

Ecological Assessment of the South Australian Lakes and Coorong Fishery

Reassessment Report – Prepared for the Department of Agriculture, Water and the Environment

For the purposes of part 13 and 13(a) of the *Environment Protection and Biodiversity Conservation Act 1999*

MARCH 2022

Ecological Assessment of the SA Lakes and Coorong Fishery

Information current as of 8 March 2022

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1 Purpose

This report has been prepared by the Fisheries and Aquaculture Division of the Department of Primary Industries and Regions (PIRSA) to inform the assessment of the fishery for the purposes of Parts 13 and 13(a) of *Environment Protection and Biodiversity Conservation Act 1999*.

This report has been prepared in accordance with the *Guidelines for the Ecologically Sustainable Management of Fisheries*, 2nd Edition (2007) (the *Guidelines*) and addresses the level of change that has occurred in the Lakes and Coorong Fishery (LCF) since the February 2018 assessment.

2 Background

The LCF is a multi-species, multi-method, community based fishery, which is managed using input and output controls. This report addresses key species taken in the fishery, including Mulloway (*Argyrosomus japonicus*), Pipi (*Donax deltoides*), Yelloweye Mullet (*Aldrichetta forsteri*), Golden Perch (*Macquaria ambigua*), Greenback Flounder (*Rhombosolea tapirina*), Black Bream (*Acanthopagrus butcheri*) and Bony Bream (*Nematasola erebi*). Commercially important exotic fish species taken by this fishery include European Carp (*Cyprinus carpio*) and Redfin (*Perca fluviatilis*).

The *Fisheries Management Act 2007* provides a broad statutory framework to ensure the ecologically sustainable management of South Australia's aquatic resources. The regulations that govern the management of the LCF are the *Fisheries Management (Lakes and Coorong Fishery) Regulations 2009* and the *Fisheries Management (General) Regulations 2017*.

3 Marine Stewardship Council certification

The LCF Pipi sector was recently re-assessed and has been granted Marine Stewardship Council (MSC) certification until 24 February 2027.

4 Level of Assessment

The LCF was last assessed by the Department of Agriculture, Water and Environment (DAWE) as an approved Wildlife Trade Operation (WTO) in February 2019 following provision of a reassessment report to DAWE in 2018. Since the last assessment report was provided there have been changes in one area of interest as outlined in page 6 of the 'Guidelines for the Ecologically Sustainable Management of Fisheries' (see Table 1).

Table 1: Level of assessment required by the Lakes and Coorong Fishery

Issue	Area of Interest	Yes	No
Fishery	Has there been any change to management arrangements, and/ or fishing practices?	X	
External Influences	Has there been any change to an environmental issue/influence outside of the fishery management agencies control?		X
Interaction with protected species	Has there been any change in the nature, scale, intensity of impact, and/or management response?		X
Ecosystem impact	Has there been any change in nature, scale or intensity of impact and/or subsequent management response?		X
Target Stock Status	Has there been any change in the target stock status?		X
By-product/bycatch status.	Has there been any change in the by-product and/or by-catch stock status?		X

Based on the *Guidelines*, the assessment submission for the LCF is one that requires a ‘standard plus ancillary level of information’. Detailed historical information on the fishery can be found in the previous ‘[Ecological Assessment of the South Australian Lakes and Coorong Fishery](#)’ provided to DAWE in 2016.

PIRSA provided a reassessment report to DAWE in late 2021 for consideration of WTO for the Lakes and Coorong Fishery. In February 2022, the export approval for the fishery was extended via an amendment to the List of Exempt Native Specimens until 25 August 2022. This extension was provided to allow for consideration of a new management plan that came into effect from 1 March 2022. DAWE requested a re-assessment report be submitted with updated information to include the adopted replacement management plan.

5 Lakes and Coorong Fishery

5.1 Management Changes

The following three sections will provide information on changes to management arrangements within the commercial, recreational and aboriginal traditional sectors of the LCF since provision of the reassessment report to DAWE in the February 2019 export approval.

In June 2021, the Minister for Primary Industries and Regional Development approved the adoption of a new Lakes and Coorong Fishery Management Plan. This plan took effect on 1 March 2022, following the expiry of the previous management plan. The Minister adopted the new Management Plan for the fishery following a request from industry to use the reviewed harvest strategies for both the finfish and pipi sectors for the 2021/2022 fishing season. The main change within the new management plan is the revised harvest strategies for both the Pipi and Finfish sectors. Details of these changes are listed in section 5.2 below. The Pipi and Finfish sectors will continue to operate under the new management plan for the 2022/2023 fishing season.

5.2 Commercial Fishery

Management changes for Pipi

As part of the mid-term review of the Lakes and Coorong Fishery Management Plan, the Pipi harvest strategy was reviewed. Following approval of the new Lakes and Coorong Fishery Management Plan, the Minister granted approval for the revised harvest strategy to be used for the 2021/22 fishing season. The new Pipi harvest strategy incorporates a change to the decision table to support retaining higher levels of biomass on the beach and to smooth out variability of outputs.

The Pipi total allowable commercial catch (TACC) for the 2021/2022 fishing season was reduced by 50 tonnes compared to the previous fishing season consistent with the decision rules within the revised Pipi Harvest Strategy.

Spatial access to the Pipi fishery has been formally allocated in the *Management Plan for the South Australian Commercial Lakes and Coorong Fishery* (PIRSA 2016) to provide the recreational sector with access to 64 km of coastline and the commercial sector to 192 km of coastline.

The spatial separation of recreational and commercial fishing has now been formalised and included within the *Fisheries Management (General) Regulations 2017*, to enforce a permanent arrangement. Commercial Pipi fishing throughout the winter months has now also been included within the *Fisheries Management (General) Regulations 2017*, to enable the commercial sector to fish 12 months of the year.

The former Minister for Primary Industries and Regional Development approved amendments to the *Fisheries Management (Lakes and Coorong Fishery) Regulations 2009* to allow uncaught 2019/20 Pipi quota entitlements on individual licences to be carried over to the 2020/21 and 2021/22 quota periods. These arrangements came into effect on 27 August 2020 and were approved as COVID mitigation measures for the Pipi fishery.

Management changes for the finfish sector

The LCF net sector has been operating under a harvest strategy since 2016, which is incorporated in the *Lakes and Coorong Fishery Management Plan* (PIRSA 2016). This harvest strategy was reviewed in 2018/19 as part of the mid-term review of the management plan and was approved by the Minister to be used to assist setting the total allowable commercial effort (TACE) for the 2021/22 fishing season. The new harvest strategy incorporates the following:

- secondary (biological) performance indicators into decision tables for finfish to supplement the management process, including Total Allowable Commercial Effort (TACE) setting process for each sector (freshwater and estuarine) of the fishery to ensure the finfish resources are harvested within ecologically sustainable limits;

- updated decision tables with decision table outputs and revised TACE (net unit) values in the finfish harvest strategy recognizing changes in the number of net units in the fishery over the past couple of years (from 1250 to 1175); and
- information on the reference points for secondary (biological) performance indicators for finfish.

The harvest strategy aims to manage the sustainable harvest of finfish relative to environmental conditions – specifically the amount of habitat available to key species for three habitat/gear-based sectors. The sectors are: (i) estuarine large mesh gill net (ELMGN) in the Coorong; (ii) estuarine small mesh gill net (ESMGN) in the Coorong; and (iii) freshwater large mesh gill net (FWLMGN) in Lake Alexandrina and Lake Albert (Knuckey et al., 2015). The finfish harvest strategy uses environmental performance indicators and decision rules to guide management of the fishery through adjustment of the annual total allowable commercial effort (TACE) for each of the three sectors.

The finfish TACE for the 2021/2022 fishing season was set at the maximum entitlement within the harvest strategy of 1175 net units (being made up to licence holders holding 25, 50, 75 and 100 mesh nets) for the Freshwater Large Mesh Gill Net and Coorong Small Mesh Gill Net sectors (performance indications were above the target reference points); and a reduction of nets from 1175 to 987 for the Coorong Estuarine Large Mesh Gill Net sector; as the performance indicator was below the target reference point (see Table E-2).

Table E-2. Results from the annual assessments of the environmental performance indicators for the three finfish sectors of the LCF from 2018/19 to 2020/21 (reporting years) against their target, trigger and limit reference points (RP). The annual total allowable commercial effort (TACE) for each sector for each financial year from 2017/18 to 2019/20 is also shown.

Finfish sector	Financial year	TACE (net units)	Performance indicator	Limit RP	Trigger RP	Target RP	Reporting year	PI value
Estuarine LMGN	2017/18	1,250	Habitat available to Mulloway	10%	24.9%	55%	2018/19	55.0%
	2018/19	1,175					2019/20	59.6%
	2019/20	1,175					2020/21	52.3%
Estuarine SMGN	2017/18	1,250	Habitat available to YE Mullet	10%	30.9%	50%	2018/19	87.9%
	2018/19	1,175					2019/20	85.1%
	2019/20	1,175					2020/21	64.2%
Freshwater LMGN	2017/18	1,250	Water level in the Lower Lakes (m)	-1.2 m	-0.71 m	0.4 m	2018/19	0.65 m
	2018/19	1,175					2019/20	0.69 m
	2019/20	1,175					2020/21	0.71 m

Black Bream

In response to the classification of the Black Bream stock in the Lakes and Coorong as 'depleted' in 2021 (Earl et al., 2021), PIRSA implemented temporary management arrangements for the Black Bream stock in the Lakes and Coorong for the 2021 spawning season. These temporary management arrangements apply to both commercial and recreational fishing to protect Black Bream and promote recovery of the stock:

For the period from 1 October 2021 to 31 December 2021:

- A closure prohibiting the use of mesh nets (commercial and recreational) within 300 m of all barrages located in the Coorong (Area 1).
- A prohibition on the take or possession of Black Bream by both the commercial and recreational fishing sectors within the Lakes and Coorong.

Extending the existing 150 m fishing closure around the barrages to 300 m provides additional protection for Black Bream aggregating at the barrage during the spawning season. This seasonal closure which prohibits the take of Black Bream from October to December inclusive, will likely reduce the capture of mature Black Bream, minimise disturbance to spawning fish caused by fishing activities, as well as reducing fishing pressure/exploitation rate on the stock.

The management arrangements were an interim measure until the longer term Black Bream recovery strategy is finalised in consultation with the Lakes and Coorong Management Advisory Committee (LCFMAC).

Murray Cod

The current status of Murray Cod in the lower River Murray is classified as 'depleted' and licence holders in the LCF continue to not target Murray Cod.

Long-nosed fur seal interactions

Licence holders in the LCF have indicated that Long-nosed Fur Seals continue to significantly impact the fishery through the loss of catch and damage to mesh nets. Due to these circumstances, the South Australian Government through PIRSA, SARDI, and the Department for Environment and Water (DEW) continue to work with industry to identify and develop potential mitigation measures which can be implemented within the fishery.

PIRSA has been working with and will continue to work with the LCF to discuss a number of short- and long-term management options, that are applicable under the *Fisheries Management Act 2007*, that may assist to limit interactions with Long-nosed Fur Seals.

Further to this, SARDI has undertaken research into alternative fishing gear, methods and deterrent devices, including seal crackers, in an effort to reduce impacts of fur seals on fishers in the Coorong and Lower Lakes. 'Seal crackers' are underwater explosives which cause a shock wave that is uncomfortable and alarming to seals. DEW has issued a number of permits for use. Fishers using crackers must have a police clearance in addition to a permit from DEW and must have undergone mandatory training in cracker use.

SARDI is also undertaking a research project funded by the Fisheries Research and Development Corporation (FRDC) to investigate the diet, foraging and consumption distribution of Long-nosed Fur Seals. The project will also model their trophic linkages to provide an objective assessment of their impact on commercial fish and aquaculture species, on seafood production in South Australia, and the likely impacts that increasing populations may have on the seafood industry into the future.

5.3 Recreational Fishery

There are 404 recreational mesh nets currently permitted for use by registration holders in the waters of the LCF, which are subject to specific conditions. These recreational net registrations are non-transferable and no new registrations can be issued. A recreational survey has not been undertaken since the last report to DAWE.

Black Bream

In response to the Black bream stock in the Lakes and Coorong continuing to be classified as 'depleted' in 2021 PIRSA implemented temporary management arrangements for the Black Bream stock in the Lakes and Coorong for the 2021 spawning season (October to December). These temporary management arrangements apply to both commercial and recreational fishing to protect Black Bream and promote recovery of the stock. The details of these arrangements are described above.

Murray Cod

Temporary management arrangements for Murray Cod have been in place since 2011. In 2021, the management arrangements were formalised and included within the *Fisheries Management (General) Regulations 2017*.

Murray Cod Stock Enhancement was continued in 2020 and 2021, with approximately 70,000 fingerlings released at Kingston on the River Murray in 2020 and a further 125,000 fingerlings into four sites along the River Murray in 2021.

5.4 Aboriginal Traditional Fishing

PIRSA appointed an ongoing Traditional Fisheries manager in 2017 and part of their role is developing traditional management plans for South Australia's fisheries.

6 External Influences

The LCF is heavily influenced by freshwater inflows as a result of the modified environment caused by the construction of barrages. Further background information on this can be found in the agency application on ecological sustainability provided to DAWE in September 2016. No changes to external influences have occurred since this time.

7 Interactions with Protected Species

There has been no significant change in interactions with protected species since the agency application on ecological sustainability was provided to DAWE in September 2016 and the fishery was granted a 3-year WTO in February 2019.

The nature and extent of interactions with threatened, endangered or protected species (TEPS) within the LCF is reported by fishers in a TEPS logbook. SARDI

provides an annual advice note, which is made available on the PIRSA website, summarising TEPS interactions for South Australian fisheries. The 2019/20 advice note indicated that in 2019/20, the LCF reported 363 wildlife interactions with 1,473 individuals (i.e. some interactions involved more than one individual). The majority of interactions and individuals involved Long-nosed Fur Seals, with no mortalities. The remaining wildlife interactions reported in the LCF in 2019/20 were with leatherback turtles.

As highlighted in section 6, PIRSA, in collaboration with SARDI and industry, is currently developing a number of mitigation measures to reduce interactions with Long-nosed Fur Seals.

8 Target Stock Status and Statistical Reporting

SARDI collects, collates and validates catch and effort data from the LCF for stock assessment and statistical reporting.

9 Stock assessments

A stock assessment report was completed for Pipi in 2016/2017 (Ferguson et al., 2017). The assessment indicated that the status of the Pipi resource is classified as sustainable.

The latest stock assessments for other species remain as described in the 2016 assessment provided to DAWE and the 2019/20 annual report provided to DAWE.

10 Fishery Statistics and Stock Status Reports

A fishery statistics report is produced annually and provides a brief assessment of the performance of the fishery for each key species of the LCF, as measured by performance indicators (PIs) for established management objectives and reference points (RPs) outlined in the management plan. The latest LCF statistics report was published in 2021 (Earl, 2021). A summary of the current status and catch and effort trends for key species in the LCF is found in Table 3.

The *Status of Key Australian Fish Stocks* report (Stewardson et al., 2016) provides a scientifically robust and simple tool to inform fishers, seafood consumers, managers, policy makers and the broader community about the status of the key wild-caught fish stocks around Australia. Pipi, Mulloway and Yelloweye Mullet continue to be classed as sustainable in this report.

11 Other sources of species data

Stock assessments and fishery statistics reports for the LCF rely heavily on fishery-dependent data. However, SARDI has a significant focus on freshwater ecology and conducts a number of research projects within the River Murray system, including the Lakes and Coorong region. In addition to stock assessment reports, there is ongoing research into fish passage, ecology and larval recruitment of key species as part of the Murray Darling Basin Authorities' and

CSIRO’s icon site activities. Additionally, these studies aim to provide information on the population structure (age/size structure) for key species (Table 3), and enhance understanding of the role of environmental factors (e.g. flows and associated conditions) in their life histories.

Table 3: Current status and 5-year trends (2015/16–2019/20) for key species in the LCF.

Species	Stock status	Trend in annual catch (last 5 years)	Trend in annual effort (last 5 years)
Mulloway	Sustainable	Increasing	Fluctuating
Yelloweye Mullet	Sustainable	Increasing	Stable
Golden Perch	Sustainable	Decreasing	Decreasing
Black Bream	Depleted	Stable - historically low	Stable - historically low
Greenback Flounder	Depleted	Stable - historically low	Stable - historically low
Pipi	Sustainable	Stable	Decreasing

12 By-product and by-catch

There have been no changes in the status of by-product or by-catch species in the LCF since the agency application on ecological sustainability was provided to DAWE in November 2018 and the fishery was granted a one year WTO in February 2019.

13 Conditions and Recommendations

Condition 1

Operation of the South Australian LCF will be carried out in accordance with the *Management Plan for the South Australian Lakes and Coorong Fishery 2022*, *South Australian Fisheries Management (Lakes and Coorong Fishery) Regulations 2009 (SA)*, *Fisheries Management (General) Regulations 2017 (SA)* and the *South Australian Fisheries Management Act 2007 (SA)*.

Progress

The new management plan took effect on 1 March 2022. PIRSA will now operate the Commercial LCF in accordance with the *2022 Management Plan for the South Australian Lakes and Coorong Fishery*, *South Australian Fisheries Management (Lakes and Coorong Fishery) Regulations 2009*, *Fisheries Management (General) Regulations 2017* and the *South Australian Fisheries Management Act 2007*.

Condition 2

The Department of Primary Industries and Regions South Australia to inform the Department of any intended amendments to the management arrangements that

may affect the criteria on which *Environment Protection and Biodiversity Conservation Act 1999* decisions are based.

Progress

PIRSA has and will continue to inform DAWE on any intended amendments to the management arrangements that may affect the criteria on which *Environment Protection and Biodiversity Conservation Act 1999* decisions are based.

Condition 3

The Department of Primary Industries and Regions South Australia to produce and present reports to the Department annually as per Appendix B to the *Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition*.

Progress

PIRSA provided an annual report including relevant information with regards to the LCF to DAWE in February 2019.

Condition 4

The Department of Primary Industries and Regions South Australia to continue to:

- a) regularly review the management arrangements for Murray Cod stocks in the SA Lakes and Coorong Fishery, on an annual basis as a minimum
- b) implement appropriate and timely protection and management measures, until Murray Cod stock levels increase to a sustainable level.

Progress

PIRSA has implemented temporary management arrangements to protect and support the recovery of the Murray Cod population since 2011 and have now formalised the arrangements in the *Fisheries Management (General) Regulations 2017*. This arrangement is an annual permanent prohibition on the taking of Murray Cod from waters of the River Murray and Lower Lakes excluding waters of the Coorong.

Condition 5

The Department of Primary Industries and Regions South Australia to:

- a) conduct a review of the current (temporary) management arrangements for Black Bream and implement appropriate management arrangements for the 2019 spawning season.
- b) advise the Department of the outcomes of the review in 2019.
- c) provide the Department with the report *Monitoring salt wedge conditions and black bream (*Acanthopagrus butcheri*) recruitment in the Coorong during 2017- 18* once released; and
- d) advise of any associated changes to Black Bream management arrangements.

Progress

PIRSA implemented temporary management arrangements for Black Bream in the Lakes and Coorong in 2018/19. These temporary management arrangements to protect Black Bream and promote the recovery of the stock apply to both commercial and recreational fishing. The following temporary management arrangements were implemented.

- For the period from 1 September 2018 to 30 November 2018 and for the period from 21 September 2019 to 30 November 2019:
 - a closure prohibiting the use of mesh nets (commercial and recreational) within 300 m of all barrages located in the Coorong (Area 1)
 - a prohibition on the take or possession of Black Bream by both the commercial and recreational fishing sectors within the Lakes and Coorong.

Given the continued 'depleted' Classification for Black Bream, PIRSA has implemented the above temporary management arrangements for the 2021 spawning season (1 October to 31 December 2021).

These arrangements aim to protect Black Bream during their key spawning period, and around the barrages where they are known to aggregate to spawn. These arrangements were implemented through a closure notice issued under section 79 of the *Fisheries Management Act 2007*. Given a section 79 notice may only be in place for 12 months (with the potential to be renewed for a further 12 months), PIRSA is working with the LCFMAC to develop a longer-term recovery strategy before the next spawning season in 2022, that will assist transitioning the Black Bream from 'depleted' to 'sustainable' in the years to come.

Condition 6

The Department of Primary Industries and Regions South Australia to continue to:

- a) monitor catch level trends for Greenback Flounder, and continue to develop/implement management measures as required to:
 - minimise the impact from fishing
 - minimise the impact from environmental conditions known to affect the species.
- b) monitor catches of juvenile and female Yelloweye Mullet, and implement measures as required, to ensure that this species does not become recruitment overfished
- c) improve monitoring of discards in the Lakes and Coorong Fishery, particularly for Mulloway
- d) monitor trends in stock levels of all target species and implement measures to mitigate risks identified in the June 2011 risk assessment for the Lakes and Coorong Fishery.

Progress

Recent stock assessments provide up to date information on trends in stock levels and have been completed for Mulloway (Earl and Ward, [2014](#)), Golden Perch (Ferguson and Ye, [2012](#)), Yelloweye Mullet (Earl and Ferguson, [2013](#)), Pipi (Ferguson and Hooper, [2017](#)), Greenback Flounder (Earl and Ye, [2016](#)) and Black Bream (Earl et al., [2016](#)).

The most recent Stock Status report, '*Fishery statistics and performance indicators for the South Australian Lakes and Coorong Fishery. Report to PIRSA Fisheries and Aquaculture*' (Earl, 2018), was published in May 2018 and provides updated catch and effort information for the 2016/17 season. A summary of this information is provided in **Error! Reference source not found..**

PIRSA will continue to monitor catch levels for Greenback Flounder, which are fluctuating at low levels with low targeted effort. Noting a fish condition monitoring report including greenback flounder was released in 2020. The most recent stock assessment for Yelloweye Mullet was undertaken in 2021, and included an analysis of the size, age and sex composition of the population in the Coorong, as well as trends in catch, effort and catch rate. The stock was classified as sustainable.

PIRSA will continue to actively work with other state and national water and management agencies to have input into decisions made on freshwater inflows in the Lakes and Coorong with the known spawning events for key target species.

Condition 7

The Department of Primary Industries and Regions South Australia to:

- a) provide advice of when the trial of electronic reporting is to commence.
- b) provide results of the trial, with a view to implementation of electronic reporting in the Lakes and Coorong Fishery
- c) provide a report to the Department, particularly highlighting the reporting of discards, and the effect of Long-nosed Fur Seals on the fishery.

Progress

PIRSA is in the process of developing a trial of electronic reporting in the LCF. The new system will request fishers to provide information on discarding in the fishery, and fur seal impacts (e.g. damaged/discarded catch, gear damage).

The Pipi sector of the LCF is in the transitional stage of shifting towards e-catch data collection for the fishery. Currently the Pipi sector can either submit a paper or electronic return sheet from the SARDI Catch and Effort Logbook.

Condition 8

The Department of Primary Industries and Regions South Australia to provide the Department with a copy of SARDI's annual fishery statistics report (2019) following their assessment of status stocks for key target species, including Mulloway.

Progress

Attached is a copy of the latest *Assessment of the South Australian Lakes and Coorong Fishery in 2019/2020* to this report (see Section 14).

14 Additional Information and Attachments

The following research reports that have been completed since the last reassessment:

Earl, J and Bailluel, F (2021). *Assessment of the South Australian Lakes and Coorong Fishery in 2019/20*. Report to PIRSA Fisheries and Aquaculture. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2020/000208-2. SARDI research Report Series No. 1092. 81pp

Ye, Q., Bucater, L., Furst, D., Lorenz, Z., and Giatas, G. and Short D. (2019). *Monitoring salt wedge dynamics, food availability and black bream (Acanthopagrus butcheri) recruitment in the Coorong during 2018-19*. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2018/000425-2. SARDI Research Report Series No. 1045. 48pp

Ye, Q, Bucater, L., Short, D. A., and Giatas, G. C. (2021). *Coorong Fish Condition Monitoring 2008-2020: Black Bream (Acanthopagrus butcheri), Greenback Flounder (Rhombosolea Tapirina) and Smallmouth Hardy Head (Atherinosoma microstoma) populations*. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2011/000471-8. SARDI Research Report Series No. 1091. 76pp.

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