FRDC acknowledges the traditional custodians of this land, and pay our respects to their elders past and present. We acknowledge the special relationship that Indigenous Australians have with their traditional lands and waters.

Status of Australian Snapper – Briefing Notes

VERSION ONE: July 2019

Overview of Australian Snapper

Snapper (*Chrysophrys auratus*) is an iconic Australian scalefish species that is distributed in the inshore waters from southern Queensland to Western Australia, and more recently, being encountered in Tasmanian waters. Snapper are targeted by the commercial, Indigenous, charter and recreational fishing sectors throughout their distribution. For consumers, Snapper is a popular and familiar eating species, and as such, commands high retail prices – in the vicinity of $50 to $60 per kilogram for fillets.

Given their importance to all fishing sectors and the broader community, Snapper has been well researched in Australia, with the FRDC investing a considerable quantum of funds across a number of projects that have sought to better understand the life history, connectivity, and stock structure of the species – refer to the table of FRDC projects at the end of the document for a representative subsample of Snapper-related, FRDC-funded projects.

FRDC has also supported projects to optimise the aquaculture potential of Snapper (e.g. 2000-226 and 2001-208). However, to date there are no commercial Snapper aquaculture ventures in Australia.

Commercial catch data, the most readily available and reported for the species, indicate that Snapper is caught in different quantities throughout their range (Table 1). While it is acknowledged that the catch of the recreational sector also includes substantial quantities of Snapper in all States, there is a paucity of robust data available to factor into management planning.

Table 1. Commercial Snapper catch across Australia in 2016/17 (ABARES 2018)

State	Commercial Wild Catch (tonnes)	Commercial Wild Catch value ($)
Queensland	73	591,000
New South Wales	167	1.86 million
Victoria	54	517,000
South Australia	343	3.50 million
Western Australia	244	1.95 million

Snapper are managed as twelve stocks. From the recent SAFS report it is apparent that seven are sustainable, one is recovering, three are depleted and one is undefined (Table 2). The management of catches for Snapper varies among the jurisdictions, which employ different input and output controls. Nevertheless, given the popularity of Snapper, access to and the allocation of Snapper catches among sectors is often controversial and contentious topic and debated across social media platforms.

For more information on the stock status and management of Snapper – refer to the Snapper page in the 2018 SAFS report (https://www.fish.gov.au/report/230-Snapper-2018).

Table 2 Snapper summary from the 2018 Status of Australian Fisheries Stocks (SAFS)

Jurisdiction	Stock	Fisheries[1]	Stock status	Indicators
New South Wales	New South Wales	OTLF	Sustainable	Estimated biomass, catch, effort, size and age composition
Queensland	Queensland	ECIFFF, RRFFF	Depleted	Estimated biomass, standardised catch rates, length and age composition, fishing mortality rate, catch, effort, CPUE
South Australia	Gulf St. Vincent	NZRLF, MSF	Sustainable	Catch, CPUE, age composition, fishery independent spawning biomass survey
South Australia	Spencer Gulf/West Coast	NZRLF, MSF	Depleted	Catch, CPUE, age composition, fishery independent spawning biomass survey
South Australia, Victoria	Western Victoria	SZRLF, MSF, VIT, OF, PPBWPF, VRLF, OW	Sustainable	Catch, CPUE, pre-recruit survey, age and length composition
Victoria	Eastern Victoria	VIT, CIF, GLF, OF, OPSF, VRLF	Undefined	Catch
Western Australia	West Coast	CSLPMF, WCDGDLIMF, WCDSIMF	Recovering	Catch, fishing mortality rate, spawning potential ratio
Western Australia	Shark Bay Oceanic	GDSMF, NDSMF, PLF	Depleted	Catch, CPUE, estimated biomass
Western Australia	South Coast	JASDGDLMF, SCEMF, WL (SC), FBLC74	Sustainable	Catch, fishing mortality rate, spawning potential ratio
Western Australia	Shark Bay Inshore Denham Sound	SBBSMNMF	Sustainable	Catch, estimated biomass
Western Australia	Shark Bay Inshore Eastern Gulf	SBBSMNMF	Sustainable	Catch, estimated biomass
Western Australia	Shark Bay Inshore Freycinet Estuary	SBBSMNMF	Sustainable	Catch, estimated biomass

[1] CIFCorner Inlet Fishery (VIC) ; CSLPMFCockburn Sound (Line & Pot) Managed Fishery (WA) ; ECIFFFEast Coast Inshore Fin Fish Fishery (QLD) ; FBLC74Fishing Boat Licence Conditions (WA) ; GDSMFGascoyne Demersal Scalefish Managed Fishery (WA) ; GLFGippsl& Lakes Fishery (VIC) ; JASDGDLMFJoint Authority Southern Demersal Gillnet & Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA) ; MSFMarine Scalefish Fishery (SA) ; NDSMFNorthern Demersal Scalefish Managed Fishery (WA) ; NZRLFNorthern Zone Rock Lobster Fishery (SA) ; OFOcean Fishery (VIC) ; OPSFOcean Purse Seine Fishery (VIC) ; OTLFOcean Trap & Line Fishery (NSW) ; OWOcean Wrasse (VIC) ; PLFPilbara Line Fishery (WA) ; PPBWPFPort Phillip Bay & Western Port Bay Fishery (VIC) ; RRFFFRocky Reef Fin Fish Fishery (QLD) ; SBBSMNMFShark Bay Beach Seine & Mesh Net Managed Fishery (WA) ; SCEMFSouth Coast Estuarine Managed Fishery (WA) ; SZRLFSouthern Zone Rock Lobster Fishery (SA) ; VITVictorian Inshore Trawl Fishery (VIC) ; VRLFVictorian Rock Lobster Fishery (VIC) ; WCDGDLIMFWest Coast Demersal Gillnet & Demersal Longline (Interim) Managed Fishery (WA) ; WCDSIMFWest Coast Demersal Scalefish (Interim) Managed Fishery (WA) ; WL (SC) ; Open Access in the South Coast (WA)

FRDC-funded research demonstrates that Snapper stocks cross State boundaries, and as such, there are a number of FRDC projects that explore the need for inter-jurisdictional management practices. The potential for managing species across multiple State boundaries will challenge the current fisheries management practices and require collaboration among State and Commonwealth-based fisheries agencies.

Furthermore, FRDC-funded research has demonstrated that Snapper are sensitive to changing local climatic conditions (e.g. increasing water temperatures) (2011-039). This is resulting in Snapper extending their distribution further southward – e.g. Snapper are becoming more frequently encountered in Tasmania (2018-070). While this change in distribution creates opportunities in Tasmania, there is also the potential for coincident losses throughout the northern distribution of the species, as conditions become unfavourable (e.g. less frequent encounters in southern Qld) (2016-139).

At a national level, the stock status of Snapper is relatively positive (Table 2). However, for some key stocks there are concerns about the sustainability of the species. For example, catches of the Western Australian commercial Snapper fishery in Shark Bay have progressively decreased, in spite of substantial management interventions, such that retained catches are below 50% of pre-2003 levels.

Declines in catches have been most notable in South Australia, which has historically produced the largest catches of Snapper in Australia. Concerns about sustainability for this economically and socially important species in South Australia have resulted in considerable effort from PIRSA Fisheries and Aquaculture to recover these stocks. This is also apparent in the formation of the cross-sector 'Snapper Working Group' by the State Government, which is tasked with enhancing Snapper management arrangements. A report from a recent meeting of the Working Group can be found here, which notes the FRDC investment in Snapper.

FRDC has been in consultation with PIRSA Fisheries and Aquaculture in addressing Snapper stock sustainability in South Australia. This has included FRDC investing and/or seeking projects funded through the South Australian Research Advisory Committee, to address the following information needs:

- Assessing and optimising the survival of Snapper post release
- Assessing alternate, non-lethal and cost effective approaches to estimating the biomass and recruitment success of Snapper
- Determining the options for the SA charter fishing sector (that largely targets Snapper)

The details relating to each of these three projects are detailed below.

Project no.	Project Title	Status	PI	Organisation	Budget ($)
2018-154	A market research-driven and co-management approach to developing an industry strategy for the SA Charter Boat Fishery	Active	Julian Morison	BDOEcon-Search	32,840
Industry has highlighted a need to address this declining trend through accessing new opportunities. While the fishery is a commercial operation offering a recreational fishing platform, it is not explicitly accounted for in the process of assessing recreational or commercial fishery performance. The need to better understand the needs and wants of the fishery's client group (recreational fishers) and the capacity of the charter fleet to meet this demand is critical to addressing the continued decline in participation and fishery profitability. Addressing the reasons for the ongoing decline is important if the industry is to improve its economic performance. The fishery has capacity within its resource shares for growth for a wide range of species including key species such as Snapper and King George whiting. Notwithstanding this, there is also a need to explore and develop broader experiences for clients on charter operations other than fishing.					
2019-044	Quantifying post-release survival and movement of Snapper (*Chrysophrys auratus*): Informing strategies to engage the fishing community in practices to enhance the sustainability of an important multi-sector fishery	Approved	Mike Steer	SARDI-University of Adelaide	395,517
PIRSA Fisheries and Aquaculture (PIRSA F&A) and South Australia's Research Advisory Committee identified the need to develop cross-sectorial research to support the future management and recovery of SA's Snapper stocks. The priority identified was to better understand the factors that explain Post Release Survival (PRS) of Snapper, to identify practical strategies to mitigate PRS, and subsequently use that information to improve awareness among all fishing sectors, but particularly the recreational fishers in relation to capture, handling and release practices in cases where under-sized (<MLL) fish or unwanted (non-targeted) individuals are captured and discarded. These state-based research priorities are in-line with the National Strategy for the Survival of Released Line Caught Fish, a key initiative of the FRDC in conjunction with recreational fishing bodies to improve the understanding of, and increase the survival probabilities of released line-caught fish. A linked strategic review by McLeay et al. (2002) outlined priorities for Snapper that are consistent with the objectives of this proposal. Community concern for the humane-treatment of animals is gaining global traction and no longer confined to livestock. The rising pressure from animal rights movements on banning catch and release fishing in some European states have motivated fishers to develop more responsible fishing and fish-handling practices aimed at harm-minimisation at the level of fish stocks, individual fish and the environment (Winstanley 2019). Similar motivation is occurring Australia, with the development of the 'Tuna Champions' initiative, and is likely to extend to other key species that are commonly targeted by recreational fishers or appreciated by Australian seafood consumers. There is a need to be pro-active and address these challenges, particularly with high profile fishery species, to ensure the industry maintains best-practice approaches in resource use and sustainable management.					
SARAC Priority	Cost-effective, non-destructive solutions to developing a pre-recruitment index for Snapper	Application being evaluated			
Snapper pre-recruitment surveys have been undertaken in South Australia from 2000 to 2010 using an established trawl-based sampling method. However, this method is non-discriminatory, incidentally catching a range of other demersal species and is relatively destructive. Other non-destructive survey techniques, such as fish traps, baited remote underwater surveillance (BRUVS), or video transects may provide feasible and cost-effective alternatives. There is a need to trial and establish alternate methods that provide a suitable proxy for recruitment strength without destructively sampling undersize Snapper and the demersal assemblage. This will also contribute in reducing the impact of non-harvested fishing mortality. In addition, there is the need to develop a better understanding of larval ecology, connectivity, and the underlying causes of the variability in recruitment. The combined benefits from addressing both needs would significantly enhance the scientific basis from to be able to predict future trends in fishable Snapper biomass.					

These South Australian Snapper focused projects complement a suite of FRDC-funded activities that are informing the structural reform of the South Australian Marine Scalefish Fishery (MSF), of which, Snapper is a key target species. Projects associated with the MSF structural reform include:

Project no.	Project Title	Status	PI	Organisation	Budget ($)
2018-035	Fisheries biology of Western Australian Salmon: improving our understanding of population dynamics in South Australia to enable quantitative stock assessments and improved fisheries management	Active	Jason Earl	SARDI-University of Adelaide	246,454
2018-011	A South Australian gulfs and coastal ecosystem model to optimise multi-species fisheries management in a changing environment	Active	Simon Goldsworthy	SARDI-University of Adelaide	218,932
2017-183	Alternate business models for Community Supported Fisheries	Active	Franca Romero	Wildcatch Fisheries SA	100,280
2017-023	ESD risk assessment for under-utilised species to facilitate structural reform of South Australia's commercial Marine Scalefish Fishery	Active	Tony Fowler	SARDI	109,546
2017-014	Informing the structural reform of South Australia's Marine Scalefish Fishery	Active	Mike Steer	SARDI	496,836
2016-213	Building economics into fisheries management decision making - to utilise a suite of SA case studies	Active	Julian Morison	BDOEconSearch	158,500
2016-003	King George Whiting spawning dynamics in South Australia's southern Gulfs: to inform improved assessment and management of the resource	Active	Mike Steer	SARDI	454,390
2015-505	Identifying opportunities for developing community supported fisheries in South Australia's small scale, multi-species, multi-gear community based fisheries	Active	Johnathon McPhail	PIRSA	20,000
2015-220	Isolating social and economic objectives within multiple stakeholder fisheries – a case study: the South Australian Marine Scalefish Fishery	Finalised	Melissa Nursey-Bray	University of Adelaide	51,500
2015-018	Do commercial fishery data reflect stock status in South Australia's Southern Garfish fisheries?	Active	Tony Fowler	SARDI	498,941

List of FRDC Snapper Projects

The summary details of the active and completed projects can be found on the FRDC web site (www.frdc.com.au). Note that these are a representative subset of FRDC-funded projects that relate to Snapper. Moreover, given the iconic status of Snapper in Australia, there is a suite of non-FRDC funded research projects being undertaken by the State-based

fishery research organisations and universities throughout the distribution of the species that are not reflected here.

Project no.	Project Title	Status	PI	Organisation	Budget ($)
2018-091	Assessment of national-scale tracking of commercially important fish species	Active	Michelle Heupel	SIMS	85,000
2018-050	Where did the snapper go? Determining factors influencing the recovery of snapper stocks on the west coast of Australia	Active	Gary Jackson	DPIRD WA	352,587
2015-216	Informing inter-jurisdictional snapper management in eastern Australia	Active	Wayne Sumpton	DAF QLD	315,000
2014-019	Developing a fishery independent estimate of biomass for snapper	Finalised	Mike Steer	SARDI	316,985
2013-201	Development of a harvest management, governance and resource sharing framework for a complex multi-sector, multi-jurisdiction fishery: the south-east Australian 'western' snapper stock	Active	Paul Hamer	VFA	598,685
2013-031	A trophic model for Gulf St Vincent: balancing exploitation of three fisheries in an Ecosystem Based Fisheries Management framework	Finalised	Simon Goldsworthy	SARDI Food Safety and Innovation	138,407
2013-018	Using commercial and recreational fisher knowledge to reconstruct historical catch rates for Queensland Snapper (*Chrysophrys auratus*), Spanish Mackerel (*Scomberomorus commerson*) and Coral Trout (*Plectropomus* spp.): long-term data for incorporation into future stock assessments	Finalised	Ruth Thurstan	University of Queensland	44,800
2012-020	The influence of fish movement on regional fishery production and stock structure for South Australia's Snapper (*Chrysophrys auratus*) fishery	Finalised	Tony Fowler	SARDI	371,409
2010-004	Passive acoustic techniques to monitor aggregations of sound producing fish species	Finalised	Miles Parsons	Curtin University	141,000
2009-006	Determination of the diets of Snapper and Silver Trevally and construction of a food web for the demersal fish community in south-western Australia	Finalised	Ian Potter	Murdoch University	74,288
2006-046	Effects of environmental variability on recruitment to fisheries in South Australia	Finalised	John Middleton	SARDI	49,709
2004-051	Management and monitoring of fish spawning aggregations within the West Coast Bio-region of Western Australia	Finalised	Michael Mackie	DPIRD WA	630,431

2003-074	National Strategy for the Survival of Released Line Caught Fish: survival of snapper and bream released by recreational fishers in sheltered coastal temperate ecosystems	Finalised	Simon Conron	VFA	216,697
2003-066	Comparing conventional 'social-based', and alternative output-based, management models for recreational finfish fisheries using Shark Bay pink snapper as a case study	Finalised	Gary Jackson	DPIRD WA	204,735
2002-001	Adult migration, population replenishment and geographic structure for snapper in South Australia	Finalised	Tony Fowler	SARDI	109,089
2001-061	Identifying nursery areas used by inner bay and oceanic snapper stocks in the Shark Bay region, in relation to the effect of prawn trawling on inner bay snapper stocks	Finalised	Dan Gaughan	DPIRD WA	97,634
2000-139	Quantification of changes in recreational catch and effort on inner Shark Bay snapper species following implementation of responsive management measures	Finalised	Neil Sumner	DPIRD WA	49,125
2000-138	Minimising the cost of future stock monitoring, and assessment of the potential for increased yields from the oceanic snapper, *Pagrus auratus*, stock off Shark Bay	Finalised	Dan Gaughan	DPIRD WA	89,792
1999-145	Stock assessment models with graphical user interfaces for key South Australian marine finfish stocks	Finalised	Richard McGarvey	SARDI	287,738
1999-134	Migratory dynamics and recruitment of snapper (*Pagrus auratus*) in Victorian Waters	Finalised	Greg Jenkins	VFA	513,978
1999-145	Stock assessment models with graphical user interfaces for key South Australian marine finfish stocks	Finalised	Richard McGarvey	SARDI	287,738
1999-134	Migratory dynamics and recruitment of snapper (*Pagrus auratus*) in Victorian Waters	Finalised	Greg Jenkins	VFA	513,978
1998-146	Evaluation of recreational fishery management controls of commercially important scalefish species	Finalised	Simon Conron	VFA	104,000
1998-139	Coastal stocks of fish: from which estuaries are most adults derived?	Finalised	Bronwyn Gillanders	University of Sydney	142,684
1997-127	Assessment of the snapper fishery in Victoria	Finalised	Patrick Coutin	VFA	237,167