The NSW Commercial Fisheries Port Monitoring Program

Data summary report for 2020/21

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Introduction

Within New South Wales (NSW) monitoring of commercial fisheries is the primary source of information for stock assessment, including data on catch and effort as reported in mandatory logbooks, as well as information on the sizes, ages and species composition in landed catches. These stock assessments underpin management decisions, determination of quota allocations and fulfil Departmental obligations as part of the national Status of Australian Fish Stocks (SAFS) reports.

The Port Monitoring Program is a long-term collaboration between the commercial seafood industry (fishers, regional co-operatives and the Sydney Fish Markets) and NSW DPI (Fisheries). Port monitoring of the landed commercial catch has been an important component of fisheries assessments in NSW for more than 70 years, and the time series of data generated provide considerable insight into the dynamics of the stocks and the fisheries that exploit them, far beyond what is achievable through simple logbook catch and effort data. For example, age and size composition samples are used to calculate indicators such as mean age, mortality rates or the fraction of fish smaller than a threshold length. These indicators are used, along with indicators of relative abundance such as catch rates, to make inferences about current levels of fishing pressure and relative biomass – the 2 requirements for the SAFS exploitation status assessments. Monitoring the size and age composition of the commercial catch is also a cost-effective option to insure against deficiencies of commercial catch per unit effort data.

In addition to providing essential data for stock assessment and management, the program promotes co-management, industry ownership of monitoring data and supports the ongoing social licence to fish. The program is completed within the 'Monitoring Program' of the Fisheries Resource Assessment Unit of DPI. The program directly services the NSW DPI Strategic Plan 2021-2030 strategic outcome "Sustainable Resources and Productive Landscapes", the strategic priority to "Assess and monitor natural resource health for sustainability", and the measure of the outcome being "100% of all assessed fish stocks primarily managed by NSW are sustainable".

The Port Monitoring Program directly contributes to:

- Stock status assessments in terms of changes to size and age compositions in landings
- Validation of the commercial logbook records
- Information on species compositions in species complexes (e.g. the trawl whiting species, bugs, unspecified catch categories)
- Baseline data on biology (e.g. morphometric relationships such as length/weight and fork length/total length, reproductive biology, age and growth, diet etc.)
- Assessment of recovery programs
- Analyses of the impacts of management changes (e.g. changes to minimum legal lengths)
- Stakeholder engagement – DPI staff at co-operatives liaise with commercial fishers and co-op staff and are at the front line of communications
- Various externally funded projects with commitments to provide data on commercial landings
- Unplanned events – e.g. Perfluorooctane sulfonate (PFOS) contamination sampling, prawn white-spot monitoring
- Assisting the commercial fishing industry to maintain a social licence to operate through transparency in operations and co-operation with government

This data summary report is designed to be a source of information for Fisheries Resource Assessment scientists responsible for stock assessment, as well as fisheries managers, industry and interested stakeholders. Review of the performance of the program is essential to maintain confidence in the data collected and to provide an opportunity for the scientists responsible for each species to refine the sampling protocols. The report also proves transparency around expenditure from the Commercial Trust.

This version of the data report has had the reported commercial catch data by month and sampling strata removed from the Tables for reasons of confidentiality.

Methods

The NSW commercial fisheries port monitoring program is a collaboration between industry and government. The Sydney Fish Markets and various key places of landing (including the Ballina, Iluka, Maclean, Coffs Harbour, Newcastle and Nelson Bay Fishermen's Co-operatives) allow DPI-Fisheries monitoring staff access to landed catches prior to being sold.

The port monitoring program utilizes a spatially and temporally stratified sampling design in order to generate representative estimates of the landed commercial catch. The base units of sampling are generally monthly and commercial fishing reporting zone; however, these may vary depending on advice from fisheries scientists primarily responsible for the assessment (species' lead) and/or management. Sampling protocols are established for each species to optimize the likelihood that representative samples of the landed catch are obtained from a port (fishing reporting zone) on each day sampled. The number of days sampled each month and area may differ between species and are based upon advice from each species' lead within the Resource Assessment Unit, as well as the dynamics of the fishery and the capacity of the program.

The relative importance of landings from each month/fishing zone are dependent upon the reported commercial landings provided by the commercial fishing logbooks. These data are used to reweight and combine the sampled length frequency data in each base unit of sampling (e.g. month/fishing zone) in order to provide estimates that are representative of the entire fishing fleet in NSW. The Department has developed efficient computing applications to automate these processes. The project has also moved largely to electronic data collection. Electronic measuring boards have made data available in real time and largely removed the need for paper-based records and the associated data entry expense and potential data entry errors.

Process for selection of species to monitor

Species to be included in the port monitoring program are selected each year through a rigorous process involving all DPI-Fisheries stock assessment scientists. The process utilizes the Species Priority List (SPL) for Resource Assessment (see Appendix B) to rank species of relative importance, followed by the Data and Monitoring Plan (DMP) to rank species for which port monitoring has been identified as being important for assessment purposes. Within the DMP the requirements of a port monitoring program for each species needs under a base case scenario required to inform a reliable assessment are also identified and ranked. These requirements being potentially biology, length composition and/or age composition. Following the identification and ranking of species requiring port monitoring the list is sent to all relevant assessment scientists who are designated 'leads' for each species for their recommendations. This is an important step in the process as the SPL was not designed specifically to be used for Port Monitoring, and under an environment limited by resources it may not be suitable to rely on the SPL as being totally prescriptive. Species leads may also be aware of other programs collecting similar data, therefore allowing the group to make more balanced and practical decisions on allocation of port monitoring resources to species.

Generally, between 10-15 species are monitored for length compositions each year, with the numbers being dictated by sampling designs, sampling logistics and the resources available. In addition, a few (generally between 3 and 5) species are sampled for age composition. Port monitoring staff assess the feasibility of successfully sampling each identified species based on the temporal and spatial distribution of the fishery, the operations of the fleet and how they land catches, and the resourcing of the program. Once a final list of proposed species to monitor for lengths and ages has been compiled it is sent for endorsement by the relevant scientists.

Fish assessed for age are purchased directly from either the Fishermen's co-operative or the Sydney Fish Markets. Where it is considered cost-effective (e.g. for high value species such as large Snapper and Mulloway), the fish have their otoliths removed and are resold to recoup costs.

Details of the prioritisation and justification, sampling aims, reported landings and sampling data for 2020/21 are presented below for each species separately. A brief commentary on how well the sampling met the aims is provided for each species.

Balmain and Smooth Bug

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales, Queensland	Eastern Australia	**Sustainable**	Catch rates, catch, effort, size structure, risk assessment

OTF Ocean Trawl Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **45**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **24**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **3**

Rank for lengths – **24**

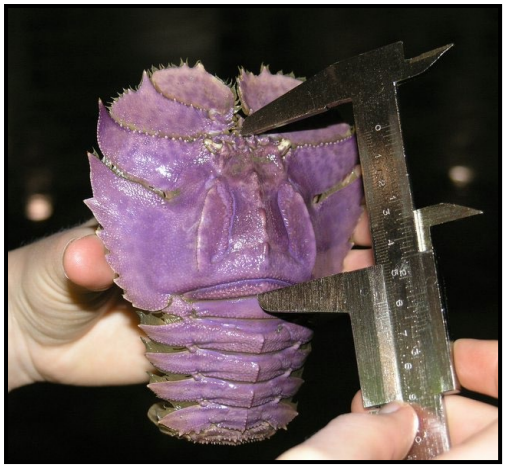
Rank for ages – **not required**

Aim of the Port Monitoring sampling for 2020/21

To collect size and species composition data that are representative of the commercial landed catch for NSW.

Sampling design

Opportunistic length frequency data to be collected from the Sydney Fish Markets, Coffs Harbour Co-op, Maclean Co-op and Ballina Co-op. Balmain/Smooth Bugs are measured as carapace length to the nearest whole millimetre below the true length with calipers (see photo below).



Balmain bug (*Ibacus peronii*) being measured with caliper.

Sampling graded catches

Balmain/Smooth Bug catches are generally ungraded; however, if grading occurs then all grades are sampled.

Results

Table 1. Reported landings heat map of Balmain Bug by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													56953.5

Legend
Percent of Max Value
100%
75%
50%
25%
0%

Table 2. The number of days sampled for Balmain Bug by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													38
Total													38

Table 3. The number of catches sampled for Balmain Bug by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			3					1	1				5
Zone 2	1		3	3			1	1	5	1	1		16
Zone 3	1	2	1				1		1	3	1	3	13
Zone 4													
Zone 5			2	2					1	1			6
Zone 6				1									1
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	2	2	9	6	0	0	2	2	8	5	2	3	41
Total	2	2	9	6	0	0	2	2	8	5	2	3	41

Table 4. The number of Balmain Bug sampled by month and area during 2020/21. The shaded heat map represents the reported commercial landing

Number of bugs Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													978
Total													978

Table 5. Reported landings heat map of Smooth Bug by month and area during 2020/21

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													200

Legend

Percent of Max Value

100%

75%

50%

25%

0%

Table 6. The number of days sampled for Smooth Bug by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1	1		1		1		1	1					
Zone 2	3	3	2	6	3	3	5	4		4	5	2	
Zone 3	2	6	2	5	2	3	2		4	3	2		
Zone 4													
Zone 5													
Zone 6				1									
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													91
Total													91

Table 7. The number of catches sampled for Smooth Bug by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1	1		1		1		1	1	1	1			7
Zone 2	3	3	3	8	4	5	6	6	16	7	10	2	73
Zone 3	3	8	2	7	6	8	3		6	6	4	7	60
Zone 4													
Zone 5													
Zone 6				1									1
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	7	11	6	16	11	13	10	7	23	14	14	9	141
Total	7	11	6	16	11	13	10	7	23	14	14	9	141

Table 8. The number of Smooth Bug sampled by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of bugs Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1	119		77		36		122	124					
Zone 2	195	428	275	759	309	210	458	599		413	790	170	
Zone 3	276	674	176	740	521	406	164		506	389	227		
Zone 4													
Zone 5													
Zone 6				9									
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)													11328
Total													11328

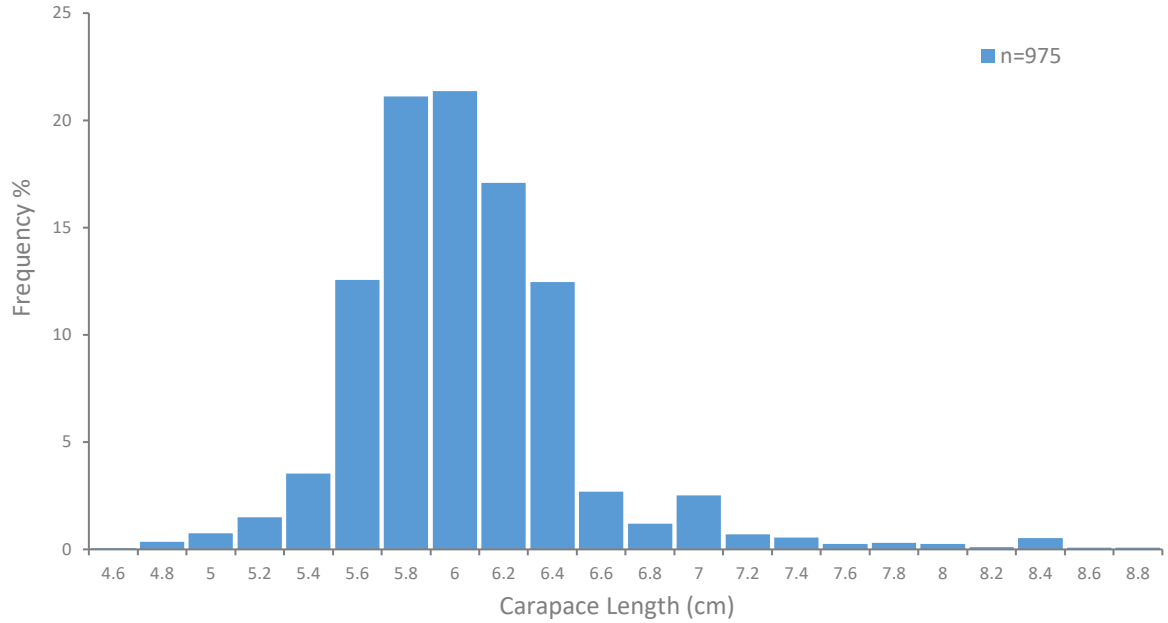


Figure 1. Length composition of Balmain Bugs sampled through the Port Monitoring program during 2020/21. Balmain Bugs were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

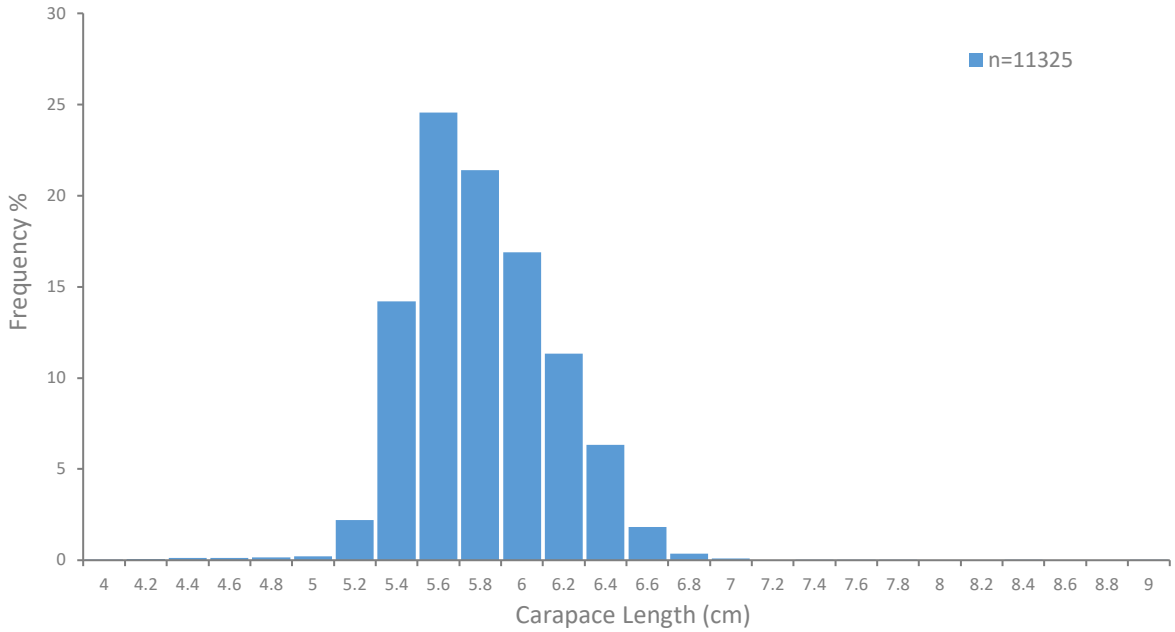


Figure 2. Length composition of Smooth Bugs sampled through the Port Monitoring program during 2020/21. Smooth Bugs were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Species Composition

Smooth Bugs were the dominant species in the northern zones and Balmain Bugs dominated landings from the more southern zones. The overall percentage of the 'bug' catch was 16.7% Balmain Bugs and 83.3% Smooth Bugs (Table 9). These species compositions differed vastly from those reported in commercial logbooks, in which almost all Bugs were reported as being Balmain Bugs.

Table 9. The relative weights of Balmain Bugs and Smooth Bugs sampled within each ocean zone during port monitoring in 2020/21, compared with the relative reported weights in commercial fishing logbooks.

	% observed in port monitoring		% reported in logbooks	
Ocean Zone	Balmain	Smooth	Balmain	Smooth
1	37.3%	62.7%	99.8%	0.2%
2	6.9%	93.1%	99.9%	0.1%
3	5.8%	94.2%	97.6%	2.4%
4			100.0%	0.0%
5	100.0%	0.0%	100.0%	0.0%
6	90.5%	9.5%	100.0%	0.0%
7			100.0%	0.0%
All zones	**16.7%**	**83.3%**	**99.7%**	**0.3%**

Commentary

Comprehensive sampling of 'bugs' was achieved during 2020/21. The species reporting issues identified are substantial and need to be addressed in future.

Bluespotted Flathead

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	Eastern Australia	**Sustainable**	Catch, catch rates, length and age compositions, biomass depletion and harvest rate estimates

OTF Ocean Trawl Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **1**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring: **1**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **1**

Rank for ages – **1**

Aim of the Port Monitoring sampling for 2020/21

To collect size composition data that are representative of the NSW commercial fishery.

Sampling design

Length frequency data were collected through Maclean/Iluka, Coffs Harbour and the Sydney Fish Markets. For each location, all catches from a selected ocean zone that were on the floor on the day of sampling were sampled. Bluespotted Flathead were measured from the tip of the nose to total length (nearest cm rounding down).

Bluespotted Flathead sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

Sampling graded catches

Almost all Bluespotted Flathead catches are graded, generally into XL, L, M, S or U. All grades are sampled from a catch. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software.

Results

Table 1. Reported landings heat map of Bluespotted Flathead by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													71235.3

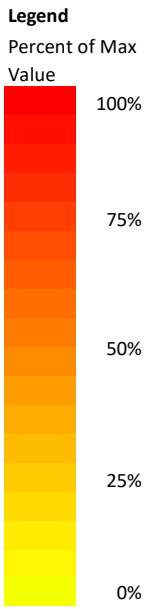


Table 2. The number of days sampled for Bluespotted Flathead by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8	1												
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)													111

Total													111

Table 3. The number of catches sampled for Bluespotted Flathead by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			1										1
Zone 2	5	2	6	8	8	5	3	4	11	5	6	5	68
Zone 3	1	6	1	7	4	3	2		5	7	4	11	51
Zone 4													
Zone 5	1	3	5	2	1		1	1	3	2	4		23
Zone 6	2	6	2	2	3	1		1	2	2			21
Zone 7	1		1	1						1			4
Zone 8	1												1
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)	11	17	16	20	16	9	6	6	21	17	14	16	169

Total	11	17	16	20	16	9	6	6	21	17	14	16	169

Table 4. The number of fish sampled for Bluespotted Flathead by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8	176												
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)													8244

Total													8244

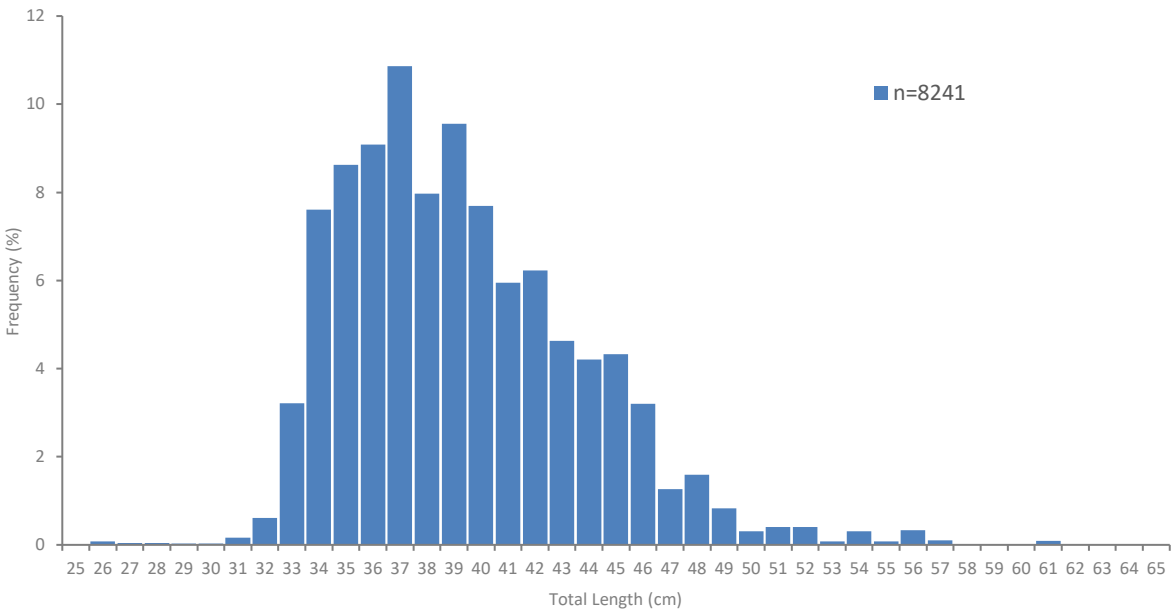


Figure 1. Length composition of Bluespotted Flathead landed by the commercial fishery during 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES. The number of lengths used to create the Figure may differ slightly from the number of lengths measured due to length rules in the PISCES software.

Commentary

Comprehensive sampling was achieved for Bluespotted Flathead during 2020/21. Sampling generally reflected the spatial and temporal distribution of the landings, potentially oversampling in the more northern zones.

Dusky Flathead

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	New South Wales	**Sustainable**	Commercial catch, CPUE, and length frequency

EGF Estuary General Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **15**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring: **8**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths – **8**

Rank for ages – **6**

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the commercial landed catch for selected key estuaries in NSW.

Sampling design

Length Frequency data from the Estuary General Fishery were collected for the estuary catches from Tuggerah Lakes and Wallis Lakes through the Sydney Fish Market and from the Clarence River through the Maclean Co-op. All catches from these locations on the floor on the day of sampling were attempted to be sampled. Dusky Flathead were measured from the tip of the nose to total length (nearest cm rounding down).

Thirty fish from each of the three sampled estuary regions were also purchased each month from Maclean Co-op and the Sydney Fish Market for ageing. Fish were selected from each grade in the approximate ratio of each grade in the total catch by weight.

Dusky Flathead sampling is based on month and estuary region for data expansion using reported commercial landings for each month and region. These expansions are done using the PISCES software.

Sampling graded catches

Almost all Dusky Flathead catches are graded, generally into XL, L, M, S or U. All grades are sampled during a sampling event. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software.

Results

Table 1. Reported landings heat map of Dusky Flathead by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													115505.5

Legend
Percent of Max Value
100%
75%
50%
25%
0%

Table 2. The number of days sampled for Dusky Flathead by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													105
Total													105

Table 3. The number of catches sampled for Dusky Flathead by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2								1		1			2
Zone 3													
Zone 4													
Zone 5	1				1				1				3
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2	18	15	9	16	16	10	5	11	11	6	12	34	163
EG Region 3													
EG Region 4	18	11	8	9	12	2	10	1	14	20	9	8	122
EG Region 5		1											1
EG Region 6				1									1
EG Region 7													
Total (area known)	37	27	17	26	29	12	15	13	26	27	21	42	292
Total	37	27	17	26	29	12	15	13	26	27	21	42	292

Table 4. The number of Dusky Flathead sampled by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													7680
Total													7680

Table 5. The number of fish sampled for ageing Dusky Flathead by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2								8		8			16
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2	30	30	30	30	30	30	30	22	30	22	30	55	369
EG Region 3													
EG Region 4	66	60	45	45					60	45	61	45	427
EG Region 5													
EG Region 6				15									15
EG Region 7													
Total (area known)	96	90	75	90	30	30	30	30	90	75	91	100	827
Total	96	90	75	90	30	30	30	30	90	75	91	100	827

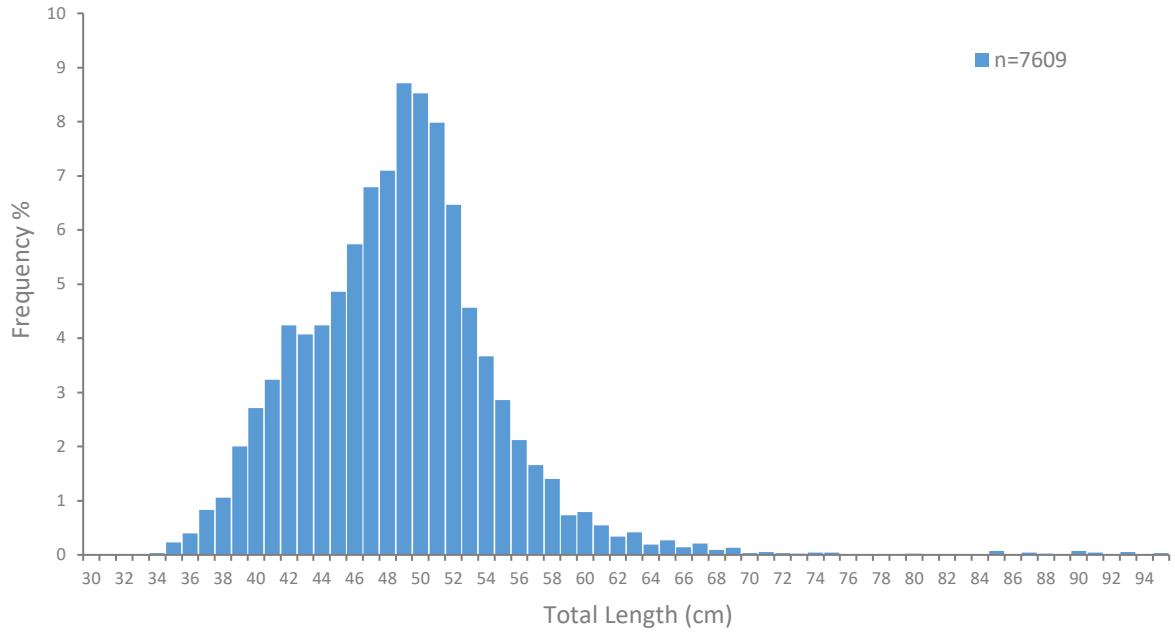


Figure 1. Length composition of Dusky Flathead landed by the commercial fishery for 2020/21. Dusky Flathead were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

Comprehensive sampling for Dusky Flathead was achieved during 2020/21 in terms of both length and age sampling. The key estuaries for commercial landings were covered, with the exception of Lake Illawarra in region 6 that had a very short season. Ongoing issues with access to the Wallis Lake co-op meant that fish from that estuary had to be sampled on the Sydney Fish Market floor by Sydney-based staff, consuming extra resources at the expense of sampling other species.

Eastern School Whiting

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	South Eastern Australia	**Sustainable**	Catches, standardised CPUE, lengths, ages, discards, biomass depletion estimates (stock synthesis)

OTF Ocean Trawl Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **2**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring: **2**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **2**

Rank for ages – **2**

Aim of the Port Monitoring sampling for 2020/21

To collect size composition data representative of the NSW commercial fishery and to collect fish for otolith and tissue sampling to support stock assessment and the FRDC project.

Sampling design

There was a dedicated FRDC project on stock structure and spatial variation in biology during the 2020/21 sampling year, and all sampling from Coffs Harbour co-op was done by the FRDC funded technician. Export box sampling was done at Iluka and Coffs Harbour Fishermen's co-operatives, where length frequencies were recorded along with the species split of Eastern School Whiting and Stout Whiting. A small number of each species were also processed for ageing. Approximately 5-8 kg export boxes were purchased each month from each location. Eastern School Whiting were measured from the tip of the nose to fork length (nearest cm rounding down).

Eastern School Whiting sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

A sample of 15 fish from ocean zones 5 and either 6 or 7 was also purchased at the Sydney Fish Market each month for ageing, as well as 15 fish from Iluka co-op and 15 fish from the Coffs Harbour co-op. Fish were selected from each grade in the approximate ratio of each grade in the total catch by weight.

Sampling graded catches

Almost all Eastern School Whiting catches are graded, generally into XL, L, M, S or U. All grades are sampled during a sampling event. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software.

Results

Table 1. Reported landings heat map of Eastern School Whiting by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													527969

Legend

Percent of Max Value

100%

75%

50%

25%

Table 2. The number of days sampled for Eastern School Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			1	1			2						
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8	2		1		2		1	3	1			1	
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													138
Total													138

Table 3. The number of catches sampled for Eastern School Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			1	1			2						4
Zone 2	2	2	4	4	2	5	2	2	1	2	2	2	30
Zone 3	1	3	1	2	1	1	2	2	1		2	1	17
Zone 4				1									1
Zone 5	2	3	6	7	6	8	5	1	6	5	7	3	59
Zone 6	7	5	3	1	2	1	2	3	7	3		1	35
Zone 7	4	4	4	5	2	3	3		2	2		1	30
Zone 8	2	1	1	1	3		2	4	1	1	2	1	19
Zone 9													
Zone 10				1									1
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	18	18	20	23	16	18	18	12	18	13	13	9	196
Total	18	18	20	23	16	18	18	12	18	13	13	9	196

Table 4. The number of fish sampled for Eastern School Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			8	4			91						
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8	201		210		219		86	376	130			123	
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													17018
Total													17018

Table 5. The number of fish sampled for ageing Eastern School Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			8	16			91						115
Zone 2	35	44	44	44	44	44	44	44	7	22	38	47	457
Zone 3	21	22	22	22	22	22	22	22	22		44	25	266
Zone 4				20									20
Zone 5	22	15	15	91	37	16	15		15	14	39		279
Zone 6	29	15	15		15			15	15	19			123
Zone 7	15	30	16	30		15	15		15	19			155
Zone 8					15		15	15			14		59
Zone 9													
Zone 10				40									40
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	122	126	120	263	133	97	202	96	74	74	135	72	1514
Total	122	126	120	263	133	97	202	96	74	74	135	72	1514

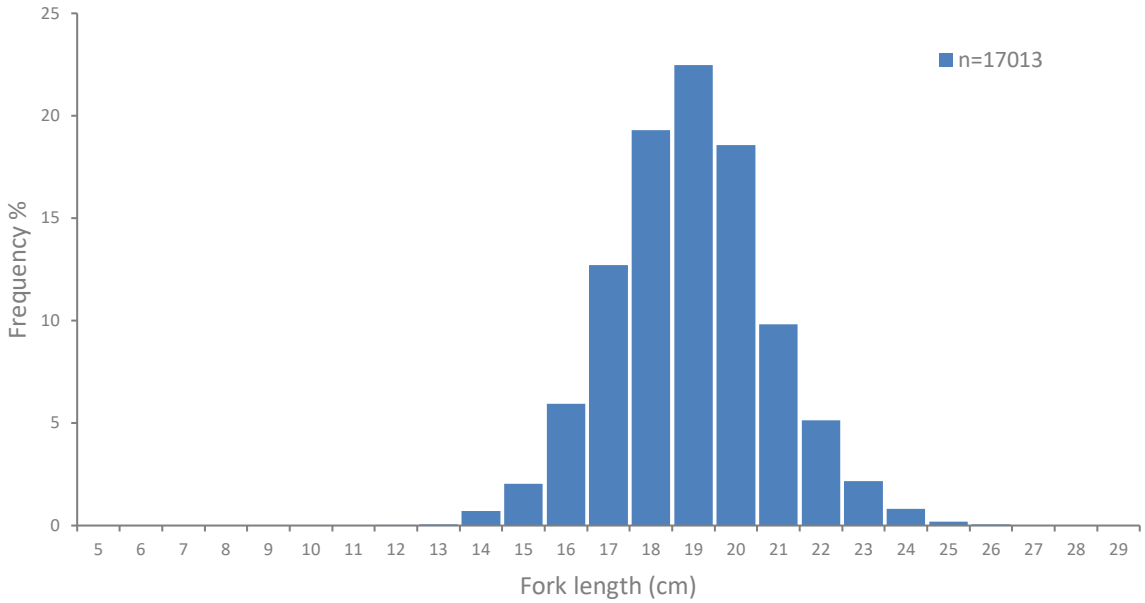


Figure 1. Length composition of Eastern School Whiting landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES. The number of lengths used to create the figure may differ slightly from the number of lengths measured due to length rules in the PISCES software.

Commentary

Comprehensive sampling was achieved for Eastern School Whiting during 2020/21, with the distribution of sampling effort being similar to the spatial and temporal operations of the fishery.

Eastern Sea Garfish

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	Eastern Australia	**Sustainable**	Spawning stock biomass, fishing mortality rate, age composition, catch, effort

EGF Estuary General Fishery (NSW)

OHF Ocean Hauling Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***26***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **16**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **16**

Rank for ages – **11**

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the commercial landed catch for NSW.

Sampling design

Most sampling is done at the Sydney Fish Markets; however, some is done at regional Fishermen's co-operatives and instructions are sent to staff (see below). Sea Garfish sampling is based on the standard port monitoring design that is based on monthly and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

Sea Garfish are measured from the lower jaw to fork length to the nearest cm rounding down.

Both the Ocean Hauling and Estuary General Fisheries are monitored.

Sea Garfish were purchased for ageing, with an aim of 20 per catch through the SFM from all ocean zones between 5 and 10. Fish were selected from each grade in the approximate ratio of each grade in the total catch by weight.

Sampling graded catches

Almost all Sea Garfish catches are graded, generally into XL, L, M, S or U. All grades are sampled during a sampling event. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly using the PISCES software.

Sea Garfish *(Hyporhamphus australis)*

Sample days

- Opportunistically up to 4 days per month

Lengths required

- Sea garfish are almost always graded by size. Sample from **each grade 80-100 fish** (approx. 3-10kgs depending on size). Make sure you weigh the sub-sample taken from each grade. If whole catch is ungraded then only need to do one sample of 80-100 length measurements
- Measure catches as fork length (FL - from the tip of the top jaw to the fork in the tail – see figure below) to the nearest whole cm below true length.
- You will need to record the total catch weight, total weight of each size grade and the total weight of the fish measured from each size grade.
- Try and measure from as many different fishermen as time allows.

Otoliths required

20 otoliths per catch taken proportionately from each grade. Collect ototliths from 2 catches per month; 40 otoliths in total per month.

Field code **NB-Ha 1**

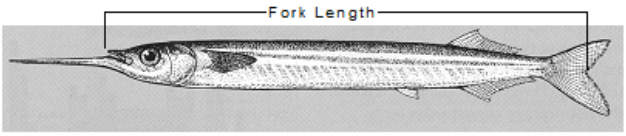


Figure 1. Sea Garfish sampling instructions for Nelson Bay

Results:

Table 1. Reported landings heat map of Eastern Sea Garfish by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													22467

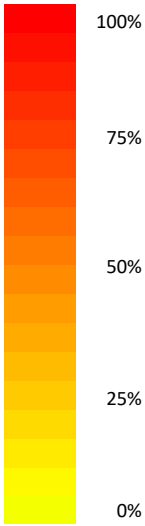


Table 2. The number of days sampled for Eastern Sea Garfish by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5								2	6	2	3	1	14
Zone 6													
Zone 7							2	5	2				9
Zone 8								1	1	3			5
Zone 9													
Zone 10									1				1
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4								3	1	1			5
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	0	0	0	0	0	0	2	11	11	6	3	1	34
Total	0	0	0	0	0	0	2	11	11	6	3	1	34

Table 3. The number of catches sampled for Eastern Sea Garfish by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8								1	1	3			
Zone 9													
Zone 10									1				
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													39
Total													39

Table 4. The number of fish sampled for Eastern Sea Garfish by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5								458	599	241	477	290	2065
Zone 6													
Zone 7							442	1582	364				2388
Zone 8								130	71	389			590
Zone 9													
Zone 10									80				80
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4								413	260	175			848
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	0	0	0	0	0	0	442	2583	1374	805	477	290	5971
Total	0	0	0	0	0	0	442	2583	1374	805	477	290	5971

Table 5. The number of fish sampled for ageing Eastern Sea Garfish by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8								15	40	60			
Zone 9													
Zone 10									20				
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													562
Total													562

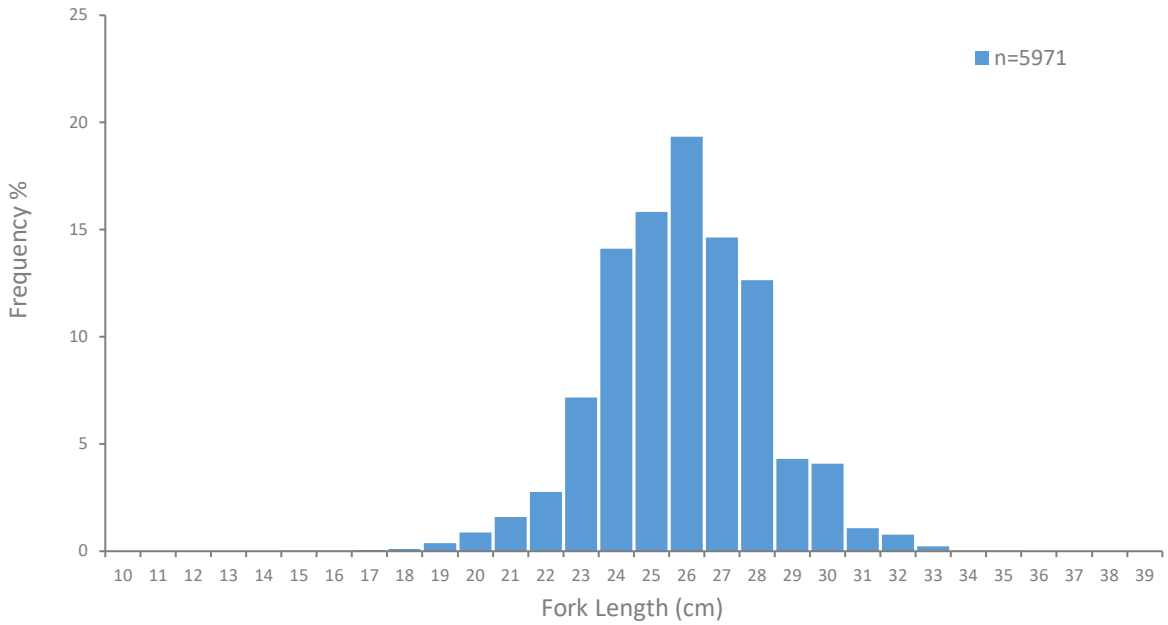


Figure 2. Length composition of Eastern Sea Garfish landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

Comprehensive sampling of Sea Garfish was achieved during 2020/21, reflecting the spatial and temporal operations of the fishery.

Giant Mud Crab

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	Eastern Australia	**Sustainable**	Catch, catch rate, biomass, fishing mortality

EGF Estuary General Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***6***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **4**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **4**

Rank for ages – **not required**

Aim of the Port Monitoring sampling for 2020/21

To collect size composition data that are representative of the commercial landed catch from the Clarence River and Coffs Harbour Fishermen's Co-ops.

Sampling design

Length frequency data were collected through the Clarence River Fishermen's co-operative and Coffs Harbour Fishermen's co-operative. Giant Mud Crab were measured as carapace length (CL) to the nearest mm, rounding down, and all crabs on the floor on the day of sampling were measured unless the catch exceeded 50 individuals in which case sub-sampling was done. A separate length frequency was recorded for each sex and maturity. The breakdown of quality grade (A, B or C) by weight was also recorded for each catch sampled.

Sampling is based on month and estuary region strata for data expansion using reported commercial landings for each month and estuary region. These expansions are done using the PISCES software.

Sampling graded catches

Giant Mud Crab catches are graded according to their size and density. All grades are sampled during a sampling event.

Results

Table 1. Reported landings heat map of Giant Mud Crab by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													89555.4

Legend

Percent of Max Value

100%

75%

50%

25%

0%

Table 2. The number of days sampled for Giant Mud Crab by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2	2	2	2	2	5	3	2	3	3	2	2	2	30
EG Region 3	2	3	1	1	4	3	3	2	2	2	1	2	26
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	4	5	3	3	9	6	5	5	5	4	3	4	56
Total	4	5	3	3	9	6	5	5	5	4	3	4	56

Table 3. The number of catches sampled for Giant Mud Crab by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2	5	2	7	3	11	10	6	10	7	7	5	4	77
EG Region 3	2	3	2	1	11	4	7	7	4	6	2	5	54
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	7	5	9	4	22	14	13	17	11	13	7	9	131
Total	7	5	9	4	22	14	13	17	11	13	7	9	131

Table 4. The number of Giant Mud Crabs sampled by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													5701
Total													5701

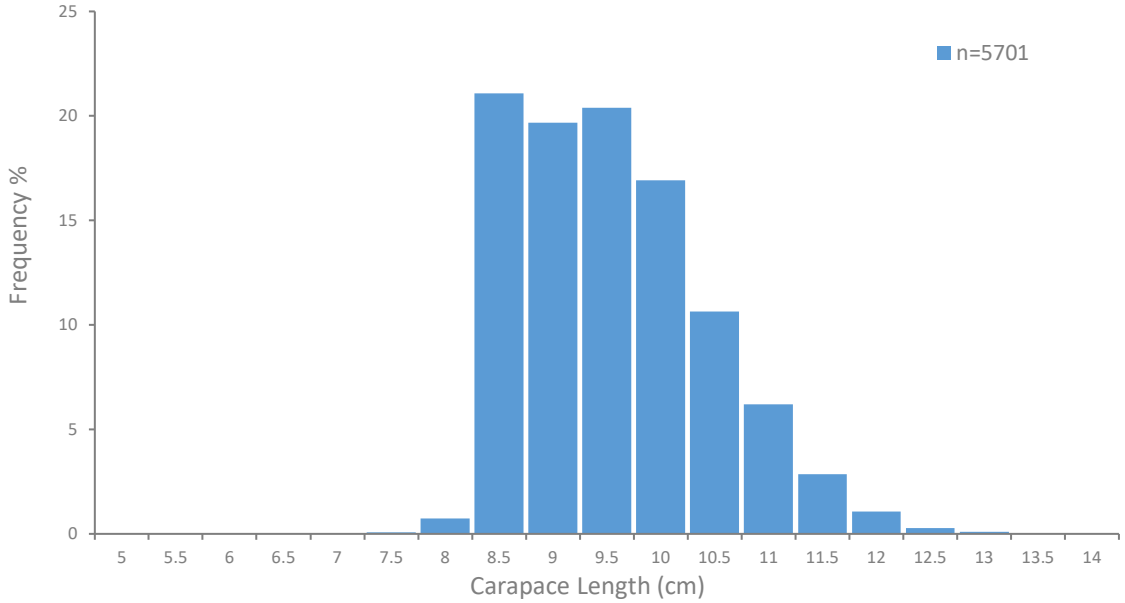


Figure 1. Length composition of Giant Mud Crab landed by the commercial fishery for 2020/21. Crabs were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

Excellent coverage was achieved for the main fishery in regions 2 and 3; however it is noted that future sampling to include zones 1 and 4 would increase coverage of the fishery. Ongoing issues in accessing landings at the Wallis Lake co-op continue to inhibit monitoring and assessment.

Grey Morwong

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales, Queensland	Eastern Australia	**Depleted**	Catch, Catch rates, size structure, age structure, fishing mortality

OTF Ocean Trawl Fishery (NSW)

OTLF Ocean Trap and Line Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***11***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **8**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **8**

Rank for ages – **5**

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the commercial landed catch for NSW.

Sampling design

Length frequency data from the commercial fishery were collected for as many ocean zones as possible through the Iluka/Maclean and Coffs Harbour Fishermen's co-operatives and the Sydney Fish Markets. For each location, all catches from an ocean zone that were on the floor on the day of sampling were attempted to be sampled. Grey Morwong were measured from the tip of the nose to fork length (nearest cm rounding down).

Otoliths were collected from Grey Morwong, with the aim of sampling 20 fish from Coffs Harbour, 10 from ocean zone 6 and 20 from ocean zones 7-10 each month.

Grey Morwong sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

Sampling graded catches

Almost all Grey Morwong catches are graded, generally into XL, L, M, S or U. All grades are sampled during a sampling event, and because catches are relatively small, all fish in each catch are usually measured.

Results

Table 1. Reported landings heat map of Grey Morwong by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													26936.7

Legend

Percent of Max Value

100%

75%

50%

25%

Table 2. The number of days sampled for Grey Morwong by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													122
Total													122

Table 3. The number of catches sampled for Grey Morwong by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2		1		1			1		1				4
Zone 3	8	3	7	7	4	6	6	6	3	4	2	7	63
Zone 4	1												1
Zone 5	1	1	2		1		3				3		11
Zone 6	8	6	6	5	6	5	3	2		2	5	4	52
Zone 7								2					2
Zone 8						3		1					4
Zone 9		1	1			1	1	1	2	1	2	1	11
Zone 10		2						1					3
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	18	14	16	13	11	15	14	13	6	7	12	12	151
Total	18	14	16	13	11	15	14	13	6	7	12	12	151

Table 4. The number of fish sampled for Grey Morwong by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													4478
Total													4478

Table 5. The number of fish sampled for ageing Grey Morwong by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3	10	10	36	24	20	20		40	20	17		34	231
Zone 4													
Zone 5			10										10
Zone 6	10	10		10	10	10		10		30	20	10	120
Zone 7			20										20
Zone 8						19							19
Zone 9									22		20	20	62
Zone 10		20						20					40
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	20	40	66	34	30	49	0	70	42	47	40	64	502
Total	20	40	66	34	50	49	0	70	42	47	40	64	522

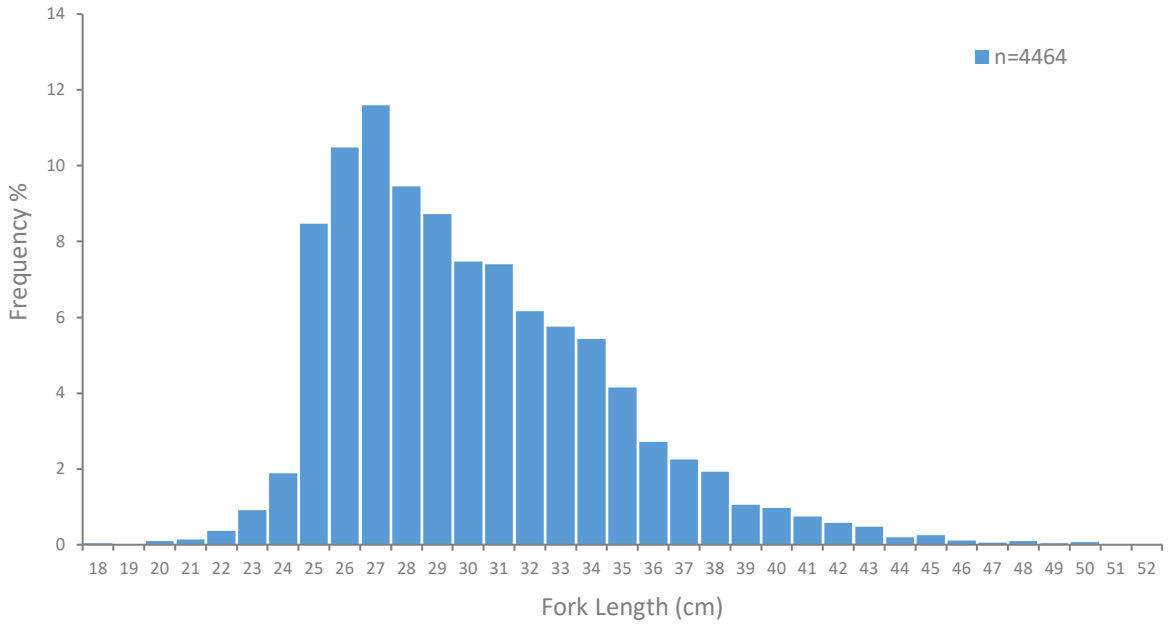


Figure 1. Length composition of Grey Morwong landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES. The number of lengths used to create the Figure may differ slightly from the number of lengths measured due to length rules in the PISCES software.

Commentary

Sampling for 2020/21 was comprehensive, noting that greater sampling for lengths and ages from fish from the far south coast (ocean zones 9 and 10) would provide better alignment with the spatial operation of the fishery.

Mulloway

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	New South Wales	**Depleted**	Catch, Catch rates, Size Composition, Yield-per-recruit, Mortality Rates, Spawning Potential Ratio

EGF Estuary General Fishery (NSW)

OHF Ocean Hauling Fishery (NSW)

OTF Ocean Trawl Fishery (NSW)

OTLF Ocean Trap and Line Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***17***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **9**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **9**

Rank for ages – **6**

Aim of the Port Monitoring sampling for 2020/21

To collect size composition data that are representative of the commercial landed catch for NSW.

Sampling design

Length Frequency data were collected through Ballina, Iluka/Maclean and Coffs Harbour Fishermen's co-ops and the Sydney Fish Markets. Landings from all commercial fisheries were monitored. For

each location sampled on a day, all catches that were available were attempted to be sampled. Mulloway were measured from the tip of the nose to total length (nearest cm rounding down).

Mulloway sampling is based on month, estuary region and ocean zone strata for data expansion using reported commercial landings for each month and area. These expansions are done using the PISCES software.

Sampling graded catches

Mulloway catches are often graded, generally into XL, L, M, S or U. All grades are sampled on a sampling event, and because catches are often relatively small in terms of numbers of fish, all fish in each catch are usually measured.

Results

Table 1. Reported landings heat map of Mulloway by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													82902.1

Legend

Percent of Max Value

100%

75%

50%

25%

Table 2. The number of days sampled for Mulloway by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6					1								
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													98
Total													98

Table 3. The number of catches sampled for Mulloway by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1										1			1
Zone 2						1				1		1	3
Zone 3	2	1							1			1	5
Zone 4												1	1
Zone 5													
Zone 6					1	1		2					4
Zone 7													
Zone 8							1						1
Zone 9													
Zone 10													
EG Region 1		1	1						1				3
EG Region 2	11	6	1	1	4		1	1	1	1	7	12	46
EG Region 3	2	1	1	1									5
EG Region 4	3	5	3	2	4	2	2	2	7	1	6	1	38
EG Region 5	2	1			2			3		2	1		11
EG Region 6	1	5	1	1	5			2				1	16
EG Region 7													
Total (area known)	21	20	7	5	16	4	4	10	10	6	14	17	134
Total	21	20	7	5	16	4	4	10	10	6	14	17	134

Table 4. The number of fish sampled for Mulloway by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6					1								
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													1625
Total													1625

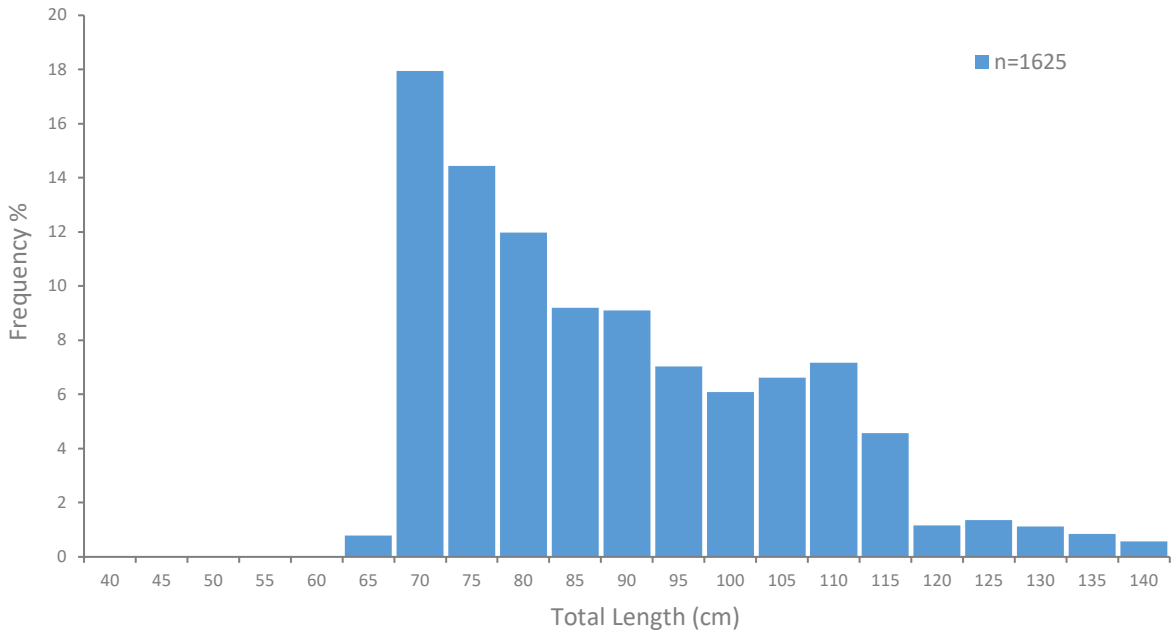


Figure 1. Length composition of Mulloway landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

Sampling for Mulloway was comprehensive during 2020/21, monitoring approximately 12.5 t of landed catch representing approximately 15% of the total commercial harvest. The distribution of

sampling was similar to the spatial and temporal operation of the fishery. Ocean landings, particularly in northern NSW, were more challenging to sample than estuary catches. No otoliths were collected this year, as Mulloway are almost always sold whole and buying, processing, then reselling these large fish beyond the capacity of the program.

Pearl Perch

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales, Queensland	Eastern Australia	**Depleted**	Biomass, Standardised Catch Rate, Fishery-Dependent Length and Age Frequency, Estimates of Total Mortality Rate, Catch and Effort

OTF Ocean Trawl Fishery (NSW)

OTLF Ocean Trap and Line Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **39**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring: **21**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **21**

Rank for ages – **15**

Aim of the Port Monitoring sampling for 2020/21

To collect size composition data that are representative of the commercial landed catch for NSW.

Sampling design

Length Frequency data were collected for ocean zones through Ballina, Iluka/Maclean and Coffs Harbour Fishermen's co-operatives. For each location, all catches that were on the floor on the day of sampling were attempted to be sampled. Pearl Perch were measured from the tip of the nose to fork length (nearest cm rounding down).

Pearl Perch sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

Sampling graded catches

Almost all Pearl Perch catches are ungraded, however, where there was more than one grade, all grades were sampled. Because there are so few numbers of fish in each catch, subsampling is rarely needed.

Results

Table 1. Reported landings heat map of Pearl Perch by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													7939.46

Legend
Percent of Max Value
100%
75%
50%
25%
0%

Table 2. The number of days sampled for Pearl Perch by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1										2			2
Zone 2		1						1					2
Zone 3	3	1	2	5	4	3	3	5	2	3	2	5	38
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)	3	2	2	5	4	3	3	6	2	5	2	5	42

Total	3	2	2	5	4	3	3	6	2	5	2	5	42

Table 3. The number of catches sampled for Pearl Perch by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1										2			2
Zone 2		1						1					2
Zone 3	3	1	4	5	5	3	3	5	2	3	2	6	42
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)	3	2	4	5	5	3	3	6	2	5	2	6	46

Total	3	2	4	5	5	3	3	6	2	5	2	6	46

Table 4. The number of fish sampled for Pearl Perch by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)													637

Total													637

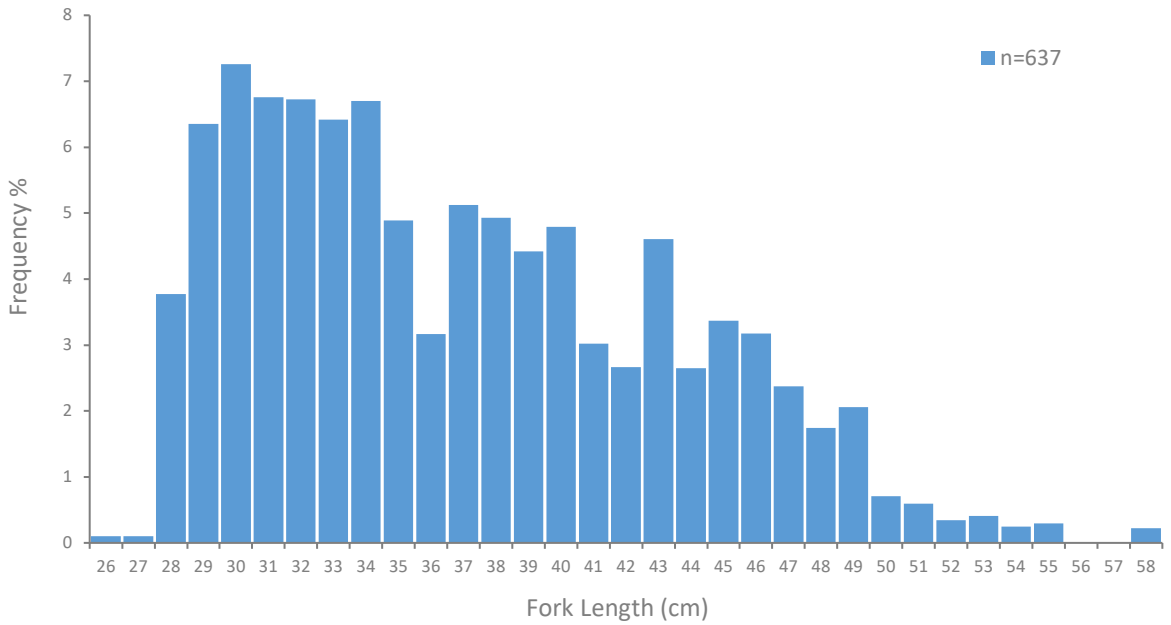


Figure 1. Length composition of Pearl Perch landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

Given the very small nature of the commercial fishery (approximately 8 t in 2020/21) the port monitoring coverage was well balanced and adequate to inform the length structure for the fishery.

Sea Mullet

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales, Queensland	Eastern Australia	Sustainable	Spawning stock biomass, Catch, CPUE, Length and age compositions

EGF Estuary General Fishery (NSW)

OHF Ocean Hauling Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***19***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **11**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **11**

Rank for ages – **8**

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the commercial landed catch during the spawn-run fishery for NSW.

Sampling design

All sampling was done during a 2 week period in May through Markwell Fisheries in Chinderah. For each catch sampled, length frequency data from an ungraded subsample of approximately 120kg was collected. A separate length frequency was recorded for each sex. Sea Mullet were measured from the tip of the nose to fork length (nearest cm rounding down).

Sea Mullet sampling is based on monthly and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

For each catch, a subsample of 15 randomly selected males and 15 randomly selected females were processed for ageing.

Results

Table 1. Reported landings heat map of Sea Mullet by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													2316233

Legend

Percent of Max Value

100%

75%

50%

25%

0%

Table 2. The number of days sampled for Sea Mullet by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													10
Total													10

Table 3. The number of catches sampled for Sea Mullet by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2											1		1
Zone 3											1		1
Zone 4											2		2
Zone 5											7		7
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	0	0	0	0	0	0	0	0	0	0	11	0	11
Total	0	0	0	0	0	0	0	0	0	0	11	0	11

Table 4. The number of fish sampled for Sea Mullet by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)													1438

Total													1438

Table 5. The number of fish sampled for ageing Sea Mullet by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2											30		30
Zone 3											30		30
Zone 4											80		80
Zone 5											240		240
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)	0	0	0	0	0	0	0	0	0	0	380	0	380

Total	0	0	0	0	0	0	0	0	0	3	380	0	380

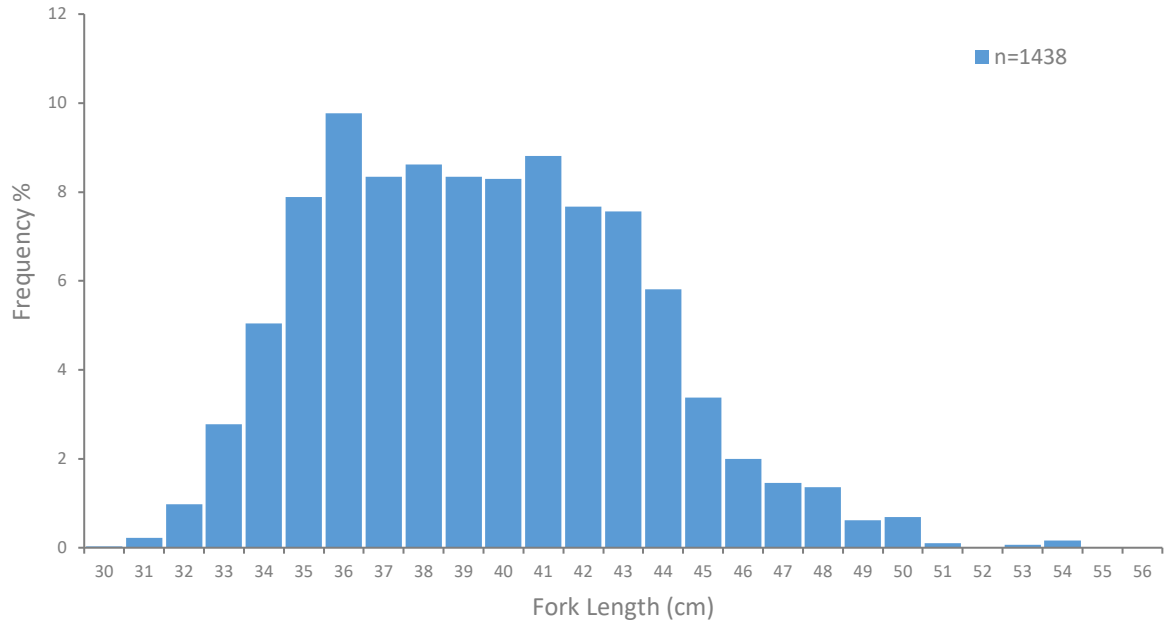


Figure 1. Length composition of Sea Mullet landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

The 2020/21 Sea Mullet spawn run fishery was relatively quiet, and catches were scarce during the two weeks our team were stationed at Markwell's factory. Nevertheless the 11 catches we were able to sample provided a reasonable coverage from the fishery.

Silver Trevally

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	New South Wales	Depleted	Catch, CPUE, biomass, fishing mortality, spawning potential, length and age structures

EGF Estuary General Fishery (NSW)

OHF Ocean Hauling Fishery (NSW)

OTF Ocean Trawl Fishery (NSW)

OTLF Ocean Trap and Line Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***4***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **3**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths - **3**

Rank for ages – **3**

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the commercial landed catch for NSW.

Sampling design

Length Frequency data from all state fisheries were collected through the Sydney Fish Markets. For each location, all catches that were on the floor on the day of sampling were attempted to be sampled. Silver Trevally were measured from the tip of the nose to fork length (nearest cm rounding down).

Silver Trevally sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

Sampling graded catches

Silver Trevally catches are generally graded into XL, L, M, S or U. All grades are sampled. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software. Because catches are relatively small, all fish in each catch are usually measured.

Results

Table 1. Reported landings heat map of Silver Trevally by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													41259.5

Legend
Percent of Max Value
100%
75%
50%
25%
0%

Table 2. The number of days sampled for Silver Trevally by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													66
Total													66

Table 3. The number of catches sampled for Silver Trevally by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6	2	6	5	2	3	1		7	4	4	1		35
Zone 7	3		1	2				2	1				9
Zone 8								1				1	2
Zone 9						1			2	1	1	1	6
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4			1			1		1					3
EG Region 5		2		1	2	1							6
EG Region 6	6	3	1	2				2	1	2	1	2	20
EG Region 7		1							1				2
Total (area known)	11	12	8	7	5	4	0	13	9	7	3	4	83
Total	11	12	8	7	5	4	0	13	9	7	3	4	83

Table 4. The number of fish sampled for Silver Trevally by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													

Total (area known)													3864

Total													3864

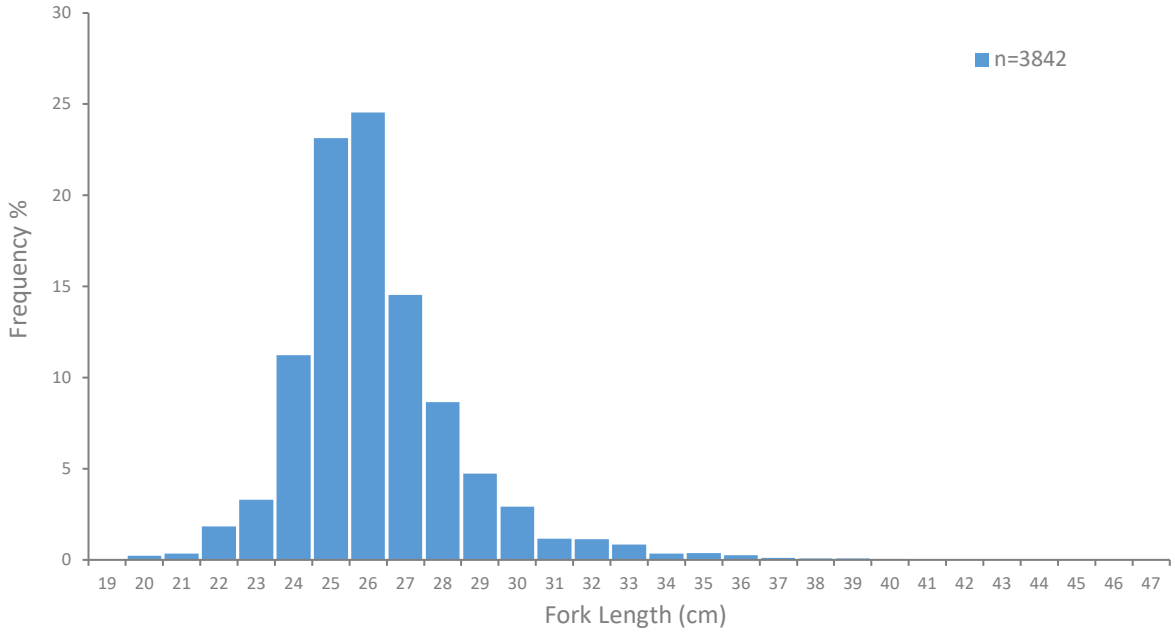


Figure 1. Length composition of Silver Trevally landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES. Number of lengths used to create figure may differ slightly from number of lengths measured due to length rules in PISCES software.

Commentary

Port monitoring for Silver Trevally during 2020/21 adequately covered the spatial and temporal operation of the fishery. The shift towards the total harvest comprising a greater proportion of estuary landings was captured through our sampling protocols.

Snapper

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales	New South Wales	**Sustainable**	Estimated biomass, standardized catch rates, catch, effort, size and age composition

OTLF Ocean Trap and Line Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **24**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring: 14

Base case port monitoring required to inform a reliable assessment:

Rank for biology – 2

Rank for lengths – 14

Rank for ages – 10

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the NSW commercial fishery landings.

Sampling design

Length Frequency data from the Ocean Trap and Line Fishery were collected for all ocean zones through Ballina, Iluka/Maclean, Coffs Harbour, and the Sydney Fish Markets. For each location, all catches from the Ocean Trap and Line Fishery that were on the floor on the day of sampling were attempted to be sampled. Snapper were measured from the tip of the nose to fork length (nearest cm rounding down).

Snapper sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

Fish were also purchased each month from Ballina, Maclean and Coffs Harbour Fishermen's co-operatives and the Sydney Fish market (targeting all NSW locations not covered by Maclean and Coffs Harbour sampling) for ageing. Fish were selected from each grade in the approximate ratio of each grade in the total catch by weight.

Sampling graded catches

Almost all Snapper catches are graded, generally into XL, L, M, S or U. All grades are sampled during a sampling event. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software.

Results

Table 1. Reported landings heat map of Snapper by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													177225

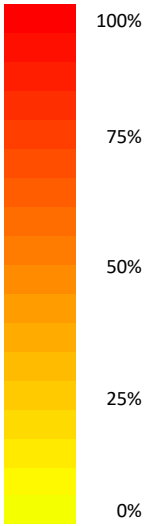


Table 2. The number of days sampled for Snapper by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													164
Total													164

Table 3. The number of catches sampled for Snapper by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1		2	2	4	2		5			1		1	17
Zone 2	2	7	5	1		2	3		1	1	1	2	25
Zone 3	11	9	4	7	8	13	9	8	4	7	1	8	89
Zone 4													
Zone 5				1		1							2
Zone 6	8	9	8	8	11	11	5	3	4	4	9	5	85
Zone 7									1	1			2
Zone 8				1								1	2
Zone 9		2	1		2		1	3		1		1	11
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5								1	1				2
EG Region 6													
EG Region 7		1											1
Total (area known)	21	30	20	22	23	27	23	15	11	15	11	18	236
Total	21	30	20	22	23	27	23	15	11	15	11	18	236

Table 4. The number of Snapper sampled by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													15581
Total													15581

Table 5. The number of fish sampled for ageing Snapper by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1		60	30	30		30	30						180
Zone 2	10	10	10	10		20	10		10		4	36	120
Zone 3		40	20	20		40		40		40		40	240
Zone 4													
Zone 5													
Zone 6	40	30	33		20	22	19	19		20	19	20	242
Zone 7													
Zone 8				11					10		10		31
Zone 9				10			11	10		10		10	51
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7		12											12
Total (area known)	50	152	93	81	20	112	70	69	20	70	33	106	876
Total	50	152	93	81	20	112	70	69	20	70	33	106	876

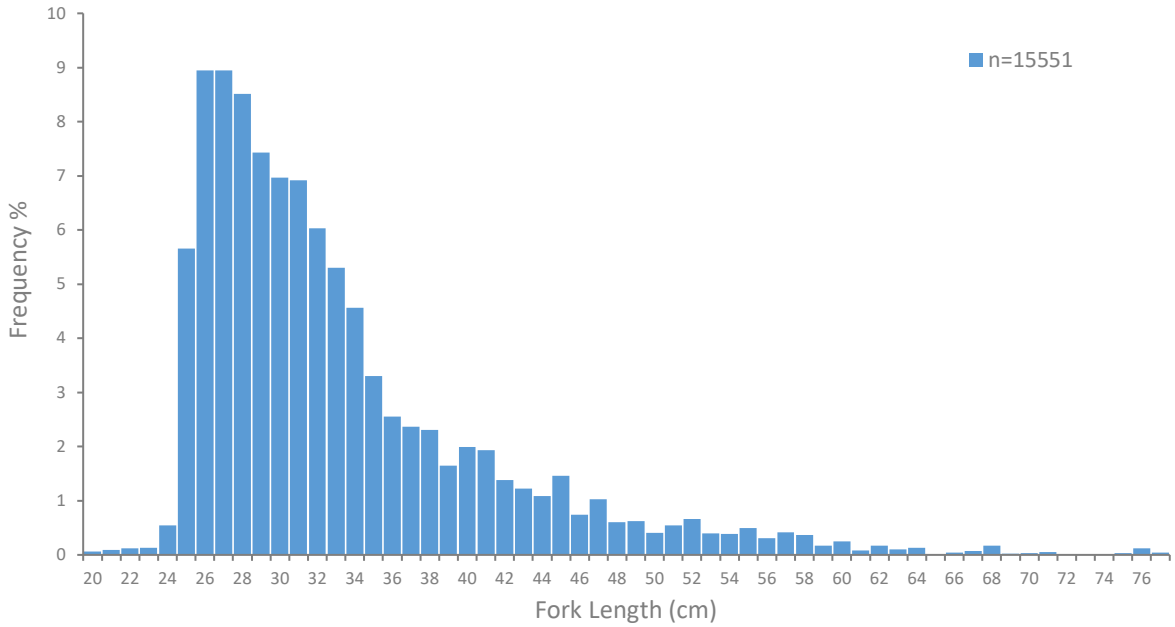


Figure 1. Length composition of Snapper landed by the commercial fishery for2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES. The number of lengths used to create the figure may differ slightly from the number of lengths measured due to length rules in PISCES software

Commentary

The port monitoring for Snapper during 2020/21 provided comprehensive length and age information that aligned with the spatial and temporal operation of the fishery. In particular the major ocean zones for landings (being ocean zones 2, 3 and 6) had very good sampling coverage.

Stout Whiting

STOCK STATUS OVERVIEW (2020)

Stock status determination			
Jurisdiction	Stock	Stock status	Indicators
New South Wales, Queensland	Eastern Australia	Sustainable	Standardised CPUE, age composition

OTF Ocean Trawl Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: ***10***

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **7**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **1**

Rank for lengths - **7**

Rank for ages – **4**

Aim of the Port Monitoring sampling for 2020/21

To collect size composition data that are representative of the commercial landed catch through the Iluka and Coffs Harbour co-ops. These data are to supplement those being collected via observer programs.

Sampling design

There was a dedicated FRDC project on stock structure and spatial variation in biology during the 2020/21 sampling year, and all sampling from Coffs harbour co-op was done by the FRDC-funded technician. Export box sampling was done at Iluka and Coffs Harbour Fishermen's co-ops, where length frequencies were recorded along with the species split of Eastern School Whiting: Stout Whiting. A small number of each species was also processed for ageing. Approximately 5-8 kg export boxes were purchased each month from each location. Stout Whiting were measured from the tip of the nose to fork length (nearest cm rounding down).

Stout Whiting sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

A sample of 15 fish from Iluka co-op and 15 fish from Coffs Harbour co-op were collected each month for ageing. Fish were selected from each grade in the approximate ratio of each grade in the total catch by weight.

Sampling graded catches

Almost all Stout Whiting catches are graded, generally into XL, L, M, S or U. All grades are sampled during a sampling event. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software.

Results

Table 1. Reported landings heat map of Stout Whiting by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													198689

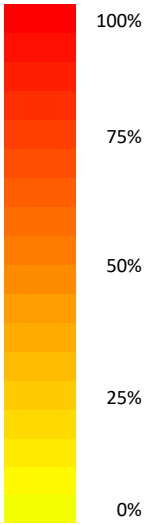


Table 2. The number of days sampled for Stout Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			1	1			2			1			5
Zone 2	3	2	3	2	2	3	1	1	1	2	2	2	24
Zone 3	1	1		1	1	1	1			1	1		8
Zone 4													
Zone 5	2					1				1	1		5
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	6	3	4	4	3	5	4	1	1	5	4	2	42
Total	6	3	4	4	3	5	4	1	1	5	4	2	42

Table 3. The number of catches sampled for Stout Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			1	1			2			1			5
Zone 2	3	2	4	2	2	4	1	1	1	2	2	2	26
Zone 3	1	1		1	1	1	1			1	1		8
Zone 4													
Zone 5	2					1				3	1		7
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	6	3	5	4	3	6	4	1	1	7	4	2	46
Total	6	3	5	4	3	6	4	1	1	7	4	2	46

Table 4. The number of fish sampled for Stout Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1			8	4			143			99			254
Zone 2	276	106	169	145	75	177	40	74	149	186	221	124	1742
Zone 3	18	95		100	98	24	51			25	162		573
Zone 4													
Zone 5	75					39				100	14		228
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	369	201	177	249	173	240	234	74	149	410	397	124	2797
Total	369	201	177	249	173	240	234	74	149	410	397	124	2797

Table 5. The number of fish sampled for ageing Stout Whiting by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													809
Total													809

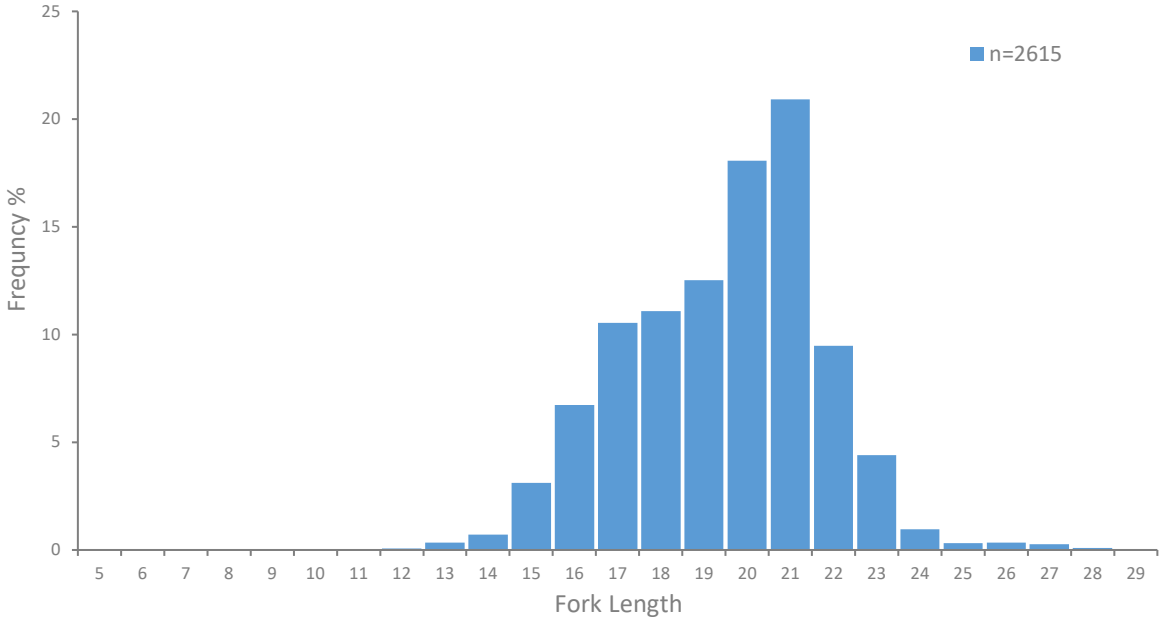


Figure 1. Length composition of Stout Whiting landed by the commercial fishery for 2020/21. Fish were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES. The number of lengths used to create the figure may differ slightly from the number of lengths measured due to length rules in the PISCES software.

Commentary

Sampling for Stout Whiting during 2020/21 followed the agreed protocols. While sampling aligned reasonably well with the spatial and temporal operation of the fishery, sampling a greater number of catches from each ocean zone each month may improve the precision of the length frequency estimates.

Yellowtail Scad

STOCK STATUS OVERVIEW (2020)

Stock status determination

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales, Queensland	Eastern Australia	**Sustainable**	Historical catch and effort data, natural mortality, fishing mortality, fishing gear selectivity.

OHF Ocean Hauling Fishery (NSW)

OTF Ocean Trawl Fishery (NSW)

OTLF Ocean Trap and Line Fishery (NSW)

Prioritization and justification

Species Priority Ranking for 2020/21: **18**

Data and Monitoring Plan for 2020/21

Ranking for Port Monitoring **10**

Base case port monitoring required to inform a reliable assessment:

Rank for biology – **not required**

Rank for lengths – **10**

Rank for ages – **8**

Aim of the Port Monitoring sampling for 2020/21

To collect size and age composition data that are representative of the NSW commercial fishery landings.

Sampling design

Length Frequency data from the purse seine fisheries off Wollongong and Ulladulla (ocean zones 7 and 8) were collected from the Sydney Fish Markets. For each location all catches were attempted to be sampled on any given day. Yellowtail Scad were measured from the tip of the nose to fork length (nearest cm rounding down).

Yellowtail Scad sampling is based on month and ocean zone strata for data expansion using reported commercial landings for each month and ocean zone. These expansions are done using the PISCES software.

A sample of 20 fish from ocean zones 7 and 8 were also purchased at the Sydney Fish Market each month for ageing. Fish were selected from each grade in the approximate ratio of each grade in the total catch by weight.

Sampling graded catches

Almost all Yellowtail Scad catches are graded, generally into XL, L, M, S or U. All grades are sampled. Approximately 10 times the number of size classes per grade are measured (as tallied by the electronic measuring board software). These sub-samples are weighed and the total weight of each grade recorded and the sample scaled up accordingly, using the PISCES software.

Results

Table 1. Reported landings heat map of Yellowtail Scad by month and area during 2020/21.

Reported Landings

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total													337967

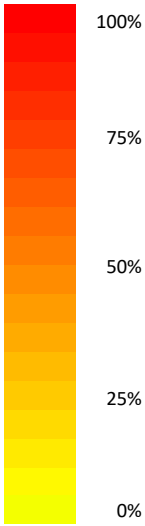


Table 2. The number of days sampled for Yellowtail Scad by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Days Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													70
Total													70

Table 3. The number of catches sampled for Yellowtail Scad by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Catches Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4			3										3
Zone 5		1		1									2
Zone 6													
Zone 7	3	3	2	7	2	4	5	5	5	6	5	3	50
Zone 8	2	1			1	4	5	3	2	2	3	4	27
Zone 9									1				1
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	5	5	5	8	3	8	10	8	8	8	8	7	83
Total	5	5	5	8	3	8	10	8	8	8	8	7	83

Table 4. The number of individuals sampled for Yellowtail Scad by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of fish Sampled

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)													6785
Total													6785

Table 5. The number of fish sampled for ageing Yellowtail Scad by month and area during 2020/21. The shaded heat map represents the reported commercial landings.

Number of Bios

Month-->	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total by Area
Ocean Zone/EG Region													
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7	20	20	20	20	15	20	15	20	20	20	20	20	230
Zone 8					15	20	15	20	20	19	19	20	148
Zone 9													
Zone 10													
EG Region 1													
EG Region 2													
EG Region 3													
EG Region 4													
EG Region 5													
EG Region 6													
EG Region 7													
Total (area known)	20	20	20	20	30	40	30	40	40	39	39	40	378
Total	20	20	20	20	30	40	30	40	40	39	39	40	378

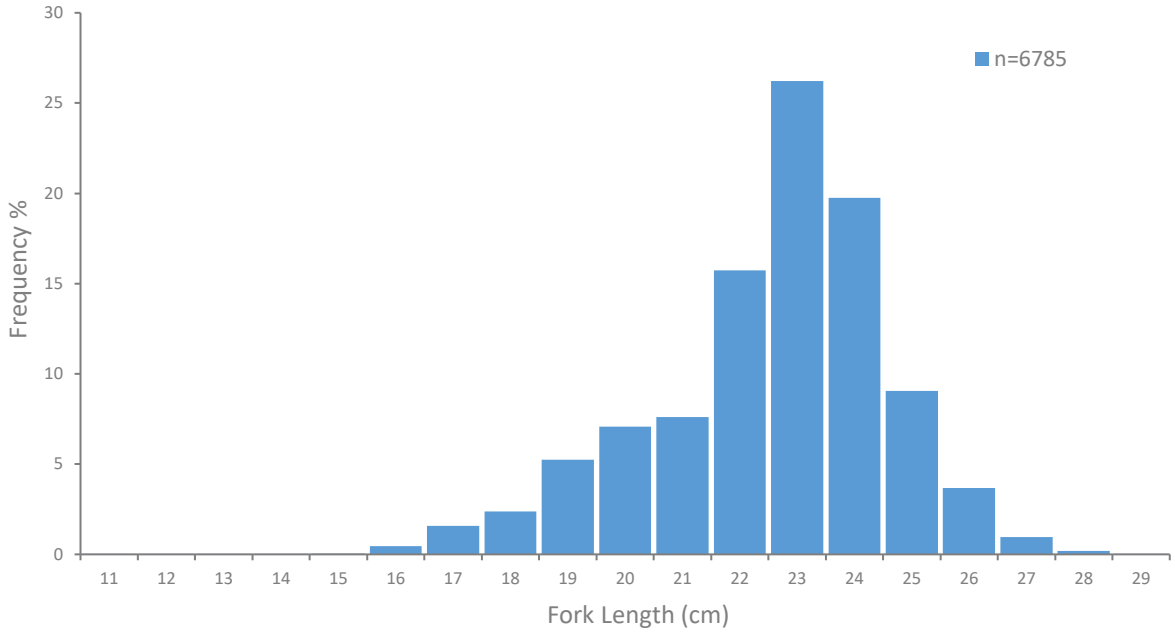


Figure 1. Length composition of Yellowtail Scad landed by the commercial fishery for 2020/21. Yellowtail Scad were sampled through the Port Monitoring program and combined according to the reported commercial landings in each sampling strata using the software PISCES.

Commentary

Monitoring of Yellowtail Scad during 2020/21 aligned well with the spatial and temporal operation of the fishery. Sampling 83 purse seine catches during the year should provide a reliable estimate of the sizes and ages of fish landed.

Appendices

Appendix A -Staff

Core funded

John Stewart

James Craig

Anne-Marie Hegarty

Caitlin Young

Antony Gould

Commercial Trust funded

David Barker

Glen Cuthbert

Glenn Campbell

Angela Russell

Chantelle Clain

Holly Gunton

Nick Meadows

Appendix B - Species Priority List 2020/2021

Species priority list for research for 2020/2021, ranked highest to lowest. The multi-criteria decision analysis (MCDA) was based on commercial and recreational management weightings. Species selected for port monitoring in 2020/2021 are highlighted.

MCDA score	Common Name	MCDA score	Common Name	MCDA score	Common Name
11.063	Bluespotted Flathead	3.950	Green Sea Urchin	1.251	Cunjevoi
10.589	Eastern School Whiting	3.608	Spanish Mackerel	1.250	Estuary Perch
10.166	Gemfish	3.417	Loligo Squid	1.154	Freshwater Shrimp
9.686	Silver Trevally	3.344	Cockles	1.098	Australian Herring
9.498	Blacklip Abalone	3.312	Bass Groper	1.048	Australian Bass
9.274	Giant Mud Crab	3.134	Australian Bonito	1.021	Golden Perch
9.201	Eastern King Prawn	3.094	Tailor	1.000	Black Bream
9.062	Pipi	3.001	Crimsonband Wrasse	0.954	Bastard Trumpeter
8.285	Eastern Rock Lobster	2.865	Spotted Mackerel	0.953	Ribaldo
7.959	Stout Whiting	2.657	Royal Red Prawn	0.951	Bluethroat Wrasse
7.860	Grey Morwong	2.654	Common Jack Mackerel	0.951	Blue Warehou
7.817	Tiger Flathead	2.640	John Dory	0.950	Spangled Emperor
7.774	Pink Ling	2.619	Mirror Dory	0.950	Elephantfish
7.726	Spanner Crab	2.609	Yellowfin Tuna	0.950	School Mackerel
7.634	Dusky Flathead	2.606	Jackass Morwong	0.950	Silver Warehou
7.572	Blue-eye Trevalla	2.462	Shovelnose Rays	0.943	Angel Sharks
7.565	Mulloway	2.282	Estuary Cobbler	0.914	Eastern Pigfish
7.557	Yellowtail Scad	2.263	Dart	0.530	Trawl Octopus
7.330	Sea Mullet	2.246	Mahi	0.337	Wobbegong Sharks
7.199	Redfish	2.232	Leatherjackets-other	0.335	Greentail Prawn
7.076	Eastern School Prawn	2.207	Periwinkle (Turban Shell)	0.327	Red Gurnard and Latchets
7.006	Blue Mackerel	2.200	Mangrove Jack	0.322	Mackerel Tuna
6.960	Red Sea Urchin	2.094	Yabby (freshwater)	0.320	Tiger Prawn (Brown)
6.920	Snapper	2.020	Sawsharks	0.310	Gloomy Octopus
6.719	Australian Sardine	1.983	Murray Cod	0.309	Red Morwong
6.651	Yellowtail Kingfish	1.942	Purple Sea Urchin	0.309	Frigate Mackerel
6.515	Yellowfin Bream	1.921	Blacktip Sharks (Common)	0.307	Diamondfish

MCDA score	Common Name	MCDA score	Common Name	MCDA score	Common Name
6.208	School Shark	1.906	Sandbar Shark	0.306	Striped Perch
6.193	Eastern Sea Garfish	1.905	Dusky Whaler	0.305	Bigeyes
5.934	Blue Swimmer Crab	1.877	Rock Blackfish	0.304	Hammerhead Sharks
5.665	Luderick	1.866	Goulds (Arrow) Squid	0.303	Tiger Shark
5.627	Ocean Perch	1.850	Striped Marlin	0.303	Tilefish
5.354	Sand Whiting	1.700	Southern Bluefin Tuna	0.302	Boarfish
5.258	Dogfish	1.437	Red Mullet	0.301	Blue Shark
5.094	Eastern Australian Salmon	1.436	Flounders	0.300	Mantis Shrimps
5.057	Trumpeter Whiting	1.411	Soles	0.300	Ghostsharks
4.965	Ghost Nipper	1.386	Whitebait - Sandy Sprat	0.300	Banded Morwong
4.943	Silver Sweep	1.348	Sand Mullet	0.026	Maori Octopus
4.929	Pearl Perch	1.346	Cuttlefish	0.022	Forktail Catfish
4.708	Hapuku	1.336	Eastern Red Scorpionfish	0.002	Pale Octopus
4.667	Ocean Jackets	1.300	River Garfish	0.000	Snook
4.597	Southern Calamari	1.285	Banded Rockcod		
4.567	Gummy Shark	1.268	Hairtail		
4.481	Beachworms	1.265	Whaler Sharks - other		
4.450	Balmain Bugs	1.265	Southern Maori Wrasse		
4.199	River Eels	1.258	Australian Anchovy		
4.108	Common Silverbiddy	1.256	Cobia		
4.017	Tarwhine	1.255	Eastern Blue Groper		
4.016	Goldspot Mullet	1.254	Mako Sharks		
4.013	Teraglin	1.252	Longtail Tuna		

Appendix C - Ballina co-op sampling procedures July 2020 – June 2021

Sampling Schedule

2020/21	**Ballina**
Balmain/smooth bugs	3 LF days/month
Mulloway	Opportunistic
Pearl Perch	Opportunistic
Snapper	3 LF days/month (30 otoliths/month)

Sampling Protocols

Snapper (*Chrysophrys auratus*)

Sample days

- 3 sample days/month when traps are in the water
- Collect from both Ballina co-op and Northern Rivers seafood

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Otoliths required

- 30 otoliths per month taken from either one or two catches. Take fish proportionately from each grade if catches are graded
- Collect fork length (0.1 cm), body weight (0.1g), sex, gonad stage, gonad weight (0.1g) and otoliths (start field code **BA-Pa 1**)
- It is fine to collect samples from gilled and gutted samples and only collect the fork length and otoliths.
- Be sure to collect samples from both trap AND handline catches if possible.

Smooth and Balmain Bug (*Ibacus chacei* & *Ibacus peronii*)

Sample days

- 3 days/month

Lengths required

- Measure all bugs on the floor on the day of sampling unless the catch exceeds 120 individuals (approx. 15kg).

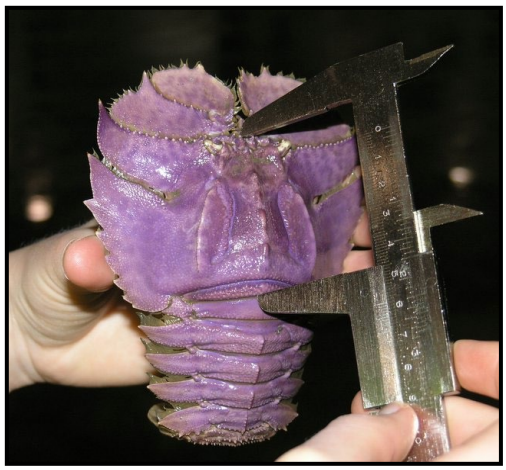
Procedure

- Measure as carapace length to the nearest whole millimetre below true length with calipers (see photo below).

- If catch exceeds 15kg, sub-sampling will be required. Refer to 'Sampling procedures – general' in this document for information regarding sub-sampling.

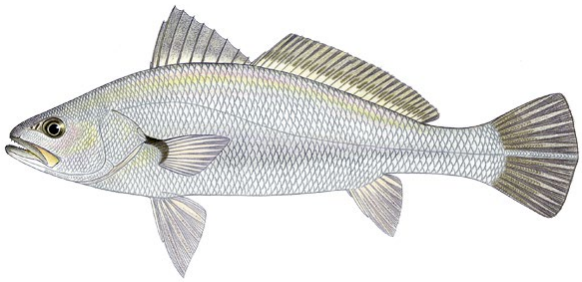
- Important to distinguish species - Smooth (*Ibacus chacei*) versus Balmain (*Ibacus peronii*) bug (as per the laminated ID provided) and record on datasheet against measurements. Whilst measuring, separate the two species then once you have finished measuring weigh each species and record as separate samples on the bug-specific datasheet.

- Please also be aware of two other species Bruce's bug (*I. brucei*) and a deepwater bug (*I. alticrenatus*) (refer to laminated ID card provided) – these species are not to be measured. If you come across either of these other species whilst measuring smooth and balmain bugs, please set aside in a separate bucket/container and indicate in the notes section of your datasheet the number of each species and total weight (kg) of them combined.



Balmain bug (*Ibacus peronii*) being measured with caliper.

Mulloway (*Argyrosomus japonicus*)



Sample days

- Opportunistically up to 4 days per month

Lengths required

- Measure all catches of mulloway on the floor on the day of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

Pearl Perch (*Glaucosoma scapulare*)

Sample days

- Opportunistically up to 4 days per month

Lengths required

- Measure all the catches of pearl perch on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

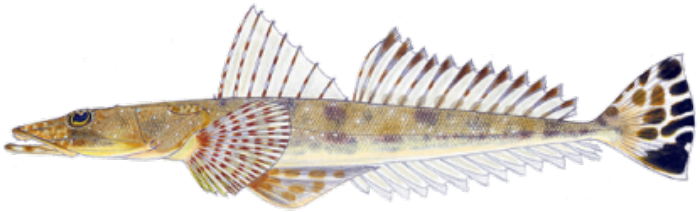
Appendix D - Clarence River co-op sampling procedures July 2020 – June 2021

Sampling Schedule

2020/21	**Clarence**
Balmain/smooth bugs	3 LF days/month
Bluespotted flathead	3 LF days/month
Dusky flathead	3 LF days/month (20 otoliths/month)
Trawl whiting	1-2 LF days/month (15 otoliths per species/month)
Export whiting box (FRDC project)	1 export box/month
Mud crab	2 LF days/month
Mulloway	Opportunistic
Pearl Perch	Opportunistic
Snapper	Opportunistic (10 otoliths/month)

Sampling Protocols

Bluespotted Flathead (*Platycephalus caeruleopunctatus*)



Sample days

- 3 days/month

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

Otoliths required

- Nil

Snapper (*Chrysophrys auratus*)

Sample days

- Opportunistic

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Otoliths required

- 10 otoliths per month taken from either one or two catches. Take fish proportionately from each grade if catches are graded

- Collect fork length (0.1 cm), body weight (0.1g), sex, gonad stage, gonad weight (0.1g) and otoliths (start field code **CR-Pa 1**)

- It is fine to collect samples from gilled and gutted samples and only collect the fork length and otoliths.

- Be sure to collect samples from both trap AND handline catches.

Smooth and Balmain Bug (*Ibacus chacei* & *Ibacus peronii*)

Sample days

- 3 days/month

Lengths required

- Measure all bugs on the floor on the day of sampling unless the catch exceeds 120 individuals (approx. 15kg).

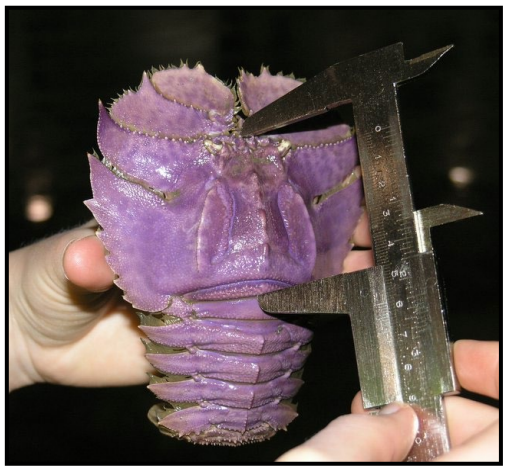
Procedure

- Measure as carapace length to the nearest whole millimetre below true length with calipers (see photo below).

- If catch exceeds 15kg, sub-sampling will be required. Refer to 'Sampling procedures – general' in this document for information regarding sub-sampling.

- Important to distinguish species - smooth (*Ibacus chacei*) versus balmain (*Ibacus peronii*) bug (as per the laminated ID provided) and record on datasheet against measurements. Whilst measuring, separate the two species then once you have finished measuring weigh each species and record as separate samples on the bug-specific datasheet.

- Please also be aware of two other species Bruce's bug (*I. brucei*) and a deepwater bug (*I. alticrenatus*) (refer to laminated ID card provided) – these species are not to be measured. If you come across either of these other species whilst measuring smooth and balmain bugs, please set aside in a separate bucket/container and indicate in the notes section of your datasheet the number of each species and total weight (kg) of them combined.



Balmain bug (*Ibacus peronii*) being measured with caliper.

Dusky Flathead (*Platycephalus fuscus*)

Sample days

- Opportunistic

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

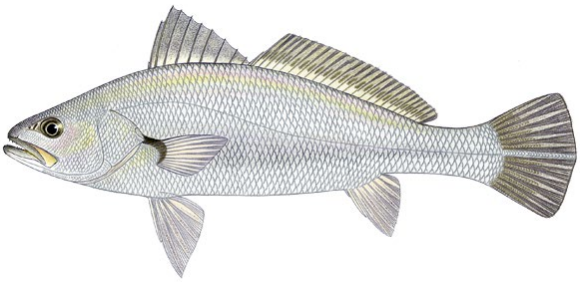
Otoliths required

- 20-30 otoliths per month taken from either one or two catches. Take fish proportionately from each grade if catches are graded

- Collect fork length (0.1 cm), body weight (0.1g), sex, gonad stage, gonad weight (0.1g) and otoliths (start field code **CR-Ps 1**)

- Can collect otoliths from gilled and gutted catches.

Mulloway (*Argyrosomus japonicus*)



Sample days

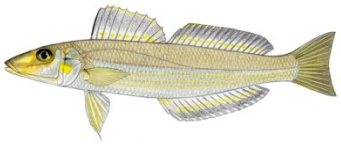
- Opportunistically up to 4 days per month

Lengths required

- Measure all catches of mulloway on the floor on the day of sampling.

- Measure catches as total length (TL) to the nearest whole cm below true length.

Eastern School Whiting (*Sillago flindersi*) and Stout whiting (*Sillago robusta*) EXPORT whiting box



Sample days

- 1 x 8kg export box per month. Please deliver to Coffs Harbour NMSC.

Maclean Coop
Trawl Whiting - Eastern School Whiting (*Sillago flindersi*) and Stout whiting (*Sillago robusta*)

Sample days

- 1-2 days per month (as there is only 1 fisher to sample from)

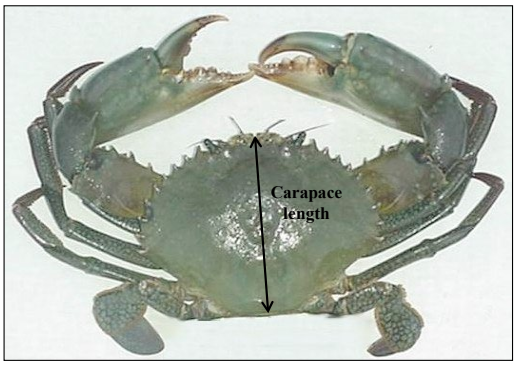
Lengths required

- Measure all the catches of Trawl Whiting on the floor on the day of sampling.
- Sub-sampling will be required for large catches.
- Record/weigh species split from approx. 15 kg box
- Measure lengths of each species as fork length (FL) to the nearest whole cm below true length.
- If there is a significant species bias and extra fish are available, measure an extra sub-sample of the lesser species until at least 100 of each species have been measured for the day (if possible). Record these as a separate sub-sample and clearly label as 'Extra fish'.

Otoliths required

- For both Eastern School Whiting and Stout Whiting collect 15 otoliths per month, taken from one catch. Take fish proportionately from each grade if catches are graded
- Please deliver to freezer at Coffs Harbour NMSC in a labelled bag.

Giant Mud Crab (*Scylla serrata*)



Sample days

- 2 days per month

Lengths required

- Measure all crabs on the floor on the day of sampling.
- Measure as carapace length (CL) to the nearest whole millimetre below true length with calipers (see diagram below for CL measurement).
- A separate length frequency needs to be recorded for each sex and maturity
- Please record total weights by GRADE of individual catches in the notes section of the crab-specific datasheet

Pearl Perch (*Glaucosoma scapulare*)

Sample days

- Opportunistically up to 4 days per month

Lengths required

- Measure all the catches of pearl perch on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Appendix E - Nelsons Bay co-op sampling procedures July 2020 – June 2021

Sampling Schedule

2020/21	**Clarence**
Bluespotted flathead	3 LF days/month
Eastern School Whiting/ Stout Whiting	2 LF/month (15 otoliths/month)
Grey Morwong	3 LF days/month
Mulloway	Opportunistic
Snapper	Opportunistic

Sampling Protocols

Bluespotted Flathead (*Platycephalus caeruleopunctatus*)

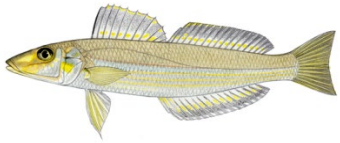
Sample days

- 3 days/month

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

Eastern School Whiting (*Sillago flindersi*) and Stout whiting (*Sillago robusta*)



Sample days

- Opportunistic (to supplement Karina's OZ5 samples)

Lengths required

- Measure all the catches of Trawl Whiting on the floor on the day of sampling.
- Sub-sampling will be required for large catches. Try and measure from as many different fishermen as time allows.
- If species are combined, record/weigh species split from approx. 15 kg box
- Measure lengths of each species as fork length (FL) to the nearest whole cm below true length.

Otoliths required

- For both Eastern School Whiting and Stout Whiting (if possible) collect 15 otoliths per month, taken from one catch. Take fish proportionately from each grade if catches are graded
- Collect fork length (0.1 cm), body weight (0.1g), sex, gonad stage, gonad weight (0.1g) and otoliths (start field code **NB – ESW 1** and **NB – SW 1**)

Grey Morwong (*Nemadactylus douglasii*)

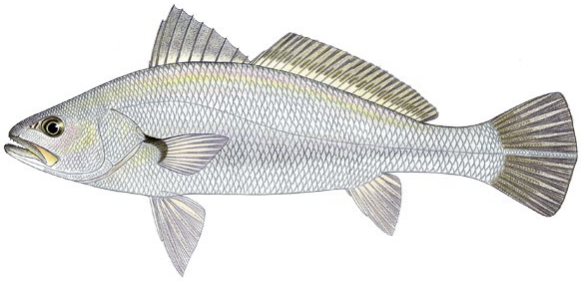
Sample days

- Opportunistically - up to 3 days per month

Lengths required

- Measure from both fish trawl and ocean trap and line catches
- Measure all the catches on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Mulloway (*Argyrosomus japonicus*)



Sample days

- Opportunistically

Lengths required

- Measure all catches of mulloway on the floor on the day of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

Snapper (*Chrysophrys auratus*)

Sample days

- Opportunistic

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Appendix F – Coffs Harbour co-op sampling procedures July 2020 – June 2021

Sampling Schedule

2020/21	**Coffs Harbour**
Balmain/smooth bugs	3 LF days/month
Bluespotted flathead	3 LF days/month
Grey morwong	3 LF days/month (20 otoliths/month)
Mud crab	2 LF days/month
Mulloway	Opportunistic
Pearl Perch	Opportunistic
Snapper	3 LF days/month (20 otoliths/month)

Sampling Protocols

Bluespotted Flathead (*Platycephalus caeruleopunctatus*)

Sample days

- 3 days/month

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

Otoliths required

- Nil

Snapper (*Chrysophrys auratus*)

Sample days

- 3 days/month

Lengths required

- Measure all catches on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Otoliths required

- 20 otoliths per month taken from either one or two catches. Take fish proportionately from each grade if catches are graded
- Collect fork length (0.1 cm), body weight (0.1g), sex, gonad stage, gonad weight (0.1g) and otoliths (start field code **CH-Pa 1**)
- It is fine to collect samples from gilled and gutted samples and only collect the fork length and otoliths.
- Be sure to collect samples from both trap AND handline catches.

Smooth and Balmain Bug (*Ibacus chacei* & *Ibacus peronii*)

Sample days

- 3 days/month

Lengths required

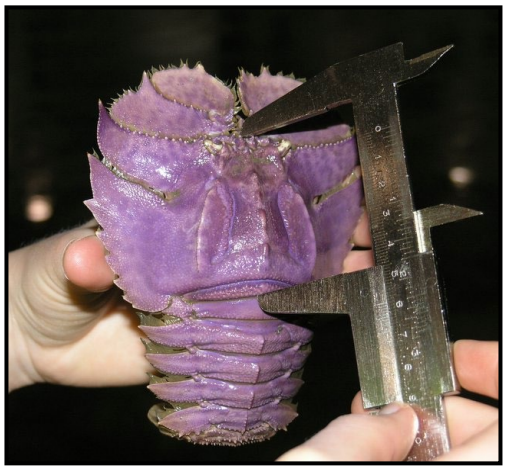
- Measure all bugs on the floor on the day of sampling unless the catch exceeds 120 individuals (approx. 15kg).

Procedure

- Measure as carapace length to the nearest whole millimetre below true length with calipers (see photo below).
- If catch exceeds 15kg, sub-sampling will be required. Refer to 'Sampling procedures – general' in this document for information regarding sub-sampling.
- Important to distinguish species - smooth (*Ibacus chacei*) versus balmain (*Ibacus peronii*) bug (as per the laminated ID provided) and record on datasheet against measurements. Whilst measuring,

separate the two species then once you have finished measuring weigh each species and record as separate samples on the bug-specific datasheet.

- Please also be aware of two other species Bruce's bug (*I. brucei*) and a deepwater bug (*I. alticrenatus*) (refer to laminated ID card provided) – these species are not to be measured. If you come across either of these other species whilst measuring smooth and balmain bugs, please set aside in a separate bucket/container and indicate in the notes section of your datasheet the number of each species and total weight (kg) of them combined.



Balmain bug (*Ibacus peronii*) being measured with caliper.

Grey morwong (*Nemadactylus douglasii*)

Sample days

- 3 days/month

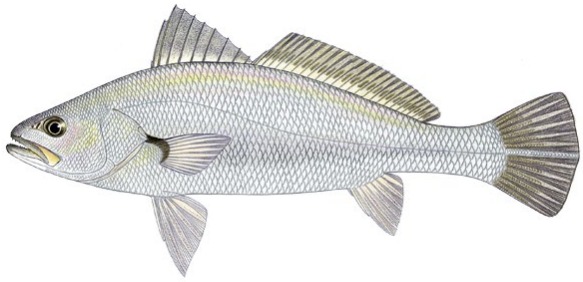
Lengths required

- Measure from both fish trawl and ocean trap and line catches
- Measure all catches on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.

Otoliths required

- 20 otoliths per month taken from either one or two catches. Take fish proportionately from each grade if catches are graded
- Collect fork length (0.1 cm), body weight (0.1g), sex, gonad stage, gonad weight (0.1g) and otoliths (start field code **CH-Nd 1**)

Mulloway (*Argyrosomus japonicus*)



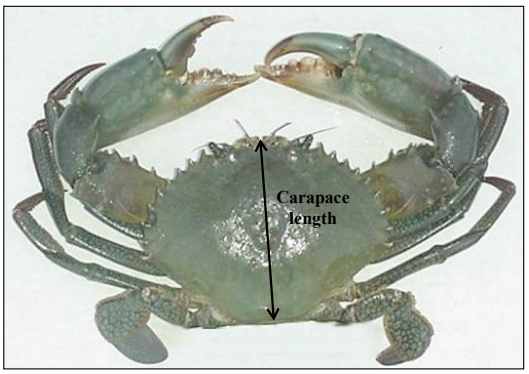
Sample days

- Opportunistically up to 4 days per month

Lengths required

- Measure all catches of mulloway on the floor on the day of sampling.
- Measure catches as total length (TL) to the nearest whole cm below true length.

Giant Mud Crab (*Scylla serrata*)



Sample days

- 2 days per month

Lengths required

- Measure all crabs on the floor on the day of sampling.
- Measure as carapace length (CL) to the nearest whole millimetre below true length with calipers (see diagram below for CL measurement).
- A separate length frequency needs to be recorded for each sex and maturity
- Please record total weights by GRADE of individual catches in the notes section of the crab-specific datasheet

Pearl Perch (*Glaucosoma scapulare*)

Sample days

- Opportunistically up to 4 days per month

Lengths required

- Measure all the catches of pearl perch on the floor on the day and time of sampling.
- Measure catches as fork length (FL) to the nearest whole cm below true length.