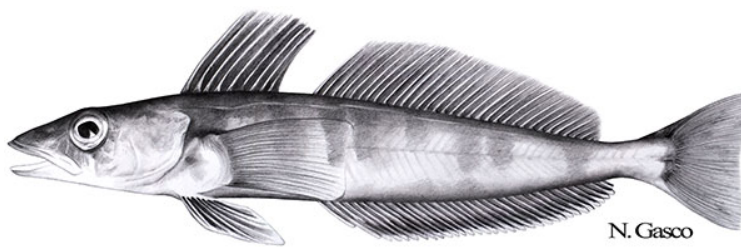


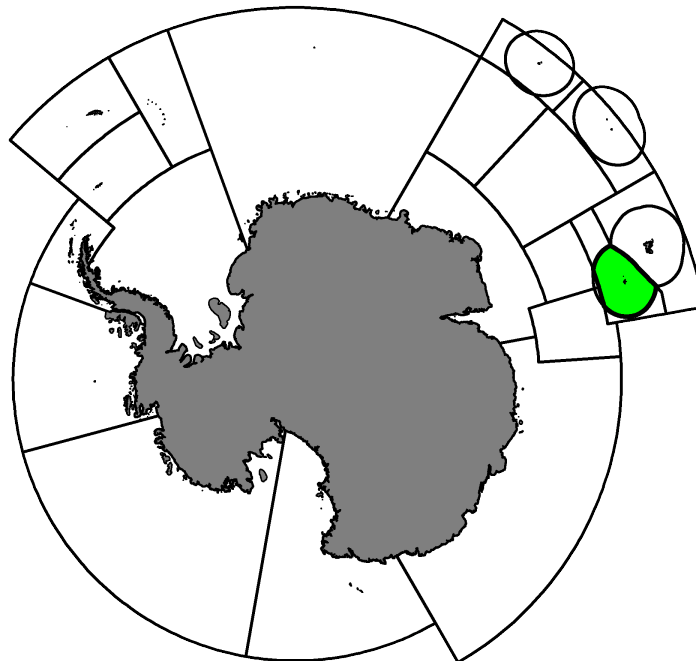
Stock Assessment Report 2022: *Champscephalus gunnari* at Heard Island (Division 58.5.2)

CCAMLR Secretariat

14 March 2023



Mackerel icefish, *Champscephalus gunnari* Lönnberg, 1905.



Map of the management areas within the CAMLR Convention Area. The region discussed in this report is shaded in green.

Stock Assessment Report 2022: *Champtocephalus gunnari*
Heard Island, Australian EEZ (Division 58.5.2)

1. Model configuration

The Heard Island and McDonald Islands fishery for mackerel icefish (*Champtocephalus gunnari*) in Division 58.5.2 was assessed in 2022 using the Generalised Yield Model (WG-FSA-2022/08).

The specification for the assessment model used for management advice are provided in the Stock Annex.

2. Population structure and biomass

Using the data from the random stratified trawl survey (RSTS; WG-FSA-2022/07), the distribution of length cohorts consisted of five year classes from 0+ to 4+ (Figure 1).

Table 1: Results generated from CMIX analyses for *Champtocephalus gunnari* from the 2022 random stratified trawl survey in Division 58.5.2.

	Mixture Components				
	0 (0+)	1 (1+)	2 (2+)	3 (3+)	4 (4+)
Mean length (mm)	60	168	266	334	376
SD (mm)	11	12	14	15	15
Intercept of CV		10			
Slope of CV		0.014			
Total density (n.km ⁻²)	26.0	96.8	105.2	8401.7	4428.8
SD (n.km ⁻²)	26	34	35	3037	1396
Sum of observed densities		13047			
Sum of expected densities		13056			

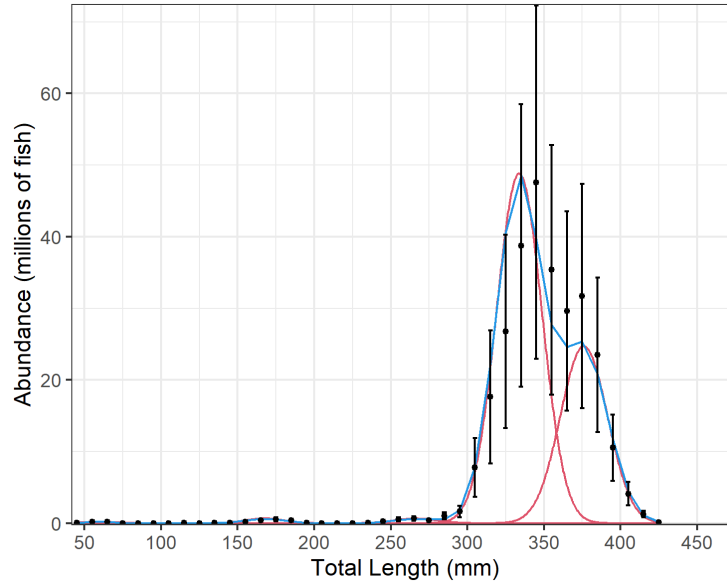


Figure 1: Size distribution of *Champsocephalus gunnari* from the 2022 random stratified trawl survey in Division 58.5.2 with standard errors. Cohorts were present in ages 0+ to 4+.

The biomass estimates with bootstrapped uncertainty for each icefish survey stratum and overall are shown in Table 2.

Few fish in the mackerel icefish population in Division 58.5.2 survive beyond age 4, with a drop in abundance between 3+ and 4+ cohorts observed in consecutive surveys (Welsford 2011, Welsford 2015). Consequently, the assessment scenarios only included the biomass estimated from the 0+ to 3+ cohorts, which means that 14 879 t of the overall 26 433 t lower 95% CI was used in the projection.

Table 2. Abundance (tonnes) of mackerel icefish in Division 58.5.2 estimated by bootstrapping hauls from the 2022 random stratified trawl survey. SE = standard error; Lower CI & Upper CI = lower and upper confidence intervals respectively; LOS 95% CI = lower one-sided 95% confidence interval.

Stratum	Mean	SE	Lower CI	Upper CI	LOS 95% CI
Gunnari Ridge	36,373	14,689	17,929	67,226	14,950
Plateau SE	13,900	8,953	2,767	33,425	3,160
Plateau W	2,889	429	2,092	3,681	2,217
Pooled	53,162	17,870	22,550	91,342	26,434

3. Yield estimates

The stock projections using the GYM indicated that catches of 2 616 t in the 2022/23 season and 1 857 t in the 2023/24 season satisfy the CCAMLR decision rules (Table 3).

Table 3. Target fishing mortality rate and annual yields of mackerel icefish in Division 58.5.2, estimated to ensure 75% escapement over a 2-year projection period for the 0+to 3+ cohorts in the Generalised Yield Model, using the parameters shown in the Stock Annex.

Scenario	Initial biomass estimate (t)	Target fishing mortality rate (yr ⁻¹)	Catch after RSTS	Yield (tonnes)	
				2022/23	2023/24
2022	14879	0.1955	0	2616	1857

Additional Resources

- Fishery Summary: [pdf](#), [html](#)
- Fishery Report: [pdf](#), [html](#)
- Species Description: [pdf](#), [html](#)
- Stock Annex: [pdf](#)
- [Fisheries Documents Browser](#)