



The science behind estuary management

Painkalac Creek June 2020



What is an estuary?

An estuary is the place where the freshwater from the river meets the salt water of the sea.

Estuaries provide key spawning and nursery grounds for many species of fish, and drought refuge and critical breeding and foraging areas for birds. They also play a pivotal role in maintaining water quality through nutrient and sediment filtering.

Estuaries underpin key social, economic and cultural heritage values within our region. They are a significant drawcard for tourism and are highly valued by the local and broader communities for scenic beauty, recreational fishing, swimming, camping, bird watching and boating.

What is the process of artificially opening the estuary?

If the threat of flooding is not imminent, the Surf Coast Shire Council (the Permit Holder for Painkalac Creek artificial estuary openings) works with the Corangamite Catchment Management Authority (CCMA, the Waterway Regulator) to undertake an environmental risk assessment. The two organisations will work through environmental and risk data to decide on a course of action with regard to potentially opening the estuary mouth. Once the decision to open has taken place the Surf Coast

Shire Council then arranges for earth-moving equipment to dig a channel from the estuary mouth towards the ocean to allow for the water to flow out.

Who is permitted to open the estuary?

The Surf Coast Shire Council currently holds a permit, issued by the CCMA, to artificially open the estuary mouth. The CCMA and the Surf Coast Shire Council have a collaborative approach to artificially opening the estuary and consider several factors to determine when this may be required.

If there is an actual or imminent threat to safety, health or property an opening may be conducted under emergency provisions in accordance with By-law No. 4 Waterways Protection 2014 and the Emergency Management Act 1986. In such circumstances, a permit is not required.

When would an estuary be artificially opened?

Corangamite CMA's estuaries are known as intermittently closed/open estuaries which open from time to time as part of a natural process, this supports the estuarine ecosystems, including protected flora and fauna. Increased estuary water levels can bring significant environmental benefits including flooding adjoining wetlands and fringe vegetation.

Artificially opening an estuary only occurs when water levels begin to impact, or when there is an imminent threat to built infrastructure, including roads and buildings, or inundation of property.

All artificial estuary openings are undertaken consistent with the relevant policies of the State Waterway Management Strategy. [Click here](#) for more Information.

Why undertake a risk-based assessment?

Where conditions and time permits, a complete risk-based assessment is conducted to ensure a consistent process is used when making the decision whether or not to open the estuary. It also ensures that the decision considers the environmental, cultural and socio-economic values of each estuary.

How does the Painkalac reservoir and environmental flows affect the estuary?

Water is released throughout the year from the Painkalac reservoir to mimic natural flows as much as possible. Because there are limitations to how much water can be released at one time, releases will never exactly match pre-dam flows, and the dam tends to smooth out flashy flooding events unless the reservoir is full. These environmental releases prevent the river below the dam from drying out and provide water for recreational and environmental purposes. The releases are important to maintain water and habitat quality, as well as allowing nutrient and fish movement. Water coming into the estuary can leave the estuary through evaporation and groundwater connection, as well as through an open mouth. When synchronized with an artificial opening, a 'fresh' release or pulse of water can help sustain an open estuary and lower the risk of fish deaths.

What can cause fish death in an estuary?

The water has two layers; an oxygen-rich freshwater layer on top and an oxygen-poor saline layer on the bottom. If an estuary in this condition is artificially opened, the oxygen-rich surface layer flows out first, leaving behind water with potentially critically low oxygen levels. When this occurs, there is a high likelihood of fish deaths.

If you notice dead or dying fish, crustaceans or eels in an estuary, please contact the Environment Protection Authority in the first instance on **1300 372 842**.

How are fish deaths managed?

If it is deemed necessary to artificially open the estuary mouth then the CCMA may liaise with Barwon Water to determine if a “fresh” can be released from the Painkalac Dam to coincide with the opening to aid in prolonging the opening. The “fresh” can ensure sediments and biofilms move down the creek to maintain the water’s quality. This additional water moving down the creek can also reduce the likelihood of a fish death event by topping up the system with fresh, oxygenated, water.

Who do I contact if I am being affected by high water levels in the estuary?

Contact Surf Coast Shire Council on **5261 0600**.

What is EstuaryWatch and how can I get involved?

EstuaryWatch is a community water quality monitoring program where locals monitor the condition or ‘health’ of the estuary. This can be as simple as taking a photo of the estuary and sending it to the Corangamite CMA, or as involved as recording scientific measurements of turbidity, salinity and algal concentrations.

To join EstuaryWatch, contact the Corangamite CMA at: estuarywatch@ccma.vic.gov.au or phone **1800 002 262** or alternatively visit the EstuaryWatch website at: <http://www.estuarywatch.org.au/>.

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cared for by thriving communities*

