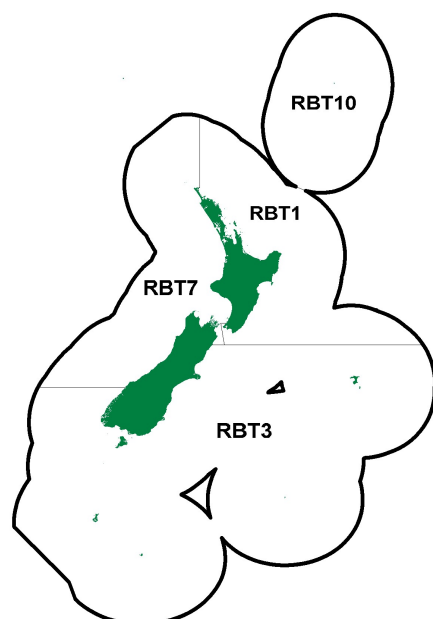


REDBAIT (RBT)*(Emmelichthys nitidus)***1. FISHERY SUMMARY****1.1 Commercial fisheries**

Redbait (*Emmelichthys nitidus*) was introduced to the Quota Management System on 1 October 2009, with a combined TAC of 5 316 t and TACC of 5 050 t. There are no allowances for customary non-commercial or recreational fisheries, and 266 t was allowed for other sources of mortality.

RBT is mainly taken as bycatch of the jack mackerel target trawl fishery, but also widely taken as bycatch of barracouta trawl tows, with some taken in the squid and hoki fisheries. A target fishery developed in the mid-2000s. Reported total landings ranged from 2184 to 4307 t during the 2000s, but declined across all QMAs and target fisheries in 2009–10 and 2010–11 to nearer 1000 t. Since the fishing year 2011–12 total landings have ranged between 1456 and 2856 t.

RBT 3 includes the southern fisheries for squid, and fisheries for jack mackerel on the Mernoo Bank and Chatham Rise, and accounted for most of the redbait landed in each year during the 1990s. From 2002–03 to 2009–10 however, the jack mackerel fishery on the west coast expanded into north and south Taranaki Bights, with landings from RBT 7 exceeding those from RBT 3. Since 2010 RBT 3 landings have declined, with RBT 3 catches once again making up the bulk of the landings. In 2019–20 just 22 t of RBT 7 were landed compared to 2459 t of RBT 3. Landings of RBT 1 have been small (less than 5 t) in most years, increasing slightly in the late 2000s.

TACs, allowances and TACCs from 1 October 2009 are reported in Table 1. Table 2 and Figure 1 show historical landings from 2001–02 to the present, reported by QMAs.

Table 1: TACs, allowances and TACCs of redbait.

Fishstock	Other mortality	Customary non-commercial and recreational	TACC	TAC
RBT 1	1	0	19	20
RBT 3	115	0	2 190	2 305
RBT 7	150	0	2 841	2 991
RBT 10	0	0	0	0

REDBAIT (RBT)

Table 2: Reported landings (t) of redbait by Fishstock and TACCs from 2001–02 to present.

FMA	RBT 1		RBT 3		RBT 7		RBT 10		Total	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
2001–02	1	-	1 638	-	1 669	-	0	-	3 308	-
2002–03	1	-	1 219	-	2 113	-	0	-	3 333	-
2003–04	1	-	1 535	-	2 771	-	0	-	4 307	-
2004–05	1	-	676	-	1 507	-	0	-	2 184	-
2005–06	3	-	2 016	-	1 936	-	0	-	3 955	-
2006–07	3	-	1 098	-	1 506	-	0	-	2 607	-
2007–08	5	-	560	-	2 376	-	0	-	2 941	-
2008–09	10	-	1 808	-	1 649	-	0	-	3 467	-
2009–10	9	19	886	2 190	170	2 841	0	0	1 066	5 050
2010–11	21	19	284	2 190	713	2 841	0	0	1 017	5 050
2011–12	2	19	1 229	2 190	369	2 841	0	0	1 599	5 050
2012–13	2	19	1 826	2 190	325	2 841	0	0	2 153	5 050
2013–14	4	19	2 774	2 190	78	2 841	0	0	2 856	5 050
2014–15	4	19	2 020	2 190	132	2 841	0	0	2 156	5 050
2015–16	5	19	1 068	2 190	383	2 841	0	0	1 456	5 050
2016–17	5	19	2 435	2 190	160	2 841	0	0	2 600	5 050
2017–18	2	19	1 687	2 190	75	2 841	0	0	1 764	5 050
2018–19	< 1	19	2 648	2 190	26	2 841	0	0	2 674	5 050
2019–20	2	19	2 459	2 190	22	2 841	0	0	2 483	5 050
2020–21	< 1	19	2 171	2 190	38	2 841	0	0	2 210	5 050

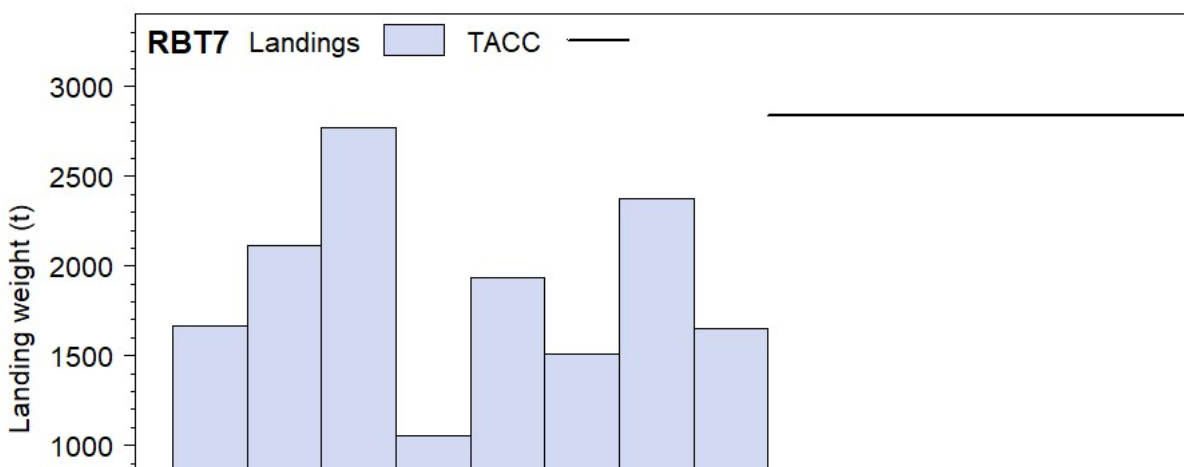
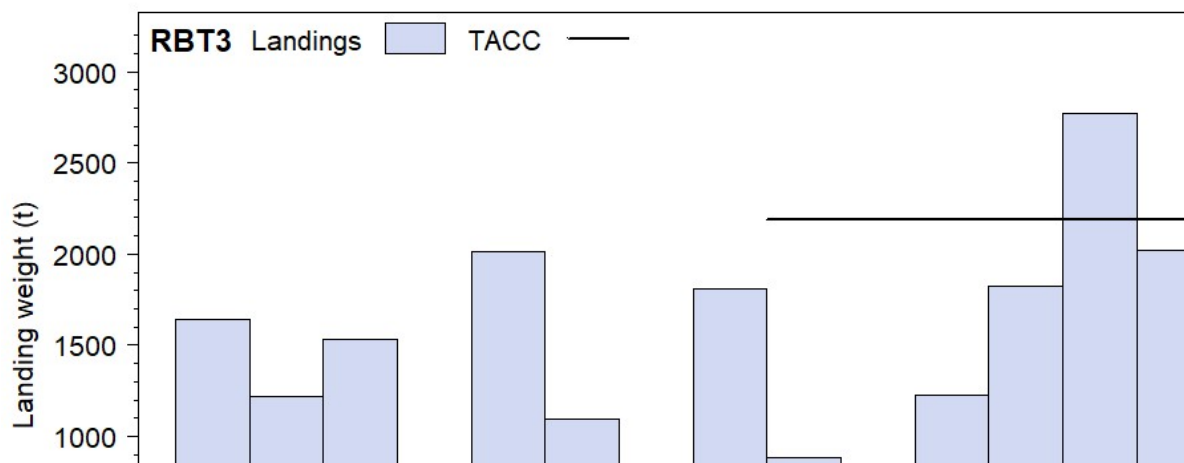


Figure 1: Reported commercial landings and TACC for the two main RBT stocks. From top: RBT 3 (South East Coast) and RBT 7 (Challenger).

1.2 Recreational fisheries

There is no known non-commercial fishery for redbait.

1.3 Customary non-commercial fisheries

There is no known customary non-commercial fishery for redbait.

1.4 Illegal catch

No quantitative information is available on the level of illegal catch of redbait.

1.5 Other sources of mortality

Taylor (2009) described up to 345 tonnes (but usually less than 200 t annually of redbait reported as discarded between 1988–89 and 2008–09.

2. BIOLOGY

Emmelichthys nitidus is a schooling, bathypelagic species that is closely related to rubyfish. It is widely distributed around New Zealand in depths from 85 to 500 m. Juveniles are found at the surface and adults near the bottom in deeper waters, including seamounts.

There is not much information about growth and development of redbait in New Zealand. Offshore studies suggest regional differences in maximum size with a maximum age of 10 years in east Victoria and 7 years in Tasmania, where the maximum reported size of redbait is 316 mm fork length. Spawning in Tasmania is thought to last 2–3 months during spring, with 50% mature at 24 cm FL and 2–3 years. Von Bertalanffy growth parameters of Tasmanian redbait for both sexes combined are given in Table 3.

Research data from New Zealand show that the maximum size of redbait here is about 420 mm FL, which is larger than most other regions where length of this species has been recorded, except South Africa. Recent validation of the ageing of the closely related rubyfish in New Zealand confirms maximum ages of 90+ suggesting that some emmelichthyids may be long-lived, so current estimates of growth and maximum age may not be reliable

Table 3 shows estimated biological parameters for redbait.

Table 3: Estimates of biological parameters for redbait. Growth is based on Australian studies (Welsford & Lyle 2003).

Fishstock	Estimate			Source
<u>1. Weight = a (length)^b (Weight in g, length in cm fork length)</u>				
	Combined sexes			
RBT (All)	a 0.004947	b 3.259168		NIWA (unpub. data)
<u>2. von Bertalanffy growth parameters</u>				
	Combined sexes			
RBT (Tasmania)	L_{∞} 28.7	k 0.56	t_0 -0.36	Welsford & Lyle (2003)

3. STOCKS AND AREAS

There is no information about stock structure, recruitment patterns, or other biological characteristics that would indicate stock boundaries. As the catch of redbait has been mainly (66%) from bycatch in the jack mackerel trawl fisheries, management boundaries have been set the same as those used for jack mackerel. Analysis of encounter rates suggests a north-south seasonal movement of redbait may occur at a spatial scale that is greater than QMAs.

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4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

There are no estimates of fishery parameters or abundance for any redbait fishstock.

4.2 Biomass estimates

There are no biomass estimates for any redbait fishstock.

4.3 Yield estimates and projections

There are no yield estimates for any redbait fishstock.

5. STATUS OF THE STOCKS

There are no estimates of reference or current biomass for any redbait fishstock. It is not known whether redbait stocks are at, above, or below a level that can produce *MSY*.

6. FOR FURTHER INFORMATION

- Bentley, N; Kendrick, T H; MacGibbon, D J (2014) Fishery characterisation and catch-per-unit-effort analyses for redbait (*Emmelichthys nitidus*), 1989–90 to 2010–11. (2014 Draft New Zealand Fisheries Assessment Report held by Fisheries New Zealand.)
- Taylor, P R (2009) A summary of information on redbait *Emmelichthys nitidus*. Final Research Report for Ministry of Fisheries Project SAP2008-18. (Unpublished report held by Fisheries New Zealand, Wellington.)
- Welsford, D C; Lyle, J M (2003) Redbait (*Emmelichthys nitidus*): a synopsis of fishery and biological data. *TAFI Technical Report Series* 20. 32 p.