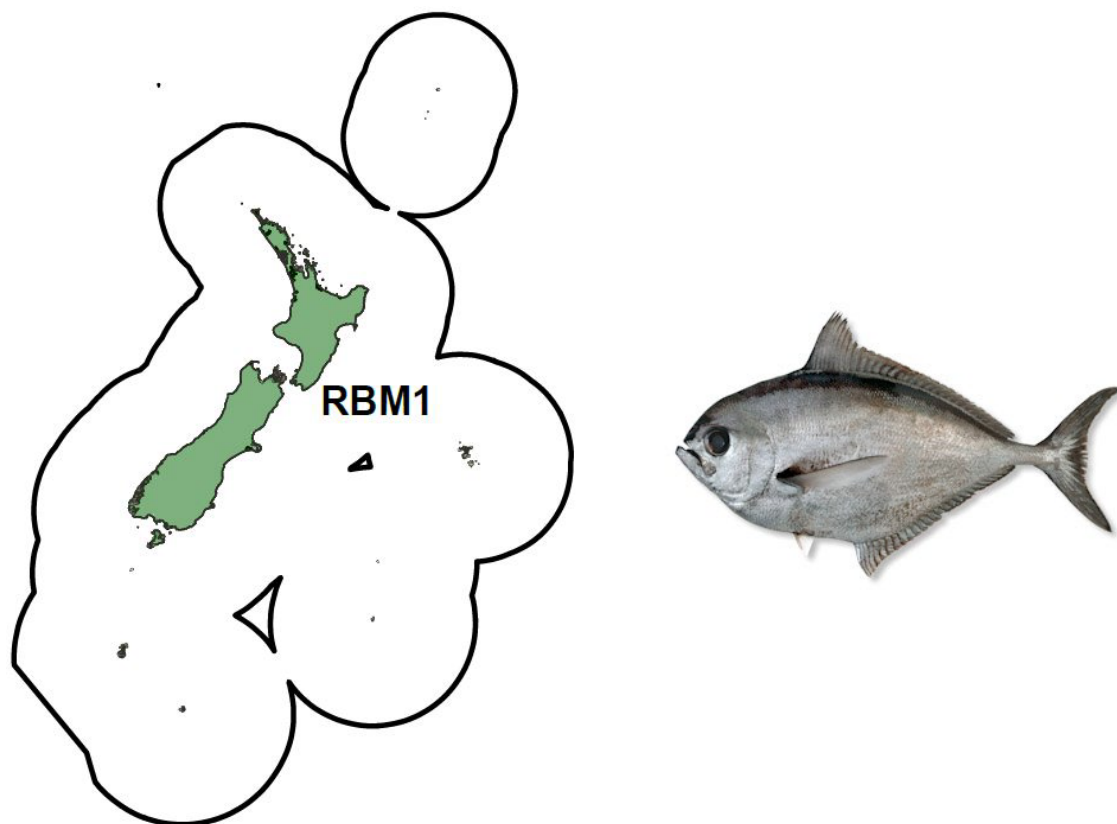


## RAY'S BREAM (RBM)

(*Brama brama* and *Brama australis*)



### 1. FISHERY SUMMARY

Ray's bream (*Brama* spp.) was introduced into the Quota Management System (QMS) on 1 October 2004 under a single Quota Management Area, RBM 1; allowances, Total Allowable Commercial Catch (TACC), and Total Allowable Catch (TAC) are given in Table 1.

**Table 1: Recreational and customary non-commercial allowances, TACC, and TAC (all in tonnes) for Ray's bream.**

Fishstock	Recreational allowance	Customary non-commercial allowance	Other mortality	TACC	TAC
RBM 1	10	5	50	980	1 045

At least two closely related species (*Brama brama* and *Brama australis*) are thought to be caught in New Zealand fisheries. Southern Ray's bream (*Brama australis*), which is difficult to distinguish using external features from *B. brama*, has been reported in both catch statistics and research surveys but the actual proportions of the two species in the catch is unknown. A third closely related species, bronze bream (*Xenobrama microlepis*), is more easily distinguished from the other two but is also likely to have been recorded as Ray's bream in catch statistics.

#### 1.1 Commercial fisheries

Ray's bream is a highly migratory species and has a wide distribution, being found throughout the subtropical to sub-Antarctic waters across the South Pacific Ocean between New Zealand and Chile. Since the early 1990s the reported catch of Ray's bream fluctuated widely between a low of 83 t in 2023–24 to a high of 1001 t in 2000–01 (Table 2 and 3).

Ray's bream is taken by a wide variety of fishing methods. Based on records since 2003–04, midwater trawling caught the most (46%) Ray's bream, bottom trawling 27%, surface longlining 18%, trolling 5%, and bottom longlining 3%. Ray's bream is caught by midwater trawlers in all Fishery Management Areas (FMAs) around the South Island, with the largest number in midwater trawls being taken from Stewart-Snares shelf (FMA 5) and the Chatham Rise (FMA 3 and FMA 4). The major catches by bottom trawling have occurred on the Chatham Rise. Ray's bream is taken on surface tuna longlines off the east coast of the North Island, especially in the Bay of Plenty/East Cape (FMA 1). Most of the South Island longline catch comes from off the west coast in FMAs 5 and 7. It is also taken by tuna trolling, especially off the west coast of the South Island (FMA 7). While observer coverage of the troll fleet is limited (0.5% of fishing days), observer records for the troll vessels have identified 100% of the Ray's bream in the troll catch as *B. brama*. Figure 1 shows historical landings for the two Ray's bream fisheries.

Ray's bream made up less than 1% of the surface longline catch by weight in 2024–25 (Figure 2). Most of the New Zealand Ray's bream catch is caught off the west coast of the South Island, southern Stewart-Snares shelf, and around the sub-Antarctic islands (Figure 3).

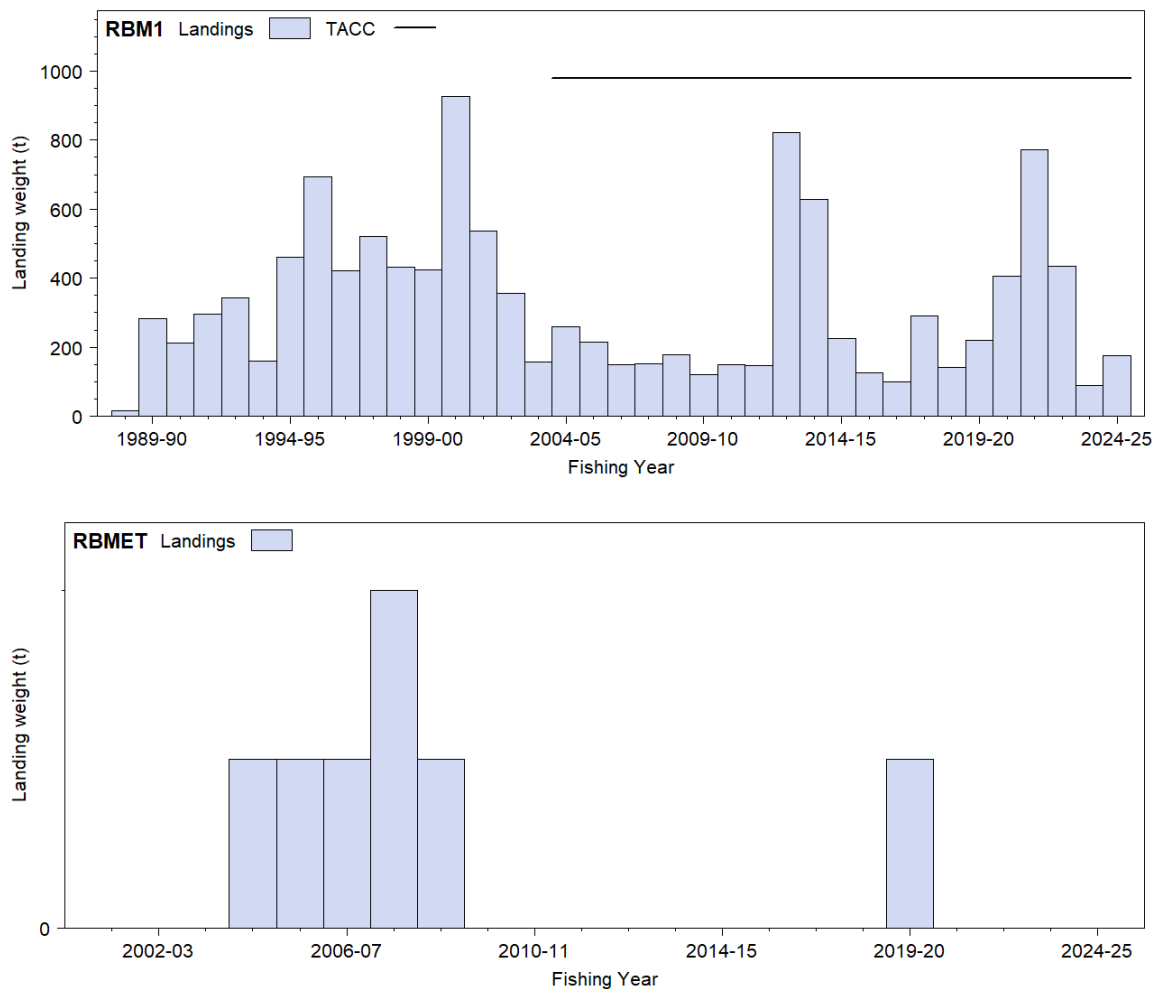


Figure 1: [Top] Ray's bream landings from 1988–89 to present within New Zealand waters (RBM 1) and [Bottom] 2001–02 to present on the high seas (RBM ET).

**Table 2: Reported commercial landings and discards (t) of Ray's bream from Catch Effort Landing Returns (CELRs) and Catch Landing Returns (CLRs), and Licensed Fish Receiver Returns (LFRRs) (processor records) by fishing year.**

Year	Reported by fishers		Total reported	Processed LFRR
	CELR and CLR Landed	Discarded		
1988–89	9	0	9	16
1989–90	328	< 1	328	284
1990–91	239	< 1	239	211
1991–92	297	< 1	297	295
1992–93	340	1	341	342
1993–94	151	3	154	160
1994–95	462	8	470	460
1995–96	717	3	720	693
1996–97	356	7	362	421
1997–98	546	8	554	520
1998–99	425	10	435	431
1999–00	444	23	467	423
2000–01	941	60	1 001	926

**Table 3: LFRR and Monthly Harvest Return (MHR) data on Ray's bream catches by fishing year.**

Year	MHR data
2001–02	536
2002–03	357
2003–04	157
2004–05	259
2005–06	215
2006–07	149
2007–08	152
2008–09	179
2009–10	119
2010–11	150
2011–12	147
2012–13	823
2013–14	627
2014–15	224
2015–16	125
2016–17	101
2017–18	290
2018–19	141
2019–20	219
2020–21	405
2021–22	770
2022–23	421
2023–24	87
2024–25	174

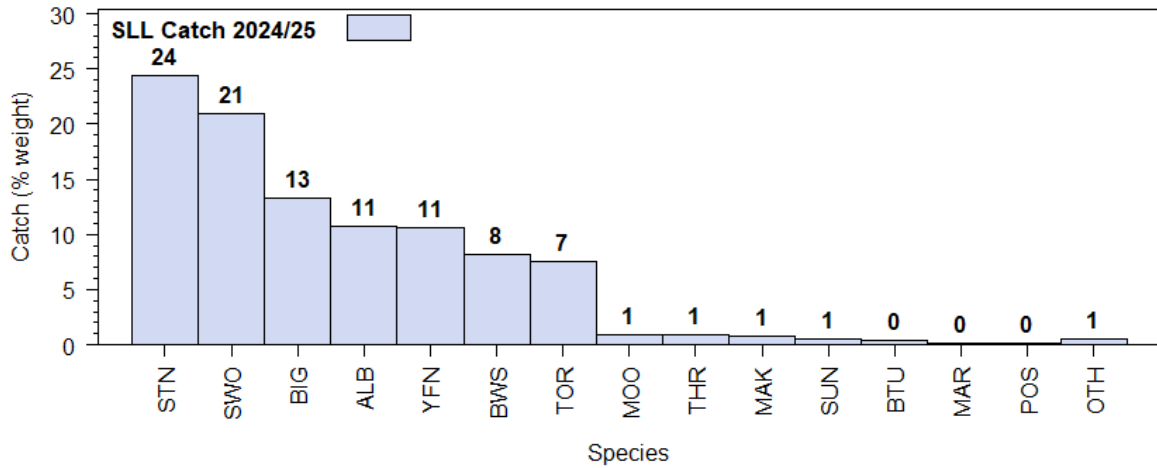


Figure 2: A summary of species composition of the surface longline estimated catch in the most recent year. The percentage by weight of each species is calculated for all surface longline trips.

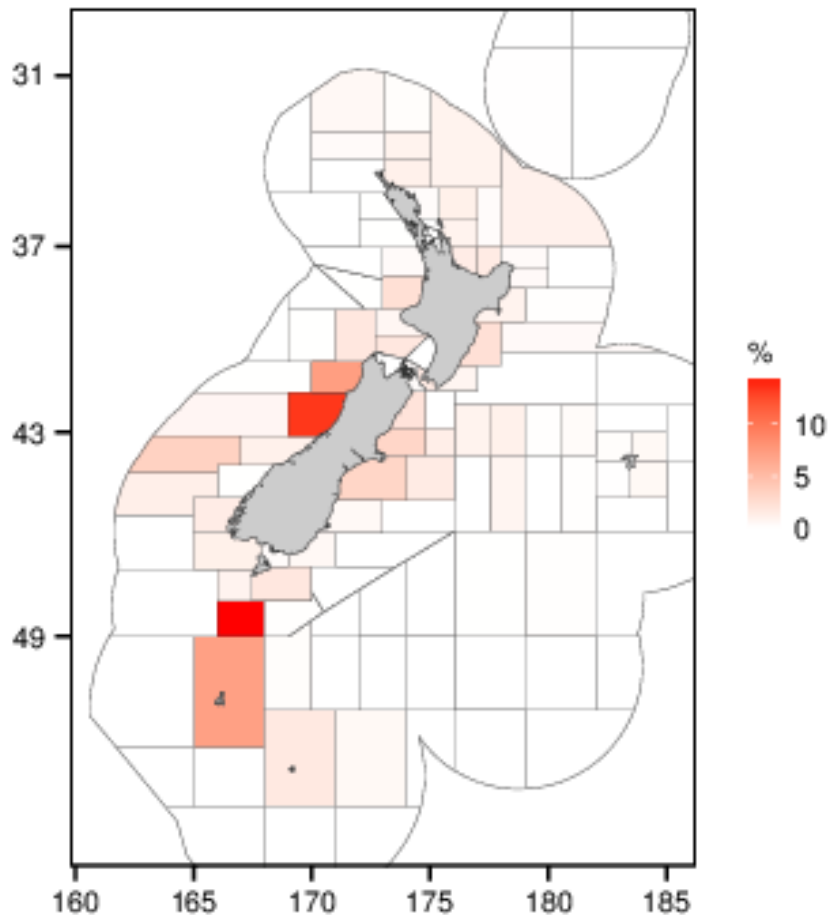


Figure 3: Distribution of catch of Ray's bream by statistical area for all years and all fishing gears (Bentley et al. 2013).

Across all fleets of the surface longline fishery from 2006–07 to 2017–18, more than 80% of the Ray's bream were alive when brought to the side of the vessel (Table 4). Both the domestic and foreign longline fleets retained more than 90% of their Ray's bream catch between 2006–07 and 2017–18 (Table 5).

**Table 4: Percentage of Ray's bream (including discards) that were alive or dead when arriving at the longline vessel and observed during 2006–07 to 2020–21, by fishing year, fleet, and region. Small sample sizes (number observed < 20) were omitted (Griggs & Baird 2013, Griggs et al. 2018, 2021, 2024). Only the New Zealand domestic fleet operated after 2014–15.**

Year	Fleet	Area	% alive	% dead	Number
2006–07	Charter	North	87.0	13.0	215
		South	96.0	4.0	10 350
	Domestic	North	65.8	34.2	442
	<b>Total</b>		<b>94.6</b>	<b>5.4</b>	<b>11 019</b>
2007–08	Charter	South	95.7	4.3	3 680
		Domestic	North	70.2	29.8
	<b>Total</b>		<b>94.6</b>	<b>5.4</b>	<b>3 831</b>
2008–09	Charter	North	90.1	9.9	313
		South	97.9	2.1	4 277
	Domestic	North	78.8	21.2	551
		South	94.1	5.9	34
	<b>Total</b>		<b>95.4</b>	<b>4.6</b>	<b>5 175</b>
2009–10	Charter	South	96.3	3.7	3 259
		Domestic	North	85.6	14.4
		South	92.0	8.0	88
	<b>Total</b>		<b>95.5</b>	<b>4.5</b>	<b>3 611</b>
2010–11	Charter	South	97.4	2.6	5 689
		Domestic	North	83.2	16.8
	<b>Total</b>		<b>95.3</b>	<b>4.7</b>	<b>6 662</b>
2011–12	Charter	South	92.2	7.8	2 965
		Domestic	North	97.1	2.9
		South	83.9	16.1	255
	<b>Total</b>		<b>92.5</b>	<b>7.5</b>	<b>3 915</b>
	2012–13	Charter	South	96.0	4.0
Domestic			North	87.8	12.2
<b>Total</b>			<b>95.6</b>	<b>4.4</b>	<b>4 578</b>
2013–14	Charter	South	92.8	7.2	2 295
		Domestic	North	76.5	23.5
		South	69.0	31.0	129
	<b>Total</b>		<b>91.3</b>	<b>8.7</b>	<b>2 458</b>
2014–15	Charter	South	92.8	7.2	4 746
		Domestic	North	45.0	55.0
		South	75.2	24.8	226
<b>Total</b>		<b>91.8</b>	<b>8.2</b>	<b>4 992</b>	
2015–16	Domestic	North	78.1	21.9	626
		South	90.4	9.6	648
<b>Total</b>		<b>84.4</b>	<b>15.6</b>	<b>1 274</b>	
2016–17	Domestic	North	80.8	19.2	120
		South	84.5	15.5	304
	<b>Total</b>		<b>83.5</b>	<b>16.5</b>	<b>424</b>
2017–18	Domestic	North	80.7	19.3	88
		South	88.3	11.7	162
	<b>Total</b>		<b>85.6</b>	<b>14.4</b>	<b>250</b>
2018–19	Domestic	North	88.9	11.1	63
		South	83.8	16.2	142
	<b>Total</b>		<b>85.4</b>	<b>14.6</b>	<b>205</b>
2019–20	Domestic	North	88.1	11.9	151
		South	89.8	10.2	166
	<b>Total</b>		<b>89.0</b>	<b>11.0</b>	<b>317</b>
2020–21	Domestic	South	86.0	14.0	336
		<b>Total</b>		<b>84.4</b>	<b>15.6</b>

**Table 5: Percentage of Ray's bream that were retained, or discarded or lost, when observed on a longline vessel during 2006–07 to 2020–21, by fishing year and fleet. Small sample sizes (number observed < 20) omitted (Griggs & Baird 2013, Griggs et al. 2018, 2021, 2024). Only the New Zealand domestic fleet operated after 2014–15.**

Year	Fleet	% retained	% discarded or lost	Number
2006–07	Charter	96.8	3.2	11 744
	Domestic	95.7	4.3	442
	<b>Total</b>	<b>96.8</b>	<b>3.2</b>	<b>12 198</b>
2007–08	Charter	96.8	3.2	3 714
	Domestic	98.7	1.3	152
	<b>Total</b>	<b>96.9</b>	<b>3.1</b>	<b>3 866</b>
2008–09	Charter	98.7	1.3	4 646
	Domestic	98.3	1.7	585
	<b>Total</b>	<b>98.7</b>	<b>1.3</b>	<b>5 231</b>
2009–10	Charter	98.8	1.2	3 291
	Domestic	95.3	4.7	361
	<b>Total</b>	<b>98.4</b>	<b>1.6</b>	<b>3 652</b>
2010–11	Charter	98.7	1.3	5 705
	Domestic	96.7	3.3	996
	<b>Total</b>	<b>98.4</b>	<b>1.6</b>	<b>6 701</b>
2011–12	Charter	97.1	2.9	2 973
	Domestic	93.8	6.2	1 006
	<b>Total</b>	<b>96.3</b>	<b>3.7</b>	<b>3 979</b>
2012–13	Charter	97.2	2.8	4 389
	Domestic	93.2	6.8	205
	<b>Total</b>	<b>97.0</b>	<b>3.0</b>	<b>4 594</b>
2013–14	Charter	95.5	4.5	2 300
	Domestic	97.6	2.4	164
	<b>Total</b>	<b>95.6</b>	<b>4.4</b>	<b>2 464</b>
2014–15	Charter	93.5	6.5	4 774
	Domestic	94.0	6.0	299
	<b>Total</b>	<b>93.5</b>	<b>6.5</b>	<b>5 073</b>
2015–16	Domestic	98.0	2.0	1 273
	<b>Total</b>	<b>98.0</b>	<b>2.0</b>	<b>1 273</b>
2016–17	Domestic	98.2	1.8	443
	<b>Total</b>	<b>98.2</b>	<b>1.8</b>	<b>443</b>
2017–18	Domestic	99.6	0.4	250
	<b>Total</b>	<b>99.6</b>	<b>0.4</b>	<b>250</b>
2018–19	Domestic	52.7	47.3	205
	<b>Total</b>	<b>52.7</b>	<b>47.3</b>	<b>205</b>
2019–20	Domestic	97.2	2.8	317
	<b>Total</b>	<b>97.2</b>	<b>2.8</b>	<b>317</b>
2020–21	Domestic	95.8	4.2	355
	<b>Total</b>	<b>95.8</b>	<b>4.2</b>	<b>355</b>

## 1.2 Recreational fisheries

Recreational fishers take Ray's bream infrequently, generally as bycatch when targeting bluenose (*Hyperoglyphe antarctica*), hāpuku (*Polyprion oxygeneios*), and bass (*P. americanus*) over deep reefs. The recreational harvest is assumed to be low and is likely to be insignificant in the context of the total landings.

## 1.3 Customary non-commercial fisheries

There is no quantitative information available to allow the estimation of the harvest of Ray's bream by customary fishers, however, the harvest is assumed to be insignificant in the context of the commercial landings.

## 1.4 Unreported catch

There is no known unreported catch of Ray's bream.

### 1.5 Other sources of mortality

Ray's bream is a desirable species, and only a small percentage (about 1–5% annually) has been reported or observed as having been discarded. Most of the trawl catch of Ray's bream that is reported on CELR and CLR forms is retained. Most of the discarding appears to occur in the tuna fisheries, but these fisheries only take a small proportion of the total catch of Ray's bream. There may be some unobserved shark and cetacean depredation of longline-caught Ray's bream.

## 2. BIOLOGY

Little is known about the biology of Ray's bream in New Zealand waters. A 2004 study examined growth rates, natural mortality, and maturity for Ray's bream. Unfortunately, the actual species examined in this study could not be determined. It is possible that more than one species was involved, and the species (one or more) may not have been representative of the New Zealand catch recorded as Ray's bream. Until further samples are collected, the identification cannot be confirmed, but it is likely that the study was based wholly or partly on Southern Ray's bream (*Brama australis*).

It is expected that the main biological characteristics of Ray's bream will be similar to Southern Ray's bream, so the general findings of the recent study are reported here (Table 6). The small otoliths proved to be extremely difficult to age; notwithstanding this, Southern Ray's bream appear to have rapid initial growth, reaching 40–50 cm in 3–5 years, with little increase in length after this time. The maximum age observed was 25 years.

**Table 6: Estimates of biological parameters.**

Parameter	Estimate	Source
1. Weight = $a \cdot (\text{length})^b$ (Weight in t, length in cm) Both sexes $a = 5.31 \times 10^{-9}$	$b = 3.320$	Livingston et al. 2004

## 3. STOCKS AND AREAS

Ray's bream probably come from a wide-ranging single stock found throughout the South Pacific Ocean and southern Tasman Sea. The catch of Ray's bream elsewhere in the South Pacific needs to be considered when assessing the status of Ray's bream within New Zealand's fisheries waters.

## 4. ENVIRONMENTAL AND ECOSYSTEM CONSIDERATIONS

This summary is from the perspective of Ray's bream, but there is no directed fishery for them.

### 4.1 Role in the ecosystem

Ray's bream (*Brama* spp.) is found in midwater depths down to 1000 m. Ray's bream undertakes daily vertical migrations (Lobo & Erzini 2001) and is thought to feed opportunistically on small fish and cephalopods. It is known to be predated on by deepwater sharks such as the deepwater dogfish species *Centrophorus squamosus* and *Centroscymnus owstonii*, and the school shark *Galeorhinus galeus* (Dunn et al. 2010).

### 4.2 Non-target fish catch

Ray's bream is a non-target catch in midwater trawl, bottom trawl, surface longlining, trolling, and bottom longlining fisheries in the New Zealand EEZ. Blue sharks are the most commonly caught species (by number), followed by lancetfish and porbeagle shark (Table 7).

### 4.3 Benthic interactions

Please refer to other fisheries for benthic interactions.

**Table 7: Total estimated catch (numbers of fish) of common bycatch species in the New Zealand surface longline fishery as estimated from observer data from 2017 to 2022. Observer data too limited to raise to the fleet for 2023. Also provided is the percentage of these species retained (2022 data only) and the percentage of fish that were alive when discarded, N/A (none discarded). Ray's bream is highlighted in grey.**

Species	2017	2018	2019	2020	2021	2022	% retained (2022)	discards % alive (2022)
Blue shark	49 924	63 618	89 377	37 093	39 524	65 277	0	91.9
Porbeagle shark	3 101	2 594	2 883	1 320	2 248	2 810	0	29.2
Lancetfish	13 274	13 163	18 747	11 457	4 211	2 212	0	2.1
Butterfly tuna	406	419	348	120	388	663	96.0	0
Moonfish	2 022	2 698	1 975	1 834	1 033	526	100.0	N/A
Oilfish	227	602	417	1 149	504	510	0	74.3
Pelagic stingray	1 798	2 949	526	1721	3 182	508	0	97.1
Ray's bream	2 421	1 579	1 949	3 211	2 514	494	90.0	10.0
Mako shark	1 391	2 721	1 138	859	933	310	0	72.2
Striped marlin	290	247	157	279	426	175	0	66.7
Escolar	300	594	488	808	388	146	0	30.0
Skipjack tuna	57	184	8	134	110	117	100.0	N/A
Rudderfish	680	253	186	164	221	80	66.7	33.3
Dealfish	72	25	23	69	18	80	0	33.3
Sunfish	1 648	3 648	1 982	1 618	1 537	56	0	100.0
Big scale pomfret	17	34	0	52	17	53	0	50.0
School shark	59	187	116	29	64	27	100.0	N/A
Deepwater dogfish	32	6	90	29	42	27	0	100.0
Thresher shark	260	253	193	269	161	15	0	0

## 5. STOCK ASSESSMENT

No assessments are available for Ray's bream; therefore, estimates of biomass and yield are not available.

### 5.1 Estimates of fishery parameters and abundance

A time series of relative abundance estimates is available from the Chatham Rise trawl survey, but these estimates may not be a reliable index of relative abundance because Ray's bream are thought to reside in the midwater. Their vulnerability to the bottom trawl survey gear is consequently unknown and could be extremely low. Similarly, a time series of unstandardised CPUE from the tuna longline fishery is highly variable and may not reflect relative abundance.

### 5.2 Biomass estimates

No biomass estimates are available for Ray's bream.

### 5.3 Other yield estimates and stock assessment results

There are no other yield estimates or stock assessment results available for Ray's bream.

### 5.4 Other factors

At least three closely related species are thought to be caught in New Zealand fisheries. Two species from the genus *Brama*, Ray's bream (*Brama brama*) and Southern Ray's bream (*Brama australis*), are difficult to distinguish from external features and have been reported together in both catch statistics and research survey data in unknown ratios. A third closely related species, bronze bream (*Xenobrama microlepis*), is more easily distinguished from the other two but is also likely to have been recorded as Ray's bream in catch statistics.

As none of the reported catch is from target fishing, the quota allocated under the QMS system covers bycatch of midwater trawl fisheries for squid, hoki, and jack mackerels, and target tuna longline fisheries.

It is not known if observers distinguished Ray's bream from Southern Ray's bream in the past and it is possible that there are two species with different distributions. However, observer training and fish

identification guides now used by the observers should allow for correct identification and, as a result, the incidence of misidentification in recent years is likely to be low.

## 6. STATUS OF THE STOCKS

### Stock structure assumptions

RBM 1 is assumed to be part of the wider south-western Pacific Ocean stock but the assessment below relates only to the New Zealand component of that stock.

<b>Stock Status</b>	
Most Recent Assessment Plenary Publication Year	No assessment
Intrinsic productivity level	Medium
Catch in most recent year of assessment	Year: <span style="float: right;">Catch:</span>
Assessment Runs Presented	-
Reference Points	Target: Not established Soft Limit: Not established but HSS default of 20% $SB_0$ assumed Hard Limit: Not established but HSS default of 10% $SB_0$ assumed Overfishing threshold: Not established
Status in relation to Target	Unknown
Status in relation to Limits	Unknown
Status in relation to Overfishing	Unknown

<b>Fishery and Stock Trends</b>	
Recent Trend in Biomass or Proxy	Unknown
Recent Trend in Fishing Intensity or Proxy	Unknown
Other Abundance Indices	Between the early 1990s and 2018–19 the reported catch of Ray's bream fluctuated widely between a low of 101 t in 2016–17 to a high of 1001 t in 2000–01

<b>Projections and Prognosis</b>	
Stock Projections or Prognosis	Unknown
Probability of Current Catch or TACC causing Biomass to remain below or to decline below Limits	Soft Limit: Unknown Hard Limit: Unknown
Probability of Current Catch or TACC causing Overfishing to remain or to commence	Unknown
<b>Assessment Methodology and Evaluation</b>	
Assessment Type	Level 4: Low information evaluation – There are only data on catch and TACC, with no other fishery indicators.
Assessment Method	-
Assessment Dates	Latest assessment Plenary publication year: None <span style="float: right;">Next assessment: Unknown</span>

Overall assessment quality rank	N/A	
Main data inputs (rank)	-	
Data not used (rank)	-	
Changes to Model Structure and Assumptions	-	
Major Sources of Uncertainty	-	

### Qualifying Comments

There is no target fishery for Ray's bream, but it is a non-target catch in midwater trawl, bottom trawl, surface longlining, trolling, and bottom longlining.

## 7. FOR FURTHER INFORMATION

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