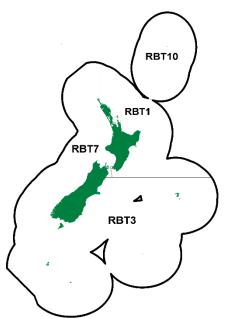
REDBAIT (RBT)

(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 5316 t and TACC of 5050 t. Allowances are zero for customary non-commercial or recreational fisheries. Following a period of low catch from RBT 7, the Minister decided to reduce the RBT 7 TAC to 421 t from 1 October 2022.

Redbait is mainly taken as bycatch of the jack mackerel target trawl fishery, but also widely taken as bycatch of barracouta and squid trawl tows, with some taken in the hoki fishery. A target fishery developed in the late-2000s, primarily on the Chatham Rise. Reported total landings ranged from 2184 t to 4307 t during the 2000s, but declined across all QMAs and target fisheries in 2009–10 and 2010–11 landed nearer 1000 t. Since the fishing year 2011–12 total landings have ranged between 1456 t and 2856 t and have primarily been taken in RBT 3.

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 off the west coast expanded into north and south Taranaki bights, with landings from RBT 7 exceeding those from RBT 3. Since 2010 RBT 7 landings have declined, with RBT 3 catches once again making up the bulk of the landings. Since 2018–19 annual RBT 7 landings have been under 40 t compared with 1700 t to 2700 t in RBT 3. Landings of RBT 1 have been small (less than 5 t) in most years, increasing slightly in the late 2000s with the majority taken as bycatch in rubyfish target midwater trawling.

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 (t), allowances (t), and TACCs (t) of redbait as at 1 October 2022.

Fishstock	Other mortality	Customary non-commercial and recreational	TACC	TAC
RBT 1	1	0	19	20
RBT 3	115	0	2 1 9 0	2 305
RBT 7	21	0	400	421
RBT 10	0	0	0	0

Fishestic Landings ACC Landings ACC Landing ACC Landi			RBT 1		RBT 3		RBT 7		RBT 10		T ()
1989-90 < <1 - 53 - (1 - 0) - 53 - (1 - 0) - 53 - (1 - 0) - 15 - (1 - 0) - 15 - (1 - 0) - 152 - (1 - 1) - 1770 - 46 - 0 - (1 - 1) - 1816 - (1 - 1) - 1935 - (1 - 1) - 10 - 2007 - (1 - 1) - 1940 - 7199 - 0 - (1 - 2) - 2010 - (1 - 2) - 2010 - (1 - 2) - 2010 - (1 - 2) - 2010 - (1 - 1) - 1335 - (2 - 771) - 0 - (1 - 1) - 3333 - (1 - 1) - 1335 - (2 - 771) - 0 - (1 - 3) - 3333 - (2 - 2) - 2000-01 - (1 - 1) - 135 - (2 - 771) - 0 - (1 - 3) - 3355 - (2 - 2) - 2000-06 - (2 - 2) - 2010 - (1 - 1) - 1360 - 0 - (2 - 3) - 3355 - (2 - 2) - 2000-07 - (3 - 1) - 1098 - (1 - 1) - 306 - 0 - (2 - 2) - 2000-07 - (2 - 2) - 2000 - (1 - 1) - 1936 - 0 - (2 - 2) - 2 - 2000 - 07 - (2 - 2) - 2 - 2 - 10 - 1) - 1936 - 0 - (2 - 2) - 2 - 2 - 2 - 2 - 2 - 10 - 1) - 1936 - 0 - (2 - 2) - 2 - 2 - 2 - 2 - 2 - 1 - 1 - 1038 - 1 - 1609 - 0 - (2 - 3) - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 1 - 1 - 1	FMA Fishstock	Landings	<u>1,2</u>	Landings	<u>3, 4, 5, 6</u>	Landings	<u>7, 8, 9</u> TACC	Landings	<u>10</u>	Landings	<u>Total</u> TACC
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		0						0		0	-
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1990–91	< 1	_	6	_	9	_	0	_	15	_
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			_		_	109	_		_		_
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			-		-		_		_		_
1995-96 < <1 - 1522 - 460 - 0 - 1993 - 983 - 1995-97 < 1 - 1194 - 608 - 0 - 2007 - 1997-98 1997-98 3 - 1485 - 518 - 0 - 2207 - 2971 - 2007-01 - 1529 - 0 - 2131 - 1997-90 2000-10 <1 - 940 - 739 - 0 - 21971 - 2007-01 2001-02 <1 - 1638 - 1669 - 0 - 3308 - 2007-03 - 2007-03 - 2007-03 - 2007-03 - 2016 - 1936 - 0 - 3303 - 2007-03 - 1098 - 1506 - 0 - 2395 - 2007-06 - 2007-06 - 2077 - 0 - 2484 - 2007-06 - 2376 - 0 - 24941 - 2007-09 - 10 - 1808 - 1649 - 0 - 3467 - 2941 - 2007-09 - 10 - 1808 - 1649 - 0 - 3467 - 500 - 2007-08 - 2007-08 - 2190 - 73 - 2441 0 0 - 1066 - 5000 - 2017 - 2007-09 - 10 - 1808 - 1649 - 0 - 3467 - 500 - 2017 - 2007-09 - 10 - 1808 - 1649 - 0 - 3467 - 500 - 2017 - 2007-09 - 10 - 1808 - 1649 - 0 - 3467 - 500 - 2017 - 2007-09 - 10 - 1808 - 1649 - 0 - 2555 - 5560 - 2017 - 13 - 219 - 182 - 2190 - 78 - 2441 0 0 0 - 1066 - 5000 - 2011-12 - 219 - 182 - 2190 - 78 - 2441 0 0 0 - 2153 - 5600 - 2017-13 - 2 19 - 182 - 2190 - 78 - 2441 0 0 0 - 2153 - 5600 - 2017-18 - 2 19 - 1867 - 2190 - 75 - 2441 0 0 0 - 2463 - 5000 - 2017-18 - 2 19 - 1687 - 2190 - 75 - 2441 0 0 0 - 2463 - 5000 - 2017-18 - 2 19 - 1687 - 2190 - 75 - 2441 0 0 0 - 2646 - 5000 - 2017-18 - 2 19 - 1687 - 2190 - 75 - 2441 0 0 0 - 2646 - 5000 - 2017-18 - 2 19 - 1687 - 2190 - 75 - 2441 0 0 0 - 2646 - 5000 - 2017-18 - 2 19 - 1687 - 2190 - 75 - 2441 0 0 0 - 2648 - 5000 - 2017-18 - 2 19 - 1687 - 2190 - 75 - 2441 0 0 0 - 2648 - 5000 - 2017-18 - 2 19 - 2459 - 2190 - 75 - 2441 0 0 0 - 2648 - 5000 - 2017-18 - 2 19 - 2648 - 2019 - 20 - 2 19 - 2459 - 2190 - 22 - 2441 0 0 0 - 1738 - 5050 - 2017-2 - 3 - 19 - 2459 - 2190 - 22 - 2441 0 0 0 - 1738 - 5050 - 2017-18 - 2 19 - 2648 - 2007-68 - 2007-68 - 2007-18 - 2017-19 - 2018-19							-				_
196-97 = 41 - 1194 - 608 - 0 - 1802 - 1907 - 1995-99 = 3 - 1485 - 518 - 0 - 2207 - 2007 - 2995-99 = 1 - 1820 - 693 - 0 - 2513 - 2007 - 2017 - 2391 - 579 - 0 - 2313 - 2001-02 < 1 - 940 - 739 - 0 - 3333 - 2003-04 - 1 - 1535 - 2771 - 0 - 3333 - 2003-04 - 1 - 676 - 1507 - 0 - 2.184 - 2005-06 - 2 - 2.016 - 1936 - 0 - 2.947 - 2005-06 - 2 - 2.016 - 2.076 - 0 - 2.947 - 2005-07 - 2.00 - 2.007 -							-				-
1997-98 = 3 - 1485 - 518 - 0 - 2007 - 2513 - 1997-90 - 1 - 2313 - 0 - 2513 -							_				_
1998-90 = < 1 - 1820 - 693 - 0 - 2313 - 2971 - 2001-01 < 1 - 940 - 739 - 0 - 1679 - 2001-01 < 1 - 940 - 739 - 0 - 3308 - 2001-02 < 1 - 1658 - 1669 - 0 - 3333 - 2003-04 - 1 - 1535 - 2771 - 0 - 4307 - 2001-02 < 1 - 1555 - 2771 - 0 - 2484 - 2005-06 - 2 - 2016 - 1936 - 0 - 3955 - 2006-07 - 2007-08 - 0 - 2944 - 2005-06 - 2 - 2016 - 1936 - 0 - 2947 - 2005-07 - 2007-08 - 5 - 560 - 2376 - 0 - 2941 - 2005-07 - 2001-01 - 1808 - 1600 - 0 - 3467 - 2001-01 - 1808 - 1600 - 0 - 3467 - 2001-01 - 1808 - 1600 - 0 - 2344 - 2005-07 - 0 - 2941 - 2005-07 - 2001-01 - 1808 - 1600 - 0 - 2346 - 2005-07 - 0 - 2941 - 0 - 2185 - 5050 - 2017-18 - 2015-16 - 2017-18 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2005-07 - 2005-07 - 2005-07 - 2015-20 - 2015-20 - 2015-20 - 2005-07 - 2005-07 - 2005-07 - 2005-07 - 2015-20 - 2015-20 - 2015-20 - 2015-20 - 2005-07 - 2005											_
1999-00 = 1 - 2391 - 579 - 0 - 2971 - 2001 - 2001 - 2 - 1 - 1638 - 1669 - 0 - 3308 - 2002 - 03 < 1 - 1219 - 2113 - 0 - 3333 - 2002 - 04 1 - 1353 - 2771 - 0 - 44307 - 2003 - 04 1 - 1576 - 1507 - 0 - 2184 - 2005 - 06 - 2 - 2016 - 1936 - 0 - 2941 - 2005 - 06 - 2 - 2016 - 1936 - 0 - 2941 - 2007 - 08 5 - 560 - 2376 - 0 - 2941 - 2009 - 10 - 1808 - 1649 - 0 3457 - 2009 - 10 - 1808 - 1649 - 0 3457 - 2009 - 10 - 1808 - 1649 - 0 3457 - 2009 - 10 - 1808 - 1649 - 0 - 2941 - 2009 - 10 - 1808 - 1649 - 0 - 2941 - 2009 - 10 - 1808 - 1649 - 0 - 2347 - 0 - 23447 - 2009 - 10 - 1808 - 1649 - 0 - 23441 - 0 0 - 1066 5050 - 2011 - 12 - 219 - 1829 - 2190 - 713 - 2841 - 0 - 0 - 23457 - 2009 - 10 - 18 - 19 - 2208 - 2190 - 713 - 2841 - 0 - 0 - 2345 - 5050 - 2012 - 13 - 2 - 19 - 1826 - 2190 - 325 - 2841 - 0 - 0 - 2356 - 5050 - 2012 - 13 - 2 - 19 - 1826 - 2190 - 325 - 2841 - 0 - 0 - 2366 - 5050 - 2013 - 14 - 4 - 19 - 2774 - 2190 - 78 - 2841 - 0 - 0 - 2485 - 5050 - 2013 - 16 - 5 - 19 - 1068 - 2 - 190 - 325 - 2841 - 0 - 0 - 2485 - 5050 - 2013 - 16 - 5 - 19 - 1668 - 2 - 190 - 325 - 2841 - 0 - 0 - 2660 - 5050 - 2013 - 16 - 5 - 19 - 1668 - 2 - 190 - 75 - 2841 - 0 - 0 - 2660 - 5050 - 2013 - 16 - 5 - 19 - 1668 - 2 - 190 - 75 - 2841 - 0 - 0 - 2685 - 5050 - 2015 - 16 - 5 - 19 - 1668 - 2 - 190 - 75 - 2841 - 0 - 0 - 2685 - 5050 - 2013 - 16 - 5 - 19 - 1668 - 2 - 190 - 75 - 2841 - 0 - 0 - 2674 - 5050 - 2013 - 18 - 2 - 19 - 268 - 2019 - 32 - 2841 - 0 - 0 - 268 - 5050 - 2013 - 18 - 2 - 19 - 268 - 2019 - 20 - 22 - 22 - 878 - 2010 - 17 - 20 - 5050 - 2015 - 10 - 2017 - 18 - 2017 - 18 - 2019 - 20 - 202 - 20 - 20 - 20 - 20 - 20 -							_				_
2001-02 < <1 - 1638 - 1669 - 0 - 3308 - 308 - 308 - 308 - 3013 - 2001-03 <1 - 1219 - 2113 - 0 - 3333 - 2001-05 - 1237 - 0 - 3333 - 2001-05 - 2376 - 0 - 2341 - 2001-07 - 3 - 1098 - 1506 - 0 - 2347 - 2001-07 - 0 - 2941 - 2001-07 - 1808 - 1649 - 0 - 3457 - 2001-07 - 1808 - 1649 - 0 - 3457 - 2001-11 - 21 - 19 - 284 - 2190 - 713 - 2841 - 0 - 0 - 3467 - 2001-12 - 219 - 1229 - 2190 - 369 - 2441 - 0 - 0 - 2467 - 5050 - 2011-12 - 219 - 1229 - 2190 - 376 - 2841 - 0 - 0 - 2467 - 5050 - 2011-12 - 2 - 19 - 1229 - 2190 - 376 - 2841 - 0 - 0 - 2865 - 5050 - 2011-12 - 2 - 19 - 1229 - 2190 - 376 - 2841 - 0 - 0 - 2865 - 5050 - 2011-14 - 4 - 19 - 2774 - 2190 - 78 - 2841 - 0 - 0 - 2156 - 5050 - 2011-14 - 4 - 19 - 2774 - 2190 - 78 - 2841 - 0 - 0 - 2156 - 5050 - 2011-15 - 4 - 19 - 2160 - 2190 - 333 - 2841 - 0 - 0 - 2166 - 5050 - 2011-16 - 5 - 19 - 1068 - 2190 - 378 - 2841 - 0 - 0 - 2166 - 5050 - 2011-16 - 5 - 19 - 1068 - 2190 - 338 - 2841 - 0 - 0 - 2166 - 5050 - 2011-18 - 2 - 19 - 2435 - 2190 - 160 - 2841 - 0 - 0 - 2434 - 5050 - 2015-16 - 5 - 19 - 1068 - 2190 - 338 - 2841 - 0 - 0 - 2648 - 5050 - 2015-17 - 5 - 19 - 2435 - 2190 - 160 - 2841 - 0 - 0 - 2648 - 5050 - 2015-16 - 5 - 19 - 1068 - 2190 - 32 - 2841 - 0 - 0 - 2648 - 5050 - 2015-16 - 217-18 - 2162 - 201-22 - 2192 - 2459 - 2190 - 22 - 2841 - 0 - 0 - 2748 - 5050 - 2012-22 - 3 - 19 - 174 - 2190 - 32 - 2841 - 0 - 0 - 1738 - 5050 - 2012-22 - 3 - 19 - 174 - 2190 - 32 - 2841 - 0 - 0 - 1738 - 5050 - 2021-22 - 3 - 19 - 174 - 2190 - 32 - 2841 - 0 - 0 - 1738 - 5050 - 2021-22 - 3 - 19 - 174 - 2190 - 21 - 2841 - 0 - 0 - 1738 - 5050 - 2021-22 - 3 - 19 - 174 - 2190 - 21 - 2841 - 0 - 0 - 1738 - 5050 - 2021-22 - 3 - 19 - 174 - 2190 - 21 - 2841 - 0 - 0 - 1738 - 5050 - 2021-22 - 3 - 19 - 174 - 2190 - 21 - 2841 - 0 - 0 - 1738 - 5050 - 2001-02 - 2003-04 - 2005-06 - 2007-06 - 2001-02 - 201-02 - 201-02 - 2022-22 - 2756 - 2007-06 - 2007-06 - 2001-02 - 201-02 - 201-02 - 2022-22 - 2756 - 2017-18 - 2017-18 - 2015-20 - 2022-22 - 2756 - 2017-18 - 2015-10 - 2017-18 - 2015-20 - 2022-22 - 205-00 - 2007-06 - 2					_		_				_
2002-03 <1 - 1219 - 2113 - 0 - 3333 - 2004-05 1 - 1535 - 2771 - 0 - 4307 - 2004-05 1 - 1575 - 2771 - 0 - 2184 - 2005-06 2 - 2016 - 1936 - 0 - 2395 - 2006-07 3 - 1098 - 1506 - 0 - 22677 - 2007-08 5 - 550 - 2376 - 0 - 23941 - 2007-08 5 - 3500 - 2376 - 0 - 23941 - 2007-08 10 - 1808 2190 170 2841 0 0 10107 5050 2011-12 2 19 1826 2190 369 2841 0 0 1006 5050 2012-13 2 19 1826 2190 369 2841 0 0 2185 5050 2012-13 2 19 1826 2190 325 2841 0 0 21856 5050 2012-14 4 19 2074 2190 78 2841 0 0 21856 5050 2013-14 4 19 2070 2190 132 2841 0 0 21856 5050 2013-14 4 19 2070 2190 132 2841 0 0 21856 5050 2013-15 4 19 2074 2190 78 2841 0 0 21856 5050 2013-14 5 19 1687 2190 75 2841 0 0 21856 5050 2015-16 5 19 2435 2190 160 2841 0 0 2485 6050 2017-18 2 19 1687 2190 75 2841 0 0 2483 5050 2017-17 5 19 2435 2190 160 2841 0 0 2483 5050 2017-17 5 19 2435 2190 160 2841 0 0 2483 5050 2017-18 2019-20 2 19 1687 2190 72 2841 0 0 2483 5050 2017-18 2019-21 29 19 687 2190 75 2841 0 0 2483 5050 2017-18 2019 217 2190 38 2841 0 0 2483 5050 2012-12 - 3 19 1714 2190 21 2841 0 0 2483 5050 2012-12 - 3 19 1714 2190 21 2841 0 0 2483 5050 2012-12 - 3 19 1714 2190 21 2841 0 0 2483 5050 2012-12 - 3 19 1714 2190 21 2841 0 0 2483 5050 - 2017-18 2019-20 2021-22 - 196 22 2841 0 0 2483 5050 - 2017-18 2019-20 2021-22 - 196 22 2841 0 0 2483 5050 - 2017-18 2019-20 2021-22 - 197 2459 2190 22 2841 0 0 2483 5050 - 2017-18 2019-20 2021-22 - 197 2459 2190 22 2841 0 0 2483 5050 - 2017-18 2019-20 2021-22 - 197 2459 2190 21 2841 0 0 2483 5050 - 2017-18 2019-20 2021-22 - 2005-04 205-06 2007-08 200-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 - 2005-04 205-06 2007-08 200-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 - 2005-04 205-06 2007-08 200-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 - 2005-04 205-06 2007-08 200-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 - 2005-04 205-06 2007-08 200-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 - 2005-04 205-06 2007-08 200-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 - 2015-04 2015-06 2007-08 2000-10 2011	2000-01	< 1	_	940	_	739	_	0	_	1679	_
2003-06 1 - 1 535 - 2771 - 0 - 4307 - 2004-05 1 - 676 - 1507 - 0 - 2184 - 2005-06 2 - 2016 - 1936 - 0 - 2184 - 2005-06 2 - 5 - 560 - 2376 - 0 - 2941 - 2005-09 10 - 1808 - 1649 - 0 - 3467 - 0 - 2467 - 2005-09 10 - 1808 - 1649 - 0 - 3467 - 0 - 3467 - 2005-01 - 11 21 19 284 2190 713 2841 0 0 100 1006 5050 2011-12 2 19 1229 2190 369 2841 0 0 2153 5050 2012-13 2 19 1826 2190 325 2841 0 0 2153 5050 2012-14 4 19 2774 2190 78 2841 0 0 2155 5050 2015-16 5 19 1068 2190 383 2841 0 0 2156 5050 2015-16 5 19 1068 2190 75 2841 0 0 2156 5050 2015-16 5 19 1068 2190 75 2841 0 0 2455 5050 2015-16 5 19 1068 2190 75 2841 0 0 2455 5050 2015-16 5 19 1068 2190 75 2841 0 0 2465 5050 2015-16 5 19 1068 2190 75 2841 0 0 2465 5050 2015-16 5 19 1068 2190 75 2841 0 0 2464 5050 2015-16 5 19 1068 2190 75 2841 0 0 2464 5050 2015-16 5 19 1068 2190 75 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 75 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 75 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 75 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 75 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 75 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 26 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 26 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 26 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 26 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 26 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 26 2841 0 0 2464 5050 2015-21 < 1 19 2459 2190 22 2841 0 0 2756 2017-18 2019-20 2021-22 Fishing Year	2001-02	< 1	-	1 638	-	1 669	-	0	-	3 308	-
2004-05 1 - 676 - 1907 - 0 - 2184 - 2005-06 2 - 2016 - 1936 - 0 - 3955 - 2006-07 3 - 1098 - 1506 - 0 - 2407 - 2007 - 2007-08 5 - 560 - 2376 - 0 - 3467 - 2007 - 2008-09 10 - 1808 - 1649 - 0 - 3467 - 2009-10 18 19 886 2190 170 2841 0 0 1006 5050 2011-12 2 19 1229 2190 369 2841 0 0 2153 5050 2012-13 2 19 1826 2190 325 2841 0 0 2155 5050 2012-14 4 19 2774 2190 78 2841 0 0 2156 5050 2013-14 4 19 2774 2190 78 2841 0 0 2156 5050 2015-16 5 19 1066 5190 1038 2841 0 0 2156 5050 2015-16 5 19 1066 2190 383 2841 0 0 2156 5050 2015-17 5 19 2435 2190 160 2841 0 0 2456 5050 2015-17 5 19 2435 2190 160 2841 0 0 2456 5050 2015-17 5 19 2435 2190 26 2841 0 0 2468 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2435 2190 26 2841 0 0 2467 5050 2015-17 5 19 2445 2190 26 2841 0 0 2467 5050 2015-17 5 19 2445 2190 26 2841 0 0 2467 5050 2015-10 2017-18 2019-20 2021-22 Fibling Year			-		-		-		_		-
2005-06 2 - 2 016 - 1936 - 0 - 3955 - 2006-07 3 - 1098 - 1506 - 0 - 2 607 - 2007-08 5 - 560 - 2376 - 0 - 2941 - 2008-09 10 - 1808 - 1649 - 0 - 3467 - 0 - 3467 - 2008-10 18 19 886 2190 170 2841 0 0 1006 5050 2011-12 2 19 1229 2190 369 2841 0 0 2153 5050 2011-13 2 19 1229 2190 325 2841 0 0 2153 5050 2013-14 4 19 2774 2190 78 2841 0 0 2156 5050 2013-16 5 19 1068 2190 383 2841 0 0 2156 5050 2015-16 5 19 1068 2190 383 2841 0 0 1456 5050 2015-16 5 19 1068 2190 75 2841 0 0 2456 5050 2018-19 - 119 2435 2190 160 2841 0 0 2456 5050 2018-19 - 119 2459 2190 75 2841 0 0 2483 5050 2018-19 - 1 19 2459 2190 75 2841 0 0 2483 5050 2018-19 - 1 19 2459 2190 22 2841 0 0 2483 5050 2018-19 - 1 19 2459 2190 22 2841 0 0 2483 5050 2012-21 < 1 19 2171 2190 38 2841 0 0 2483 5050 202-21 < 1 19 2171 2190 38 2841 0 0 1266 5050 2012-21 < 3 19 1714 2190 21 2841 0 0 1778 5050 00 - 2483 5050 202-21 < 1 0 2171 2190 38 2841 0 0 2483 5050 202-21 < 1 0 2171 2190 38 2841 0 0 2483 5050 202-21 < 1 0 2171 2190 38 2841 0 0 1778 5050 00 - 2600 -					-		-				-
2006-07 2007-08 5 - 5 2017-18 2019-11 21 19 1289 2190 2129 2190 2129 2190 2129 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2190 2122 2191 2122 2190 2122 2190 2122 2191 2122 2190 2122 2191 2122 2190 2122 2191 2122 2190 2122 2191 2122 2191 2122 2191 2122 2191 2122 2191 2122 2190 2122 2191 2192 2190 212 2191 2122 2191 2122 2191 2122 2191 212 2191 212 2191 212 2191 212 2191 212 2191 212 213 2190 212 2841 0 0 217-18 2019-21 2020-21 219 2192 219 2192 212 2841 0 0 217-18 2019-20 201-12 2015-16 2017-18 2019-20 201-22 201-2					-		_				-
2007-08 5 - 560 - 2376 - 0 - 2941 - 2008-09 10 - 1808 - 1649 - 0 - 3467 - 2009-10 18 19 886 2190 170 2841 0 0 1006 5050 2010-11 21 19 284 2190 713 2841 0 0 2153 5050 2012-13 2 19 1826 2190 325 2841 0 0 2153 5050 2013-14 4 19 2020 2190 132 2841 0 0 2155 5050 2013-16 5 19 1068 2190 383 2841 0 0 1256 5050 2015-16 5 19 1068 2190 383 2841 0 0 1456 5050 2015-16 5 19 1068 2190 383 2841 0 0 1456 5050 2015-16 5 19 1068 2190 26 2841 0 0 2483 5050 2015-17 5 19 2435 2190 175 2841 0 0 2483 5050 2015-17 5 19 2459 2190 22 2841 0 0 2483 5050 2015-18 2 19 1687 2190 75 2841 0 0 2483 5050 2015-20 2 19 2459 2190 22 2841 0 0 2483 5050 2015-20 2 19 2459 2190 22 2841 0 0 2483 5050 2015-20 2 19 2459 2190 22 2841 0 0 2483 5050 202-21 3 19 2171 2190 38 2841 0 0 2483 5050 202-21 3 19 2171 2190 38 2841 0 0 2483 5050 202-21 3 19 2171 2190 38 2841 0 0 2483 5050 202-21 3 19 7174 2190 21 2841 0 0 2483 5050 202-22 3 3 19 1714 2190 21 2841 0 0 2483 5050 202-22 3 3 19 1714 2190 21 2841 0 0 2483 5050 202-22 3 3 19 1714 2190 21 2841 0 0 2483 5050 202-22 5 3 19 10 174 5050 5050 201 5 5050 200 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 201 5 5050 200 5 500 5 5050 200 5 500 5 5050 200 5 500 5 500 5 500 5 500 5 500 5 500 5 500 5 500 5 500 5 500 5 500 5 50					-		_				-
2008-09 2009-10 18 19 2010-11 21 19 124 19 214 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 1229 2 19 122 2 19 122 2 19 122 2 19 122 2 19 122 2 19 122 2 19 122 2 19 122 2 19 16 2 19 2 1 2 19 19 2 19 2 19 19 2 19 2 19 2 19 19 2 19 19 1							_				-
2009-10 2010-11 21 19 22 21 19 22 21 19 22 21 19 22 21 21 22 21 21 22 21 21 22 21 21							_				_
2010-11 2011-12 2 19 129 219 219 219 219 219 219 2											5 0 5 0
2011-12 2012-13 219 1229 219 1229 219 212-13 219 1229 219 2129 219 2129 219 21											
2012-13 2013-14 4 19 2014-15 4 19 2020 2190 132 2841 0 0 2190 2190 132 2841 0 0 2156 5050 2015-16 5 19 2020 2190 132 2841 0 0 2156 5050 2015-16 5 19 2016 219 2190 212 2841 0 0 2600 5050 2017-18 2 19 2485 2190 25 2190 25 2841 0 0 2674 5050 2019-20 2 19 2483 2190 21 2841 0 0 2674 5050 2019-20 2 219 2483 2190 21 2841 0 0 2210 2674 5050 2020-21 4 19 2171 2190 21 2841 0 0 2210 2841 0 0 2210 2841 0 0 2210 2841 0 0 2174 290 290 202-21 210 5050 2021-22 3 19 1714 2190 21 2841 0 0 1738 5050 7 7 7 7 7 7 7 7 7 7 7 7 7											
2013-14 2013-14 4 19 2014 2015 2015-16 5 19 1068 2190 1068 2190 1068 2190 1068 2190 1060 2841 0 0 1764 5050 2017-18 2 19 1687 2190 2 19 2 435 2190 1687 2190 2 2 19 2 435 2190 2 19 2 435 2190 2 2 19 2 435 2190 2 2 2 41 0 0 2 2 19 2 435 2 190 2 438 2 190 2 2 2 41 0 0 2 2 19 2 435 2 190 2 2 2 41 0 0 2 2 19 2 4 0 0 178 5 050 2012-21 3 19 1714 2 190 2 19 2 190 2 2 8 10 0 2 2 19 2 19 2 190 2 2 8 10 0 2 2 19 2 190 2 2 8 10 0 2 2 19 19 2 19 2 19 19 2 19 2 19											
2015-16 5 19 1068 2190 383 2841 0 0 1456 5050 2016-17 5 19 2435 2190 160 2841 0 0 2600 5050 2018-19 <1 19 2648 2190 26 2841 0 0 2674 5050 2019-20 2 19 2459 2190 22 2841 0 0 2483 5050 2020-21 <1 19 2171 2190 38 2841 0 0 2483 5050 2021-22 3 19 1714 2190 21 2841 0 0 1738 5050 2021-22 $RBT3$ Landings TACC	2013-14	4	19	2 774	2 190	78	2 841	0	0	2 856	5 0 5 0
2016-17 5 19 2435 2190 160 2841 0 0 2600 5050 2017-18 2 19 1687 2190 75 2841 0 0 1764 5050 2019-20 2 19 2459 2190 22 2841 0 0 2674 5050 2020-21 < 1 19 2171 2190 38 2841 0 0 2210 5050 2021-22 $1 19 2171 2190 21 2841 0 0 1738 5050$ 2021-22 $1 19 2171 2190 21 2841 0 0 1738 5050$ 2020-21 $1 19 2171 2190 21 2841 0 0 1738 5050$ 2020-20 $1 19 2000 - 10 $	2014-15		19	2 0 2 0	2 190	132	2 841		0	2 1 5 6	
2017-18 2 19 1687 2190 75 2841 0 0 1764 5050 2018-19 1 19 2648 2190 26 2841 0 0 2483 5050 2020-21 1 19 2171 2190 38 2841 0 0 2210 5050 2021-22 3 19 1714 2190 21 2841 0 0 1738 5050 $1000 \frac{1}{1000} \frac{1}{10$											
2018-19 <1 19 2648 2190 26 2841 0 0 2674 5050 2019-20 2 19 2459 2190 22 2841 0 0 2483 5050 2020-21 <1 19 2171 2190 38 2841 0 0 1738 5050 2021-22 3 19 1714 2190 21 2841 0 0 1738 5050 $\begin{bmatrix} 3000 \\ 0 \\ 2000 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$											
2019-20 2019-20 2 19 2 459 2 190 2 2 2 841 0 0 2 2 10 3 2 2 10 2 2 2 841 0 0 2 2 10 5 050 2 2 10 5 050 2 2 10 5 050 2 2 10 5 0 50 2 2 2 2 841 0 0 1738 5 0 50 0 0 0 0 0 0 0 0 0 0 0 0 0											
2020-21 < 1 19 2171 2190 38 2841 0 0 2210 5050 2021-22 3 19 1714 2190 21 2841 0 0 1738 5050 RBT3 Landings TACC											
2021-22 3 19 1714 2190 21 2.841 0 0 1738 5050 RBT3 Landings TACC											
RBT3 Landings TACC -											
3000 2000 2000 2000 1500 000 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 Fishing Year RBT7 Landings TACC TACC TACC TACC TACC 2000-10 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 203-04 2015-16 2017-18 2019-20 2021-22 203-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 203-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 203-04 2015-16 2017-18 2019-20 2021-22 203-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 2021-22 203-04 2015-16 2017-18 2019-20 2021-22 2021-22 203-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 2021-2		[
$\left(\begin{array}{c} 1 \\ 1 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$	300		andings _	TACC							
$\left(\begin{array}{c} 1 \\ 1 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$											
⁹ ¹⁵⁰⁰ ¹⁰⁰	250	0									
⁹ ¹⁵⁰⁰ ¹⁰⁰	(t)	-									
⁹ ¹⁵⁰⁰ ¹⁰⁰	jg 200	io -]									
P_{1000}^{0} P_{1	we									-	
RBT7 Landings TACC	<u>E</u> 150	0 -									
RBT7 Landings TACC	and				_	l r	_				
0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 Fishing Year RBT7 Landings TACC — 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100	⁻ 100	0 - 0									
0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 Fishing Year RBT7 Landings TACC — 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100				_							
2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 Fishing Year RBT7 Landings TACC	50										
2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 Fishing Year RBT7 Landings TACC											
RBT7 Landings TACC		-	2003-04	2005-06	2007-08	2009-10 20	11-12 2	013-14 2015-	16 2017	-18 2019-20	2021-22
3000 2500 1500 1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22						Fish	ing Year				
2500 1500 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22 2		RBT7 La	ndings 🗌	TACC -							
E 2000	3000	p∮									
E 2000		-									
1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22		o -]									
1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	it (t)	1 _									
1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22		p-]									
1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	š										
1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	<u>بة</u> 1500	D -									
1000 500 0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	Lan										
0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	1000	D -									
0 2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22											
2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	500										
2001-02 2003-04 2005-06 2007-08 2009-10 2011-12 2013-14 2015-16 2017-18 2019-20 2021-22	,										
	(2003-04	2005-06	2007-08	2009-10 20	11-12 2	013-14 2015	-16 2017	-18 2019-20	2021-22
					-						

 Table 2: Reported landings (t) of redbait by Fishstock and TACCs from 1989–90 to present. Landings from 2001–02 are MHR totals, while landings from 1989–90 to 2000–01 are from CELR/CLR data (Middleton in prep).

Figure 1: Reported commercial landings and TACC for the two main RBT stocks. From top: RBT 3 and RBT 7. 1214

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 t (but usually less than 200 t) of redbait reported annually as discarded between 1988–89 and 2008–09.

2. BIOLOGY

Emmelichthys nitidus is a schooling, bathypelagic species in the same family (Emmelichthyidae) as rubyfish. It is widely distributed around New Zealand in depths from 85 to 500 m.

There have been no ageing studies of redbait in New Zealand. Australian studies suggest regional differences in maximum size and age with a maximum age of 14 years off New South Wales, 7 years off South Australia (Dennis et al 2021) and 8 years off Tasmania, where the maximum reported size of redbait is 316 mm fork length (Welsford & Lyle 2003). 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 is about 420 mm FL, which is larger than most other regions where length of this species has been recorded, except South Africa. Welsford and Lyle (2003) suggested that the much larger redbait reported from Africa could indicate that the maximum age of redbait may be greater than Australian studies, or that growth is highly variable regionally. They also noted that ageing of rubyfish (subsequently documented by Horn et al 2012) indicated some emmelichthyid species are long lived. However, the relevance of this observation to redbait is questionable: meta-analysis by Thorson et al (2017) indicates that while there is some segregation of life history parameters by family, parameters nevertheless vary by orders of magnitude variation within families and show significant overlap between families. Welsford & Lyle (2003) attempted marginal increment analysis of redbait otoliths but could not identify a clear pattern in otolith growth throughout the year. Most redbait measured by observers from New Zealand fisheries, to the nearest cm below, are over 250 mm; however modes of smaller fish at approximately 120 mm, 200 mm, and 250 mm are consistent with the expected sizes of 1, 2, and 3 year old fish from the Tasmanian growth curve (Middleton in prep).

Spawning in Tasmania extends over 2–3 months during spring, with females producing batches of eggs at three day intervals. Size at maturity varied markedly by region; sizes at 50% maturity in males were 146 mm for eastern and 244 mm for south-western fish, and 157 mm for eastern and 261 mm for south-western females (Ewing & Lyle 2009). There is some evidence that redbait in New Zealand may also spawn in spring, with most stage 4 females recorded by observers in September and October; however, some ripe fish have also been recorded in December and January (Middleton in prep.). Almost all the females sampled off Southland were immature, including fish in the 300–400 mm size range. Size at 50% maturity appears to be around 240 mm on the eastern Chatham Rise, but 270 mm on the western Chatham Rise.

Table 3 shows estimated biological parameters for redbait.

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

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

3. STOCKS AND AREAS

Because information on redbait stock structure was lacking, management boundaries were established for redbait that mirrored those for jack mackerel. A subsequent analysis of encounter rates (Bentley et al 2014) suggested a north-south seasonal movement of redbait may occur at a spatial scale that is greater than QMAs.

Observer sampling indicates that redbait smaller than 250 mm are only encountered frequently in the Southland fishery, which has been focused in Statistical Area 028. Most redbait sampled in the southern fisheries are immature. Spawning fish have been recorded on the Chatham Rise, particularly on the Mernoo Bank, and, less frequently, off the South Island west coast. It is feasible that there is a single EEZ-wide stock of redbait, with recruiting fish entering the Southland fishery and variable movements of fish to the west coast and Chatham Rise.

4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

There are no estimates of spawning stock abundance for any redbait fishstock.

4.2 Biomass estimates

Catch per unit effort analyses were attempted in 2022 for the redbait fisheries in Southland, on the Chatham Rise, and off the west coast South Island/Taranaki Bight fisher-reported and observer data (Middleton in prep). Both the Chatham Rise and the west coast South Island/Taranaki Bight fisheries have variable catches and periods where the absence of any redbait catch precluded the development of CPUE indices.

The Working Group considered that the series using observer catch and effort data were the most promising. For the west coast South Island/Taranaki Bight, the CPUE index (Figure 2) confirmed that redbait abundance was significantly higher in this area in the 2000s than in the 2010s.

For the Southland area, the Working Group considered that the event-resolution observer CPUE series might be regarded as index of the recruiting stock abundance. The index (Figure 3) increased from 1998 to a high point in 2002, then declined to 2008 and fluctuated without trend until 2015 before increasing steadily to 2022. Catch sampling data (Figure 4) suggested that a strong 2016 year class may have been entering the fishery from 2018 to 2020, influenced by increasing selectivity with size.

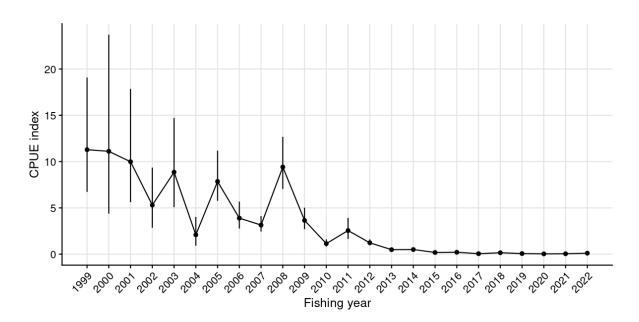


Figure 2: Observer event-resolution combined delta-lognormal CPUE index for the RBT 7 west coast South Island and Taranaki Bight midwater trawl fisheries targeting BAR and JMA showing approximate 95% confidence intervals.

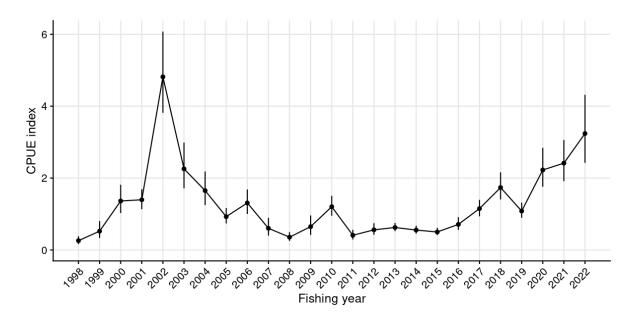


Figure 3: Observer event-resolution combined delta-lognormal CPUE index for the RBT 3 Southland midwater and bottom trawl fisheries targeting SQU, BAR, and JMA showing approximate 95% confidence intervals.

4.3 Future research considerations

- Ageing.
- Directed observer sampling focused on understanding stock structure: regular sampling of the Mernoo Bank fisheries, and verification of maturity stages in the Southland fishery.
- Spatio-temporal modelling of catch and effort data.

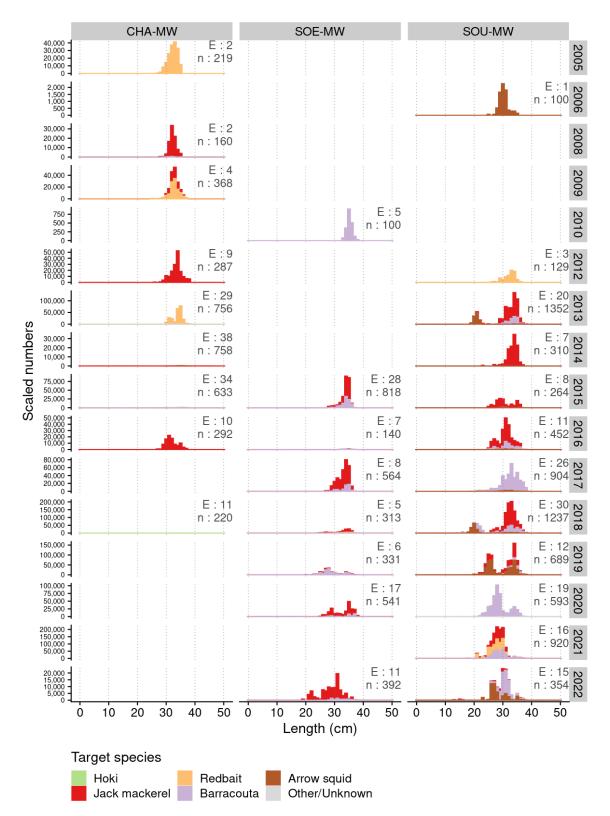


Figure 4: Scaled observer length-frequency distributions for redbait caught in the midwater trawl fishery, by observer region (CHA: Challenger; SOE: eastern Chatham Rise; SOU: Southland), year, and target species (E: Events sampled; n: number of measured fish).

5. STATUS OF THE STOCKS

Redbait may consist of a single New Zealand biological stock. There are no estimates of reference points or current biomass for any redbait fishstock, therefore stock status cannot be determined.

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. (Draft New Zealand Fisheries Assessment Report held by Fisheries New Zealand.)
- Dennis, J D; Grammer, G; Ward, T; Smart, J; Huveneers, C (2021) Using otolith chronologies to identify extrinsic drivers of growth of 2 commercially targeted small pelagic fish species. *Fishery Bulletin 119*: 135–148.
- Ewing, G P; Lyle, J M (2009) Reproductive dynamics of redbait, Emmelichthys nitidus (Emmelichthyidae), from south-eastern Australia. Fisheries Research 97: 206–215.
- Horn, P L; Neil, H L; Paul, L J; McMillan, P J (2012) Age verification, growth and life history of rubyfish Plagiogeneion rubiginosum. New Zealand Journal of Marine and Freshwater Research 46: 353–368.
- Middleton, D A J (in prep) Characterisation and CPUE analyses for the RBT 1, RBT 3, and RBT 7 fisheries. Draft New Zealand Fisheries Assessment Report.
- 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.)
- Thorson, J T; Munch, S B; Cope, J M.; Gao, J (2017) Predicting life history parameters for all fishes worldwide. *Ecological Applications* 27: 2262–2276.
- Welsford, D C; Lyle, J M (2003) Redbait (*Emmelichthys nitidus*): a synopsis of fishery and biological data. *TAFI Technical Report Series 20*. 32 p.