

The desired state of the Southern Coorong – discussion paper

Building a shared understanding of current scientific
knowledge | June 2020



Australian Government



**Government
of South Australia**

Department for
Environment and Water

What is the desired state of the Southern Coorong?

The Coorong is a wetland of local, national and international importance and one of the most significant waterbird habitats in the Murray-Darling system. The condition and value of the Coorong has suffered long-term decline and was further substantially damaged by the Millennium Drought. As a result, recommended actions to restore the ecological character of the Southern Coorong (south lagoon and central Coorong from the Needles) were identified.

We need to define what we think the condition of the Southern Coorong should be so we can guide management priorities and actions and help to restore its ecological character.

To move forward we want to create:

- a shared understanding of the current state of the Southern Coorong; the consequences of not acting to restore it, and what we think it should look like in the future
- guiding principles on how to achieve this desired state.

Purpose of this document

This discussion paper seeks to build a shared understanding of the existing and emerging scientific knowledge of the Southern Coorong. It communicates what we know, where our knowledge gaps are, and ideas for how we might achieve the desired state. It acknowledges community and stakeholder knowledge and aspirations and is not a definitive scientific position, but the starting point for a way forward.

The scientific knowledge and understanding in this paper is drawn from synthesis reports on the hydrodynamics, water quality, primary producers, invertebrates, fish, and waterbirds of the Coorong as well as the outcomes from two workshops of environmental managers and leading scientists held in May 2020.

The information describes:

- the current state
- what happens if we 'do-nothing'
- our view on the 'desired state'

It also includes broad statements on how we might achieve the desired state for discussion.

Key points on our current scientific knowledge and understanding

1. *The Southern Coorong is a unique and complex ecological system and requires complex management solutions.*
2. *The current state of the Southern Coorong is degraded and if we do nothing, is at risk of no longer supporting the elements that make it a wetland of local, national, and international importance (its ecological character).*
3. *Waterbirds, fish, plants and invertebrates of the Southern Coorong have been affected by prolonged hyper-saline and hyper-eutrophic conditions.*
4. *The desired state for the Southern Coorong is a resilient and naturally variable system, which provides habitat to support waterbird, fish, plants and invertebrate populations.*
5. *To reach the desired state, we need short-term and long-term strategies to manage salinity and nutrients to improve ecological function.*

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	Current state	'Do-nothing' state	Proposed desired state	Ideas for getting there
Environmental value	<ul style="list-style-type: none"> • degraded state • predominantly 'hyper-eutrophic' (high nutrient state) leading to algal blooms, sulfidic black ooze • worse following the Millennium Drought • is at risk of no longer supporting some of the elements that make it a wetland of local, national, and international importance. 	<ul style="list-style-type: none"> • further degraded state • increased risk of no longer supporting elements that make it a wetland of local, national and international importance • will lack resilience to environmental extremes • ecosystem services may collapse. 	<ul style="list-style-type: none"> • a resilient and naturally variable system • able to withstand environmental variability • supports the environmental values that make it a wetland of local, national and international importance. 	<ul style="list-style-type: none"> • assess the risks and benefits of a broad range of management actions to maintain and/or improve environmental condition (salinity, nutrient cycling, physical habitat, flow regime) of the Coorong • evaluate the combined influence of potential management actions. • implement feasible management options to improve the current state of the Southern Coorong.
Salinity	<ul style="list-style-type: none"> • extremely hyper-saline (>60 g/L). • long-term net accumulation of salt due to limited potential for increased inflow and flushing. • salt accumulation due to water staying in the lagoon (not flushing out), leading to evaporation and a concentration of salts. 	<ul style="list-style-type: none"> • long-term net accumulation of salt due to limited potential for increased inflow and flushing. 	<ul style="list-style-type: none"> • a naturally variable system including: <ul style="list-style-type: none"> ◦ some periods of hyper-salinity (>60 g/L) ◦ a range of lower maximum salinities between years. 	<ul style="list-style-type: none"> • manage salinity to allow seasonal variation within years and between years; minimise the duration of peak salinities and frequency of peak salinity events • assess options to improve long-term export of salt through inflow of low salinity water, flushing, and reducing salt load in flow sources.
Eutrophication (high-nutrient state)	<ul style="list-style-type: none"> • the condition of the sediment is degraded, and is fuelling the cycle of eutrophication. <ul style="list-style-type: none"> ◦ predominantly hyper-eutrophic (high levels of chlorophyll-a, nitrogen, and phosphorus). ◦ high level of primary producers (phytoplankton and filamentous macro algae) 	<ul style="list-style-type: none"> • the sediment continues to deteriorate as the Southern Coorong becomes more eutrophic <ul style="list-style-type: none"> ◦ permanent state of hyper-eutrophication ◦ continued nutrient accumulation, and increasing eutrophication over time. 	<ul style="list-style-type: none"> • healthy sediment nutrient cycling and sediment-water fluxes • mesotrophic conditions defined as moderate levels of primary productivity, chlorophyll-a, nitrogen, and phosphorus. 	<ul style="list-style-type: none"> • assess options to remove nutrient pools and organic loads within the Southern Coorong • ongoing and long-term flushing and export of nutrients. • facilitating aquatic plant community and invertebrate restoration.

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Food webs (plants, invertebrates, fish and waterbirds)

Current state	'Do-nothing' state	Proposed desired state	Ideas for getting there
<ul style="list-style-type: none">the entire food web of the Southern Coorong has been affected by poor conditions.nutrient cycling and key primary production processes have been disrupted, reducing the quality and availability of habitat and food sources for elements of the Southern Coorong foodweb.	<ul style="list-style-type: none">the food web of the Southern Coorong may functionally collapse due to:<ul style="list-style-type: none">nutrient cycling and key processes disrupted by nuisance species dominating the system, which do not provide quality habitat or food sources.	<ul style="list-style-type: none">the Southern Coorong supports functional food webs including:<ul style="list-style-type: none">aquatic plant (Ruppia) communities, invertebrate, fish and waterbird populationsa more complex resilient food web with multiple trophic levels and productive and diverse biota.	<ul style="list-style-type: none">Integrated management solutions addressing the needs of each key component of the Southern Coorong food web.Strategies could include:<ul style="list-style-type: none">Improve water and sediment quality, and management of hyper-saline and hyper-eutrophic conditionsImprove system connectivity to facilitate recolonisation of waterbirds, fish, plants and invertebrates.Direct restoration of habitat features and ecosystem processes

Glossary of terms

Ecological character - Ecological character is the combination of the ecosystem components, processes, benefits and services that characterise the wetland at a given point in time

Ecosystem services - Ecosystem services are the benefits provided to humans through the transformations of resources into a flow of essential goods and services e.g. clean air, water, and food

Hyper-eutrophic - high nutrient state / enrichment of an ecosystem with chemical nutrients, typically compounds containing nitrogen, phosphorus, or both.

Mesotrophic – moderate nutrient state / enrichment of an ecosystem with chemical nutrients, typically compounds containing nitrogen, phosphorus, or both.

Trophic levels - the position that an organism occupies in a food chain - what it eats, and what eats it

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More information

To receive Healthy Coorong, Healthy Basin updates and opportunities, including citizen science activities and community consultations, please email project.coorong@sa.gov.au

If you have any questions or comments at this time please let us know at projectcoorong@sa.gov.au

Visit the [Project Coorong](#) website.