Scientists hold onto hope for the Coorong

Purple swamphens, Lake Alexandrina: the rich birdlife of the Coorong and Lower Lakes is under threat. Michael Buddle

A worsening hyper-marine condition is one of five altering ecological states identified by researchers studying the future of the Coorong, Lower Lakes and Murray Mouth (CLLAMM) region under a three-year, $5.3-million CLLAMMecology Research Cluster, established by CSIRO's Water for a Healthy Country Flagship. It is the region's most comprehensive ecological health check to date – and very timely.

Each year hundreds of thousands of migratory wading birds have found refuge in the internationally protected wetlands of the Lower Lakes and Coorong, at the mouth of the drought-stricken River Murray in South Australia.

But, as recent media reports have highlighted, increased salinity and decreased water levels have turned the Coorong region from a wader's delight into a brine shrimp's paradise. The Coorong's entire South Lagoon is becoming a 'Dead Sea' – low water levels have eliminated plants, and water up to five times saltier than the sea has contracted wading birds' traditional food sources of aquatic plants and invertebrates to a small area around the Murray Mouth.

The CLLAMMecology program involves four linked research themes and collaborating researchers from Adelaide and Flinders universities, the South Australian Research and Development Institute and the Water for a Healthy Country Flagship.

This team is investigating the region's habitats, food webs, key species' responses to water management, and future scenarios with the aim of evaluating water management options to secure and sustain the health of the estuary.

'The Southern Lagoon of the Coorong has perhaps another two years to hang on before all of it resembles the Dead Sea,' says Dr Rebecca Lester, a Research Fellow with the CLLAMMecology Research Cluster. 'The Coorong has always had a combination of ecosystem states, and what we have seen is a change in the distribution of states and the appearance of new ones.'

CLLAMMecology was launched in 2006, at a time when drought and the over-allocation of the Murray River's water to irrigation had begun to bite into the life-sustaining flow down the country's major river basin.

As the trickle of water into the region has ceased completely, the emerging ecological picture is not pretty. Salinity in the South Lagoon is now four to five times saltier than seawater, and once-abundant food supplies that attracted migratory birds are contracting in distribution or disappearing altogether.

In the northern Coorong, a key habitat for aquatic fauna, scientists have found no trace of the once-dominant aquatic plant *Ruppia megacarpa*.

The distribution of another important aquatic plant, *Ruppia tuberosa*, which grows in the hyper-marine systems of the southern Coorong, is contracting, with no plants having flowered in the South Lagoon in spring 2007.

Most species of invertebrates, a significant food source for fish and birds, have disappeared from the southern part of the Coorong, including parts of the North Lagoon.

The one remaining fish species found in the hyper-saline South Lagoon – the small-mouth hardyhead – has effectively disappeared after rising salinity exceeded their tolerance level.

The bird community naturally varies along the length of the Coorong, and has changed significantly since the 1980s. While birds are not directly affected by salinity, they now have nothing to eat in many parts of the waterway and so can no longer survive there. Their disappearance is likely to have other local effects.

But researchers have developed a short-term rescue plan to pump hyper-saline water from the South Lagoon out to sea, which would increase the input of seawater through the Murray Mouth and reduce the salinity of the South Lagoon.

CLLAMMecology's CSIRO project leader, Dr Sébastien Lamontagne, says this reduction in salinity should allow the return of a number of organisms previously present in the South Lagoon.

'For the longer term, we are helping water managers design new environmental flow strategies for the region,' he says. 'This includes different combinations of River Murray inflows, dredging the Murray Mouth and water releases from the South-East Drainage Scheme to the South Lagoon.'

● **Helen Beringen**

More information:
CLAMMecology,
www.csiro.au/partnerships/CLLAMMecologyCluster.html