Falkland Islands Fisheries Department

Vessel Units

Allowable Effort

Allowable Catch

2024

Summary and Recommendations

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Contents

1. Foreword

The 2024 Licensing Advice document (Vessel Units, Allowable Effort, and Allowable Catch) summarizes licensing advice for all regulated fisheries in Falkland Islands Conservation Zones for 2024 apart from the B-licensed *Illex* fishery. Current licencing advices are based on data through the end of 2022 for finfish, toothfish and skates, and through the end of first season 2023 for calamari. Summary tables of the licencing advice are presented at the end of the report.

Stock assessments and survey data that inform the licencing advice standards are published as separate reports and are available on the Falkland Islands Fisheries Department website: https://www.falklands.gov.fk/fisheries/ (publications).

Falkland calamari *Doryteuthis* (*Loligo*) *gahi* was fished for the full 1st season 2023, obtaining the fourth-highest catch and CPUE of 1st seasons since 2004. Four of the last five 1st seasons have totalled over 40,000 tonnes *D. gahi* catch. Accordingly, allowable effort is set with the expectation of full seasons in 2023, and Vessel Units were calculated as the average of the past three years: 27.01. However, two of the last five 2nd seasons – 2019 and 2023 – have been closed early for conservation, and continued cautious monitoring of the stock is indicated.

Finfish license allocations have since 2022 been changed significantly with the retirement of the effort index based on rock cod (*Patagonotothen ramsayi*) and shift towards a Total Allowable Catch system along the guidelines of the 2020 finfish external review. Total Allowable Efforts from 2021 (the last year before implementation of the current TAE / TAC protocol) have been set as a baseline for continuity, but adjusted by target proportion and TAC proportion factors calculated from updated stock assessments of individual species. For 2024, an additional stock abundance factor was added to take into consideration that stock abundances of commercial species may themselves be changing independently of the license allocation baseline. With hake (*Merluccius* spp.) continuing to represent by far the greatest percentage of finfish catches in 2022, the effort allocation to A license decreased slightly as the proportion of hake bycatch taken by other licenses decreased. The effort allocation to G license also decreased as G license obtained a lower target proportion factor than the year before, while W license effort allocation increased with W license having taken much lower hake catches in 2022.

Patagonian toothfish (*Dissostichus eleginoides*) catch in the target longline fishery obtained 1,097.3 tonnes in 2022, while toothfish bycatches in calamari trawls and finfish trawls both continued to decrease from their peaks in 2017 and 2016. Tag recapture data were included in stock assessment modelling for the first time, and the current assessment estimates a spawning stock biomass (SSB) of 11,416 t toothfish and a ratio of 2022 SSB to unfished SSB of 0.467 – both lower than last year's estimates. Following four consecutive years of weak toothfish recruitment, the SSB/SSB_0 ratio is now projected to decrease from the current *expansion range* to the *target range* within 10 years. Accordingly, harvest control rules require that the TAC cannot be increased, and the TAC for 2024 is therefore maintained at 1040 tonnes.

Skate (Rajiformes) total catch in 2022 of 1,254 tonnes was the lowest since 1998. The year 2022 was also the second year on record with a complete absence of skate target (F license) effort, following a new regulatory minimum trawl mesh of 400 mm for F-license fishing. To evaluate the potential for reactivating the skate fishery, four trawl surveys from 2013 to 2021 were analysed, with the results indicating that skate biomass in Falkland Islands waters may have decreased by 45% to 70% over that period. Given the hiatus in skate target fishing, and the change in regulatory mesh, the previous Vessel Unit protocol for F license was discontinued

again for 2024. Results of the survey analysis instead provided the same recommendation as last year that a skate TAC of 500 tonnes may be allocated, with use of the new regulatory mesh, an approved fishing plan, and continuance of the exclusion zone to skate target fishing south of 51°S latitude.

Southern blue whiting (*Micromesistius australis*) commercial catches in Falkland Islands waters were higher in 2022 than 2021 and 2020 due to exceptionally large catches in the C-license calamari fishery, but still lower than all earlier years on record. Besides 149 tonnes caught under C license, in 2022 24 tonnes southern blue whiting were caught under X license, 3 tonnes under A license, less than one tonne under G or W licenses, and 97 tonnes under experimental E license. A pelagic fishing trip by one vessel, jointly under S and E licenses, had been proposed for 2023 but was subsequently cancelled for logistic reasons. Accordingly, the statutory S license TAC of 2,000 metric tonnes is rolled forward again for 2024, but may be augmented if an approved joint commercial-exploratory fishery is reprised next year.

We are grateful to the scientific observers of the FIFD for data collection and to data management staff for processing catch reports from fishing vessels. We also thank our local and foreign-partner fishing companies for their cooperation in providing timely and informative fisheries data.

2. *Doryteuthis gahi* (*Loligo*) – Falkland calamari

2.1. Management and stock trends

The targeted fishery for Falkland calamari (*Doryteuthis gahi* – colloquially *Loligo*) is managed through two levels of control: 1) season schedule and 2) total biomass to a minimum escapement threshold per season. Season schedules are currently set as: 1st season (C license), 64/65 days opening from late February; 2nd season (X license), 64 days from late July. Since 2013 a flexible option also allows vessels to start and end either season as much as 6 days later, including compensatory days for deferred fishing days in-season. In either 1st or 2nd season the minimum escapement threshold is set at 10,000 tonnes biomass (Barton 2002, Arkhipkin et al. 2008). If in-season depletion models project that calamari biomass will fall below 10,000 tonnes, the fishery may be suspended or stopped before the scheduled end date of the season. With the use of these controls, actual Vessel Units (VU) play a nominal role in determining the effort allocation to the Falkland calamari fishery. As long as no significant decline in stock biomass is anticipated, all licensed vessels can expect to fish for the duration of the season (except vessels restricted to fixed proportions of the season based on their replacement categories; see below). Vessel allocations are calculated from 1st seasons, given the schedule for publishing licencing advice. Four of the last five 1st seasons were among the five highest for CPUE since at least 2004, when catch management was assumed by the FIFD (Winter 2023). Concurrently abundant biomasses are reflected in nil to low risks of season-end escapement failure (Table 2.1).

Table 2.1. Catches, estimated biomass, escapement risks, and VU allocations of Falkland calamari 1st seasons 2019-2023.

Year	1st season calamari catch (t)	1st season calamari biomass (t)[a]	Risk of <10,000 t escapement	Total VU allocation
2019	55,586	189,577	0.000	
2020	29,116	52,941	0.001	
2021	59,587	145,482	0.000	27.01
2022	56,417	242,913	0.000	
2023	52,704	160,375	0.000	

a: Biomass estimate at the end of the pre-season survey, plus in-season immigration.

2.2. Vessel units and q-values.

As in previous years (e.g., Section 2 in FIFD 2022), the total VU allocation for 2024 was set as the average of the preceding three years (Table 2.1). As this procedure has been followed for a number of years, the total VU allocation at this point is essentially a fixed value of 27.01. Total VU allocation was partitioned among licensed vessels in proportion to the GT category-averaged catchability coefficients (q values). Catchability coefficients represent the efficiency of a vessel at fishing (Arreguín-Sánchez 1996), and are calculated as catch per unit effort per available biomass. To smooth variations within seasons, catchability coefficients were averaged over the most recent three years 2021 to 2023 (Table 2.2). Since 2016 catchability coefficients have been calculated only on unsubstituted vessels, i.e. excluding vessels that had been entered as short-term substitutes for logistic or mechanical reasons. Substitute vessels

may be less experienced in the fishery and therefore have lower catch efficiency independently of their GT category.

Table 2.2. Parameters for average q-value calculations. Trends were visualized for the five years 2019 - 2023; q averages were calculated for the most recent three years 2021 – 2023.

Parameter	GT Cat	Year					3-year average
		2019	2020	2021	2022	2023	
Biomass		189,577	52,941.0	145,482	242,913	160,375	
Catch (t)	4	11275.0	6674.6	15946.3	15864.5	14653.7	
	5	16712.5	8988.6	15570.2	14902.5	14461.9	
	6	18320.0	9307.3	19196.3	17752.6	16632.9	
	7	9225.3	4145.6	8450.5	7561.0	6464.9	
Fishing days	4	232	251.0	283	299	307	
	5	294	322.0	217	242	244	
	6	303	318.0	273	307	291	
	7	124	121.0	110	115	115	
CPUE (t day^{-1})	4	48.6	26.6	56.3	53.1	47.7	
	5	56.8	27.9	71.8	61.6	59.3	
	6	60.5	29.3	70.3	57.8	57.2	
	7	74.4	34.3	76.8	65.7	56.2	
Catchability (q)	4	2.56e-4	5.02e-4	3.87e-4	2.18e-4	2.98e-4	3.01e-4
	5	3.00e-4	5.27e-4	4.93e-4	2.54e-4	3.70e-4	3.72e-4
	6	3.19e-4	5.53e-4	4.83e-4	2.38e-4	3.56e-4	3.59e-4
	7	3.92e-4	6.47e-4	5.28e-4	2.71e-4	3.51e-4	3.83e-4

Table 2.3. VU allocations per vessel.

Vessel Callsign	GT category	GT avg. q	VU allocation
ZDLC1	4	3.01e-4	1.48
ZDLC4	4	3.01e-4	1.48
ZDLD4	5	3.72e-4	1.83
ZDLE1	6	3.59e-4	1.77
ZDLF2	5	3.72e-4	1.83
ZDLM3 [a]	4	2.77e-4	[a] 1.37
ZDLO1	6	3.59e-4	1.77
ZDLP1	5	3.72e-4	1.83
ZDLR1	6	3.59e-4	1.77
ZDLS3	5	3.72e-4	1.83
ZDLT1	4	3.01e-4	1.48
ZDLU1	6	3.59e-4	1.77
ZDLW3	4	3.01e-4	1.48
ZDLY [b]	7	3.29e-4	[b] 1.62
ZDLZ	7	3.83e-4	1.89
ZDLZ1	6	3.59e-4	1.77
			27.01

[a] Replacing a category 3 vessel, restricted to 92% of the season.
[b] Three-way replacement between category 5 and 7 vessels, restricted to 86% of the season.

One category 4 vessel has been licensed to replace a category 3 vessel since 2019 (FIFD 2019), and is restricted to 92% of the season to offset its higher fishing capacity. One category 7 vessel had part of its allocation transferred to a newer category 5 vessel, and the allocation restriction was calculated at 86% (Table 2.3). By agreement in the Fisheries Advisory Committee (Winter and Ross 2022a, b), allocation restrictions for inter-category vessel replacements are kept to fixed percentages going forward.

Note that the 3-year average has now obtained higher catchability q, and therefore VU allocation, for smaller category 5 vessels than category 6 vessels (Table 2.2, Table 2.3).

2.3. References.

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3. Finfish

3.1. Introduction

Finfish trawl catch in the Falkland Islands is allocated by three licenses: A (unrestricted finfish), G (*Illex* squid and restricted finfish), and W (restricted finfish). Specialized fisheries for toothfish, skates and surimi are separately allocated by L, F and S licenses. In 2022, catch of major commercial species by A, G and W licenses totalled 67,940 tonnes (Table 3.1).

Table 3.1. Catches in 2022 of commercial species targeted by finfish licenses.

Species	Catch by Licence (tonnes)			
	A	G	W	
Common hake	55434.1	5999.7	806.3	62240.1
Southern hake	0.1	0.3	7.6	8.0
Illex squid	289.0	714.7	82.5	1086.2
Blue whiting	2.8	0.2	0.6	3.5
Hoki	129.2	620.9	1564.4	2314.4
Red cod	457.9	122.3	118.8	699.1
Kingclip	938.3	251.9	107.3	1297.4
Rock cod	166.3	95.3	29.9	291.5
	57417.6	7805.2	2717.3	67940.2

Finfish license allocations have, for the previous and current year, been set by Total Allowable Effort (TAE) adjusted by target proportion and TAC proportion factors (FIFD 2021, 2022). For next year, an additional adjustment is included as the stock abundance factor (Table 3.2), to take into consideration that stock abundances of commercial species may themselves be changing independently of the license allocation baseline (Winter 2023).

3.2. Vessel Units and Fishing Time

TAE is expressed by Vessel Units (VU), a metric of the fishing effort expected to yield a standard level of catch of the target species. VUs are then used to apportion the total effort allocation into fishing time.

Table 3.2. 2024 VU allocation calculated from 2021 VU allocations.

Licence	2021 VU		target proportion		TAC proportion		stock abundance		2024 VU
A	12.20	×	0.999	×	1.607	×	1.165	=	22.83
G	12.77	×	0.505	×	1.647	×	0.955	=	10.14
W	14.27	×	0.350	×	0.983	×	1.237	=	6.07

The VUs from 2021 per finfish license were multiplied by each of the proportion factors calculated by Winter (2023) to give the 2024 VUs. Note that VUs from 2021 were taken as the baseline; i.e., the last year prior to implementation of the current TAE / TAC protocol, not

2023; the current year of the TAE / TAC protocol. If 2023 was taken as the baseline, then relative penalties / advantages among licenses that were already effected last year would be compounded again (Winter 2022).

VUs are translated to fishing time (vessel-days or vessel-months) by the vessel-units per month (VUMs), which are a function of catchability and available fish biomass. For 2024 VUMs are again considered constant since the year before, as catchability may be assumed to have not fundamentally changed, and available fish biomass is accounted for by the TAC proportion. Differences in fishing time allocated for 2024 are therefore directly proportional to differences in VU (Table 3.2), from 2021:

Table 3.3. Fishing effort VUM and allocated fishing time in vessel-months by GT category, for A license, 2015 to 2024.

GT category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fishing effort VUM										
3	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
4	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
5	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
6	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
7					0.46	0.46	0.46	0.46	0.46	0.46
Fishing time vessel-months										
3	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
4	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
5	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
6	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
7					26.6	26.6	26.6	48.7	52.0	49.6

Table 3.4. Fishing effort VUM and allocated fishing time in vessel-months by GT category, for G license, 2015 to 2024.

GT category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fishing effort VUM										
3	0.37	0.40	0.40	0.40	0.38	0.38	0.38	0.38	0.38	0.38
4	0.72	0.68	0.68	0.68	0.73	0.73	0.73	0.73	0.73	0.73
5	1.06	0.96	0.96	0.96	1.07	1.07	1.07	1.07	1.07	1.07
6	1.40	1.25	1.25	1.25	1.42	1.42	1.42	1.42	1.42	1.42
7					1.76	1.76	1.76	1.76	1.76	1.76
Fishing time vessel-months										
3	53.8	49.7	44.8	38.1	40.0	35.2	33.4	19.3	29.6	26.7
4	27.9	29.3	26.3	22.4	21.0	18.5	17.5	10.1	15.4	13.9
5	18.9	20.7	18.7	15.9	14.3	12.6	11.9	6.9	10.5	9.5
6	14.2	16.1	14.5	12.3	10.8	9.5	9.0	5.2	7.9	7.1
7					8.7	7.7	7.3	4.2	6.4	5.8

Table 3.5. Fishing effort VUM and allocated fishing time in vessel-months by GT category, for W license, 2015 to 2024.

GT category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fishing effort VUM										
3	0.27	0.31	0.31	0.31	0.40	0.40	0.40	0.40	0.40	0.40
4	0.47	0.49	0.49	0.49	0.56	0.56	0.56	0.56	0.56	0.56
5	0.67	0.66	0.66	0.66	0.72	0.72	0.72	0.72	0.72	0.72
6	0.87	0.84	0.84	0.84	0.88	0.88	0.88	0.88	0.88	0.88
7					1.03	1.03	1.03	1.03	1.03	1.03
Fishing time vessel-months										
3	81.2	71.0	64.0	54.4	42.5	37.4	35.5	10.0	9.0	15.2
4	47.0	45.7	41.2	35.0	30.5	26.9	25.4	7.2	6.4	10.8
5	33.1	33.7	30.3	25.8	23.8	21.0	19.9	5.6	5.0	8.4
6	25.5	26.7	24.0	20.4	19.5	17.2	16.3	4.6	4.1	6.9
7					16.5	14.5	13.8	3.9	3.5	5.9

Note that GT categories are equalized for A license only, as previous analyses (FIFD 2018) showed no statistically significant correlation between GT and VU of individual vessels under A license. Also note that VUM and vessel-months per category are alternate (not additive) total outcomes, for example, the W-license fishery could be taken by Category 3 vessels fishing a total of 15.2 vessel-months or by Category 4 vessels fishing a total of 10.8 vessel-months or by Category 5 vessels fishing a total of 8.4 vessel months, etc.; or any fractional combination of these categories.

A summary number of allocated fishing days has also been calculated for each license, defined as the vessel-days equivalent to the vessel-months (×30.5), average-weighted by the number of fishing days per GT category actually carried out in the preceding year 2022 (Tables 3.6, 3.7, 3.8).

Table 3.6. A license summary of vessel days and fishing days. V-months / v-days are equivalent to Table 3.3.

GT category	2024		2022
	v-months	v-days	fishing days
3	49.6	1513.8	510
4	49.6	1513.8	430
5	49.6	1513.8	457
6	49.6	1513.8	9
7	49.6	1513.8	0

Table 3.7. G license summary of vessel days and fishing days. V-months / v-days are equivalent to Table 3.4.

GT category	2024		2022
	v-months	v-days	fishing days
3	26.7	814.1	65
4	13.9	423.8	93
5	9.5	289.1	84
6	7.1	217.9	0
7	5.8	175.8	0

Table 3.8. W license summary of vessel days and fishing days. V-months / v-days are equivalent to Table 3.5.

GT category	2024		2022
	v-months	v-days	fishing days
3	15.2	462.5	12
4	10.8	330.3	61
5	8.4	256.9	35
6	6.9	210.2	0
7	5.9	179.6	0

Summary A days =

$$\frac{(1513.8 \times 510) + (1513.8 \times 430) + (1513.8 \times 457) + (1513.8 \times 9) + (1513.8 \times 0)}{(510 + 430 + 457 + 9 + 0)}$$

= 1513.8

Summary G days =

$$\frac{(814.1 \times 65) + (423.8 \times 93) + (289.1 \times 84) + (217.9 \times 0) + (175.8 \times 0)}{(65 + 93 + 84 + 0 + 0)}$$

= 481.9

Summary W days =

$$\frac{(462.5 \times 12) + (330.3 \times 61) + (256.9 \times 35) + (210.2 \times 0) + (179.6 \times 0)}{(12 + 61 + 35 + 0 + 0)}$$

= 321.2

3.3. References

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4. *Dissostichus eleginoides* – Patagonian toothfish

4.1. Introduction

The targeted longline fishery for Patagonian toothfish (*Dissostichus eleginoides*) is listed under L-license and managed through total allowable catch (TAC). In addition to longlines, notable quantities of toothfish are taken as bycatch in finfish and calamari trawl fisheries. In the finfish fishery, toothfish are a commercially valuable bycatch; in the calamari fishery, toothfish are typically discarded due to the small size of the specimens.

Toothfish stock assessment is conducted using a statistical catch-at-age model implemented in CASAL software (Bull et al. 2012). The model integrates the catch, effort, and tag recapture data reported by fisheries, with toothfish age, length and maturity data collected by observers during commercial trips and research surveys. Toothfish tag-release and tag-recapture data were introduced into the model for the first time in the 2023 assessment (Skeljo et al. 2023); tag-recapture data were used as an index of absolute abundance, thus reducing model reliance on commercial CPUE data. The main observations used to inform the model are catch-at-age data for Spanish-system longline, umbrella-system longline, finfish trawl and calamari trawl fisheries, catch-at-age data for groundfish survey and calamari pre-season survey, CPUE data for Spanish- and umbrella-system longline, and tag-recapture data for the umbrella-system longline. CPUE is standardized across several covariates (individual vessel, month, soak time, depth, fishing area and number of hooks per umbrella).

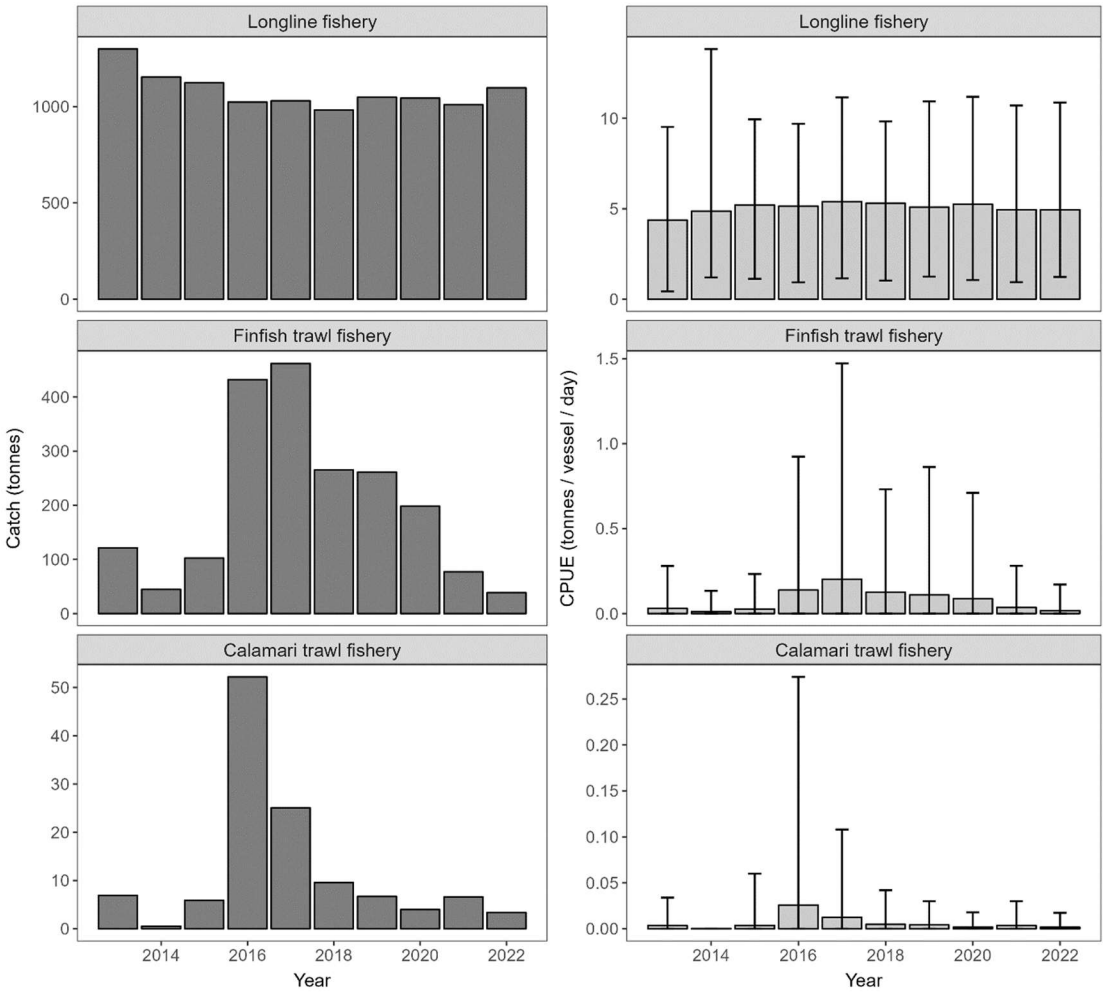

Figure 4.1 [previous page]. Time series of toothfish catches (left) and observed CPUE (right) for longline, finfish trawl and calamari trawl fisheries. Error bars are 95% quantiles of observed CPUE.

Reported toothfish catch in 2022 totalled 1,140.2 tonnes, of which 96.2% was caught by longline (1,097.3 t in 222 vessel-days), 3.4% by finfish trawl (38.7 t in 1,755 vessel-days) and 0.3% by calamari trawl (3.4 t in 1,945 vessel-days) (Figure 4.1). The remaining 0.1% (0.8 t in 71 vessel days) was caught by research surveys. Combined toothfish bycatch in finfish and calamari trawl fisheries decreased compared to the previous year.

4.2. Stock assessment estimates

Model estimates (with 95% credible intervals) of initial spawning stock biomass (SSB_0), current spawning stock biomass (SSB_{2022}) and current spawning stock biomass relative to SSB_0 (SSB_{2022}/SSB_0) are given in Table 4.1. Estimates of SSB_0 and $SSB_{current}$ were approximately halfway between the estimates of the previous two assessments (8.9% and 4.9% lower than the last one); the estimate of $SSB_{current}/SSB_0$ was marginally lower than in the previous two assessments (3.5% lower than the last one). The 95% credible intervals were noticeably narrower than in the previous assessment, likely due to tag-recapture data being highly informative on the SSB_0. Deterministic MSY was estimated at 1,653 t (4.3% lower than in the previous assessment).

Table 4.1. Key output parameters estimated by the 2023 toothfish stock assessment model (based on the data up to the end of 2022), with corresponding MCMC credible intervals.

Parameter	MPD value	MCMC 95% CI
SSB_0	24,429 t	22,567 - 27,042 t
SSB_{2022}	11,416 t	9,691 - 14,289 t
SSB_{2022}/SSB_0	0.467	0.428 - 0.529

Projections from the current assessment were somewhat less optimistic than in the previous assessment, with SSB/SSB_0 now projected to decrease from the *expansion range* to the *target range* in the near future. The main driver of the projected decrease was the cumulative effect of four consecutive years of weak toothfish recruitment; the model estimated below-average year-class strength in 2018-2021, in line with recruitment estimates external to the model (Lee et al. 2021). This emphasizes the need to monitor juvenile toothfish abundance during research surveys, improve identification and reporting of juvenile toothfish in commercial catches, and to protect high recruitment cohorts while on the shelf, possibly via spatiotemporal management of trawl fisheries (Skeljo 2023).

4.3. Management advice

Management advice is based on the harvest control rules (HCR) established for the Falkland Islands toothfish longline fishery (Farrugia and Winter 2018, 2019). The estimated SSB_{2022}/SSB_0 ratio of 0.467 was above the *upper target reference point* (0.45), i.e. in the

expansion range; projections from the current model indicated that the SSB/SSB_0 ratio will drop to the *target range* by 2026 and remain within the *target range* throughout the projection period. 2022 was the third consecutive year with $SSB_{current}/SSB_0$ ratio within the *expansion range*; however, since SSB/SSB_0 projections under the current TAC showed a decrease below 0.45 within ten years, no alteration of TAC was anticipated by HCR at this point.

The recommendation is to maintain toothfish annual TAC in the longline fishery at its current level of 1,040 tonnes.

4.4. References

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5. Rajiformes – Skates

5.1. Management and stock trends

Skate (Rajiformes) are since 1994 licensed separately from other groundfish trawl fisheries in the Falkland Islands (F license). The skate fishery has been regulated by total allowable effort (TAE) of licensed vessels. A large proportion of skate catch is routinely taken in finfish trawls, while skate-licensed vessels may take large amounts of groundfish other than skate.

Total catch of skate in 2022 was the lowest since 1998 (Figure 5.1). 2022 was also the second year on record with a complete absence of skate catch under target (F) license, which has been decreasing continually since 2014 (Figure 5.1). Therefore, a new catch / effort-based stock assessment was again not calculated in 2022. Most skate in 2022 was caught under finfish (A, G and W) licenses, but representing no more than low single-digit percentages of the total commercial catches of these licenses (Table 5.1). The most recent stock assessment (Winter 2018) showed stable trends of the skate stock, while reviews of the skate assemblage (Arkhipkin et al. 2012, Winter et al. 2015) noted high population abundance, species diversity, and habitat structure. In contrast, an analysis of skate surveys indicated that since 2013 (the latest year examined by Winter et al. 2015) skate biomass in Falkland Islands waters may have decreased by 45% to 70% overall, with most individual species showing declines (Winter 2022, Winter and Arkhipkin 2023).

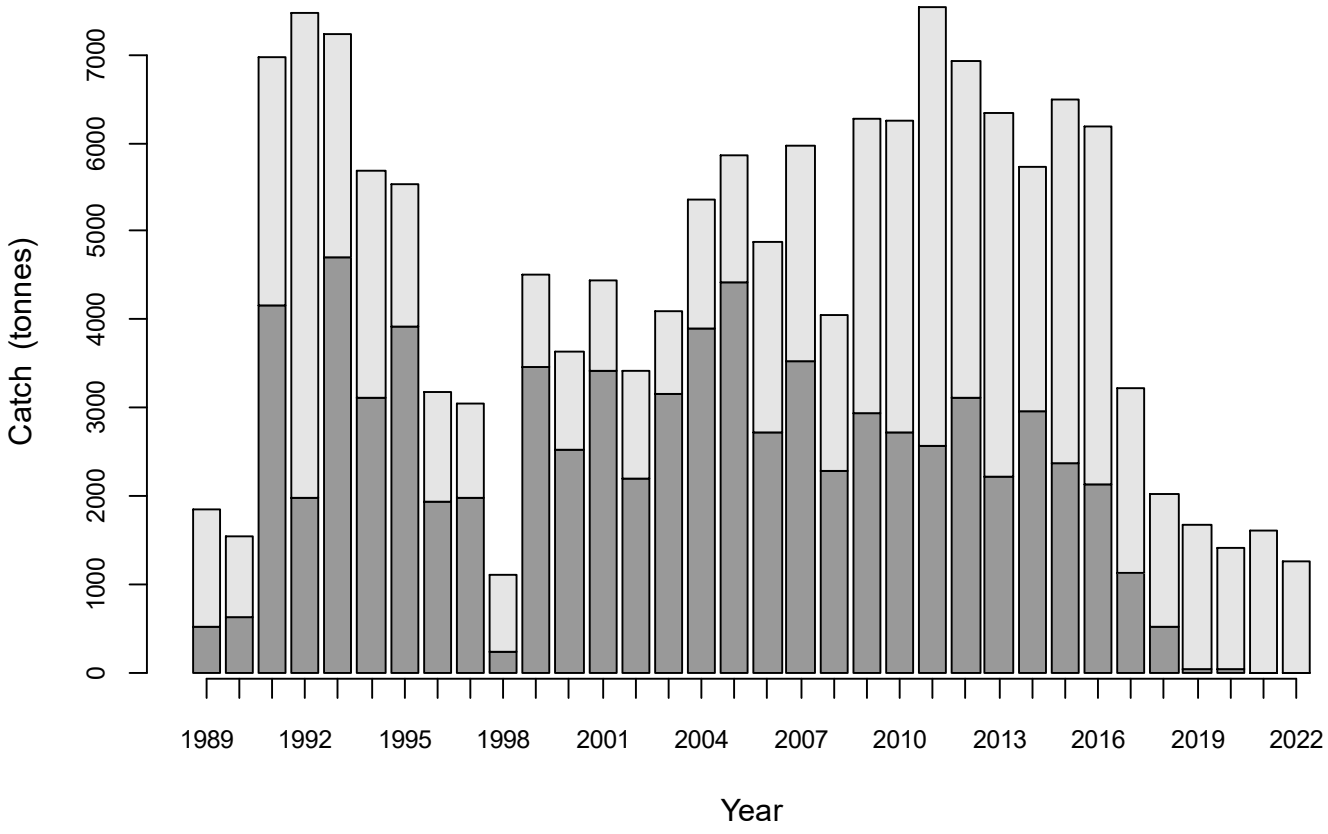

Figure 5.1. Target-license catches (dark) and all catches (light grey) of skates, 1989 to 2022.

Table 5.1. Skate catch by fishing license in 2022, and percentage that skate represented of each license's total commercial catch.

Licence	Tonnes	% of commercial species catch
A	911.6	1.6
B*	2.2	1.7
C	10.8	< 0.1
E	3.4	0.2
G	140.2	1.7
L	34.3	2.9
O*	53.5	0.6
W	81.0	2.9
X	17.1	< 0.1
Total	1254.0	0.7

* Excluding jig fishing.

5.2. Allowable effort and catch

The general aim of Licencing Advice is to maintain fisheries at sustainable catch levels while mitigating year-to-year fluctuations in allocated effort. Vessel Units (VU) are therefore calculated over three-year rolling averages (FIFD 2022). However, the speculative use of F license in recent years has made the VU protocol impractical. Before ceasing completely in 2021, 59 fishing days under F license were recorded in 2020, of which only 2 reported >50% skate in the catch and only 12 reported even >10% skate in the catch. The year before, in 2019, a total of 27 fishing days were recorded under F license, of which 9 reported >50% skate in the catch and 13 reported >10% skate in the catch. Furthermore, a regulatory minimum codend mesh size of 400 mm for skate target trawling, established in 2021 (Arkhipkin et al. 2021) (and thus never used commercially) would prevent any straightforward catch-per-unit-effort comparison with previous years.

The skate survey analysis recommended that with as much as 70% reduction of biomass, a precautionary limit on catch should be 30% of the most recent calculated MSY, which after deduction of bycatch, would leave approximately 500 tonnes TAC for F license (Winter 2022). As no skate target fishing is being taken in 2023, and no more recent stock assessment data are available, the 500 tonne TAC is continued for next year. Fishing this 500 tonne TAC should require use of the regulatory 400 mm mesh trawl codend, and should continue to be excluded from south of 51°S latitude, established as a skate conservation area since 1996 (Agnew et al. 1999).

As noted above, setting a corresponding fishing days allocation is impeded by the lack of comparability with previous skate trawl effort using smaller mesh. For 2023, a nominal maximum effort allocation of 114 days was set based on previous years (FIFD 2022). For 2024, the 114-day effort allocation is continued by default, but in practice, any resumption of F license skate target fishing in 2024 will require an approved fishing plan.

5.3. References

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6. Quick reference guide to VUM/GT Categories

6.1. Falkland calamari fishery (C)

VU = 27.01 – allows for a standard fleet of 16 vessels.

6.2. Finfish fishery (A, G, W)

VU allocations for 2021 to 2024.

Licence	2021 VU	2022 VU	2023 VU	2024 VU
A	12.20	22.39	23.93	22.83
G	12.77	7.34	11.26	10.14
W	14.27	4.01	3.60	6.07

A license. Fishing effort VUM and fishing time vessel-months.

GT category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fishing effort VUM										
3	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
4	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
5	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
6	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
7					0.46	0.46	0.46	0.46	0.46	0.46
Fishing time vessel-months										
3	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
4	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
5	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
6	29.3	26.5	26.6	26.6	26.6	26.6	26.6	48.7	52.0	49.6
7					26.6	26.6	26.6	48.7	52.0	49.6

G license. Fishing effort VUM and fishing time vessel-months.

GT category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fishing effort VUM										
3	0.37	0.40	0.40	0.40	0.38	0.38	0.38	0.38	0.38	0.38
4	0.72	0.68	0.68	0.68	0.73	0.73	0.73	0.73	0.73	0.73
5	1.06	0.96	0.96	0.96	1.07	1.07	1.07	1.07	1.07	1.07
6	1.40	1.25	1.25	1.25	1.42	1.42	1.42	1.42	1.42	1.42
7					1.76	1.76	1.76	1.76	1.76	1.76
Fishing time vessel-months										
3	53.8	49.7	44.8	38.1	40.0	35.2	33.4	19.3	29.6	26.7
4	27.9	29.3	26.3	22.4	21.0	18.5	17.5	10.1	15.4	13.9
5	18.9	20.7	18.7	15.9	14.3	12.6	11.9	6.9	10.5	9.5
6	14.2	16.1	14.5	12.3	10.8	9.5	9.0	5.2	7.9	7.1
7					8.7	7.7	7.3	4.2	6.4	5.8

W license. Fishing effort VUM and fishing time vessel-months.

GT category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fishing effort VUM										
3	0.27	0.31	0.31	0.31	0.40	0.40	0.40	0.40	0.40	0.40
4	0.47	0.49	0.49	0.49	0.56	0.56	0.56	0.56	0.56	0.56
5	0.67	0.66	0.66	0.66	0.72	0.72	0.72	0.72	0.72	0.72
6	0.87	0.84	0.84	0.84	0.88	0.88	0.88	0.88	0.88	0.88
7					1.03	1.03	1.03	1.03	1.03	1.03
Fishing time vessel-months										
3	81.2	71.0	64.0	54.4	42.5	37.4	35.5	10.0	9.0	15.2
4	47.0	45.7	41.2	35.0	30.5	26.9	25.4	7.2	6.4	10.8
5	33.1	33.7	30.3	25.8	23.8	21.0	19.9	5.6	5.0	8.4
6	25.5	26.7	24.0	20.4	19.5	17.2	16.3	4.6	4.1	6.9
7					16.5	14.5	13.8	3.9	3.5	5.9

6.3. Toothfish longline fishery (L)

TAC – 1,040 tonnes.

6.4. Skate fishery (F)

TAC – 500 tonnes, maximum 114 vessel-days pursuant to an approved fishing plan.

6.5. Restricted finfish – Pelagic fishery (S)

TAC for southern blue whiting – 2,000 tonnes plus FIFD-approved exploratory fishing.