



BACKGROUND PAPER 2: THE JERVIS BAY MARINE ENVIRONMENT

THE JERVIS BAY MARINE ENVIRONMENT

What we know

1. Physical characteristics

Jervis Bay (35° 04'S 150° 44'E) is located on the East coast of Australia, approximately 150km south of Sydney in New South Wales and 20km southeast of Nowra in the Batemans marine bioregion. It spans over 100km of coastline and adjacent ocean extending from Kinghorn Point in the north to Sussex Inlet in the south. The dimensions of Jervis Bay are approximately 15 km (north-south) and 8 km (east-west) with a total area of 124 km². The bay has a 3.5km narrow outlet to the ocean to the south east. The bathymetry (depth of water) of the bay resembles a bowl with increasing depth from the coastline to the middle of the bay, where maximum depth reaches 35m. The bay is relatively deep at its entrance (e.g., 40-50m at the mouth), with a shoaling bathymetry that results in shallow waters at the northern half of the bay. Average depth across the bay is 20m.

A key feature of Jervis Bay is the constant transportation of water into and out of the bay due to a circular (clockwise) flow that enters the bay on the southern side and discharges from the bay near the seabed on the northern side. Waters have been calculated to remain in the bay between a broad range of 10 to 74 days, before being flushed into oceanic waters at the mouth. The fact that no major freshwater estuaries flow into the bay means that hydrological processes are mainly driven by oceanic processes (e.g., current flow trajectories and tidal processes).

2. Jervis Bay Marine Park

Jervis Bay Marine Park (JBMP) was established in 1998 by the NSW Government and Zoning established in 2002. JBMP is one of 5 Marine Parks in the NSW Marine Estate. The waters within the Jervis Bay Park are conserved and managed under the Marine Parks Act 1997. The JBMP extends south from Kinghorn Point in the north to Sussex Inlet in the south from the mean high-water mark to 3 nautical miles offshore. The Park covers an area of approximately 21,100 hectares which is managed via a zoning plan consisting of Sanctuary, Habitat Protection, Special Purpose and General Use Zones. Sanctuary zones protect the marine biodiversity while habitat protection zones also allow for recreational and commercial activities. Extensive aquaculture is permitted in no more than 2% (e.g., 440Ha) of the total area of the Marine Park.

The NSW State Government is currently reviewing the management of the Marine Park and its Zones. Stage 2 of the Marine Park Management Plan Review is currently being considered. Marine Park Advisory Committees play a key role during the development of the new [marine park management plans](#). Members of the Committee can be viewed here: [Jervis Bay marine park advisory committee \(nsw.gov.au\)](#)

3. Jervis Bay Marine Habitat and Biodiversity

The Jervis Bay region supports over 200 reef fish species, sharks, rays, many marine mammals, crustaceans, marine plants, and sea and shore birds. Hundreds of invertebrates can be found in its waters, including a wide variety of cephalopods, crustaceans, nudibranchs and more. It is home to over 230 algae species, with extensive ecologically important sea grass beds. The park is home to a unique mix of tropical and temperate species including the weedy sea-dragon, eastern blue devil fish, bottlenose dolphin and little penguin. Fur seals and whales also use the park.

A total of 389 fauna species and 1117 flora species are listed in the NSW BioNet Atlas records in the locality of Jervis Bay. Ninety-nine species are estimated to potentially inhabit or utilise the marine and/or estuarine environments of Jervis Bay, including 6 flora species, 20 mammal species (whales, dolphins and the dugong), five reptile species and 68 bird species, including seabirds, waders and intertidal species.

Jervis Bay Marine Environment Threatened and Vulnerable Species

A number of species inhabiting Jervis Bay and surrounding waters have been classified as vulnerable, threatened or extinct by NSW State and Australian Federal Governments.

The NSW Government list species protected under the Threatened Species Conservation Act 1995 ([TSC Act act-1995-101 \(nsw.gov.au\)](#)) and the Fisheries Management Act 1994 (FM Act. [Fisheries Management Act 1994 No 38 Fisheries Management Bill 1994 - NSW Legislation](#)). Those potentially occurring in the Southern Rivers marine zone (Jervis Bay lies in this zone) include.

- 2 species listed as 'critically endangered' under the TSC Act: Grey Nurse Shark *Carcharias taurus*); beach stone-curlew (*Esacus neglectus*);
- 10 species listed as 'endangered'
- 33 species were listed as 'vulnerable' under the TSC Act;
- 3 species were listed as 'vulnerable' under the FM Act; and
- 43 species were identified as 'protected' under the FM Act

The EPBC Act Protected Matters Search Tool generated a summary of matters of National Environmental Significance (NES), within Jervis Bay and a 20 km buffer zone (i.e. total area searched = 314 km²):

- **63 Listed Threatened Species:** 3 'critically endangered'; 21 'endangered'; and 39 'vulnerable'

- **76 Migratory Species:** 21 marine birds; 25 intertidal and/or wading birds; 8 terrestrial birds; 4 terrestrial birds; 10 marine mammals; 3 sharks; and 5 reptiles.
- **119 Listed Marine Species:** 5 marine reptiles; 2 fur seals; 1 dugong; 22 marine birds; 32 intertidal and/or wading birds; 9 terrestrial birds; and 21 syngnathiforms (includes trumpetfish and seahorses).
- **27 species of Whales and Other Cetaceans**

(Note: These Listings are frequently changing (mostly unfortunately being added to), so should be checked for currency).

Threats and challenges to Jervis Bay Marine Ecosystems

1. *Catchment disturbance*

Changes in land use and the removal of vegetation in coastal catchments contributes to increased runoff and associated loadings of nutrients and sediments from diffuse sources. The nature of the alternative land use will determine by how much the level of runoff increases. Increasing urbanisation leads to greater runoff from the hard non-porous surfaces found in urban areas. Increasing sedimentation can alter benthic communities. Point source pollution may also occur as a result of localised discharges – oil spills, pesticides and other chemicals impacting marine organisms.

2. *Population and demographic change*

Population growth is an important driving force that may have significant implications for the Jervis Bay marine ecosystem. Increased tourism can lead to increased use of the Bay for recreational activities. Increased population growth and usage of the Bay for various commercial and recreational activities. Increased development can add to surface runoff and erosion and consequential impacts to the marine environment.

3. *Nutrient and sediment loads*

Urban development and some agricultural land-use practices have the potential to substantially increase the rate of sediment and nutrient inputs to the Bay. Increases in nutrient loads may lead to excessive production of algae and aquatic plants, with flow-on effects up the food chain. High levels of total suspended sediments can reduce the levels of light and smother sensitive species.

4. *Commercial and recreational boating can cause*

- turbulence from vessels can alter benthic habitats.
- Dredging for Cruise Ship access into Jervis Bay.
- Disturbance to seagrasses which are important in sustaining many marine species.

- Point source pollution including bilge, oil and fuel spills as well as waste such as plastics and fishing line can have a significant impact on marine life.
- Propeller strike injuries to marine mammals,
- Harassment of marine mammals
- Noise pollution from boating for species that rely on sonar / sound

5. *Invasive species*

The hulls of vessels and bilge water (e.g. from cruise ships) may be carriers of exotic pests and diseases which have the potential to decimate locally endemic marine species.

6. *Climate change*

The potential impacts of climate change on marine and estuarine ecosystems include:

- increased saltwater intrusion into estuaries
- altered flushing characteristics, tidal ranges and salinity regimes
- changes to sediment and nutrient dynamics
- changes in water quality.

These will result in changes to marine habitats and community distribution. Adverse weather conditions, such as increase in the frequency of East Coast Lows, can cause severe coastal erosion, damage corals and seagrasses, thus impacting the Bays water quality and marine ecosystems.

7. *Other pressures*

Foreshore structures, such as reclamation walls and jetties; moorings and poorly located and designed aquaculture facilities, can cause changes to hydrology and tidal flows. This can have an impact on salinity levels and the composition of estuarine ecosystems.

Regulations / controls / plans

Management of the NSW coastal zone is the responsibility of all levels of government. The anticipated growth in coastal population is likely to increase the importance of integrated coastal zone management and climate change adaptation strategies. Local government plays a key role in protecting the health of estuarine ecosystems through a variety of mechanisms including land-use and strategic planning, development controls and a range of policies affecting water utilities and water quality management, such as sewage and stormwater management strategies and estuary management plans.

Legislation

The NSW [Environmental Planning and Assessment Act 1979](#) sets the framework for land-use planning decisions. The [Coastal Management Act 2016 No 20 - NSW Legislation](#) provides the strategic direction and legislative framework for managing the NSW coastal zone. Mangroves and seagrass habitats are protected under the [Fisheries Management Act 1994](#).

The Act defines the coastal zone as four (sometimes overlapping) coastal management areas. The Act establishes management objectives specific to each of these management areas, reflecting their different values and threats. The four areas are:

1. Coastal wetlands and littoral rainforests area – areas which display the characteristics of coastal wetlands or littoral rainforests that were previously protected by SEPP 14 and SEPP 26.
2. Coastal vulnerability area – areas subject to coastal hazards such as coastal erosion and tidal inundation.
3. Coastal environment area – areas with natural coastal features such as beaches, rock platforms, coastal lakes and lagoons and undeveloped headlands. Marine and estuarine waters are also included.
4. Coastal use area

The Resilience and Hazards SEPP maps the four coastal management areas that make up the coastal zone [Resilience and Hazards SEPP \(Chapter 2 – Coastal Management\) - \(nsw.gov.au\)](#). The Coastal Viewer allows views of coastal management areas down to the individual lot scale. [NSW Coastal Management State Environmental Planning Policy Maps](#)

Plans and planning processes.

State Plan 2006 <http://more.nsw.gov.au/StatePlan2006>

Jervis Bay Marine Park Operational Plan (note a new Management Plan is currently being developed)

[OperationalPlanforJervisBayMarinePark final october 2003.D... \(nsw.gov.au\)](#)

Shoalhaven Councils Coastal Zone Management Plan for the Shoalhaven Coastline focuses on how Council will manage coastal risks in partnership with local communities and government stakeholders. [DisplayDoc.aspx \(nsw.gov.au\)](#). The Council is currently reviewing the Shoalhaven Coastal Management Plan 2018 (to be updated 2023). There are “Get Involved” opportunities for community input at: [Open Coast and Jervis Bay Coastal Management Program | Get Involved Shoalhaven \(nsw.gov.au\)](#) and the St Georges Basin, Sussex Inlets Swan lake [Sussex Inlet, St](#)

[Georges Basin, Swan Lake and Berrara Creek Coastal Management Program | Get Involved Shoalhaven \(nsw.gov.au\)](#)

[Regional strategies](#) are prepared by the [Department of Planning](#) to guide and manage the high rate of population growth in coastal regions in a sustainable manner while protecting valuable natural and cultural assets. The strategies require:

- [local environmental plans](#) to protect and zone lands with aquatic, riparian and wetland conservation values
- councils to undertake an investigation of lands potentially affected by sea level rise to ensure that risks to public and private assets are minimised and managed.

Comprehensive Coastal Assessment

The coastal management toolkit *Coastal management toolkit* [Coastal management toolkit | NSW Environment and Heritage](#) contains information and guidance to help councils to manage the NSW coast and prepare coastal management programs. The toolkit provides additional technical information to help councils to meet the requirements of the [Coastal Management Act 2016](#) (CM Act), the State Environmental Planning Policy (Coastal Management) 2018 and the coastal management manual (the manual).

Management of water quality

The [NSW Water Quality Objectives](#) set out the agreed environmental values and long-term goals for NSW's surface waters. The objectives are consistent with the agreed national framework for assessing water quality described in the [ANZECC & ARMCANZ \(2000\) guidelines \(waterquality.gov.au\)](#).

Climate change

A key conclusion of the most recent assessment by the [Intergovernmental Panel on Climate Change \(IPCC 2007\)](#) is that reactive and stand-alone efforts to address the impacts of climate risks to coastal ecosystems are less effective than responses that are consistent with the principles of integrated coastal zone management. This is widely recognised as the most appropriate approach to deal with climate change, sea level rise and other current and long-term coastal challenges, such as coastal hazards and environmental degradation. The [NSW framework](#) for managing coastal hazards, including sea level rise, include:

- [Coastal Management Act 2016](#)
- [State Environmental Planning Policy \(Coastal Management\) 2018](#)
- NSW [Coastal Management Manual](#)
- [Australian Coastal Councils](#)
- [Coastal and Estuary Grants Program](#).

This paper was researched and compiled by Robyn Neeson, July 2022.