

Implementation Plan 2022-2024

Marine Estate Management Strategy

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Acknowledgement of Country

The Marine Estate Management Authority (Authority) acknowledges the Traditional Custodians of the land on which we live and work, and pays respect to Elders past, present and emerging.

Aboriginal people hold deep cultural and spiritual connections to the sea. They have cared for Sea Country for thousands of years, passing on their knowledge and tradition to each new generation. The Authority works collaboratively with Aboriginal people to maintain their social, cultural, economic and spiritual connections to the marine estate, now and into the future.



Figure 1. © Bindarray Maagun (River Feast) by Gumbaynggirr artist Lavinnia Inglis

Foreword



This [Marine Estate Management Strategy](#) (Strategy) Implementation Plan (Plan) outlines how we will deliver over 100+ projects with our partners over the next two years, with the Plan to be reviewed in 2024. We will continue our periodic reporting and evaluation on progress towards meeting our outcomes, guided by the [Marine Integrated Monitoring Program](#). Progress and achievements are communicated regularly on the [marine estate website and social media](#) and in the Authority's annual report on Strategy implementation.

The 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 and the ocean along the NSW coast. The marine estate is important for the overall wellbeing of the NSW community, providing a place for 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 and 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 through to 2028.

a healthy coast and sea,
managed for the greatest wellbeing of the community,
now and into the future

Over the first 4 years of delivery, many positive outcomes have been achieved, benefiting the community across the marine estate. With our partners, we have over 100 projects that are improving the health of the marine estate – improving water quality, rehabilitating important habitats, protecting species at risk and increasing the resilience of estuarine, coastal and marine environments.

The first 4 years severe drought, devastating bushfires, floods and the COVID-19 pandemic impact on the environment and/or NSW community. Each of these events affected project delivery under the Strategy. My sincere thanks to agency staff and delivery partners for their commitment, adaptability and for maintaining the momentum, as we recognise the positive results to date. We look forward to delivering more benefits as we continue into the final 6 years of the 10-year Strategy.

An investment of \$104.9 million by the NSW Government for the first four years enabled staff to lay the foundations for reducing priority threats. In June 2022, the NSW Government announced a major investment of over \$182 million over the next 6 years, which is approximately \$30 million per annum. This will ensure we are adaptive as we collectively manage the NSW marine estate, striving for equity and sustainability as we achieve our social, cultural, economic and environmental outcomes.

We appreciate and value our partners involvement in achieving the Strategy's outcomes. We will continue to enhance our engagement with the community and our key stakeholders to implement the 100+ projects described in this Plan, each helping to reduce the environmental, social, cultural and economic threats facing our marine estate. Collectively, through this Plan, we continue to build the path for a healthier marine estate to benefit the people of NSW.

Russell Reichelt AO AFTSE

Chair, Marine Estate Management Authority

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Introduction

Purpose of the Implementation Plan

This Plan outlines how we will deliver the Strategy from 1 July 2022 to 30 June 2024

In June 2022, the NSW Government committed approximately \$30 million per annum to deliver the Strategy over the next 6 years. This is a record investment of more than \$182 million and builds upon the \$105 million already invested over the past four years. This new funding is critical, to continue the range of projects that commenced in the first 4 years, commence new projects, enhance the partnerships developed, and ensure benefits to the marine estate and community are realised.

Over the next 2 years (2022-2024) we will continue to implement the Strategy's 9 initiatives.

This Plan identifies:

- the range of projects that will be implemented under the 9 initiatives and 53 actions
- the agencies and partners who are working together to deliver each project
- when these projects expect to be delivered and where
- the expected deliverables by June 2024.

The Plan showcases the breadth of projects underway that will continue to reduce statewide priority threats and deliver community benefits across the marine estate. Case studies in this Plan provide highlights of key Strategy deliverables from the first 4 years and innovative new projects that will commence in 2022-2024.

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 9 initiatives at 2, 5 and 10 years, so management can be adaptive. The Monitoring Program has 3 key purposes:

1. to monitor the condition and trend of environmental assets and community benefits
2. to evaluate the effectiveness of the management initiatives 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.

The independent [Baseline evaluation of the Marine Estate Management Strategy](#), that assessed the first two years of delivery (2018-2020), was uploaded to the marine estate website in September 2021. It highlighted that the program had:

- built strong foundations for future success
- achieved change against all short-term outcomes
- set a trajectory for achieving intermediate and long-term outcomes.

The [thirteen recommendations](#) from the baseline evaluation are being addressed. A mid-term evaluation will commence in mid-2023, to assess progress in achieving outcomes after 5 years.

Key achievements in the delivery of the Strategy are shared regularly using a variety of media, including:

- [NSW marine estate e-newsletter](#)

- [Triannual 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 and through [project profile webpages](#)
- 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. New and emerging threats are being identified in 2022/23 to inform the Strategy's 5-year health check.

The 5-year health check will commence in 2023. This health check will review new and emerging threats, findings from the mid-term independent evaluation, as well as respond to research and monitoring outputs as appropriate. Management responses can then be targeted towards changing priorities.

This review of the statewide threat and risk assessment (first completed in 2017), to identify new and emerging threats, does not include a comprehensive reassessment of risk levels and current threats. The full review is scheduled to occur in 2027.

The independent [Marine Estate Expert Knowledge Panel](#) (the Panel) will continue to provide their ecological, social, cultural and economic expertise in implementing and evaluating the Strategy.

Partnerships

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

- local government
- Aboriginal people
- NSW Government agencies
- the 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 critical to the Strategy's success.

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 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 consider:

- the statewide TARA - which is a key resource for considering priority threats to estuaries and coastal and marine areas during the preparation of CMP Scoping Studies
- aligning CMP actions with the initiatives and actions in the Strategy
- outcomes and key learnings from projects piloted through the Strategy since 2018 to help inform the design and implementation of local management actions.

Timeframe for delivery

This Plan refers to projects delivered from 1 July 2022 to 30 June 2024. In many cases, these projects build on existing Strategy projects, many of which are intended to continue in future years, given improvements in environmental conditions or community benefits may take many years to realise.

New projects commencing in 2022-2024 include:

- Marine litter campaign - to include a stormwater litter prevention program (Initiative 1)
- Breakwall governance and management (Initiative 2)
- Blue Carbon Policy - development and delivery of a Blue Carbon Policy and establishment of blue carbon demonstration sites (Initiative 3)
- Species habitat research (Initiative 5)
- Aquaculture socio-economic research (Initiative 6)
- Commercial fishing socio-economic research (Initiative 6)
- Marine estate activity mapping (Initiative 8)
- Blue Growth Strategy - develop a strategy to guide sustainable growth in marine industries in NSW and contribute to a stronger blue economy (Initiative 8)

Governance framework

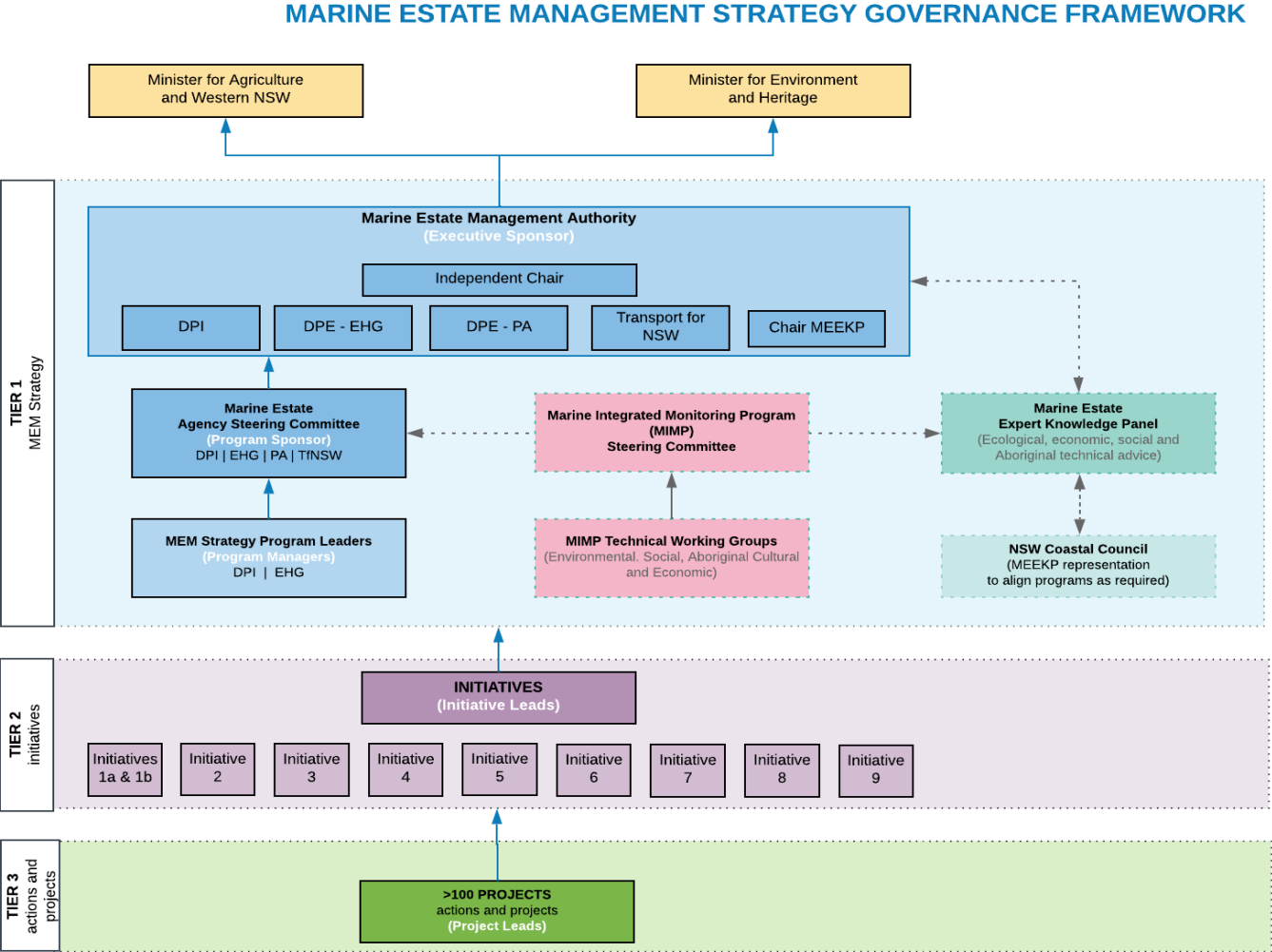
The range of spatial scales, cost, complexity and risk in the delivery of the Strategy's projects results in the need for strong collaboration between government agencies and partners under a governance structure.

The Strategy's Governance and Program Management Framework (framework) facilitates those relationships, ensures consistency in how projects are implemented and enables the Strategy's progress to be monitored and reported. 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 under each initiative and associated projects.

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



INT18/85025

Figure 2. Marine Estate Management Strategy governance framework

MANAGEMENT INITIATIVES

This section describes the projects under each of the 9 initiatives and associated 53 management actions and 9 initiatives in the Strategy, who is responsible for implementing them, and where they are occurring. Government agencies, organisations, research institutions and key stakeholders involved in delivering actions are listed in Appendix 1.



Photo 1. Sydney Fish Market pier – Photo [iStock.com/kriithnarong](https://www.iStock.com/kriithnarong)

Initiative 1 - Improving water quality and reducing litter



Photo 1. Water pollution and litter are significant contributors to poor water quality in the marine estate
– Photo iStock.com/Phonix

The problem/opportunity

Water pollution and litter are significant contributors to poor water quality in the marine estate. Water quality affects the health of habitats and wildlife and the vast social, cultural and economic benefits associated with 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 improvement 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. Most water quality projects in the Strategy span the life of the 10-year Strategy, to ensure effort is sustained over time and helping to tackle water pollution using a variety of approaches.

We are working with local councils to identify the sources of pollutants to local waterways and develop best practice responses. We are also working with agricultural landholders, urban planners and developers to improve awareness of best practices to reduce their impacts on water quality. We will continue to work with marine industries, such as the NSW seafood industry, to identify point and diffuse pollution sources, to develop tools that reduce risks to oyster farms and areas frequented by fishers, so that the community have access to clean waterways and fresh seafood.

On-ground works are occurring at many high priority sites, directly reducing the impacts of water pollution on important waterways statewide. Projects include sealing dirt roads, erecting fencing to limit stock access to riparian vegetation, riverbank stabilisation works, wetland rehabilitation or oyster reef restoration. Local Land Services, local government, industry, and marine estate agencies are working together on-ground to improve water quality and monitor success.

Reducing the incidence of litter entering the marine estate is also a priority. A targeted campaign is changing the behaviour of people responsible for marine litter and raising awareness in the community about the impact of litter on marine wildlife and on how people use the marine estate.

In time, we expect to see more 'best practice' adopted in water quality and litter management as key industries and the community get involved in projects and improve their compliance with regulations. We also expect improved communication and coordination between the government agencies, landholders, industries and other stakeholders that influence water quality.

Initiative 1


Objective



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



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


	Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
Action 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 .			
	Risk-based framework for urban waterway health Apply the Risk-based Framework in South Creek as an urban diffuse source water pollution pilot.	DPE-EHG DPE-P DPE-W LGOV Industry	South Creek	Delivery in 2022-23 Targeted stakeholder training sessions to start building capacity to shift towards a new approach (beyond business as usual) to stormwater management. Targeted stakeholder training sessions on new technical water sensitive urban design guidelines for achieving new stormwater development control targets in Wianamatta-South Creek.




	Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
	Risk-based framework for regional waterway health Develop and trial a governance framework for the Richmond River catchment to coordinate management, reduce diffuse source runoff and improve waterway health, and contributing to the development of the Richmond River Coastal Management Program.	LGOV DPI-F LLS DPI-Ag Private Industry	Richmond River	Regular meetings of the Richmond River Collaborative Partnership to continue working toward improved coordination and collaboration. Industry-based, best management practice-focused research into diffuse source water pollution management with the macadamia and beef industries. Support capacity building for improved land-use practice across the agricultural sector including the macadamia, cane and beef industry. Stage 1 of an investigation into landholder incentives to restore wetlands on private land.
Action 1.2	Improve the management of diffuse-source water pollution by: <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 improving minimum requirements for industry standards and ensuring compliance with regulations and best practice through social research, education campaigns and compliance programs. 			
	Diffuse Source Water Pollution Oversight Committee Develop a new governance framework for improving the coordination and focus of diffuse source water pollution management across NSW Government.	DPE-EHG DPI DPE-P EPA OLG TfNSW WNSW LLS DPE-W	Statewide	Finalisation and commencement of new governance arrangements to improve the coordination of NSW Government agencies involved in managing diffuse source water pollution.



	Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
	Building capacity on the Risk-based framework Strengthen provisions in the NSW planning system to improve the management of water quality by building stakeholder capacity to implement the Risk-based Framework.	SGOV LGOV	Statewide	Guidance material, case studies, datasets, e-learning modules and other tools to support stakeholder use of the Risk-based Framework, accessed through an online portal. Public webinar series to raise awareness on how the Risk-based Framework is used to manage urban and rural runoff to coastal waterways. Tailored skills-based training for local and state government on how to use the Risk-based Framework. Marketing campaign to raise awareness of the Risk-based Framework. Application of the Risk-based Framework in the lower Hawkesbury River catchment area.
	Review of the NSW Water Quality Objectives Review NSW Water Quality Objectives for each coastal catchment in NSW to assess whether they reflect contemporary values and expectations.	DPE-EHG DPI DPE-W LGOV LALC LLS EPA WNSW DPE-P OLG	Statewide	Updated NSW Water Quality Objectives for all 184 coastal catchments in NSW, disseminated on a new Water Quality Objectives website. Water quality data for freshwater tributaries in coastal catchments made available on the NSW environmental data portal Sharing and Enabling Environmental Data (SEED). Mapping of community environmental values and uses of waterways in coastal NSW published on the SEED database and a new Water Quality Objectives website. Published report on the findings of the review of NSW Water Quality Objectives, including updated outcomes and recommendations. Information sessions for stakeholders and community on the environmental values and uses of coastal waterways.



	Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
	Coastal floodplain study Finalise floodplain study and implement a communication plan to share results with stakeholders and increase their understanding and use of the study results.	DPI-F LGOV DPE-EHG DPE-W Industry	Statewide	Coastal floodplain study completed. Community awareness campaign that shares coastal floodplain study results.
	Fish friendly workshops for councils Engage with NSW coastal councils to share knowledge and build capacity to integrate fish friendly concepts into development and on-ground works.	DPI-F DPE-EHG DPE-P TfNSW LGOV	Statewide	Fish friendly council workshops delivered in local government areas across the marine estate.
	Construction sediment management Periodically update a set of standard conditions that improve existing controls for erosion and sediment management for (but not limited to) residential development sites during the construction phase and prepare guidance material to support the standard conditions.	DPE-P	Statewide	Guidance material for implementing the erosion and sediment conditions. Expand the erosion and sediment conditions for residential development to other development types.
Action 1.3	Facilitate and deliver on-ground activities that reduce diffuse-source water pollution through investigation and provision of funding programs and financial incentives.			
	Oyster reef restoration and research Facilitate increased protection and restoration of oyster reef habitat in NSW through provision of planning information, contributions to on-ground works, education, engagement and ongoing research and monitoring.	DPI-F LGOV UNI NGO LLS ANMM	Statewide Wagonga Inlet Botany Bay Brisbane Waters Wallis Lake Tweed River	On-ground works for one new oyster reef restoration site in NSW. Planning for future on-ground oyster reef restoration sites in NSW, including educating and empowering local councils and other partners to get involved. Community education and engagement activities about the benefits of oyster reefs, including



Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
	Riverbank vegetation improvements Plant new riverbank vegetation, maintain previous revegetation work, undertake weeding, erect fencing and implement other improvements to enhance the health of waterways and their foreshores.	LLS DPE-EHG LGOV DPI DPE-W Private landowners	preparation for a regional travelling exhibition in partnership with the Australian National Maritime Museum (ANMM). Increased understanding of Aboriginal cultural links to oyster reefs and more opportunities for Aboriginal community involvement in oyster reef projects.
			15 kilometres of riparian improvements in 2022-23 and 15 kilometres in 2023-24.
	Clean coastal catchments on-ground Undertake on-ground works in coastal catchments to improve land use practices that reduce nutrient and sediment run-off from the blueberry, greenhouse vegetable and intensive livestock industries.	LLS DPI-Ag UNI NSWFA Industry	2022-23 <ul style="list-style-type: none"> • 2.5km of riparian improvements • implement works with 11 growers/producers • work with 19 growers/producers to develop plans and adopt improved nutrient management practices • install 2 bioreactors • 2 best-practice industry workshops.
			2023-24 <ul style="list-style-type: none"> • 2km of riparian improvements • implement works with 11 growers/producers • work with 22 growers/producers

Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
			<ul style="list-style-type: none"> • install 2 bioreactors • 2 best-practice industry workshops.
 <p>Clean coastal catchments research Conduct applied research in coastal catchments to refine and promote best management practices that reduce nutrient and sediment losses in the berry, greenhouse vegetable, macadamia and livestock industries.</p>	DPI-Ag UNI Industry LLS DPE-EHG UNI	Ballina Coffs Harbour Manning Kiama Eurobodalla Bega Valley	<p>Preliminary blueberry nutrition research results delivered, and a blueberry fertigation recipe calculator developed.</p> <p>Drainage treatment options (wetland and bioreactor) established at the Wollongbar Blueberry Nutrition Research Facility and monitoring underway.</p> <p>Demonstration farm monitoring continuing and up to 4 years of monitoring data reported at all sites.</p> <p>One additional berry farm demonstration trial and 2 macadamia demonstration trials established.</p> <p>Macadamia erosion mitigation trials completed, and industry advisory materials produced.</p> <p>Applied research trial implemented on-farm demonstrating the benefits of soil testing and matching nutrient requirements in livestock pasture systems.</p> <p>One dairy monitoring and demonstration farm established to showcase improved nutrient management, updated effluent systems and associated improvements in water quality outcomes.</p> <p>Four Fert\$mart workshops targeting agronomists and farmers (2 per year) delivered.</p> <p>Six full day live grower-focused events and 3 half day industry targeted engagement events held.</p>

Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
 Riverbank stabilisation Maintain existing stabilising structures constructed since 2018 and undertake new work, such as the construction of log, rock and vegetation bank protection works that stabilise erosion hotspots, helping to reduce sediment entering waterways.	LLS DPI LGOV DPE-W TfNSW	Richmond River Tweed River Manning River Kiama Shellharbour Shoalhaven Eurobodalla Bega Valley	Delivery of 6 live broadcast webinars, 6 newsletters, 8 articles and one detailed case study showcasing Clean Coastal Catchments applied research. 1.2 km of bank stabilisation works in 2022-23 and 1.2 km in 2023-24.
 Coastal wetland rehabilitation Undertake assessments, plan for future rehabilitation activities (including priority wetland purchases to add to NPWS and Council reserve estates) and contribute to wetland restoration on-ground works in priority locations. .	DPI-F DPE-P LLS RF TfNSW NPWS LGOV SCS UNI PIPAP EHG DPE-CL	Kempsey Shoalhaven Kiama Clarence Valley Richmond Tweed Mid-Coast	Site assessments in key locations to identify best possible outcomes with minimal risks. On-ground works, including improving or removing drainage infrastructure. Contribute to consultation and planning with key stakeholders to identify potential wetland rehabilitation management actions, benefits, and risks.
 Improving roads and tracks Seal gravel roads and undertake other works to reduce sediment entering waterways.	LLS SGOV LGOV UNI DPI-F	Richmond River Manning River Myall Lakes Kiama Shellharbour Shoalhaven	Seven roads improved in 2022-23 and 8 roads in 2023-24.

Projects		Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
			Eurobodalla Bega Valley	
	Clean coastal catchments monitoring Assessing the benefits of multiple projects in Initiative 1 delivering on-ground works, using water quality monitoring and ecosystem health assessment methodologies, to measure the success of targeted works and achievement of outcomes.	DPE-EHG LLS DPI-Ag	Statewide	<p>Catchment monitoring focused on quantifying any changes in water quality and aquatic ecosystem health in response to on-ground works (e.g. stock exclusion fencing and riparian vegetation rehabilitation).</p> <p>Waterways monitoring to quantify nutrient and sediment export from intensive agricultural land use activities (e.g. beef grazing, dairy).</p> <p>Produce annual dashboard, factsheets and technical reports summarising findings, made available on the marine estate and NSW environment websites.</p> <p>Assessment methodologies and frameworks outlining assessment techniques and methods that can be applied in other coastal catchments.</p> <p>Ongoing annual stakeholder and community workshops to communicate results, receive feedback and present findings.</p>
Action 1.4 Implement a targeted marine litter campaign and establish a Marine Litter Working Group.				
	Marine litter campaign Expand the marine component of the 'Don't be a tosser' campaign (new project).	EPA DPE-EHG	Statewide	<p>Local government and community consultation on the future direction of the marine litter campaign and local campaign needs.</p> <p>Activation of marine litter campaign for 2023.</p> <p>Promotion of the new marine debris campaign website to key target groups, including building web analytics to track community awareness, attitudes and behaviours.</p> <p>Commencement of a Litter Prevention and Stormwater Litter prevention project</p> <p>Re-launch of the marine litter campaign in 2024.</p>

	Projects	Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
	Marine debris research and management program Convene the Marine Debris Working Group composed of agency representatives and academic experts to oversee a marine debris risk assessment and coordinate research, monitoring and analysis activities associated with marine debris actions.	DPE-EHG EPA UNSW NPWS Taronga NMSC SCU TBF MU SCCG	Statewide	Marine Debris Threat and Risk Assessment Summary Report and supplementary documents released. Webinar and continued community engagement on the assessment and its application. Conceptual model of marine debris and management in the marine estate. Design of strategic research and management projects addressing priority threats.
Action 1.5	Develop monitoring, reporting and performance indicators for water quality actions and fill key knowledge gaps. This action is integrated into the Monitoring Program.			
	Estuarine water quality monitoring Monitoring and reporting on water quality and ecosystem health in estuaries and relevant catchments to track broadscale condition over time. Develop new indicators where relevant.	DPE-EHG DPI LGOV LLS	Statewide	Continue to implement the Statewide estuary water quality, ecological health and stressor monitoring program. Continued analysis and reporting on datasets to track broadscale condition and trends. Robust review and gap analysis of current estuary monitoring program to guide the future implementation of the program. Publish Annual Report card grades to communicate estuary ecosystem health condition across NSW. Produce scientific technical reports and datasets for the updated NSW estuary water quality guideline values for condition reporting. Continued engagement with universities, stakeholder and the Community to monitor changes in the Richmond River Implement a two-year monthly monitoring campaign for Sydney Harbour to improve understanding of spatial and temporal variability. The program will

Projects		Partners	Location/LGA	What we will deliver in 2022-23 and 2023-24
				allow more detailed reporting of waterways health for Sydney Harbour.
	Mapping outflow events Mapping subtidal habitats and monitoring coastal outflow events to quantify impacts on coastal and marine waters.	DPE-EHG DPI LGOV	Statewide (mapping) Sydney-metro region (riverine overflows)	Datasets to improve the capacity of using satellite imagery for monitoring the extent of outflows from large estuaries to coastal areas, and monitoring broadscale water quality in coastal areas.
	Land use pressures on the marine estate Monitoring diffuse source runoff from a range of intensive land use types and assessing the condition of coastal waterways in response to land use intensification. Understand diffuse source runoff characteristics, the impacts on environmental assets and inform management approaches.	DPE-EHG DPI LGOV DPI-Ag UTS	Statewide	Datasets highlighting nutrient, sediment, microbial and organic matter loads from a range of intensive land use areas, from target coastal catchments. Technical reports highlighting monitoring program findings. Assessment methodologies and frameworks outlining how to monitor and assess diffuse source runoff and impacts in receiving environments. New novel indicators to assess diffuse source runoff treatment performance. Conceptual diagrams of key processes to inform diffuse source runoff management and treatment.

More information

More information on Initiative 1 projects are on the marine estate website: [strategy-implementation/water-quality-and-litter](#).

Case study

OYSTER REEF RESTORATION

The project

This project delivers innovative shellfish reef restoration in NSW, identifying the best ways to restore natural shellfish reefs and the most suitable places in NSW for reef restoration activities. It also explains why shellfish reefs are so important.

The sites

Port Stephens was the pilot site, with 7.5 hectares established as shellfish reef. Wagonga Inlet is the second site to be established, approximately 0.3 hectares in size.

Rationale

Shellfish reefs improve water quality by filtering water, provide fish habitat, and create a living and growing barrier between foreshore erosion and important estuarine habitats. Native shellfish reefs were once common in estuaries across NSW. Unfortunately, they have been almost completely lost since colonisation, contributing to a decline in water quality and fish numbers in our estuaries. Shellfish reef restoration projects are gaining momentum worldwide, to restore marine ecosystem functioning.

The benefits

- Improving water quality and boosting fish stocks in estuaries.
- Providing a living and growing barrier between foreshore erosion and important estuarine habitat, increasing estuarine resilience.
- Restoring a lost marine ecosystem.
- Providing opportunities to understand and share Aboriginal cultural values and connections with Sea Country
- Enabling education and engagement opportunities with the community about the value and role of shellfish reefs.
- Supporting the delivery of improved coordinated management of the NSW marine estate and addressing important coastal management issues through the development of Coastal Management Programs.

Key outputs

Engaged and educated community and key stakeholders through several activities, including hosting the 2021 International Conference on Shellfish Restoration.

Developed and implemented a methodology for Sydney rock oyster reef restoration in NSW through the delivery of the landmark project in Port Stephens. The restored 7.5 hectare oyster reef is filtering over 7.5 million litres, or 3 Olympic-sized swimming pools, of water an hour.

Supported Worimi people's Sea Country values by naming the new Port Stephens reefs *Bindayimaguba Ninang* and *Garuwaguba Ninang* which translates to the home of the black possum oyster and Sea Country oysters, respectively.

Built capacity in local government to undertake reef restoration by identifying opportunities, forging partnerships, filling knowledge gaps and demonstrating restoration solutions.

Mapped current oyster reef habitat to facilitate future shellfish reef restoration project planning, improve estuarine management and contribute to the conservation of this important ecosystem.

Delivered stage one of the new Living Shoreline project in Wagonga Inlet, Narooma, which is restoring intertidal Sydney rock oyster reefs and, for the first time in NSW, restoring subtidal Native flat oyster reefs.

Delivered by

Department of Primary Industries

The Nature Conservancy Australia (Port Stephens and Wagonga Inlet projects)

Australian Government through its Reef Builder initiative

Eurobodalla Shire Council (Wagonga Inlet project)

Related actions

Relates to management actions 1.3



Photo 3. Worimi Elders naming the new Port Stephens reefs *Bindayimaguba Ninang* and *Garuwaguba Ninang*, celebrated with a traditional smoking ceremony on site – Photo Salty Dingo.

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



Photo 4. Foreshore development, land use and waterway infrastructure provide important social and economic benefits for NSW. Manly aerial – Photo Shutterstock.com/Juergen_Wallstabe ©

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 and more certainty for stakeholders seeking to undertake works in the coastal zone.

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

Initiative 2


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.




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

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 2.1	Assess and manage cumulative and legacy impacts for estuary entrance modification and dredging.			
	Commercial dredging best practice Implement the outcomes of the audit of commercial dredging in estuaries that identified and recommended actions to improve licencing conditions and related environmental outcomes.	DPE-CL DPE-EHG DPI-F DPE-P EPA Industry LGOV	Statewide	Dredging audit report and site-specific evaluation reports. Continue to implement recommendations in the audit report, such as: <ul style="list-style-type: none">• collaborate with DPE-P on priority planning actions, for example, develop environmental impact statement guidelines and standard conditions of consent for commercial dredging and extraction in coastal areas• develop guiding principles for authorising dredging or extractive operations on Crown land to inform competitive selection processes and the assessment of landowner’s consent applications

Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	Breakwall governance and management Identify ownership of orphaned breakwater assets and work toward sound management strategies, or their removal where social, environmental, cultural and economic values will also be enhanced (new project).	DPE-CL DPE-EHG TfNSW DPI-F EPA Industry LGOV	• develop a communication and education program to ensure applicants, industry and councils know the correct planning pathways.
	Intermittently closed and open lakes and lagoons (ICOLL) management Develop a framework for consistent approvals and management of ICOLLs that can be included in Coastal Management Programs.	DPI-F DPE-EHG DPE-P DPE-CL	Identification of orphan breakwater assets (e.g. rock, sheet pile, groynes and other training works within estuaries on Crown land) Ownership of identified assets in high priority locations. Condition and risk assessment (social, cultural and economic, environmental) of assets and prioritisation for more detailed investigation.
Action 2.2	Assess and manage cumulative and legacy impacts on foreshore development and land use change in the coastal zone.		
	Coastal Design Guidelines Review Finalise the review of the Coastal Design Guidelines, develop case studies and promote best practice designs in coastal urban environments.	DPE-P DPE-EHG DPE-W DPI-F LGOV	Coastal Design Guidelines 2022 finalised, in response to comments received during the exhibition period, and published. Case studies to accompany the updated guidelines developed and published.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	Aquatic biodiversity offsets Develop and implement policy to protect high-value fish habitats through the use of biodiversity offsets.	DPI-F DPE-EHG	Statewide	Offset values for key fish habitat types developed, based on environmental services they provide and the cost involved in rehabilitating them. Information provided to natural capital accounting and blue carbon projects.
Action 2.3	Develop and implement a statewide policy for the management of coastal Crown land (including submerged lands) in collaboration with local government Coastal Management Programs in priority areas.			
	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 DPE-CL TfNSW LGOV DPE-P DPE-W DPE-EHG	Tweed Byron Ballina Richmond Valley Lismore Wollongong Shellharbour Shoalhaven Eurobodalla	Domestic waterfront structure strategies and web-based mapping completed and published for the Evans River, Lake Illawarra, Tweed River and St Georges Basin. Updated domestic waterfront structure strategies for the Richmond River and Brunswick River. Expansion of the project to southern NSW, with estuaries assessed and development of strategies in priority estuaries commenced. Pilot project in the St Georges Basin completed, involving the removal of three unsafe, unclaimed, and environmentally damaging jetties. Approval and structure removal pathway documented. Sites identified and prioritised, and funding sources explored for the removal of unsafe, unclaimed and damaging infrastructure on Crown Land.
	Marine vegetation management 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, reduce red tape for low impact works (e.g. mangrove	DPI-F DPE-EHG DPE-P DPE-CL	Statewide Tweed Ballina	Co-host the Australian Mangrove and Saltmarsh Network Conference. Report on the methods for developing marine vegetation strategies and a summary of interventions recommended in the estuary specific strategies. Completed strategies for the Tweed River and Richmond River.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	trimming for safety traffic sight-lines), and enhance understanding and appreciation of the value of intertidal marine vegetation.			Complete strategies for three south coast estuaries.
	Estuary bank management strategies Develop estuary-wide bank protection management strategies that guide bank protection works proposals, including beach nourishment and grooming options, and facilitate rehabilitation opportunities.	DPI-F DPE-W DPE-CL DPE-EHG DPE-P LLS LGOV	Tweed Byron	Estuary-wide bank protection options investigated in three estuaries to inform the assessment of bank protection work proposals.
Action 2.4	Re-establish resilient coastal floodplains and connectivity within coastal catchments by: <ul style="list-style-type: none"> • 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. 			
	Coastal floodplain drainage management Review and improve the regulatory framework for coastal agricultural drainage works and activities, aiming to reduce the impact of these works and activities on downstream water quality, aquatic ecosystems, communities and industries, as well as addressing the complexity, time and costs associated with the approvals process.	DPE-W DPI-F DPE-P DPE-CL DPE-EHG LGOV Industry	Statewide	Regulatory review of NSW Government approvals processes. Regulatory and other reform options developed, for consideration by stakeholders during consultation. Consultation completed, feedback considered, and an options report developed for NSW Government.
	Reconnecting fish habitats Provide fish passage at priority weir and road crossing barrier sites in coastal catchments.	DPI-F WNSW LGOV	Statewide	Refurbishment of Liverpool Weir fishway (Georges River) and Stroud Weir fishway (Karuah River). Further planning to deliver fish passage outcomes at other priority coastal barriers.
Action 2.5	Undertake research and monitoring to address key knowledge gaps, such as techniques to minimise the impact of trained estuary entrances, and methods for determining marine vegetation resilience, and assess the effectiveness of the management actions within this initiative. This action is integrated into the Monitoring Program.			

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	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.	DPI-F	Greater Sydney region	Maps of multiple stressors to fish and fish-habitat developed for estuaries in the Greater Sydney region. Scientific information collated to fill knowledge gaps, to assist the management of NSW estuaries.
	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	Underwater sampling of reef fishes and habitats repeated and extended in the Greater Sydney region. Trend and condition of reef fishes and habitat forming species (e.g. kelp) assessed in the Greater Sydney region.
	Reviewing jetty designs Research on jetty design features that contribute to the loss of seagrasses and develop guidelines for estuaries in NSW to reduce seagrass loss.	DPI-F	Statewide	The main design features of jetties that contribute to the loss of seagrasses quantified in priority estuaries. Jetty design guidelines completed that document sustainable features that are sensitive to seagrass.

More information

More information on Initiative 2 projects are on the marine estate website: [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

DOMESTIC WATERFRONT STRUCTURE STRATEGIES FOR THE RICHMOND RIVER AND BRUNSWICK RIVER

The project

Domestic Waterfront Structures Strategies

The site

The 'waterfront' or area where the marine estate borders the estuary foreshore spans 102 km of the Brunswick River (also within the Cape Byron Marine Park on the north coast of NSW), and 285 km of the Richmond River, also on the north coast. Each are each now managed by new domestic waterfront structure strategies.

Rationale

Marine estate waterfront environments are important habitats for wildlife and offer recreational fishers, boaters, sightseers, tourism, and marine businesses numerous benefits, including access. Coastal managers strive to implement policies and legislation that maximise access to foreshore areas while minimising harmful impacts to the natural environment. Poor coordination across authorities involved in development approvals can lead to inefficient and ineffective management including poorly designed or inappropriately built private jetties and pontoons along the foreshore, which can negatively affect important natural habitats, for example by smothering seagrass or changing sediment movement. In addition, illegal structures can obstruct public access and prevent some uses of the waterway.

The benefits

The domestic waterfront structure strategy project improves collaboration across multiple NSW Government agencies. It provides a strategic approach that minimises negative impacts of waterfront development on coastal habitats, reduces conflict between waterway users and informs consistent waterfront decision making processes. They also reduce red tape for landholders in locations suitable for a domestic waterfront structure.

A domestic waterfront structure strategy consolidates existing policies and legislation, to easily guide a landowner's ability to construct new domestic waterfront structures in a specific location, thereby simplifying the approvals process and reducing the likelihood of harmful structures being proposed in sensitive locations.

The strategies use a traffic light system to map locations and determine areas of waterfront where: private structures could be installed; where more detailed assessment is required; or where existing policies do not support proposals for foreshore structures. Strategies can be downloaded as a booklet from the [marine estate website](#) that identifies responsible agencies, a streamlined approval process and links to an online interactive map.

They deliver a strategic, transparent, streamlined, and consistent framework for managing the development of private waterfront structures such as jetties and pontoons.

Key outputs

A multi-agency team worked together to develop a systematic process for developing domestic waterfront structure strategies. Strategies have been developed for the Richmond River and the Brunswick River. These form templates for future estuaries within a marine park (Brunswick River) and outside of marine park areas (Richmond River) and set the stage for further strategies to be developed

in future. A video on the marine estate website explains the purpose and benefits of the strategies. On-ground works have been approved to remove three unauthorised, unsafe, and unclaimed jetties that have environmental impacts.

Delivered by

DPI-F, DPE-CL, TfNSW, DPE-P, DPE-W, DPE-EHG, and various local government authorities.

Related actions

Domestic waterfront structure strategies align with research in Initiative 2 investigating sustainable jetty designs and the DPE-CL Compliance Strategy 2020-2023. The Strategies also combine with projects that are developing estuary bank management strategies and marine vegetation management strategies, to deliver a more holistic approach to the assessment of proposed activities around the sensitive foreshore areas of estuaries.



Photo 5. Well planned, designed and approved jetties provide users access to the marine estate while limiting the impacts of structures and people to important marine habitats - Photo Jennifer Grant.

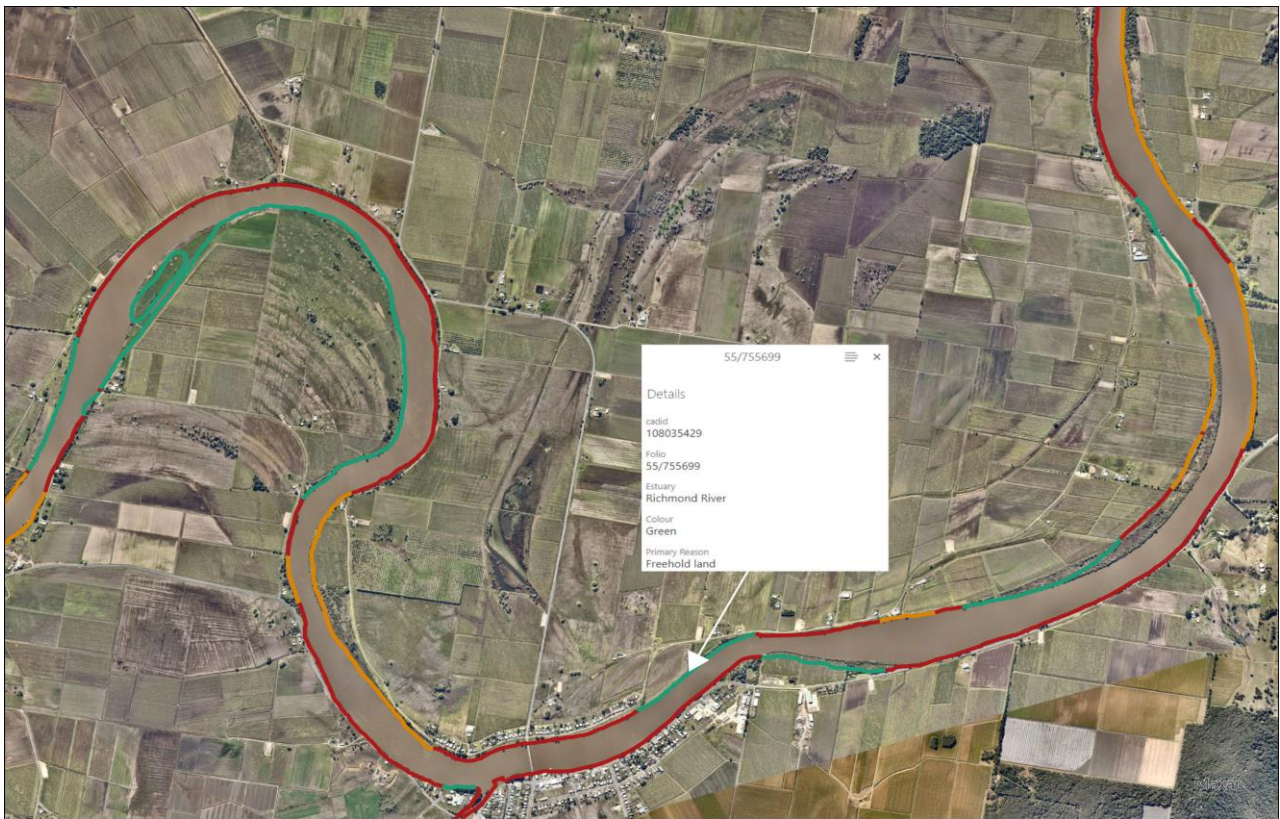


Figure 3. Domestic waterfront structures strategies online mapping. The traffic-light approach integrates NSW legislation and long-standing public policies to consider impacts of proposed structures, while also establishing a transparent, consistent and streamlined approvals process.

Initiative 3 - Planning for climate change



Photo 6. The effects of climate change are expected to increase over time. Flooding at The Entrance on the Central Coast in 2021 – Photo Shutterstock/Adam Marshal ©

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 are monitoring and reporting 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 and increase the capacity of coastal and marine managers and communities to anticipate climatic impacts and provide improved access to new knowledge. We are also investing in Blue Carbon work, which involves the collaboration of many agencies and external partners, to plan and implement policy that will guide enhanced carbon sequestration by mangroves, seagrass and kelp.

This period of implementation sees the inclusion of marine vegetation mapping projects initially in Initiative 2. It also includes exciting new blue carbon projects, a first for NSW. There will be a focus on increased cross agency collaboration in the climate change space and utilisation of climate change research across NSW.

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

Initiative 3



Objective




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



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

	Projects	Partners	Location	What we will deliver in2022-23 and 2023-24
Action 3.1	Enhance mapping of estuarine communities (such as saltmarsh and mangroves) to identify those communities most at threat from sea level rise under expected 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 Identify mangrove and saltmarsh communities most at risk from sea level rise and use vulnerability assessment principles to prioritise threat mitigation efforts and identify priority areas suited to migration using bespoke modelling.	DPE-P DPI-F UNI	Statewide	Second-pass, statewide assessment of vulnerability to sea level rise, which incorporates climate change impacts on catchment hydrology. Eco-morphodynamic wetland response model suited to testing and assessing potential management actions for facilitating mangrove and saltmarsh migration or mangrove and saltmarsh maintenance in situ. Case study demonstrations that apply the wetland response model and decision support tools on examples in each of the 5 NSW estuary types.
	Estuarine habitat monitoring and threat assessment Monitoring threats to, and extent of seagrasses, mangroves and saltmarshes to	DPI-F	Statewide	Maps of extent and impacts to seagrass, mangrove and saltmarsh completed for 8 estuaries. Data made available via an estuarine habitat dashboard and spatial data portal.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	fill knowledge gaps, assess the effectiveness of management actions, and inform blue carbon storage estimates and predictive models (new project).			Habitat fragmentation and loss estimates calculated and related to anthropogenic impacts, with data reported in scientific publications and MIMP outputs. Maps of predicted changes to mangrove and saltmarsh distribution under sea level rise uploaded to the estuarine habitat dashboard.
	Developing and delivering Blue Carbon Policy This project is focused on planning and delivering priority actions in the NSW Blue Carbon Strategy 2022-2027. This will support restoring coastal biodiversity and ecosystems and aiding their adaptation and migration while simultaneously working towards carbon sequestration and emissions reduction (new project).	DPE-EHG DPI-F DPE-P NPWS UNI LALC LGOV DPE-CL PIPAP	Statewide	Review and determine effectiveness of blue carbon ecosystem legislative protection, conservation and climate change adaptation mechanisms. Review the NSW planning system to streamline approvals and enable blue carbon restoration projects. Support private and public land covenanting arrangements and other funding options to manage and conserve blue carbon ecosystems. Undertake a gap analysis, publish a research prospectus and work with key partners to identify potential funding pathways to deliver research priorities.
	Blue carbon demonstration on primary production land Progress a demonstration site at the DPI Duck Creek Research Station, Ballina that showcases the benefits of a blue carbon project on primary production land and will facilitate the development of guidance materials to support primary producers and landholders (new project).	DPI-F DPE-EGH NPWS LGOV UNI DPI LALC	Statewide	Duck Creek blue carbon demonstration site investigation completed. Investigations into intertidal and coastal wetland blue carbon reversal risk undertaken.
	Blue carbon demonstration on national parks land Progress a demonstration site at Everlasting Swamp near Maclean, one of the largest	DPE-EHG DPI-F DPE-P	Clarence	In 2022-23, an Ecological Values Assessment and updated hydrological modelling of potential restoration options will be completed to inform project feasibility and restoration planning.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	coastal wetlands in NSW, delivering on Action 2.5 in the NSW Blue Carbon Strategy 2022-2027 (new project).	NPWS LALCS LGOV PIPAP		In 2023-24, a restoration plan for the Everlasting Swamp will be developed in consultation with adjacent landholders and the local community, Traditional Owners and Clarence Valley Council. If determined feasible, DPE-EHG will seek to register the site with the Clean Energy Regulator.
Action 3.2	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. <i>This management action is being addressed through wider work in Initiative 3 and through other programs managed by DPE-EHG.</i>			
Action 3.3	Build the knowledge and capacity of coastal and marine managers and the community to increase resilience to climate change in the marine estate through strategic adaptation planning and management.			
	Informing the Climate Change Adaptation Strategy Developing and consolidating marine estate information to contribute to the NSW Climate Change Adaptation Strategy, promoting alignment of actions between the NSW Climate Change Adaptation Strategy with Marine Estate Management Strategy, ensuring innovative on-ground climate adaptation actions are delivered.	DPE-EHG DPI-F OECC	Statewide	Marine estate data considered in the statewide Climate Change Risk and Opportunity Assessment. Marine estate content developed and included on the AdaptNSW website. Facilitation of on-ground marine adaptation projects.
Action 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. This action is linked to Initiative 4.			
Action 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 Monitoring Program.			
	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 DPE-EHG	Statewide	Research undertaken on the role of kelp in blue carbon cycles, linking in with Blue Carbon Policy development.

Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
			Marine park vulnerability to climate change and adaptability of key species assessed and reported on to inform marine park management.
 Climate change monitoring Monitoring the condition and resilience of priority environmental assets at most risk from climate change.	DPI-F	Statewide	Condition of rocky reef habitats and biota, and the impacts of floods assessed. Baseline monitoring data collected for a new priority environmental asset (to be determined).
 Climate change citizen science Mapping marine species redistributions due to climate change using community data.	DPI-F UTasRed map	Statewide	Citizen science projects and the Redmap web portal supported, to document out of range species. Data will continuously be collected and update future report cards (due in 2026).

More information

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

Case study

MONITORING KEY ASSETS TO DETECT IMPACTS OF CLIMATE CHANGE

The project

This project monitors key environmental assets in the marine estate, to detect and predict the impacts of climate change and guide management actions. Rocky reef habitats such as kelp forests, sea urchin barrens and algal turfs, as well as fish and urchin abundance, are monitored using towed video and SCUBA surveys throughout the NSW marine estate annually. Four years of baseline data on rocky reefs has been collected so far and monitoring will continue in future years. Baseline data is being used in modelling to predict the likely future impacts of climate change to rocky reefs. This information will be used to plan and implement adaptive management strategies that anticipate climate change.

The site

Statewide

Rationale

The impacts of climate change are often not well understood or documented. Many assets in the marine estate lack baseline data from which to measure change and detect impacts hindering the ability to develop and implement proactive management and mitigation strategies.

The benefits

This baseline data allows state government to detect early climate driven change to key marine habitats and implement proactive management strategies to mitigate or adapt to change. It provides the data, information and knowledge to “future-proof” marine management and secure the ecological, social, cultural and economic benefits underpinned by these key habitats. This data will be incorporated into adaptation planning.

Key outputs

- Baseline data on rocky reef habitat and species cover, abundance and health, from which to measure change and inform the Marine Integrated Monitoring Program.
- Mapping and modelling to predict likely future impacts under climate change scenarios in the marine estate.
- Scientific publications and communication material.

Delivered by

DPI-F

Related actions

Relates to management action 3.5.



Photo 7. Scientist collecting baseline data on kelp cover, abundance and health on marine estate rocky reefs. - Photo Tom Davis DPI.

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



Photo 8. Joonga Aboriginal Land and Sea Corporation employees have relished the chance to participate in a capacity building program to support gaining their sea time and training experience as part of the Eurobodalla SMART drumline shark mitigation contract

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 the 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 and their ownership and active involvement in managing the marine estate.

Aboriginal communities are becoming more involved in marine estate natural resource management, tourism, aquaculture, and fishing sectors. Aboriginal staff are employed in DPI-Fisheries under the Strategy to deliver on the actions in Initiative 4 and linking with staff and partners implementing projects of relevance in other initiatives.

Through this initiative, we will see increased opportunities for Aboriginal organisations to secure contracts and employment in the marine sector.

Initiative 4


Objective




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




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 benefits 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

	Project	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 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.			
	Sea Country management Enhance opportunities for Aboriginal employment in NSW Government to manage Sea Country.	DPI-F DPE-EHG	Statewide	Retain eight identified roles and explore opportunities for further development.

	Project	Partners	Location	What we will deliver in 2022-23 and 2023-24
	Aboriginal engagement Evaluate current arrangements of Aboriginal peoples' participation in Sea Country management and establish an effective Aboriginal Engagement Framework.	DPI-F DPE-EHG	Statewide	Engagement with Aboriginal people assessed, and an Aboriginal Engagement Framework developed. Use of technology such as social media, still photography, videos, mail outs and familiarisation excursions to engage with communities and share information.
Action 4.2	Work with Aboriginal communities to identify the cultural values of Sea Country to improve the incorporation of values into decision-making on the marine estate.			
	Sea Country plans Develop Sea Country plans with Aboriginal communities that document their custodian roles, responsibilities and priorities to care for Sea Country and protect their cultures. They also provide important cultural information such as cultural management practices, subsistence fishing and continuity of cultural traditions to be handed down for future generations.	DPI-F DPE-EHG Local Aboriginal communities LALC TO	South Coast Port Stephens	Sea Country Plan project commenced with the Aboriginal community in the Batemans Marine Park. Draft Cultural Resource Use Agreement for the Worimi people in the Port Stephens-Great Lakes region finalised.
	Cultural Immersion Aboriginal Elders spend time working with and mentoring marine estate staff and imparting their knowledge so that staff gain a greater respect and appreciation of Sea Country and Aboriginal cultural values which is transferred into the day-to-day management of Sea Country.	DPI-F DPE-EHG Local Aboriginal communities LALC TO	Statewide	Mentoring continued in existing marine parks and plan to expand this project to other areas in the marine estate, via boat trips in culturally significant waterways or offshore, and delivery of cultural camps where appropriate.

	Project	Partners	Location	What we will deliver in 2022-23 and 2023-24
	Cultural interpretations Work with Aboriginal communities to increase cultural interpretation in marine protected areas, to increase public awareness of Aboriginal cultural values, which may include signage and artwork depicting the stories and cultures of Aboriginal peoples' connections to Sea Country, developed with Aboriginal communities.	DPI-F DPE-EHG Local Aboriginal communities LALC TO	Far North Coast Statewide	Complete the Aboriginal interpretive signage for the Cape Byron Marine Park, on Arakwal Country. Complete the fit out for 3 interpretation trailers that can be used statewide to share important cultural values and stories.
Action 4.3	Implement an integrated Aboriginal engagement model to increase Aboriginal participation in Sea Country management, planning and monitoring through employment and training of Aboriginal people at a regional and local level.			
	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 DPE-EHG TfNSW Local Aboriginal communities LALC TO	Statewide	Caring for Sea Country activities and training expanded to other communities, to deliver boat licence training, boat building, coastal weed management, threatened species protection, scientific diving, eco-tourism, and other activities.
	Reviving culture Work with Aboriginal communities to maintain or revive cultural knowledge and practices of Sea Country.	DPI-F DPE-EHG TfNSW Local Aboriginal communities LALC TO PA	North Coast Port Stephens South Coast	Yaegl and Worimi Sea Country School Education program completed, and planning commenced for expansion to other areas. Yuin Sea Country School Education program implemented and success evaluated to inform future programs.
Action 4.4	Explore and assist Aboriginal communities to implement opportunities for economic development in the NSW marine estate and improved representation of Aboriginal cultural values in NSW marine parks.			

	Project	Partners	Location	What we will deliver in 2022-23 and 2023-24
	Cultural economic development Identify and expand opportunities for economic development across the marine estate.	DPI-F DPE-EHG UNI LALC TO	Statewide	Current economic development projects, including eco-tourism business establishment, supported and work commenced with other communities to expand the project. Economic opportunities for communities in other marine industries explored, including aquaculture and commercial fishing.
	Cultural fishing funds Delivering targeted funds to increase economic opportunities for Aboriginal people in the fishing and seafood industry. DPI-F	DPI-F	Statewide	Grant opportunities enhanced for Aboriginal people, to undertake activities in the fishing and seafood industry.
Action 4.5	Integrate research and monitoring into the Monitoring Program to address key knowledge gaps and to assess management effectiveness in reducing threats and risks to Aboriginal cultural heritage.			
	Cultural research and monitoring Develop research, monitoring and evaluation approach that is integrated with the Aboriginal Engagement Framework and aligns with the Marine Integrated Monitoring Program.	DPI-F DPE-EHG UNI	Statewide	Cultural research and monitoring activities expanded elsewhere in the marine estate, undertaking activities such as underwater visual census, offshore mapping, urchin monitoring, acoustic tracking of mullet, reseeding jetty piles and artificial oyster reefs.
	Cultural Site Protection Undertake local cultural research activities with local Elders and communities targeting important cultural sites and informing management strategies to conserve cultural sites and artefacts.	DPI-F DPE-EHG HNSW	South Coast	Complete research, planning and management for the Buckenbowra Fish Trap.
	Pipi harvest Consolidate research and implement Stage 2 of the 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 LALC TOs	North and Central Coast	Stage 2 discussions with projects partners completed.

	Project	Partners	Location	What we will deliver in 2022-23 and 2023-24
	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 DPE-EHG HNSW NPWS	North Coast	Investigations into the Moonee Beach Aboriginal burial site completed, a site that was exposed by coastal erosion and exacerbated by climate change. A remediation and protection plan developed for the Moonee Beach site in collaboration with NPWS, Traditional Owners, Heritage NSW and DPE-EHG Coastal Management Program, that may be applied elsewhere on Sea Country. Ongoing collaboration between DPI-F, NPWS, The Everick Foundation, DPE-EHG and Heritage NSW to support the local Aboriginal community to protect their cultural heritage.

More information

More information on Initiative 4 projects are on the marine estate website: [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

SMART DRUMLINE TENDER, TRAINING & CAPACITY BUILDING

The project

The culmination of several Aboriginal marine skills projects in this initiative over several years has contributed to building capacity for Aboriginal people in the marine industry. Marine skills training in Certificate I in Marine Operations (Deckhand) and Certificate II in Marine Operations (Coxswains) have been particularly valuable and has resulted in two south coast Aboriginal corporations, the Joonga Aboriginal Land and Sea Corporation and the Yuin Ngura Custodians winning the Shark Management Alert in Real Time (SMART) drumline contracts for shark mitigation in the Eurobodalla and Kiama local government areas respectively. This involves monitoring and managing the detection, capture and removal of sharks from SMART drumlines (Figure 4) and their release further offshore. The Program has also provided funding and support for Aboriginal trainees for each corporation.

The site

Yuin Sea Country

Rationale

Aboriginal communities have historically had limited opportunities to develop the specialist skills and training sought after in many marine industries and businesses.

The benefits

This case study highlights the benefits of several projects in Initiative 4 collectively building capacity for Aboriginal people and communities to be confident and competitive in starting marine related businesses and tendering for Government contracts that manage aspects of Sea Country. The vessel qualifications and skills obtained by Aboriginal people, funded under Initiative 4, enabled two Aboriginal corporations to win the SMART drumline contracts.

For the First Nations People of the Yuin Nation, the work showcases their custodianship responsibilities, cultural values, and knowledge of Sea Country to the broader public.

Key outputs

Two South Coast Aboriginal Corporations, Joonga Aboriginal Land and Sea Corporation and Yuin Ngura Custodians, awarded the SMART drumline tenders.

Delivered by

Joonga Aboriginal Land and Sea Corporation and Yuin Ngura Custodians.

Related actions

Relates to management actions 4.3 and 4.4

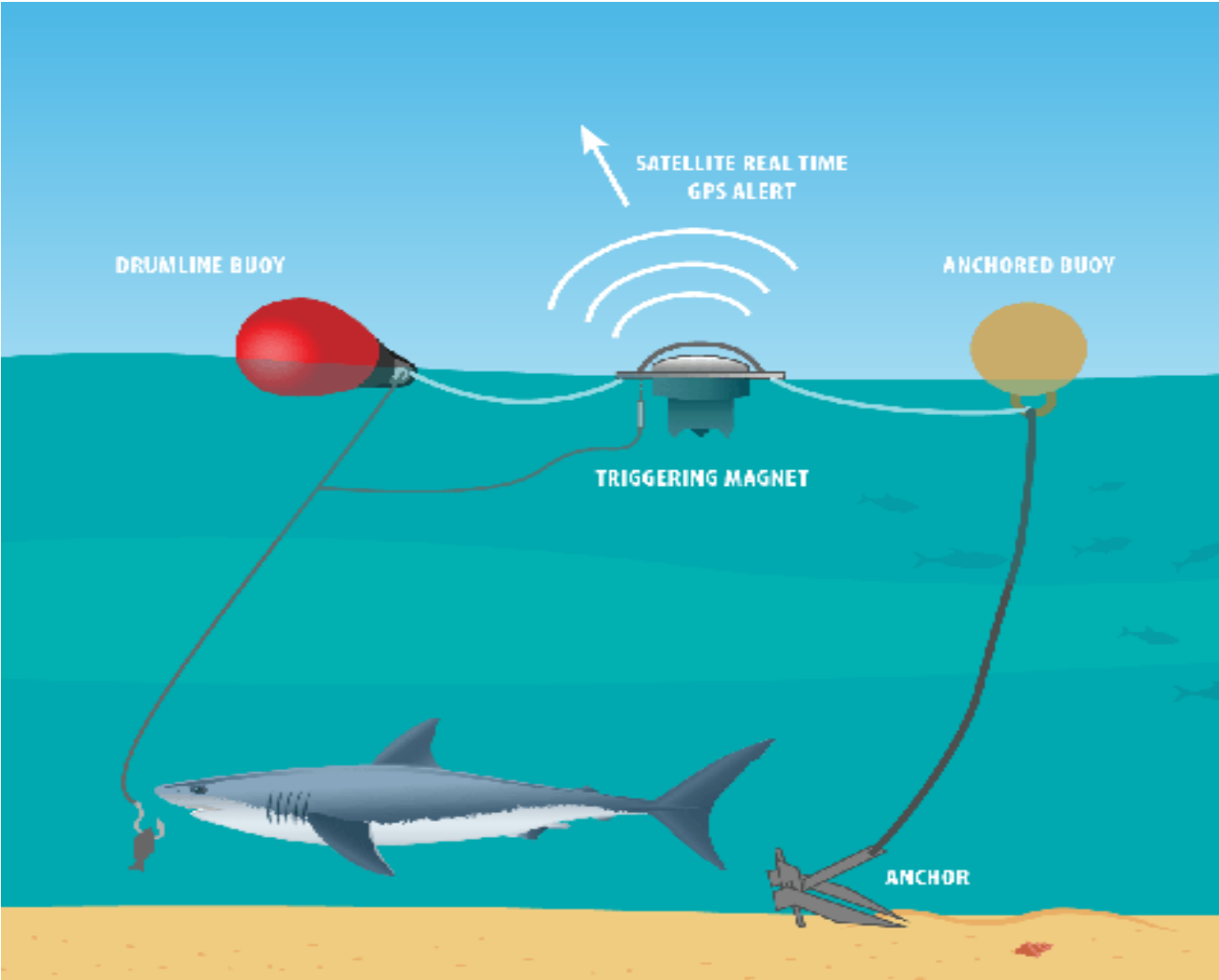


Figure 4. SMART drumline operation.

Initiative 5 – Reducing impacts on threatened and protected species



Photo 9. The weedy seadragon (*Phyllopteryx taeniolatus*), a protected species in the NSW marine estate, benefiting from projects in Initiative 5 – Photo David Harasti DPI.

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

This initiative will reduce the cumulative threats to threatened and protected species. This will allow species and populations to recover from past threats, and for the community to continue to appreciate the social, cultural and economic benefits from the multitude of marine species in the NSW marine estate.

The complex set of threats will take time to understand and address. In 2022-2024, we will continue to work with staff across multiple agencies, and with key stakeholders to organise our responses to marine wildlife incidents better. This includes expanding the NPWS *Elements* database so it can capture information about marine wildlife incidents across the marine estate in real time.

We will also develop targeted education and compliance campaigns 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 by fishers with threatened and protected species, which will inform strategies, such as gear modifications, to reduce interactions with non-target species.

Initiative 5


Objective




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




Long-term outcomes


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

Management actions and projects

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 5.1	Improve strategic planning and coordination for marine threatened and protected species programs across NSW to address priority threats.			
	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.	DPE-EHG NPWS DPI-F	Statewide	Training of NPWS staff, veterinarians and licensed marine fauna rehabilitators to improve management of marine fauna events. Support a marine Duty Officer to improve outcomes from marine fauna events. Implementation of the new operating system for NPWS to respond to marine fauna events. Marine Wildlife Management Manual reviewed and updated. Strategic plan developed to guide priorities allocated to marine fauna response. Centralised database for marine training records created. Capacity to respond to oiled wildlife events and live stranded large cetaceans improved.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 5.2	Strengthen partnerships for marine threatened and protected species conservation responses to ensure effective 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.	DPE-EHG NPWS SCR DPI-F Indigenous Rangers	Statewide	Accreditation and training in Large Whale Disentanglement completed. Training of NPWS staff and rehabilitation organisations in pinniped assessment and capture workshops delivered. Delivery of shorebird monitoring workshops. Memorandums of Understanding with partner agencies established.
Action 5.3	Improve the 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.			
	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.	DPE-EHG DPI-F NSW TurtleWatch Schools	Statewide	Audit of lights being used in NSW National Parks and skyglow assessments undertaken at sea turtle nesting sites and key sea bird rookeries. Educational material demonstrating appropriate seal interactions developed and disseminated. Educational material demonstrating cetacean approach distances developed and disseminated. Educational material on appropriate handling and sampling of animals developed for veterinarians and organisations involved in marine species rehabilitation.
Action 5.4	Improve reporting and data sharing on threatened and protected species threats 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.			
	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	DPE-EHG NPWS DPI-F Veterinarians	Statewide	Increased reporting of marine fauna events and interactions reported into Elements. Upload of Elements data into BioNet to improve understanding of species habitat use. Collection for beach-nesting shorebird.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	awareness of reporting pathways, actively analysing and communicating data more regularly, and integrating research and data into the Monitoring Program.	Rescue and rehabilitation organisations		Retrospective analysis of selected Elements datasets to determine trends and relevant environmental factors.
Action 5.5	Expand existing observer programs, including the use of new technologies to high and moderate risk commercial fisheries to better understand threats associated with bycatch and interactions with threatened and protected species.			
	Estuary general fishery observer survey Observer-based survey of the Estuary General mesh net fishery to address threats to fish assemblages (harvest and bycatch).	DPI-F DPE-EHG Industry	Statewide	Observer-based survey of the Estuary General mesh net fishery to address threats to fish assemblages (harvest and bycatch).
	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 6 and 8).	DPI-F Industry DPE-EHG NGO	Statewide	Environmentally friendly fishing gear provided to commercial fishers. Trial of electronic monitoring equipment to investigate its feasibility in the fishing industry completed, providing independent data on the incidence of fish discards and components of fisheries that are high-risk to non-target species.
Action 5.6	Understand and reduce the impacts of threatened and protected species habitat modification through mapping of key habitat areas, embedding rehabilitation and conservations actions in planning processes, and collaborating with land owners and the community to protect species and habitats.			
	Species habitat research Understand and reduce impacts of habitat modification on threatened and protected species (new project).	DPE-EHG DPI-F UNI	Statewide	Review of community produced databases documenting threatened marine species to assess suitability for inclusion into BioNet and identify key knowledge gaps. Desktop models developed to predict habitat use by marine fauna. Assessment of habitat health through analysis of sediments, macro-algae and water quality.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
5.7	Develop and implement research programs to address key knowledge gaps associated with cumulative threats to threatened and protected species and the effectiveness of management interventions. This action will be integrated into the Monitoring Program.			
	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.	DPE-EHG DPI-F UNI	Statewide	Assessment of anthropogenic pollutants on the health of marine fauna. Audiograms on stranded mysticetes. Improved assessment of threats driving morbidity and mortality in marine wildlife. Assessment of heavy metal levels in cetaceans. Assessment of marine debris in marine fauna. Determination of sex of stranded marine turtles. Determination of rehabilitation outcomes for stranded marine fauna.

More information

More information on Initiative 5 projects are on the marine estate website: [strategy-implementation/reducing-impacts-on-threatened-and-protected-species](#)

Case study

SIGNAGE AT A FUR SEAL HAUL OUT SITE

The project

This trial tests the effectiveness of a seaward-facing sign placed at a regular, and increasingly used, fur seal haul-out site to better inform vessel users about approach distances.

The site

A fur seal haul-out site on the north-western side of Barrenjoey Headland sees recreational and commercial vessels pass regularly as they travel between Pittwater and Broken Bay, north of Sydney. For around 7 years an increasing number of fur seals have used the site, choosing a large flat rock 20 metres from shore to rest (or haul out) after foraging at sea. They are generally visible from the vessels passing by the headland and are a regular detour for vessel users and the subject of social media posts which generates significant community interest and additional vessel-based sightseers who travel to see the seals.

Rationale

Australian and New Zealand fur seals are an increasing sight along parts of the NSW coast, including highly urbanised areas within Sydney Harbour, Broken Bay, Botany Bay, and Port Stephens. Their populations are slowly recovering from historic sealing practices, which saw them almost hunted to extinction 2 centuries ago.

Their presence along the NSW coast is slowly changing in many sites, from occasional visitors to intermittent residents where bachelors return regularly to the same site, and eventually to permanent breeding colonies, such as Montague Island. However, the absence of seals for many generations from places where they once thrived has meant that as they return many people are unfamiliar with wild seal behaviour and the laws that keep the community safe and allow seals to live undisturbed.

Seals are protected under the *Biodiversity Conservation Regulation (2017)* and if hauled out on land, they should not be approached any closer than 40 metres, or 80 metres if a pup is present.

At Barrenjoey Headland, there have been regular reports of jet skis, kayaks and motorboats approaching within 40 metres of seals potentially resulting in the disturbance and harassment of seal populations. After consultation and approval from TfNSW, NPWS are trialling a seaward facing sign to inform and remind vessel operators about the legal approach distances.

The benefits

The effectiveness of the seaward facing sign will be evaluated to determine vessel owner compliance with approach distances. The trial aims to keep vessel users safe and allow seals to live with minimal disturbance from water-based sightseers. If found to be effective, it may be used at other regular haul out sites where vessels are known to approach too closely. This complements the pedestrian-based approach distance signs rolled out over the last four years.

Key outputs

A vessel approach survey was completed before the sign was installed in 2021. A regulatory sign was scoped for legibility at 40 metres from the regular haul out rock and approved for use by TfNSW and NPWS. It was installed at the site by NPWS in late 2021. A report on the 12-month trial, including survey results before and after installation, will be available late 2022.

Delivered by

NPWS in collaboration with TfNSW.

Related actions

Relates to management actions 5.3



Photo 10. Fur seals hauled out on flat rock at Barrenjoey Headland prior to the installation of the sign. Photo K. Cooper/NPWS.

Initiative 6 - Ensuring sustainable fishing and aquaculture



Photo 11. Commercial fisherman unloading his catch of Eastern rock lobster (*Sagmariasus verreauxi*). Photo DPI

The problem/opportunity

Sustainable fishing and aquaculture are important to community for health and wellbeing, but they also need to be managed to reduce the impacts of the activities on marine species and habitats. This initiative supports projects that promote sustainable practices, while enabling continued social, cultural and economic benefits to be enjoyed by the people of NSW.

Steps to achieving our long-term outcomes

This initiative aims to improve the ecological sustainability and economic viability of all 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 have:

- improved understanding among agencies and commercial and recreational fishers of the impacts of fishing and aquaculture on the marine estate
- developed best practice guidelines and rules to ensure ecologically sustainable practices
- enhanced 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 diseases to the marine estate and ways they can minimise these risks.

Initiative 6


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.




Long-term outcomes





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


Management actions and projects

	Management actions	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 6.1	Introduce harvest strategies and evaluate ecological risk in partnership with stakeholders and shareholders to address the priority threats associated with the reduction in abundance of fish species and trophic levels.			
	Harvest strategy development Expand the harvest strategy framework by continuing development and implementation of harvest strategies for key NSW species and fisheries consistent with the NSW Harvest Strategy Policy and Guidelines.	DPI-F Industry CommFish RFNSW AFAC Community	Statewide	Fisheries management measures implemented consistent with harvest strategies for the Eastern rock lobster (<i>Sagmariasus verreauxi</i>) and trawl whiting (several species). Harvest strategies developed for spanner crabs (<i>Ranina ranina</i>) and mulloway (<i>Argyrosomus japonicus</i>). Draft harvest strategies developed for Snapper (<i>Pagrus auratus</i>) and Yellowtail kingfish (<i>Seriola lalandi</i>). Progress one fishery-level harvest strategy to provide a framework for managing multiple stocks and broader issues such as ecological risk. Progress draft strategy development for key species or fisheries through a staged process.

Management actions	Partners	Location	What we will deliver in 2022-23 and 2023-24
 <p>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).</p>	DPI-F Industry AFAC CommFish RFNSW MFAC Community	Statewide	<p>Communications material developed promoting the benefits of harvest strategies, fisheries science and resource management decisions.</p> <p>Improved understanding of the terminology, methods and processes used in fisheries assessment (including ecological risk assessment), harvest strategy development and fisheries management.</p> <p>An evidence base for developing harvest strategy components, including performance indicators and reference points.</p> <p>Testing and evaluation of harvest strategies, to ensure greater certainty in the mechanics of harvest strategies meeting their stated objectives.</p> <p>Ecological Risk Assessment interim reports and integrated databases supporting quantitative analyses, including evaluation of management measures to reduce or mitigate threats to and from fisheries resources, thereby underpinning harvest strategies for priority fisheries.</p> <p>Development of a framework for cultural fishing in NSW harvest strategies including targeted engagement with Aboriginal stakeholders.</p>
Action 6.2	Conduct an environmental assessment of recreational fishing, periodically review current rules, and take action to improve fish stocks and to address threats associated with harvest, bycatch and illegal sale of fish.		
 <p>Recreational fishing environment assessment Develop an environmental assessment of recreational fishing (saltwater), prepare a Recreational Fishing Management Strategy and commence implementation of key recommendations.</p>	DPI-F Industry	Statewide	<p>Complete all components of the environmental assessment (saltwater species), including a cultural impacts assessment, to be undertaken in 2022-23.</p> <p>Recreational Fishing Management Strategy developed in response to the environmental assessment, including initiatives to mitigate key stressors identified.</p> <p>Responsible fishing initiatives delivered that align with the assessment, to address key stressors such as bycatch of fish and threatened and protected species and marine debris. Initiatives include the distribution of responsible</p>

	Management actions	Partners	Location	What we will deliver in 2022-23 and 2023-24
				fishing gear such as circle hooks, release weights and a crab trap swap scheme, with the promotion of relevant advisory material.
Action 6.3	Explore opportunities for new marine aquaculture ventures.			
	Oyster aquaculture business and environment Bridging the gap between academic research and policy needs with regard to water quality in the marine estate, and the role of oyster aquaculture.	DPI-F UNI Industry	North Coast	Investigation completed on sediment load under and around oyster leases in comparison to the wider estuarine environment, and an assessment of any identified potential impacts associated with deposited matter from the oyster farming activity to develop best practices for the oyster industry. Research on the optimisation of denitrification capacity from commercial oysters and oyster reefs, which helps to inform the role of microbial communities in both situations.
Action 6.4	Apply best-practice guidelines for seagrass protection in the NSW Oyster Industry Sustainable Aquaculture Strategy.			
Action 6.5	Integrate various commercial, recreational and cultural fishing data and new research into the Monitoring Program to address key knowledge gaps associated with harvest and bycatch.			
	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	Hastings	Culturally appropriate data collection methods based on face-to-face, telephone and online diary surveys, co-designed by the Birpai/Bunyah Aboriginal Advisory Committee members and DPI, with support from the Australian Institute of Aboriginal and Torres Strait Islander Studies, implemented. Preliminary quantitative data on local cultural fishing participation, catch and effort delivered. Qualitative data on the importance and value of cultural fishing at a local level delivered.
	Commercial fisheries socio-economic research Produce an annual time series of economic and social indicators for NSW commercial fisheries, filling key social and economic knowledge gaps (new project).	DPI-F	Statewide	Publish results from the 2019-20. Engagement with commercial fishers seeking participation in a short business survey that will inform the development of economic and social indicators for future years.

	Management actions	Partners	Location	What we will deliver in 2022-23 and 2023-24
				Annual survey results will be published for all three survey periods by 2024.
	Aquaculture socio-economic research Undertake a socio-economic valuation of the aquaculture industry in the marine estate, filling key social and economic knowledge gaps (new project).	DPI-F	Statewide	Socio-economic valuation completed for the aquaculture industry.
Action 6.6	Enhance fisheries via targeted fish stocking and other activities to improve fishing opportunities where appropriate.			
	Fisheries enhancements Undertake marine fish stocking and artificial reef installation at key locations to improve fishing access.	DPI-F Industry	Statewide	Marine fish stocking of key species including dusky flathead (<i>Platycephalus fuscus</i>) into Recreational Fishing Havens. Large scale, purpose built offshore artificial reefs deployed in the Forster and Central Coast regions in 2023. Additional offshore artificial reefs delivered off the NSW coastline in 2024.
Action 6.7	Partner with fishing and aquaculture sectors to deliver information and training to fishers in NSW to improve self-compliance and sustainable fishing practices and develop economic opportunities.			
	Fishing industry marine stewardship Develop information and training package in partnership with key fishing sectors and assist in delivery.	DPI-F Industry NGOs	Statewide	Support opportunities that instil accountability and build leadership and stewardship capacity within the NSW commercial fishing industry.
Action 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.			
	Eat more NSW seafood Deliver the Eat More NSW Seafood grant program to build marketing and promotion capability within seafood businesses through small-scale and large-scale grants which contributes to building social licence	DPI-F Industry	Statewide	Grant applications sought from seafood businesses to build the marketing and promotion capability within seafood businesses through small-scale and large-scale grants and promote the consumption of NSW seafood.

	Management actions	Partners	Location	What we will deliver in 2022-23 and 2023-24
	for the commercial, aquaculture, recreational and Aboriginal fishing sectors.			Promotion of the program through media and social media channels.
Action 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.			
	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	Continued delivery of the Communications Plan, including distribution of advisory materials to key stakeholders and attendance at key stakeholder events.

More information

More information on Initiative 6 projects are on the marine estate website: [strategy-implementation/ensuring-sustainable-fishing-and-aquaculture](https://www.marineestate.nsw.gov.au/strategy-implementation/ensuring-sustainable-fishing-and-aquaculture)

Case study

EAT MORE SEAFOOD

The project

The Seafood Industry Partnerships in Schools to 2030 project was granted funds under the Eat More NSW Seafood project. It will enable up to 200 fishers, farmers, processors, or retailers to tell their story uniquely and directly to 200 teachers and 6,000 students throughout NSW, building support for the seafood industry by increasing understanding of the sustainable practice and the pride of seafood people in delivering quality seafood product to the NSW communities.

The site

Statewide

Rationale

The Eat More NSW Seafood grant program aims to build marketing and promotion capability with seafood businesses through grants which contribute to building social licence for the commercial, aquaculture, recreational and Aboriginal fishing sectors.

The benefits

The Seafood Industry Partnerships in Schools 2030 project will create an attractive, sustainable, viable engagement program for the NSW seafood industry to regularly engage with school communities throughout NSW to 2030.

Key outputs

It will deliver agreed key messages and industry values to the heart of local communities and schools.

This whole-of-industry supported engagement concept will particularly (but not exclusively) showcase the commitment of OceanWatch Master Fishermen, who have previously been recognised for demonstrating responsible fishing practices to their local communities, as trusted stewards of the marine environment, and encourage further fisher uptake of training.

Delivered by

OceanWatch Australia

Related actions

Relates to management action 6.8



Photo 2. OceanWatch Australia showing students responsible fishing techniques - Photo OceanWatch Australia

Initiative 7 - Enabling safe and sustainable boating

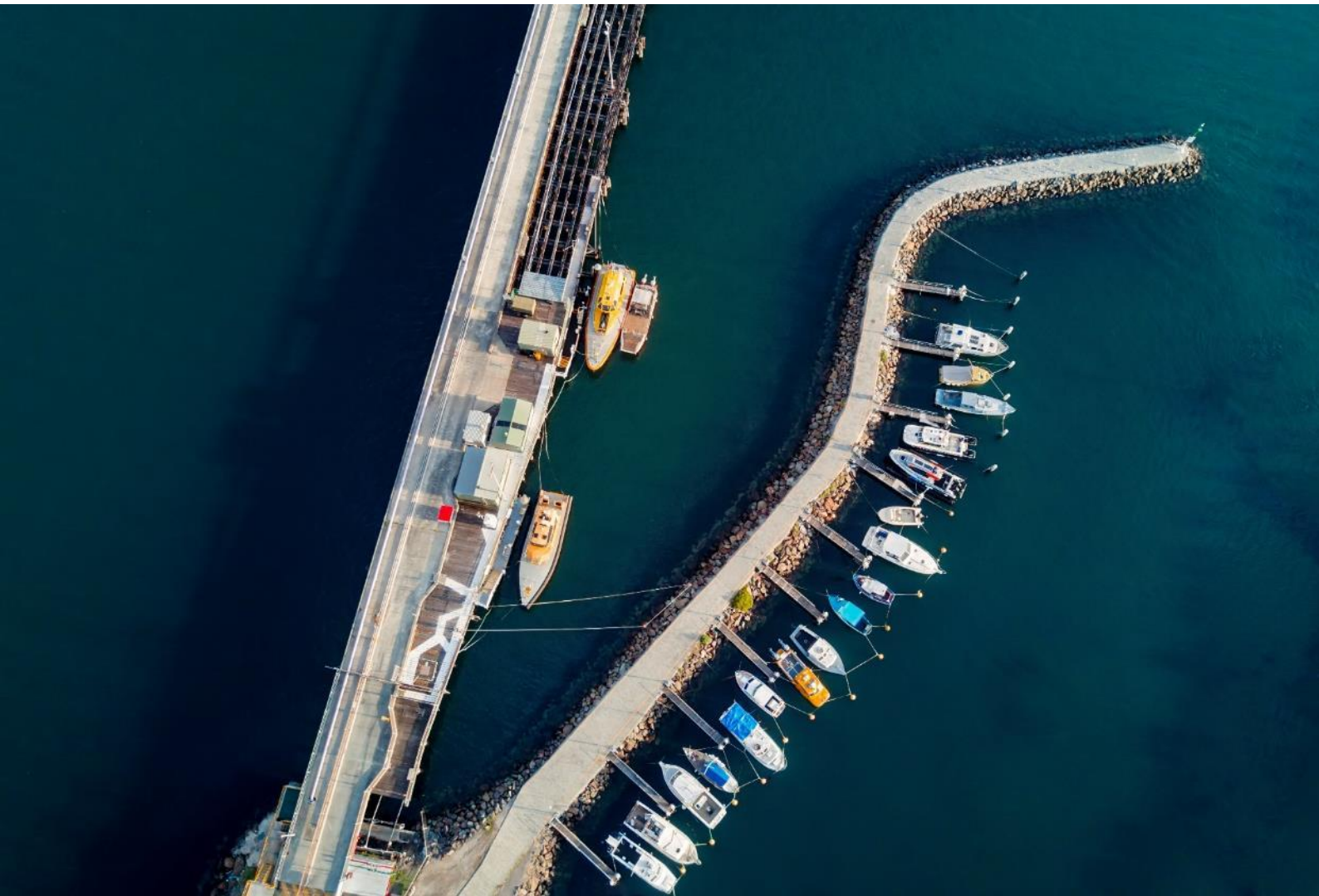


Photo 13. Meeting the demand for safe and sustainable boating access to our waterways. Wollongong Jetty – Photo [iStock.com/lovleah](https://www.iStock.com/lovleah) ©

The problem/opportunity

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

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 have improved boating infrastructure and increased 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.

TfNSW continues 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.

Initiative 7



Objective





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




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.

Management actions and projects

Action	Management actions	Partners/agency	Location	What we will deliver 2022-23 and 2023-24
7.1	Reduce the threats to seagrass from vessels through improved regulation, administration, education, new mooring technologies and delivery mechanisms.			
	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 DPE-P CSIRO	Mid North Coast Greater Sydney Region Shoalhaven	Continued implementation of EFM research trial.
7.2	Establish a framework to manage increased mooring demand through the Moorings Review program.			
	Mooring strategy Review and modernise the strategy for mooring management and administration to improve access to moorings.	TfNSW DPI-F DPE-P	Statewide	Continued implementation of policies for processing and issuing of moorings. Continued implementation of mooring audits.

Action	Management actions	Partners/agency	Location	What we will deliver 2022-23 and 2023-24
	Mooring access Optimise mooring density in mooring fields to better meet demand.	TfNSW DPI-F	Statewide	Progress dependant on mooring management issues.
	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 DPI-F DPE-P	Statewide	Release of Policy Options Paper presenting policy and program proposals to mitigate safety and environmental risks and economic costs of ELVs in NSW waterways. Finalisation and implementation of agreed policy options to manage end of life vessels.
7.3	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, anti-fouling and sewage pump out into waterways.			
	Vessel environmental standards Continue to enforce environmental standards and regulations among domestic commercial vessels and recreational vessels.	TfNSW	Statewide	Continued enforcement of environmental standards and regulations among domestic commercial vessels and recreational vessels.
7.4	Partner with industry to investigate a pilot program at marinas in NSW to design and install sump drain runoff handling systems with sediment traps.			
7.5	Improve awareness of threats to threatened and protected species, and compliance with regulations, through data sharing, education, social research and compliance planning to reduce impacts of boating. This links to actions in Initiatives 5, 8 and 9.			
7.6	Integrate research and monitoring into the Monitoring Program to address key knowledge gaps associated with shipping movements and interactions with threatened and protected species.			
	Vessel monitoring Identify available data and undertake gap analysis.	TfNSW DPE-EHG NPWS DPI-F	Statewide	Vessel monitoring data.

Action	Management actions	Partners/agency	Location	What we will deliver 2022-23 and 2023-24
	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	Greater Sydney Region	Current knowledge of anchoring impacts and best management practices reviewed. Management effectiveness of offshore anchoring and monitor ecological recovery assessed.
7.7	Continue improving environmentally sustainable boating and resolve conflicting uses and waterway access to the marine estate through the NSW Boating Now Program.			
	Boating Now Work with partners to deliver projects funded through Round 3 of the Boating Now Program .	TfNSW	Statewide	Continued delivery of the Boating Now Program Round 3 and Round 4.
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 Initiative 8).			
	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	Mid-term review of Maritime Infrastructure Plan in 2022/23.

More information

More information on Initiative 7 projects are on the marine estate website: [strategy-implementation/enabling-safe-and-sustainable-boating](#).

Case study

Environmentally friendly moorings (EFMs) Research Program

The project

This program commenced in July 2021 to support the delivery of commitments under the Mooring Reform Program and this Strategy.

The program is being delivered in partnership with the CSIRO to respond to knowledge gaps around design and performance specifications of EFMs and to overcome negative perceptions about the safety, cost, and benefits of EFMs associated with past EFM trials.

Knowledge gained from this 4-year collaborative research program will provide an evidence-base for developing standards and guidelines, and regulatory options to increase the use of EFMs.

The program involves an in-water trial of 12 EFMs over 2 years.

The site

EFMs will be deployed across 3 NSW Maritime regions to encompass a range of environmental conditions. Locations include the NSW mid-north coast, Sydney Harbour, and the Shoalhaven.

Rationale

There is limited knowledge about the recovery of seafloor environment when an EFM is installed. This project will measure habitat recovery and carbon sequestration associated with implementing EFMs and contribute to an improved understanding of the lifecycle costs and benefits of EFMs.

The program addresses knowledge gaps around EFM design and performance. It will evaluate the performance of EFMs in terms of safety and environmental impacts and provide technical advice for generalised EFM design specifications suitable for different vessel types and environmental conditions.

The benefits

Traditional block and chain moorings use a weight on the seabed attached to a heavy chain, ropes, and a buoy to hold vessels in position under various weather conditions. The mooring chain can scour the seafloor when a moored vessel swings with the wind and current. Physical damage to the seafloor caused by traditional chain moorings is a threat to sensitive seabed habitat.

To reduce this threat, the program will engineer and test different types of EFMs that do not scour the seafloor and establish performance-based standards to support their wider use.

Key outputs

The research will generate mooring engineering data and develop EFM design specifications suitable for different vessel types and environmental conditions. The program will also test and evaluate EFM performance regarding safety and environmental impacts, including habitat recovery and carbon sequestration.

Delivered by

TfNSW - Centre for Maritime Safety - Strategy and Policy

Related actions

Relates to management action 7.

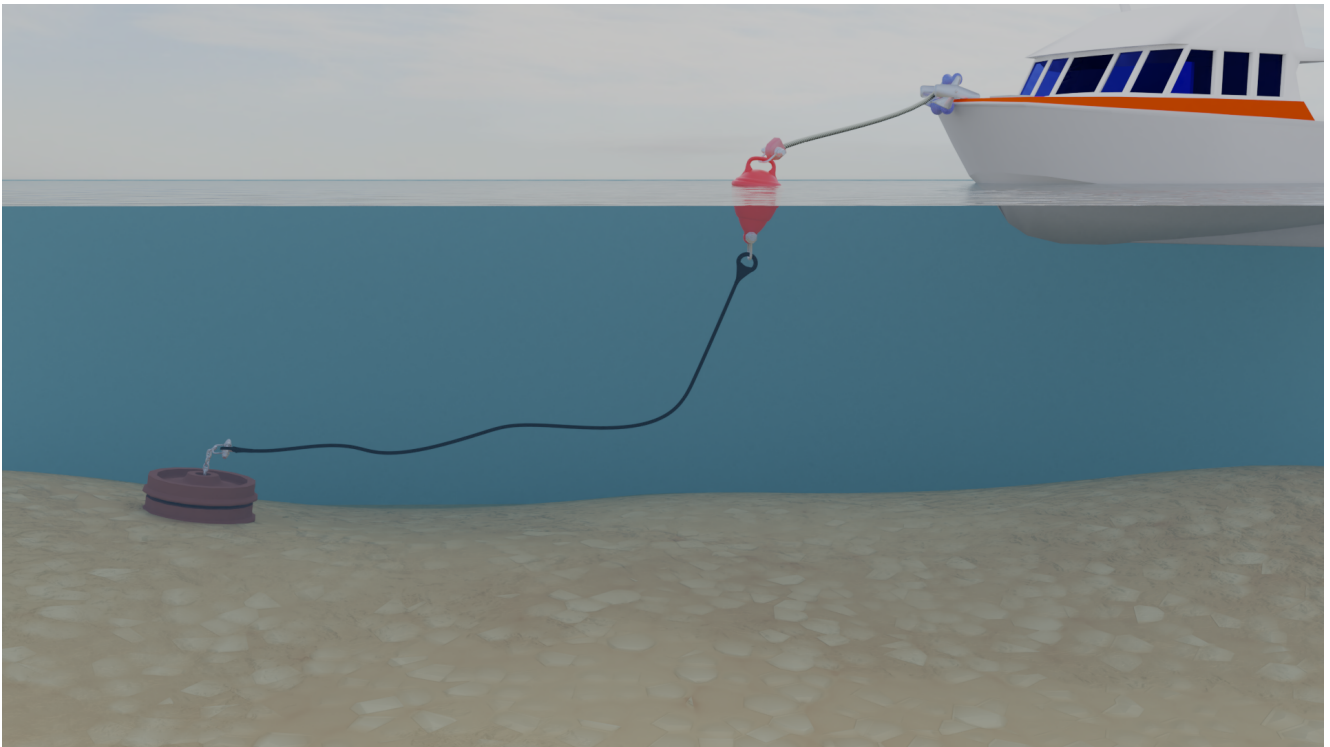


Figure 5. CSIRO's Environmentally Friendly Mooring.

Initiative 8 - Enhancing social, cultural and economic benefits



Photo: 14. Improving the social, cultural and economic benefits that the NSW community derives from the marine estate. Having fun by the sea – Photo Shutterstock/Nina Buday ©

The problem/opportunity

To better inform decision making, 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. 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 the NSW community derives from the marine estate, increase stakeholder and community adoption of safe and sustainable use of the marine estate, and raise awareness of its benefits. To do this, multiple strategic outputs will be delivered over 10 years, including a Marine Estate Education Strategy, a Marine Integrated Monitoring and Evaluation Framework, 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 have improved 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 8


Objective




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




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

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 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 / codes of practice to reduce resource use conflicts (also see action 8.4) • developing online information resources and expansion of digital technologies. 			
	 <p>Marine estate education strategy Implement the NSW Marine Estate Education Strategy and curriculum-based school package.</p>	<p>DPI-F DPE-EHG DPE-P TfNSW, NGO Schools Community</p>	<p>Statewide</p>	<p>The Marine Estate Agents primary school program released. A marine estate high school program developed with key stakeholders The Healthy Marine Estate Healthy You education campaign developed and implemented. A safe and sustainable use education campaign developed and implemented.</p>
8.2	<p>Improve awareness of, promote and identify threats to marine historic and non-Aboriginal cultural heritage to inform future management in the marine estate. This action is linked to Initiative 4.</p>			

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	 Maritime heritage review Review marine historic heritage in NSW to identify priority areas or items for communication and interpretation.	DPI-F HNSW	Statewide	A review of maritime heritage in the NSW marine estate to prioritise areas or items to receive funding for communication and interpretation of their historical significance.
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 / results publicly through appropriate information portals. 			
	 Social and cultural benefits monitoring and research Design and implement statewide surveys to monitor community benefits, impacts, and inform the evaluation of the Strategy's effectiveness, as identified in the community wellbeing framework. Undertake research to improve understanding of statewide survey results or additional aspects of wellbeing related to the marine estate.	DPI-F DPE-EHG DPE-P TfNSW LGOV UNI	Statewide	A Community Wellbeing Framework Report. Four NSW marine estate community wellbeing survey reports, with responses from: <ul style="list-style-type: none"> coastal residents coastal visitors youth (14-17 years) Aboriginal people. Findings from a marine estate agency staff survey. Prioritisation and commencement of focussed research on statewide survey results and community wellbeing, to fill key knowledge gaps.
	 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 DPE-EHG	Statewide	Economic working group established and an economic research prioritisation plan developed that is closely aligned to the Community Wellbeing Framework and the economic projects in the Strategy focused on blue economy, blue car bob, economic valuation and activity mapping.
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			

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
	 Values and activity mapping Pilot a comprehensive, spatial mapping project of socio-cultural values and human use activities, to support marine planning prioritisation and management (new project).	DPI-F LGOV	TBC	Spatial mapping of community and stakeholder socio-cultural values and activities piloted in the marine estate, with some reference to quality, intensity, and frequency of activities.
	 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 DPE-EHG TfNSW LLS DNSW LGOV RDA	Statewide	A series of physical and monetary environmental, economic ocean accounts piloted in response to specific management needs with an initial focus on blue carbon ecosystem assets.
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.			
	 Blue 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 (new project).	DPI-F DPE-EHG TfNSW Industry	Statewide	Draft Blue Growth Strategy developed in consultation with key stakeholders.

More information

More information on Initiative 8 projects are on the marine estate website: [strategy-implementation/enhancing-social,-cultural-and-economic-benefits](#)

Case study

MONITORING THE ECONOMIC HEALTH OF THE NSW MARINE ESTATE

The project

The marine estate economic valuation project is developing a consistent and robust economic valuation model that captures both market and non-market values and is based on international best practice in [ocean accounting](#). The initial focus has been on the assessment of the economic contribution of the marine estate to the NSW Gross State Product (GDP) and employment.

The site

Statewide.

Rationale

Whilst we know the marine estate is a significant contributor to the economy of NSW, we currently have no means of accurately measuring the total value across a broad range of sectors. Individual industries have developed valuation models, however, methodologies vary between sectors, and spatial scales may not align with the marine estate. Traditionally, the valuation of our ocean has focused on production value which significantly underestimates the true extent of ocean wealth. Given the complexity of our ocean economy, we need to look beyond GDP to reflect the true value the marine estate provides to the economy and people of NSW to ensure sustainable investment and equitable management decisions.

The benefits

With continued and growing pressures on the marine environment, this work provides critical data for government to make more holistic decisions, balancing between using the marine estate today and conserving, restoring and enhancing for the future.

The economic valuation project will:

- coordinate, organise and standardise information across government, to analyse and evaluate the performance of the ocean economy
- aid transparent and evidence-based decision making to support ongoing investment in marine estate management
- capture the total economic value of the marine estate which goes beyond traditional production measures of GDP to take account of our use of the marine environment and the services and benefits it provides to communities
- establish baseline economic data to fill knowledge gaps and help monitor the condition and trend in the economic health of the marine estate and assess the effectiveness of Strategy implementation.
- demonstrate the significant value of the marine and coastal environment to the people and economy of NSW.

Key outputs

Marine Estate Economic Contribution Report

Delivered by

DPI-F

Related actions

Relates to management action 8.3, 8.5 and all monitoring projects and all monitoring projects



Figure 6. The Economic Contribution of the NSW Marine Estate report developed by Deloitte Access Economics.

Initiative 9 – Delivering effective governance



Photo 15. NPWS, EHG and DPI-F staff at Everlasting Swamp, collaborating on improved management and governance – Photo Pat Dwyer, DPI-F.

The problem/opportunity

Complex governance arrangements and overlapping jurisdictions can lead to a lack clarity of roles and responsibilities, inconsistencies, duplication and inappropriate regulation. Governance arrangements that are simpler and easier to understand will better support effective marine estate management 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 program 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 have clarified the responsibilities and accountabilities of responsible agencies, so we can improve our capacity to fulfil those roles. We have also focused on improving consistency, coordination and communications. This has allowed agencies to work together more closely with each other and the community, to enhance participation in marine estate management and decision making. This will continue in future years.

Simpler and clearer regulatory process are also an aim, to reduce timescales and costs for obtaining permits and improving compliance with rules and regulations by landholders, businesses and the community.

Initiative 9


Objective


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


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

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 9.1	Improved co-ordination and integration across all levels of government (including cross-border and the land-sea interface) by developing a governance framework piloted at a catchment scale (see Initiative 1) to: <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; and communication and engagement.			
	Improving project governance Monitoring and reporting on project governance across the Strategy to inform continuous improvement and support coordinated, transparent and inclusive decision making. This project compliments the catchment governance project being delivered in Initiative 1 and the program governance delivered in the program management section of this Plan.	DPI-F DPE-P DPE-EHG TfNSW	Statewide	Updates provided in regular and annual reporting. Input into the five-year health check, to identify achievement of intermediate-term governance outcomes and determine future governance improvements required.

	Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
Action 9.2	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.			This action is being delivered in part by action 9.3, and in the program management section of this Plan.
Action 9.3	Identify opportunities through the marine park management planning pilot projects 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. 			
	Improved marine protected area planning and management Work is underway to improve planning and management for marine parks and aquatic reserves. This work aims to balance coordination and consistency across the network of marine protected areas with tailored local solutions where required. This will result in improved governance and improved management of marine protected area values.	DPI-F DPE-EHG TfNSW DPE-P Commercial fishers Recreational fishers Conservation groups TO LALC UNI MPAC Community	Marine parks and aquatic reserves	Mainland Marine Park Network Management Plan (NMP) completed. Governance and prioritisation processes for implementation of the NMP developed. NMP Implementation Plan developed in consultation with marine park advisory committees, marine estate agencies and action leads, and priority actions commenced. Draft management rules for Batemans and Port Stephens-Great Lakes marine parks prepared for community consultation. Management planning for Lord Howe Island Marine Park commenced. Environmental, social, cultural and economic literature reviews for the LHIMP completed. Report completed on social and ecological information previously collected for 5 aquatic reserves. Literature review on management actions to address threats to environmental assets and community benefits in aquatic reserves completed.

Projects	Partners	Location	What we will deliver in 2022-23 and 2023-24
			Interpretive signage for 1 aquatic reserve designed and installed, and the aquatic reserve webpages updated.
Action 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. 		
	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 DPE-EHG DPE-P TfNSW LGOV	Greater Sydney Compliance plans for the Greater Sydney region. Compliance updates in Strategy reporting and Annual Report.

More information

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

Case study

GREATER METROPOLITAN MOBILE FISHERIES SQUAD – Operation Turbo Reef

The project

The Greater Metropolitan Mobile Fisheries Squad assist Sydney Fisheries Officers as part of Operation Turbo Reef to detect and report the unlawful collecting of intertidal invertebrates. The operation was conducted on Australia Day long weekend in 2022, adding to the capabilities of Sydney based teams of NSW DPI Fisheries Officers to curb illegal activity.

The mobile squad regularly operates between Newcastle and Wollongong a part of the coast that is fringed by the largest urban area in NSW. A large number of fishers and shellfish collectors have ready access to an abundance of rocky foreshores, sand flats and mud flats in which to collect shellfish for bait or food.

Officers spend many hours on patrol, detecting and preventing illegal fishing or collecting, and damage to aquatic habitats. Illegal fishing and habitat damage impact on the sustainability of our aquatic resources across NSW.

This project enhances the capability of the NSW DPI Fisheries to have a presence on the foreshores to facilitate an increase in voluntary compliance, deter illegal fishing and enhance habitat protection in these areas, particularly in the many aquatic reserves and intertidal protected areas found in the Sydney region.

The site

The coastline between Newcastle and Wollongong, including the network of marine protected areas in the greater Sydney region which comprises 10 aquatic reserves and 9 intertidal protected areas with various restrictions on fishing and shellfish collection in place.

The outcomes

- Operation Turbo Reef detected 304 offences between Newcastle and Wollongong, seizing and returning 3,598 invertebrates and 25 fin-fish to the water over the four-day Australia Day weekend in 2022. 185 cautions and 119 penalty infringement notices were issued, totalling over \$43,000. The mobile squad detected 46 offences (15%) of the total offences detected.
- More broadly, as the squad is mobile, they can respond quickly to changing compliance risks and respond to community needs, working with other coastal District Fisheries Officers and other agencies to coordinate compliance and education responses as required.
- A wide range of educational and engagement programs are used extensively by the mobile squad to improve community knowledge of regulations applying to marine protected areas.
- Operation Turbo Reef featured on an episode of *Harbour Force* on the Discovery Channel network, the show having a global reach of over 900 million people.

Delivered by

DPI-F Fisheries Compliance Unit

Related action

Relates to management action 9.4



Photo 16. Molluscs seized from Little Bay during Operation Turbo Reef - Photo DPI-F.

Program management, monitoring, reporting, evaluation and engagement

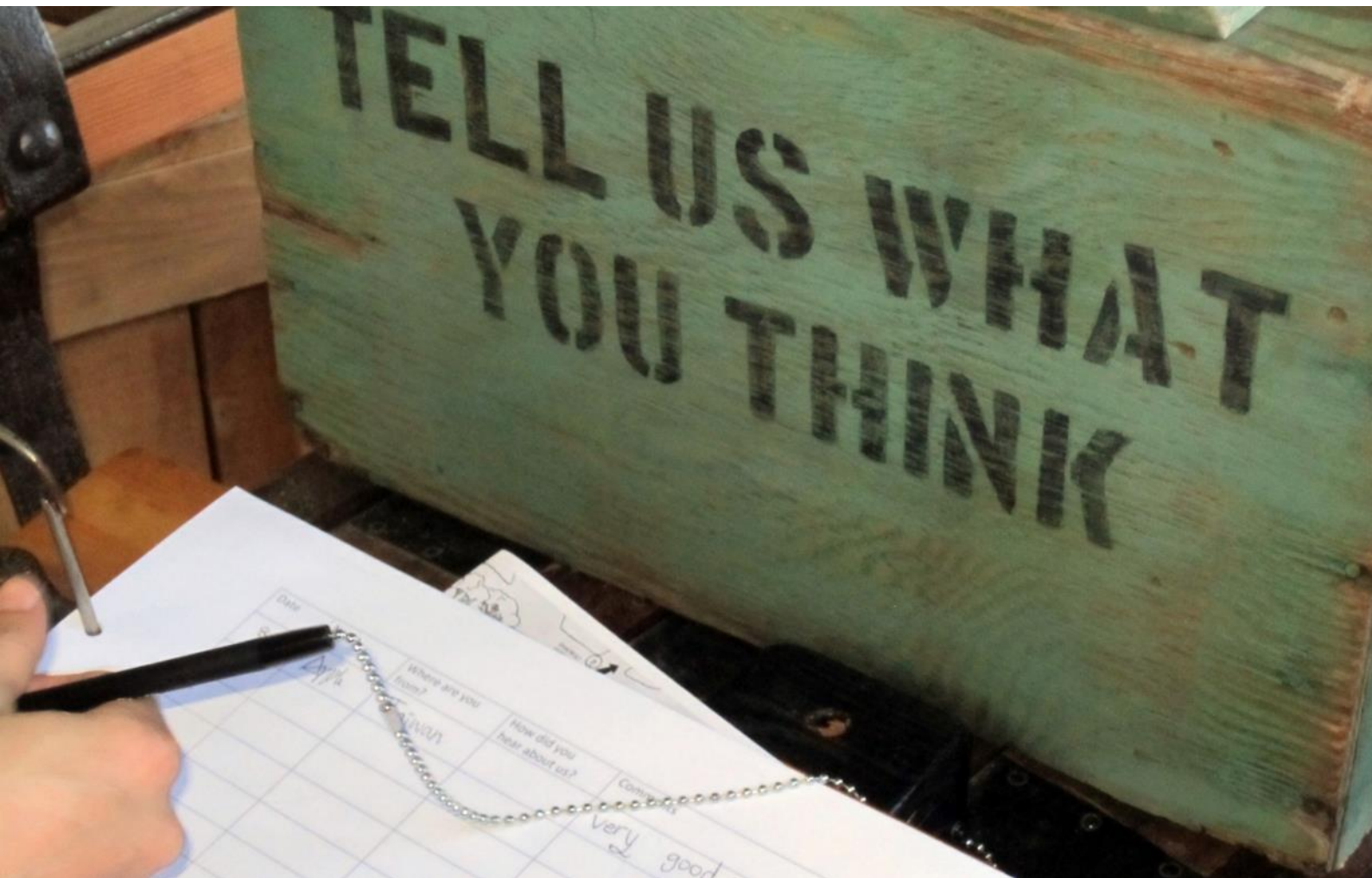


Photo 17. Keeping all stakeholders engaged in, and informed of, the progress and achievements of the Strategy is vital to its success – Photo iStock.com/Hailshadow ©

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 assures the community and stakeholders that the Strategy is being implemented in a coordinated, integrated and transparent way. The benefits of the work in this area may not always 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 strategy's progress and achievements is vital 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 identified as part of the statewide threat and risk assessment (TARA) process.

Implementing 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 the Strategy's progress 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 management


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

	Projects	Partners	Location	What we will deliver 2022-23 and 2023-24
	Strategy program management 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.	DPI-F DPE- EHG TfNSW DPE-P	Statewide	Improved governance and project management framework, developed in response to lessons learnt from implementation to date. This includes conducting a 5-year health check of the Strategy. Regular and ongoing rigorous oversight and scrutiny of Strategy implementation to ensure projects are within scope, budget and timescales and effectively manage risk to minimise impacts to program delivery. Project management training, support and development for all Strategy project managers across agencies delivered, to ensure consistent, efficient and effective management of the Strategy. Regular reporting to stakeholders and the community on progress and future activities to

Projects	Partners	Location	What we will deliver 2022-23 and 2023-24
			<p>raise awareness, maximise benefits and ensure transparency.</p> <p>Improved coordination of initiatives and projects by providing support for triannual/annual reporting, budget management and communications to ensure consistent, efficient and effective management of the program.</p> <p>Development of an EHG Communication Strategy to support Strategy promotion and establish EHG governance procedures for communication and stakeholder engagement material, understand key stakeholders and audiences and the best channels to access them, establish key messages, outcomes and milestones to be celebrated and communicated and support the Strategy communication and engagement review process.</p>
 <p>Strategy education, communication and stakeholder liaison</p> <p>Implementation of communication tools, including website and e-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).</p>	<p>DPI-F DPE- EHG TfNSW DPE-P</p>	<p>Statewide</p>	<p>Communication and Stakeholder Engagement Framework.</p> <p>Stakeholder engagement strategic approach and action plan.</p> <p>Stakeholder mapping guidelines and supporting toolkit.</p> <p>Campaigns Strategy, key messages, and content calendar.</p> <p>Ongoing improvements to the marine estate website.</p> <p>Ongoing Promotion of the Strategy through social media and e-newsletter.</p>
 <p>Better geographic information systems (GIS) for the marine estate</p> <p>Providing GIS support including developing, obtaining and publishing datasets, map production, spatial planning advice and spatial data analysis</p>	<p>DPI-F DPE- EHG TfNSW DPE-P</p>	<p>Statewide</p>	<p>Ongoing GIS support for marine estate projects.</p>

Projects		Partners	Location	What we will deliver 2022-23 and 2023-24
Implement the Marine Integrated Monitoring Program				
	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 DPE- EHG TfNSW DPE-P	Statewide	Statewide TARA five-year review. Collated data and coordination for the Strategy mid-term evaluation. Mid-term evaluation of the Strategy to measure progress towards achieving outcomes, identify insights for continuous improvement and support transparency and accountability. Effective program management and coordination of monitoring, evaluation, and reporting. Finalised technical documents describing the marine estate's environmental, social, cultural, and economic monitoring. A fully developed and implemented communications and engagement strategy for the MIMP and TARA. Reporting tools, such as dashboards to share key information from the MIMP and TARA with stakeholders. This includes report cards describing the condition of the marine estate and progress towards achieving our anticipated Strategy outcomes. A cross-agency data management system. Monitoring case studies in selected locations in NSW. Cumulative impact assessments at selected locations in NSW.

Appendix 1 Strategy agencies and partners

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

Table 1. 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.	ANMM	Australian National Maritime Museum
4.	COM GOV	Commonwealth Government
5.	CommFish	Commercial Fishing NSW Advisory Council
6.	Community	Community
7.	CSIRO	Commonwealth Scientific and Industrial Research Organisation
8.	DNSW	Destination NSW
9.	DPI	Department of Primary Industries
10.	DPI-Ag	Department of Primary Industries – Agriculture
11.	DPI-BFS	Department of Primary Industries – Biosecurity and Food Safety
12.	DPI-F	Department of Primary Industries – Fisheries
13.	DPI-Fo	Department of Primary Industries – Forestry
14.	DPE-EHG	Department of Planning & Environment – Environment and Heritage Group *
15.	DPE- CL	Department of Planning & Environment – Crown Lands
16.	DPE -NPWS	Department of Planning and Environment - National Parks and Wildlife Services DPE-EHG
17.	DPE-P	Department of Planning & Environment – Planning
18.	DPE-W	Department of Planning & Environment – Water
19.	ELV	End-of-life vessel
20.	EPA	Department of Planning & Environment - Environment Protection Authority
21.	GSC	Greater Sydney Commission
22.	HNSW	Heritage NSW
23.	Industry	Industry
24.	INSW	Infrastructure NSW
25.	IPART	Independent Pricing & Regulatory Tribunal
26.	LALC	Local Aboriginal Land Councils
27.	LGA	Local Government Area
28.	LGOV	Local government
29.	LLS	Local Land Services
30.	MFAC	Ministerial Fisheries Advisory Council
31.	MIAA	Marine Industry Association of Australia

#	Abbreviation	Full name
32.	MU	Macquarie University
33.	NGOs	Non-government organisations
34.	NMSC	National Marine Science Centre
35.	NPWS	Department of Planning and Environment - National Parks and Wildlife Services DPE-EHG
36.	NRAR	Natural Resource Access Regulator
37.	NSWCC	NSW Coastal Council
38.	NSWFA	NSW Farmers' Association
39.	NSWSC	NSW Shellfish Committee
40.	OECC	Office of Energy and Climate Change
41.	OLG	Office of Local Government
42.	OWA	OceanWatch Australia
43.	PIPAP	Pacific Island Protected Area Portal
44.	Private	Private landowners
45.	RDA	Regional Development Australia
46.	RFNSW	Recreational Fishing NSW Advisory Council
47.	RNSW	Regional New South Wales
48.	SCCG	Sydney Coastal Council Group
49.	SCS	Soil Conservation Service
50.	SCU	Southern Cross University
51.	SFNSW	Safe Food NSW
52.	SIMS	Sydney Institute of Marine Science
53.	SNSW	Stormwater NSW
54.	SOS	Department of Planning and Environment – Environment and Heritage Group - <i>Saving Our Species</i> DPE-EHG
55.	SW	Sydney Water
56.	Taronga	Taronga Zoo
57.	TBF	Tangaroa Blue Foundation
58.	TfNSW	Transport for NSW
59.	TO	Traditional Owners
60.	UNI	Universities
61.	UNSW	University of NSW
62.	UTas	University of Tasmania
63.	WNSW	Water NSW
64.	WSPPO	Western Sydney Planning Partnership Office

* The agency previously known as the Office of Environment & Heritage (OEH) is now established under the Department of Planning & Environment - Environment and Heritage Group (DPE-EHG).