

PAINKALAC CREEK: FACTS ON FLOODING

Recent La Nina weather patterns have seen an increase of unpredictable storm events and rainfall. It has resulted in increased flooding risk to residential properties, businesses and critical infrastructure near the Painkalac Creek. These issues are expected to worsen as climate change impacts continue to emerge.

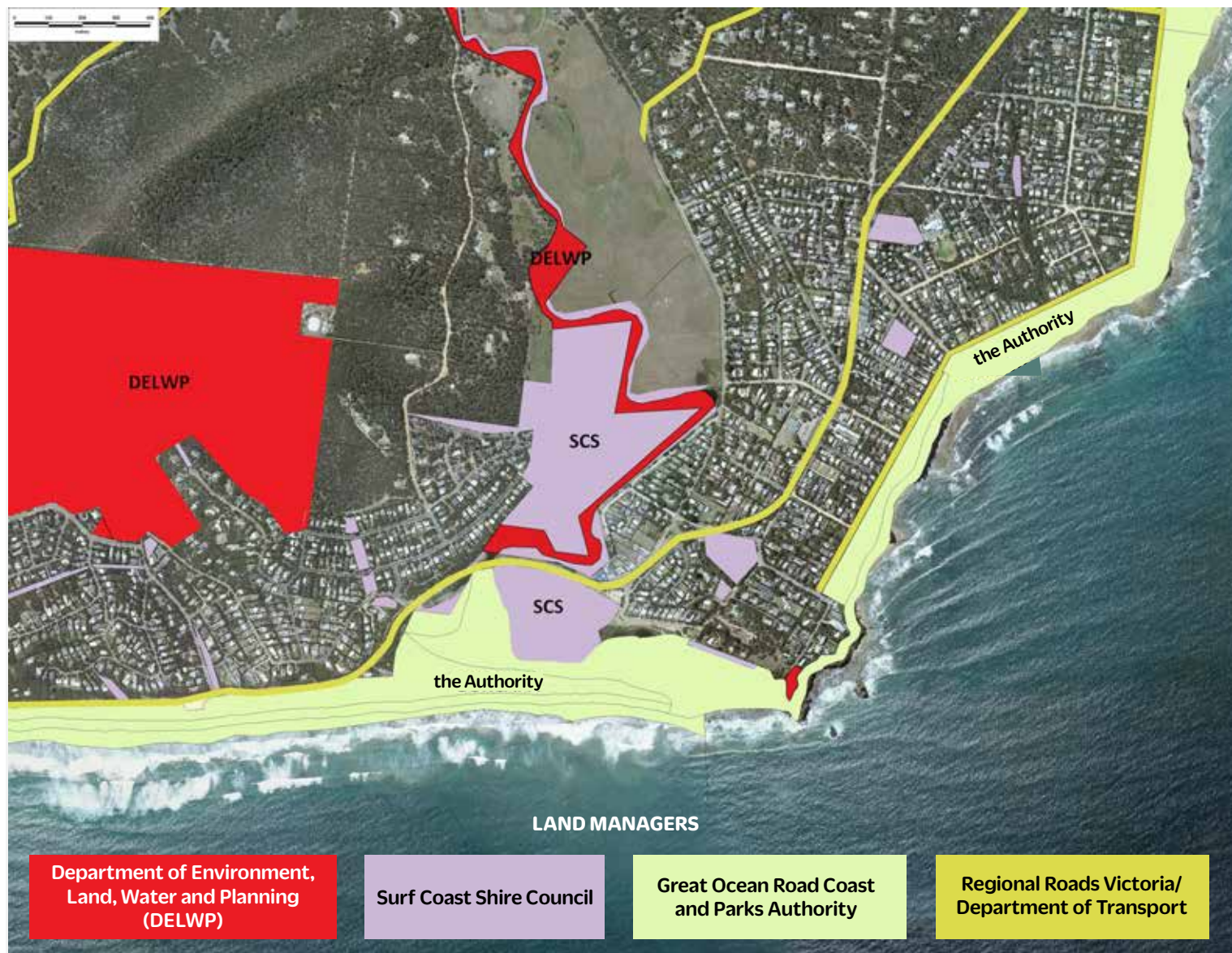
Around 50 private properties near Painkalac Creek are at risk of inundation from flooding without intervention, such as artificial (i.e., non-natural) estuary openings. Surf Coast Shire Council has the challenge of balancing the protection of property and infrastructure and the impacts on the environment when deciding whether to open the estuary.

The diversity of estuary habitats, land use and land tenure typically requires various agencies to undertake management roles.

Details of local roles and responsibilities in managing the Painkalac Creek estuary are below.

These organisations want to share their estuary management practices and challenges.

GROUP OR AGENCY	RESPONSIBILITY AT THE PAINKALAC CREEK
Surf Coast Shire Council (SCSC)	Manages storm water drainage, land management and emergency openings of the river mouth to reduce risk of flooding.
Corangamite Catchment Management Authority (CCMA)	Regulates artificial estuary openings for Painkalac Creek. As the regulator, CCMA issues a permit to SCSC that allows SCSC to ask permission to open the estuary mouth. CCMA also undertakes risk assessments of artificial openings, and works with Barwon Water on releases from the Painkalac Reservoir.
Great Ocean Road Coast and Parks Authority (the Authority)	Manages the coastal land at and adjacent to the estuary mouth. Includes management of the clifftops and foreshore to the east and dune systems and foreshore to the west of the estuary.
Victoria State Emergency Service (VICSES)	Plays a key role in preparing communities for the impacts of floods and storms, and manages responses to flood.
Barwon Water	Provides water and sewerage services to the townships of Aireys Inlet and Fairhaven. Barwon Water manages land-based recreation activities at Painkalac Reservoir and environmental flows from the reservoir to Painkalac Creek. (Environmental flows are necessary to sustain healthy creek habitats.)
Department Environment, Land, Water & Planning	Development of waterway policy, coordinates regional delivery and prioritisation of government investment in waterways; management of fisheries, including recreational fishing.
Regional Roads Victoria/Department of Transport	Manages the Great Ocean Road through Aireys Inlet. This includes drainage and maintenance of the bridge over Painkalac Creek.
Traditional Owners	Recognised native title rights, collaboration in the development and implementation of plans and protection of cultural heritage values



The map above demonstrates the complex arrangements of public land tenure in and around the Painkalac Creek estuary. Public land tenure results from development history, ongoing legislative reform and current town planning.

FREQUENTLY ASKED QUESTIONS

WHAT IS AN ESTUARY?

The area where freshwater from a 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. Many estuaries are closed at certain times due to the build up of sand that is not flushed out by water flowing downstream

IS THE ESTUARY ALWAYS CLOSED?

The Painkalac estuary is an “intermittently open/closed estuary”. This means it sometimes naturally opens and closes. The mouth may stay open or closed for long periods of time, or it may rapidly cycle through an open/ closed state over a number of days/weeks. This is a natural process and the variability leads to positive environmental outcomes.

WHY DO WE NEED TO ARTIFICIALLY OPEN THE ESTUARY?

To reduce risk of flooding. When water levels are high and rainfall is forecast, Council occasionally opens the estuary to prevent flooding of houses, businesses and public assets/infrastructure.

DO YOU EVER OPEN THE ESTUARY FOR ENVIRONMENTAL PURPOSES?

No, the estuary is artificially opened due to inundation risk of assets. Wherever possible, estuaries are left to function naturally.

WHAT IS THE PROCESS OF ARTIFICIALLY OPENING AN ESTUARY?

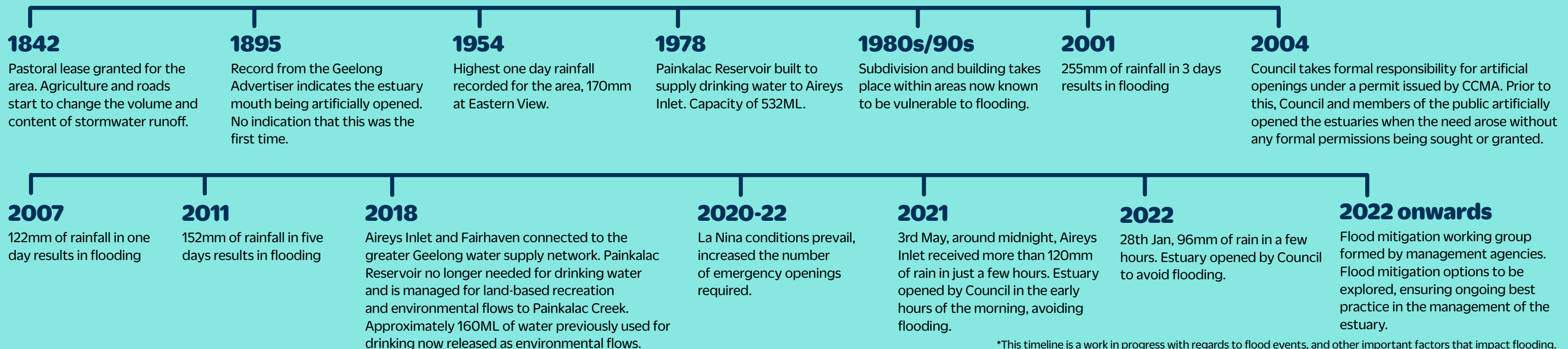
All artificial estuary openings are undertaken consistent with the relevant policies of the Victorian Waterway Management Strategy.

When there is a risk of flooding, Council requests CCMA to undertake an environmental risk assessment. This risk assessment is considered by Council along with a range of other factors. If the decision is made to open the estuary, earth-moving equipment is used to dig a channel from the estuary mouth out to the ocean to allow the water to flow out.

CCMA then works with Barwon Water to release fresh water from the Painkalac Reservoir to ensure a flush of fresh water enters the creek system and supports those species that require it.

Timeline* and roadmap

To contribute to this timeline and help develop a more comprehensive picture of the history of flooding of the Painkalac, please email resilient@surfcoast.vic.gov.au



*This timeline is a work in progress with regards to flood events, and other important factors that impact flooding.

FREQUENTLY ASKED QUESTIONS

WHY DOES COUNCIL OPEN IT RATHER THAN ANOTHER AGENCY?

SCSC also manages the Anglesea River estuary to prevent flooding. Elsewhere in our region, the Authority manages the Lorne River and Spring Creek estuaries, and Parks Victoria manages the Aire, Curdies and Gellibrand estuaries.

Although this isn't a unique role for local government (SCSC also manages the Anglesea River to prevent flooding), it is not necessarily the default arrangement at all estuaries – for example in our region the Authority manages the estuary at the Lorne River and Spring Creek, and Parks Victoria manages the Aire, Curdies and Gellibrand Rivers. This approach is in line with the Victorian Waterway Management Strategy.

WHAT IS THE LEGAL MECHANISM THAT ALLOWS COUNCIL TO OPEN THE ESTUARY?

CCMA issues a permit to SCSC ("the Permit Holder") to allow the estuary to be opened. The estuary can only be opened by the Permit Holder after a risk assessment has been undertaken by CCMA.

The risk assessment will highlight any potential environmental impacts of an artificial opening, which allows actions to attempt to mitigate them.

Mitigation actions include Barwon Water and CCMA releasing fresh water from the dam to improve water quality after an opening, and Council timing an opening in the afternoon when possible when there is more dissolved oxygen in the water.

Opening the estuary without a permit is illegal, as no mitigation actions will have been undertaken, increasing the risk of adverse impacts.

WHY ARE YOU OPENING THE ESTUARY SO OFTEN?

In the past we have needed to open the Painkalac 2-3 times per year to avoid flooding. Due to La Nina conditions and elevated rainfall over the last two years, we have had to open it more often to reduce the risk of flooding.

Climate change data for our region doesn't predict a large change in total rainfall volumes, but it does predict that we'll receive that rainfall in more intense rainfall events. This may mean we need to open the Painkalac with increased regularity, as 80mm of rainfall in 24 hours can lead to flooding risk, whereas 80mm over two weeks presents less of a risk.

CAN YOU PARTIALLY OPEN IT? OR CLOSE IT AFTER OPENING, TO KEEP SOME WATER IN THE ESTUARY?

No. Estuaries naturally close when the force of the ocean (waves) is greater than the energy coming from the flow of the creek. During an opening, a large amount of sand is washed out to sea. To close the estuary, we would need to dig up an equivalent quantity of sand from the beach to place it in the estuary mouth, resulting in further disturbance to the beach and the sand dune/cliff area. Hence, we would not consider additional intervention by closing the sand berm.

WHAT ARE THE ENVIRONMENTAL IMPACTS OF AN ARTIFICIAL OPENING?

Artificial openings increase the risk of adverse ecological effects such as interruption to native fish lifecycle (eg washing eggs out to sea) and pose a high risk of fish kill events.

Artificial openings also decrease water quality and prevent floodplain inundation, which is an important process for fish and birds to breed and live.

This is why Council has a permit to open the estuary, so that a risk assessment can be undertaken by CCMA. The risk assessment will highlight any potential negative impacts of an artificial opening, which allows steps to be taken to attempt to mitigate them.

DO AGENCIES WORK TOGETHER WHEN AN OPENING IS REQUIRED?

Yes. For example, VICSES may provide advice on rainfall forecasts to Council which undertakes the opening. CCMA analyses water quality data to provide a risk assessment of opening the estuary.

If requested, Barwon Water will release extra water from the Painkalac Reservoir. While this may seem counterintuitive to reducing flood risk, extra fresh water helps increase dissolved oxygen and water quality to reduce risk to estuarine species.

WHERE CAN I FIND OUT MORE?

If you would like to be kept informed of our progress please email resilient@surfcoast.vic.gov.au to be placed on the mailing list.