

# CONTENTS

**EXECUTIVE SUMMARY** ERROR! BOOKMARK NOT DEFINED.

---

**1. INTRODUCTION** 5

---

1.1	Background	5
1.2	Objectives	5
1.3	Approach and scope	6
1.4	Contributors	6

**2. ABOUT THE BASIN** 7

---

2.1	Location and global context	<b>Error! Bookmark not defined.</b>
2.2	Riverine landscapes	<b>Error! Bookmark not defined.</b>
2.3	Climate and hydrology	<b>Error! Bookmark not defined.</b>
2.4	Riverine ecosystems and biodiversity	<b>Error! Bookmark not defined.</b>
2.4.1	Boom and bust ecology	<b>Error! Bookmark not defined.</b>
2.5	People, settlements and land use	<b>Error! Bookmark not defined.</b>
2.6	Key values	<b>Error! Bookmark not defined.</b>

**3. CURRENT STATUS** ERROR! BOOKMARK NOT DEFINED.

---

3.1	Introduction	<b>Error! Bookmark not defined.</b>
3.1.1	Knowledge sources and approach	<b>Error! Bookmark not defined.</b>
3.1.2	Aboriginal engagement	<b>Error! Bookmark not defined.</b>
3.2	Hydrology	<b>Error! Bookmark not defined.</b>
3.2.1	Key messages	<b>Error! Bookmark not defined.</b>
3.2.2	Recent surface water patterns	<b>Error! Bookmark not defined.</b>
3.2.3	Longer-term surface water trends	<b>Error! Bookmark not defined.</b>
3.2.4	Groundwater interactions	<b>Error! Bookmark not defined.</b>
3.2.5	Waterhole hydrology	<b>Error! Bookmark not defined.</b>
3.2.6	Coongie Lakes	<b>Error! Bookmark not defined.</b>
3.3	Water quality	<b>Error! Bookmark not defined.</b>
3.3.1	Key messages	<b>Error! Bookmark not defined.</b>
3.3.2	Overview	<b>Error! Bookmark not defined.</b>
3.3.3	Temporal trends	<b>Error! Bookmark not defined.</b>
3.3.4	Biological indicators	<b>Error! Bookmark not defined.</b>
3.3.5	Condition	<b>Error! Bookmark not defined.</b>
3.4	Fish	<b>Error! Bookmark not defined.</b>
3.4.1	Key messages	<b>Error! Bookmark not defined.</b>
3.4.2	Fish distributions	<b>Error! Bookmark not defined.</b>
3.4.3	Endemicity and evolution	<b>Error! Bookmark not defined.</b>
3.4.4	Exotic and translocated species species	<b>Error! Bookmark not defined.</b>
3.4.5	Condition assessment	<b>Error! Bookmark not defined.</b>
3.4.6	Coongie Lakes	<b>Error! Bookmark not defined.</b>
3.5	Waterbirds	<b>Error! Bookmark not defined.</b>
3.5.3	Temporal trends	<b>Error! Bookmark not defined.</b>
3.5.4	Coongie Lakes	<b>Error! Bookmark not defined.</b>

#### **4. CURRENT AND EMERGING PRESSURES AND THREATS** ERROR! BOOKMARK NOT DEFINED.

4.1	Introduction	<b>Error! Bookmark not defined.</b>
4.2	Hydrologic alteration	69
4.3	Land and water degradation	<b>Error! Bookmark not defined.</b>
4.4	Mining and petroleum	<b>Error! Bookmark not defined.</b>
4.5	Tourism and recreation	<b>Error! Bookmark not defined.</b>
4.6	Invasive species	<b>Error! Bookmark not defined.</b>
4.7	Social concerns	79
4.8	Climate change	<b>Error! Bookmark not defined.</b>
	4.8.1 Observed trends	<b>Error! Bookmark not defined.</b>
	4.8.2 Future climates	<b>Error! Bookmark not defined.</b>
	4.8.3 Potential impacts	<b>Error! Bookmark not defined.</b>
4.9	Management status	<b>Error! Bookmark not defined.</b>
	4.9.1 Overview	<b>Error! Bookmark not defined.</b>
	4.9.2 Water resources planning and monitoring	<b>Error! Bookmark not defined.</b>
4.10	Key knowledge needs	<b>Error! Bookmark not defined.</b>

#### **5. IDENTIFIED RISKS AND CONSIDERATIONS FOR GOVERNMENTS** ERROR! BOOKMARK NOT DEFINED.

5.1	Risk assessment	<b>Error! Bookmark not defined.</b>
5.2	Pressures and threats of the highest risk	<b>Error! Bookmark not defined.</b>
5.3	Strategic knowledge needs	<b>Error! Bookmark not defined.</b>

#### **6. CONCLUSION** ERROR! BOOKMARK NOT DEFINED.

6.1	Condition	<b>Error! Bookmark not defined.</b>
6.2	The Intergovernmental Agreement	<b>Error! Bookmark not defined.</b>
6.3	Community involvement	<b>Error! Bookmark not defined.</b>
6.4	Future risks	<b>Error! Bookmark not defined.</b>

#### **REFERENCES** ERROR! BOOKMARK NOT DEFINED.

#### **GLOSSARY** ERROR! BOOKMARK NOT DEFINED.

#### **APPENDICES** ERROR! BOOKMARK NOT DEFINED.

# 1. Introduction

## 1.1 Background

The Lake Eyre Basin (the Basin) represents around one sixth of the Australian continent and covers significant portions of the Northern Territory, Queensland and South Australia, as well as a corner of north-western New South Wales. Amongst the world's largest internally draining river basins, the Lake Eyre Basin supports ecological, socio-economic and cultural values of very high national and international significance. The Basin is widely recognised as being relatively undisturbed by human activities compared with adjacent basins such as the Murray-Darling. Unless well managed, growing pressures to develop and intensify agricultural and mining enterprises, along with a burgeoning tourism industry and the overlying threat of climate change, pose risks to the Basin's watercourses and catchments and the many diverse values that they support.

In 2000, Ministers of the Australian, Queensland and South Australian governments signed the Lake Eyre Basin Intergovernmental Agreement to protect the Basin's water resources and river systems and to promote their sustainable management, especially with regard to minimising cross-border downstream impacts. The Northern Territory government also signed this agreement in 2004 (Figure 1).

The Agreement encompasses the Cooper Creek catchment (excluding the north-western corner of New South Wales), the Georgina and Diamantina catchments and the Finke, Todd, Hay Macumba and Neales, catchments in the west and south (Figure 1). The Agreement is governed by the Lake Eyre Basin Ministerial Forum. A Community Advisory Committee and Scientific Advisory Panel provide advice to the Ministerial Forum in relation to matters relevant to the Agreement. An initial State of the Basin report was produced in 2008; the current report is the second condition assessment of the Basin.

## 1.2 Objectives

This report addresses the requirements of the *Lake Eyre Basin Intergovernmental Agreement Act 2001* to review and report on the condition of watercourses and catchments within the Lake Eyre Basin Agreement Area every 10 years. The major aims of this report are to:

- describe the current status of Basin's watercourses and catchments, including rivers, floodplains, and riverine lakes and wetlands, with a particular focus on hydrology, water quality, fish and waterbirds
- identify and evaluate current threats and pressures facing water resources and riverine ecosystems of the Basin, especially those requiring a coordinated inter-jurisdictional approach.

### **1.3 Approach and scope**

This report synthesises knowledge of hydrology, water quality, riverine fish and waterbirds of the Lake Eyre Basin as well as current and emerging threats to these features. Results of monitoring and evaluation conducted under the recent Lake Eyre Basin Rivers Assessment programme are presented in addition to assessment of other relevant datasets where available. The Lake Eyre Basin Rivers Assessment Implementation Plan was adopted by the Ministerial Forum in 2010, and hydrology, water quality and fish have been monitored regularly in 53 waterholes under the Lake Eyre Basin Rivers Assessment programme since 2011 (Appendix 1). Waterbirds in 10 major wetlands of the Basin have been monitored annually in October since 1983 as part of the Eastern Australian Waterbird Survey (Kingsford & Porter 2009).

This report does not consider the condition of the physical landscape, riverine vegetation or other ecological components, such as terrestrial animals, that depend on watercourses and catchments of the Basin. Where available, information regarding catchment-wide risks to watercourses and riverine biodiversity has been considered (Chapter 4).

The report comprises six chapters. Chapter 2 provides a brief overview of the Basin, its riverine landscapes, climate, hydrology, riverine biodiversity and ecosystems, and people. Chapter 3 presents findings regarding the status of hydrology, water quality, fish and waterbirds in the Basin. Chapter 4 discusses current and emerging threats to water resources and riverine ecosystems in the Basin. Chapter 5 identifies the risks and strategic knowledge needs. Finally, Chapter 6 provides a synthesis of the report's key messages and conclusion.

### **1.4 Contributors**

This report represents the contributions of many individuals and organisations. Hydrological information was compiled by University of Melbourne (Dr Justin Costelloe) and water quality information by the Environment Protection Authority South Australia, University of Adelaide (John Tibby), Northern Territory Department of Environment and Natural Resources, and Queensland Department of Natural Resources and Mines. Fish information and condition assessments were provided by South Australian Research and Development Institute in consultation with Griffith University (Emeritus Professor Angela Arthington), Queensland Department of Natural Resources and Mines, and Northern Territory Department of Environment and Natural Resources. Waterbird information was supplied by University of New South Wales (Professor Richard Kingsford and Dr Gilad Bino). Many of the maps in this report were produced by South Australian Research and Development Institute and the Bureau of Agricultural Resources, Economics and Sciences.

The Lake Eyre Basin State of the Basin Steering Committee, along with the Community Advisory Committee and Scientific Advisory Panel, have also made significant contributions to the report.

The report was coordinated and produced by a team at the Australian Rivers Institute at Griffith University comprising Drs Samantha Capon, Stephen Balcombe and Amy George and Associate Professor Fran Sheldon.



Figure 1 Map of the Lake Eyre Basin showing major catchments, watercourses, lakes, towns and the Lake Eyre Basin Intergovernmental Agreement area. (source: Australian Bureau of Agriculture and Resource Economics and Sciences, 2017)