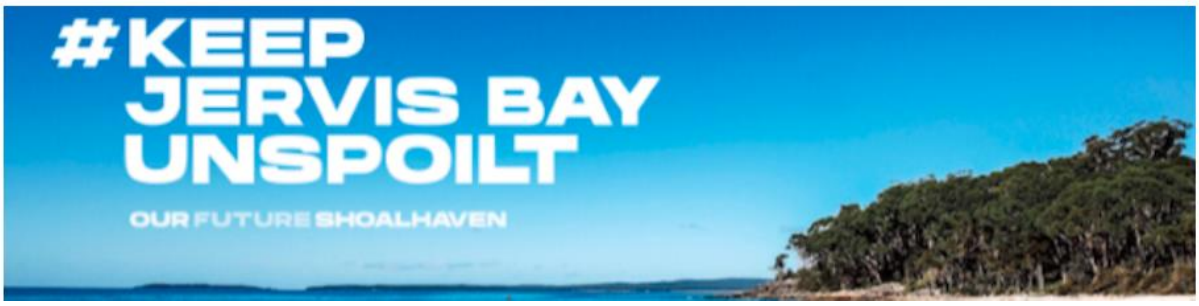

BACKGROUND PAPER 1: JERVIS BAY HYDROLOGY, RIVERINE AND ESTUARINE ENVIRONMENTS

What we know

Jervis Bay was formed around about 15,000 years ago when sea levels rose and flooded a series of creeks and rivers; the white sands, now almost pure washed silicon from the Permian period. The water catchment area for Jervis Bay is approximately 400km^2, and is unique insomuch as no major rivers flow into the Bay (Brown, Nudd, and Scarsbrick 1995; West et al. 1985). The remaining creeks and rivers that run into Jervis Bay are so small that they usually do not carry enough silt to muddy the Bay or change the colour of the sands.

Lakes and Wetlands / Swamps – Most notable is Lake Wollumboola. It is an intermittently closing and opening coastal lagoon located just inland of the eastern foreshore of Jervis Bay at Culburra Beach. Its bushland is also important wildlife habitat. Both the lake and parts of its catchment are included in Jervis Bay National Park. Lake Wollumboola is the largest shallow saline lagoon on the New South Wales south coast. The Healthy River Commission's Independent Inquiry into Coastal Lakes (2002) determined that Lake Wollumboola is one of only a few NSW coastal lakes warranting the highest level of protection. The lake is unusual in regard to the high natural variability of its processes and ecosystems and is recognised as highly sensitive to water pollution due to its complex hydrology and biodiversity. Lake Wollumboola and Cabbage Tree Swamp feeds Carama Creek and inlet on the northern side of the Bay.

A number of 'perched' lakes and swamps occur around Jervis Bay. These include in Booderee National Park - Lakes Windermere and McKenzie, Blacks Waterhole and Ryan's Swamp; Black Swamp (located directly adjacent to Callala). Underground aquifers in the Jervis Bay area contribute to perched water tables which exist throughout the Vincentia and Hyams Beach area, emanating largely from rocky upslope areas; these unconsolidated sand aquifers overlying Triassic sandstones show a rapid response to rainfall pulses. Source: 1.1.4.1 Groundwater systems | Bioregional Assessments)

Creeks and streams - Currambene Creek / Georges Creek is the main source of potential run-off during heavy rainstorms. Other creeks include Moona Moona Creek (also collect some stormwater runoff from Bayswood Estate and Vincentia / Huskisson villages), Coonemia Creek, Callala Creek, Wowly Gully and Bid Bid Creek (Callala), and Greenfield Gully and Duck Gully (Vincentia / Hyams Beach). Creeks located in Booderee National Park include Flat Rock Creek, Stoney Creek and Telegraph Creek.

Extensive mangrove systems - are a feature of the larger creeks entering the Bay. These play a significant role in maintaining water quality and provide important habitat for a number of marine and avian species.

Beaches – Jervis Bay is well known for its white sands. These sands are now almost pure washed silicon from the Permian period. Those beaches adjacent to or near urban development include: Iluka, Seamans, Hyams, Chinamans, Greenfield, Blenheim, Nelsons, Barfleur, Orion, Collingwood, Moona Moona Creek, Huskisson, Shark Net and Callala beaches. Beach management is largely conducted by Shoalhaven Council, although National Parks plays an operational role above the high tide mark where a National Parks abuts a beach.

Threats and challenges

- ***Siting of developments on floodplains*** – climate change impacts have seen more frequent and inundation of flood prone zoned land. Given this scenario should siting developments on this land be reconsidered. Whole of catchment hydrological and ecosystem impacts should also be considered in this determination.

- ***Inappropriate urban development in natural drainage and recharge areas*** results in clearing of native vegetation, loss of habitat and altering of the landscape's natural drainage. Clearing of native vegetation from wetlands, swamps and areas with perched water tables can significantly impact whole ecological communities, as well as causing adverse downslope drainage impacts. These areas can also be important for capturing excess water, reducing recharge and surface runoff, and improving water quality. Wetlands, swamps and perched lakes provide important habitat for many species of plants and animals. The construction of Stockland's and Bayswood Estate in Vincentia saw the removal of significant numbers of the black she-oak *(Allocasuarina littoralis),* the preferred food source of the Glossy Black Cockatoo (*Calyptorhynchus lathami*), listed as Endangered under the EPBC Act. The endangered Jervis Bay Leek orchid (*Prasophyllum affine*) was also known to exist at the site.

- ***Siting of developments adjacent to highly sensitive riparian and estuarine zones*** creates interface conflict and impacts sensitive estuarine ecosystems. For example, developments directly adjacent to Sanctuary Zones and Mangroves have the potential to severely impact the health of these environments due to increased human activity some of which will require an increased regulatory response from authorities in order to prevent illegal activities such as fishing and collecting. Increased construction of jetties and boating activity can cause changes to tidal flows, erode banks and damage mangrove systems.

- ***Beach and foreshore dune impacts from development and increased tourism***– impacts include foreshore erosion as a result of vegetation removal (some as a result of illegal poisoning of dune vegetation to facilitate views of the Bay) and the construction of retaining walls as a result of increased storm impacts, particularly increasing frequency of intense East Coast Low events. Tourism impacts to beaches include increased waste, removal of native vegetation for lighting of fires, and human and dog impacts on nesting of some marine birds.

Regulations / controls / plans

Federally, the protection of estuarine species and environment comes under the Environmental Protection and Biodiversity Conservation Act, 1999. Environment Protection and Biodiversity Conservation Act 1999 (legislation.gov.au)

In NSW, protection and management of estuaries is the responsibility of the NSW Department of Planning, Industry and Environment. See: Protection and management of estuaries | NSW Environment and Heritage

Shoalhaven 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)

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