Intermittently closed and open lakes and lagoons (ICOLLs)

**Intermittently closed and open lakes and lagoons (ICOLLs) are coastal lakes and lagoons that alternate between being open or closed to the ocean.**

ICOLLs are separated from the ocean by a beach barrier or berm. The entrance barrier forms or breaks down depending on the movement of sand and sediments by waves, tides, flood flows and wind.



Tooway Lake

ICOLLs open and close to the ocean naturally in a constant, but irregular cycle. When there is sufficient water flowing into the lake or lagoon from the surrounding catchment, water levels within the ICOLL will rise. This can happen in response to rainfall events – the force of this high-water level can rapidly scour an entrance channel through the beach once the ICOLL reopens to the ocean.

ICOLLs close when ocean waves and tides push sand from offshore into the entrance, which gradually closes the entrance channel.

Flooding and drying are natural components of the hydrological and ecological processes operating within ICOLLs. Coastal lakes, and the life they support, have evolved in response to these processes and are important for maintaining a ‘healthy’ lake. Ideally, ICOLLs should be left to operate as close to natural as possible, which is the intent of Council’s ICOLL management program.

Ecological importance of ICOLLs

Estuaries form the transition zone between river and ocean environments. ICOLLs are one example of an estuary system.

ICOLLs are important ecosystems for sustaining fish, birds, marine life, vegetation and wetlands. They are also highly significant cultural use places for Traditional Owners of this land, the Kabi Kabi people.

They offer immense value from an environmental, social and economic perspective as well provide a range of active and passive recreational opportunities for the broader community.

Sunshine Coast ICOLLs

* Currimundi Lake
* Coondibah Lake
* Bunbubah Creek
* Tooway Lake
* Stumers Creek.

Why are ICOLLs artificially opened to the ocean?

The main reason for artificially opening an ICOLL entrance is to mitigate and reduce the impacts of flooding. When water levels rise in a closed ICOLL, due to catchment rainfall, this can lead to an increased risk of flooding of urban development or public structures adjacent to and upstream of the ICOLL.

Artificial opening of the entrance barrier is undertaken to ‘drain’ the ICOLL to the ocean and lower its water levels. Council must carefully plan the opening of an ICOLL around tides, swell and rainfall conditions to mitigate negative ecological impacts.

Heavy equipment such as excavators are used to open ICOLLs by digging a predominately central channel through the entrance barrier to the ocean. On occasion ICOLLs may be required to be opened in response to an environmental pollutant.

Council is responsible for managing ICOLL entrances

Sunshine Coast Council is responsible for the management of ICOLL entrances within its local government area and all works are undertaken under an Environmental Authority issued by the State Government. Prior to opening an ICOLL entrance, council must notify the relevant authorities of the works and ensure that they are undertaken as permitted.

Are closed ICOLLs “unhealthy”?

Closed ICOLLs can often cause community concern over issues such as perceived poor water quality, unpleasant smells and odour, flooding of low-lying areas and the health of fish stocks. However, just because an ICOLL is closed, it doesn’t mean it has poor water quality or should be opened.

Although the entrance is closed there is still water circulation occurring within the lake and tidal exchange through the sand.

After heavy rainfall, the water quality in a closed ICOLL can temporarily decline because of runoff containing sediment, nutrients and pollutants entering from upstream waterways and stormwater drains throughout the catchment.

When ICOLLs are closed for long periods some plants around the lake edges may die from prolonged waterlogging. This is a natural process with riparian vegetation gradually advancing and retreating along the foreshore in response to the varying water levels over time.

Are open ICOLLs better for fish?

ICOLLs are very complex environments and the impact of artificially opening entrances on fish species and fish habitats is not well understood. Many species of estuarine fish and prawns that are targeted by recreational and commercial fishers, breed in oceanic or coastal waters and enter estuaries and ICOLLs from the ocean as larvae and juveniles.

While some fish need to migrate to the sea to complete their breeding cycle, others reproduce in the estuary and do not require an open entrance for spawning.

Long periods of entrance closure may restrict the recruitment of certain fish species to ICOLLs. Some fish and fish larvae will enter an ICOLL from the ocean even if it is only open for a short period of time, or during ‘wash over’ events when seawater flows over the entrance berm during high tides and storm surges.

Estuarine fish are adapted to the varying conditions experienced in ICOLLs, such as changing water levels and lowered dissolved oxygen and salinity. They can survive for many years in closed ICOLLs without the need for the entrance to be open to maintain fish stocks.

Ongoing fish surveys indicate that Sunshine Coast ICOLLs are in good health.

What you can do to help protect ICOLLs

* Prevent fertiliser, green waste, animal waste or litter from entering stormwater drains in your catchment which flows into the ICOLL affecting water quality.
* Make sure you only use designated paths when accessing the lake edge.
* Use sediment barriers when carrying out earthworks on your property to prevent sediments entering the water.
* Limit boatwash to prevent streambank erosion.

Current as at August 2021

