

Snapper Science Stakeholder Group (SSSG) Communiqué

Meeting #4 – Monday 27 November 2023

The fourth Snapper Science Stakeholder meeting covered the upcoming field work for summer 2023/24, as well as updates for two existing projects - 'Quantify post-release survival and movement of Snapper in South Australia' (FRDC [2019-044](#)) and 'Developing a pre-recruit index' (FRDC [2019-046](#)).

Refinement of Theme 2 – Estimates of Biomass

The feedback received from the stakeholder group following Meeting No. 3 (August 2023) was presented, which was used to refine research projects in Theme 2 – Estimates of Biomass. The projects are:

- Refinement of the daily egg production method (DEPM) for Snapper
- Development and application of hydroacoustic surveys
- Scoping study for close-kin mark-recapture (CKMR) for Snapper
- Enhancement of the 'SnapEst' fishery assessment model

Group feedback was used to refine the finalised application and assisted in clarifying specifics of the different methods. In particular, the presentation on projection modelling by Dr Rick McGarvey generated considerable interest regarding how the relative abundance of juvenile Snapper from pre-recruit surveys will be used to predict future trends in fishable biomass.

A consistent message from the stakeholder group was the importance of cost-effective monitoring for Snapper into the future.

Recent work

- Submission of funding applications to FRDC for Themes 1 and 2.
- Procurement for commercial fishers and processors for Snapper sampling (almost finished).
- Recruitment of numerous staff, with some to start in early 2024.
- Launch of the [Snapper Recovery microsite](#) on the PIRSA website and the development of communication materials for the post-release survival project.
- Establishment of DEPM Working Group, which includes researchers from across southern Australia and guides project development and survey design for the DEPM refinement study.
- Juvenile Snapper bycatch was retained during fishery-dependent prawn surveys in Spencer Gulf (SG) and Gulf St Vincent (GSV).

Field work plan – summer 2023/24

Field work program	Expected Dates
Biological sampling program	December 2023 to June 2026
DEPM refinement study	12-18 December 2023 and 10-16 January 2024
Hydroacoustic surveys	12-18 December 2023 and 10-16 January 2024
Juvenile Snapper release (SG)	8-12 January 2024
Juvenile recruitment surveys	March 2024

Biological sampling program

Representative samples of Snapper will be collected using commercial fishers and processors from five regions – the West Coast of Eyre Peninsula (WC), Northern Spencer Gulf (NSG), Southern Spencer Gulf (SSG), Northern Gulf St Vincent (NGSV) and Southern Gulf St Vincent (SGSV). Representative samples for the South-East Region (SE) will be collected through a market sampling program. The target is more than 250 fish per region in each calendar year.

Samples will be caught by commercial Marine Scalefish Fishery (MSF) fishers with a SARDI observer onboard. The study will collect biological information including length, weight, sex and reproductive condition, with samples obtained including otoliths for ageing (Figure 1) and fin clips for genetics. After biological information is collected, the fish will be filleted by accredited fish processors and the fillets donated to Foodbank who distribute them to people in need across South Australia.



Figure 1 – example of a sectioned Snapper otolith with annual growth rings.

Theme 2 – Estimates of biomass

At the meeting, Dr Mick Drew presented the scheduled fieldwork for Research Theme 2 – Estimates of Biomass in summer 2023/24. The work relates to two projects: (i) the DEPM survey refinement study and (ii) development and application of hydroacoustic surveys. Fieldwork for the two projects will occur in December 2023 and January 2024, with the two methods applied over the same area at the same time to enable comparison of the different methods.

The DEPM refinement survey involves two main objectives to determine the most appropriate sampling design for future applications of DEPM for Snapper. The first objective is to evaluate the spatial scale of sampling, i.e., how far apart plankton samples are collected throughout the survey area. This objective relates to the aggregating behaviour of Snapper. Samples will be collected in a grid pattern at three spatial scales – $2 \times 4 \text{ nm}^2$, $2 \times 2 \text{ nm}^2$, and $1.4 \times 1.4 \text{ nm}^2$ (Figure 2). Previous surveys for Snapper have sampled plankton at $2 \times 4 \text{ nm}^2$.

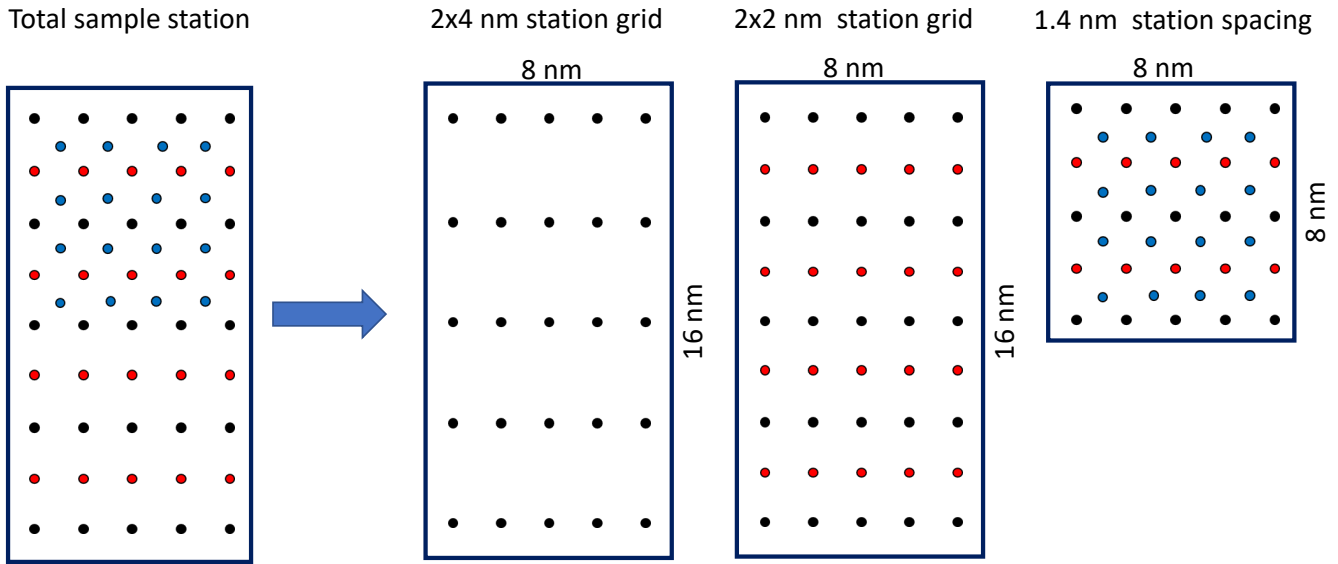


Figure 2. Schematic of the spatial sampling design for the DEPM refinement study.

Due to the relatively low counts of Snapper eggs collected in previous surveys, the second objective is to compare the effectiveness of different methods to sample Snapper eggs. Previous surveys for Snapper eggs in SA, WA, and NZ over the past 30 years have used a paired bongo net that is towed diagonally through the water column from near the seafloor to the surface (i.e., an oblique tow). At each plankton sampling station, three different plankton tows will be done to compare their effectiveness to sample Snapper eggs. The three tow types are (Figure 3):

- Vertical – deployed to near the seafloor and retrieved vertically back to the vessel.
- Oblique – deployed to near the seafloor and retrieved diagonally back to the vessel.
- Horizontal – deployed and towed at the surface for 5-minutes.

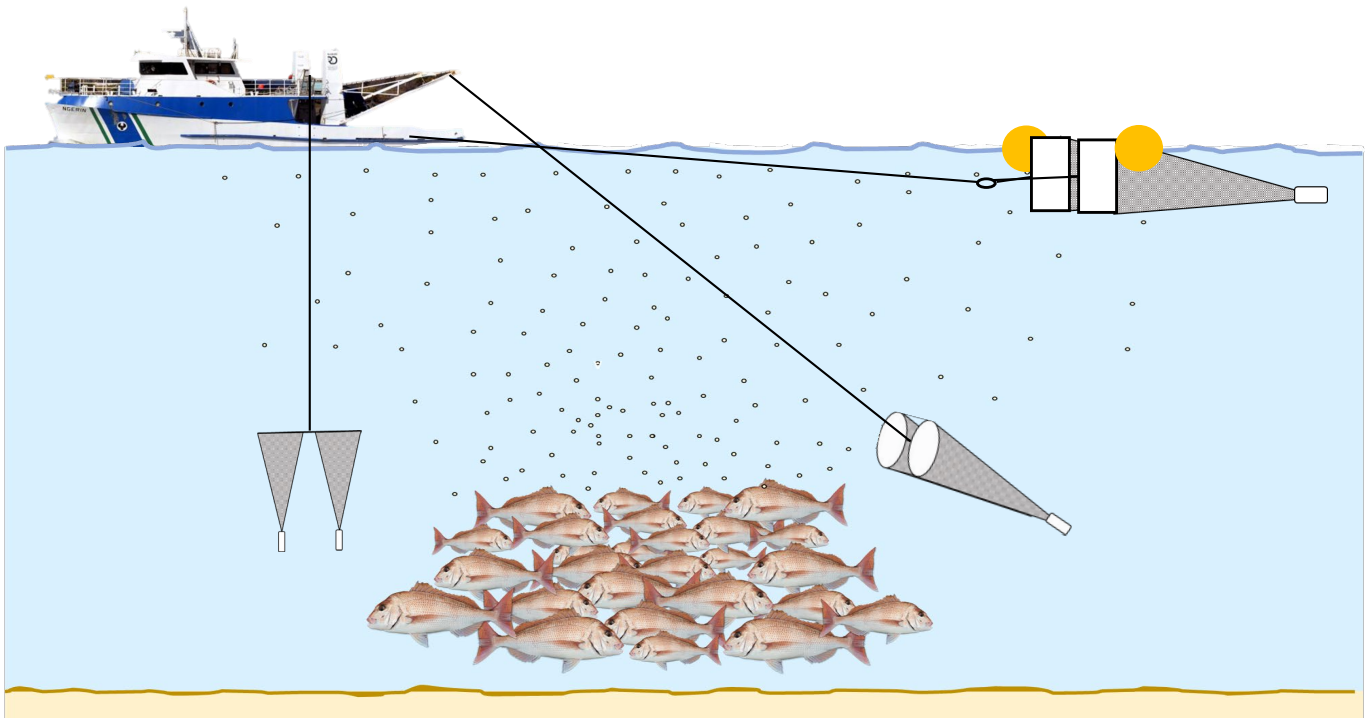


Figure 3. Conceptual diagram of the methods that will be compared to sample Snapper eggs. The methods are vertical, oblique (diagonal), and horizontal (surface) tows with paired plankton nets.

Similarly, the hydroacoustic surveys will compare different sampling designs to identify the most appropriate structure for future applications in SA's gulfs. The sampling designs are:

- Systematic series of transects equally spaced throughout the survey area.
- Localised areas of intensive sampling around Snapper aggregations.
- Consideration of an integrated design, i.e., transects and targeted sampling.

The sampling designs were developed from previous surveys in Western Australia and are supported by international experts. During the acoustic survey, underwater video will be used to quantify the composition of fish schools (i.e., which species are present) and to estimate the length of individual fish.

An update on the fieldwork for the DEPM refinement study and hydroacoustic surveys will be presented at the next Snapper stakeholder meeting.

Juvenile Snapper release

A release of hatchery-reared juvenile Snapper will occur in early January 2024 at Weeroona Island in the northern Spencer Gulf. The fish will be released over consecutive days and will be transported by SARDI staff.

Communications update

A communications update was provided to complement research and project milestones over the coming months. Past activities were also discussed with statistics provided in regard to the website traffic and analytics to the Snapper recovery pages on the PIRSA website and media exposure around the release of the website hub.

Post-release survival educational materials

In December 2023, educational materials will be released to the public to encourage recreational fishers to use best practice capture, handling and release techniques, based on the latest research from SARDI, to improve the survival of released fish. During the meeting the SSSG reviewed the materials and had the opportunity to provide feedback. This includes:

- Ministerial release from the Minister for Primary Industries and Regional Development
- Webpages with information on the PIRSA website to explain the effects of barotrauma and best practice capture, handling and release techniques.
- A series of videos to demonstrate the best practice techniques and show recreational fishers how to improve the chance of survival of released fish, with videos being hosted on [YouTube](#), the [PIRSA website](#) and shared across social channels.
- A flyer that will be printed and available at fishing and tackle stores and visitor information centres throughout South Australia, with a focus on the Eyre and Yorke Peninsulas.

Other communications activities discussed included

- Media to promote the fingerling release in Weeroona Island, Spencer Gulf in January 2024.
- Using video opportunities where possible to capture footage of the two research trips in December and January, the processing of biological sampling at West Beach and processing of plankton samples.
- Release of a short video to explain concept of Snapper spawning at West Beach facility.
- Amplification of Snapper milestones through the SSSG's members channels.

Project update - Snapper post-release survival

Dr Troy Rogers provided an update on the Snapper post-release survival project (FRDC 2019-044), which is supported by the Fisheries Research and Development Corporation (FRDC).

The study has shown a clear relationship between depth and barotrauma injuries experienced by Snapper, with the number and severity of barotrauma injuries increasing with depth, which resulted in a higher rate of post-release mortality.

The study identified that the survival rates of released Snapper differed across the three depths considered. The survival rate was highest at 17 m (100% survival), decreased at 25 m (78% survival) and was lowest at 32 m (68% survival). The size range of Snapper sampled was 40-80 cm.

It was discussed that studies have investigated venting to increase survival rates. However, it has been demonstrated that incorrect venting can cause greater damage to Snapper which is why it was not considered in this project.

A series of videos and other resources have been developed by SARDI to educate recreational fishers on releasing Snapper to increase their chance of survival. These will be released in early December prior to the school holiday period and will cover capture, handling and release techniques and how to use a release weight.



Project update - developing a pre-recruit index

Dr Troy Rogers presented an update on the 'Developing a pre-recruit index' project (FRDC 2019-046), which is supported by the FRDC.

A pre-recruit index is a fishery-independent metric to monitor trends in the abundance of juveniles (i.e., age 0 fish that were spawned in the previous summer). The annual series of juvenile abundance provides an indication of recruitment strength that can be used to predict future trends in the Snapper population.

The pre-recruit index is developed from the relative abundance of age-0 juvenile Snapper collected in targeted surveys in Spencer Gulf and Gulf St Vincent. For Spencer Gulf, the nursery areas are well defined as the result of previous surveys for juvenile Snapper from 2000 to 2010. However, the nursery areas for Gulf St Vincent are poorly understood, as surveys were not done in this gulf previously.

To address this need, a habitat survey in Gulf St Vincent will be undertaken in 2024 to identify areas that support the appropriate habitat for juvenile Snapper. These areas will then be sampled to monitor trends in recruitment.

Next meeting

The next SSSG meeting is anticipated to be held in late February or early March 2024.