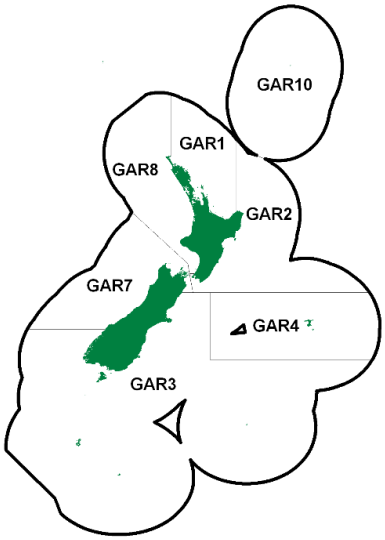
GARFISH (GAR)

(*Hyporhamphus ihi*)
Takeke



1. FISHERY SUMMARY

Garfish was introduced into the QMS from 1 October 2002 with allowances, TACCs and TACs as shown in Table 1. These have not changed.

Table 1: Recreational and Customary non-commercial allowances, other mortality, TACCs, and TACs (t) for garfish by Fishstock.

Fishstock	Recreational allowance	Customary Non-Commercial allowance	Other sources of mortality	TACC	TAC
GAR 1	20	10	0	25	55
GAR 2	8	4	0	5	17
GAR 3	2	1	0	5	8
GAR 4	1	1	0	2	4
GAR 7	10	5	0	8	23
GAR 8	8	4	0	5	17
GAR 10	–	–	–	0	0

1.1 Commercial fisheries

Garfish landings were first recorded in 1933, and a minor fishery must have existed before this (Table 2). Moderate quantities of garfish can be readily caught by experienced fishers, it is a desirable food fish, and informal sales at beaches or from wharves are likely to have been made from the late 1800s onwards. Reported landings to 1990 almost certainly understate the actual "commercial" catch.

Table 2: Reported total New Zealand landings (t) of garfish from 1931 to 1990.

Year	Landings	Year	Landings	Year	Landings	Year	Landings	Year	Landing	Year	Landing
1931	–	1941	1	1951	4	1961	3	1971	11	1981	7
1932	–	1942	1	1952	7	1962	4	1972	4	1982	11
1933	1	1943	1	1953	6	1963	4	1973	10	1983	12
1934	–	1944	2	1954	8	1964	2	1974	6	1984	13
1935	–	1945	9	1955	9	1965	2	1975	2	1975	8
1936	–	1946	3	1956	7	1966	3	1976	5	1986	14
1937	–	1947	2	1957	2	1967	4	1977	5	1987	36
1938	–	1948	1	1958	2	1968	3	1978	15	1988	20
1939	4	1949	6	1959	4	1969	5	1979	12	1989	15
1940	6	1950	2	1960	6	1970	13	1980	12	1990	24

Source: Annual Reports on Fisheries (Marine Department/Ministry of Agriculture & Fisheries) to 1974, and subsequent MAF data.

Table 3: Reported catches or landings (t) of garfish by Fishstock from 1990–91 to present*. Prior to 2001–02 the catches or landings (t) of garfish were reported by FMA. † - CELR data.

Fishstock	GAR 1		GAR 2		GAR 3		GAR 4	
FMA (s)	1		2		3,5&6		4	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1990–91†	31	-	< 1	-	2	-	-	-
1991–92†	22	-	< 1	-	1	-	-	-
1992–93†	14	-	< 1	-	1	-	-	-
1993–94†	23	-	0	-	2	-	-	-
1994–95†	17	-	< 1	-	< 1	-	-	-
1995–96†	15	-	< 1	-	1	-	-	-
1996–97†	15	-	< 1	-	1	-	-	-
1997–98†	21	-	< 1	-	< 1	-	-	-
1998–99†	19	-	< 1	-	< 1	-	-	-
1999–00†	17	-	< 1	-	< 1	-	-	-
2000–01†	11	-	0	-	< 1	-	-	-
2001–02†	8	25	0	5	< 1	5	0	2
2002–03†	6	25	0	5	< 1	5	0	2
2003–04†	11	25	0	5	0	5	0	2
2004–05†	13	25	< 1	5	0	5	0	2
2005–06†	7	25	< 1	5	1	5	0	2
2006–07†	10	25	0	5	0	5	0	2
2007–08†	8	25	0	5	0	5	< 1	2
2008–09†	10	25	0	5	0	5	0	2
2009–10†	9	25	0	5	0	5	0	2
2010–11†	11	25	0	5	< 1	5	0	2
2011–12†	8	25	0	5	0	5	0	2
2012–13	12	25	< 1	5	< 1	5	0	2
2013–14	15	25	0	5	0	5	0	2
2014–15	16	25	0	5	0	5	0	2
2015–16	25	25	0	5	0	5	0	2
2016–17	26	25	0	5	0	5	0	2
2017–18	22	25	0	5	0	5	0	2
2018–19	16	25	0	5	< 1	5	0	2
2019–20	23	25	0	5	0	5	0	2
2020–21	14	25	0	5	0	5	0	2
2021–22	15	25	< 1	5	0	5	0	2
2022–23	8	25	0	5	0	5	0	2
2023–24	6	25	0	5	0	5	0	2

Fishstock	GAR 7		GAR 8		GAR 10			
FMA (s)	7		8&9		10		Total	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1990–91†	4	-	1	-	0	-	38	
1991–92†	6	-	0	-	0	-	29	-
1992–93†	2	-	2	-	0	-	18	-
1993–94†	2	-	0	-	0	-	26	-
1994–95†	2	-	0	-	0	-	19	-
1995–96†	3	-	< 1	-	0	-	19	-
1996–97†	5	-	< 1	-	0	-	20	-
1997–98†	4	-	1	-	0	-	27	-
1998–99†	6	-	1	-	0	-	26	-
1999–00†	4	-	< 1	-	0	-	21	-
2000–01†	2	-	0	-	0	-	13	-
2001–02†	3	8	0	5	0	0	11	50
2002–03†	< 1	8	0	5	0	0	6	50
2003–04†	1	8	< 1	5	0	0	12	50
2004–05†	0	8	< 1	5	0	0	13	50
2005–06†	0	8	0	5	0	0	9	50
2006–07†	< 1	8	< 1	5	0	0	10	50
2007–08†	< 1	8	0	5	0	0	8	50
2008–09†	1	8	0	5	0	0	11	50
2009–10†	3	8	0	5	0	0	12	50
2010–11†	1	8	0	5	0	0	13	50
2011–12†	< 1	8	< 1	5	0	0	9	50
2012–13	0	8	0	5	0	0	12	50
2013–14	0	8	0	5	0	0	15	50
2014–15	< 1	8	0	5	0	0	16	50
2015–16	< 1	8	0	5	0	0	25	50
2016–17	0	8	0	5	0	0	26	50
2017–18	0	8	0	5	0	0	22	50
2018–19	0	8	0	5	0	0	16	50
2019–20	0	8	0	5	0	0	23	50
2020–21	0	8	0	5	0	0	14	50
2021–22	0	8	0	5	0	0	15	50
2022–23	0	8	0	5	0	0	8	50
2023–24	< 1	8	0	5	0	0	6	50

* Listed as landings but are the higher of catch or landing values. There were relatively small differences between the two series.

By 1990 reported landings were in the range 20–40 t, and the total catches may have reached 50 t. Reported catches and landings through the 1990s were of a similar order of magnitude, before catches declined to lower levels during the 2000–01 to 2011–12 fishing seasons. Since 2012 landings have increased to levels last seen in the 1990s (Table 3).

Largest catches and landings (8–31 t) were made in FMA 1, mostly in Statistical Area 003 (southern east Northland) and 009 (central Bay of Plenty). Small (2–6 t) quantities were taken in FMA 7, almost entirely in area 017 (Marlborough Sounds). Only minor and intermittent catches and landings were made elsewhere. The most consistent catches were taken by beach seine, with some catches by lampara net. Most of the catch is reported as targeted.

In the early 1990s about 50 vessels reported a catch or landing in a year; by the late 1990s this had declined to 20–30. Most vessels reported garfish in only a few years. Annual reported landings have fluctuated between 9 and 26 tonnes since 2010–11.

1.2 Recreational fisheries

Some garfish is taken, probably incidentally, using rod and line but most is taken in a small and specific fishery using beach seines from the shore in northern FMAs. Harvest estimates are uncertain. The total annual harvest was estimated to be about 10 000 fish in the 2022–23 national panel survey (Heinemann & Gray 2024) (Table 4).

Table 4: Recreational harvest estimates for garfish stocks (Wynne-Jones et al 2014, 2019, Heinemann & Gray 2024).

Stock	Year	Method	Number of fish	CV
GAR 1	2011–12	Panel survey	20 548	0.59
	2017–18	Panel survey	11 065	0.44
	2022–23	Panel survey	9 505	0.43
GAR 2	2011–12	Panel survey	–	–
	2017–18	Panel survey	8 571	0.88
	2022–23	Panel survey	–	–
GAR 3	2011–12	Panel survey	58	1.03
	2017–18	Panel survey	–	–
	2022–23	Panel survey	–	–
GAR 7	2011–12	Panel survey	1 515	1.06
	2017–18	Panel survey	1 401	0.80
	2022–23	Panel survey	285	1.01
GAR 8	2011–12	Panel survey	932	0.63
	2017–18	Panel survey	7 170	1.00
	2022–23	Panel survey	158	1.01

1.3 Customary non-commercial fisheries

Quantitative information on the current level of customary non-commercial catch is not available.

1.4 Illegal catch

Estimates of illegal catch are not available, but this is probably insignificant or nil.

1.5 Other sources of mortality

There may be some accidental catches of garfish in small-mesh nets (purse seines, lampara nets, and beach seines) used in the fisheries for pilchard and yellow-eyed mullet.

2. BIOLOGY

Only one species of garfish or piper is common in New Zealand waters, *Hyporhamphus ihi*. It is endemic, but very similar species occur in Australia. A larger garfish, *Euleptorhamphus viridis*, is occasionally recorded in northern New Zealand. The common garfish is not closely related to the ocean piper or saury, *Scomberexox saurus*. Garfish occur around most of New Zealand, and are present at the Chatham Islands. They are most abundant in sheltered gulfs, bays, and large estuaries, particularly near seagrass beds in shallow water, and over shallow reefs. The pale green, almost transparent colouring, and localised schooling behaviour of garfish makes them difficult to see and their abundance difficult to estimate.

Spawning occurs during spring and summer probably in suitable shallow bays; the eggs sink to the seafloor and adhere to vegetation. Larvae are seldom taken in coastal plankton surveys. Patterns of age and growth are not known in New Zealand, but likely to be similar to Australia, where the larger of two closely related species (southern garfish, *H. melanochir*) matures at 25 cm (2–3 years) and reaches 52 cm (10 years). The New Zealand garfish matures at 22 cm, and with a maximum size of 40 cm may have a lower maximum age. Average size is 20–30 cm.

The Intrinsic Productivity Level is categorised as High for this species.

Garfish feed on zooplankton. They form single-species schools, but occur in close proximity with other small pelagic fishes in shallow coastal waters, particularly yellow-eyed mullet.

There have been no biological studies that are directly relevant to the recognition of separate stocks, or to yield estimates. Consequently, no estimates of biological parameters are available.

3. STOCKS AND AREAS

There is no information on whether separate biological stocks occur in New Zealand. Given their preferred habitat of shallow sheltered waters, and the mode of reproduction in which the eggs are attached to the seafloor rather than free-floating, it is probable that localised populations occur, and possible that these may differ in some biological parameters (e.g., growth and recruitment). Consequently, these populations may be susceptible to local depletion.

Garfish are sometimes taken as a non-target catch in the pilchard fishery, but this catch is likely to be very small. Although the target fisheries for these two species are quite separate, it is convenient for their Fishstocks to have the same boundaries.

4. STOCK ASSESSMENT

There have been no previous stock assessments of garfish.

4.1 Estimates of fishery parameters and abundance

No fishery parameters are available.

4.2 Biomass estimates

No estimates of biomass (B_0, B_{MSY}, or $B_{current}$) are available.

4.3 Yield estimates and projections

MCY cannot be determined.

Current biomass cannot be estimated, so *CAY* cannot be determined.

4.4 Other factors

The extent of natural variability in the size of garfish populations is not known, but from their very shallow inshore distribution, and demersal rather than pelagic eggs, it is suspected that they are less variable than other small pelagic species. However, these features also suggest localised populations, susceptible to local depletion.

There is anecdotal information that garfish are very abundant in some localities. It is not known whether this represents similar abundance over a larger region, or a tendency for a few schools to become concentrated in these localities. Apparent abundance, and initial catches, may be misleading in terms of sustainable yields.

The maximum age of 10 years proposed for a similar Australian garfish implies that productivity might not be as high as would be expected from a small pelagic species.

There is no reliable information on catches from the recreational fishery for garfish, or even their size relative to that of the commercial fishery.

5. STATUS OF THE STOCKS

No estimates of current biomass are available. A fishery has existed for several decades, but it is not known how heavily this has exploited the stock. For all Fishstocks there is insufficient information to estimate current stock status.

6. FOR FURTHER INFORMATION

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