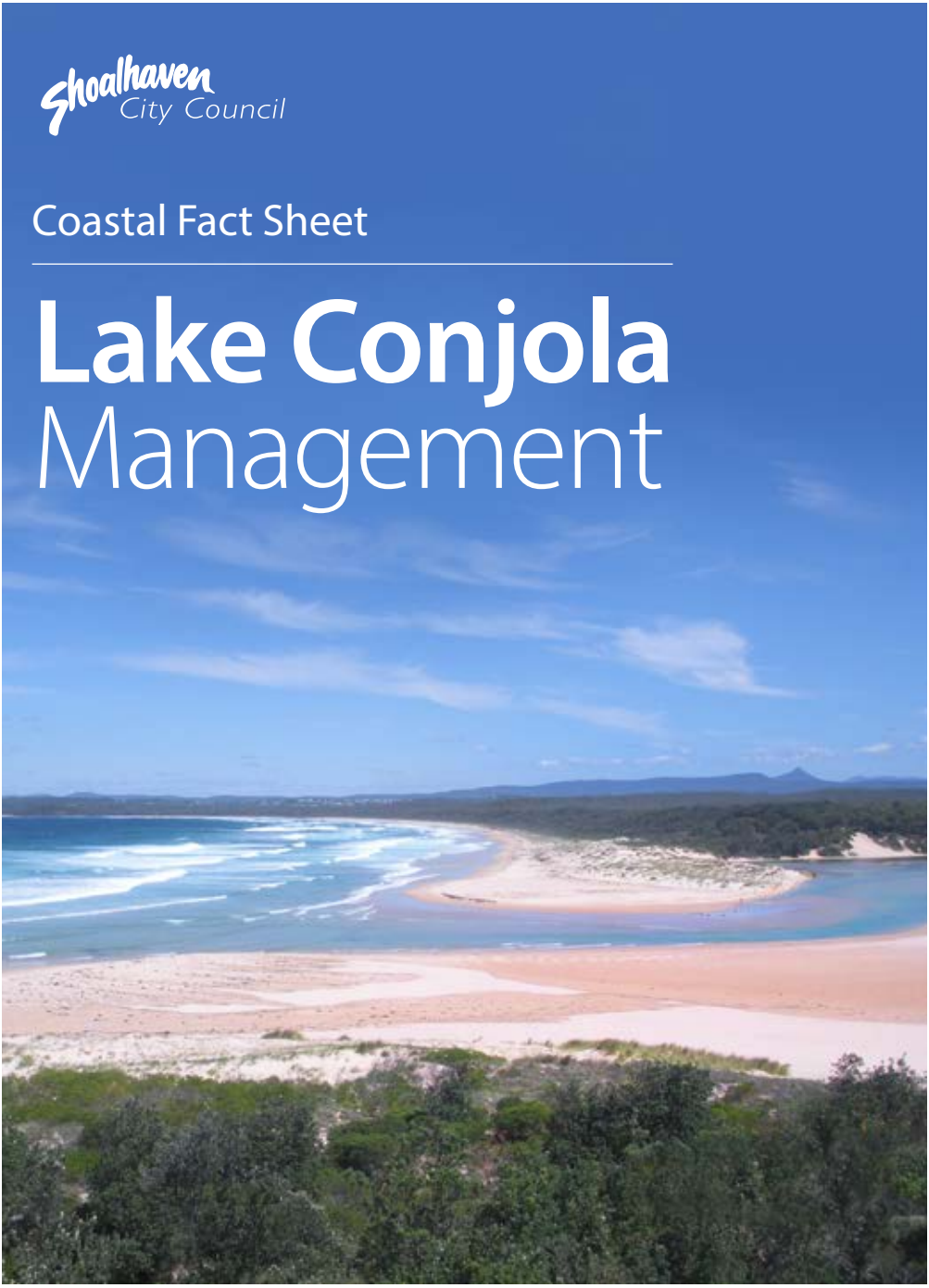
Shoalhaven City Council

Coastal Fact Sheet

Lake Conjola Management



Many coastal lakes open and close naturally. They are known as

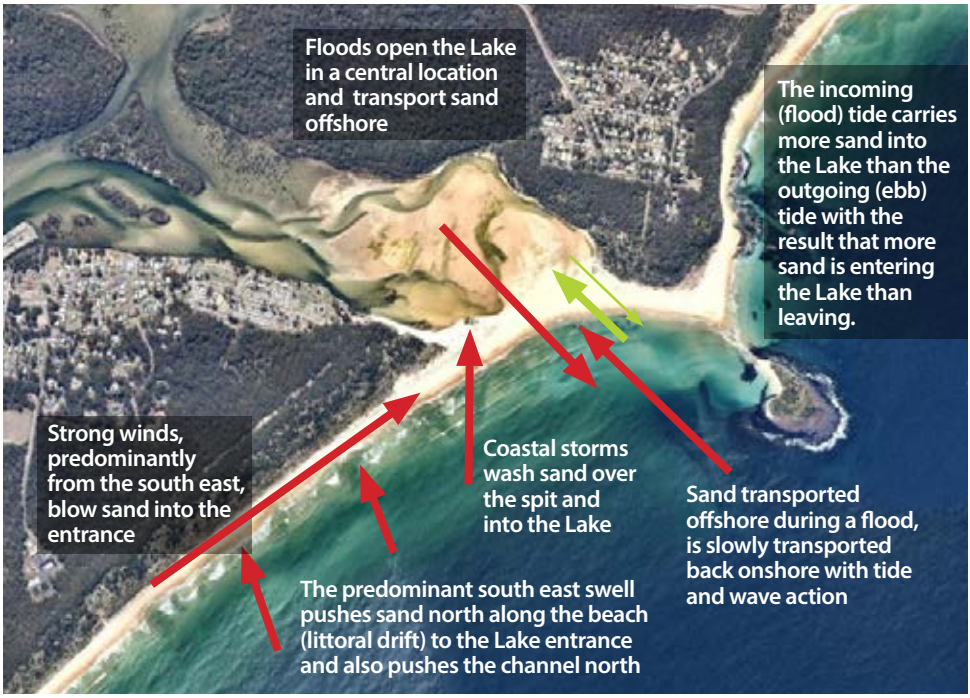
ICOLLs –

Intermittently Closed and Open Lakes and Lagoons.

World-wide, ICOLLs are quite rare. The NSW south coast is home to most of Australia's ICOLLs.

Shoalhaven has a number of ICOLLs including Swan Lake, Burrill Lake, Tabourie Lake and Lake Conjola. ICOLLs are very sensitive to human disturbance. This makes them one of the most complex and difficult coastal environments to manage.

Council must comply with NSW Government legislation, and the management of ICOLLs is undertaken in partnership with Government agencies and the community.



Why is the Lake closed?

It's natural for the Lake to be closed at times. In NSW, about 70% of ICOLLs are closed most of the time.

Lake Conjola entrance is constantly changing, from being open to the ocean after a big flood, to being completely closed due to drought and severe coastal storms. In between these events, the entrance channel naturally drifts north until it's against Cunjurong Point.

These changes are caused by water and wind constantly moving sand into, and around, the entrance. These effects include:

Water

- Coastal storms with big swells wash offshore sand over the spit and into the entrance
- Rainfall in the catchment may 'refresh' the channel by increasing flows that scour sand build up in the entrance and carry some sand offshore
- Floods dramatically and quickly wash sand out to sea, and scour a more central channel
- Wave action carries sand from south to north along the beach (littoral drift), pushing the entrance channel north
- Tides carry sand in and out of the Lake entrance. The flood (in-coming) tide carries more sand in, than the ebb (out-going) tide carries out, resulting in a nett gain in sand volume in the entrance

Wind

- The wind, which blows predominantly from the south-east, carries large amounts of sand into the entrance.

The combination of storm wash-over, littoral drift, wind and tides, carries approximately 68,000 cubic metres of sand into the entrance every year.

Lake Conjola
Circa 1964

Why doesn't Council keep the Lake open?

- An open entrance lets the ocean in (both normal tides and storm surge) and ocean flooding is as big a risk to Lake Conjola as catchment flooding. The April 2013 flood demonstrated this when the Lake naturally opened, and flooding occurred from both the ocean and the catchment
- Flood models show that only modest reductions in peak flood levels are achieved with an open entrance (Flood Risk Plan 2013)
- A more permanently open entrance will change the Lake's natural ecology. Possible impacts include loss of seagrass and saltmarsh, mangrove colonisation and decline in recreational species such as prawns
- Increased tidal flushing does not necessarily mean overall improvement to water quality or water clarity, as water quality is largely a function of catchment runoff

The long-term goal of the NSW Government is, as far as possible, to progressively allow ICOLL entrances to return to their natural processes.

- The natural vegetation around the Lake is adapted to changing water levels and protects the foreshores. Lower water levels would expose additional foreshore and potentially lead to erosion, as well as impacting saltmarsh that is dependent on periods of higher water levels.
- An open entrance would reduce low level flooding in the short term. This flooding is already managed by **The Entrance Management Plan**. In the longer term, sea level rise will lead to increased water levels and inundation of low lying areas (Flood Risk Plan 2013)

For these reasons, the millions of dollars required for training walls and dredging to maintain an open entrance, is difficult to justify. The NSW Marine Estate Threat (2013) and Risk Assessment identified the modification of coastal estuary entrances as the third highest risk to the health of the estuaries, behind agricultural runoff and storm water.

When does Council open the Lake?

In order to address flooding, when the Lake is closed, Council's adopted Entrance Management Plan allows for mechanical opening at trigger levels of between 1.0m AHD (planned) and 1.2m AHD (Emergency Opening).

Prior to intervention Council must gain approval from relevant NSW government agencies.

Mechanical openings are generally short lived due to two factors:

- the water level at the time of opening is too low to create the surge required for effective scouring of the channel. Opening the Lake at a level lower than the trigger level will lead to an even more rapid closure. The better the scour, the longer the Lake stays open
- storm wash-over carries offshore sand back into the entrance

What's the best location for a mechanical opening?

A central to northern location is favoured because

- Green Island protects the northern area from wave energy and storm wash-over
- littoral drift causes the spit to move northwards, naturally forcing the entrance channel towards Cunjurong Point
- with a channel located along a rocky shoreline, such as Cunjurong Point, there are benefits to both scouring and persistence of the opening
- threatened migratory shorebirds nest on the sand spit at Lake Conjola and are endangered. During the nesting season from September to March, Council must minimise disturbance to the nesting area. Only a northern intervention can be considered at this time.

Mechanical intervention is only used to alleviate low level, flooding

What about the fish?

Fish stocks in ICOLLs are adapted to periods of entrance closure, which allows species such as prawns, mullet and bream to grow and reach maturity, enhancing survival and reproductive success. When the entrance opens they head for the ocean to reproduce and younger fish and prawns enter the Lake to mature.

These are natural cycles.

ICOLLs on the south coast can remain highly productive systems, even after extended periods of closure.

The water looks dirty, is it safe?

It's natural for ICOLLs to be closed at times. During long periods of closure the water can change colour. This doesn't mean that the Lake is dirty or unhealthy.

When the Lake is closed, weekly water quality monitoring is undertaken by Council at three locations and results are posted on Council's website. For the period of Lake closure during 2018, test results consistently rated as 'Good' which indicates that the water is suitable for swimming.

If test results indicate that water quality is unsafe, then Council will advise the community.

Sediment and pollutants are washed into the Lake by heavy rain and water quality is affected whether the entrance is open or closed. For this reason it's best to avoid swimming for at least a day after heavy rain, especially near storm water outlets.

Council, residents and visitors all play a part in keeping the catchment and the Lake clean and healthy.

FLOOD SCOURED
During a flood the Lake breaks out in a central location.

REGIME STATE
Due to the influence of 'littoral drift', the Lake entrance moves north to Cunjurong Point.

CLOSED
Over time, in the absence of heavy rain, waves, tides and wind, transport sand back into the entrance.

Shoalhaven City Council

Lake Conjola Entrance Management Plan 2013

Lake Conjola Floodplain Risk Management Study and Plan 2013

Management of Coastal Lakes and Lagoons DPI

Brochure update in 2018.
For further information contact Shoalhaven City Council's Natural Resources & Floodplain Unit on 4429 3392.

Address all correspondence to

The General Manager, PO Box 42, Nowra NSW 2541 Australia

DX5323 Nowra Fax 02 4422 1816

council@shoalhaven.nsw.gov.au

Bridge Rd, Nowra NSW 2541 02 4429 3111