Department of Planning and Environment

NSW GOVERNMENT

NSW Blue Carbon Strategy 2022–2027

Acknowledgement of Country

The NSW Government acknowledges the Traditional Custodians of the lands and waterways to which this NSW Blue Carbon Strategy applies, and pays respect to Elders past, present and future. The NSW Government recognises and respects the continuation of cultural, spiritual and educational practices of First Nations peoples.

The development of this strategy acknowledges more than 60,000 years of continuous First Nations connection to the land, waterways and sea that make up NSW.

First Nations peoples knowledge and management of the land and sea are based on deep spiritual connections with Country. Country takes in everything within the cultural, spiritual and physical landscape – landforms, waters, plants, animals, foods, and special places. These continued connections are also visible in their songs, stories, dances and art, and reinforced by their continued cultural practices and knowledge of Country.

As part of the world's oldest living culture, First Nations of the Australian continent and adjacent islands share a unique bond to Country–a bond forged through thousands of years of interaction with land and sea environments.

The traditional name for Hexham Swamp in the Hunter Valley is Burraghihnbihng.

The area has significant cultural value to the Awabakal and Worimi people who used the vast resources provided by the productive wetlands. Jo Erskine/NPWS.

Foreword

The simplest way to understand the concept of blue carbon is to liken it to underwater rainforests – just as trees store carbon, marine plants and ecosystems do too, except more efficiently.

This is blue carbon, and it represents a major opportunity to restore biodiversity and ecosystems, while simultaneously working towards emissions reduction.

As an island surrounded by vibrant coastlines, we are lucky in Australia to have great potential for blue carbon projects, and I want to make sure NSW is at the forefront.

In NSW, our marine and coastal ecosystems currently store about 10 million tonnes of carbon. That's equivalent to emissions from 500,000 households.

We have more than 2,000 kilometres of NSW coastline and surrounding areas that could support the storage of additional blue carbon, which would significantly contribute to our goal to reduce carbon emissions.

We also know that businesses are keen to invest in blue carbon because it delivers carbon reduction and biodiversity improvements, while meeting increasing demand for 'Environmental, Social and Governance' criteria.

There are also benefits for communities up and down the coast from greater climate resilience, income for landholders, and habitat for the marine life, which underpins our blue economy.

This NSW Blue Carbon Strategy 2022–27 is aimed at kick-starting blue carbon in NSW, and supporting us with a scientific evidence base needed to make the right decisions.

The strategy will help us to forge partnerships, including with private landholders and investors, because we are stronger and more effective when we work together to achieve our shared goal of protecting and conserving our environment.

This is a landmark strategy for NSW, and it delivers so many exciting opportunities to conserve our marine environment for future generations.

The Hon. James Griffin, MP
Minister for Environment and Heritage

Hexham Swamp/DPI

Contents

Acknowledgement of Country 2

Foreword 3

NSW Blue Carbon Strategy 5

- What is blue carbon? 5
- Blue carbon in coastal ecosystems 6
- Blue carbon projects can help achieve net zero goals 7
- Blue carbon ecosystems in NSW 8
- Potential areas for blue carbon restoration 9
- Why is blue carbon important in NSW? 10
- Opportunities for blue carbon in NSW 10

Priority area 1: Conserving blue carbon ecosystems and supporting their adaptation and migration 11

- Determining effectiveness of legislative mechanisms 11
- Supporting private land conservation 12
- Investigating opportunities to support seagrass and seaweed conservation 12
- Promoting and supporting blue carbon ecosystems on public and private land 12

Priority area 2: Delivering blue carbon projects on public, private and First Nations peoples owned and managed land 13

- Addressing landholder hesitancy and financial barriers 14
- Identifying and progressing ten new blue carbon restoration sites 14
- Advising, guiding and supporting landholders and primary producers 15
- Supporting First Nations peoples and their communities 15
- Everlasting Swamp — a site of high blue carbon potential 16
- Duck Creek — a site for building capacity with coastal land managers 17

Priority area 3: Embedding blue carbon in coastal and marine policy planning and management 18

- Reviewing the NSW planning system and streamlining approvals 18
- Supporting councils to integrate blue carbon projects in coastal management programs and transition land use 19
- Determining Marine Estate Management Strategy opportunities 19

Priority area 4: Progressing blue carbon research 20

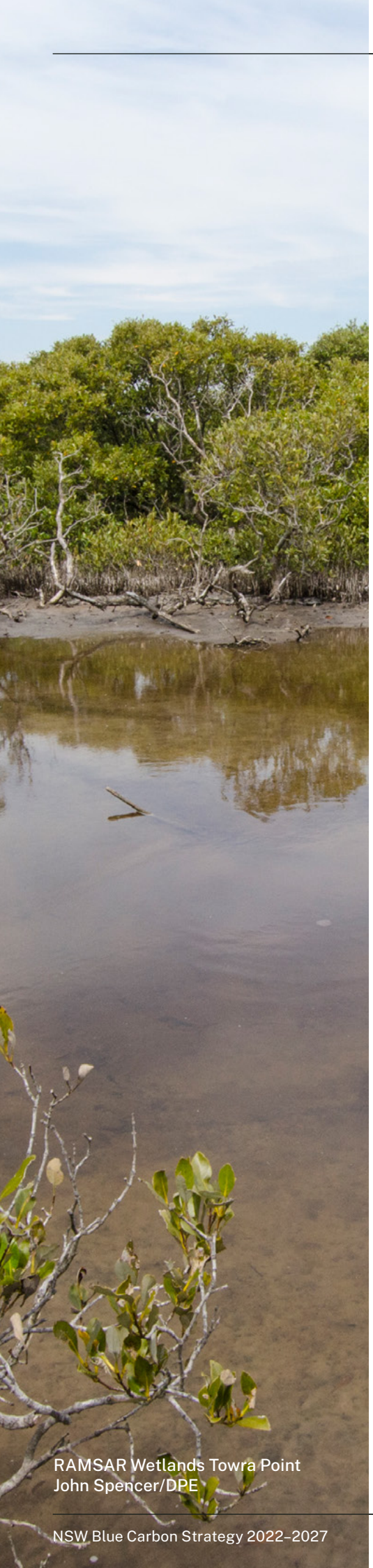
- Identifying potential funding pathways for research priorities 20
- Understanding and improving valuation and benefits 21
- Exploring opportunities to pilot a kelp forest restoration project 21

Priority area 5: Promoting blue carbon investment 22

- Driving investment in blue carbon 23
- Investigating blue carbon financing models and pathways with stakeholders 23
- Piloting a Blue Carbon Instrument and kick starting the NSW blue carbon market 23

Delivering the strategy 24

- Overview of priority areas, objectives, outcomes and actions 24



RAMSAR Wetlands Towra Point
John Spencer/DPE

NSW Blue Carbon Strategy

The NSW Blue Carbon Strategy is a statewide initiative to support evidence-based projects and research to protect and conserve important blue carbon ecosystems.

The strategy will help unlock the investment potential of blue carbon projects through carbon credits and other mechanisms that will ultimately benefit the state's economy and build our resilience to climate change.

The strategy identifies 5 overarching priorities and the actions we will deliver under each priority over the next 5 years.

1. Conserving blue carbon ecosystems and supporting their adaptation and migration.
2. Delivering blue carbon projects on public, private and First Nations peoples owned and managed land.
3. Embedding blue carbon in coastal and marine policy planning and management.
4. Progressing blue carbon research.
5. Promoting pathways for blue carbon investment.

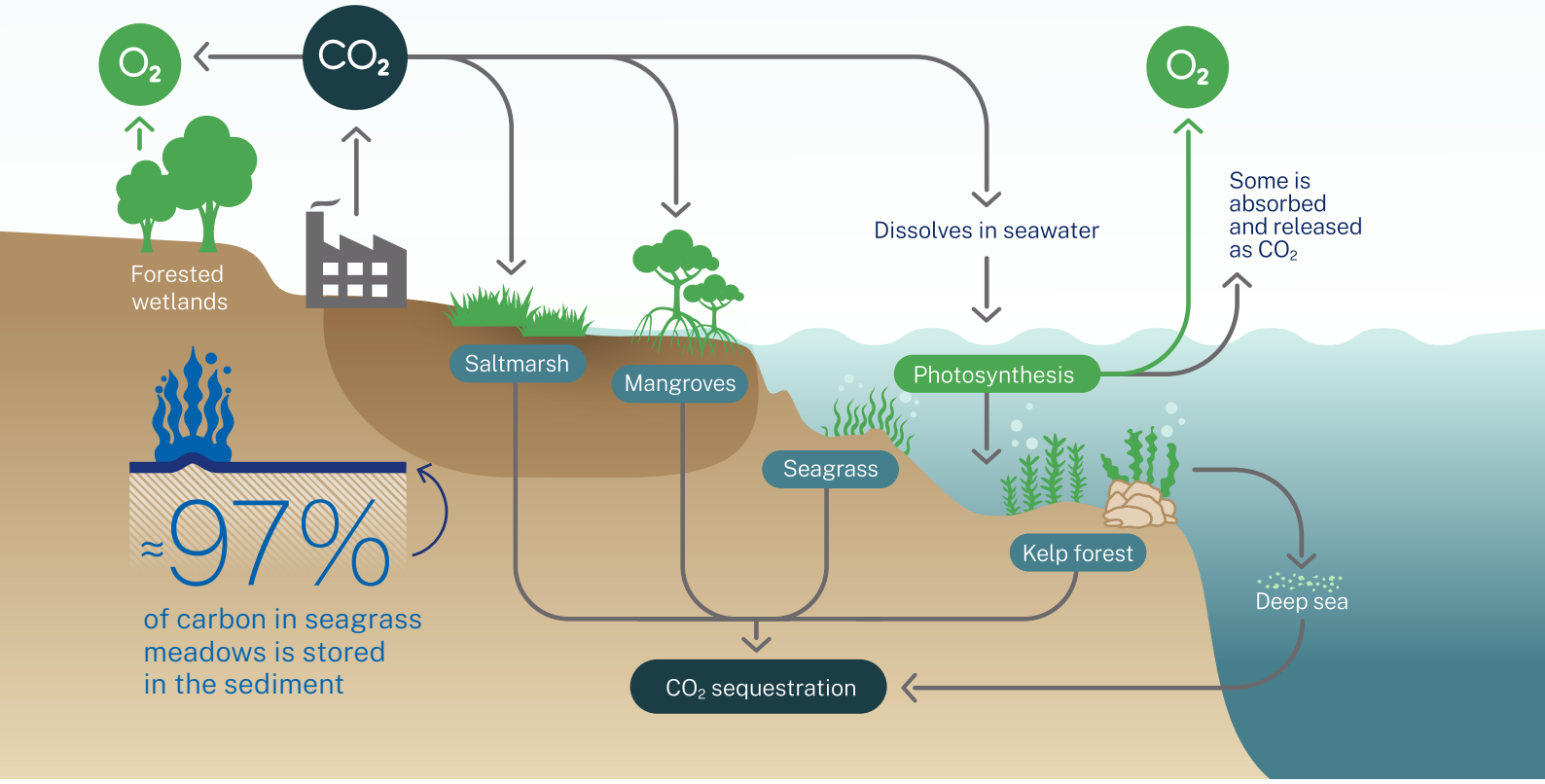
What is blue carbon?

Blue carbon is the carbon captured and stored in coastal and marine ecosystems, including seagrass meadows, saltmarshes, mangroves and supratidal forests.

When healthy, these ecosystems are efficient natural carbon sinks that accumulate and retain large quantities of carbon, both in the living plants and in the sediments and biological material below the ground. For example, approximately 97% of carbon in seagrass meadows is stored in the sediment.

In addition to their carbon storage benefits, blue carbon ecosystems provide a range of co-benefits such as jobs and income for local economies, improving water quality, supporting healthy fisheries and opportunities for investment, recreation and nature-based tourism.

Blue carbon in coastal ecosystems



These ecosystems are estimated to store nearly

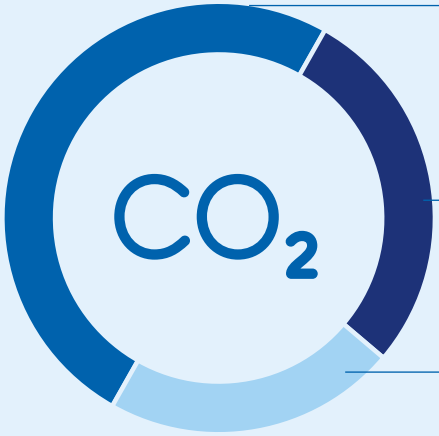
10 million tonnes

of total carbon stock in NSW.

Equivalent to the annual emissions of

≈ 500,000

Australian households.



Mangroves store approximately **50%**

Saltmarshes store **28%**

Seagrass accounts for **22%**

Australia's coastline stores approximately

5–11%

of global blue carbon stocks.

NSW is estimated to have:

Seagrass
15,300 hectares

Saltmarsh
7,100 hectares

Mangroves
13,700 hectares

Kelp forest
14,800 hectares

Quibrary Bay viewing platform, Towra Point Nature Reserve. John Spencer/DPE

Blue carbon projects can help achieve net zero goals

Globally and in Australia, the importance of blue carbon ecosystems as carbon sinks is increasingly being recognised and valued, given Australia holds 5-11% of global blue carbon stocks.

Despite blue carbon ecosystems supporting our quintessential coastal Australian lifestyle, we are losing them. Since European settlement across Australia, we have lost approximately 50% of saltmarshes, 52–78% of mangroves and 20–26% of seagrass meadows.

Degraded blue carbon ecosystems are a significant source of greenhouse gas emissions by releasing methane and the carbon into the atmosphere and oceans. Drained wetlands are the source of acidic or black water runoff which can cause large-scale fish kills and poor water quality.

The conservation and restoration of blue carbon ecosystems can address issues such as acid sulfate soils and inundation, and also support in the mitigation of and adaptation to climate change.

Net Zero Plan Stage 1: 2020-2030

The Net Zero Plan Stage 1: 2020-2030 is the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. It outlines the NSW Government's plan to reduce emissions up to 2030.

Blue carbon ecosystem restoration and protection can help achieve 2 priorities of the Net Zero Plan Stage 1: 2020–2030:

- Priority 1 Drive the uptake of proven emissions reduction technologies,
- Priority 4 Ensure the NSW Government leads by example.

Hexham Swamp. Peggy Svoboda/ Local Land Services.

Blue carbon ecosystems in NSW

Mangroves

Mangroves have been
spreading
into areas of saltmarsh as a result of environmental change

Matching upslope migration of saltmarsh is often constrained by public infrastructure and land uses

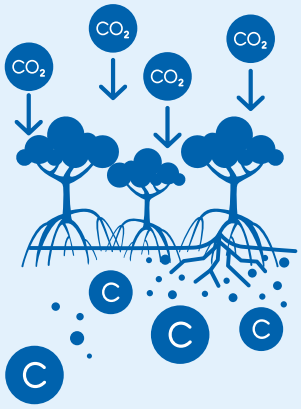
In mapped estuaries, there has been an increase in mangroves in 17 estuaries and a decline in 3

17 ↑ 3 ↓

Saltmarsh

38% ↓

of estuaries mapped in the past 5 years have shown a
significant decrease



4x CO_2

per area as land-based forest.

If undisturbed can store carbon in soils
>100 years

NSW kelp forests form part of the
'Great Southern Reef'
which extends from the NSW/Queensland border, 8,000 km along the Australian continent's southern coastline to Western Australia.

Great Southern Reef kelp forests are estimated to sequester and store

>30%

of the total blue carbon around the Australian continent, with most occurring within the 3 nautical miles of state coastal waters.

Blue carbon ecosystem loss since European settlement across Australia:

Saltmarshes
–50%

Mangroves
–52 to –78%

Seagrass meadows
–20 to –26%

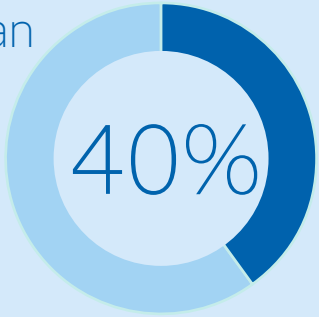
NPWS

Carbon Positive by 2028 Plan details actions to enhance carbon sequestration.

CO_2 + by 2028

NSW National Parks and Wildlife Service manage greater than 40% of the NSW coast.

This represents one of
Australia's largest carbon stores.

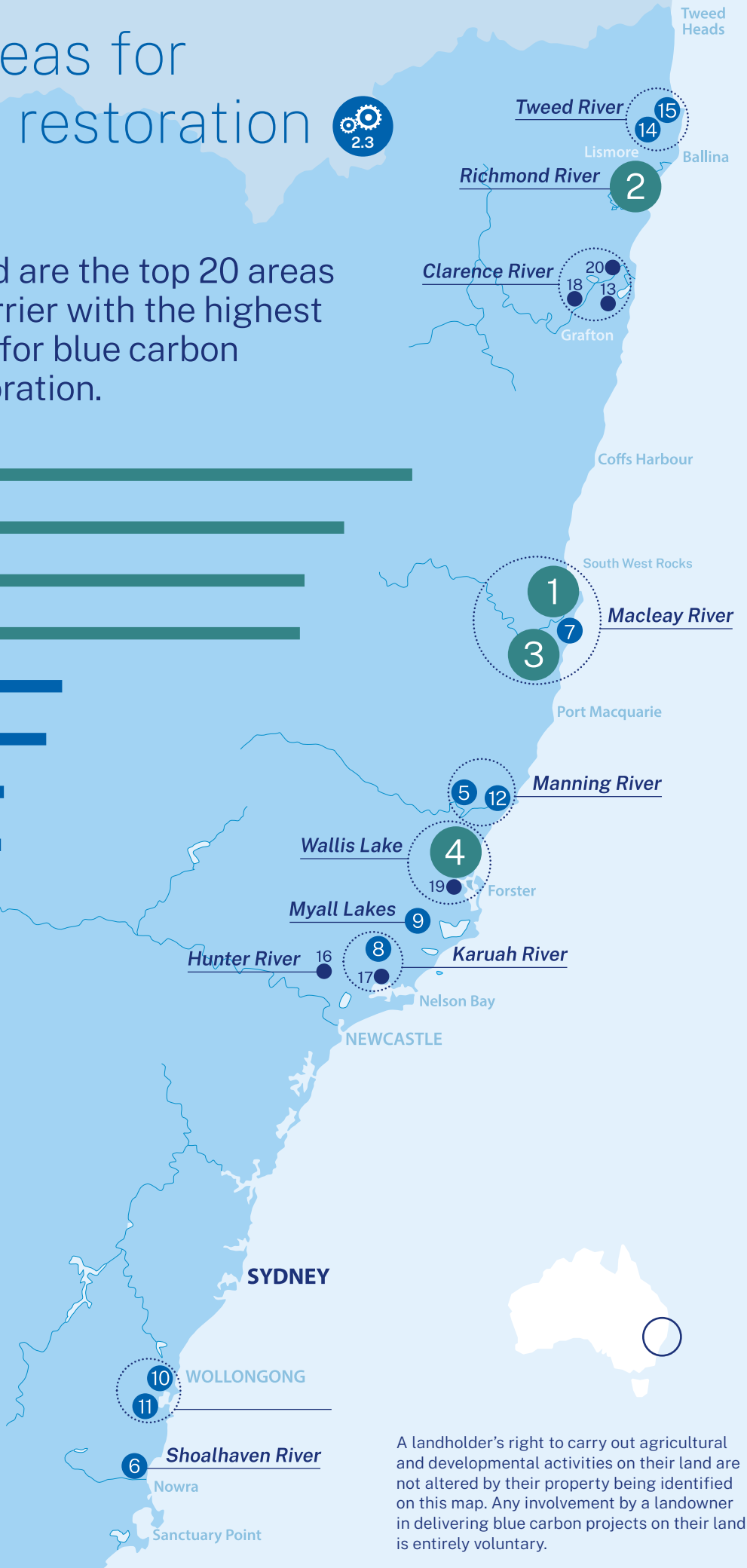


Potential areas for blue carbon restoration

2.3

Tributaries listed are the top 20 areas above a tidal barrier with the highest indicative areas for blue carbon ecosystem restoration.

1. Clybucca Creek
2. Tuckean Broadwater
3. Belmore River
4. Wallamba River
5. Lansdowne River
6. Crookhaven Creek
7. Kinchela Creek
8. The Branch River
9. Crawford River
10. Mullet Creek
11. Macquarie Rivulet
12. Pipeclay Canal
13. Southgate/Alumny Creek
14. Tweed River
15. Leddays/McLeods Creek
16. Williams River
17. Little Branch Creek
18. Sportsmans Creek
19. Cooloongoolook River
20. Broadwater Creek



A landholder's right to carry out agricultural and developmental activities on their land are not altered by their property being identified on this map. Any involvement by a landowner in delivering blue carbon projects on their land is entirely voluntary.

RAMSAR Wetland Towra Point.
John Spencer/DPE

Why is blue carbon important in NSW?

In addition to the carbon sequestration benefits of blue carbon ecosystems, these assets also provide us with a range of co-benefits, called ecosystem services, including:

Protection against increasingly regular and severe climatic events, via:

- stabilising foreshores and reducing wave energy to reduce coastal erosion
- trapping sediment and improving water quality
- reducing risk to coastal communities from inundation and resultant insurance payout and premium risk

Mitigation against species loss

- conserving and enhancing important habitats
- maintaining biodiversity and ecosystem integrity
- improving resilience to the impacts of climate change

Tourism and recreational benefits

- increasing opportunities for fishing, coastal travel and recreation

Agriculture benefits

- increasing industry resilience and helping economic diversification
- supporting healthy fish populations, fisheries and aquaculture
- trapping pollutants, nutrients and sediment in runoff

First Nations connection to Country

- maintaining spiritual connection
- providing employment opportunities in management and protection
- enhancing wellbeing benefits

On average, these ecosystems are being lost or degraded at a rate of

1–2% ↓

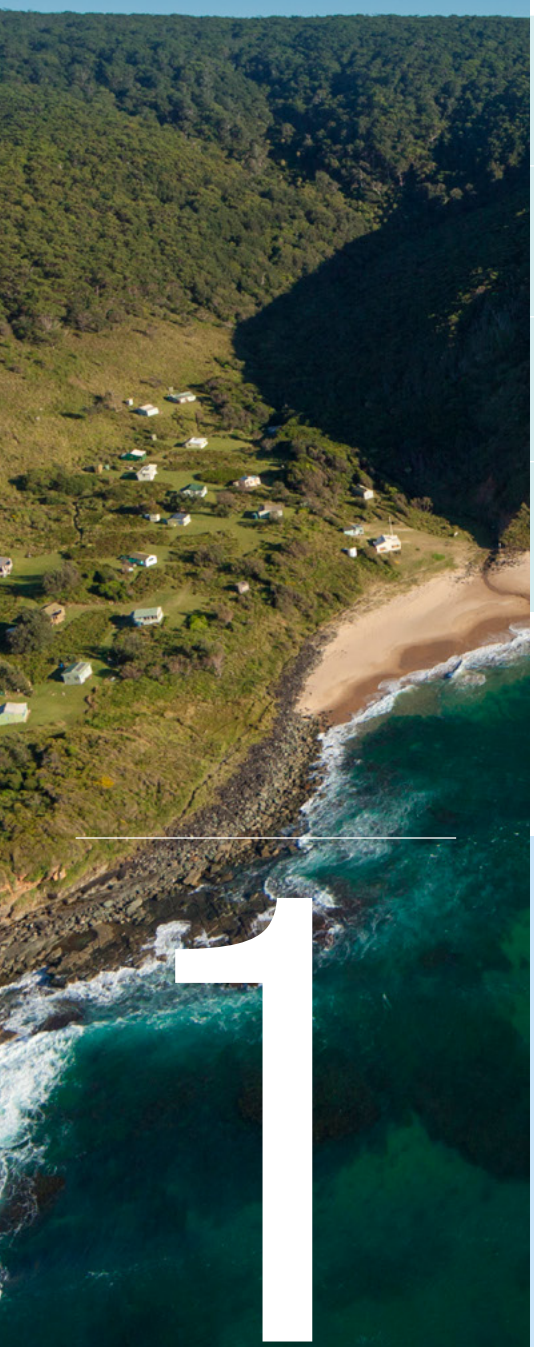
every year globally.

Opportunities for blue carbon in NSW

This strategy recognises that blue carbon opportunities can be realised by supporting a range of priority initiatives in collaboration with First Nations, local communities, councils, and other stakeholders. It aims to provide the catalyst for action, increase participation in the emerging blue carbon market and leverage the many co-benefits of blue carbon projects.

Priority area 1: Conserving blue carbon ecosystems and supporting their adaptation and migration

The NSW Government will take a lead role in working with all levels of government, industries, landowners, and communities to conserve existing blue carbon ecosystems.



1

Royal National Park aerial view.
David Finnegan/DPE

Action 1.1: Determine effectiveness of blue carbon ecosystem legislative protection, conservation and climate change adaptation mechanisms.

Action 1.2: Support private and public land covenanting arrangements and other funding options to manage and conserve blue carbon ecosystems.

Action 1.3: Investigate opportunities to support seagrass and seaweed ecosystem conservation projects.

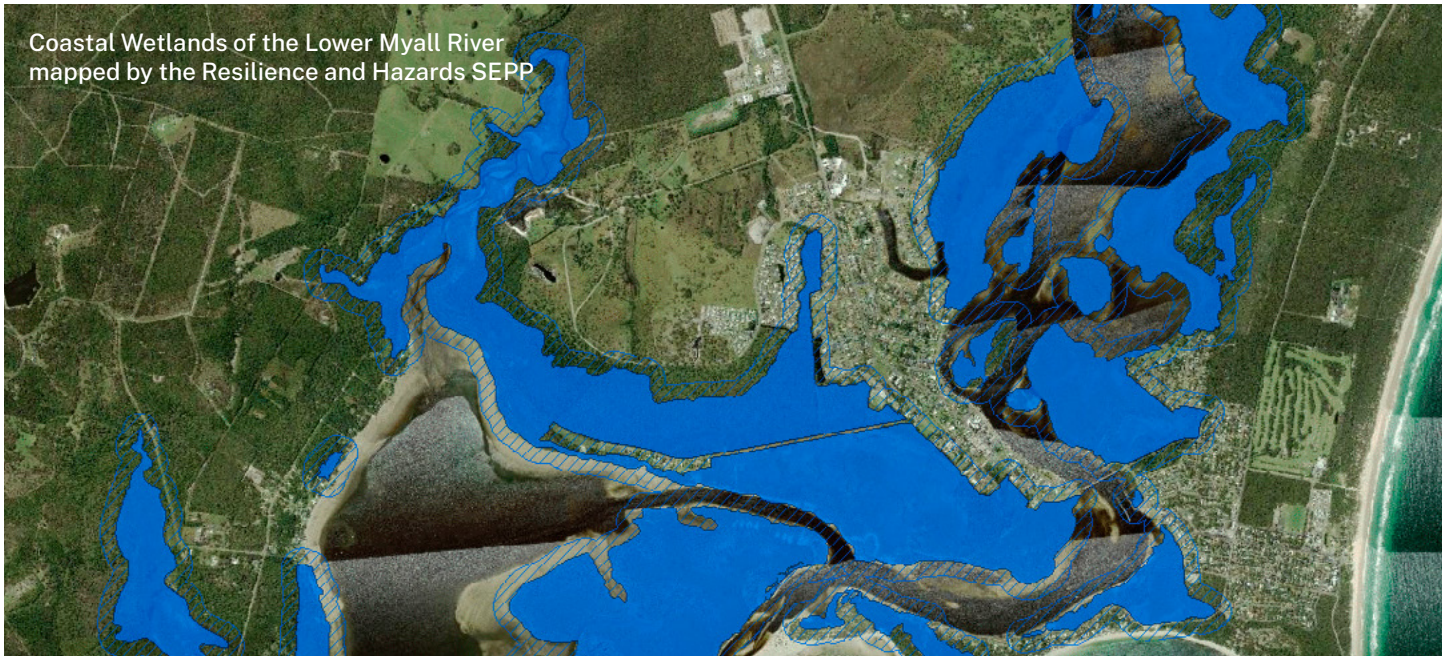
Action 1.4: Promote and support the conservation, adaptation and migration of blue carbon ecosystems by the community and organisations on public and private land.

Existing controls and measures to conserve blue carbon ecosystems

Determining effectiveness of legislative mechanisms

Many blue carbon ecosystems already benefit from protection under Commonwealth and NSW Legislation. The Ramsar Convention protects 3 internationally significant wetlands in the coastal zone.

The *Coastal Management Act 2016* specifies management objectives that are to protect, rehabilitate and improve the resilience of coastal wetlands, including opportunities for migration. The Resilience and Hazards State Environmental Planning Policy includes development controls to protect coastal wetlands and guide appropriate development. Several other Acts, including the *Fisheries Management Act 1994* protects seagrass, mangrove and saltmarsh species.



Coastal Wetlands of the Lower Myall River mapped by the Resilience and Hazards SEPP

Restoring mangroves on Shoalhaven River. Daniel Wiecek/DPE

Supporting private land conservation

1.2

In 2018, the NSW Government released a Biodiversity Conservation Investment Strategy to guide investment for private land conservation. The strategy outlines criteria to help government prioritise where investment in private land conservation should occur in NSW.

The NSW Government will work with the Biodiversity Conservation Trust to accelerate new opportunities to protect blue carbon ecosystem.

Seagrass marine life habitat. Rosie Nicolai/DPE

Investigating opportunities to support seagrass and seaweed conservation

1.3

Seagrass meadows store large amounts of carbon and provide food, shelter and nursery grounds for many important marine organisms. A range of organisations are leading innovative work to restore seagrass ecosystems in NSW. Continued delivery of projects like these are critical in building the resilience of blue carbon ecosystems to human impacts and climate change. Through supporting both current and future research and restoration efforts, we will be able to gain further understanding of ecosystem function and co-benefits for others to use and demonstrate suitability for wider uptake.

Imeson Cottage, Cape Byron State Conservation Area. John Spencer/DPE

Promoting and supporting blue carbon ecosystems on public and private land

1.4

The NSW Government will work with stakeholders and the community to investigate a variety of mechanisms that may be suitable for conservation of blue carbon ecosystems on public and private land.

For example, private land conservation initiatives may also play an important role. Mechanisms such as conservation agreements and grant funding complement the protection of National Park blue carbon ecosystems and maintain regulatory controls. In addition, initiatives such as ‘rolling’ voluntary conservation covenants could allow for conservation covenants on land title.

2

Everlasting Swamp National Park
John Spencer/DPE

Priority area 2: Delivering blue carbon projects on public, private and First Nations peoples owned and managed land

The NSW Government will address barriers and provide support to deliver new blue carbon projects. We will also examine the best way to provide advice and other support to land managers such as primary producers, councils and First Nations communities.

2.1 **Action 2.1:** Explore options that address landholder hesitancy, remove financial barriers and deliver Clean Energy Regulator registered projects.

2.2 **Action 2.2:** Identify and progress 10 new sites for blue carbon restoration with potential for registration with the Clean Energy Regulator.

2.3 **Action 2.3:** Provide advice, guidance and support to landholders and primary producers to help their decision making.

2.4 **Action 2.4:** Provide support to First Nations peoples and their communities to integrate blue carbon projects into Sea Country management.

2.5 **Action 2.5:** Progress blue carbon demonstration projects at Duck Creek Agricultural Research Station, Ballina and the Everlasting Swamp wetland complex.

Zoysia macrantha saltmarsh Hunter Wetlands National Park. Doug Beckers/DPE

Addressing landholder hesitancy and financial barriers

2.1

NSW has a strong track record in delivering coastal ecosystem restoration projects that have blue carbon values.

In collaboration with partners, multiple wetland restoration projects including staged restoration of tidal flows to the Hexham Swamp, Kooragang Island, and Tomago in the Hunter Estuary Wetlands, and to the Yarrahapinni Wetlands on the Macleay River, have been delivered in collaboration with agencies and partners.

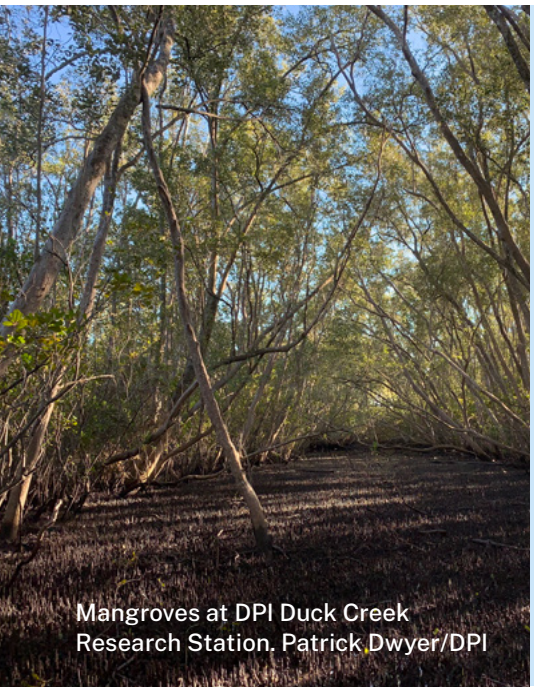
An important lesson from these projects is that navigating planning and other regulatory approvals can be complex. The NSW Government will examine options to simplify planning, regulatory and administrative approval pathways for blue carbon projects. This will include approval processes for projects on Crown Lands and Crown waterways.

The emerging nature of the blue carbon market can also be a barrier to broader uptake. Land managers can be encouraged to adopt carbon farming practices when there are broader co-benefits of a project such as enhanced agricultural productivity, and benefits to the environment.

The restoration of natural flows and enabling habitats to migrate can also help build resilience to the impacts of climate change and sea level rise.

Blue carbon projects also offer an opportunity for landowners to transition from land uses that may become unprofitable or no longer viable in the future due to climate change and sea level rise.

These projects can enable landowner to remain in their local community, provide greater flexibility to diversify their income and adopt more resilient and sustainable land use practices.



Mangroves at DPI Duck Creek Research Station. Patrick Dwyer/DPI

Identifying and progressing 10 new blue carbon restoration sites

2.2

NSW Coastal Wetland Restoration First Pass Prioritisation Report identified potential opportunities for high blue carbon projects on coastal floodplains of northern NSW.

The NSW Government is committed to developing 10 blue carbon demonstration projects. The experience of various organisations in NSW places the state in a leading position to continue delivering ecosystem restoration projects, distil learnings for others and pilot innovative projects to demonstrate suitability and encourage wider uptake.

Demonstration blue carbon projects will be a critical part of building the resilience of our estuaries and coastlines to climate change and maintaining the extensive blue carbon that they store. They will also show how blue carbon can be a part of a viable business enterprise mix for primary producers, private landholders, local councils or First Nations people and their communities.

Jerusalem Creek, mangrove and saltmarsh area. John Lugg/DPE

Advising, guiding and supporting landholders and primary producers

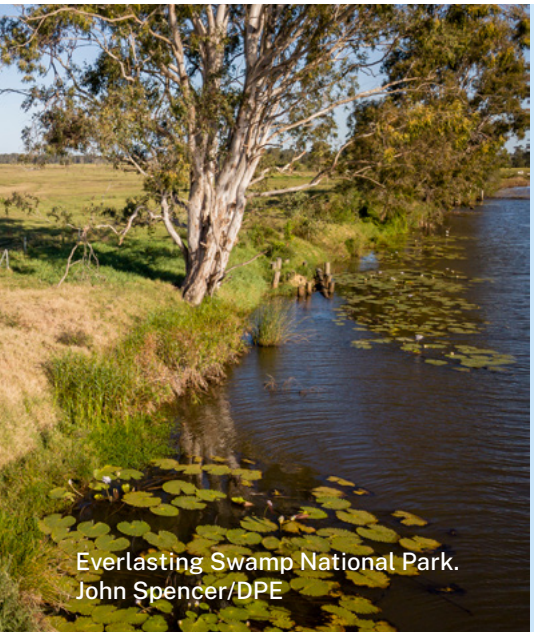
2.3

The NSW Government, as part of the Marine Estate Management Strategy, funded a project that assessed the potential of coastal wetlands in NSW to achieve carbon abatement through the restoration of tidal flows.

The project found that there is approximately 60 km^2 of high blue carbon potential area upstream of tidal barriers in NSW, with roughly 4,200 instream tidal barriers identified throughout the state. The north coast of NSW was identified as having particularly high blue carbon potential, including the Richmond River, Clarence River and Macleay River catchments.

Additional information is required so that land managers can make informed decisions around repairing or creating new tidal barriers, or removing a tidal barrier so they can take advantage of carbon financing linked to blue carbon ecosystem restoration.

The project also identifies potential areas to leverage the management of public lands as demonstration sites and involve public land managers and agencies as key delivery partners.



Everlasting Swamp National Park. John Spencer/DPE

Supporting First Nations peoples and their communities

2.4

The NSW Government is committed to understanding how blue carbon projects could present opportunities for First Nations peoples owned and managed land and how they may intersect and rights, native title interests and Sea Country management. This is key if we are to move forward with reconciliation and achieve social, cultural and environmental outcomes in NSW.

The NSW Government has already begun conversations on how best to involve First Nations communities in Duck Creek and Everlasting Swamp demonstration projects.

The government is committed to having broader conversations around the support needed for First Nations peoples to tap into potential economic benefits associated with blue carbon projects.

2.5

Everlasting Swamp – a site of high blue carbon potential

Everlasting Swamp National Park.
John Spencer/DPE

Delivery of this project is dependent on registration with the Clean Energy Regulator.

The project could restore at least:

556 ha

of high blue carbon potential area

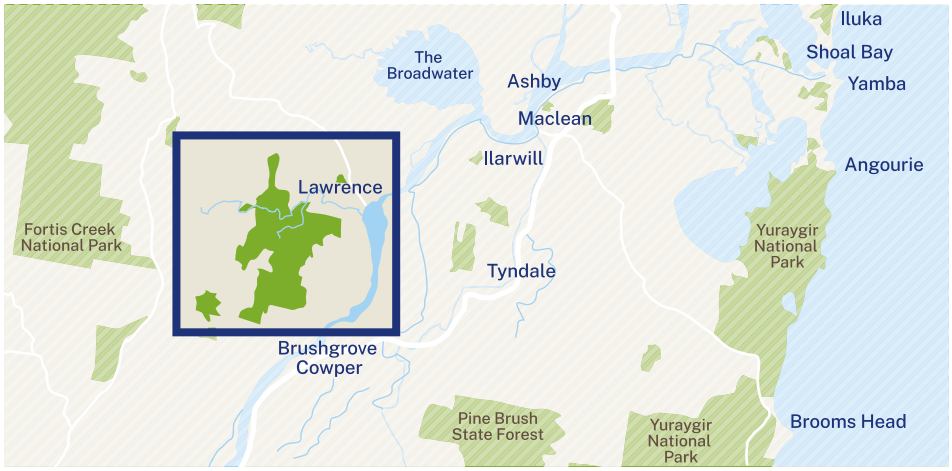
State outcomes

- Connecting communities to resilient and sustainable energy and local environments
- Productive and sustainable land use
- Stronger and cohesive regional communities and economies
- Fair, secure and efficient markets
- A strong, resilient and diverse economy
- Empowering First Nations communities
- Improved biodiversity and water quality

Project benefits

- Potential for reduced nutrient input
- Potential increased fish nursery habitat
- Potential expansion of endangered ecological communities
- Increased habitat and foraging area for birdlife
- Improved water quality and reduced blackwater events
- Rehabilitation of acid sulfate soils
- Increased tourism opportunities for the local area

Establishing blue carbon demonstration projects is important to advance scientific knowledge, understand delivery challenges, build capacity and scale up participation.



The Everlasting Swamp near Maclean in northern NSW has been extensively modified through historic drainage works and tidal restriction infrastructure. This has caused a significant decline in the environmental values of the area and resulted in Everlasting Swamp becoming one of the worst acid sulfate soil affected areas in NSW. However, Everlasting Swamp is one of the highest blue carbon potential sites in NSW, with at least 556 hectares (ha) that could be restored through the re-introduction of tidal flows. This represents approximately 9% of the total area considered to be of high potential for blue carbon above a tidal barrier in NSW identified by the First Pass Prioritisation Report.

The Marine Estate Management Authority, in partnership with NPWS, First Nations, the Sportsmans Creek Drainage Union and the broader local community is currently undertaking feasibility assessments at Everlasting Swamp.

The broader site contains at least 1,289 ha of suitable blue carbon habitat where tidal flow could be restored. Full restoration of the entire wetland complex would be the largest coastal wetland restoration project in NSW, and one of the largest in Australia, and could potentially abate approximately 136,000 tonnes over a 25-year crediting period.

2.5

Duck Creek
– a site for building capacity with coastal land managers

Point Paddock intertidal zone at Duck Creek. Patrick Dwyer/DPI

Delivery of this project is dependent on registration with the Clean Energy Regulator.

The project could restore at least:

13 ha

of high blue carbon potential area

State outcomes

- Connecting communities to resilient and sustainable energy and local environments
- Productive and sustainable land use
- Stronger and cohesive regional communities and economies
- Fair, secure and efficient markets
- A strong, resilient and diverse economy
- Empowering First Nations communities
- Improved biodiversity and water quality

Project benefits

- Extension activities for landholders, including primary producers
- Potential for reduced nutrient input
- Potential increased fish nursery habitat
- Increased habitat and foraging area for birdlife
- Benefits for First Nations communities

The Marine Estate Management Authority (MEMA), in partnership with the Department of Regional NSW and First Nations peoples, is investigating the feasibility of undertaking a blue carbon project at Duck Creek Agricultural Research Station.

Tidal flows have been precluded from the site by levees for more than 60 years, which led to the loss of approximately 70 hectares of blue carbon ecosystems. Approximately 13 hectares of the site will initially be restored. A boardwalk is planned for education purposes allowing stakeholders to witness the progress of blue carbon ecosystem recovery at the site.

A blue carbon ecosystem restoration project at the site will enable the NSW Government to show how blue carbon can become part of a business' enterprise mix. It aims to demonstrates how low-lying properties can become more resilient and adapt land-use to accommodate sea level rise.

Priority area 3: Embedding blue carbon in coastal and marine policy planning and management

The NSW Government will embed blue carbon approaches into coastal and marine estate management to encourage and enable blue carbon ecosystem restoration projects at different scales.

Action 3.1: Review the NSW planning system to streamline approvals and enable blue carbon restoration projects.

Action 3.2: Support councils to integrate blue carbon projects in coastal management programs and transition land uses on low lying floodplains vulnerable to extreme events and climate change.

Action 3.3: Determine Marine Estate Management Strategy opportunities that facilitate the uptake of blue carbon projects.

Reviewing the NSW planning system and streamlining approvals

Blue carbon projects will likely require a number of regulatory approvals under planning and other state and Commonwealth legislation. There is an opportunity to streamline and simplify approvals for restoration projects to assist with reducing upfront costs and increasing investment certainty and project take-up.

The NSW Government recognises that having certainty about the process to undertake a blue carbon project can greatly influence a proponent's decision to plan for and deliver such a project.

The NSW planning system can be divided into 2 broad areas –land use planning and development controls.

The NSW Government will embed blue carbon ecosystem projects and associated works into existing planning system provisions, with a view to streamlining approvals and facilitating project delivery. This will align the existing framework around aquatic habitat offsets for development impacts under the *Fisheries Management Act 1994* that generally also achieve blue carbon outcomes.

3

Hare Point Track estuarine wetlands including saltmarsh and mangroves Carama Inlet, northern shores of Jervis Bay. Michael Van Ewijk/DPE

Newcastle Coastline
John Spencer/DPE

Supporting councils to integrate blue carbon projects in coastal management programs and transition land use

3.2

The NSW Government has established a modern and integrated coastal management framework through the *Coastal Management Act, 2016* that better equips coastal communities to respond to existing and future coastal management challenges and opportunities.

Local councils in NSW are currently preparing the first round of coastal management programs under this Act. These programs set the long-term strategy for the coordinated management of the coastal zone and also enable local councils, First Nations peoples and communities to identify potential blue carbon ecosystem restoration priorities and actions. Lands on low lying floodplains that are vulnerable to extreme events and climate change may be suitable to transition to blue carbon ecosystems.

The NSW Blue Carbon Strategy recognises the opportunity to better integrate local coastal management with statewide priorities for carbon sequestration and the protection and enhancement of ecosystems.

Blue carbon ecosystem restoration represents a significant opportunity to realise several objectives of the *Coastal Management Act, 2016* which are:

- protecting and enhancing coastal wetlands in their natural state, including their biological diversity and ecosystem integrity
- promoting the rehabilitation and restoration of degraded coastal wetlands
- improving the resilience of coastal wetlands to the impacts of climate change, including opportunities for migration.

The NSW Blue Carbon Strategy informs key pieces of work that will support local councils' efforts to integrate the management of blue carbon ecosystems and low lying floodplains into coastal management programs.

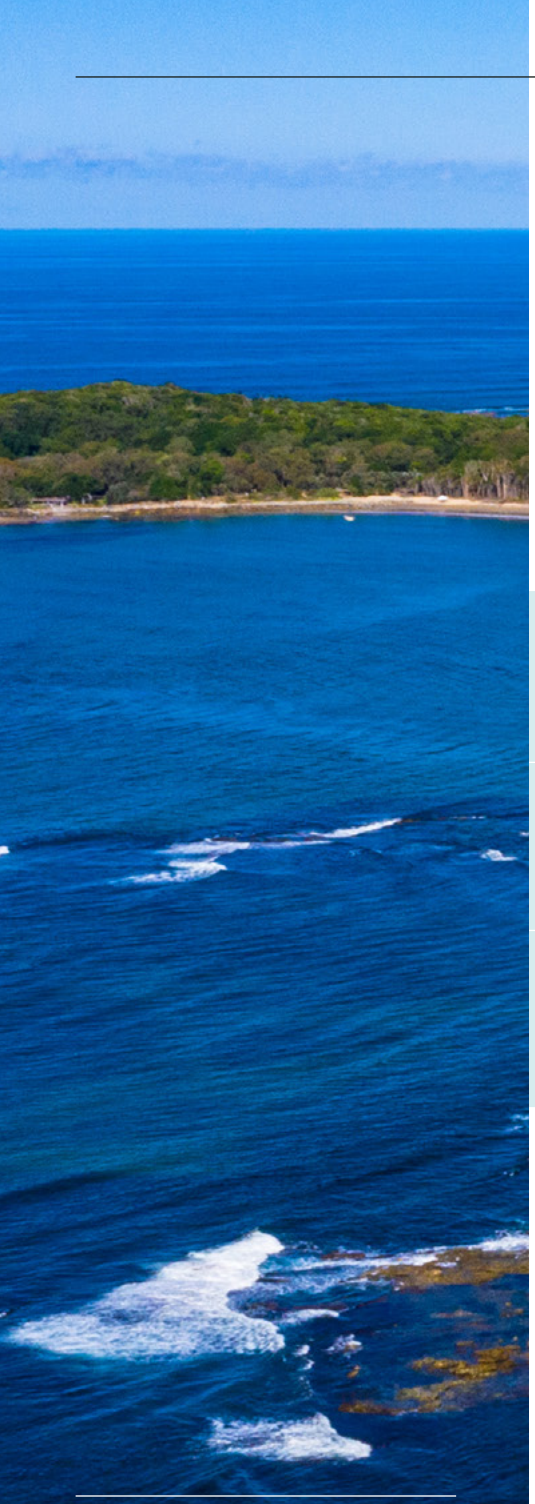
Mangroves within Emigrant Creek.
Patrick Dwyer/DPI

Determining Marine Estate Management Strategy opportunities

3.3

The Marine Estate Management Strategy integrates with other coastal and marine programs and reforms in NSW to achieve a more coordinated approach to management of the marine estate by all levels of government. In delivering the NSW Blue Carbon Strategy we will determine opportunities to facilitate the uptake of blue carbon projects through continued delivery of the Marine Estate Management Strategy.

The NSW Government has committed over $285 million to deliver the NSW Marine Estate Management Strategy 2018–2028. The strategy outlines how to protect and enhance our waterways, coastline and estuaries over the next 10 years. It is tackling the most significant threats to our marine estate, including threats to blue carbon ecosystems such as poor water quality, modified freshwater flows, climate change, habitat clearing and wetland drainage.



4

Shark Bay coastline, Bundjalung National Park. Jessica Robertson/DPE

Priority area 4: Progressing blue carbon research

The NSW Government will support further targeted research to identify opportunities, including additional measurement and mapping of the various blue carbon ecosystems along with ways to recognise and value co-benefits.

4.1 **Action 4.1:** Undertake a gap analysis, publish a research prospectus and work with key partners to identify potential funding pathways to deliver research priorities.

4.2 **Action 4.2:** Understand and improve the valuation of blue carbon ecosystem services and the benefits of restoration and conservation.

4.3 **Action 4.3:** Explore opportunities for a pilot kelp forest restoration project in NSW.

Identifying potential funding pathways for research priorities

4.1

Both the nature and extent of blue carbon opportunities in NSW are yet to be fully realised. Further targeted research is necessary to address information gaps and provide the evidence base to drive greater investment in blue carbon.

Leading blue carbon researchers in Australia have considered what the research agenda for blue carbon needs to be, after surveying the senior authors of the 50 most cited papers on blue carbon science.

Several priority research areas identified include:

1. How climate change will impact carbon accumulation in mature blue carbon ecosystems and during their restoration.
2. How human driven disturbance to blue carbon ecosystems affects the burial rate of blue carbon.
3. The importance of macroalgae like kelp, as blue carbon sinks and donors.
4. The extent and temporal distribution of blue carbon ecosystems.
5. What management actions best maintain and promote blue carbon sequestration.

Scientists surveying mangrove forests within the Tweed River estuary. Patrick Dwyer/DPI

Understanding and improving valuation and benefits

4.2

Research has largely focused on physical and biological processes and don't include social and economic research, which needs to be considered by the government if a blue carbon market is to be created.

Partnerships with universities and research institutions will be fundamental to addressing knowledge gaps around blue carbon in the biological, social and economic realms.

Targeted research projects will provide the evidencebase to make investment decisions and improve our understanding of the benefits and value of blue carbon ecosystem services. For example, monitoring and researching the reinstatement of tidal flows within areas of the Clybucca River, Tuckean Broadwater, Belmore River and Wallamba River will improve our understanding of the benefits and value of restoring approximately 5,150 ha of blue carbon ecosystems. Similar projects are also underway on the Hunter River at Hexham Swamp and Tomago.

NSW has already begun this work through two projects with the CSIRO:

- estimating Australia's blue carbon potential
- investigating the carbon sequestration potential associated with installing environmentally friendly moorings.

Conducting surveys of kelp health. Tom Davis/DPI

Exploring opportunities to pilot a kelp forest restoration project

4.3

The potential for seaweeds to contribute to sequestering carbon at large scales is being investigated. There may be significant opportunities presented by kelp forest research and restoration to enhance biodiversity, blue carbon and the contributions to regional NSW economies.

A kelp forest monitoring project is currently being delivered by the Department of Primary Industries–Fisheries under the Marine Estate Management Strategy.

The project is monitoring the resilience and condition of these ecosystems in NSW, in order to detect the impacts of climate change, fill priority knowledge gaps and predict future climate-induced changes.

Kelp forests have been surveyed across more than 1,000 km of the NSW coastline using underwater cameras and diving surveys. The project has established baseline data on the health and condition of kelp forests, identified areas of refuge where kelp forests are likely to thrive in the future, and predicted how the cover of these kelp forests will respond under climate change. The outcomes of the research will inform conservation, management and on-ground works such as restoration.

Restoration projects typically involve removing the cause of decline to enhance natural recovery and may involve transplanting adult or juvenile kelp to suitable sites.

5

Richmond River Estuary.
Patrick Dwyer/DPI

Priority area 5: Promoting pathways for blue carbon investment

The NSW Government will increase investment in blue carbon markets and natural capital by playing a leading role in helping the public and private sector to identify new opportunities for investment in emerging blue carbon markets.

5.1 **Action 5.1:** Quantify and value ecosystem services and associated benefits to drive investment in blue carbon.

5.2 **Action 5.2:** Engage with stakeholders to investigate blue carbon financing models and pathways.

5.3 **Action 5.3:** Pilot the first NSW Government endorsed Blue Carbon Instrument by 2025 and grow the blue carbon market in NSW.

Natural capital is a way of thinking about nature in much the same way as traditional capital – if we invest in it, it creates value, and if we degrade it, we limit its value.

By better accounting for any environmental degradation of natural capital in decision-making, a holistic picture of the social, economic, and environmental costs can be obtained, and nature can be properly accounted for in our decisions.

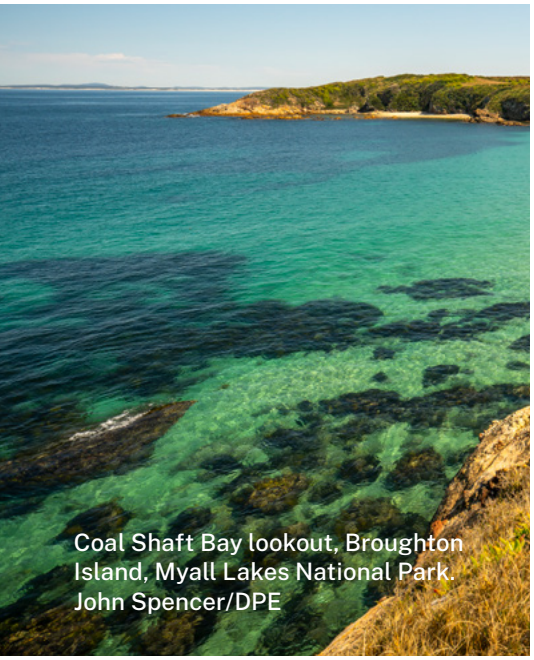
Blue carbon and the ecosystem services flowing from blue carbon projects are a form of natural capital. Carbon markets will play an important role in enabling and encouraging participation in blue carbon projects.

This strategy aligns with the NSW Natural Capital Statement of Intent, which recognises the value of natural capital and creating the environment for evolving natural capital markets and investment opportunities that unlock alternative on-farm revenue streams for primary industries and landholders.

We are considering a range of financial products to accelerate private sector financing of natural capital and low carbon farming opportunities by establishing public-private partnerships with the finance sector.

This strategy supports an integrated approach to offsets across the Natural Capital and Blue Carbon initiatives to optimise access to natural capital and carbon market opportunities in NSW.

We will evaluate the financial mechanisms and suitable models for the operation and management of blue carbon investment. This is so we can link investment outcomes with natural capital valuation.



Coal Shaft Bay lookout, Broughton Island, Myall Lakes National Park. John Spencer/DPE

Driving investment in blue carbon

5.1

In April 2022, the NSW Government launched its approach to sustainably managing natural capital in New South Wales by releasing a consultation draft NSW Natural Capital Statement of Intent.

Natural capital is the world's stocks of natural assets and the services that flow from them. Our natural capital includes geology, soil, air, water, and all living things, like our coastal wetlands, seagrass beds, kelp forests, and the life that lives within these places. Our blue carbon ecosystems are a form of natural capital.

The Taskforce on Scaling Voluntary Carbon Markets (TSVCM), sponsored by the Institute of International Finance (IIF) with knowledge support from McKinsey, estimates carbon credit demand may increase by a factor of 15 or more by 2030 and up to 100 by 2050. By 2030, the global carbon credit market may be worth upward of $50 billion.

For example, in 2018, the Seychelles Government launched the world's first sovereign blue bond to support sustainable marine and fisheries projects raising $15 million from investors.

Tomago Wetlands floodgates, Hunter Wetlands National Park/Soil Conservation Services

Investigating blue carbon financing models and pathways with stakeholders

5.2

The introduction of the tidal restoration of blue carbon ecosystems method by the Commonwealth Government, is an important milestone in providing a market-based pathway for investable blue carbon projects that sequester carbon. Other activities such as land-use planning to allow for future migration of blue carbon ecosystems and avoiding disturbance of mangroves, saltmarsh and seagrass are potentially suitable methods for incorporation into a future Emissions Reduction Fund method.

Other examples include:

- land-use planning for sea-level rise, that enables the migration of blue carbon ecosystems
- re-establishment or creation of new seagrass ecosystems
- avoided clearing and disturbance of mangrove and saltmarsh ecosystems.

Khappinghat Creek, mangrove and saltmarsh areas. John Lugg/DPE

Piloting a Blue Carbon Instrument and kick starting the NSW blue carbon market

5.3

There is large and growing investment demand for conservation projects due to their potential value as premium carbon credits and leveraging important co-benefits.

There is still much to learn about the financial mechanisms and barriers. Actions will focus on providing a clearer pathway for investment in blue carbon ecosystems, through existing and emerging carbon and environmental markets.

The Australian Government has recently approved the first blue carbon method under the Emissions Reduction Fund that generates Australian Carbon Credit Units when restoring tidal flows to blue carbon ecosystems.

The NSW Government will play a leading role in enabling sustainable finance for new and emerging markets. This will broaden investment in blue carbon ecosystem protection and restoration, in addition to projects currently supported through the Emissions Reduction Fund.

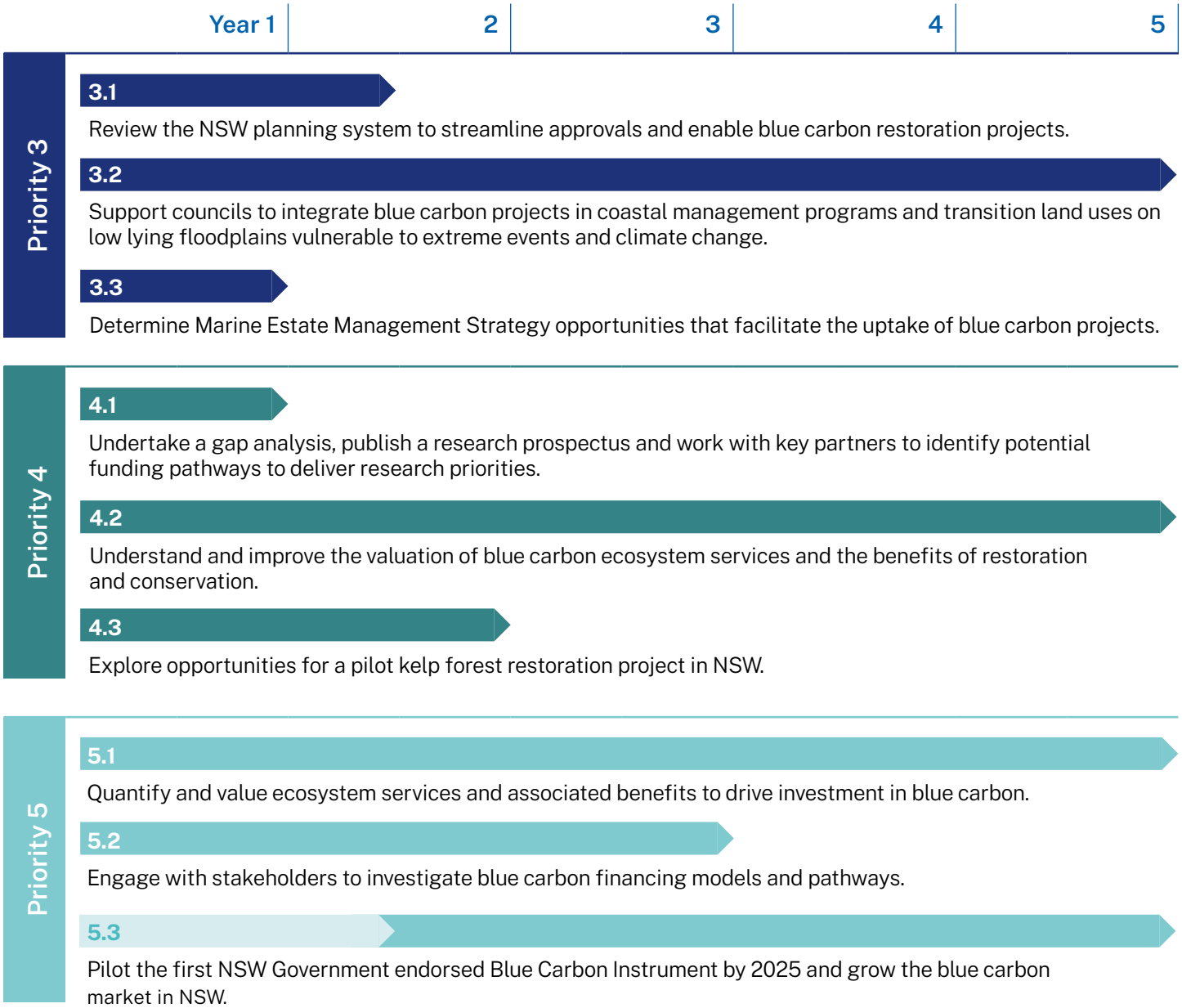
Delivering the strategy

The actions identified in this strategy will be delivered over a 5-year period.

Campground Ben Boyd National Park.
John Spencer/DPE

NSW Blue Carbon Strategy – Overview of priority areas actions

	Year 1	2	3	4	5
Priority 1	1.1				
	Determine effectiveness of blue carbon ecosystem legislative protection, conservation and climate change adaptation mechanisms.				
	1.2				
	Support private and public land covenanting arrangements and other funding options to manage and conserve blue carbon ecosystems.				
	1.3				
	Investigate opportunities to support seagrass and seaweed ecosystem conservation projects.				
	1.4				
	Promote and support the conservation, adaptation and migration of blue carbon ecosystems by the community and organisations on public and private land.				
Priority 2	2.1				
	Explore options that address landholder hesitancy, remove financial barriers and deliver Clean Energy Regulator registered projects.				
	2.2				
	Identify and progress 10 new sites for blue carbon restoration with potential for registration with the Clean Energy Regulator.				
	2.3				
	Provide advice, guidance and support to landholders and primary producers to help their decision making.				
	2.4				
	Provide support to First Nations peoples and their communities to integrate blue carbon projects into Sea Country management.				
	2.5				
	Progress blue carbon demonstration projects at Duck Creek Agricultural Research Station, Ballina and the Everlasting Swamp wetland complex.				


Year 1
2
3
4
5
Priority 3
3.1
Review the NSW planning system to streamline approvals and enable blue carbon restoration projects.
3.2
Support councils to integrate blue carbon projects in coastal management programs and transition land uses on low lying floodplains vulnerable to extreme events and climate change.
3.3
Determine Marine Estate Management Strategy opportunities that facilitate the uptake of blue carbon projects.
Priority 4
4.1
Undertake a gap analysis, publish a research prospectus and work with key partners to identify potential funding pathways to deliver research priorities.
4.2
Understand and improve the valuation of blue carbon ecosystem services and the benefits of restoration and conservation.
4.3
Explore opportunities for a pilot kelp forest restoration project in NSW.
Priority 5
5.1
Quantify and value ecosystem services and associated benefits to drive investment in blue carbon.
5.2
Engage with stakeholders to investigate blue carbon financing models and pathways.
5.3
Pilot the first NSW Government endorsed Blue Carbon Instrument by 2025 and grow the blue carbon market in NSW.

RAMSAR Wetlands Towra Point is the most significant wetland in the Sydney region, and important at a National and International level.
John Spencer/DPE

Find out more about your environment at:
www.environment.nsw.gov.au

Published by:
Environment and Heritage Group Department of Planning and Environment, on behalf of NSW Government
Locked Bag 5022, Parramatta NSW 2124
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (Environment and Heritage Group enquiries)
TTY users: phone 133 677, then ask for 1300 361 967
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967

Email: info@environment.nsw.gov.au

Website: www.environment.nsw.gov.au

Report pollution and environmental incidents
Environment Line: 131 555 (NSW only) or info@environment.nsw.gov.au

See also www.environment.nsw.gov.au

ISBN 978-1-922899-46-0

EHG2022/0450

Cover photograph: Everlasting Swamp National Park.
John Spencer/DPE