

PROJECT COORONG

Healthy Coorong, Healthy Basin



Healthy Coorong, Healthy Basin Update

Welcome to the September 2021 edition of the *Healthy Coorong, Healthy Basin* (HCHB) Update. In this edition we are providing an insight into the Coorong Infrastructure Feasibility Investigations Community Discussions that took place on 14-15 July 2021. We are also introducing the updated version of the *State of the Southern Coorong - Discussion Paper* which is now available online.

If you would like more information on the HCHB Program or have questions on anything contained in this update please contact the program team at projectcoorong@sa.gov.au.

The Coorong, connected waters and surrounding lands have sustained many unique First Nations cultures and economies since time immemorial. The Healthy Coorong, Healthy Basin program acknowledges the range of First Nations rights, interests and obligations for the Coorong and connected waterways and the cultural connections that exist between Ngarrindjeri and First Nations of the South East peoples across the region and seeks to support their equitable engagement.

Aboriginal and Torres Strait Islander readers are advised that the following document may contain images and names of people who have died.



Coorong Infrastructure Investigations

Throughout 2021, the Coorong Infrastructure Investigations Project (CIIP) is investigating the feasibility of long-term infrastructure and management options for improving the ecological health of the Coorong.

What are we trying to achieve?

The Department for Environment and Water is committed to consulting the community throughout the *Healthy Coorong, Healthy Basin* Program.

In the first stages of our consultation we worked with the community and the Coorong Partnership to determine what they deemed to be the essential outcome from any infrastructure works for the Coorong South Lagoon. It was determined that the most important, and essential, outcome of the CIIP is finding the option/s:

“That best contribute to improving the ecology of the South Lagoon as determined by scientific evidence, given water availability and constraints.”

Through mid-2020, we undertook a consultation process to gather community input into assessing and ultimately shortlisting a range of potential infrastructure options for further investigation. The following options were progressed to further feasibility investigations:

- A connection between the Coorong South Lagoon and Southern Ocean
- Targeted dredging of Coorong flow constrictions to improve connectivity
- Lake Albert to Coorong connector
- Further augmentation of South East Flows to the Coorong
- Additional automated barrage gates.

This is an investigation into feasibility at this stage, not a decision to proceed any of these proposed concepts. Further community consultation will be undertaken on any options deemed to be feasible before such a decision would be made.



Community Discussion at Goolwa 14 July 2021

CIIP Community Discussions

Continuing our commitment to involve the community through each stage of the CIIP, HCHB hosted four community discussion sessions on 14-15 July 2021 at Goolwa, Meningie, Robe and Salt Creek. These sessions were well attended with over 140 community members participating.

These community discussions aimed to:

- Update the community on progress of the Coorong Infrastructure Investigations Project;
- Outline the infrastructure options that are proceeding to concept design and cost estimation;
- Revisit the values of the community and check their alignment with the options proposed; and
- Ask the community to consider how well do the proposed criteria to assess the infrastructure options reflect what matters to them.

Recognising that the Coorong is critical to the health of the Murray-Darling Basin, and that there are always hot topics in this space, each of the community sessions started with asking the participants about what was on their minds and what they would like to know. This will help shape the nature of our engagement going forward.

Community update presentations - What we shared

The HCHB team set the scene for the day with Professor Michelle Waycott giving a presentation on [State of the Coorong – Discussion Paper](#). The State of the Coorong is a HCHB Science synthesis product from the HCHB Trials and Investigations Integration team giving an up-to-date, shared understanding of:

- The **current state** of the Southern Coorong
- What happens if we '**do-nothing**'
- Our view on the '**desired state**'
- **Guiding principles** on how to achieve the desired state based on the science available

HCHB then presented on the progress of the project including:

- CIIP Program Overview
- Hydrological Modelling
- Ecological Investigations
- Infrastructure Solutions for Concept Design

Throughout the presentations the discussion participants were able to ask the project staff questions, offer feedback and raise their concerns about any of the options currently being investigated. This feedback has been collated and will be used to inform our investigations as they progress and the forthcoming infrastructure Feasibility Assessment Report.

The presentations were followed by a workshop where community members broke up into groups to discuss the proposed infrastructure evaluation criteria and how well this reflects the community's values.

Group workshop - What we heard

The proposed evaluation criteria being discussed in these workshops were divided into the below six categories each with their own sub-criteria. These criteria will be used to make a comparative evaluation of each infrastructure design option.

- Environment / Ecological
- Financial
- Socio-Economic
- First Nations
- Constructability
- Operations and Maintenance

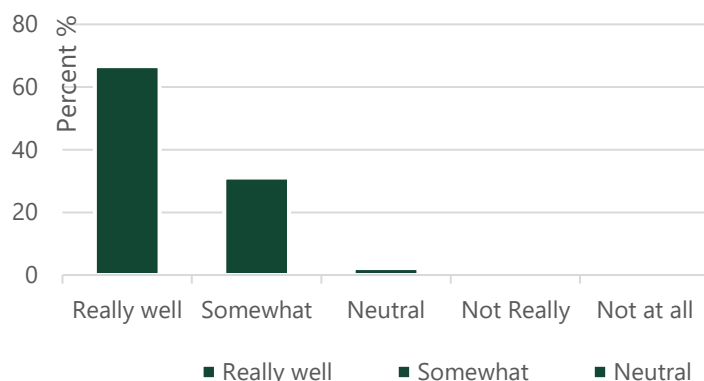
How well do the proposed criteria reflect what matters to their community?

We asked the participant groups how well the proposed criteria reflected what matters to their community. The majority of participants agreed that the criteria reflected the community values “really well”. Not one of the participating groups indicated “not really” or “not at all”.

Which of the evaluation criteria do you rate as being most important to you?

Every group in all locations identified the environmental/ecological criteria as their first priority. Overall, the top three criteria identified were:

1. Environmental/Ecological
2. First Nations
3. Constructability



Graph: How well does the proposed criteria reflect what matters to their community?

However, it is worth noting that the First Nations and constructability preferences were ranked as equal consideration with environmental concerns for three groups involved in the discussions.

How can we improve or strengthen the criteria?

In groups, the participants were asked to evaluate ways that the criteria could be strengthened or improved. Suggestions included some additional sub criteria and improvements to the detail of the criteria. We will consider this feedback to ensure that the criteria are meeting the needs of the community.

Where to from here?

We were very fortunate with the timing of these community discussions that we were able to meet with the community face-to-face. Of course, this will be our preference moving forward, however we will have to be flexible due to the changing nature of COVID-19 restrictions.

As the investigations progress this year we will:

Inform you throughout the process – through our quarterly HCHB updates and communications after significant milestones.

Involve the Coorong Partnership, First Nations, and targeted stakeholders where appropriate, ahead of any major review / decision point that significantly changes an option, or any review of whether to continue with an option.

Consult the community on the final feasibility evaluation/assessment of infrastructure options – through community workshops, meetings and the YourSAy online consultation hub.

Be flexible in our approach - willing to change the approach to suit evolving needs of the project and community.

With the investigation results now starting to come in, we anticipate an engagement schedule for the remainder of the investigations year to include:

October/November 2021 – Sharing information on the draft concept designs.

Early 2022 – A series of community engagement activities including workshops/meetings and a YourSAy online consultation on the feasibility evaluation/assessment of infrastructure options

Infrastructure options update

Additional automated barrage gates

Preliminary modelling indicates that a doubling of automated barrage gates, even under a range of 'best case' operational scenarios, would not sufficiently reduce salinities in the Coorong South Lagoon. Positive benefits from further barrage automation would only be experienced at a very local level in the North Lagoon. On this basis, and with the endorsement of the Coorong Partnership, additional automated barrages has been discontinued from further consideration under CIIP.

Further augmentation of South East Flows to the Coorong

As previously reported, early indications highlighted that this option delivers only a modest increase in freshwater flows directly to the South Lagoon. An immediate priority therefore was to revise previous yield modelling through a more contemporary interpretation of likely climate change to 2050. The intent has been to provide a revised indication of whether South East Flows Augmentation is viable from a "yield to the Coorong", and therefore from an environmental benefit perspective.

This re-assessment is now complete and confirms that estimates of yield are far lower than earlier modelling. This is in part due to different methodologies, previous modelling used a much longer (127 year) time series, whilst the most recent work has adopted a more contemporary and pragmatic period (30 year) that reflects a step change more representative of current climate, and hence provided a lower average yield volume.

Under the most realistic re-modelled scenario, further augmentation of South East Flows to the Coorong would yield 11 GL/yr to the Coorong South Lagoon, decreasing to 7 GL/yr under 2050 conditions.

Whilst any flows from the South East to the Coorong provide salinity and nutrient benefits, both qualitative and quantitative ecological assessments (against a do nothing scenario) have concluded that further augmentation of South East Flows:

- would have limited ecological benefit to the Coorong South Lagoon (individually or in combination with other options) relative to the other infrastructure options under investigation; and
- would not be significant enough to halt or reverse the trajectory of system decline, particularly when climate change is considered.

On this basis, and with the endorsement of the Coorong Partnership, further augmentation of South East Flows to the Coorong has been discontinued from further consideration under CIIP.

Design update:

Our engineering services provider, [KBR](#), is working up a range of concept designs for the range of shortlisted options still in scope through to October 2021.

Solution	Description
1	<i>Passive connection between Lake Albert and Coorong North Lagoon:</i> Passive connection between Lake Albert and Coorong North Lagoon (open channel or culvert/piped connection with regulator structure).
2	<i>Targeted dredging of Parnka Point alignment:</i> Targeted dredging along 18.5 km long alignment to a possible depth of 1.2 mAHd (where required).
3	<i>Pumped Southern Ocean connection out of Coorong South Lagoon:</i> Pumped connection out of Coorong South Lagoon via pumps on a pontoon structure, within a concrete wet well, or on a jetty structure (to be determined through engineering investigation). Pumping infrastructure could be located either on Younghusband Peninsula or on the mainland (to be confirmed).
4	<i>Bi-directional pumped Southern Ocean connection – one location, separate pumping stations:</i> Bi-directional pumped ocean connection into and out of Coorong South Lagoon via pumps in both the Southern Ocean and Coorong South Lagoon. Pumping station considerations include; potential

	pontoon structure (CSL only), utilisation of a concrete wet well, or jetty structures (to be determined through further engineering investigation), with all infrastructure to be positioned within the one alignment. A common wet well solution could be adopted, positioned within Younghusband Peninsula with reversible flow pipes and a single set of pumps.
5	<i>Bi-directional pumped Southern Ocean connection –separate pumping station at two independent locations:</i> Bi-directional pumped connection into and out of Coorong South Lagoon via pumps in both the Southern Ocean and Coorong South Lagoon on a pontoon structure (CSL only), within a concrete wet well or on a jetty structure (to be determined through engineering investigation), with infrastructure positioned at two separate locations allowing circulation of flows within Coorong South Lagoon (e.g. pumping in at Round Island and pumping out at Policeman Point).
6	<i>Bi-directional passive piped connection into and out of Coorong South Lagoon:</i> Bi-directional passive piped connection with flow driven by differing water levels between Coorong South Lagoon and Southern Ocean.

Next Steps

By the end of September 2021, we anticipate that the next phase of Ecological Investigations will be well progressed in order to help inform and refine the current design concepts under consideration.

Our engineering services provider (KBR) will continue to progress a range of engineering investigations and concept design work, with the intent to have 30% design details completed on the range of concept designs outlined above by October 2021. These concept designs will outline the major design elements of each prioritised option, and allow us to establish a cost estimate for each option. More detailed design documentation would be undertaken as part of any subsequent 'design and construction' implementation process.

Also in the coming months our focus will shift to undertaking a preliminary socio-economic assessment of the options, ahead of the series of community engagement activities on the feasibility evaluation/assessment of infrastructure options.



Coorong Infrastructure Cultural Heritage Surveys

Ngarrindjeri and First Nations of the South East Traditional Owners are commencing cultural heritage surveys with the Coorong Infrastructure Investigation Project (CIIP) team. The surveys will help guide the CIIP to produce culturally appropriate designs to reduce impact to Ngarrindjeri and First Nations of the South East culture and heritage.

This phase of investigation will be critical in informing the decision making of Traditional Owners and will be used in conjunction with further cultural knowledge to find the best solution for managing the Coorong and its surrounding lands and waters.

From left to right Joseph Koolmatrrie, Cyril Trevorrow, Gordon Stenhouse (archaeologist), Malcolm Aston, Eunice Aston and Gordon Rigney
Photo: DEW



Coorong photo image DEW

The updated *State of the Southern Coorong Discussion Paper* is now available online

A revised [State of the Southern Coorong](#) discussion paper, which defines what we think the condition of the Southern Coorong should be and guides management priorities and actions to help restore its ecological character, has been developed by the Department for Environment and Water in collaboration with key researchers. The updated report is now available on the Project Coorong [Publications](#) webpage.

The report provides an up-to-date understanding of the current state of the Southern Coorong, explains what happens if we 'do-nothing' and outlines our view on the 'desired state' based on findings from leading scientists. Guiding principles on how to achieve the desired state are evolving based on consultation and integration of the range of information coming forward.

New science from the HCHB Trials and Investigations project is filling critical knowledge gaps and improving our ability to manage the site. The State of the Southern Coorong report is informed by this new science, as well as past scientific knowledge, across nutrients, food webs (including aquatic plants, algae, microbiota, invertebrates, fish and waterbirds), climate adaptation and science integration.

South East flows deliver much needed relief to the Coorong



Salt Creek Regulator after recent above average rainfall in the SE region. Photo: A/Professor Qifeng Ye, Principal Scientist – Science Leader (Inland Waters and Catchment Ecology) SARDI

For the first time since construction completion in 2019, the \$60 million South East Flows Restoration Project infrastructure is being fully utilised thanks to recent above average rainfall throughout the South East.

It is expected that 400 megalitres per day will be delivered to the Coorong South Lagoon via Salt Creek over the coming months with occasional higher flow rates to test the infrastructure under controlled conditions.

Historically, freshwater flowed naturally from the South East into the Coorong South Lagoon, however drainage works over the last 150 years have significantly reduced the volume of flow available to the Coorong. Over time, reduced freshwater inflows and drought have raised salinity in the Coorong South Lagoon to very high concentrations, making it too salty to support its estuarine ecosystem. The South East Flows Restoration Project was built to help manage salinity levels and nutrients.

Unfortunately, there are limited ways to influence water quality in the South Lagoon and the increase in flows from the South East has provided an excellent opportunity to deliver additional

fresh water to the Coorong South Lagoon to see how much salinity and nutrient levels in the Coorong can be lowered and for how long. The project also provides significant benefits to the South East wetlands with flows on the way to the Coorong helping to reinstate wetland habitat and attracting more wetland birds to the area.

Scientists from the Department for Environment and Water (DEW), University of Adelaide (UoA), the Flinders University of South Australia (FUSA) and the South Australian Research and Development Institute (SARDI) will monitor a range of water quality parameters and the ecological response to this unusual event.

In addition to ongoing monitoring of water quality and nutrients, ecological response monitoring to this SE flow discharge will be used to understand the relevance of freshwater inflow to the South Lagoon in the context of the wider *Healthy Coorong Healthy Basin* (HCHB) program.

Water quality monitoring at 20 sites along the length of the Coorong is routinely undertaken by DEW every three weeks as part of the HCHB Program's Coorong Water Quality Monitoring Program. Due to this unusual high flow event, the first since the completion of the South East Flows Restoration Program, a number of other scientists with differing expertise and interests are joining the Department's sampling effort. Scientists from the UoA will use stable isotopes to help determine the source of nitrogen and carbon in waters entering the Coorong South Lagoon via Salt Creek. Understanding the source of nitrogen and carbon inputs, originating from land or water-based materials, will help scientists understand the effects of Salt Creek on Coorong water quality.

There is also an additional opportunity to monitor the ability of Tilley Swamp to remove nutrients before they reach the Coorong South Lagoon. In addition to water quality monitoring, other scientists from UoA will be monitoring aquatic plants (namely *Ruppia*, a seagrass found in the Coorong) and algae to document the increase in overall plant biomass and monitoring potential changes in life stage to determine productivity and timing of transitions between life stages for modelling purposes.

Scientists from SARDI Aquatic Sciences will monitor fish populations before, during and after the high flow event to see what effect, if any, the increased flows from Salt Creek have. Data from this study will contribute to the understanding of potential benefits for the food web in the South Lagoon, along with investigations by FUSA scientists into what the fish populations are eating, such as macroinvertebrates. It is anticipated that the increased flows at Salt Creek will extend suitable habitat for *Ruppia*, macroinvertebrates and fish. The South East flow discharge event from Salt Creek offers an opportunity for FUSA scientists to test whether the resulting lower salinities will increase macroinvertebrate abundances in the South Lagoon and food availability for higher trophic levels (fish and shorebirds).

This high flow event is likely to last for about two months, during which time scientists will monitor water quality and the ecological response of the Coorong South Lagoon to the increased freshwater input. This will help better inform management of the South East Drainage Network and the Coorong so we can make the most of the water that is available in the future.

The South East Flows Restoration Project was jointly funded by the Australian and the South Australian governments and is operated by the South Eastern Water Conservation and Drainage Board.

Lake Hawdon North restoration feasibility assessment underway

The *Healthy Coorong, Healthy Basin* On-Ground Works projects aims to implement short to medium term on-ground works to support key Coorong biota (species) while long-term management solutions are investigated and implemented.

Localised wetland improvement projects have been prioritised, to enhance their role as regional refuges for waterbirds by improving the availability and quality of habitat at wetlands near the Coorong including the Lower Lakes and Limestone Coast region of South Australia.

Four wetlands have been selected for investigation that may provide a significant increase in habitat extent and availability:

- Tolderol (163 ha)
- Waltowa (60 ha)
- Teringie (40 ha)
- Lake Hawdon North on the Limestone Coast (1763 ha).

Lake Hawdon North is located 90km from the Coorong South Lagoon and in combination with Lake Hawdon South (Conservation Park) is one of the largest wetlands in the South East at 5773 ha.

Many species that use these wetlands also use the Coorong South Lagoon. It is vital that the Coorong continues to provide the habitat requirements and food resources to retain this function and, where it can't, the restoration of alternative habitat in surrounding areas are considered. Tolderol, Waltowa and Teringie wetland investigations are complete and Lake Hawdon North is currently subject to



Sharp-tailed Sandpiper: Photo: Bob Green.



Red-necked Stint Photo Mary-Ann van Triat

a wide range of investigations to assess the feasibility of on-ground works to improve the availability and quality of habitat for migratory shorebirds at Lake Hawdon North. These include:

- Cultural heritage surveys
- Topographic surveys
- Hydrological monitoring
- Hydrodynamic modelling
- Groundwater conceptualisation
- Vegetation assessment
- Vegetation removal options identification
- Geotechnical survey
- Baseline and ongoing ecological monitoring

Drainage construction for Lake Hawdon commenced in 1915 with excavation of Drain L through the bed of the wetland, directing water out to sea via the Robe Lakes. Prior to this, the lake supported very little perennial vegetation. Since the 1950s when Drain L was further deepened, open pan areas have been displaced by perennial vegetation (notably *Melaleuca halmaturorum*) and the lake is drying much earlier than would otherwise have been the case.

The Lake Hawdon North proposal aims to extend the period of shallow inundation of Lake Hawdon North through to early autumn to provide important foraging habitat for migratory waterbirds before they embark on their migration to the northern hemisphere to breed. It is predicted that restoration work could provide a hydrological regime that more closely resembles the pre-drainage regime, providing a significant increase in shorebird habitat and quality and therefore shorebird abundance.

The *Healthy Coorong Healthy Basin* On-Ground Works team is working with the Limestone Coast Landscape Board to engage with key stakeholders including landholders, leaseholders, grazing licence holders, Friends of Shorebirds SE, Robe District Council, South Eastern Water Conservation and Drainage Board and National Parks and Wildlife Service. The team is consulting directly with First Nations of the South East through the South East Aboriginal Focus Group.

A community meeting will be held in Robe from 5:00pm-8:00pm on Thursday, 7 October 2021 for anyone interested in learning more about the Lake Hawdon North project and the current investigations.

For more information contact Tania Rajic at the Limestone Coast Landscape Board on 0418 448 053. Registrations can be made here on [Eventbrite](#).

Coorong Partnership Communique

The twelfth meeting of the Coorong Partnership was held on 29 July 2021 via videoconference due to COVID-19 restrictions.

The Department for Environment and Water (DEW) provided an update on the HCHB program, including the welcomed advice that a decision from the Commonwealth is expected soon on the On-Ground Works Regional Bird Refugia funding proposal for priority infrastructure upgrades at Lower-Lakes wetland sites.

The Communique from this meeting and all other past Coorong Partnership meetings are available on the [Project Coorong Website](#).

If you have any questions on this update, or would like to request a presentation on the project to your stakeholder group, or anything else related to Project Coorong, please contact the project team at projectcoorong@sa.gov.au.

The South Australian Government's Healthy Coorong, Healthy Basin Program is jointly funded by the Australian and South Australian governments.