



MARINE ESTATE MANAGEMENT STRATEGY **Implementation Plan**

2021-2022

MARINE ESTATE MANAGEMENT AUTHORITY



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More information

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Foreword



The [Marine Estate Management Strategy 2018–2028](#) (Strategy) coordinates and streamlines the management of the New South Wales (NSW) marine estate, one of the State's most significant natural assets. It includes almost a million hectares of tidal rivers and estuaries and their shorelines, submerged lands, offshore islands as well as the ocean along the NSW coast. The marine estate is important for the overall wellbeing of the NSW community, providing a place for simple enjoyment, recreational, cultural and commercial activities.

The Strategy is a requirement of the [Marine Estate Management Act 2014](#). It addresses statewide priority threats to the environment as well as threats to community benefits we all derive from the marine estate. It sets out nine initiatives and the actions needed to deliver improved, evidence-based management of our marine estate. Developed with input from key stakeholders and the community, the Strategy outlines how we will deliver our vision for the marine estate over the next 10 years.

a healthy coast and sea,

managed for the greatest wellbeing of the community,

now and into the future

Over the first three years of delivery, many positive outcomes have been achieved, benefiting the community across the marine estate. We have continued to implement over 100 projects with our partners, that are improving the health of the marine estate. We are working towards improving water quality, rehabilitating important habitats, protecting species at risk and increasing the resilience of estuarine, coastal and marine environments. These actions underpin how the NSW community enjoy, make a living from, or continue cultural practices in the marine estate, into the future. The first three years have not been without challenges, including severe drought, devastating bushfires and subsequent floods. Each of these have affected project delivery. The COVID-19 pandemic creates new challenges that we must overcome as we continue to implement projects this year. My sincere thanks to agency staff and delivery partners for their commitment and adaptability which has enabled our momentum to continue to build on outcomes as we move into Stage 3.

Our partners are critical participants in its delivery and to achieving the Strategy's outcomes. We will continue to enhance our engagement with the community and our key stakeholders to implement the projects described in this Plan and to reduce the threats facing our marine estate. The investment of \$105 million by the NSW Government from 2018 through to 2022 will enable the good work to continue, as outlined in this Implementation Plan (2021-2022) (Plan). We will report periodically on our progress towards meeting intended outcomes over ten years. A [Marine Integrated Monitoring Program](#) will monitor, evaluate and report on progress. We will communicate our progress and achievements regularly, on the [marine estate web site](#), as well as in the Authority's annual report on Strategy implementation.

Russell Reichelt AO FTSE

Chair, Marine Estate Management Authority

Aboriginal people are the Traditional Owners
of the NSW marine estate
and have a continuing connection
to their Land and Sea Country



Photo: 1. Fish traps, Five Islands. Photo: John Spencer, DPIE-EES ©

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Introduction

Purpose of the Implementation Plan

This Plan outlines how we will deliver the Strategy in 2021-2022

The NSW Government has invested \$30.7 million in 2021-2022 to continue to deliver the Strategy's nine initiatives. This funding is critical to continue the foundational work that commenced in the first three years, the partnerships built, and early benefits realised.

This Plan identifies:

- the range of projects that will be implemented under the nine initiatives and 53 actions
- who the lead agencies and partners are, who are working together to deliver projects
- when these projects expect to be delivered and where.

The Plan showcases the breadth of projects underway to reduce statewide priority threats and their benefits across the marine estate. Case studies in this Plan provide highlights of key Strategy deliverables from the first three years and innovative new projects that have commenced in 2021-2022.

Measuring and communicating our success

The [Marine Integrated Monitoring Program](#) (Monitoring Program) has been developed to monitor, evaluate and report on progress towards achieving outcomes for each of the nine initiatives at 2, 5 and 10 years, so management can be adaptive. The Monitoring Program has three key purposes:

1. to monitor the condition and trend of environmental assets and community benefits against components of the vision
2. to evaluate the effectiveness of the management initiatives and actions that aim to reduce priority threats and risks
3. fill knowledge gaps that were identified as part of the statewide [Threat and Risk Assessment](#) (TARA) process in 2017.

Progress is also shared regularly using a variety of media including:

- NSW marine estate newsletter (monthly)
- snapshot reports on the marine estate website
- Marine Estate Management Strategy implementation annual report
- regular updates on the marine estate website, including the above documents
- Marine estate social media such as NSW Marine Estate Instagram.

Implementation of the Strategy is adaptive and has been designed to address changing and emerging threats through regular review. The statewide threat and risk assessment (TARA) completed in 2017 will be reviewed after five years. Planning for this has commenced, to consider new information and other data to ascertain if the statewide priority threats identified in 2017 have changed, and if new threats have emerged.

A five-year health check of the Strategy will commence in 2023. This health check will include a mid-term independent evaluation of how initiatives are performing against key performance indicators and is informed by the review of the statewide TARA. The five-year health check will respond to research and monitoring outputs, new evidence and emerging threats. Management responses can then be applied as required.

Partnerships

The Strategy requires strong collaboration and partnerships with stakeholders involved in marine estate management, including:

- local government

- Aboriginal people
- NSW Government agencies
- the general community
- peak industry groups and community-based organisations
- research providers.

Aboriginal involvement in the management of Sea Country, and enhanced stewardship of the marine estate by the broader NSW community, are both critical to the success of the Strategy. The independent [Marine Estate Expert Knowledge Panel](#) (the Panel) will continue to provide their ecological, social, cultural and economic expertise in the ongoing implementation of the Strategy.

Links between the Strategy and Coastal Management Programs

Local government's [Coastal Management Programs](#) (CMPs) are strongly aligned with improving outcomes for the marine estate. CMPs are required to support the objectives of the *Marine Estate Management Act 2014*. The development and implementation of the Strategy and CMPs are bound by legislation and both rely on a risk-based approach. We will continue to partner with local government to deliver projects with common objectives. As councils develop their CMPs through their five stages, they should consider:

- the statewide TARA - which is a key resource for considering priority threats to estuaries and coastal and marine areas during preparation of CMP Scoping Studies
- aligning CMP actions with the initiatives and actions in the Strategy
- outcomes and key learnings from projects piloted in Stage 1 to help inform the design and implementation of local management actions.

Timeframe for delivery

This Plan refers to projects that are being delivered in Stage 2 from 1 July 2021 to 30 June 2022. They build on the projects that have commenced, many of which intend to continue in subsequent stages of the Strategy, given improvements in environmental condition or community benefits may take many years to realise. Planned projects that are on hold, or are yet to commence due to funding constraints, are referred to in the Plan. These include:

- marina pollution monitoring (Initiative 1)
- climate change modelling (Initiative 3)
- species habitat research (Initiative 5)
- marine estate activity mapping (Initiative 8)
- understanding government and non-government stakeholder (Initiative 8) and
- coordinating compliance (Initiative 9).

New projects commencing in 2021-2022 include:

- ICOLL management and research (Initiative 2)
- species monitoring (Initiative 5)
- end-of-life vessel management (Initiative 7).
- blue economy (Initiative 8)

To help identify the status of projects in each Stage we have colour coded them as shown in Table 1; this colour-coding is used throughout this document.

Table 1. Inclusion of projects in each implementation stage.

				
Timeframe funding	Stage 1 funded (2018–2020)	Stage 2 funded (2020–2021)	Stage 2 funded (2021–2022)	Commencement pending funding

Governance framework

The range of spatial scales, cost, complexity and risk in the Strategy results in the need for collaboration between government agencies and partners under a strong governance structure.

The Strategy's Governance and Program Management Framework (framework) facilitates those relationships and tracks the Strategy's progress. Under the framework the Authority continues to have program oversight.

The framework consists of three tiers. These closely reflect the structure of the Strategy.

- Tier 1—the Strategy
- Tier 2—each of the nine initiatives
- Tier 3—management actions and their projects.

Interagency working groups in each tier regularly meet to enhance cross-linkages and ensure good communication across initiatives. Membership of these groups is determined by the initiative or project lead to ensure membership is relevant and appropriate. There are also linkages with other related government reforms that have an influence on the delivery of the Strategy. Effective coordination with these related reforms is important. The full governance structure is outlined in Figure 1.

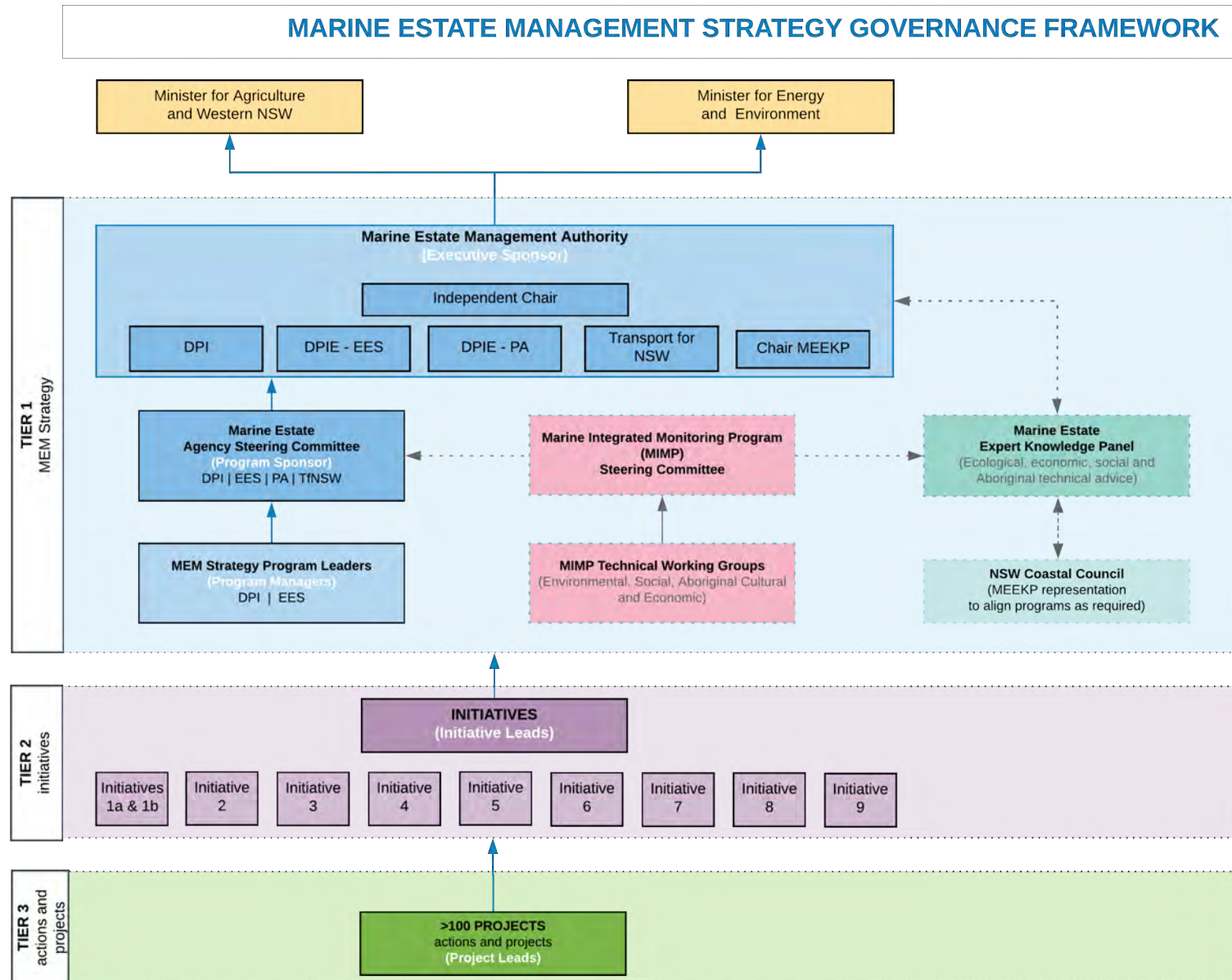


Figure 1. Marine Estate Management Strategy governance framework

Management initiatives

This section describes the projects under each of the 53 management actions and nine initiatives in the Strategy, who is responsible for implementing them, and where they are occurring. Collaboration is important - agencies, organisations, research institutions and key stakeholders involved in delivering actions are listed in Appendix1.



Photo: 2 Kayaking. Photo: iStock.com/shapecharge ©



Photo: 3 School of Yellowtail. Photo iStock.com/Searsie ©

Initiative 1 - Improving water quality and reducing litter

The problem/opportunity

Water pollution and litter are together a significant contributor to poor water quality in the marine estate. Water quality affects the health of habitats and wildlife as well as the vast social, cultural and economic benefits provided by the marine estate.

Steps to achieving our long-term outcomes

This initiative aims to improve water quality and reduce the amount of litter in our waterways. This can take some time as complex natural systems like rivers, estuaries and coastal waters respond slowly to active management; it can take more than 10 years for water quality and ecological health to improve. Action is continuing to ensure the foundational work can begin to realise benefits.

Funding for on-ground works, such as road sealing, stock fencing, riverbank, wetland or oyster reef restoration is allocated to priority sites that have been identified in collaboration between Local Land Services, local government and marine estate agencies.

A targeted campaign seeks to change the behaviour of those responsible for marine litter and raise awareness in the broader community of the impact of litter in the marine estate. We are working with local councils to identify the sources of pollutants to their waterways and best practice responses. We are working with agricultural landholders, urban planners and developers to improve awareness of best practice to reduce the impacts of their activities on water quality.

In time, we expect to see more 'best practice' adopted in water quality and litter management as key industries and the community improve their compliance with regulations. We are also expecting more consistency and better coordination between the government agencies that can influence water quality.

Initiative objective

To improve water quality and reduce marine litter for the benefit of marine habitats, wildlife and the community.




Initiative long-term outcomes




Improved water quality and waterway health in the marine estate in alignment with community values.




Reduction in input of litter to the marine estate in alignment with community values.






Maintained or improved biodiversity and marine habitats.





Management actions and projects









Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
1.1		Improve water quality in agricultural and urban catchments using a pilot-based implementation of the Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land use Planning Decisions .				Mandatory planning control for protecting and restoring waterways and managing stormwater in the South Creek catchment.
	Risk-based framework for urban waterway health Apply the <i>Risk-based Framework</i> in South Creek as an urban diffuse source water pollution pilot.		DPIE-EES	LGOV DPI-F LLS SW WSPPO	Central Region Sydney – South Creek	Complete technical compliance guide for achieving water quality and flow-related objectives, and stormwater management in South Creek catchment. Contributed to the Richmond River catchment CMP and aligned with the Risk-based Framework.
	Risk-based framework for regional waterway health A catchment governance and waterway health officer trialling a governance framework for the Richmond River catchment. This will provide a case study on managing agricultural run-off and to enhance integration of waterway health initiatives into the development of CMPs.		DPIE-EES	LGOV DPI-F LLS	Northern Region Richmond River catchment	Barriers and opportunities identified, to the effective management of diffuse source water pollution within the Richmond River catchment. Contributed to the Richmond River catchment water quality monitoring program.









					Work collaboratively, progressing a refreshed governance framework in the Richmond River catchment.
1.2		<p>Improve the management of diffuse source water pollution by:</p> <ul style="list-style-type: none"> clarifying NSW Government and local government roles and responsibilities building capacity to implement the <i>Risk-based Framework</i> using mechanisms within existing policy, planning and legislative frameworks to improve outcomes improve minimum requirements for industry standards and ensure compliance with regulations and best practice through social research, education campaigns and compliance programs. 			<p>Consolidated the NSW Government's diffuse source water pollution management responsibilities.</p> <p>Arrangements to improve the coordination and focus of diffuse source water pollution management across NSW Government finalised.</p> <p>NSW Water Quality Objectives reviewed for all coastal catchments within NSW.</p>
	<p>Diffuse Source Water Pollution Strategy</p> <p>Review and refine government arrangements for the management of diffuse source water pollution in NSW based on learnings from earlier stages.</p>	DPIE-EES	DPI DPIE-PA EPA SW OLG GSC TfNSW WNSW LLS DPIE-W	Statewide	<p>NSW Water Quality Objectives website updated, including regional or site-specific guideline values.</p> <p>Stakeholder and practitioner guidance for applying the Risk-based Framework provided.</p> <p>Online portal of foundational datasets for the Risk-based Framework established.</p> <p>Training and professional development program developed for the Risk-based Framework.</p>
	<p>Building capacity on the Risk-based framework</p> <p>Strengthen provisions in the NSW planning system to improve the management of water quality.</p> <p>Build capacity for stakeholders to implement the <i>Risk-based Framework</i>, through delivery of guidance materials, industry forums and an online portal.</p>	DPIE-EES	EPA GSC DPI-F NSWCC Wollongong City Council Lake Macquarie City Council	Statewide	<p>Role of Water Quality Working Group reviewed.</p> <p>Fish Friendly Council workshops delivered in south coast local government areas.</p> <p>Four Fish Friendly Council educational videos completed.</p>


			Rous County Council SCCG WNSW Hunter Water SNSW Industry Practitioners		Community awareness campaign undertaken sharing Coastal Floodplain Study results. Aquatic Biodiversity Offsets project final report delivered on biodiversity 'values' review.
	Review of the NSW Water Quality Objectives Review NSW Water Quality Objectives for each catchment in coastal NSW to assess whether they reflect contemporary values and expectations, and update in selected pilot areas.	DPIE-EES	DPI DPIE-W LGOV LALCs LLS EPA WNSW DPIE-PA OLG	Statewide	
	Water Quality Working Group Representatives from all agencies with responsibility for water quality management meet to discuss water quality actions in Initiative 1 and other water quality policy issues.	DPIE-EES	DPI DPIE-PA EPA SW OLG GSC TfNSW WNSW LLS DPIE-W	Statewide	
	Coastal floodplain study Finalise draft studies and implement a communication plan to share results with stakeholders and increase their understanding and use of the results.	DPI-F	LGOV DPIE-EES DPIE-PA DPIE-W	Tweed Richmond Clarence Hastings	

			Industry	Macleay Manning & Shoalhaven estuary floodplains	
	Aquatic biodiversity offsets Develop and implement policy to protect high-value fish habitats through use of biodiversity offsets.	DPI-F	DPIE-EES LLS Private	Statewide	
	Fish friendly workshops for councils Provide training and education to south coast local council staff on how to integrate fish friendly concepts and infrastructure into on-ground works and development.	DPI-F	LGOV Industry	Bega Eurobodalla Shoalhaven	
	Construction sediment management Develop a set of approval conditions that improve the existing controls for erosion and sediment (ErSed) management at development sites during the construction phase.	DPIE-PA	DPI DPIE-EES LGOV Industry	Statewide	
1.3		Facilitate and deliver on-ground activities that reduce diffuse source water pollution through investigation and provision of cost-effective funding programs and financial incentives.			1,620m of bank stabilisation works completed. 12 gravel road sections improved. 22.5km of riverbank vegetation improved.
	Oyster reef restoration Restore areas of natural oyster reef in the Wagonga estuary with project partners, conduct knowledge gathering and awareness raising, and plan for expansion to other locations in 2022-2023. Initiate a citizen science project to contribute to filling knowledge gaps and enhance community engagement.	DPI-F	LGOV UNI NGOs	Wagonga Inlet Hastings River Botany Bay Port Stephens Statewide	10 blueberry industry growers improved farm practices. Bi-monthly Fertilizer Stewardship Group forums held and newsletters published increasing awareness of best practices.

	Oyster reef restoration research Research new restoration techniques, species and benefits in collaboration with partner organisations. Monitor the Port Stephens pilot on-ground works and initiate pre-works monitoring with partners at Botany Bay, Hastings and Wagonga.	DPI-F	Uni NGOs LLS LGOV	Wagonga Inlet Hastings River Botany Bay Port Stephens	10 agronomy advisors complete Fertcare accredited training courses. Water quality monitoring sites established and functioning. Blueberry nutrient research continued. Preliminary erosion mitigation methods identified for NorthCoast intensive plant agriculture.
	Riverbank vegetation improvements Plant new vegetation, undertake weeding, erect fencing and implement other improvements to enhance the health of waterways and their foreshores in the North Coast, Hunter and South East LLS regions. Continue to maintain revegetation work conducted in earlier stages, in these regions.	LLS	DPIE-EES LGOV DPI DPIE-W Private	Ballina Midcoast Eurobodalla Bega Valley Shoalhaven Kiama Shellharbour Wollongong	Wetland restoration projects progressed in Everlasting Swamp, and Manning and Crookhaven Rivers. Oyster reef restoration projects in Wagonga progressed. Oyster reef projects supported in Botany Bay and Hastings River.
	Clean coastal catchments on-ground Undertake on-ground works to improve land use practices to reduce nutrient and sediment run-off in the blueberry, greenhouse vegetable and intensive livestock industries.	LLS	LLS UNI NSWFA Industry	Coffs Harbour Eurobodalla Bega Valley Shoalhaven	Port Stephens oyster reef project monitoring continued. Community engagement and education activities regarding oyster reefs in NSW delivered. Oyster reef restoration research with partners supported.
	Clean coastal catchments research Influence behavioural change in on-farm fertiliser management through a structured approach to social research targeting agricultural industries and engagement of, and knowledge sharing with, industry advisors. Conduct applied research in nutrient and sediment management to reduce nutrient and sediment run-off in the blueberry, greenhouse vegetable, macadamia industries, and the livestock sector.	DPI Ag	UNI Industry LLS DPIE-EES	Coffs Harbour Ballina Eurobodalla Statewide (applied research)	

	Riverbank stabilisation Maintain existing structures constructed in earlier stages and undertake approximately 1.6km of new work, such as the construction of log, rock and vegetation bank protection that stabilise erosion hotspots, to reduce sediment entering waterways.	LLS	DPI LGOV DPIE-W TfNSW	Ballina Midcoast Eurobodalla Bega Valley Kiama Shoalhaven	
	Coastal wetland rehabilitation Contribute to Clybucca wetland restoration on-ground works, undertake necessary assessments in the Everlasting, Manning, and Crookhaven wetlands and contribute to planning for future rehabilitation activities in the Tuckean and other locations.	DPI-F	DPIE-EES DPIE-PA UNI, LLS NPWS LGOV Private	Richmond Clarence Midcoast Shoalhaven	
	Improving roads and tracks Seal 12 gravel roads and other works in the North Coast, Hunter and South East LLS regions to reduce erosion entering waterways.	LLS	LGOV DPIE-EES NPWS Private	Ballina Midcoast Eurobodalla Bega Valley Kiama Shoalhaven	
1.4	  	Implement a targeted marine litter campaign and establish a Marine Litter Working Group.			Phase 2 of the marine litter campaign delivered. New Litter Prevention Strategy and Program Plan developed to drive actions towards new litter targets (reduce litter by 60% by 2030 using the Key Litter Item study measurement). Delivered a co-design workshop with key stakeholders on design and implementation of new litter program to reach 2030 targets.
	Marine litter campaign Expand the marine component of the 'Don't be a tosser' campaign .	EPA	DPIE-EES	Statewide	
	Marine Debris Working Group Convene the Marine Debris Working Group composed of agency representatives and academic experts to oversee a marine debris risk assessment and the research,	DPIE-EES	EPA, UNSW, NPWS Taronga, NMSC, SCU,	Statewide	

	monitoring, analysis and coordination of marine litter/debris actions.		TBF, MU, SCCG		New litter prevention grants for councils and communities in the second half of 2021.
	NSW Litter Prevention Strategy Expand the Litter Prevention Strategy to enhance focus on marine litter, to contribute to reducing litter by 60% by 2030, using the marine based Key Littered Item study and incorporating additional stormwater and catchment management actions into the litter prevention program.	EPA	DPIE-EES	Statewide	A new dashboard developed to display key littered item data across the NSW coast and made accessible to key stakeholders. Marine Debris Working Group develop actions to address priority threats identified in the marine debris threat and risk assessment.
1.5	   	Develop monitoring, reporting and performance indicators for water quality actions, and incorporate them and key knowledge gaps. This action is integrated into the Monitoring Program and key knowledge gaps.			Model outputs and monitoring data collected as baselines to support the implementation of Risk-based framework in priority rural catchments (supports Action 1.1).
	Estuarine water quality monitoring Develop new indicators where relevant for integration into the Monitoring Program. Monitor and report on water quality and ecosystem health in estuaries and relevant catchments.	DPIE-EES	DPI LGOV LLS	Statewide	Water quality and ecosystem health data for the 2021-22 subset of NSW estuaries collected as part of the ongoing statewide estuary monitoring program.
	Mapping outflow events Mapping subtidal habitats and monitoring coastal outflow events to quantify impacts on coastal and marine waters.	DPIE-EES	DPIE-EES DPI LGOV	Statewide (mapping) Sydney-Metro region (riverine overflows)	Published up-to-date report card grades highlighting status and trend in ecosystem health in NSW estuaries on the DPIE EES website .
	Marina pollution monitoring A pilot program implementing and evaluating systems that trap runoff and pollution from slipways and marinas in NSW (project to commence in future years pending funding).	DPIE-EES	DPIE-EES DPI LGOV TfNSW MIAA	TBC	Estuary-type scale water quality guideline values published for a range of indicators for continued assessment of the condition of NSW estuaries. Published the preliminary statewide monitoring, evaluation and reporting

	<p>Land use pressures on the marine estate</p> <p>Monitoring the condition of gauged streams using water quality and biological indicators, stratified by different land use.</p>	DPIE-EES	DPI LGOV	<p>Sydney-Metro Hunter-Central Coast (urban catchments)</p> <p>South coast north coast (rural catchments)</p>	<p>protocol for assessing the condition of coastal freshwater streams</p> <p>Water quality and ecosystem health data collected, from assessing on-ground works and management actions (supports Action 1.3).</p> <p>Published monitoring and assessment framework for assessing remediation efforts and on-ground works.</p> <p>Assessed the extent of outflows from a subset of major estuaries following rainfall events, and the habitats these events impact.</p>
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More information

More information on Initiative 1 projects are on the marine estate web site: [strategy-implementation/water-quality-and-litter](https://www.marineestate.nsw.gov.au/strategy-implementation/water-quality-and-litter).

Case study

APPLYING THE RISK-BASED FRAMEWORK TO INFORM DECISIONS ON COSTS OF STORMWATER MANAGEMENT – LAKE ILLAWARRA PILOT

THE SITE

The Risk-based Framework project is a statewide project which will have benefits for all coastal councils. This case study includes key findings and lessons from the Lake Illawarra pilot project in Stage 1.

THE PROJECT

Decision making on stormwater infrastructure and management are large and complex but have significant flow on effects on water quality. Often councils must weigh up environmental, economic and social factors to arrive at the appropriate outcomes.

The Lake Illawarra pilot illustrates how the Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions has been applied to assist decisions on investment in stormwater infrastructure.

The project sought to provide Councils with cost-effective stormwater management strategies that protected the lake, while still accommodating extensive urban developments in the catchment. Specific objectives were:

- review stormwater treatment devices used as best-practice by the industry, and account for on-ground effectiveness and maintenance requirements
- undertake an options analysis with Councils to establish a range of stormwater management strategies and analyse the capital and maintenance costs of three strategies for managing stormwater discharges to the lake:
 - post development stormwater quality load reduction targets which are specified in the council's Development Control Plan
 - no net increase in pre-development load targets, similar to what is applied in Sydney's drinking water catchment
 - sustainable load reduction targets which are defined as the maximum load the lake can sustain before the community environmental values and uses are impacted by the stormwater discharges.
- Economic appraisal consisting of:
 - life cycle costing of the range of stormwater management strategies, and individual devices
 - co-benefits achieved by the range of stormwater treatment options
 - sustainable funding models to assess the viability of the stormwater management strategies to deliver tailored mechanisms for funding of life cycle costs of assets.

THE OUTCOMES

A cost-effectiveness analysis was used to compare the relative cost of stormwater treatment in reducing the nutrient and sediment loading to the lake. This analysis found that:

- capital and maintenance costs were lowest for delivering the post development stormwater quality load reduction targets, but the targets do not treat all stormwater discharges. For example, nutrients generated and discharged to the lake in this scenario will impact recreational and commercial uses of the lake
- costs for achieving the sustainable load reduction targets were higher, however this strategy would be cost-effective if a regional approach to stormwater infrastructure delivery was applied (e.g. large end of line wetlands, biofiltration basins and multi-functional parks)
- the benefits of a decentralised approach had the highest costs but are increasingly documented to achieve healthy waterways in addition to providing urban cooling and amenity.

As a result of the pilot, Councils have a clear pathway for improved management of waterways and stormwater in line with the certified Lake Illawarra Coastal Management Program 2020-2030. The results and learnings will be applied to other pilots across the NSW marine estate.

DELIVERED BY

DPIE-EES in partnership with Wollongong City Council and Shellharbour City Council.

RELATED ACTIONS

Relates to management actions 1.1 and 1.2.



Photo: 4. Stormwater management, Lake Illawarra. Photo: DPIE-EES.



Photo: 5. Stormwater management, Lake Illawarra. Photo: DPIE-EES.



Photo: 6: Sydney Harbour. Photo [iStock.com/structuresxx](https://www.iStock.com/structuresxx) ©

Initiative 2 - Delivering healthy coastal habitats with sustainable use and development

The problem/opportunity

Foreshore development, land use and waterway infrastructure provide important social and economic benefits for NSW. If they are not managed and planned for appropriately, they can detract from these benefits and impact on marine estate habitats and species.

Steps to achieving our long-term outcomes

This initiative coordinates the management of coastal habitats. To achieve this, we will:

- coordinate investment in established and innovative on-ground environmental activities and infrastructure management
- improve coordination across agencies to effectively manage coastal habitats
- increase stakeholder capacity and knowledge
- increase the uptake of best practice.

In the short term, we will work with agencies, management authorities and the community to improve their understanding of the threats and risks to sustainable coastal management in estuaries. We will also work towards better coordinated management, policy and approval frameworks.

In the intermediate term, we aim to see an improved evidence base, consistency, coordination and integration among responsible agencies, so these factors are embedded in their routine policies and processes. The result should be faster assessment and processing times as well as more certainty for stakeholders seeking to undertake works in the coastal zone.

Ultimately, we are aiming for better coordination of management of coastal habitats and species in the marine estate, while incorporating community values. This includes better coordination of investment planning and infrastructure management.

Initiative objective




To protect coastal and marine habitats and associated species, and enhance the health of the marine estate by improving the design, quality and ongoing management of foreshore development, use and waterway infrastructure.










Initiative long-term outcomes











Improved design and management of foreshore and coastal land use and development, balancing social and economic benefits of development with enhanced coastal and marine habitats.






Maintained or improved biodiversity and marine habitats.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
2.1		Assess and manage cumulative and legacy impacts for estuary entrance modification and dredging.				Consultation completed with commercial dredging operators about the audit findings and release of final report.
	Commercial dredging audit Implement the outcomes of the audit of commercial dredging in estuaries that identified and recommended actions to improve licencing conditions and related environmental outcomes.		DPIE-HP (CL)	DPI-F DPIE-PA	Statewide	
	Breakwater audit Audit breakwater structures-large coastal structures that train river entrances, armour harbours and manage sand along the NSW coastline, to determine opportunities for multi-use and eco-features, and develop guidelines to install these features during maintenance works.		DPI-F	TfNSW	Statewide	Release of final guidelines, audit summary report and illustrated volumes, and interactive webpage with map.

	Intermittently Closed and Open Lakes and Lagoons (ICOLL) management Develop a framework for consistent approvals and management of ICOLLs that can be included in CMPs.	DPI-F	DPIE-EES DPIE-HP (CL) DPIE-NPWS	Statewide	An Audit Report on ICOLL entrance works approvals required across agencies, with recommendations to improve consistency and clarity of approval conditions and processes.
2.2	 	Assess and manage cumulative and legacy impacts on foreshore development and land use change in the coastal zone.			Public exhibition undertaken, review, submissions report completed and guidelines finalised.
	Coastal design guidelines review Implementation of the reviewed and updated coastal design guidelines to promote best practice designs in coastal urban environments.	DPIE-PA	DPIE-EES NRAR DPIE-W DPI-F	Statewide	
2.3	  	Develop and implement a statewide policy for the management of coastal Crown lands (including submerged lands) in collaboration with local government Coastal Management Programs, in priority areas.			Domestic Waterfront Structure Strategies and web-based mapping completed for the following estuaries:
	Domestic waterfront structure strategies Develop estuary-wide strategies that reduce red tape and inform the assessment of domestic waterfront structures (such as pontoons and boat ramps) spanning the intertidal foreshores.	DPI-F	DPIE-W DPIE-HP (CL) DPIE-PA TfNSW LGOV DPIE-EES	Tweed, Byron Ballina Richmond Valley Lismore Wollongong Shellharbour Shoalhaven	<ul style="list-style-type: none"> Richmond River Brunswick River Evans River Lake Illawarra St Georges Basin Lake Conjola
	Marine vegetation strategies Develop marine vegetation management strategies that maximise resilience, accommodate sea level rise and address key threats such as clearing, drainage, cattle grazing and four-wheel drive access on saltmarsh. Strategies also facilitate rehabilitation opportunities and	DPI-F	DPIE-EES DPIE-HP (CL)	Statewide Tweed Ballina	<p>Report prioritising blue carbon sites in NSW, incorporating some temporal analysis, finalised.</p> <p>Marine Vegetation Management Strategies completed for Tweed River, Richmond River and three south coast estuaries (TBC).</p> <p>Testing completed on the estuary bank management Decision Support Tool and apply it to Tweed and</p>

	reduce red tape for low impact works (e.g. mangrove trimming for safety traffic sight-lines).				Brunswick estuaries to complete the mapping, and three south coast estuaries (TBC).
	Estuary bank management strategies Investigate estuary-wide bank protection options in three estuaries to inform the assessment of bank protection work proposals (including beach nourishment and grooming) and facilitate rehabilitation opportunities.	DPI-F	DPIE-W DPIE-HP (CL) DPIE-EES DPIE-PA LLS, LGOV		
2.4	  	Re-establish resilient coastal floodplains and connectivity within coastal catchments by: better aligning existing government policy and resourcing of floodplain and drainage management providing fish passage at priority weir and road crossing barrier sites in coastal catchments.			Results of stakeholder consultation on regulatory concerns and opportunities distributed. Regulatory reform options developed, consultation undertaken, and recommendations completed. Fish passage improved at Jerrys Plains Weir on the Hunter River and Cooke's Weir on the Richmond River.
	Coastal floodplain drainage management Improve coastal floodplain infrastructure management by better aligning existing government policy and resourcing for improved water quality and drainage management outcomes through regulatory mechanisms.	DPI-F DPIE-W	DPIE-PA DPIE-HP (CL) DPIE-EES NRAR LGOV	Statewide	
	Reconnecting fish habitats Provide fish passage at priority weir and road crossing barrier sites in coastal catchments. Works to be completed at Jerrys Plain Weir and commence Cooke's Weir removal in the Richmond River.	DPI-F	WNSW	Statewide	
2.5	  	Undertake research and monitoring to address key knowledge gaps and assess the effectiveness of the management actions within this initiative. This action will be integrated into the Monitoring Program.			Completed macrophyte and disturbance maps for 5 estuaries. Release of an Estuarine Habitat Data Dashboard compiling historical macrophyte mapping and identifying changes over time. Rollout of new methods for mapping saltmarsh and mangroves.
	Mapping seagrass, mangrove and saltmarsh Estuarine scale mapping of macrophytes and disturbances, to update data sets and fill knowledge gaps. Data used to inform the development of marine	DPI-F		Kempsey Lake Macquarie Sydney	

	vegetation strategies, for use by local government, and to inform climate change actions.			Eurobodalla	Developed methods for estimating mangrove condition and recovery from damage.
	Innovative technology research Development of artificial intelligence methods for improving seagrass, mangrove and saltmarsh mapping, assessing habitat condition and changes in species composition. An extension of the mapping project.	DPI-F	DPI-Fo	Port Stephens Lake Macquarie Sydney	Released maps showing predicted distribution of mangrove and saltmarsh under sea level rise. Released maps identifying damage to saltmarsh from off road vehicles.
	Threats to estuarine vegetation Research on anthropogenic impacts to seagrass, mangroves and saltmarsh to fill knowledge gaps. Data to be used in management and policy development, CMP planning and climate change projects.	DPI-F	EES	Statewide	Estuarine fish monitoring competed in Pittwater. Completed baited underwater video monitoring of the region's rocky reef fishes, and species distribution maps for snapper and kelp.
	Threats to estuarine fish assemblages Research to quantify the influence of boating infrastructure, stormwater drains and natural habitats on fish assemblages and better understand potential human impacts. Trialled at a broad seascape approach.	DPI-F		Greater Sydney Region	Completed research on jetty design features and drafted guidelines to reduce seagrass loss in Port Hacking.
	Subtidal reef monitoring Research on the diversity, abundance and size of fishes and the distribution of kelp and sessile invertebrates across the Greater Sydney region's deep rocky reefs.	DPI-F		Greater Sydney Region	
	Reviewing jetty designs Research on jetty design features that contribute to the loss of seagrasses and develop guidelines for estuaries in the Greater Sydney region to reduce seagrass loss.	DPI-F		Greater Sydney Region	

More information

More information on Initiative 2 projects are on the marine estate web site: [strategy-implementation/delivering-healthy-coastal-habitats-with-sustainable-use-and-development](https://www.marineestate.nsw.gov.au/strategy-implementation/delivering-healthy-coastal-habitats-with-sustainable-use-and-development)

Case study

FIRST PASS PRIORITISATION FOR BLUE CARBON

THE SITE

A statewide first pass prioritisation for Blue Carbon and co-benefits in NSW.

THE PROJECT

The tidal conditions in which mangroves and saltmarshes thrive, enable the storage of carbon in the oxygen depleted sediments in their above-ground and below ground biomass. High rates of carbon sequestration and storage in these ecosystems has led to scientific and policy interest in the role blue carbon has in climate change mitigation efforts. A methodology for assessing activities that improve blue carbon sequestration by reintroducing tidal flows to landscapes where they have previously been obstructed is being developed by the Australian Government. Once implemented, the Emissions Reduction Fund will incentivise reintroducing tidal flows to restore and manage mangrove and saltmarsh habitats.

DPI Fisheries collaborated with experts from the University of Wollongong who undertook a pixel-based approach to identify blue carbon areas along the NSW coast where carbon storage, preservation, permanence and generation are relatively high. In addition, a database of fish passage barriers was used to identify 78 priority structures that truncate tidal flows.

It was found that the broad coastal floodplains of northern NSW have 5,146 ha (~51 km²) of former tidal plains upstream of drainage and flood mitigation structures that form barriers. Whilst 928 ha occurs on the South Coast. Cumulatively these barriers preclude tidal flows from ~61 km² of former mangrove and saltmarsh habitat, approximately 31% of the existing intertidal macrophyte estate in NSW.

Reintroducing tidal flows into these areas aligns with the Australian Government's proposed methodology and could provide commercial blue carbon opportunities. This data set is key to maximise blue carbon opportunities in NSW and highlights an urgent need to audit the position, function and condition of engineered tidal barrier structures to improve decision-making. It also informs the decision making that will be required as sea-level rise compromises the functionality of existing engineered structures with decisions to maintain or upgrade these structures costed against the lost blue carbon and other co-benefits (such as water quality improvements, biodiversity values, foreshore protection, fisheries production, social and cultural values) that could be realised with removal of tidal impediments, and aid ecosystem restoration.

THE OUTCOMES

Preparation of A Coastal Wetland Restoration First Pass Prioritisation for Blue Carbon and Co-benefits in NSW is a first step into investigating blue carbon opportunities in NSW. The prioritisation links with the delivery of several MEMS actions, in particular, the development of estuary specific marine vegetation management strategies and helps the prioritisation and undertaking of on ground coastal wetland rehabilitation projects that could involve the restoration of natural hydrology.

DELIVERED BY

DPI-Fisheries in collaboration with the University of Wollongong.

RELATED ACTIONS

Relates to management actions 1.2, 2.3, 2.4 and 3.1.

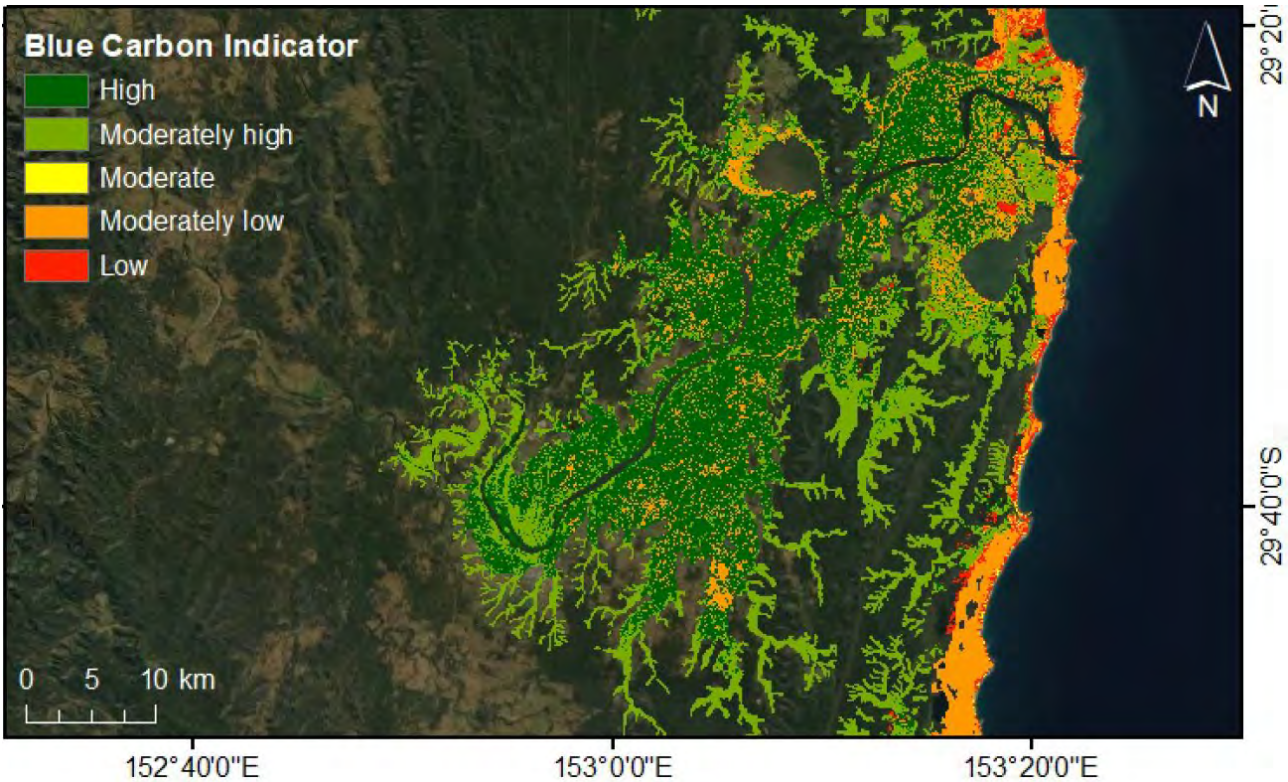


Figure 2. Storage, preservation, generation, permanency of blue carbon and Blue Carbon Indicator distribution on the Clarence River.



Photo: 7. Storm over Bondi. Photo [iStock.com/RugliG](https://www.iStock.com/RugliG) ©

Initiative 3 - Planning for climate change

The problem/opportunity

The effects of climate change are expected to increase over time. What is not always known is the likelihood and consequence of these effects. As a result, the effects of climate change are often not well planned for.

Steps to achieving our long-term outcomes

This initiative aims to incorporate climate change impacts into adaptation planning, strategies and decision making.

In the short term, we will monitor and report on the ongoing and likely effects of climate change in the NSW marine estate. The aim is to fill knowledge gaps in climate change impacts.

In the intermediate term, we aim to improve our knowledge of climate change impacts as well as increase the capacity of coastal and marine managers and communities to anticipate climatic impacts, and provide improved access to new knowledge.

In the long-term, our actions are designed to help us understand, adapt and increase resilience to help mitigate the impacts of climate change in the NSW marine estate.




Initiative objective








Understand, adapt and increase resilience, to help mitigate the impacts of climate change on the NSW marine estate.


Initiative long-term outcomes

Adaptation planning, strategies and decision making across the marine estate incorporates the likely future impacts of climate change.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver 2021-2022
3.1		Enhance mapping of estuarine communities (such as saltmarsh and mangroves) to identify those communities most at threat from sea level rise expected under climate change scenarios and use this information to model areas of land suitable for retreat and those that should be prioritised for protection. Apply this information in decision making.				
	Climate change threats to mangrove and saltmarsh Develop a first-pass model of wetland distributions under future sea level rise scenarios to help identify those most at risk and to prioritise land suitable for wetland protection and retreat (see Action 2.3). Use models to identify where future macrophyte mapping is most needed (see Action 2.5). Outputs are used to inform the development of marine vegetation strategies.		DPIE-EES	DPI-F	Statewide	Outputs finalised from the statewide, first-pass mangrove and saltmarsh vulnerability assessment to sea level rise (including maps of potential future mangrove and saltmarsh areas under three sea level rise scenarios for 110 NSW estuaries) Second-pass assessment of mangrove and saltmarsh vulnerability to sea level rise in priority estuaries, that includes consideration of climate changes to catchment hydrology Model developed for testing management options at an individual wetland scale.
3.2		Provide support to coastal and marine managers to facilitate consistent application of the NSW and ACT Regional Climate Modelling (NARClIM) projections in marine management.				

	Consistent regional climate modelling Provide support to coastal and marine managers to facilitate consistent application of the NSW and Australian Capital Territory (ACT) Regional Climate Modelling (NARClIM) projections in marine management (project to commence in future years pending funding).	DPIE-EES	DPI-F	Statewide	
3.3		Build the knowledge and capacity of coastal and marine managers and the communities to increase resilience to climate change in the marine estate by facilitating strategic adaptation planning and management.			Finalise climate change adaptation assessment approach.
	Climate change adaptation Using adaptation assessments, build knowledge and capacity of coastal and marine managers and communities to increase resilience and identify adaptation solutions to climate change in the marine estate.	DPIE-EES	DPI-F	Statewide	
3.4		Investigate the impacts of climate change on Aboriginal cultural heritage values in the marine estate and implement strategies to reduce or adapt to this risk.			Project delivered in Initiative 4.
3.5		Research and monitor the effects of climate change on the marine estate to fill knowledge gaps and inform future management actions, focusing on marine biodiversity and coastal communities. This action will be integrated into the Marine Integrated Monitoring Program.			Commence climate change research to fill priority knowledge gaps. Progress monitoring and modelling underway. Support REDMAP and use data to inform change in species distributions in NSW.
	Climate change research Targeted experimental research to fill priority knowledge gaps about probable climate change impacts on environmental assets in the marine estate.	DPI-F	DPIE-EES	Statewide	
	Climate change monitoring Monitoring the condition and resilience of priority environmental assets at most risk from climate change on offshore rocky reefs focussing primarily on canopy forming macroalgae.	DPI-F		Statewide	

	Climate change citizen science Mapping marine species redistributions due to climate change using community data.	DPI-F	UTas	Statewide	
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More information

More information on Initiative 3 projects are on the marine estate web site: [strategy-implementation/planning-for-climate-change](https://www.marineestate.vic.gov.au/strategy-implementation/planning-for-climate-change)

Case study

STATEWIDE MODELLING OF SUBTIDAL MARINE HABITATS IN THE NSW MARINE ESTATE

THE PROJECT

Climate change is a priority threat to many environmental, economic, social and cultural values of the NSW marine estate. Rocky reef habitats have already experienced climate-related declines in some biota and this is threatening biodiversity and other ecosystem goods and services. There is considerable uncertainty in the rate and scale of future impacts. This project aims to use the first three years of monitoring data that has been collected to develop predictive models of rocky reefs biota in NSW to better inform management to understand likely climate change impacts and conservation strategies.

THE OUTCOMES

Over the last three years scientists collected baseline data on rocky reef biota over 1000km of coastline. This allowed sensitive indicators of climate driven change and likely refugia for kelp to be identified. Ongoing monitoring of the resilience and condition of rocky reefs in the NSW marine estate will continue. Monitoring and reporting will be used to detect and document impacts of climate change and inform management and conservation strategies. Monitoring will be combined with experimentation to determine drivers of change and modelling to understand likely future change. This will include using climate projections for the state along with stacked species distribution models that consider key species interactions to refine predictions. The project allows marine estate management agencies to understand and predict climate mediated shifts in subtidal communities along the NSW coast and develop 'future-proof' management actions and plans.

DELIVERED BY

DPI-Fisheries

RELATED ACTIONS

Relates to management action 3.5.



Photo: 8. Scientist collecting baseline data on kelp on rocky reefs off NSW coastline. Photo Tom Davis DPI



Photo: 9. South Coast Sea Country education program. Photo, Ian Kerr, DPI

Initiative 4 - Protecting the Aboriginal cultural values of the marine estate

The problem/opportunity

There are high-risk threats that cumulatively affect Aboriginal cultural heritage associated with Sea Country. There are also significant knowledge gaps relating to cultural values. Aboriginal people and their cultural values are not yet appropriately represented or engaged in management of the marine estate.

Steps to achieving our long-term outcomes

This initiative aims to increase the broader community's understanding of Aboriginal Sea Country values. It also aims to increase the economic and employment opportunities for Aboriginal people, as well as increase their ownership and active involvement in managing the marine estate.

The Aboriginal community is becoming more involved in marine estate natural resource management, tourism and the aquaculture and fishing sectors. Eight Aboriginal staff are employed in DPI-Fisheries under the Strategy, which will expedite many of the actions in Initiative 4, particularly in relation to research and monitoring programs and documentation of cultural values.

Through this initiative, we will see increased opportunities for Local Aboriginal Land Councils and other Aboriginal organisations in securing contracts and employment in the marine sector.

Initiative objective

Work with Aboriginal communities in the management of Sea Country to reduce threats and risks to Aboriginal cultural heritage.

Initiative long-term outcomes









The broader NSW community has a greater appreciation of the significance of Sea Country for Aboriginal people.






Aboriginal people derive greater economic benefit from the marine estate.











Reduced threats to Aboriginal cultural heritage and use in the marine estate.





Improved Aboriginal satisfaction with Sea Country management.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022:
4.1	  	Work with Aboriginal communities to evaluate current arrangements for Aboriginal involvement in Sea Country management and decision making and establish and implement a framework to ensure the involvement of Aboriginal people is effective and appropriate.				Aboriginal roles retained. Commence drafting an Aboriginal Engagement Framework in collaboration with Aboriginal people.
	Sea Country management Enhance opportunities for Aboriginal employment in NSW Government to manage Sea Country.		DPI-F	DPIE-ESS	Statewide	
	Aboriginal engagement Evaluate current arrangements of Aboriginal peoples' participation in Sea Country management and establish an effective Aboriginal Engagement Framework.		DPI-F	DPI-EES	Statewide	
4.2	  	Work with Aboriginal communities to identify the cultural values of Sea Country to improve the incorporation of values into decision making for the marine estate.				Sea Country Plan development piloted on the south coast of NSW

	Sea Country plans Develop Sea Country Plans with Aboriginal communities. Sea Country Plans are an important way for Aboriginal people to determine their custodian roles, responsibilities and priorities to care for Sea Country and protect their cultures. It also provides important cultural information such as cultural management practices, subsistence fishing and continuity of cultural traditions to be handed down for future generations.	DPI-F	DPIE-EES Local Aboriginal communities LALCs TOs	Batemans Bay	Cultural Resource Use Agreement finalised between the Worimi People and Port Stephens-Great Lakes Marine Park Hold the Cape Byron and Port Stephens-Great Lakes Marine Parks cultural immersion 'Elders as Mentors' days and plan to broaden the project to outside of Marine Parks.
	Cultural Resource Use Agreements Develop Cultural Resource Use Agreements between Aboriginal communities and marine parks.	DPI-F	DPIE-EES Local Aboriginal communities LALCs	Port Stephens	Yaegl and Arakwal cultural interpretation projects progressed.
	Cultural Immersion 'Elders as mentors' Deliver Cultural Immersion 'Elders as Mentor' project in the marine estate. Elders are important knowledge holders in Aboriginal communities. This project provides a special opportunity to respect and honour Aboriginal Elders as experts to spend time alongside marine estate staff and impart knowledge so that a greater respect and appreciation of Sea Country and Aboriginal cultural values can be obtained.	DPI-F	DPIE-EES Local Aboriginal communities LALCs TOs	Statewide	Trial the inclusion of cultural interpretations in Aquatic Reserves signage.
	Cultural interpretations Work with Aboriginal communities to increase cultural interpretation in marine protected areas. This includes signage and artwork depicting the stories and cultures of Aboriginal peoples' connections to Sea Country, developed with Aboriginal communities to increase public awareness of Aboriginal cultural values.	DPI-F	DPIE-EES Local Aboriginal communities LALCs TOs	Sydney	
4.3		Increase Aboriginal participation in marine estate management, planning and monitoring through employment and training of Aboriginal people at a regional and local level.			Sea Country ranger projects delivered.

	Sea Country rangers Work with Aboriginal communities to design and deliver a caring for Sea Country ranger model and activities across the marine estate.	DPI-F	DPIE-EES TfNSW Local Aboriginal communities LALCs TOs	Statewide	Environmental improvements to the Tura Headland. Clean River Clean Sea Country project delivered by Aboriginal rangers, including monitoring component.
	Reviving culture Work with Aboriginal communities to maintain or revive cultural knowledge's and practices of Sea Country.	DPI-F	DPIE-EES TfNSW Local Aboriginal communities LALCs TOs Parks Australia	Northern and Central regions	Worimi and Yaegl Sea Country School Education program continued to be developed.
4.4	   stage stage stage 2020-21 2021-22	Explore and assist Aboriginal people implement opportunities for economic development in the NSW marine estate and improved representation of Aboriginal cultural values in NSW marine parks.			Increased number of people engaged in central and northern regions to establish, retain or grow Aboriginal businesses in the marine estate.
	Cultural economic development Identify and expand opportunities for economic development across the marine estate.	DPI-F	DPIE-EES UNI LALCs TOs	Statewide	Grant opportunities enhanced for Aboriginal people, to undertake activities in the fishing and seafood industry.
	Cultural fishing funds Delivering targeted funds to increase economic opportunities for Aboriginal people in the fishing and seafood industry.	DPI-F		Statewide	
4.5	   stage stage stage 2020-21 2021-22	Integrate research and monitoring into the Monitoring Program to address key knowledge gaps and assess management effectiveness in reducing threats and risks to Aboriginal cultural heritage.			Sea Country Science Camps held in Eden and Jervis Bay and an increase in Aboriginal people

	Cultural research and monitoring Develop a research, monitoring and evaluation approach that is integrated with the Aboriginal Engagement Framework and aligns with the Marine Integrated Monitoring Program.	DPI-F	DPIE-EES UNI	Statewide	involved in in DPI-F research projects. Increase in recorded history and significance of fish traps and management plans as relevant to each cultural site.
	Cultural Site Protection Undertake local cultural research activities with local Elders and communities, starting with Buckenbowra fish trap.	DPI-F	DPIE-EES HNSW	South Coast	Midden analysis and sorting at a south coast site conducted.
	Pipi harvest Consolidate research and implement Stage 2 of Safe and Sustainable Sea Country Harvest of Shellfish project enabling Aboriginal people to harvest pipis and consume them safely for cultural purposes.	DPI-F	SFNSW UNI LALCs TOs	Statewide	Stage 2 of the safe and sustainable harvest of shellfish program commenced. Aboriginal people led work to conserve and protect significant cultural and spiritual sites affected by climate change in the Batemans Bay pilot area.
	Climate change on culture Investigate the impacts of climate change on Aboriginal communities and culture in the marine estate and develop strategies to reduce or adapt to this risk.	DPI-F	DPIE-EES HNSW	South Coast	

More information

More information on Initiative 4 projects are on the marine estate web site: [strategy-implementation/protecting-the-aboriginal-cultural-values-of-the-marine-estate](https://www.marineestate.nsw.gov.au/strategy-implementation/protecting-the-aboriginal-cultural-values-of-the-marine-estate)

Case study

WALLAGA LAKE BOAT BUILD

THE SITE

The Wallaga Lake boat building project was conducted in Eurobodalla and Bega Valley local government areas.

THE PROJECT

This project involved the Wallaga Lake men's group in the construction of a small row boat for the community to conduct the mesh netting of fish.

Aboriginal people hold custodian relationship with Sea Country and have cared for it for thousands of years. The project supports both the opportunity for the continuation of a significant cultural fishing practice as well as economic development opportunities through capacity building related to boat building.

The boat building project allowed the community to come together to revitalise an important cultural fishing practice of providing fish to Elders at the Wallaga Lake Aboriginal community village.

THE OUTCOMES

The boat building skills learnt by participants from this project have similarities to the traditional skills applied in cultural watercraft building. The boat building project also aligned with the Aboriginal Fishing Trust funded cultural net making workshop project. Together, these projects provided the opportunity for the local Aboriginal community to pass on cultural knowledge and skills which improves the social and mental health benefits to the Aboriginal community.

The sharing of this knowledge provides a window into the importance of places, traditional practices and spiritual connection of these activities to the First People of the Yuin Nation. It also showcases their custodianship responsibilities and cultural values and knowledge for Sea Country (as appropriate) with the broader public.

DELIVERED BY

Katungul Aboriginal Corporation Regional Health and Community Service.

RELATED ACTIONS

Relates to management actions 4.2 and 4.5



Photo: 10. Boat building with the Wallaga Lake mens' group. Photo Wally Stewart



Photo: 11.Vulnerable species of Hammerhead shark. Photo [iStock.com/extreme-photographer](https://www.iStock.com/extreme-photographer) ©

Initiative 5 - Reducing impacts on threatened and protected species

The problem/opportunity

Climate change and human activities on land and water are a cumulative threat to threatened and protected species of the marine estate.

Steps to achieving our long-term outcomes

In this initiative we will reduce the cumulative threats to threatened and protected species. This will allow the continued social, cultural and economic benefits the community derives from the biodiversity of the marine estate.

This a complex set of threats that will take time to understand and address. In 2021-2022, we will work with our staff and other stakeholders to better organise our responses to marine wildlife incidents. This includes expanding the NPWS *Elements* database so it can capture information about marine wildlife incidents from outside NPWS in real time.

We will also develop targeted education and compliance campaigns. The aim is to improve awareness of threatened and protected species and compliance with regulations.

Finally, this initiative will explore new and emerging technologies to better understand threats from bycatch and interactions with threatened and protected species. It also seeks to modify gear use to ameliorate those threats.








Initiative objective




To understand and mitigate threats to threatened and protected species in NSW.











Initiative long-term outcomes






Improved or maintained conservation status and health of targeted threatened and protected species in the wild.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
5.1	  	Improve strategic planning and coordination for threatened and protected species programs across NSW to address priority threats.				Developed an operational model to maximise effectiveness of marine wildlife rescue.
	Planning to protect marine wildlife Improve strategic planning and coordination for threatened and protected species programs across NSW, including implementation of the Marine Wildlife manual, to address priority threats.		DPIE-EES NPWS	DPI-F TfNSW Rescue and rehabilitation organisations Specialist veterinarians EPA LGOV	Statewide	Coordinated responses to wildlife emergencies and events (strandings, entanglements, haul outs and turtle nesting). Engagement of the Marine Wildlife Response Working Group. Consolidation of data for the Monitoring Program to inform the five-year TARA review and Strategy health checks.
5.2	  	Strengthen partnerships for marine threatened and protected species conservation response to ensure effective wildlife management.				Cooperative arrangements with partners developed, to assist in marine wildlife management.

	Partnerships to protect marine wildlife Strengthen partnerships for marine threatened and protected species conservation response, to ensure effective wildlife management, incident response and rehabilitation.	DPIE-EES NPWS	DPI-F TfNSW	Statewide	New marine wildlife emergency response training delivered. Implementation of procedural documents, tools and training among government and stakeholders such as local councils, wildlife rehabilitation sector, marine rescue, Water Police and DPI-Fisheries staff. Expanded necropsy program delivered to assess and understand trends in threats to marine wildlife in NSW. Cultural protocols for marine wildlife management progressed including protocols and outcomes from Sea Country Plans developed under Initiative 4 into NPWS Operational Response Plans.
5.3		Improve awareness of threats to threatened and protected species and compliance with regulations to reduce impacts through education campaigns, social research (see Initiative 8) and increased compliance.			Development of guidelines for the management of beach nesting shorebirds. Technical documents developed for Coastal Management Programs and other policy documents, advising of actions to reduce threats in NSW for threatened and protected marine species. 'Right Whale ID' citizen science Southern Right Whale drone project delivered. Educational resources for stakeholders developed on marine mammals. Community engagement materials developed for use at events.
	Education to protect and conserve marine wildlife Improve awareness of threats to threatened and protected species and community compliance with regulations, to reduce impacts through education campaigns, social research and effective compliance.	DPIE-EES NPWS	DPI-F	Statewide	

5.4	  	Improve reporting and data sharing on marine threatened and protected species to support evidence-based decision making, including linking and enhancing existing databases, raising awareness of reporting pathways, actively analysing and communicating data more regularly, and integrating research and data into the Monitoring Program.	Support provided for the on-boarding and training of all external partners as they develop skills and experience in Elements database. Historical marine wildlife emergency data included in the Monitoring Program to support trend analysis. Dashboard developed to share information and data.		
	Improve reporting of interactions with marine wildlife Improve reporting and data sharing on marine threatened and protected species to support evidence-based decision making, including linking and enhancing existing databases, raising awareness of reporting pathways, actively analysing and communicating data more regularly, and integrating research and data into the Monitoring Program.	DPIE-EES NPWS	DPI-F Veterinarians Rescue and rehabilitation organisations	Statewide	
5.5	  	Expand existing observer programs, including the use of new technologies, into the commercial fishing moderate and high-risk fisheries to better understand the threats associated with bycatch and interactions with threatened and protected species.	Observer-based survey of the Ocean Trap and Line Fishery extended, to include a small-scale survey of the central region. Electronic monitoring system trialled on a small number of commercial fishing vessels. Observer-based survey of the Estuary General mesh net fishery implemented to address threats to fish assemblages. Bycatch data collected from the NSW Ocean Trawl Fishery observer program analysed to address threats to fish assemblages. The potential effects of oceanographic conditions on the		
	Ocean Trap and Line Fishery observer survey Extend observer-based survey of the Ocean Trap and Line Fishery to include a third year of intensive sampling.	DPI-F	Industry DPIE-EES	Northern and Central regions	
	Estuary General Fishery observer survey Implement observer-based survey of the Estuary General mesh net fishery to address threats to fish assemblages (harvest and bycatch).	DPI-F	Industry DPIE-EES	Statewide	
	Ocean Trawl Fishery observer survey Analyses of bycatch data collected from the NSW Ocean Trawl Fishery observer program to address threats to fish assemblages (harvest and bycatch stressors).	DPI-F	Industry DPIE-EES	Northern and Central regions	

	Strategies for mitigating species interactions Work with stakeholders across all fishing sectors to develop measures to reduce interactions and increase reporting of non-target species including fishing gear modifications or other technologies (linking with Initiatives 5 and 8).		DPI-F	Industry DPIE-EES UNSW OWA	Statewide	probability of whale entanglements in NSW set fishing gear examined. Continued trialling and development of commercial fishing gear modifications and other technologies to understand and reduce non-target species interactions.
5.6		Understand and reduce impacts of threatened and protected species habitat modification through mapping of key habitat areas, embedding rehabilitation and conservation actions in planning processes, and collaborating with land owners and the community to protect species and habitats.				Postponed to future years (pending funding).
	Species habitat research Understand and reduce impacts of habitat modification on threatened and protected species (project to commence in future years).		DPIE-EES	DPI-F	Statewide	
5.7		Undertake a research program to address key knowledge gaps associated with cumulative threats to threatened and protected species and the effectiveness of management interventions. This action is integrated into the Monitoring Program.				Distribution of research prospectus to universities and key partners to facilitate collaboration on priority threats to marine wildlife.
	Species monitoring Undertake research and monitoring to help fill key knowledge gaps identified in the statewide TARA, and to address cumulative threats to marine wildlife, monitor trends in threats and the health and condition of their habitats (new project).		DPIE-EES	DPI-F	Statewide	Completion of analysis of historical marine wildlife data and preparation of scientific papers with partner organisations.

More information

More information on Initiative 5 projects are on the marine estate web site: [strategy-implementation/reducing-impacts-on-threatened-and-protected-species](https://www.marineestate.nsw.gov.au/strategy-implementation/reducing-impacts-on-threatened-and-protected-species)

Case study

RIGHT WHALE IDENTIFICATION – WORKING WITH THE COMMUNITY TO MONITOR ENDANGERED SOUTHERN RIGHT WHALES

THE SITE

Endangered Southern Right Whales predominately occur in Southern NSW but are observed along the whole coast of NSW. The Right Whale ID citizen science project activate specially trained drone operators along the NSW coast to capture images.

THE PROJECT

It is nearly 60 years since whaling ended in NSW. Unlike Humpback Whales that have a migrating population of over 40,000, Southern Right Whales are not recovering well on the east coast of Australia. There are thought to be fewer than 70 Southern Right Whales that migrate north, into NSW waters, each year. Southern Right Whales can be identified by a unique pattern on their head, made by the shape, size and location of white hardened skin 'patches' called callosities.

By taking a photo from above the whale, the pattern can be compared to photographs in an existing catalogue which will allow each whale to be identified, and new sightings entered in the system. Legally, a drone can be used to take a photo from at least 100 metres above a whale, but it is not allowed to hover.

The 2021 Right Whale ID project will recruit and train volunteer drone operators to take images using their drone legally and advise on how to share images for use in the project. Using mobile applications, reports of Southern Right Whales in coastal NSW waters will trigger a local notification to trained drone operators who will deploy to the location to obtain images. Once on site they will collect both head and body images and general information about the whale. Once uploaded the data will be compiled and shared with WhaleFace – Southern Right Whale photo identification project.

THE OUTCOMES

This project will provide critical information about individual Southern Right Whales migrating north into NSW waters, including when and where they like to go, increasing our knowledge and understanding about the Australian east coast population and the threats in NSW.

The Right Whale ID project increases community awareness and participation in marine estate management and encourages greater compliance to approach distances under the *Biodiversity Conservation Act 2016*, which aims to minimise disturbance on whales in NSW.

DELIVERED BY

National Parks and Wildlife Service in collaboration with Saving Our Species and trained volunteer drone operators in NSW.

RELATED ACTIONS

Relates to management actions 5.1, 5.2, 5.4 and 5.7.





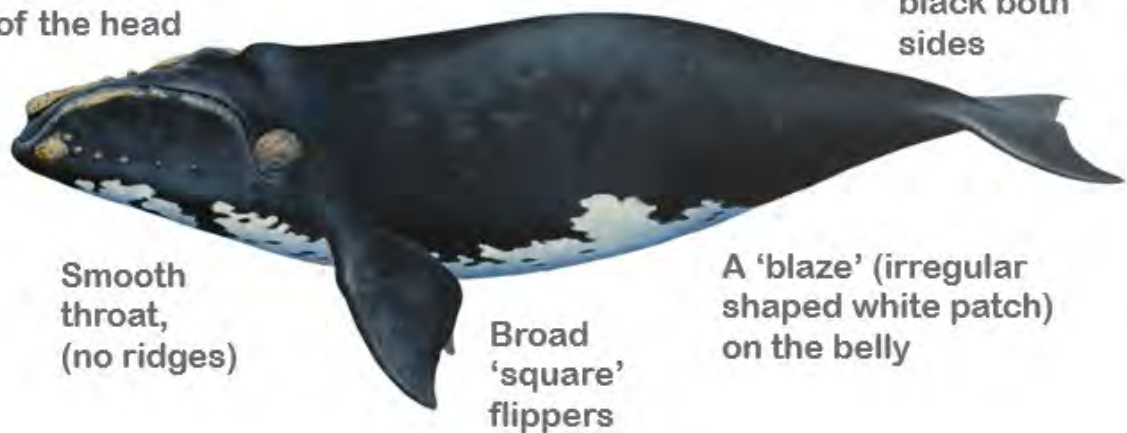
Photo: 12. Drone operator searching for a Southern Right Whale. Photo Kerry Cooper, NPWS.

Features to confirm a Southern Right Whale

Light-coloured
hardened skin
patches on the
top of the head

No dorsal fin

Smooth edge
tail, usually
black both
sides



Smooth
throat,
(no ridges)

Broad
'square'
flippers

A 'blaze' (irregular
shaped white patch)
on the belly

Illustrations: Brett Jarrett

Photo: 13. Key features of a Southern Right Whale



Photo: 14. Commercial fisher. Photo iStock.com/kali9 ©

Initiative 6 - Ensuring sustainable fishing and aquaculture

The problem/opportunity

Sustainable fishing and aquaculture need to be provided for, but they also need to be managed to reduce priority threats to the environmental assets of the marine estate. This initiative will support significant social and economic benefits for the people of NSW, as well as cultural benefits to Aboriginal people.

Steps to achieving our long-term outcomes

This initiative aims to improve the ecological sustainability and economic viability of all types of fishing and seafood harvesting activities in the marine estate. By the end of the 10-year Strategy, we will have developed harvest strategies, undertaken an environmental assessment of recreational fishing, revised recreational fishing rules, supported new marine aquaculture ventures, and worked with industry on fishing and seafood related education and marketing campaigns.

In the short term we will:

- improve understanding among agencies and commercial and recreational fishers of the impacts of fishing and aquaculture on the marine estate
- develop best practice guidelines and rules to ensure ecologically sustainable practices
- enhance opportunities for sustainable commercial and recreational fishing, aquaculture and the values they provide to the community.

An intermediate term aim is for fishers to improve their self-compliance with rules and regulations and for an improved understanding by the community of the risk posed by marine pest and disease to the marine estate and ways they can minimise these risks.






Initiative objective









To ensure fishing and aquaculture is managed in a way that is consistent with ecologically sustainable use while providing for the health, heritage and social benefits of fishing and seafood consumption.





Initiative long-term outcomes












Improved ecological sustainability, economic viability and community wellbeing of fishing and aquaculture in the marine estate.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
6.1	  	Introduce harvest strategies and evaluate ecological risk in partnership with stakeholders and shareholders to address threats to fish assemblages from harvest and bycatch that result in reductions in abundance of species and trophic levels.				
	Harvest strategy development Develop and operationalise NSW Government policy and guidelines on fisheries harvest strategies, and progress assessment and management of ecological risk posed by NSW fisheries, prioritising potential management responses.		DPI-F	Industry AFAC CommFish RFNSW MFAC Community	Statewide	Harvest strategies approved for the Lobster and Trawl Whiting fisheries, containing agreed objectives, target and limit reference points, and decision rules to guide setting of Total Allowable Catch. Draft harvest strategies developed for Spanner Crab and Mulloway. Commencement of one fishery-level harvest strategy to provide a framework for managing multiple stocks and broader issues such as ecological risk.
	Harvest strategy research Review, develop, evaluate and implement analytical components of harvest strategies and ecological risk assessment, including the use of decision-making tools for NSW fisheries, linking commercial, recreational and Aboriginal cultural fisheries information (links with management action 6.5).		DPI-F	Industry AFAC CommFish RFNSW MFAC Community		Development of a framework to ensure Aboriginal cultural fishing is effectively incorporated into harvest strategy development and capacity building workshops delivered.

						Capacity-building materials developed to support early stakeholder engagement in harvest strategy working groups and understanding of key concepts. Options to manage priority ecological risks explored. Communications material developed promoting the benefits of fisheries science and management, including harvest strategies.
6.2	  	Conduct an environmental assessment of recreational fishing, periodically review current rules and implement management actions to improve fish stocks and to address threats associated with harvest, bycatch and illegal sale of fish.				Completed a social and economic risk assessment of recreational fishing (saltwater) on other users. Completed an environmental assessment of recreational fishing (saltwater) including consideration of key methods driving risk. Distribution of responsible fishing gear to the community to reduce environmental impacts from recreational fishing – including education and advisory material.
	Recreational fishing environment assessment Develop an environmental assessment of recreational fishing (saltwater), prepare a Recreational Fishing Management Strategy (RFMS) and commence implementation of key recommendations.		DPI-F	Industry	Statewide	
6.3	  	Explore opportunities for new marine aquaculture ventures.				Processing of new applications for marine aquaculture ventures as they arise. Investigations continued into marine aquaculture best practices.
	Marine aquaculture Utilise the Marine Waters Aquaculture Strategy to identify and establish new marine aquaculture ventures in NSW.		DPI-F	DPI	Statewide	

6.4	<div><div>stage1</div><div>stage22020-21</div><div>stage22021-22</div></div>	Apply best practice guidelines for seagrass protection in the NSW Oyster Industry Sustainable Aquaculture Strategy.				Investigations into oyster aquaculture best practices continued, to update the Oyster Industry Sustainable Aquaculture Strategy
<div></div>	Oyster aquaculture business and environment Utilise the Oyster Industry Sustainable Aquaculture Strategy to support industry best practice including reducing threats to important seagrass habitat.		DPI-F	DPI	Statewide	PhD research progressed, examining the impacts of oyster infrastructure on seagrass in oyster aquaculture business.
6.5	<div><div>stage1</div><div>stage22020-21</div><div>stage22021-22</div></div>	Integrate various commercial, recreational and cultural fishing data and new research into the Marine Integrated Monitoring Program to address key knowledge gaps associated with harvest and bycatch.				Workshop held (COVID dependent) with participating Aboriginal communities to understand community needs and cultural awareness.
<div></div>	Cultural fishing monitoring Explore potential pathways to enable assessment of cultural fishing in NSW in terms of participation, catch and effort and relate these to access arrangements within current resource management decision making processes, including harvest strategies (links with management action 4.5).		DPI-F	DPI	Tweed Mid North Coast	
<div></div>	Wild catch fish stocks Contribute NSW biological, catch and effort data and information to assist the development of the Status of Australian Fish Stocks Reports and facilitate integration of this data into Harvest Strategies (links with management action 6.1).		DPI-F	DPI	Statewide	
6.6	<div><div>stage1</div><div>stage22020-21</div><div>stage22021-22</div></div>	Enhance fisheries with targeted fish stocking and other activities to improve fishing opportunities where appropriate.				Supplementary fish stockings conducted in line with the protocols developed in the existing Marine Fish Stocking Strategy.
<div></div>	Fisheries enhancements Undertake marine fish stocking and artificial reef installation at key locations to improve fishing access.		DPI-F	DPI	Statewide Eurobodalla	Recreational infrastructure planning and improved fishing opportunities throughout coastal NSW progressed, including

					deployment of artificial reef in Batemans Bay region.
6.7	  	Partner with the fishing and aquaculture sectors to deliver information and training to fishers in NSW to improve self-compliance, sustainable fishing practices and, develop economic opportunities.			Education materials developed and delivered for targeted fishing and aquaculture groups.
	Fishing industry marine stewardship Develop information and training package in partnership with key fishing sectors and assist in delivery.	DPI-F	Industry NGOs	Statewide	
6.8	  	Work with fishing sectors and tourism authorities to investigate and implement opportunities to promote fishing and NSW wild caught seafood and build social licence. Links with Initiative 8.			Grants awarded to successful participants from round 1. Round 2 promoted, and applications sought. The benefits of fishing and NSW seafood are promoted via various channels.
	Eat more seafood NSW Deliver the Eat More Seafood NSW grant program to build marketing and promotion capability within seafood businesses through small-scale and large-scale grants which contributes to building social licence for the commercial, aquaculture, recreational and Aboriginal fishing sectors.	DPI-F	Industry	Statewide	
6.9	 	Deliver advisory programs to the community to reduce the risk of spread of marine pest and diseases and enhance the understanding of everyone's general biosecurity duty so they act to minimise aquatic pest and disease risk.			Statewide communications and intervention strategy developed and delivered, informed by Charles Sturt University social research (2021). Digital and physical communication elements developed. Consultant engaged with social research expertise to develop and implement a statewide monitoring and evaluation survey, informed
	Marine biosecurity awareness Strengthen partnerships with marine stakeholders and to increase awareness of biofouling issues, marine pest organisms, obligations of the NSW General Biosecurity Duty and reporting of suspected marine pests detected in biofouling.	DPI-BFS	DPI-F TfNSW	Statewide	

					by the Charles Sturt University Monitoring and Evaluation Plan.
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More information

More information on Initiative 6 projects are on the marine estate web site: [strategy-implementation/ensuring-sustainable-fishing-and-aquaculture](#)

Case study

DEVELOPING NSW FISHERIES HARVEST STRATEGIES

THE SITE

Statewide – harvest strategies are being developed for priority species or fisheries that occur throughout the NSW marine estate.

THE PROJECT

Fishing supports significant social and economic benefits for the people of NSW, as well as cultural benefits to Aboriginal people. Fisheries management, underpinned by science, aims to maintain these benefits while reducing major threats.

Harvest strategies are a best-practice fisheries management tool widely used in Australia and throughout the world. They establish objectives, monitoring and assessment plans, and pre-agreed rules to ensure that fisheries are managed in a sustainable way, based on the best available science.

DPI research scientists are supporting the process in a number of ways, for example:

- identifying monitoring, assessment and management options
- understanding recreational fishing objectives for key species (such as mullet)
- identifying risks to and from priority fisheries (eg. target, by-product and bycatch species, threatened species, habitat, climate change) through Ecological Risk Assessments.

Draft NSW Fisheries Harvest Strategy Policy and Guidelines were released for public consultation from November 2020 to January 2021. Revised versions were provided to the NSW Aboriginal, commercial and recreational fishing advisory councils for final consideration, before the Ministerial Fisheries Advisory Council endorsed them in June 2021.



Photo: 15. Trawl fishing: Photo: iStock.com/MarcusMacksad

Harvest strategies for priority species or fisheries are underway, commencing in 2020-21 with trawl whiting, Eastern rock lobster, spanner crab and mullet. Harvest strategy development is a collaborative process involving stakeholders, independent experts and DPI coming together as part of a formal Harvest Strategy Working Group. Draft harvest strategies will be released for public consultation before being finalised and formally adopted by the Minister.

Harvest strategies contribute to addressing statewide priority threats to fish assemblages (harvest and bycatch), identified in the statewide TARA in 2017.

THE OUTCOMES

Key outcomes will be:

- improved awareness and understanding among commercial, recreational and Aboriginal fishers of the science and decision-making that underpin best-practice fisheries management
- increased engagement by commercial, recreational and Aboriginal fishers in setting fishery objectives and rules to ensure harvest is ecologically sustainable, economically viable and supportive of community wellbeing.
- reduction in risks to fish assemblages, as identified in the statewide TARA.

DELIVERED BY

NSW DPI Fisheries (in collaboration with stakeholders and independent experts).

RELATED ACTIONS

Relates to management actions 5.5, 6.2 and 6.5.



Photo: 16. Boating Lake Macquarie. Photo iStock.com/JohnCarnemolla ©

Initiative 7 - Enabling safe and sustainable boating

The problem/opportunity

Boating activity will increase in the future. We need to accommodate this increase while managing the social, economic and environmental benefits of the marine estate.

Steps to achieving our long-term outcomes

This initiative aims to meet the demand for safe and sustainable boating access to our waterways. This will be achieved with a suite of discrete projects and ongoing business activities.

In the short term, the actions in this initiative will improve boating infrastructure. They will also increase community, government and industry awareness of the regulatory framework to support safe and sustainable boating.

In the intermediate term, we will build on these actions and refine them to continue education programs and achieve increased compliance with guidelines and regulations for safe and sustainable boating.

The aim is to improve opportunities and experiences for both recreational and commercial boating, while balancing social, economic, cultural and environmental values on NSW waterways.

Initiative objective





To balance protection of coastal and marine habitat and species with ongoing access and safe and sustainable boating.






Initiative long-term outcomes










Boating provides increased social and economic benefits for NSW communities while supporting sustainable social, economic, cultural and environmental benefits of the marine estate.










TfNSW will continue to fund its commitments for Strategy implementation through the NSW Waterways Fund. This will include seeking opportunities to initiate additional activities that support the objective of safe and sustainable boating, and address the risks and threats identified in the statewide TARA.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022 <i>[Noting some projects will be delivered over multiple years]</i>
7.1	  	Reduce the threats to seagrass from vessels through improved regulation, administration, education, new mooring technologies and delivery mechanisms.				Standards to improve the safety and environmental outcomes from mooring apparatus. Accompanying the standards will be options for the adoption and enforcement of the standards, including options for increasing the use of EFMs.
	Environmentally friendly moorings Establish a performance-based standard for Environmentally Friendly Moorings (EFM) and review policy and regulatory options for improving adoption and maintenance of EFM.		TfNSW	DPI-F Industry DPIE - PA	Statewide	A detailed review of opportunities to use novel mooring apparatus and novel mooring field design, including field trials. Targeted education programs delivered to improve boaters understanding of how to protect seagrass.

7.2	<div><div>1stage</div><div>2stage2020-21</div><div>2stage2021-22</div></div>	Establish a framework to manage increased mooring demand through the Moorings Review project.			Improved customer access to moorings. Improved audit of moorings. Compliance programs, focusing on ensuring mooring apparatus are kept in good condition, and the mooring licence conditions are met. Enhanced spatial performance of mooring fields. Develop policy options for the management of End-of-Life vessels.
	Mooring strategy Review and modernise the strategy for mooring management and administration to improve access to moorings.	TfNSW	DPI-F DPIE-PA	Statewide	
	Mooring audits Improve the strategy for audit of moorings and enforcement of mooring licence conditions.	TfNSW		Statewide	
	Mooring access Optimise mooring density in mooring fields to better meet demand.	TfNSW	DPI-F	Statewide	
	End-of-Life vessel management Develop options to manage vessels that are reaching or have reached the end of their useful life to mitigate potential environmental risks and enhance access to moorings.	TfNSW		Statewide	
7.3	<div><div>1stage</div><div>2stage2020-21</div><div>2stage2021-22</div></div>	Manage boat-based contamination through the AMSA national framework and implement an education program in NSW to address the environmental impacts of water pollution from recreational vessel cleaning, antifouling and sewage pump out into waterways.			Collaboration with EPA to clarify and deliver on TfNSW's ARA role in marine parks. Up-to-date information on marine pollution and the national framework for domestic commercial vessels through the Maritime Access Line.
	Marine pollution responsibilities Review TfNSW's Appropriate Regulatory Authority (ARA) status across all NSW navigable waters under section 86 of the <i>Protection of the Environment Operations (General) Regulation 2009</i> with a focus on pollution from vessels in marine parks.	TfNSW	DPIE-EES	Statewide	

	Marine pollution legislation Complete the statutory review of the <i>Marine Pollution Act 2012</i> . The Act protects the State's marine and coastal environment from pollution by oil and certain other marine pollutants discharged from ships. The Act implements the International Convention for the Prevention of Pollution from Ships (MARPOL) in NSW.	TfNSW	EPA Port Authority AMSA	Statewide	Support the implementation of the Marine Pollution Amendment (Review) Bill 2020. Improved compliance programs for Domestic Commercial Vessels. Improved education programs for recreational boaters with a focus on environmental regulations.
	Vessel environmental standards Continue to enforce environmental standards and regulations among domestic commercial vessels and recreational vessels.	TfNSW		Statewide	
	Recreational boater education Continue to educate recreational boaters about compliance with environmental regulations.	TfNSW		Statewide	
7.4		Partner with industry to investigate a pilot program at marinas in NSW to design and install sump drain run-off handling systems with sediment traps.			To be progressed in future years in Initiative 1 (see 'marina pollution monitoring' project).
7.5	 	Reduce impacts of boating on wildlife through coordinated education, research, compliance, reporting and data sharing (links to Initiative 5, 8.1 and 9.4).			Progressed in Initiative 5 (see 'Species education' project (action 5.3)).
7.6	 	Integrate various research and monitoring into the Monitoring Program to address key knowledge gaps associated with shipping movements and interactions with threatened and protected species.			Relevant research integrated into the Monitoring Program and knowledge gaps filled.
	Vessel monitoring Identify available data and undertake gap analysis.	TfNSW	DPIE-EES NPWS DPI-F	Statewide	Review the current knowledge of anchoring impacts and best management practices.

	Review of offshore anchoring Review and investigate the effects of large commercial shipping vessel anchoring within the Greater Sydney region.	DPI-F	Port Authority TfNSW Industry	Central region Wollongong	Identify and plan to fill key knowledge gaps about the impacts of offshore vessel anchoring.
7.7	  	Continue improving environmentally sustainable boating, conflicting uses and waterway access to the marine estate through the NSW Boating Now program.			Improved access to the marine estate through funding to deliver new and updated maritime infrastructure, including public boat ramps, trailer parking, pontoons, wharves etc.
	Boating Now Work with partners to deliver projects funded through Round 3 of the Boating Now Program .	TfNSW		Statewide	
7.8	  	Deliver waterways infrastructure in accordance with the Maritime Safety Plan to enhance social, cultural and economic benefits through an interagency approach (also see 8.8).			Implement the Maritime Infrastructure Plan to continue to work collaboratively with partners to invest in maritime infrastructure and facilities to support the Plan's outcomes and strategic objectives.
	Maritime infrastructure Collaborate with key stakeholders in the implementation of the Maritime Infrastructure Plan 2019-2024 that sets out an overarching strategy to support maritime infrastructure in priority areas in NSW.	TfNSW		Statewide	Continue to improve boating access infrastructure and facilities continued through the Boating Now Program.

More information

More information on Initiative 7 projects are on the marine estate web site: [strategy-implementation/enabling-safe-and-sustainable-boating](https://www.marineestate.nsw.gov.au/strategy-implementation/enabling-safe-and-sustainable-boating).

Case study

PRIVATE MOORING MAP – ONLINE MOORING APPLICATION PORTAL

THE SITE

[Online Private Mooring Map](#)

THE PROJECT

Transport for NSW launched the online Private Mooring Map in November 2020 to streamline private mooring services for boat owners. The online map provides real-time data about mooring availability, wait lists and fee rates.

It replaced the previous paper-based system, which required boat owners to submit applications by mail, email or in person at a Service NSW centre.

THE OUTCOMES

- The new online Private Mooring Map modernises the NSW mooring application process enhancing mooring accessibility for boat owners in NSW.
- The real-time data presents mooring applicants with key information on specified mooring bays such as maximum vessel length, type of fee rate and the number of applicants on the wait list.
- Between November 2020 and March 2021 there were over 900 applications received for available and priority wait list mooring areas.

DELIVERED BY

Transport for NSW

RELATED ACTIONS

Relates to management action 7.2.

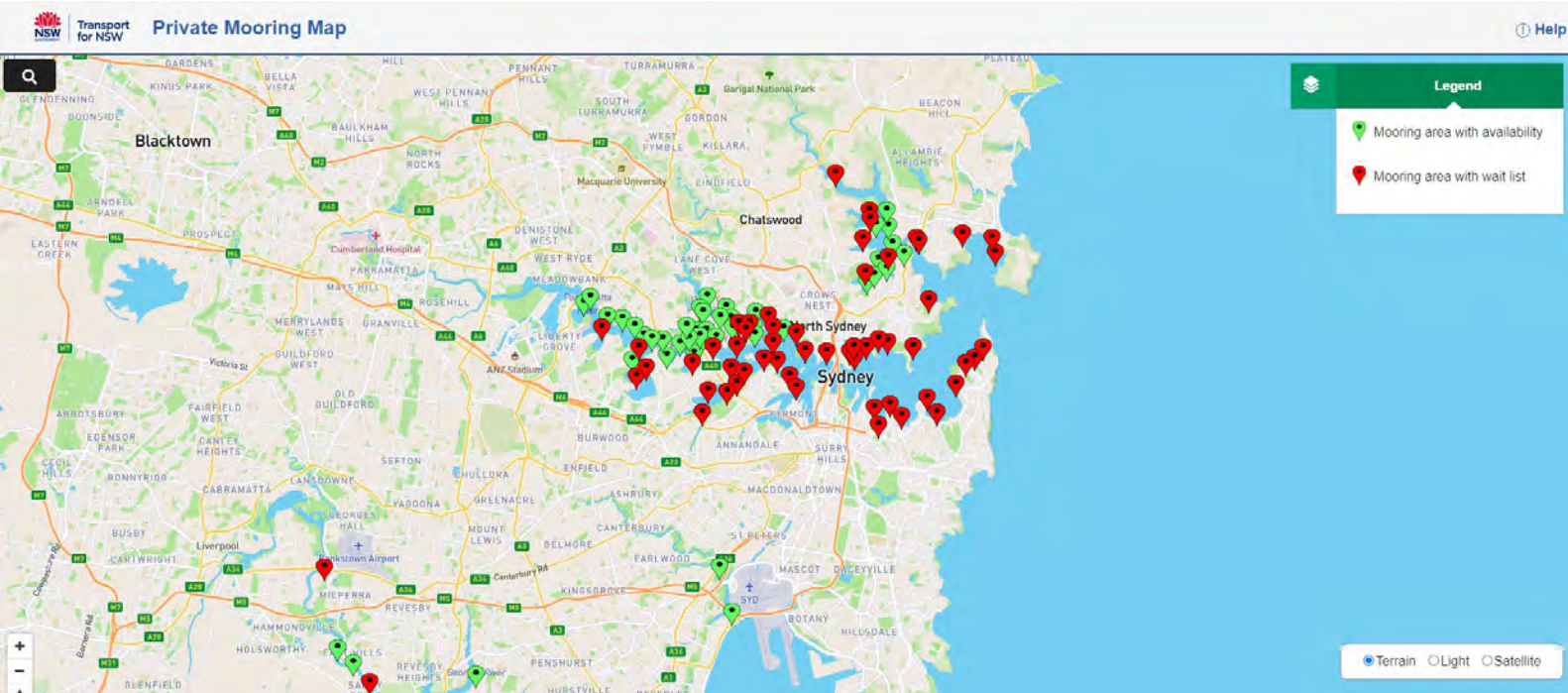


Photo: 17. The TfNSW Private Mooring Map displaying real-time information on mooring areas with availability (green) and mooring areas with wait list (red).



Photo: 18. Surfing and enjoying the social benefits of the marine estate. Photo iStock.com/AleksandarNakic ©

Initiative 8 - Enhancing social, cultural and economic benefits

The problem/opportunity

There is a need to continue to build our understanding of the social, cultural and economic use and benefits of the marine estate, including intrinsic value, to better inform decision making. There is also a need for greater awareness and understanding among the community of the benefits of the marine estate and how their actions may affect these benefits.

Steps to achieving our long-term outcomes

This initiative aims to improve the social, cultural and economic benefits that the NSW community derives from the marine estate, increase stakeholder and community adoption of safe and sustainable use of the marine estate, and raising awareness of its benefits. To do this, the Strategy will deliver over 10 years: a marine estate education strategy; a marine integrated monitoring and evaluation framework; social, cultural and economic research and monitoring; digital mapping; economic valuation and valuation of human activities in the marine estate, and a blue growth strategy.

In the short term, we will achieve this by improving stakeholder and community awareness of the benefits, threats, and management arrangements relevant to the marine estate and ways for them to participate in marine estate management.

In the intermediate term, we aim to:

- increase stakeholder and community awareness of sustainable use of the marine estate
- better incorporate social cultural, and economic values into planning and management
- increase stakeholder and community participation in management
- improve the information base on the human dimensions of the marine estate
- facilitate greater adoption of ecologically sustainable growth among marine industries.

Initiative objective



To improve the social, cultural and economic benefits that the NSW community derives from the marine estate by responding to priority threats.






Initiative long-term outcomes





Improved social, cultural and economic benefits of the marine estate that contribute to the wellbeing of the NSW stakeholders and community.



Increases stakeholder and community adoption of safe and sustainable use of the marine estate.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
8.1		<p>Increase stakeholder and community awareness of marine estate values, management arrangements and promote safe and ecologically sustainable use of the marine estate by:</p> <ul style="list-style-type: none"> building on existing school and community education programs to encourage environmental stewardship, enhance self-compliance and promote physical and mental health benefits associated with nature developing and promoting best practice guidance and codes of practice to reduce resource use conflicts developing online information resources and expansion of digital technologies. 				<p>Implementation of the Marine Estate Education Strategy including completion of Phase 1 (primary schools) of the curriculum-based schools' program and commencement of Phase 2 (high schools).</p> <p>Social media education campaign developed, featuring the Marine Estate Champions project.</p>
	<p>Marine estate education strategy</p> <p>Implement the NSW Marine Estate Education Strategy and curriculum-based schools package.</p>		DPI-F	DPIE-EES DPIE-PA TfNSW, NGOs NSW schools Community	Statewide	

8.2		Improve awareness of, promote and identify threats to marine historic and non-Aboriginal cultural heritage to inform future management in the marine estate.				Promotion and interpretation of maritime heritage in the North Coast region, to enhance their protection.
	Maritime heritage review Undertake a localised risk assessment of threats to marine historic heritage, piloted in the Coffs Harbour region and provide recommendations to address threats in future Strategy stages.	DPI-F	HNSW	Coffs Harbour		
8.3		Establish and deliver the Marine Integrated Monitoring Programs social, cultural and economic components, to: <ul style="list-style-type: none"> develop a shared understanding of the NSW community's attitudes, values, perceptions, experiences, knowledge, aspirations, patterns of use to support evidence-based decision making and adaptive management communicate data and results publicly through appropriate information portals. 				Coastal residents survey report finalised. Visitors survey report finalised. Sea Country survey report finalised. Youth survey report finalised. Local ecological knowledge case study commenced. Baseline economic benefits data collected.
	Community wellbeing framework Implement and refine the community wellbeing framework which comprehensively captures the human dimensions of the NSW marine estate to guide the strategic collection of social, cultural and economic data and provide the foundation for long-term monitoring.	DPI-F	DPIE-EES DPIE-PA TfNSW LGOV UNI	Statewide		
	Social and cultural benefits monitoring and research Design and implement statewide surveys to monitor community benefits, impacts, and strategy effectiveness as identified in the community wellbeing framework. Linked to action 4.5 and targeted stakeholder and environmental asset-focused surveys which are being conducted under relevant initiatives (e.g. water quality objectives in Initiative 1 and recreational fishing in Initiative 6) Undertake research to improve understanding of statewide survey results or additional aspects of wellbeing related to the marine estate.	DPI-F	DPIE-EES DPIE-PA TfNSW LGOV UNI	Statewide		

	Economic benefits monitoring and research Monitor the economic benefits dimension of the community wellbeing framework of the NSW marine estate. Linked to action 8.4 Marine estate economic valuation.	DPI-F	DPIE-EES DPIE-PA TfNSW	Statewide	
8.4		Develop a baseline of current and future use of the marine estate, initially at a pilot scale, to support effective management, address resource use conflicts and access to the marine estate by: <ul style="list-style-type: none"> • carrying out a comprehensive analysis of human uses, supporting infrastructure and facilities, activity trends, management issues • spatially mapping on a public facing digital platform • identifying hotspots and developing specific management responses to address issues in partnership with agencies and stakeholders • linking outcomes to education and awareness programs to promote best practice. (see 8.1) and links to 8.5. 			Economic valuation method developed. Market based value to assess the economic contribution of marine industries to the NSW economy completed.
	Activity mapping Pilot a comprehensive, spatial mapping project of human use activities, to support marine planning prioritisation and management (project postponed to future years).	DPI-F	DPIE-EES DPIE-PA TfNSW LLS DNSW LGOV RDA	TBC	
	Marine estate economic valuation Developing a consistent and comprehensive economic valuation model based on international best practice in ocean accounting that takes account of market and non-market values to monitor the economic health of the marine estate. Links to action 8.3 economic benefits monitoring.	DPI-F	DPIE-EES DPIE-PA TfNSW LLS DNSW LGOV RDA	Statewide	

8.5		Explore opportunities for innovative ecologically sustainable activities in the marine estate, based on the results of activity mapping in action 8.4, by developing a blue growth strategy.			High-level scoping for the development of a Blue Growth Strategy which identifies current and emerging sectors which present opportunities for sustainable and equitable economic growth for NSW marine estate.
	Blue growth economy Working across multiple sectors to develop a Blue Growth Strategy for NSW which explores opportunities for coordinated, innovative, long-term, sustainable development of the marine estate with a focus on those current and emerging activities which provide the greatest opportunity for sustainable growth for NSW.	DPI-F	DPIE-EES DPIE-PA TfNSW Industry	Statewide	

More information

More information on Initiative 8 projects are on the marine estate web site: [strategy-implementation/enhancing-social,-cultural-and-economic-benefits](https://www.marineestate.nsw.gov.au/strategy-implementation/enhancing-social,-cultural-and-economic-benefits)

Case study

NSW COMMUNITY WELLBEING FRAMEWORK

THE SITE

Statewide

THE PROJECT

Several Statewide surveys are being conducted as part of implementing the NSW Community Wellbeing Framework:

- NSW coastal residents survey
- visitors survey
- youth (14-17-year-old) survey
- Sea Country survey.

The primary objective of these surveys is to provide statewide baseline data on the ways people benefit from the marine estate and impacts to the benefits. The Sea Country survey also aims to understand the way Aboriginal people value and culturally connect to Sea Country and impacts to these connections.

This is the first time a series of interlinked surveys have been conducted at this scale in NSW and comprehensively include coastal Aboriginal communities. The surveys will provide essential baseline data to inform long-term trends on the way people benefit from the marine estate and impacts to these benefits, the effectiveness of the MEMS in maintaining or enhancing these benefits, and future marine estate threat and risk assessments. The surveys are a key component of the Marine Integrated Monitoring Program.

THE OUTCOMES

Key outcomes of the project will provide the baseline data required to assess long-term trends in community benefits and impacts to benefits, to inform the effectiveness of the Strategy and future threat and risk assessments. The Community Wellbeing surveys will also ensure social, cultural and economic values are better incorporated into planning and management of the marine estate and improve the information base on human dimensions of the marine estate relevant to management.

DELIVERED BY

DPI-Fisheries

RELATED ACTIONS

Relates to management action 8.3 and all monitoring projects



Figure 3. NSW Marine Estate Community Wellbeing Framework



Photo: 19. Inspecting designs. Photo: Patrick Dwyer DPI

Initiative 9 – Delivering effective governance

The problem/opportunity

Complex governance arrangements and overlapping jurisdictions can lead to lack clarity of roles and responsibilities, inconsistencies, duplication and inappropriate regulation. Governance arrangements that are simpler and easier to understand will better support effective management of the marine estate and deliver social, cultural, economic and environmental benefits.

Steps to achieving our long-term outcomes

This initiative aims to improve coordination, transparency, consistency and inclusiveness, leading to greater efficiency and effectiveness in managing the marine estate during the 10 years of the Strategy. To do this, we will produce:

- a governance framework and catchment scale governance pilot project
- stakeholder and community capacity building programs
- tools to support self-compliance
- compliance, research and monitoring projects
- new management plans for marine parks
- improved management of aquatic reserves and high value sites.

In the short term, we will clarify the responsibilities and accountabilities of responsible agencies, so we can improve our capacity to fulfil those roles. We will also focus on improving consistency, coordination and communications. This will allow agencies to work together more closely with each other and the community, to enhance participation in marine estate management and decision making.

Simpler and clearer regulatory process will reduce timescales and costs for obtaining permits and also lead to increased compliance with rules and regulations by landholder, community and businesses.

Initiative objective






To improve governance arrangements across the marine estate to support coordinated, transparent, inclusive and effective decision making.




Initiative long-term outcomes






Improved coordination, transparency, consistency and inclusiveness of managing the marine estate.

Improved efficiency and effectiveness in managing the marine estate.

Management actions and projects

Action	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
9.1	  	<p>Improved coordination and integration across all levels of government (including cross-border and land–sea interface) by developing a governance framework piloted at a catchment scale (see Initiative 1) to:</p> <ul style="list-style-type: none"> • identify overlapping jurisdictional boundaries • clarify roles and responsibilities • align policies and programs • identify opportunities for data management and sharing, research, monitoring and mapping, compliance and reporting, communication and engagement. 				This action is being delivered in Initiative 1.
9.2		<p>Increased stakeholder and community participation by building capacity and awareness of coastal and marine management piloted at a catchment scale (see Initiative 1) and locally via marine park management planning pilots.</p>				<p>Roles and responsibilities of Authority agencies and delivery partners reviewed.</p> <p>Communication with agencies, stakeholders and the community via targeted strategies improved (project to commence in future years pending funding).</p>
	<p>Understanding government stakeholders</p> <p>Identify and map agency roles, responsibilities and regulatory obligations in marine estate matters to enhance collaboration and governance arrangements (project to commence in future years).</p>		DPI-F	DPIE-EES DPIE-PA TfNSW	Statewide	

	Understanding non-government stakeholders Identify marine estate stakeholders and their networks and develop stakeholder management plans to improve communication and engagement (project to commence in future years).		DPI-F	DPIE-EES DPIE-PA TfNSW	Statewide	Stakeholder Management Plans developed (project to commence in future years pending funding).
9.3		Identify opportunities through the marine park management planning pilots to streamline regulatory instruments to: <ul style="list-style-type: none">• address inconsistencies, reduce duplication of effort and reduce regulatory burden where appropriate• ensure these instruments are efficient, effective, transparent and proportionate• increase awareness of the authorisations process and requirements for the end user through education and online tools.	DPI-F	DPIE-EES DPIE-PA TfNSW LLS DNSW RDA LGOV	NSW Marine Protected Areas	Community and stakeholder engagement on the draft management plan for the five mainland marine parks in NSW to inform the final plan. Delivered a draft regulation for community consultation on draft management rules to implement the management plan for the five mainland marine parks in NSW. Site based and regional actions identified, and priority actions implemented, at aquatic reserves and high value sites to reduce threats to marine biodiversity and enhance community benefits and uses.
	Improved marine park management planning Develop new planning processes for the preparation of management plans, and supporting management rules, with the community, industry and stakeholders to ensure good governance, a more streamlined approach and to support improved management of marine park values.		DPI - F	DPIE-EES TfNSW DPIE-PA	NSW Marine Parks	

	Reducing red tape for marine parks Following the development of new marine park management plans, review and improve marine park authorisation requirements in management rules to ensure they are efficient, effective, consistent and minimise regulatory burden.	DPI-F	DPIE-EES DPIE-PA TfNSW	NSW Marine Parks	
	Improved management of aquatic reserves and high value sites Improved management of aquatic reserves and other sites of value to the community (also contributes to 9.2 and 9.4).	DPI-F	DPIE-EES TfNSW DPIE-PA	NSW Aquatic Reserves	
9.4		Improve coordination and effectiveness of compliance across government by: <ul style="list-style-type: none"> investigating tools to support proactive compliance by users through use of new technologies and education programs (see Initiative 8) collaborate across multiple government agencies to coordinate enforcement, education and data sharing. 			Risk-based compliance program implemented in the Greater Sydney Region and reviewed annually for continuous adaptive management.
	Coordinating compliance Identify and address opportunities to improve coordination and effectiveness of compliance with marine estate regulations, and promote self-compliance, at the project level on a priority basis (project to commence in future years).	DPI-F	DPIE-EES DPIE-PA TfNSW	TBC	Offshore compliance activities delivered in Greater Sydney region.
	Greater Sydney region compliance focusing on marine protected areas Increased fisheries compliance outcomes focusing on addressing priority threats to environmental assets. Increased community and stakeholder education and awareness of fisheries and marine protected areas rules and regulations.	DPI-F		Newcastle to Wollongong	

More information

More information on Initiative 9 projects are on the marine estate web site: [strategy-implementation/delivering-effective-governance](https://www.marineestate.nsw.gov.au/strategy-implementation/delivering-effective-governance).

Case study

GREATER SYDNEY REGION COMPLIANCE

THE SITE

Coastal locations from Newcastle in the north to Lake Illawarra in the south, with a focus on the ecologically rich inter-tidal areas within Aquatic Reserves and Intertidal Protected Areas in the Greater Sydney region, which have various restrictions on fishing and shellfish collection in place.

THE PROJECT

DPI Fisheries Compliance Unit has responsibility for administering fisheries and marine estate laws governing the fisheries and aquatic resources of the state. Fisheries Officers spend many hours on patrol, detecting and preventing illegal fishing and damage to aquatic habitats. Illegal fishing and damage to habitats are serious problems and can impact on the sustainability of our aquatic resources across NSW.

The coastline from Newcastle, through the Central Coast and Sydney to Wollongong is fringed by the largest urban area in NSW with high numbers of fishers and shellfish collectors having ready access to an abundance of rocky foreshores, sand flats and mud flats. This project enhances the capability of the NSW DPI Fisheries Compliance Unit to increase voluntary compliance and deterrence to illegal fishing and aquatic habitat protection in these intertidal areas, particularly in the many aquatic reserves and intertidal protected areas found in the Sydney region.

THE OUTCOMES

- DPI Fisheries Compliance Risk-Based planning processes to deliver effective regulatory services in marine protected areas across the Greater Sydney area. These processes include assessing risk levels of non-compliance, developing and implementing controls, and regular monitoring to gauge the effectiveness of the program.
- The project is delivered by a small mobile squad of Fisheries Officers. As the squad is mobile, they can respond quickly to changing compliance risks and respond to community needs. The mobile squad has expanded their reach and productivity by working with other coastal District Fisheries Officers and other agencies to coordinate compliance and education responses.
- DPI Fisheries use educational programs to improve community knowledge of regulations applying to marine protected areas. This includes (but not limited to) television programs (e.g. Harbour Patrol), social media posts, media releases, interviews on television and in multi-cultural radio programs, collaboration with community organisations that deliver messages to culturally diverse communities, attendance of community field days, presentations in schools, development of fishing guides and multi-lingual advisory materials and respond to queries about these regulations in social media messaging channels, phone, email and in field client interactions.

DELIVERED BY: NSW Department of Primary Industries - Fisheries Compliance Unit

RELATED ACTIONS: Relates to management action 9.4

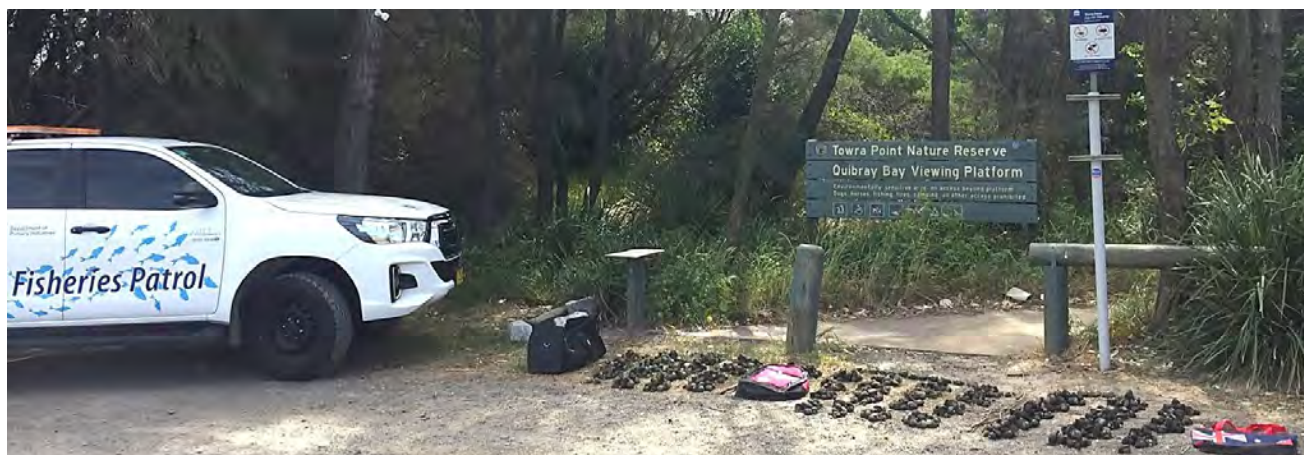


Photo 20: Seizure of cockles at Towra Point Aquatic Reserve by Greater Metropolitan Mobile Squad Officers. Photo courtesy of Cara Van Der Wal.



Photo: 21 Sydney Fish Markets – cockles. Photo iStock.com/iphotothailand ©

Program management, monitoring, reporting, evaluation and engagement

Program management

To ensure effective program management of the Strategy, a governance structure and program management framework has been implemented to support cross agency delivery of the Strategy statewide. The framework provides the community and stakeholders assurance that the Strategy is being implemented in a coordinated, integrated and transparent way. The benefits of the work in this area may not be obvious to the general community as there are limited tangible on-ground deliverables, however, good governance and project management underpins the successful delivery of the Strategy and facilitates projects being implemented on time, on budget, within scope and with risks adequately managed.

Strategy education, communication and stakeholder liaison

The Authority is committed to working collaboratively with the broader NSW community to realise the benefits of a healthy coast and sea through the Marine Estate Management Strategy. The development of the Strategy was possible through contributions from a wide and diverse stakeholder base including Aboriginal communities, community groups, peak industry bodies, environmental groups, scientists, government agencies, and interested individuals. Keeping all stakeholders engaged in, and informed of, the progress and achievements of the Strategy is important to its success. Accessible, clear and regular communication, engagement, and education will:

- recognise the importance of partners in the delivery of the Strategy and strengthen them
- promote progress and achievements
- raise awareness and support among stakeholders and the community
- enable effective community involvement in delivery and decision making
- build on existing school and education programs to encourage environmental stewardship and enhance self-compliance
- build support for implementation of the Strategy long term.

Marine Integrated Monitoring Program

The Marine Integrated Monitoring Program (Monitoring Program) has three key purposes:

- to monitor the condition and trend of environmental assets and community benefits to inform the five-year health check
- to evaluate the effectiveness of management initiatives and actions that aim to reduce the priority threats and risks
- fill key knowledge gaps that were identified as part of the statewide threat and risk assessment (TARA) process.

The implementation of the Monitoring Program facilitates centralised and efficient coordination, reporting and integration of environmental, social, cultural, and economic information for the NSW marine estate. The Monitoring Program provides the evaluation framework for the Authority, responsible agencies and relevant Ministers to report on progress of the Strategy in meeting clearly defined outcomes, highlight successes and consider threats that may need further management intervention. The Monitoring Program gives the community confidence that the management of the marine estate is being continually assessed to drive adaptive management. Program Management and Monitoring Program implementation respond to concerns raised by stakeholders and the community around lack of transparency and accountability in the management of the marine estate, lack of trust and a perceived lack of consideration of scientific evidence in decision making. Through these programs, transparency and accountability in the management of the marine estate is improved. These programs will also raise awareness of the importance of the marine estate, associated threats and the processes in place to monitor and manage them, which will reconnect people with the marine estate.

Project objective

To improve governance, monitoring, evaluation and reporting across the marine estate to support coordinated, transparent, inclusive and effective decision making (related to Initiative 9).



Long-term outcomes







Improved coordination, transparency, consistency and inclusiveness of managing the marine estate (contributes to Initiative 9 outcomes).

Improved efficiency and effectiveness in managing the marine estate (contributes to Initiative 9 outcomes).

Improved coordination and implementation of the Marine Integrated Monitoring Program for the marine estate.

Management actions and projects

	Stages	Management actions	Lead agency	Partners	Location	What we will deliver in 2021-2022
		<p>Improved coordination and integration across all levels of government (including cross-border and land-sea interface) by developing a governance framework piloted at a catchment scale (see Initiative 1) to:</p> <ul style="list-style-type: none"> • identify overlapping jurisdictional boundaries • clarify roles and responsibilities • align policies and programs • identify opportunities for data management and sharing, research, monitoring and mapping, compliance and reporting, communication and engagement. <p><i>Note – this action sits within Initiative 9 but projects in this section support overall program delivery, not at the project scale, and therefore reported here.</i></p>				<p>Improved statewide governance and project management framework, developed in response to lessons learnt during implementation.</p> <p>Regular and ongoing rigorous oversight and scrutiny of Strategy implementation to ensure projects are within scope, budget and timescales and effective management of risk to minimise impacts to program delivery.</p> <p>Project management training, support and development for all Strategy project managers across agencies delivered, to ensure consistent, efficient and effective management of the Strategy.</p> <p>Regular reporting to stakeholders and the community on progress and future activities to raise awareness and ensure transparency.</p>
	<p>Strategy program management</p> <p>Implementation of a governance structure and project management framework to support delivery of the Strategy statewide to be reviewed periodically to improve efficiency and effectiveness. Identify and address any inefficiency in governance arrangements at the project level, on a priority basis.</p>		DPI-F	DPIE-EES TfNSW DPIE-PA	Statewide	

	Strategy education, communication and stakeholder liaison Implementation of communication tools including website, and newsletters to support and enable engagement, education and stakeholder liaison across the Strategy. Includes delivery of existing projects including the Marine Estate Education Strategy (See 8.1) and understanding non-government stakeholders (See 9.2).	DPI-F	DPIE-EES TfNSW DPIE-PA	Statewide	Marine estate communications and engagement plan updated and implemented. Stakeholder Management Plans developed in Initiative 9. Marine Estate Education Strategy delivered in Initiative 8 Regular communication on the marine estate and Strategy projects through a range of channels including the NSW Marine Estate Instagram and newsletter. Marine estate website redesigned and updated.
	Better geographic information systems (GIS) for the marine estate GIS systems enhanced to support marine estate projects.	DPI-F	DPIE-EES TfNSW DPIE-PA		
	  	Implement the Marine Integrated Monitoring Program			Monitoring technical reports completed, outlining monitoring of condition and trend and key knowledge gaps.
	Marine Integrated Monitoring Program - program management Implementation of a governance structure, framework and program management to support delivery of the Marine Integrated Monitoring Program to monitor, evaluate and report on Strategy progress, the condition of environmental assets and community benefits, and fill knowledge gaps.	DPI-F	DPIE-EES TfNSW DPIE-PA	Statewide	Overarching reporting themes developed for the MIMP. Scoping for the five-year review of the statewide threat and risk assessment completed. Evaluation report for Strategy implementation Stage 1 completed. Data collation and management system for central storage and analysis of monitoring data developed. Scoping of an interactive web portal to share monitoring findings completed.

Appendix 1 Strategy agencies and partners

Abbreviations of agencies, organisations, research institutions and key stakeholders involved in delivering actions

Table 2. Abbreviations of Agencies and partners responsible for implementing the Marine Estate Management Strategy.

#	Abbreviation	Full name
1.	AFAC	Aboriginal Fishing Advisory Council
2.	AMSA	Australian Maritime Safety Authority
3.	COM GOV	Commonwealth Government
4.	CommFish	Commercial Fishing NSW Advisory Council
5.	Community	Community
6.	CSIRO	Commonwealth Scientific and Industrial Research Organisation
7.	DNSW	Destination NSW
8.	DPI	Department of Primary Industries
9.	DPI-BFS	Department of Primary Industries – Biosecurity and Food Safety
10.	DPI-F	Department of Primary Industries – Fisheries
11.	DPI-Fo	Department of Primary Industries – Forestry
12.	DPIE-EES	Department of Planning, Industry & Environment – Environment, Energy & Science*
13.	DPI-HP (CL)	Department of Planning, Industry & Environment – Housing & Property (Crown Lands)
14.	DPIE-PA	Department of Planning, Industry & Environment – Planning & Assessment
15.	DPIE-W	Department of Planning, Industry & Environment – Water
16.	EPA	NSW Environment Protection Authority
17.	GSC	Greater Sydney Commission
18.	HNSW	Heritage NSW
19.	Industry	Industry
20.	INSW	Infrastructure NSW
21.	IPART	Independent Pricing & Regulatory Tribunal
22.	LALC	Local Aboriginal Land Councils
23.	LGA	Local Government Area
24.	LGOV	Local government
25.	LLS	Local Land Services
26.	MFAC	Ministerial Fisheries Advisory Council
27.	MIAA	Marine Industry Association of Australia
28.	MU	Macquarie University
29.	NGOs	Non-government organisations
30.	NMSC	National Marine Science Centre

31.	NPWS	National Parks and Wildlife Services (DPIE-EES)
32.	NRAR	Natural Resource Access Regulator
33.	NSWCC	NSW Coastal Council
34.	NSWFA	NSW Farmers' Association
35.	NSWSC	NSW Shellfish Committee
36.	OLG	Office of Local Government
37.	OWA	OceanWatch Australia
38.	Private	Private landowners
39.	RDA	Regional Development Australia
40.	RFNSW	Recreational Fishing NSW Advisory Council
41.	RNSW	Regional New South Wales
42.	SCCG	Sydney Coastal Council Group
43.	SCU	Southern Cross University
44.	SFNSW	Safe Food NSW
45.	SIMS	Sydney Institute of Marine Science
46.	SNSW	Stormwater NSW
47.	SOS	<i>Saving Our Species</i> (DPIE-EES)
48.	SW	Sydney Water
49.	Taronga	Taronga Zoo
50.	TBF	Tangaroa Blue Foundation
51.	TfNSW	Transport for NSW
52.	TO	Traditional Owners
53.	UNI	Universities
54.	UNSW	University of NSW
55.	UTas	University of Tasmania
56.	WNSW	Water NSW
57.	WSPPO	Western Sydney Planning Partnership Office

* The agency previously known as the Office of Environment & Heritage is now established as Environment, Energy & Science under the Department of Planning, Industry & Environment (DPIE-EES).