6. Conclusion

Four conclusions emerge from this Report on the State of the Lake Eyre Basin.

6.1 Condition

Firstly, water resources, aquatic biodiversity and riverine ecosystems of the Lake Eyre Basin are generally in good condition. This positive assessment of the Basin is particularly evident when compared with neighbouring systems such as the Murray-Darling Basin. In contrast, little alteration of hydrological regimes or landscapes has occurred in the Basin, as reflected in the maintenance of diverse riverine ecosystems. Riverine ecosystems and biodiversity of the Basin are affected primarily by unusually variable climatic and hydrological patterns. Habitat characteristics throughout the Basin, including water quantity and quality, largely reflect antecedent hydrological conditions, and no long-term negative trends in hydrology or water quality have been detected from existing records. It is necessary to add a cautionary note to this conclusion: it remains possible that the lack of a negative signal is due to the high flow variability and relatively short duration of available datasets rather than to a definite absence of trends.

Yet even short-duration monitoring has proven of great value in reporting on condition. The Lake Eyre Basin Rivers Assessment programme was established in 2011 following the 2007 Review of the Lake Eyre Basin Intergovernmental Agreement. The programme has coordinated the collection of hydrological and ecological information needed to understand the natural variability of the Basin. Without this programme, the present report could not have been written with any coherence, for in the absence of monitoring there is often irresolvable argument as to whether change is occurring and, if so, what is causing it. Conduct of the Lake Eyre Basin Rivers Assessment programme between 2010/11 and 2015/16 has greatly contributed to our understanding of water resources, riverine ecosystems and biodiversity, while also providing an on-ground unifying activity at community level and thereby building awareness of Basin-scale action. Achievements of the Lake Eyre Basin Rivers Assessment programme include:

- Advances in knowledge of hydrology and persistence of waterholes.
- Greatly improved understanding of distributions and population dynamics of native fish throughout the Basin.
- Development of a 'Biological Condition Gradient' approach to assessing the condition of fish communities.
- Improved knowledge of exotic and translocated fish across the Basin.

6.2 The Intergovernmental Agreement

The second conclusion is that joint leadership by the jurisdictions in managing the Lake Eyre Basin is a major contributing factor to its present good condition. Since the adoption of the Lake Eyre Basin Intergovernmental Agreement by South Australia, Queensland, Northern Territory and the Australian Government, the jurisdictions have worked together to develop, adopt and implement strategies concerning water and related natural resources in the Lake Eyre Basin Agreement Area. This cross-border approach has ensured co-ordination and co-operation where otherwise it might not have existed.

6.3 Community involvement

Third, community involvement has continued to be influential in creating support for the Lake Eyre Basin Intergovernmental Agreement and the activities promoted by it. The Community Advisory Committee created by the Agreement is active in ensuring that grass-roots opinion is heard by the jurisdictions. Furthermore, strong linkages between the Community Advisory Committee and the Scientific Advisory Panel have ensured that two important strands of advice – from the community and from the scientific arena – on activities which may affect the condition of the Lake Eyre Basin are represented effectively to governments. The approach of seeking community and scientific advice prior to implementing activities has influenced the low level of change noted in this report, as demonstrated by the award of the Thiess International River Prize to the Basin coalition in 2015.

6.4 Future risks

Finally, most risks associated with current threats to water resources and riverine ecosystems in the Lake Eyre Basin are considered to be low under current legislation, water resource management plans, and cross-border cooperation. The exceptions are uncontrolled flow from artesian bores and altered floodplain inundation patterns resulting from floodplain infrastructure (i.e. roads and pipelines), both of which are ranked as medium risk. Further medium risks to riverine ecosystems in the Basin are associated with invasive species, overgrazing and climate change.

Risk assessment is not an exact process. Opinion from the Community Advisory Committee was inclined more towards the precautionary principle where the consequence of a threat was perceived to be dramatic, or where there were many unknown factors at work. As a local community voice, these higher estimates of future risk need to be taken into account by jurisdictions during future planning for the management of the Basin.

The Report on the State of the Lake Eyre Basin provides a solid basis for thinking about what might come next for the Basin. It reveals an internationally-significant river Basin in good environmental condition, which is a rarity around the globe. It provides a springboard for considering how jurisdictions might go about ensuring that such quality is maintained into the future.

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Glossary

alluvial	relating to sediment deposits comprising loose materials (e.g. gravel, sand or silt) typically deposited in river channels or on floodplains
annual recurrence interval (ARI)	the average period (i.e. number of years) between flood events of a particular size (or greater) based on long-term flow patterns
aquifer	a permeable layer of rock, sand or gravel that stores still or flowing groundwater
artesian	refers to groundwater occurring under pressure in a confined aquifer
coal seam gas	a type of unconventional natural gas (mostly methane) occurring in coal seams at depths of around 300 – 100 m
confidence limits	the upper and lower values defining a range within which the value of a certain parameter is predicted to lie with a specified probability
connectivity	refers to hydrologic connections between different habitats or locations
endemic	only present in this region
ephemeral	only appearing for short periods of time
exotic	refers here to species that are not native to Australia
functional response groups	refers here to major categories of waterbirds considered in the status assessment (i.e. ducks, herbivores, large wading birds, piscivores and shorebirds)
hydroraph	a graph illustrating flow discharges over time at a certain location

Limits of acceptable change	threshold values in selected ecological characteristics (e.g. hydrology, water quality) designed to alert managers to potential changes in ecological character of the site under the Ramsar Convention (DEWHA 2008)
migration	movement of animals or plants between habitats or regions
piscivores	Refers here to birds that have a diet mainly comprising fish
recruitment	the successful addition of a new cohort of organisms to the population
spawning	egg release (e.g. in fish)
species richness	the number of species present in a sample, habitat or community
terminal lake	a lake occurring at the downstream end of a drainage system
translocated	refers here to a species (e.g. sleepy cod) with a native range outside of the Basin but still within Australia
unconfined groundwater	groundwater that lacks a confining layer between its aquifer and the surface, usually the shallowest aquifer at a location, i.e. the water table