Submission by Friends of Port River to

Joint Committee on Harmful Algal Blooms in South Australia

Summary

This submission by Friends of Port River (FPR) outlines the results of water quality tests in the Port River and Barker Inlet Estuary, that show very high levels of *Karenia species,* since July 2nd, at the Outer Harbor and Garden Island boat ramps, followed by rapid growth in levels at Port River Dock One from 14th July and at the West Lakes Exit from late July. To date *Karenia species* have locally peaked at 23 million cells/litre at Port River Dock One in tests on September 8th.

Since August Port River water can be murky, with foam, there has been the loss of marine creatures in the Estuary, a sea lettuce bloom and concerns about the loss of food sources that sustain our resident dolphin population. It's not known if HAB has contributed to the loss of seagrass along Torrens Island, how HAB is affecting birds who feed in the Estuary and the impact of HAB on the Estuary as an important breeding ground for small fish and prawns who find protection amongst the mangrove roots and creeks of the Estuary.

This submission argues that while the SA Government declared a climate emergency in 2022, it's not apparent that protecting nature and the community from climate change has been a high priority in their business-as-usual, pro-development agenda.

The Port River and Barker Inlet Estuary has been negatively impacted by a series of actions, by State Government, or involving Government oversight, on our mangroves, saltmarsh and seagrass. Conservation and restoration of mangroves, saltmarsh, seagrass and shellfish reefs can store carbon (blue carbon) and make our Estuary more resilient as we inevitably face higher sea levels, heat waves, storm surges and crisis like this HAB.

The FPR is grateful for the small State Government grants that enabled the Estuary Care Foundation (FPR's predecessor) to trial the restoration of native oysters and shellfish reefs, seagrass and Living Shorelines to the Port River. Significant Commonwealth funds have enabled OzFish to greatly expand shellfish reef restoration in the River and the City of Port Adelaide Enfield to incorporate a Living Shoreline into the development of Yitpi Yartapuultiku.

FPR recommends that State and Federal funds be committed to conservation and restoration in the Port River, and beyond of course. Some of the priority projects locally include

- Greater protection of the Estuary environment, as envisaged by the ADS Act, the State Government's Blue Carbon Strategy and the Biodiversity Act and consistent with the State Government's 2022 declaration of a climate emergency
- Extension of shellfish reef restoration in the Estuary
- Implementation of blue carbon solutions in the Estuary including in significant areas of the St Kilda saltfields and Gillman, as outlined in research being funded by the Green Adelaide Blue Carbon Futures grants
- Further trialling of restoration techniques for mangroves, saltmarsh and seagrass in the Estuary

- Safeguarding, from development, the Magazine Creek wetlands, the Range Basin and the Magazine Basin and the remaining Threatened Ecological community (TEC) Subtropical and Temperate Coastal Saltmarsh

Submission focus

Friends of Port River provide the following information in response to the Terms of Reference below, with a focus on the Port River and Barker Inlet Estuary, which of course includes the Adelaide Dolphin Sanctuary.

(b) Ecological, economic, cultural and social impacts of algal blooms including impact on community health and wellbeing;
(e) The current support and recovery arrangements for impacted industries and communities;
(f) The adequacy of long-term monitoring, forecasting and prevention strategies;
(g) The adequacy of research funding, rehabilitation and recovery planning;
(h) Any other related matters.

(b) Ecological, economic, cultural and social impacts of algal blooms including impact on community health and wellbeing:

Water test results

Friends of Port River have been advocating since 2020, with the North Haven Surf Life Saving Club, for a swimming facility in the Port River, with water quality in the River making the River swimmable since at least 2017 when the Club reinstated *The Long Swim Through The Port River.*

Friends of Port River conducted water quality tests from January to March 2025 for its Stage 2 Feasibility Study which confirmed that water quality (and sediments) at Cruickshank's Corner did not then pose a risk to human health and that the water was swimmable.

The first official report of the Harmful Algal Bloom in the Port River came from the Department of Environment and Water on 8th July 2025, advising that

Testing undertaken last week has confirmed elevated levels of the Karenia species along the metropolitan coastline, and very high levels at the Garden Island and Outer Harbor boat ramps.

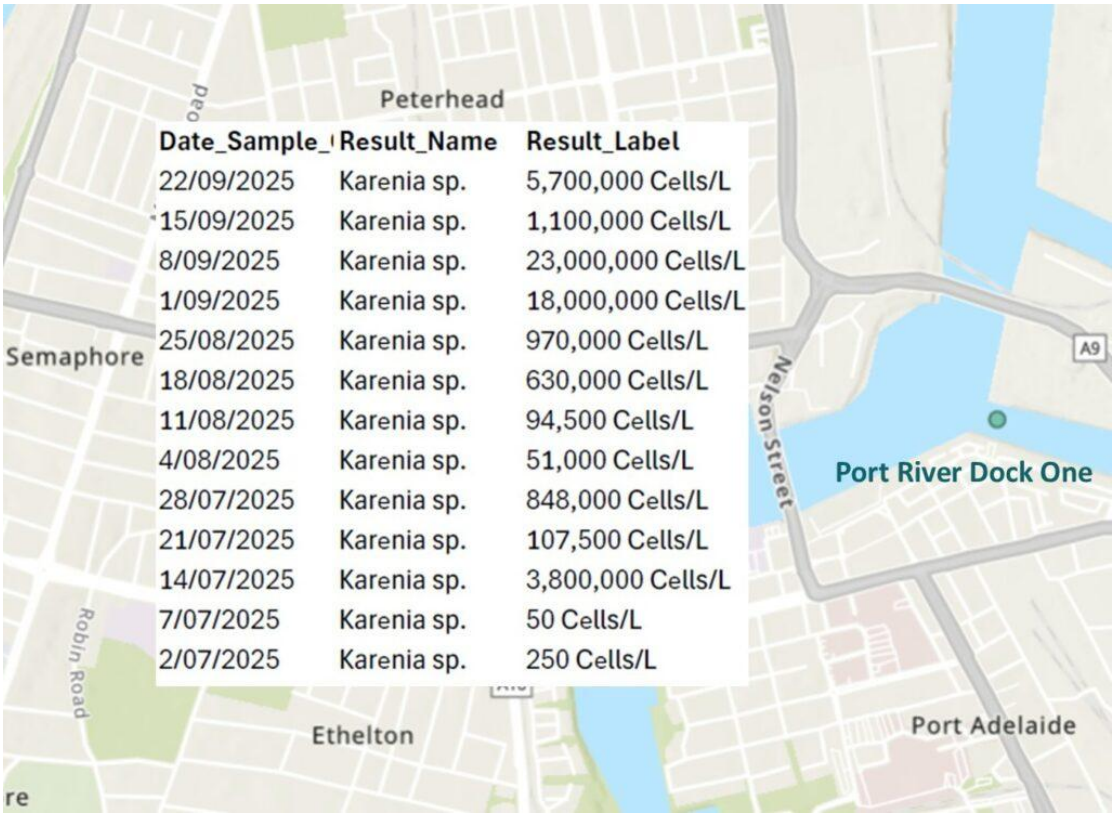
The levels detected on July 2nd were 289,500 cells/litre of Karenia species at Garden Island and 855,000 cells/litre at Outer Harbor.

After three months of weekly water samples, the varying levels of the Karenia species in the Port River and Barker Inlet Estuary and from the West Lakes Exit are outlined below.

Most notable amongst the results are

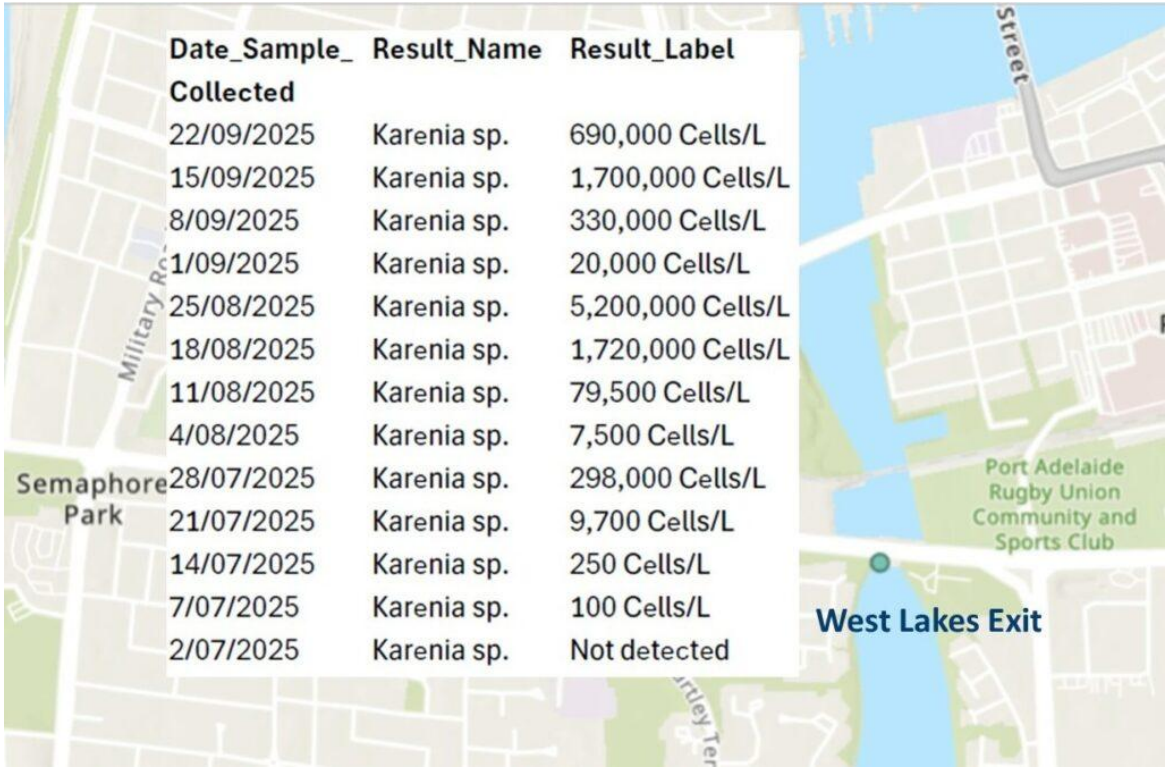
- persistent "very high levels" at the Garden Island and Outer Harbor boat ramps, though the levels detected vary from week to week
- initial lower levels at Port River Dock One in early July, which rose quickly, peaking (so far) on 1st September at 18M cells/litre and 8th September 2025 at 23M cells/litre
- a similar surge at the Outer Harbor boat ramp on 1st and 8th September, at levels of 8.7M and 6.9M cells/litre
- low levels of the Karenia species at the West Lakes Exit in early July, followed by persistent high levels in August and September and a peak of 5.2M cellls/litre on August 25th.

Test results from September 29th show that *Karenia sp* cell counts/litre increased to 7.8M at Port River Dock One and 2.8M at the West Lakes Exit, while results for October 6th were 550,000 Cells/L at Port River Dock One and 1,500 Cells/L at the West Lakes Exit.



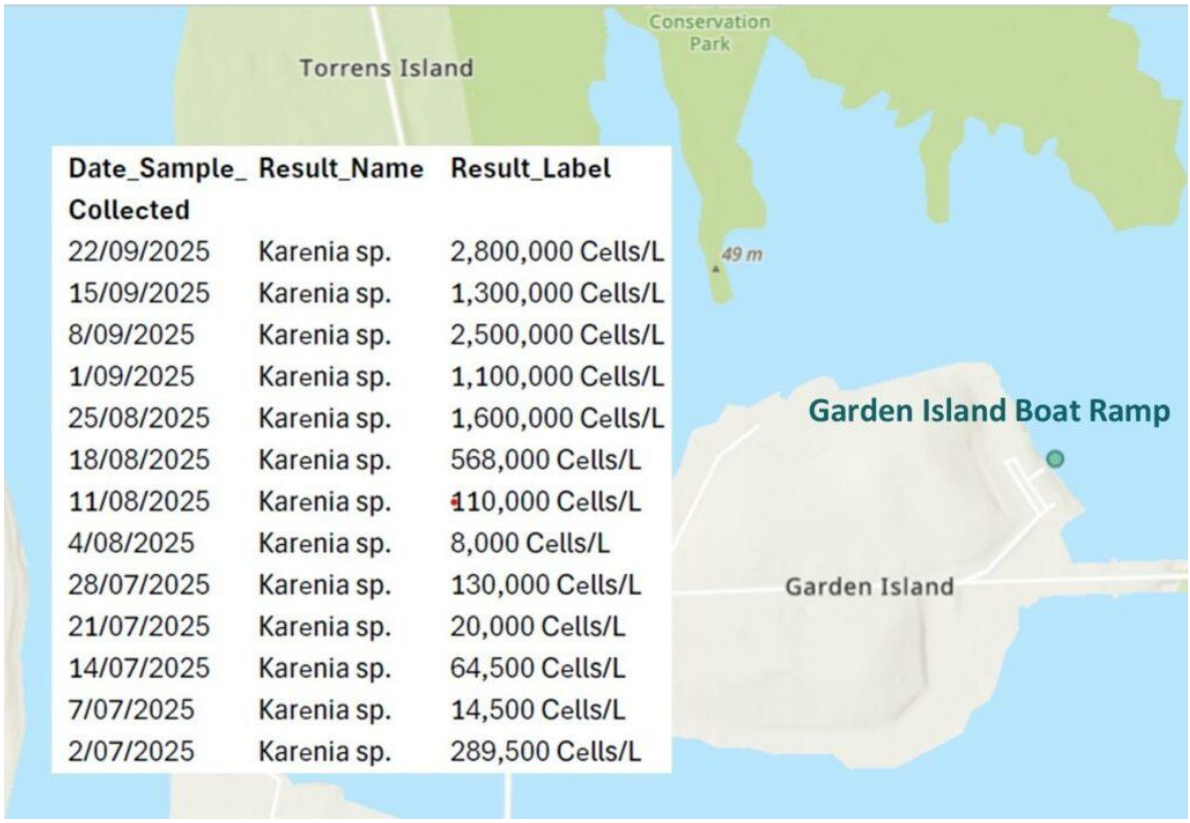
Date_Sample_	Result_Name	Result_Label
22/09/2025	Karenia sp.	5,700,000 Cells/L
15/09/2025	Karenia sp.	1,100,000 Cells/L
8/09/2025	Karenia sp.	23,000,000 Cells/L
1/09/2025	Karenia sp.	18,000,000 Cells/L
25/08/2025	Karenia sp.	970,000 Cells/L
18/08/2025	Karenia sp.	630,000 Cells/L
11/08/2025	Karenia sp.	94,500 Cells/L
4/08/2025	Karenia sp.	51,000 Cells/L
28/07/2025	Karenia sp.	848,000 Cells/L
21/07/2025	Karenia sp.	107,500 Cells/L
14/07/2025	Karenia sp.	3,800,000 Cells/L
7/07/2025	Karenia sp.	50 Cells/L
2/07/2025	Karenia sp.	250 Cells/L

Figure 1: Karenia sp detected at Port River Dock One



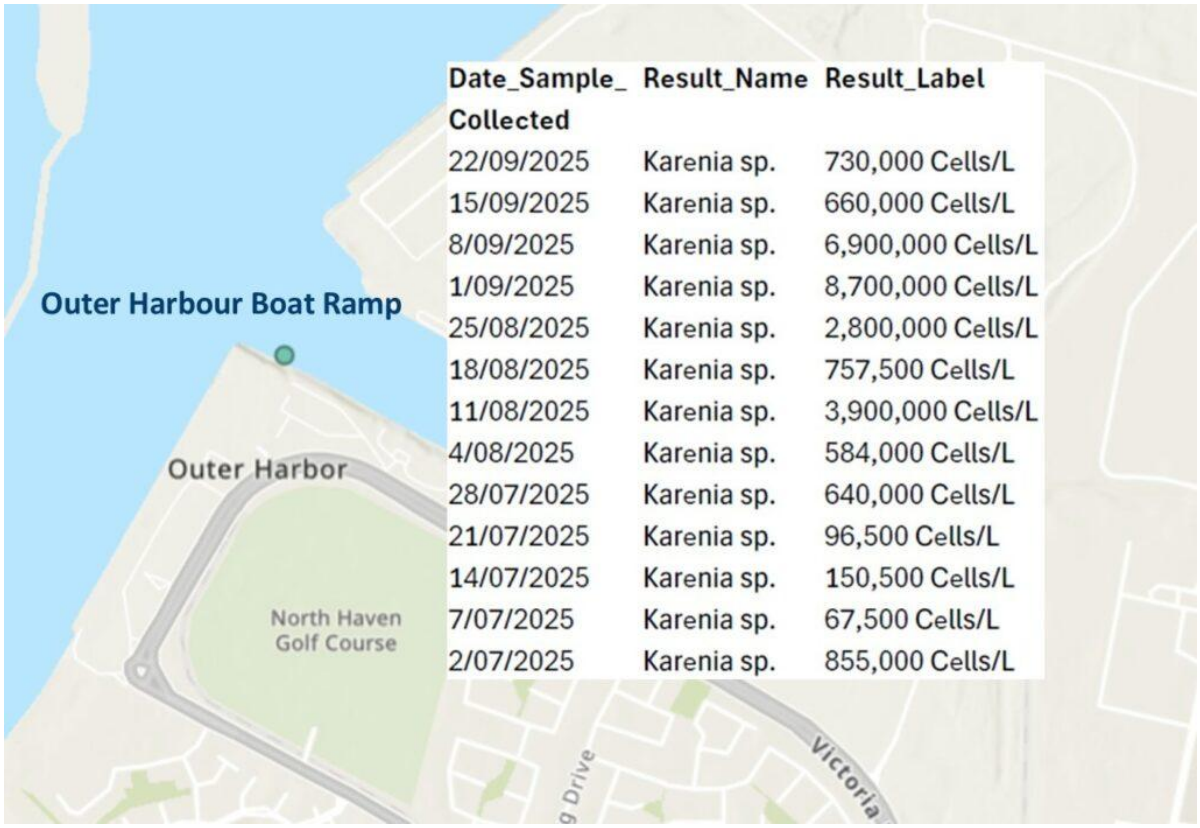
Date_Sample_ Collected	Result_Name	Result_Label
22/09/2025	Karenia sp.	690,000 Cells/L
15/09/2025	Karenia sp.	1,700,000 Cells/L
8/09/2025	Karenia sp.	330,000 Cells/L
1/09/2025	Karenia sp.	20,000 Cells/L
25/08/2025	Karenia sp.	5,200,000 Cells/L
18/08/2025	Karenia sp.	1,720,000 Cells/L
11/08/2025	Karenia sp.	79,500 Cells/L
4/08/2025	Karenia sp.	7,500 Cells/L
28/07/2025	Karenia sp.	298,000 Cells/L
21/07/2025	Karenia sp.	9,700 Cells/L
14/07/2025	Karenia sp.	250 Cells/L
7/07/2025	Karenia sp.	100 Cells/L
2/07/2025	Karenia sp.	Not detected

Figure 2: Karenia sp detected at West Lakes Exit



Date_Sample_Collected	Result_Name	Result_Label
22/09/2025	Karenia sp.	2,800,000 Cells/L
15/09/2025	Karenia sp.	1,300,000 Cells/L
8/09/2025	Karenia sp.	2,500,000 Cells/L
1/09/2025	Karenia sp.	1,100,000 Cells/L
25/08/2025	Karenia sp.	1,600,000 Cells/L
18/08/2025	Karenia sp.	568,000 Cells/L
11/08/2025	Karenia sp.	110,000 Cells/L
4/08/2025	Karenia sp.	8,000 Cells/L
28/07/2025	Karenia sp.	130,000 Cells/L
21/07/2025	Karenia sp.	20,000 Cells/L
14/07/2025	Karenia sp.	64,500 Cells/L
7/07/2025	Karenia sp.	14,500 Cells/L
2/07/2025	Karenia sp.	289,500 Cells/L

Figure 3: Karenia sp detected at Garden Island Boat Ramp



Date_Sample_Collected	Result_Name	Result_Label
22/09/2025	Karenia sp.	730,000 Cells/L
15/09/2025	Karenia sp.	660,000 Cells/L
8/09/2025	Karenia sp.	6,900,000 Cells/L
1/09/2025	Karenia sp.	8,700,000 Cells/L
25/08/2025	Karenia sp.	2,800,000 Cells/L
18/08/2025	Karenia sp.	757,500 Cells/L
11/08/2025	Karenia sp.	3,900,000 Cells/L
4/08/2025	Karenia sp.	584,000 Cells/L
28/07/2025	Karenia sp.	640,000 Cells/L
21/07/2025	Karenia sp.	96,500 Cells/L
14/07/2025	Karenia sp.	150,500 Cells/L
7/07/2025	Karenia sp.	67,500 Cells/L
2/07/2025	Karenia sp.	855,000 Cells/L

Figure 4: Karenia sp detected at Outer Harbor boat ramp

Impacts – dead marine creatures

River water has been discoloured (murky) and there's been some foam, indicating decay.

Figure 5: Discoloured water at Cruickshank's Corner 3.10.25

Figure 6: Foam on water surface and on shoreline at West Lakes outlet to Port River 9.10.25

The iNaturalist project SA Marine Mortality Events 2025 is invaluable in sharing records of dead marine creatures across SA during the harmful algal bloom (HAB). Records from the Port River and Barker Inlet Estuary include shellfish, crabs, fish as shown below.

Figure 7: Photos from iNaturalist: Black Mussels (Brad Martin), Ornate Cowfish (C McMahon), Australasian Snapper (marinejanine) and Port Jackson Shark (Brad Martin)

Figure 8: Photos from iNaturalist: Red-fingered Marsh Crab (bugsinthehood), Sydney Cockle (Brad Martin), Southern Sentinel Crab (bradlp10) and Southern Fiddler (Marianna Boormann)

Mangroves are very important breeding grounds for fish and prawns, and it's been sad to see small dead fish amongst the mangrove roots at Mangrove Cove.

One bright note is that subtidal native oysters, which are being restored to the River, "appear to be doing well".

The Port River and Barker Inlet Estuary is home to millions of Pacific oysters, which contribute to filtering river water. While University of Adelaide researchers observed high numbers of dead Pacific oysters, near where seagrass has died (further info below) along Torrens Island, a visual check in the inner harbour suggests that the Pacific oysters there are surviving well.

Figure 9: Live Pacific oysters (closed) on inner harbour seawall and post 10.10.25

Impacts – sea lettuce

In mid-August Friends of Port River observed masses of sea lettuce on the beach at Cruickshank's Corner. Peri Coleman advised that the sea lettuce was booming given high levels of Nitrogen (e.g. from dead creatures) and she recommended its removal so that it wouldn't rot in the River and add to the organic load.

On the 16th, 18th and 23rd August local volunteers joined FPR in removing as much sea lettuce as possible to shore, and to date no further masses have been seen at Cruickshank's Corner.

Figure 10: Local volunteers remove sea lettuce from Cruickshank's Corner Beach, August 2025

Impacts - seagrass

Estuary Care Foundation (now Friends of Port River) began monitoring seagrass along Torrens Island in 2017 when it became apparent, following the closure of Penrice in 2013-14, that seagrass (*Zostera)* was re-establishing along the Island, south of the Quarantine Station.

While heat waves, that coincided with very low tides in February 2023 and March 2024, had a detrimental impact on much of the seagrass, some areas were resilient and were recovering by November 2024.

Monitoring by the University of Adelaide has identified the loss of seagrass along Torrens Island, that seems to have coincided with the HAB and may have contributed to the loss e.g. reduced light from algal mats. Whether it is the marine heatwave, the HAB, or high temperatures then the impacts of climate change are affecting our seagrass and the ecosystem services it provides.

Impacts – Port River dolphins

There's great concern of course for our local dolphin population, and especially the food sources which sustain them, as expressed by Mike Bossley who describes our resident dolphins as "extremely site attached."

Impacts – bird life

It's not known how birds in the Estuary might be affected. There are anecdotal reports of fewer birds being observed, of dead birds floating on the River, and there seem to be larger numbers of pelicans near the West Lakes Exit, which could suggest that they are there seeking food.

Impacts – community

Community members who care about the River, and the coast, are naturally very concerned about the impacts on our natural environment, on all the living species and how they will fare. There's a great deal of apprehension in the local community about what the summer and the future will hold.

People regularly walk the inner harbour loop and it's disheartening to see discoloured water and foam. Similarly for people who like to kayak, paddle board and swim in the River.

Earlier this year there were 347 people who responded to FPR's online survey about the proposed swimming pool with 80% very keen and another 10% moderately keen on a swimming facility in the Port River.

Where the River was experiencing improved health and water quality, the HAB creates uncertainty.

(e) The current support and recovery arrangements for impacted industries and communities

In the Government's current arrangements, there is considerable focus on the impact on industries such as tourism and seafood, and efforts to sustain them in this crisis. It's not apparent that there's the same level of concern for the recovery of the natural environment, except as a facilitator of business as usual.

The former Deputy Premier Susan Close highlighted that the HAB was making apparent climate change impacts for SA.

"All three of the conditions that led to this have been exacerbated by climate change," she said.

"We can't hide our head in the sand and pretend that this is somehow a phenomenon that might have somehow happened without climate change."

But what have been the actions consistent with SA Government's declarations of a 'climate emergency' in 2022?

This State Government has prided itself on its pro-development focus, despite its adverse impacts for example on the Adelaide Parklands and the Estuary.

(f) The adequacy of long-term monitoring, forecasting and prevention strategies;
(g) The adequacy of research funding, rehabilitation and recovery planning;
(h) Any other related matters

Provide greater protection for nature

State Governments pro-development agendas have led to cumulative impacts on the Port River and Barker Inlet Estuary, reducing its coverage of mangroves, seagrass and saltmarsh. In development applications supported by State Governments the environment is "managed" as though some will always be there … somewhere. FPR has direct experience with the AUKUS and Gillman developments where best practice proposals were developed by consultants for these development applications, and the EPA and Coast Protection Board advised some environment protection measures, only for the DA submissions to SCAP to ignore these. These deficiencies in the State Government DA process were made apparent in considering the recent EIS report to the State Government for expansion of the Osborne shipyard and the Strategic Impact Assessment Report provided to DCCEEW.

Sadly, the Port River and Barker Inlet Estuary is home to numerous environmental problems which have been of State Governments making, in part or whole, including

- the loss of mangroves and saltmarsh at St Kilda, associated with the operation of the poorly regulated saltfields, and the ongoing risk of further harm
- facilitating Penrice waste being stored on Renewal SA land, where it remains though Penrice went into liquidation in 2013-14
- failing to maintain the Mutton Cove seawall so that it was breached in 2016, threatening the inner soil mound boundaries and the adjacent infrastructure of the AUKUS precinct
- failing to implement the provisions of the *Adelaide Dolphin Sanctuary Act 2008*, with an inadequate management plan limited to the actions possible by NP&WS staff
- approving the Gillman development, for managing spoil for the Torrens to Darlington project, allowing the destruction of 1.1 has of the Threatened Ecological community (TEC) Subtropical and Temperate Coastal Saltmarsh and not safeguarding, from development, the adjacent Magazine Creek wetlands, the Range Basin and the Magazine Basin and for the remaining Threatened Ecological community (TEC) Subtropical and Temperate Coastal Saltmarsh.

Since the ADS Act and the declaration of a climate emergency have been largely symbolic, it remains to be seen whether the State Government's new Biodiversity Act will have any influence in protecting our local and State environment.

Restoration in the Port River

From 2016 to 2023 the Estuary Care Foundation pioneered community-led shellfish reef restoration, seagrass monitoring and restoration and Living Shorelines projects in the Port River.

Successful trials by ECF confirmed that the native oysters could be restored to the River, with multi-species reefs, and that mangrove seedlings could be successfully transplanted to form Living

Shorelines. In the 2022 Federal election significant funding commitments, under the Urban Catchments and Waterways program, made possible major extensions of restoration projects with OzFish creating reefs using Robust Oyster Baskets and the City of Port Adelaide Enfield implementing a Living Shoreline at Yitpi Yartapuultiku.

Figure 11: Native oyster on trial coir reef by ECF

Figure 12: ROBs being deployed by OzFish

The Living Shoreline at Yitpi Yartapuultiku is trialling the transplanting of mangrove seedlings and of coastal plants including pigface and samphires.

Figure 13: Restoration trial of coastal plants at Yitpi Yartapuultiku, applying coastal seed mix across 1. Bare sand, 2. Hessian bags and 3. Hessian bags inoculated with healthy blue-green algae

New plant life has been observed this week (week of October 6th) on the bags treated under option 3.

There's a great deal more that can be done learning from successful restoration projects interstate. Some assist the restoration of mangroves through the use of bamboo brush plugs, with natural recruitment of propagules - https://www.mangroves.au/projects/mooloolahriver-5gsx7 and https://www.mangroves.au/projects/mooloolahriver

OzFish in Qld works with students, tying mangrove propagules to bamboo stakes with rubber bands - https://ozfish.org.au/projects/mangrove-mates/

To date ECF, SARDI and the University of Adelaide have undertaken small seagrass restoration trials that have not succeeded for a variety of factors including human interference and heat waves. However further trials are warranted given the significant benefits provided by seagrass including sediment stabilisation, carbon and nutrient trapping.

Figure 14: University of Adelaide trial of transplanted seagrass cores into potato starch structures, 4.9.2024

"..algicidal bacteria are found in abundance on common seagrasses around the world, providing healthy seagrass meadows with natural immunity. Conserving and restoring seagrass offers one way to tackle the problem longer term". (https://phys.org/news/2025-08-algal-bloom.html)

The SA's Government's Blue Carbon Strategy can provide some protection for our mangroves, seagrass and saltmarsh if there was Government commitment to implement the strategies being developed e.g. for the St Kilda saltfields and the Gillman wetlands, through Green Adelaide Blue Carbon Futures grants.

Recommendations

FPR recommends that State and Federal funds be committed to conservation and restoration in the Port River and Barker Inlet Estuary, and beyond of course. Some of the priority projects locally include

- Greater protection of the Estuary environment, as envisaged by ADS Act, the State Government's Blue Carbon Strategy and the Biodiversity Act and consistent with the State Government's 2022 declaration of a climate emergency
- Extension of shellfish reef restoration in the Estuary
- Implementation of blue carbon solutions in the Estuary including in significant areas of the St Kilda saltfields and Gillman, as outlined in research being funded by the Green Adelaide Blue Carbon Futures grants
- Further trialling of restoration techniques for mangroves, saltmarsh and seagrass
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