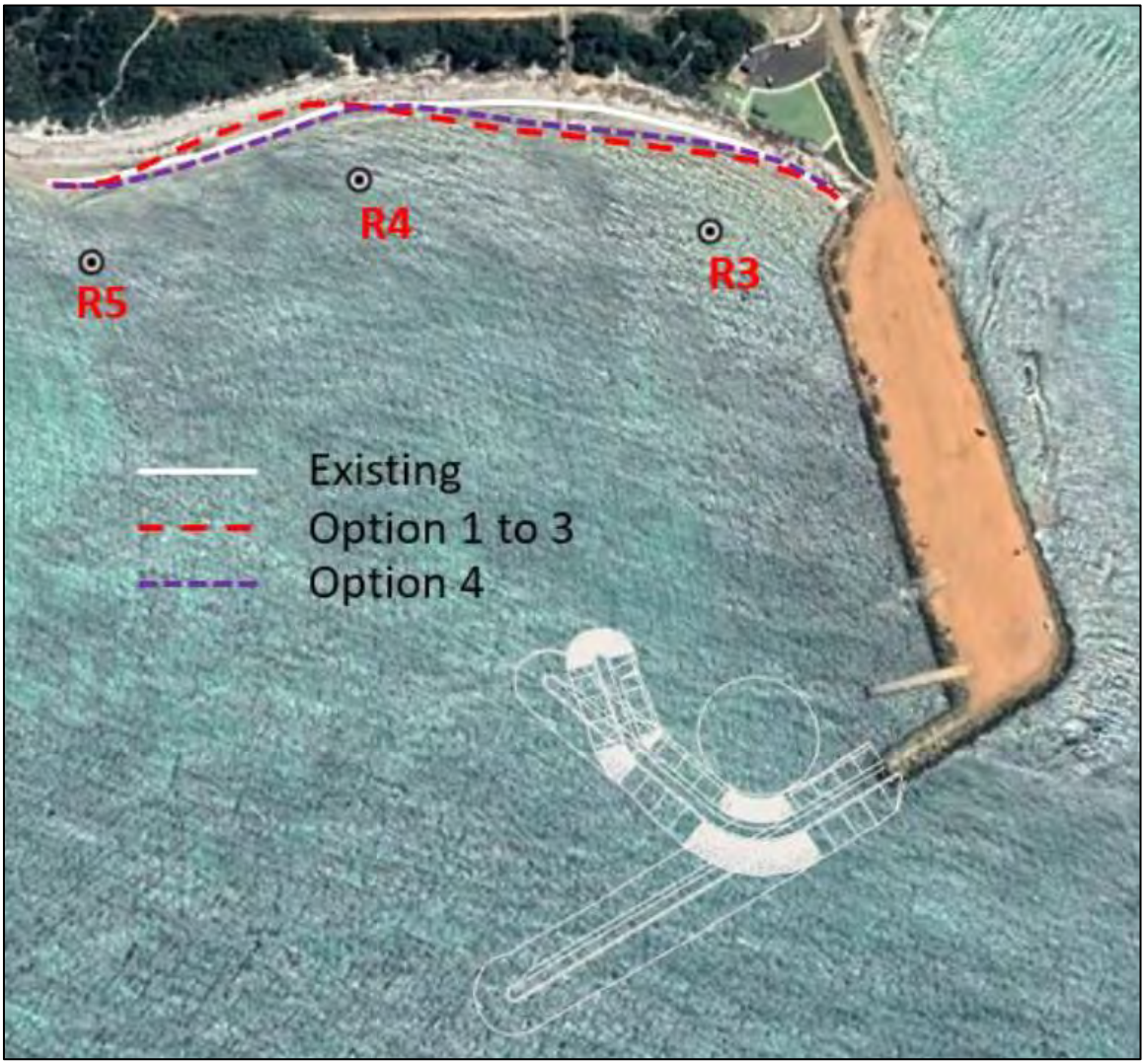

Figure 61: Hopetoun boating facility operability study anticipated shoreline response from four upgrade options (sourced from Advisian 2019).

Funding assistance:

Shire of Ravensthorpe was awarded $130,000 over the seven-year period; the Shire applied for an additional $61,778 but was not successful. Awarded projects specific to hotspots are in Table 47.

Table 47: Shire of Ravensthorpe state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	54. Hopetoun Foreshore
CAP	
H-CAP	
CMPAP	•2021/22: Hopetoun coastal hazard risk management and adaptation plan •2024/25: Hopetoun foreshore management plan 2024-2034
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Shire of Ravensthorpe did not provide a response to the face-to-face meeting request.

Survey consultation:

- Shire of Ravensthorpe did not provide a survey response.

Expected change in MI:

54. Hopetoun Foreshore	Recommendation: Remains hotspot with similar MI
While the hotspot appears generally stable, it is difficult to infer how MI may have changed due to lacking Shire feedback on this narrow foreshore. MI may be kept the same as Seashore (2019) in the face of such uncertainty.	

7.2.31. Shire of Esperance

Physical changes, state funding assistance, and consultation are listed here for Shire of Esperance. Together these provide an overview of management actions at hotspots and/or new locations.

Physical changes:

55. Esperance Town Beach
Chronic erosion at this hotspot over the seven-year period required annual trucking nourishment campaigns by the Shire, many of which were funded by CAP. A sand back-passing system was proposed in 2019 to facilitate sand nourishment at Castleton using relocated sand from the biennial maintenance dredging operation at Bandy Creek Boat Harbour, managed by DoT. A trial sand back-passing was successfully completed in 2021 using temporary pipes. Requirements for a permanent solution were addressed by a 2022/23 H-CAP and CERMP funded project to install permanent back passing infrastructure. The 3.6km pipeline was created from 200 segments of 400mm by 20m HDPE, domestically manufactured in Perth (Figure 62). It allows transport of sand from DoT maintenance dredging at Bandy Creek boat harbour southward for nourishing beaches around the groyne field. Pipeline construction finished in 2024 (Figure 63). This solution aligned with Esperance Tjaltjraak Native Title Aboriginal Corporation recommendations by burying the pipeline along the crest of primary dunes, parallel to a newly developed dual use path (Figure 64). Dune recession may eventually expose pipe segments and require hard protection to prevent pipeline damage if erosion worsens long-term. Managing nourishment campaigns effectively will help to maintain a healthy sediment budget to mitigate this issue over at least the medium term.

Figure 62: HDPE pipeline segment manufacturing at Acu-Tech, Perth in 2024.

Figure 63: As-constructed survey of permanent pipe location at the northern terminus (top) and near the southern terminus (bottom). Not shown is an additional 300m of pipeline which continues beyond the groyne in the bottom image.

Figure 64: Newly developed shared path from Castleton through to Bandy Creek Boat Harbour, built parallel to the buried sand-passing pipeline along the dune crest.

Funding assistance:

Shire of Esperance was awarded $1,720,294 over the seven-year period; the Shire applied for an additional $398,838 but was not successful. Awarded projects specific to hotspots are in Table 48.

Table 48: Shire of Esperance state funding assistance to existing and/or new hotspot locations from 2018/19 to 2024/25.

	55. Esperance Town Beach
CAP	•2018/19 to 2019/20 and 2023/24: Esperance Bay sand renourishment
H-CAP	•2022/23: Esperance Bay - Castletown sand back-passing infrastructure
CMPAP	
Coastwest	
One-off funding*	

**One-off funding includes non-CoastWA state programs e.g. RfR, WA Recovery Plan etc.*

Coastal manager meeting outcomes (where not already identified above):

- Highest unresolved priority is completion of unfunded components of back passing infrastructure. The physical pipeline has been installed however it requires pump installation to operate, originally intended as the Shire's contribution. Shire internal and approval delays necessitate temporary

pumps to ensure the 2024/25 DoT dredging campaign can include back passing to Esperance Town Beach. Permanent pump infrastructure is planned to be completed around mid-2025.

- Shire of Esperance has flagged the need to update its 10yr-old CHRMAP in 2025/26. An updated CHRMAP will provide modernised planning guidance since the construction of Town Beach seawall in 2017, and more recent pipeline infrastructure installation.
- A site-specific CHRMAP is also needed for Blue Haven to West Beach, to provide targeted adaptation planning along this coastline.

Survey consultation:

- The Shire reported a net loss of 20,000m3/yr to the sediment cell containing Esperance Town Beach hotspot, assigned to Esperance Port interrupting longshore sand movement. The shortfall was historically addressed through nourishment via trucking, though will instead be supplied through the pipeline going forward.
- Shire of Esperance spends ~$350k/yr on nourishment via trucking, so is hoping to substantially reduce coastal management costs when the pipeline is operational, whereby much of the cost will be absorbed by DoT's maintenance dredging budget.
- In the long-term planning window (25 - 50 years), additional rock revetments may be required to address chronic erosion issues.

Expected change in MI:

55. Esperance Town Beach	Recommendation: Remains hotspot with reduced MI
Installation of permanent back passing infrastructure to provide continuous sand supply and unit cost reductions demonstrates MI has reduced relative to Seashore (2019), though an ongoing management need still exists to justify this location retaining its hotspot status.	