

Snapper Science Stakeholder Group (SSSG) Communiqué

Meeting #5 – Wednesday 28 February 2024

The fifth Snapper Science Stakeholder meeting focused on the extensive field work completed over summer 2023/24. This included surveys to estimate biomass in Gulf St Vincent using the daily egg production method (DEPM) and hydroacoustic techniques, as well as the collection of Snapper from across South Australia for biological samples.

HIGHLIGHTS

- **Biological Sampling Program** – recommenced in December 2023. Over 1,500 Snapper were sampled across South Australia in 2023, with almost 600 fish sampled to date in 2024.
- **DEPM Refinement** – two field surveys completed in Gulf St Vincent in December 2023 and January 2024. Compared three methods to sample Snapper eggs and the spatial scale of sample collection. Plankton samples currently being processed to identify Snapper eggs.
- **Hydroacoustic Surveys** – two field surveys completed in Gulf St Vincent in December 2023 and January 2024. Used acoustics to locate schools of fish throughout the survey area and underwater video to identify the species present. Data analysis underway.
- **Stock Enhancement Program** – approximately 50,000 juvenile Snapper were released into northern Spencer Gulf in January 2024 through the restocking program. Multiple releases are planned for Gulf St Vincent in March and April 2024, including a community event planned for Black Point.

Next meeting

The next SSSG meeting is planned for June 2024, with the date to be confirmed. The meeting will include milestone updates for projects in Research Theme 1 – Biology and Ecology such as juvenile recruitment surveys and sampling for Snapper on the West Coast.

Biological sampling program

The continued sampling of Snapper during the fishery closure is essential to monitor trends in the population and detect signs of recovery. Since the start of the closure in late 2019, SARDI has contracted and worked with commercial fishers of the Marine Scalefish Fishery (MSF) to collect representative samples of Snapper to continue the annual time series of length and age structures for each region. The biological information collected from these fish is used to monitor trends in the population, such as recruitment, and provides samples that are used in numerous projects of the Snapper Science Program.

The samples are collected by commercial MSF fishers under the direction and presence of a SARDI observer. The fish are then processed by SARDI staff at an accredited fish processing facility to collect biological information including length, weight, sex, and reproductive condition, with samples obtained including otoliths to estimate age and fin clips for genetics. After biological information is collected, the fish are filleted by the processors and the fillets donated to Foodbank who distribute them to people in need across South Australia.

Currently, a total of 15 commercial MSF fishers across the West Coast of Eyre Peninsula, Spencer Gulf, and Gulf St Vincent are contracted for this purpose. Snapper from the South-East region are accessed through a routine sampling program at the SAFCOL fish market. In 2023, over 1,500 fish were sampled across the State and almost 600 fish have been sampled in January and February 2024.



Figure 1 – Biological sampling program. Left – Snapper captured on the West Coast, right – processing at Thevenard Fish Processors.

DEPM refinement study

Two field surveys to refine the daily egg production method (DEPM) for Snapper were completed from 13 to 19 December 2023 and 11 to 17 January 2024. The surveys were done in Gulf St Vincent and addressed two main objectives to determine the most appropriate sampling design for future applications of DEPM for Snapper. They were:

- 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.
- compare the effectiveness of different methods to sample Snapper eggs. This involved the comparison of three types of plankton tow – vertical, oblique, and horizontal.

Sampling was done from *MRV Ngerin* and involved a team of five research staff led by Dr Michael Drew (SARDI). The vessel operated for 24 hours a day and at each sampling station the team completed the three plankton sampling methods. Each plankton sample was preserved in ethanol and refrigerated in preparation for processing in the laboratory.

Adult Snapper were sampled from multiple sites throughout the survey area by a commercial MSF fisher with a SARDI observer present. The fish were processed for biological information to estimate the adult parameters of sex ratio (R), spawning fraction (S), batch fecundity (F), and female weight (W).

The mixed plankton samples are currently being processed in the laboratory by a team of four researchers. Snapper eggs are identified from the plankton samples under a microscope following a multi-stage process based on their size and features and is validated using a molecular technique. It is anticipated that the plankton sorting will take several months to complete, with the results expected in September 2024.



Figure 2 – retrieving the plankton net from an oblique tow.

Hydroacoustic surveys

There is considerable interest from all stakeholders around the feasibility of hydroacoustic techniques to estimate the biomass of Snapper in SA's gulfs. The project is led by Dr Ben Scouling (CSIRO) and builds upon previous work using hydroacoustics for Snapper in Western Australia.

Two field surveys were completed in Gulf St Vincent from 13 to 19 December 2023 and 11 to 17 January 2024, i.e., at the same time and over the same area as the DEPM surveys. There were three objectives:

- characterise the broad acoustic environment (i.e., species present and spatial distribution);
- quantify the composition of fish aggregations (i.e., species and size of individuals); and
- estimate the biomass of Snapper in the survey area.

The hydroacoustic equipment was fitted to a commercial vessel that operated during daylight hours. The equipment was calibrated prior to the survey and data were recorded continuously throughout the survey area. The vessel followed a predetermined track that included a series of equally spaced transects with localised areas of intensive sampling around Snapper aggregations.

When an aggregation of fish was identified, a variety of underwater cameras were deployed to identify the species present and estimate the size of individual fish. The most commonly observed species were Snapper, Yellowtail Scad, Blue Mackerel, and Silver Trevally. Snapper were generally found close to structures and were often observed in schools with other fish species, particularly Yellowtail Scad and Silver Trevally.

Data from the hydroacoustic recordings and video analysis are currently being analysed, which will be used to estimate biomass in the survey area.

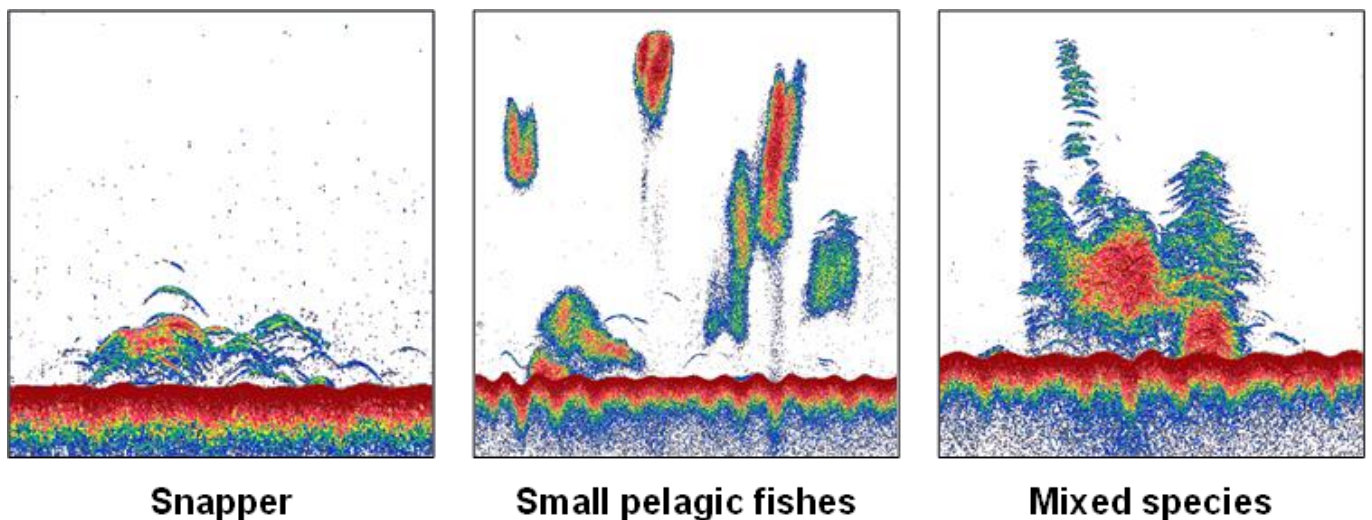


Figure 3 – examples of echograms recorded in Gulf St Vincent: Snapper (left), small pelagic fish species (middle), and a mixed species aggregation (right).

Stock enhancement program

The Aquaculture team at SARDI have successfully spawned and reared three batches of juvenile Snapper for release in early 2024. The first batch of fish (approximately 50,000) was produced from brood stock that were collected in Spencer Gulf in 2020 and have been maintained on-site at the South Australia Aquatic Sciences Centre (SAASC) at West Beach. The juvenile Snapper were released at Weeroona Island during January 2024, which is directly adjacent to the recognised nursery area for Snapper near Ward Spit.

The second batch of juvenile Snapper was produced from brood stock that were collected in Gulf St Vincent in 2020 and maintained at the SAASC. These fish, approximately 100,000 juvenile Snapper, will be released at Black Point on eastern Yorke Peninsula in early March. This location was selected because it is adjacent to a nursery area for Snapper and supports the appropriate habitats for the juvenile fish.

The third batch of juvenile Snapper was reared from brood stock that were collected in Gulf St Vincent in January 2024 that were immediately spawned in captivity at the SAASC. From this spawning event, approximately 150,000 juvenile Snapper will be ready for release in April 2024. As a commitment of the Snapper Recovery Package, a community event will be held to provide the public an opportunity to participate in the release. The proposed date of the event is Monday 15 April, with the fish to be released from 7:30am. Details of the event will be broadly distributed once finalised in March.



Figure 4 – juvenile Snapper transported to Black Point in preparation for release.