

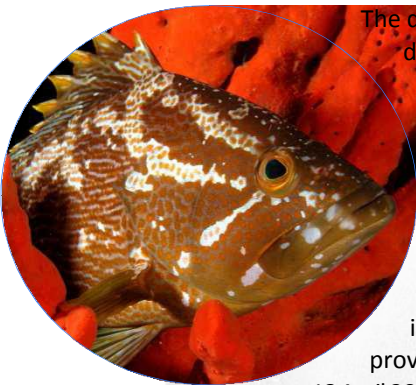
FACT SHEET 1

Draft statewide threat & risk assessment for the NSW marine estate

1. INTRODUCTION

Our vision for the NSW marine estate is *a healthy coast and sea, managed for the greatest wellbeing of the community, now and into the future.*

Many people in NSW enjoy the marine estate through activities such as diving, swimming or fishing, or rely upon its environmental **assets** for their livelihood, such as a commercial fishing or tourism businesses. To ensure that we, as a community, can continue to enjoy these **benefits** and many others, the Marine Estate Management Authority (MEMA) has undertaken a threat and risk assessment for the NSW marine estate (the draft statewide TARA).



The draft statewide TARA will inform the NSW Government's management directions for the NSW marine estate over the next ten years through the development of the new [Marine Estate Management Strategy](#). The Strategy will focus on reducing the priority threats and risks identified in the statewide TARA and look to maximise the economic, social and environmental benefits we all derive from the marine estate.

In this factsheet, we outline the major steps that we took to develop the draft statewide TARA as well as the key findings. We are seeking your feedback on these draft findings, in particular additional evidence to inform the final statewide TARA. You can view the draft statewide TARA and provide your feedback through our [interactive TARA tool](#). Submissions close on 18 April 2017.

2. WHAT DOES THE DRAFT STATEWIDE THREAT AND RISK ASSESSMENT ASSESS?

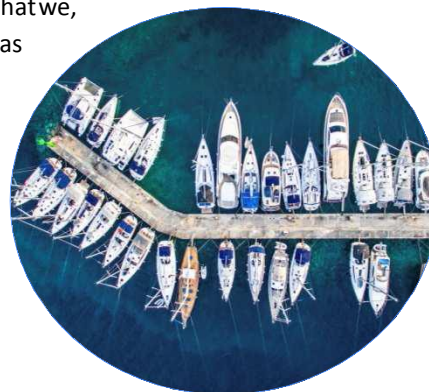
WE LOOKED AT IMPACTS ON THE ENVIRONMENT, THE ECONOMY AND ON YOU

The draft statewide TARA consists of three separate threat and risk assessments:

- an environmental TARA for coastal and marine waters out to three nautical miles
- an environmental TARA for estuaries
- a social and economic TARA.

This approach acknowledges that there are specific environmental threats and risk levels in estuaries that differ from those in coastal and marine waters. It also noted that we need to understand the priority threats and risks to the social and economic benefits the marine estate provides. As such, the draft statewide TARA identifies and assesses threats and risks to:

- [environmental assets](#), the natural features, components and living resources of the marine estate such as fish stocks, saltmarsh and subtidal reefs
- the social and economic benefits (or [community benefits](#)) that we, the NSW community, derive from the marine estate, such as going to the beach, running a SCUBA diving business or the peace of mind from knowing we have healthy marine life. This also includes Aboriginal cultural heritage and use benefits.



The draft statewide TARA also separates the NSW marine estate into [three management regions](#):

- North region – from NSW/Queensland border (Tweed Heads) to Stockton
- Central Region – from Stockton to Shellharbour (including the Hawkesbury Shelf bioregion)
- South region – from Shellharbour to the NSW/Victoria border.

3. HOW DID WE DO THE THREAT AND RISK ASSESSMENT?

[MEMA's approach to marine estate management](#) involves 5-steps—the first two steps are directly relevant to the draft statewide TARA:

STEP 1 – IDENTIFY COMMUNITY BENEFITS AND THREATS

During 2014 and 2015, we asked you about the environmental, social and economic benefits you enjoy from the marine estate in NSW. You told us these included the clean waters of the marine estate that support a variety of unique and abundant Australian marine life, its natural beauty and that it provides a safe space for people and communities (particularly Aboriginal communities) to socialise and lead an active healthy lifestyle. It also provides income to regional communities through various industries, particularly tourism and seafood related industries. We also asked you about threats and how they should be managed. Pollution was identified as a major threat, as well as loss of natural areas, antisocial behaviour and overcrowding. We published your responses in the [Marine Estate Community Survey 2014](#) and through the [Summary of Hawkesbury Shelf community and stakeholder engagement marine bioregion assessment](#) (MEMA, 2015a).

STEP 2 – ASSESS THE THREATS AND RISKS TO BENEFITS

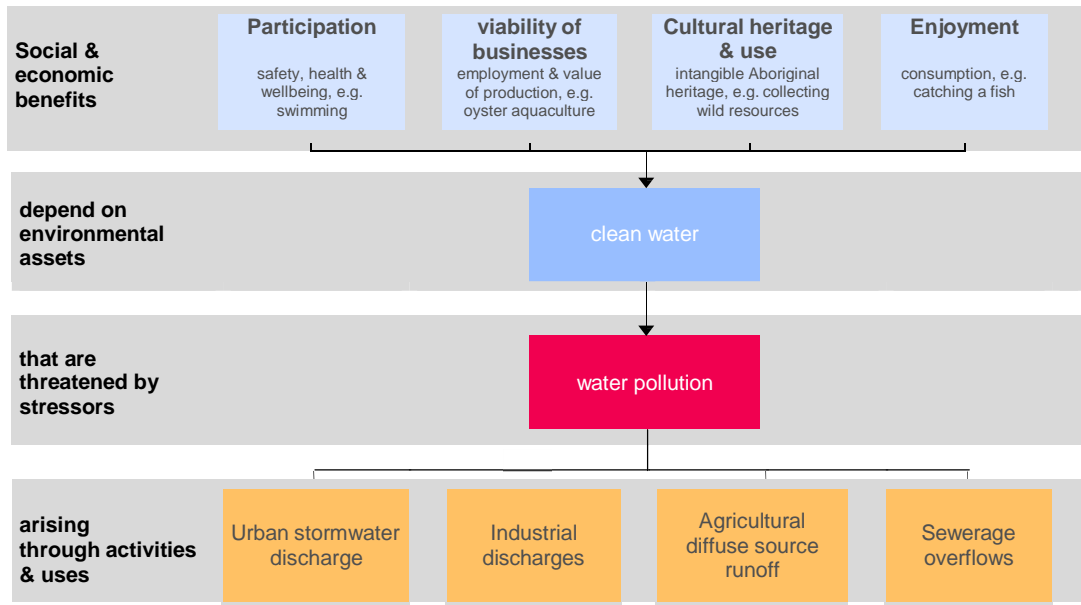
We assessed the threats and stressors to each of the environmental assets and social and economic benefits you identified. A [threat](#) is a broad activity, event or process that poses a potential level of [risk](#) to an environmental asset or social or economic benefit. For example mining, urban stormwater discharge or climate change.

[Stressors](#) are a consequence of an activity (e.g. water pollution or overcrowding), that causes an effect on an environmental asset or benefit. Threats can cause a number of stressors, for example, the threat generated by urban stormwater discharge may cause stressors such as litter, marine debris, micro-plastics and/or water pollution.

A **risk** is the chance of something happening because of a threat, which may have a detrimental impact on the benefits we get from the marine estate.

The following diagram demonstrates how threats and stressors can have impacts upon social and economic benefits and environmental assets.

Figure 1. How benefits and assets are threatened by stressors arising from activities and uses in the NSW marine estate



WE USED EVIDENCE AND INVOLVED EXPERTS

To ensure that the draft statewide TARA is **evidence-based**, we involved independent experts from universities as well as MEMA agency experts. They used the latest scientific evidence and information to assign a risk level (minimal, low, moderate or high) for each threat and resulting **stressor** in each of the three regions. We tested their risk levels in expert workshops by considering how much of an impact it would have (consequence) if it occurred and how likely the threat was to occur (likelihood).

We then assessed the trend of each threat over time (20 years, and up to 50 years for climate change) and the scale (local, regional and statewide). We also identified if the threat was increasing, decreasing, or remaining stable.

We took advice from our **Marine Estate Expert Knowledge Panel** on the key **cumulative impacts** we needed to consider. Cumulative impacts occur when one particular environmental asset or social and economic benefit is impacted by many threats. For example, urban stormwater discharge, climate change and some recreational boating activities can all impact seagrass to varying degrees.

We also rated the quality of available evidence as:

- adequate (A) - there is available scientific evidence about the impacts from this threat here in NSW
- limited (L) - there is available scientific evidence on the impacts from this threat here in Australia, or limited evidence available at a local scale in the NSW marine estate
- inferred (I) - there is available scientific evidence on the impact from this threat elsewhere in the world, but there is limited evidence available for the NSW marine estate.

WE IDENTIFIED PRIORITY THREATS AND RISKS

We next considered those threats and stressors that had the greatest impact on estuaries, marine and coastal waters and social and economic benefits, and developed a list of [priority threats](#). A threat was considered a priority if it had a high or moderate risk level.

Finally, we sought independent scientific advice from the Marine Estate Expert Knowledge Panel (MEEKP) on these results and used their advice.

4. WHAT ARE THE FINDINGS OF THE DRAFT THREAT AND RISK ASSESSMENT?

The priority 'high' and 'moderate' threats are reported in the following ways:

1. Statewide priority threats to estuaries
2. Statewide priority threats to coastal and marine waters
3. Statewide priority threats to environmental assets generally (the risks are combined and presented in the order of greatest magnitude from lists 1 and 2 above)
4. Statewide priority threats to social and economic benefits
5. Priority threats at a regional scale for environmental assets and social and economic benefits.

PRIORITY STATEWIDE AND REGIONAL THREATS AND RISKS

MEMA decided that a threat is a statewide priority if it has a high or moderate risk level for each of the three regions across NSW (north, central and south). For high and moderate risks in only one or two regions, we consider the risk to be a priority just for that region. We applied this methodology to all three of the separate TARAs.

STATEWIDE PRIORITY THREATS TO ESTUARIES

Table 1. From greatest to lowest, the priority threats to **estuaries** are:

Threat	Description
Estuary entrance modifications	When the entrance of an estuary changes affecting the volume, frequency, and for how long water flows in and out of the estuary. An example is building training walls to maintain channel depth at the entrance of the estuary
Urban stormwater discharge	Water that runs off urban areas after it rains that goes into our estuaries
Agricultural diffuse source runoff	Water that runs off agricultural lands after it rains that goes into our rivers and then to our estuaries, coastline and ocean
Clearing riparian and adjacent habitat including wetland drainage	Clearing of vegetation on our riverbanks, removal of mangroves, seagrass and saltmarsh and draining our wetlands
Recreation and tourism -boating and boating infrastructure	Recreational vessels including recreational fishing vessels, powerboats, sail boats, canoes and kayaks and the infrastructure that supports their use. For example, jetties, pontoons, moorings and boat ramps
Climate change (20yrs)	The long term change in the earth's climate that is predicted over the next twenty years

Threat	Description
Navigation and entrance management and modification, harbour maintenance, etc.	The dredging (removing sediments) of our estuaries and harbours for navigation purposes to maintain their depth and ensure safety for vessels
Sewage effluent and septic runoff	Sewage (waste water) that is released into our estuaries and ocean waters and run off from septic tanks (small scale sewage systems)
Stock grazing of riparian and marine vegetation	Stock (e.g. cattle) grazing on our riverside vegetation and on saltmarsh and mangroves
Modified freshwater flows	When the flow of water in our rivers is modified through either water extraction or the installation of dams and weirs
Foreshore development	Development such as the building of seawalls, wharves, jetties, marinas, and boat ramps or developments that impact on coastal vegetation
Recreation and tourism – four wheel driving	Four wheel driving on our intertidal habitats such as beaches
Commercial fishing-estuary general	A multi-species, multi-method fishery that operates in 86 NSW estuaries
Oyster aquaculture	The commercial growing of oysters for human consumption
Recreational fishing – shore-based line and trap fishing	Fishing from the shore using a line or a trap
Recreational fishing – boat-based line and trap fishing	Fishing from a boat using a line or traps
Beach nourishment and grooming	Adding new sand to beaches or mechanically scraping the surface of a beach to remove natural or artificial objects like seagrass or litter

STATEWIDE PRIORITY THREATS TO COASTAL AND MARINE WATERS

Table 2. From greatest to lowest, the priority threats to **coastal and marine waters** are:

Threat	Description
Climate change (20yrs)	The long term change in the earth's climate that is predicted over the next twenty years
Commercial fishing – ocean trawl	This includes prawn trawling and fish trawling
Commercial fishing – ocean trap and line	This is a multi-species fishery targeting fish that live on the bottom and fish that live in the water column. Examples of methods used include demersal fish traps, setlines, trolling and hand held lines.
Recreational fishing – boat-	Fishing for recreation from a boat using a line or traps

Threat	Description
based line and trap fishing	
Foreshore development	Development such as the building of seawalls, or developments that impact on coastal vegetation and beaches
Urban stormwater discharge	Runoff in urban areas after it rains that goes into our coastline and ocean waters
Commercial fishing – ocean haul	This is a fishery targeting finfish species such as pilchards, mullet and Australian Salmon using purse seine nets from sea beaches
Recreational fishing – shore-based line and trap fishing	Fishing for recreation from the shore using a line or a trap
Estuary entrance modification and breakwaters	When the entrance of an estuary changes affecting the volume, frequency, and for how long water flows in and out of the estuary. An example is building training walls to maintain channel depth at the entrance of the estuary
Beach nourishment and grooming	Adding new sand to one of our beaches and mechanically scraping the surface of a beach to remove natural or artificial objects like litter
Recreational fishing – hand gathering	Hand gathering of algae and species like pipis, beach worms and cunjevoi for food and bait
Charter activities – whale and dolphin watching	Whale and dolphin watching from commercial vessels
Shipping – small commercial vessels	These are small vessels like tugs, ferries, charter boats and fishing vessels

STATEWIDE PRIORITY THREATS TO ALL ENVIRONMENTAL ASSETS

We then combined the results of the estuary and the coastal and marine water assessments to form a single list of statewide priority threats to environmental assets. Estuaries have many more high and moderate risks compared to coastal and marine areas, so estuary threats tend to dominate the combined priority threats list below.

Table 3. From greatest to lowest, the statewide priority threats to **all environmental assets** are:

Threat	Description
Estuary entrance modifications	An example is building training walls at the entrance of an estuary affecting both the estuary and the open coast
Urban stormwater discharge	Water that runs off urban areas after it rains that goes into our estuaries, coastline and ocean waters
Agricultural diffuse source runoff (in estuaries)	Water that runs off agricultural lands after it rains that goes into our rivers and then to our estuaries, coastline and ocean waters

Threat	Description
Clearing riparian and adjacent habitat including wetland drainage (in estuaries)	Clearing of vegetation on our riverbanks, removal of mangroves and saltmarsh and draining our wetlands
Climate change (20 years)	The long term change in the earth's climate that is predicted over the next twenty years
Recreation and tourism - boating and boating infrastructure (in estuaries)	Recreational vessels including recreational fishing vessels, powerboats, sail boats, canoes and kayaks and the infrastructure that supports their use. For example, jetties, pontoons, moorings and boat ramps
Navigation and entrance management and modification, harbour maintenance (in estuaries)	The dredging (removing sediments) of our estuaries and harbours for navigation purposes to maintain their depth and ensure safety for vessels
Sewage effluent and septic runoff (in estuaries)	Sewage (waste water) that is released into our estuaries and runoff from septic tanks (small scale sewage systems)
Stock grazing of riparian and marine vegetation (in estuaries)	Stock (e.g. cattle) grazing on our riverside vegetation and on saltmarsh and mangroves
Foreshore development	Development such as the building of seawalls, wharves, jetties, marinas, and boat ramps or developments that impact on coastal habitats in both estuaries and the open coast
Modified freshwater flows (in estuaries)	When the flow of water in our rivers is modified through either water extraction or the installation of dams and weirs
Recreation and tourism – four wheel driving (in estuaries)	Four wheel driving on our intertidal habitats such as beaches
Commercial fishing – ocean trawl	This includes prawn trawling and fish trawling
Commercial fishing – ocean trap and line	The is a multi-species fishery targeting fish that live on the bottom and fish that live in the water column. Examples of methods used include demersal fish traps, setlines, trolling and hand held lines
Commercial fishing – estuary general (in estuaries)	A multi-species, multi-method fishery that operates in 86 NSW estuaries
Recreational fishing – boat-based line and trap fishing	Fishing for recreation from a boat using a line or trap in both estuaries and the open coast
Oyster aquaculture (in estuaries)	The commercial growing of oysters for human consumption
Commercial fishing – ocean haul	This is a fishery targeting finfish species such as pilchards, mullet and Australian Salmon using purse seine nets from

Threat	Description
	sea beaches
Recreational fishing – shore-based line and trap fishing	Fishing from the shore using a line or a trap in both estuaries and the open coast
Beach nourishment and grooming	Adding new sand to beaches or mechanically scraping the surface of a beach to remove natural or artificial objects like litter in both estuaries and the open coast
Recreational fishing – hand gathering	Hand gathering of algae and species like pipis, beach worms and cunjevoi for food and bait on the open coast
Charter activities – whale and dolphin watching	Whale and dolphin watching from commercial vessels
Shipping – small commercial vessels	These are small vessels like tugs, ferries, charter boats and fishing vessels

STATEWIDE PRIORITY THREATS TO SOCIAL AND ECONOMIC BENEFITS

Table 4. From greatest to lowest, the statewide priority threats to social and economic benefits are:

Threat	Description
Climate change (20 years)	The long term change in the earth's climate that is predicted over the next twenty years
Inadequate social and economic information	Lack of social and economic research studies to inform decision making
Urban stormwater discharge	Impacts from urban runoff that affect our use of estuaries, coastline and ocean waters
Agricultural diffuse source runoff	Impacts from agricultural runoff that affect our use of estuaries, coastline and ocean waters
Anti-social behaviour and unsafe practices	Menacing behaviour, human to human interactions, vandalism
Limited or lack of access infrastructure to the marine estate	Lack of facilities and access points such as boat ramps, moorings, car parks and disabled facilities
Reductions in the number of fish at the top and the bottom of the food chain from commercial, recreational and charter fishing	The harvest from fishing activities that result in a reduction in abundance of individual species or levels in the food chain
Litter, solid waste, marine debris and micro plastics	Litter in the water and on beaches and microplastics in the water and on beaches from personal care products
Lack of compliance with regulations (by users) or lack of compliance effort (by agencies)	When marine estate users do not follow regulations or there are not enough compliance officers on ground to ensure users comply

Threat	Description
Inadequate, inefficient regulation, over-regulation (by agencies)	When governments either do not regulate an activity enough, in the best way, or too much
Loss of public access (either by private development or government area closures)	Loss of access to favourite places when private development occurs, or saltwater fishing closures or sanctuary zones are introduced
Habitat (physical) disturbance (e.g. from foreshore development, commercial and recreational fishing methods, four wheel driving, and extractive industries (mining))	The damage to habitat for species such as shorebirds and turtles from various activities such as mining, foreshore development and fishing
Wildlife disturbance (shorebirds, turtles, whales) by dog walkers, four wheel driving, marine vessels etc.	Wildlife, including shorebirds, turtles and marine mammals are disturbed from activities like dog walking, four wheel driving and recreational boating to a point where it has negative impacts
Lack of community awareness of the marine estate, associated threats and benefits, regulations and opportunities for participation	When the community does not know about the benefits of the marine estate, the threats to these and how government is managing them
Overcrowding/congestion	Where there are too many people in one place or using limited infrastructure
Loss or decline in marine industries	When marine industries, such as commercial fishing, aquaculture or tourism are disappearing
Pests/diseases	Marine pests and diseases that impact on plants, animals and ecosystems or business viability
Modified hydrology/hydraulics and flow regimes	When the flow and volume of water moving through rivers and estuaries is changed by human activities and infrastructure
Seafood contamination	Seafood that is contaminated with metals, industrial chemicals, agricultural pesticides or diseases
Lack of or ineffective community engagement or participation in governance	Includes aspects such as a lack of evidence, political standing and regulation

PRIORITY CUMULATIVE THREATS AND RISKS

The draft statewide TARA found that the priority cumulative threats and risks are:

- **Fisheries** - in terms of management of communities of fish and the uncertainty around how fishing activities, commercial, recreational and cultural, impact the food web and function of marine ecosystems.
- **Estuaries** – in terms of their role as a receiving water quality environment. Our estuaries are impacted in many ways: by runoff from agricultural lands, urban stormwater runoff, point

source pollution (e.g. discharges from industry), microplastics and sediment contamination. We need to consider management of our estuaries in terms of their water quality as a whole, rather than managing these different threats in isolation.

- **Climate change** – the marine estate will be impacted in many ways by climate change. Coastlines will change as the sea level rises, we will get more storms, our oceans will become warmer and more acidic and our ocean currents will change, which will affect nutrient-cycles in the ocean. We need to put in place actions now that will help the marine estate to adapt and be resilient to these changes, rather than wait for them to happen.

WE RECOGNISE THERE ARE KNOWLEDGE GAPS

A key finding of this work is that we have knowledge gaps around:

- the priority cumulative threats and risks
- threats to social and economic benefits derived from the marine estate
- the tangible and intangible benefits Indigenous people derive from the marine estate.

5. WHY HAVE THE RISK LEVELS CHANGED FOR THE HAWKESBURY SHELF?

WE HAVE NEW EVIDENCE AND WE LISTENED TO SCIENTIFIC EXPERTS

In February to May of this year (2016), we consulted with you on the threat and risk assessment and proposed management initiatives for the Hawkesbury Shelf marine bioregion. We have developed a better approach to assessing risk levels through a formal risk evaluation. We also have new evidence, which has better informed the risk levels.



In addition, the Marine Estate Expert Knowledge Panel (MEEKP) also advised us on how to improve the social and economic threat and risk assessment. Rather than take a sector-based approach, for example how the activities of shipping could impact on recreational boating, we are now looking at threats and risks through the lens of impacts on community wellbeing. This means we have considered the benefits and costs to the community as a whole rather than for a particular user group, sector or industry.

In a couple of cases, risk levels within the Hawkesbury Shelf marine bioregion, now covered by the Central region, have changed as a result. Where the risk levels differ between the Hawkesbury TARA and the draft statewide TARA, the draft statewide TARA report takes precedence.

6. WHAT IS NEXT?

WE NEED YOUR EVIDENCE

The NSW Government would like the NSW community, academic institutions, local government and peak stakeholders to review the findings of the draft statewide TARA. We would like you to consider the evidence used to determine the risk levels and provide any new or additional evidence you may have that may change these. **Evidence** may include scientific research or reports, unpublished data/research or supporting background reports, but does not include personal opinion.

After we finish this phase of community engagement, we will assess your feedback for new evidence to inform the final statewide TARA report.

We will then use the findings of the statewide TARA to develop the NSW Marine Estate Management Strategy. The Strategy will include the management changes that we propose to address the priority threats and risks identified in the statewide TARA. Once we have prepared the draft Strategy, we will seek your thoughts on the proposed management changes and the benefits and costs to you.

Threats and risks that are best managed spatially, such as via marine protected areas, will also be identified and management responses developed through the preparation of new management plans for marine parks. We will start with Solitary Islands and Batemans Marine Parks. You and the Marine Park Advisory Committees will also be important in developing these management initiatives.

HOW CAN I HAVE MY SAY ABOUT THE EVIDENCE AND FINDINGS OF THE DRAFT STATEWIDE TARA?

We have developed an [interactive TARA tool](#) to help you to navigate, interrogate and provide feedback to inform the findings of the draft statewide TARA. If you have any comments on the evidence and findings of the draft statewide TARA you are invited to make a submission through the interactive TARA tool at www.marine.nsw.gov.au. Please provide comment if you:

- think there are omissions or inaccuracies within the draft statewide TARA,
- are able to provide additional evidence (environmental, social or economic) in relation to stressors, threats and risks. This may include, for example, scientific research or reports, unpublished data/research or supporting background reports.

Through the TARA tool you can provide specific comments and evidence on individual risk levels or submit overall feedback on the draft statewide TARA report. This information will be reviewed and used to inform the finalisation of the statewide TARA report. There are tips on how to use the online tool and a specific [FAQs – TARA tool](#) document to assist you to make your submission. Submissions through the TARA [interactive tool](#) can be made until **31 March 2017**.



WHERE CAN I FIND MORE INFORMATION?

The [New South Wales Marine Estate Threat and Risk Assessment Draft Report](#), TARA [Environmental Background Report](#) and a [Social and Economic TARA reference list](#) are available at www.marine.nsw.gov.au and this website will be updated as the project continues.

If you would like to receive updates on the statewide TARA or other marine estate initiatives please advise us via contact.us@marine.nsw.gov.au and provide your name, email address and postcode.

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