Transport for NSW

Kamay Ferry Wharves

Deep dive: Posidonia and seahorse protection

June 2023

Posidonia australis seagrass in Botany Bay

The NSW Government is replacing the previous ferry wharves at La Perouse and Kurnell as part of the Kamay Botany Bay National Park, Kurnell Master Plan.

Managing environmental impacts is our key focus. We are partnering with experts from the University of NSW and local Gamay Rangers to protect endangered species *Posidonia australis* and White's Seahorse.

What is *Posidonia australis*?

Posidonia australis (pronounced 'Pos-ee-doe-nee-ah, Os-trah-lees') is an important seagrass that can be found in coastlines along the southern half of Australia, including in 17 estuaries along the east coast of NSW.

In NSW, Posidonia likes to live in shallow, sheltered bays, estuaries, and coastal lakes. Its leaves are bright green and strap-like (about 1 cm wide) and can grow to over 80 cm long. As much as 90 percent of the mass of the plant may be in the underground rhizome/roots. This is part of what makes seagrasses different to seaweeds; seagrasses are vascular plants that have roots, leaves, flowers and fruits. In contrast, seaweeds are a type of algae, which are evolutionarily simpler organisms and lack a vascular system (the internal transport system for nutrients and fluids).

There are about 70 species of seagrass world-wide. Seagrasses are one of the world's oldest flowering plants, and have adapted to live fully submerged underwater. You may have heard seagrasses referred to as the 'lungs of the ocean', that's because as they photosynthesise, they produce oxygen while also capturing and storing large amounts of carbon. Seagrasses also help to prevent erosion and provide shelter for many aquatic animals, including White's Seahorse in the Sydney region.

In Botany Bay, you can find seagrass species Zostera (eelgrass), Halophila (paddleweed) and Posidonia.

Increased human activity in coastal areas has had a major impact on Posidonia populations, although natural causes, such as storm events, can also lead to declines.

Posidonia is currently listed as endangered in six NSW estuaries, including Botany Bay.

Some seagrasses, like Halophila and Zostera, grow fast and can bounce back after impacts relatively quickly. In contrast, Posidonia grows slowly and is particularly sensitive to disturbances due to ongoing declines, which make the species less able to bounce back. This is why we are providing a helping hand to restore and improve Posidonia habitat as part of the Kamay Ferry Wharves Project.

To learn more about Posidonia, visit www.dpi.nsw.gov.au and search 'Posidonia australis'.

Our plan to protect these important species

While the Kamay wharves have been designed to avoid as many impacts as possible, construction and operation activities will have some impact on seagrass, including Posidonia at the Kurnell Wharf site.

We've developed a plan called the Marine Biodiversity Offset Strategy (MBOS) – this sets out how we will manage our impact through relocating Posidonia away from the project impact area, and importantly, how we plan to create new areas of Posidonia growth in Botany Bay. As part of this plan, we will also provide new habitat for Syngnathids (the family of fish that include seahorses, seadragons, pipehorses or pipefish).

We have an ambitious restoration goal, which is why we are committed to regular, long-term monitoring to ensure that we meet our objectives.

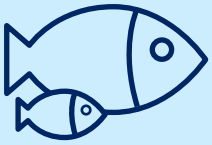
The important data collected will also help to shape future Posidonia restoration projects in Australia.

An MBOS Implementation Reference Panel will review and oversee the development and implementation of the MBOS which will be updated as required. Visit our website to view the MBOS.

Seagrass superpowers

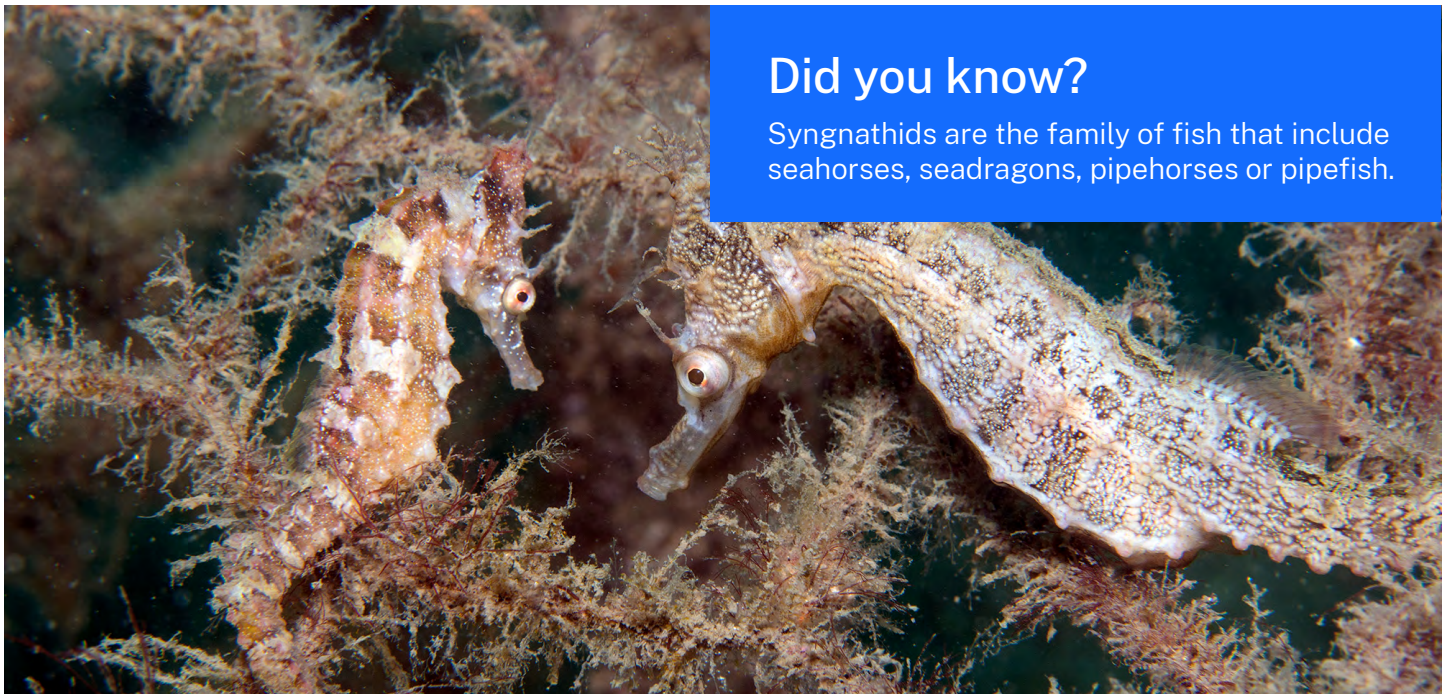
Coastal Aboriginal communities have used seagrasses in multiple ways, including for **clothing, basket weaving, medicinal purposes and in cultural ceremonies**

Can store up to **four times more carbon than terrestrial rainforests**



Provide habitat and nursery for many species of crab and fish to live and feed

Improve water quality and **reduce coastal erosion**



Did you know?

Syngnathids are the family of fish that include seahorses, seadragons, pipehorses or pipefish.

Two White's Seahorses using a seahorse hotel.

An example of newly installed seahorse hotels.
Images by Department of Primary Industries Fisheries.

An example of a seahorse hotel 18 months after installation (can you spot the two seahorses in this image?).

Seahorse hotels

Some Syngnathid species use seagrasses for habitat and feeding. Each day, before work starts to harvest and relocate Posidonia seagrass from the project impact area, marine ecologists will survey the area and relocate Syngnathids such as White's Seahorse to nearby Posidonia meadows outside the project area. Syngnathid surveys and relocation will also take place before construction work beings.

New homes will also be provided. Transport is working with NSW DPI Fisheries, seahorse experts and the MBOS Implementation Reference Panel to design and install seahorse hotels in suitable locations to create new habitat for these species.

The 'hotels' are purpose built units that start as artificial habitats, but are rapidly encrusted by algae, sponges and corals once placed in the marine environment. Over time, the weight of this marine growth causes the structure to collapse leaving a new natural habitat behind and perfect homes for seahorses.

This is not the first time seahorse hotels have been used – you can read more about how seahorse hotels are being used in NSW on the DPI website and Operation Posidonia.

Scientific Divers will remove Posidonia from impacted areas and replant it. Images by Harriet Spark, Grumpy Turtle Media.

Steps to Posidonia restoration

Planning

Over the past two years, marine ecologists have surveyed and mapped the project impact area to understand Posidonia patterns of growth. They have also surveyed the nearby Posidonia meadow at Kurnell to carefully select the best sites to rehabilitate by replanting them with Posidonia. Some of these sites include areas where we can heal existing 'scars' or damaged parts of the meadow.

Harvesting and replanting

Harvesting Posidonia from the project impact area at Kurnell will involve Scientific Divers gently removing plants from the sediment, being careful to protect the rhizomes/root area. The plants will then be replanted in the nearby rehabilitation sites. In some sites, biodegradable jute matting material will be installed to help anchor the plants in the seafloor.

We anticipate this work will take around 20 to 30 days to complete.

Once translocation is finished, the area will be mapped and surveyed to assist with future monitoring.

Replanting naturally detached Posidonia fragments

During intense weather, Posidonia plants naturally break away from meadows and wash ashore. The Gamay Rangers and UNSW Scientists will collect suitable naturally detached fragments from beaches around Botany Bay and store them in specialised holding tanks. The fragments will then be replanted in rehabilitation sites in Kurnell.

Monitoring

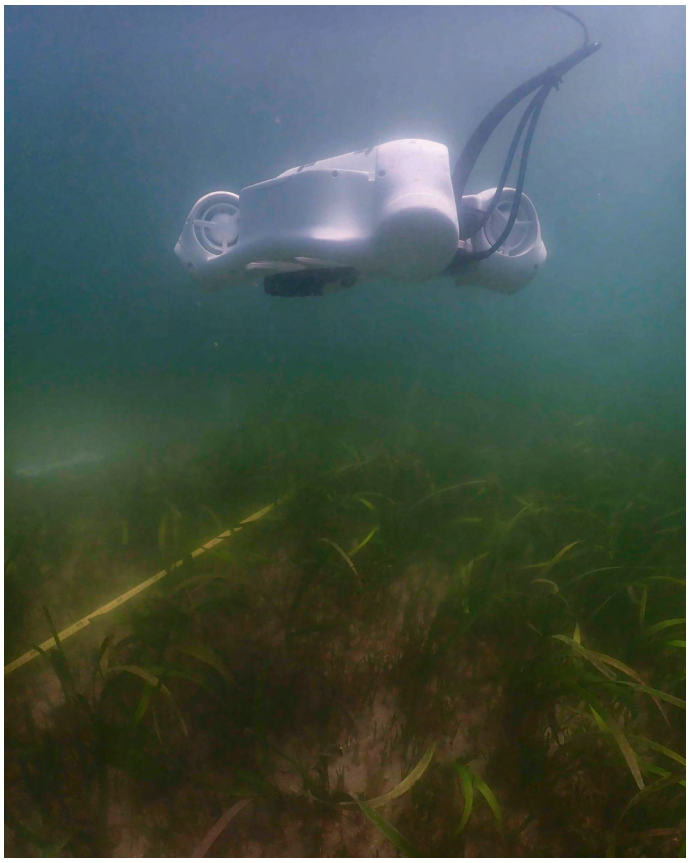
Long-term monitoring is a critical component of this work to ensure we meet the Marine Biodiversity Offset Strategy objectives. It will allow us to adapt our work where necessary to get the best outcome.

UNSW Scientists will monitor factors such as the increase in area, density, condition, and function of the seagrass rehabilitation areas, and compare it with existing 'reference' sites, to gauge the progress of the rehabilitation efforts over time.

The latest technology, including the underwater Hullbot robot, will assist by providing 3D model images to show visual changes in the rehabilitation sites over time.

Regular monitoring will take place every three to six months for the first five years and then annually for the next five years. Post-storm monitoring will also occur to assess any naturally occurring impacts.

Information on the results from this monitoring will be made available on the Kamay Ferry Wharves project website.



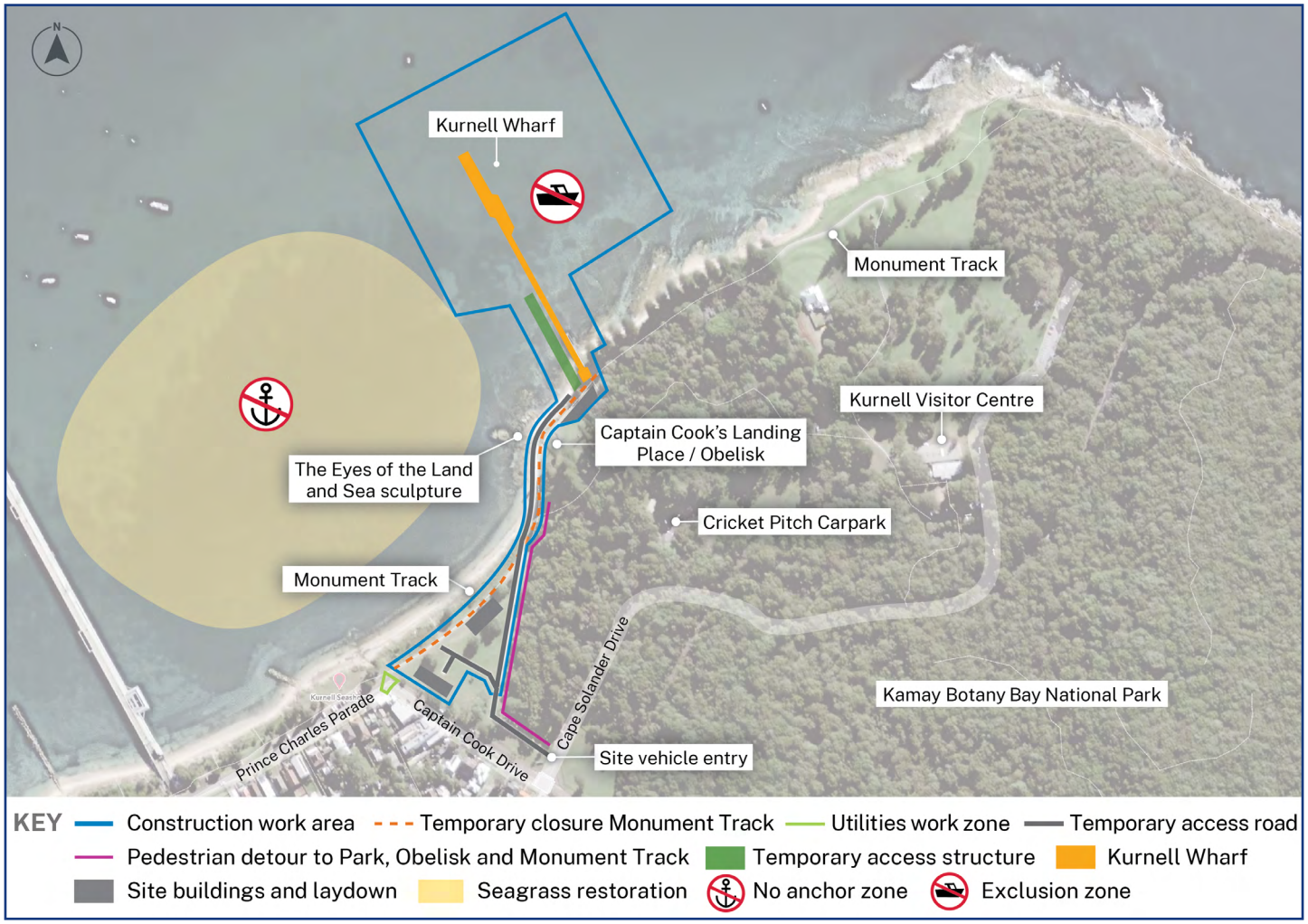
Hullbot robot in action. Image by Hullbot.

Seagrass monitoring. Image by Richard Woodgett, Grumpy Turtle Media.

No anchoring in Posidonia protection zone

Seagrasses located in shallow areas such as Botany Bay, Kurnell, are vulnerable to damage from boat anchors and propellers which can uproot the plants. To help protect the seagrass rehabilitation sites at Kurnell, a 'no-anchoring' zone is in place. Please follow signs and yellow marker buoys. We also encourage boaters to lift propellers when boating in shallow depths around seagrass. See map on the back page.

Map of seagrass protection zone



Indicative map of seagrass protection zone in Botany Bay, Kurnell, and the wharf construction work area

Learn more about the Kamay Ferry Wharves project

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nswroads.work/kamayferrywharves

Scan to visit project webpage

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Sources:

Department of Primary Industries: Primefact: Endangered population in NSW: Posidonia australis and Marine Estate Management Authority Posidonia activity book; Protecting White's Seahorse.