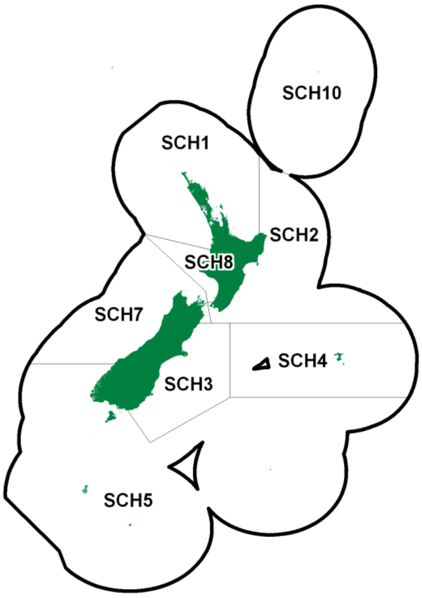
SCHOOL SHARK (SCH)

(*Galeorhinus galeus*)
Tupere, Tope, Makohuarau



1. FISHERY SUMMARY

School shark was introduced into the QMS on 1 October 1986. The recreational, customary, and other mortality allowances as well as TACCs and TACs are shown in Table 1.

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

Fishstock	Recreational allowance	Customary non-commercial allowance	Other sources of mortality	TACC	TAC
SCH 1	68	102	34	689.0	893.0
SCH 2*	–	–	–	198.6	–
SCH 3	48	48	19	387.0	502.0
SCH 4*	–	–	–	238.5	–
SCH 5	5	7	26	520.0	558.0
SCH 7	58	58	32	641.0	789.0
SCH 8	21	21	26	529.0	597.0
SCH 10*	–	–	–	10.0	–

* allowances and TAC not set

1.1 Commercial fisheries

This moderate-sized shark has supported a variety of fisheries around New Zealand from the early 1940s onwards. Landings rose steeply from the late 1970s until 1983 (Table 2), with the intensification of setnets targeting this and other shark species, and a general decline in availability of other, previously more desirable, coastal species. However, because of earlier discarding and under-reporting, this recorded rise in landings did not reflect an equivalent rise in catches. Landings decreased by about 50% from 1986 onwards because quotas were set below previous catch levels when this species was introduced into the QMS (Table 3). From 1987–88 to 1991–92 total reported landings were around 2200–2500 t annually. In 1995–96, total landings increased to above the level of the TACC (3106 t) to 3412 t, exceeding the TACC for the first time. Total landings remained near the level of the TACC from 1995–96 to 2012–13, decreasing slowly thereafter with 2459 t landed in 2023–24.

TACCs were increased by 5% for SCH 5, and 20% for SCH 3, 7, & 8 under AMP management in October 2004. From 1 October 2007, the TACC for SCH 1 was increased to 689 t, also setting a TAC for the first time at 893 t with 102 t, 68 t, and 34 t allocated to customary, recreational, and other sources of mortality respectively. In 2004, SCH 3, 5, 7, & 8 were allocated recreational and customary non-commercial allowances of 48 t, 7 t, 58 t, and 21 t, respectively, and other sources of mortality were allocated 19 t, 37 t, 32 t, and 26 t, respectively. All AMP programmes ended on 30th September 2009. The TACC for SCH 5 was reduced in 2021–22 to 520 t. School shark was added to the 6th schedule on the 1st of January 2013 which allows school shark that are alive when caught, and likely to survive, to be released. Less than 1% of the total school shark catch has been released annually, mainly in SCH5, followed by SCH 3, 4 and 7, under code X (previously under Schedule 6 and more recently the Fisheries Landings and Discards Exception Notice) or code J (authorised returns). Table 2 shows total New Zealand historical (pre-1984) SCH landings by calendar year; TACCs and landings by fishing year are provided by Fishstock in Table 3 and Figure 1.

Table 2: Reported domestic landings (t) of school shark from 1948 to 1983.

Year	Landings	Year	Landings	Year	Landings	Year	Landings
1948	75	1957	301	1966	316	1975	518
1949	124	1958	323	1967	376	1976	914
1950	147	1959	304	1968	360	1977	1 231
1951	157	1960	308	1969	390	1978	161
1952	179	1961	362	1970	450	1979	481
1953	142	1962	354	1971	597	1980	1 788
1954	185	1963	380	1972	335	1981	2 716
1955	180	1964	342	1973	400	1982	2 965
1956	164	1965	359	1974	459	1983	3 918

Source: Fisheries New Zealand data.

During the period of high landings in the mid-1980s, setnetting was the main fishing method, providing about half the total catch, with lining accounting for one-third of the catch, and trawling the remainder. There were large regional variations. These proportions have shifted somewhat in more recent years, with setnets still accounting for 38% of the landings between 2020 and 2024, bottom longline 29% and bottom trawl 28%. School shark catches by modular harvesting systems (primarily in SCH 1) have recently increased in importance, representing 4% of total school shark catches between 2020 and 2024. Small amounts of school shark are also caught by the foreign charter tuna longliners fishing offshore in the EEZ to well beyond the shelf edge.

The Banks Peninsula Marine Mammal Sanctuary was established in 1988 by the Department of Conservation under the Marine Mammal Protection Act 1978, for the purpose of protecting Hector's dolphins. The sanctuary extends 4 nautical miles from the coast from Sumner Head in the north to the Rakaia River mouth in the south. Before 1 October 2008, no setnets were allowed within the sanctuary between 1 November and the end of February. For the remainder of the year, setnets were allowed but could only be set from an hour after sunrise to an hour before sunset, be no more than 30 metres long, with only one net per boat, and the boat was required to remain tied to the net while it was set.

Voluntary setnet closures were implemented by the Southeast Finfish Management Company (SEFMC) from 1 October 2000 to protect nursery grounds for rig and elephant fish and to reduce interactions between commercial setnets and Hector's dolphins in shallow waters. The closed area extended from the southernmost end of the Banks Peninsula Marine Mammal Sanctuary to the northern bank of the mouth of the Waitaki River. This area was closed permanently for a distance of 1 nautical mile offshore and for 4 nautical miles offshore for the period 1 October to 31 January.

From 1 October 2008, a new suite of regulations intended to protect Māui and Hector's dolphins was implemented for all New Zealand by the Minister of Fisheries as part of the Hector's and Māui Dolphin Threat Management Plan (TMP). As part of the TMP, the Banks Peninsula Marine Mammal Sanctuary boundaries were extended, and fisheries restrictions were removed from the Sanctuary and implemented under the Fisheries Act 1996. Further regulations were implemented in 2012 and 2013 as part of a review of the Māui portion of the TMP, and in 2020 as part of a review of the full TMP.

For SCH 1, commercial setnet fishing was closed from Maunganui Bluff to Pariokariwa Point for a distance of 4 nautical miles offshore, and in the entrance of the Manukau Harbour on 1 October 2003. This closure was extended by the Minister to 7 nautical miles on 1 October 2008. An appeal was made by affected commercial fishers who were granted interim relief by the High Court, allowing setnet fishing for rig and school shark beyond 4 nautical miles during daylight hours between 1 October and 24 December during three consecutive years: 2008–2010, with the full closure reinstated in March 2011. In 2008, commercial and recreational set net closures were also implemented in the entrance to Kaipara and Raglan harbours and in the lower part of the Waikato River. The Manukau Harbour closure was also extended further into the Harbour. On 1 October 2020, commercial and recreational setnet fishing was closed out to 4 nautical miles offshore between Cape Reinga and Maunganui Bluff, and the existing set net closure extended out to 12 nautical miles between Maunganui Bluff and the Waiwhakaiho River (New Plymouth). Setnet closures within the Manukau Harbour were also extended to Taumatarea Point in the north and Matakawau point in the south (within the harbour).

For SCH 3, commercial and recreational set netting was banned in most areas from 1 October 2008 to 4 nautical miles off the east coast of the South Island, extending from Cape Jackson in the Marlborough Sounds to Slope Point in the Catlins. Some exceptions were allowed, including an exemption for commercial and recreational set netting to only 1 nautical mile offshore around the Kaikōura Canyon, and permitting set netting in most harbours, estuaries, river mouths, lagoons, and inlets except for the Avon-Heathcote Estuary, Lyttelton Harbour, Akaroa Harbour, and Timaru Harbour. In addition, trawl gear within 2 nautical miles of shore was restricted to flatfish nets with defined low headline heights. On 1 October 2020, commercial closures were extended off Kaikoura by between 0.2 and 1 nautical miles offshore. Along the Canterbury coast, commercial and recreational set net closures were extended to encompass Pegasus Bay, approximately 19 nautical miles offshore southeast from the headland east of Motunau Beach offshore and then southwest to a point 7 nautical miles offshore from Goat Point, and from Snuffle Nose southwest to 12 nautical miles offshore across the Canterbury Bight to just south of Timaru. On 28 November 2022, the commercial and recreational set net closures around Banks Peninsula (between Goat Point and Snuffle Nose) were extended out to 12 nautical miles offshore.

For SCH 5, commercial and recreational set netting was banned in most areas from 1 October 2008 to 4 nautical miles offshore, extending from Slope Point in the Catlins to Sandhill Point east of Fiordland and in Te Waewae Bay. An exemption which permitted set netting in harbours, estuaries, and inlets was allowed. In addition, trawl gear within 2 nautical miles of shore was restricted to flatfish nets with defined low headline heights. On 1 October 2020, commercial and recreational set-net closures were extended within Te Waewae Bay to 10 nautical miles offshore.

For SCH 7, both commercial and recreational set netting were banned to 2 nautical miles offshore from 1 October 2008, with the recreational closure effective for the entire year and the commercial closure restricted to 1 December to the end of February. The closed area extends from Awarua Point north of Fiordland to the tip of Cape Farewell at the top of the South Island. On 1 October 2020, commercial and recreational set-netting was prohibited out to 4 nautical miles offshore within Golden and Tasman Bay, from Farewell Spit to Cape Soucis (Raetihi).

For SCH8, the southern limit of the Māui dolphin closure beginning north of New Plymouth at Pariokariwa Point and offshore to a distance of 4 nautical miles took effect on 1 October 2003. As for SCH 1, this closure was extended by the Minister to 7 nautical miles on 1 October 2008. An appeal was made by affected commercial fishers who were granted interim relief by the High Court, allowing setnet fishing for rig and school shark beyond 4 nautical miles during daylight hours between 1 October and 24 December during three consecutive years: 2008–2010, with the full closure reinstated in March 2011. In July 2012, commercial set netting was prohibited from Pariokariwa Point to Hawera and offshore to 2 nautical miles. Between 2 and 7 nautical miles commercial set netting was prohibited unless there was an observer on board the vessel. On 26 December 2013, the Minister of Conservation, implemented a prohibition under the West Coast Marine Mammal Sanctuary from Pariokariwa Point to the Waiwhakaiho River offshore to a distance of 7 nautical miles. On 1 October 2020, commercial and recreational set netting was prohibited under the fisheries regulations from the Waiwhakaiho River to Hawera to 7 nautical miles offshore, and south of Hawera to Palmer Head to 4 nautical miles offshore.

The reduction in catch in SCH 4 starting in 2021–22 has been attributed to a change in fleet, with 28-40 m bottom longline vessels moving out of this fishery, although reports suggest they returned to this fishery in 2024–25.

Table 3: Reported landings (t) of school shark by Fishstock from 1931–32 to present and actual TACCs (t) from 1986–87 to present. QMS data from 1986 to present. [Continued on next two pages]

Fishstock	SCH 1		SCH 2		SCH 3		SCH 4		SCH 5	
FMA (s)	1 &		2		3		4		5	
	Land	TACC	Land	TACC	Land	TACC	Land	TACC	Land	TACC
1931–32	0	–	0	–	0	–	0	–	0	–
1932–33	0	–	0	–	0	–	0	–	0	–
1933–34	0	–	0	–	0	–	0	–	0	–
1934–35	0	–	0	–	0	–	0	–	0	–
1935–36	0	–	0	–	0	–	0	–	0	–
1936–37	0	–	0	–	0	–	0	–	0	–
1937–38	0	–	0	–	0	–	0	–	0	–
1938–39	0	–	0	–	0	–	0	–	0	–
1939–40	0	–	0	–	0	–	0	–	0	–
1940–41	0	–	0	–	0	–	0	–	0	–
1941–42	0	–	0	–	0	–	0	–	0	–
1942–43	0	–	0	–	0	–	0	–	0	–
1943–44	0	–	0	–	0	–	0	–	0	–
1944–45	0	–	0	–	0	–	0	–	0	–
1945–46	53	–	2	–	0	–	0	–	0	–
1946–47	73	–	3	–	7	–	0	–	3	–
1947–48	40	–	2	–	0	–	0	–	0	–
1948–49	48	–	3	–	0	–	0	–	0	–
1949–50	92	–	4	–	1	–	0	–	0	–
1950–51	105	–	6	–	1	–	0	–	0	–
1951–52	131	–	5	–	4	–	0	–	0	–
1952–53	144	–	7	–	5	–	0	–	0	–
1953–54	108	–	4	–	10	–	0	–	0	–
1954–55	121	–	10	–	8	–	0	–	0	–
1955–56	124	–	12	–	8	–	0	–	0	–
1956–57	92	–	19	–	5	–	0	–	0	–
1957–58	197	–	28	–	11	–	0	–	0	–
1958–59	211	–	24	–	17	–	0	–	1	–
1959–60	203	–	21	–	18	–	0	–	1	–
1960–61	219	–	19	–	23	–	0	–	1	–
1961–62	268	–	21	–	25	–	1	–	4	–
1962–63	252	–	23	–	29	–	0	–	2	–
1963–64	249	–	42	–	23	–	1	–	3	–
1964–65	186	–	51	–	30	–	1	–	1	–
1965–66	229	–	36	–	37	–	0	–	1	–
1966–67	189	–	31	–	36	–	0	–	1	–
1967–68	211	–	56	–	33	–	0	–	2	–
1968–69	195	–	57	–	41	–	0	–	4	–
1969–70	179	–	46	–	110	–	0	–	7	–
1970–71	157	–	82	–	99	–	0	–	13	–
1971–72	163	–	112	–	109	–	0	–	6	–
1972–73	136	–	59	–	30	–	0	–	3	–
1973–74	103	–	73	–	52	–	0	–	9	–
1974–75	120	–	75	–	98	–	0	–	18	–
1975–76	121	–	64	–	62	–	1	–	29	–
1976–77	389	–	88	–	54	–	0	–	70	–
1977–78	508	–	99	–	68	–	0	–	118	–
1978–79	52	–	28	–	13	–	0	–	6	–
1979–80	197	–	53	–	89	–	0	–	42	–
1980–81	690	–	127	–	295	–	2	–	229	–
1981–82	686	–	199	–	461	–	0	–	497	–
1982–83	598	–	245	–	544	–	1	–	264	–
1983–84*	1 087	–	298	–	630	–	8	–	792	–
1984–85*	861	–	237	–	505	–	12	–	995	–
1985–86*	787	–	214	–	370	–	23	–	647	–
1986–87	416	560	123	162	283	270	19	120	382	610
1987–88	528	668	123	199	320	322	22	239	531	694
1988–89	477	668	136	199	220	322	26	239	501	694
1989–90	585	668	156	199	272	322	27	239	460	694
1990–91	554	668	139	199	227	322	20	239	480	694
1991–92	596	668	161	199	255	322	34	239	622	694
1992–93	819	668	202	199	216	322	38	239	594	694
1993–94	657	668	157	199	202	322	41	239	624	694
1994–95	640	668	161	199	238	322	86	239	656	694
1995–96	802	668	214	199	296	322	229	239	714	694
1996–97	791	668	228	199	290	322	179	239	662	694
1997–98	764	668	214	199	270	322	126	239	623	694
1998–99	784	668	275	199	335	322	106	239	714	694
1999–00	820	668	250	199	343	322	97	239	706	694
2000–01	799	668	178	199	364	322	100	239	724	694
2001–02	694	668	208	199	324	322	93	239	676	708
2002–03	689	668	225	199	410	322	130	239	746	708
2003–04	758	668	187	199	323	322	149	239	729	708
2004–05	695	668	201	199	424	387	206	239	743	743
2005–06	634	668	175	199	325	387	183	239	712	743
2006–07	661	668	200	199	376	387	88	239	738	743
2007–08	708	689	227	199	345	387	133	239	781	743
2008–09	713	689	232	199	364	387	145	239	741	743

Table 3 [Continued]:

Fishstock	SCH 1		SCH 2		SCH 3		SCH 4		SCH 5	
FMA (s)	1 & 9		2		3		4		5 & 6	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
2009–10	589	689	213	199	426	387	191	239	784	743
2010–11	777	689	187	199	366	387	174	239	701	743
2011–12	689	689	188	199	351	387	201	239	729	743
2012–13	602	689	200	199	320	387	127	239	748	743
2013–14	659	689	183	199	363	387	126	239	725	743
2014–15	595	689	157	199	362	387	218	239	646	743
2015–16	497	689	152	199	434	387	206	239	623	743
2016–17	530	689	138	199	339	387	238	239	696	743
2017–18	633	689	165	199	357	387	180	239	710	743
2018–19	557	689	168	199	389	387	202	238	608	743
2019–20	537	689	131	199	375	387	168	239	656	743
2020–21	518	689	156	199	324	387	187	239	806	743
2021–22	491	689	171	199	299	387	61	239	542	520
2022–23	586	689	214	199	364	387	57	239	554	520
2023–24	450	689	207	199	406	387	64	239	596	520

Fishstock	SCH 7		SCH 8		SCH 10			Total
FMA (s)	7		8		10			
	Landings	TACC	Landings	TACC	Landings	TACC	Landings§	TACC
1931–32	0	–	0	–	–	–	0	–
1932–33	0	–	0	–	–	–	0	–
1933–34	0	–	0	–	–	–	0	–
1934–35	0	–	0	–	–	–	0	–
1935–36	0	–	0	–	–	–	0	–
1936–37	0	–	0	–	–	–	0	–
1937–38	0	–	0	–	–	–	0	–
1938–39	0	–	0	–	–	–	0	–
1939–40	0	–	0	–	–	–	0	–
1940–41	0	–	0	–	–	–	0	–
1941–42	0	–	0	–	–	–	0	–
1942–43	0	–	0	–	–	–	0	–
1943–44	0	–	0	–	–	–	0	–
1944–45	0	–	0	–	–	–	0	–
1945–46	8	–	3	–	–	–	66	–
1946–47	16	–	3	–	–	–	105	–
1947–48	13	–	3	–	–	–	58	–
1948–49	18	–	5	–	–	–	74	–
1949–50	24	–	4	–	–	–	125	–
1950–51	29	–	6	–	–	–	147	–
1951–52	14	–	4	–	–	–	158	–
1952–53	17	–	5	–	–	–	178	–
1953–54	16	–	4	–	–	–	142	–
1954–55	36	–	10	–	–	–	185	–
1955–56	26	–	10	–	–	–	180	–
1956–57	34	–	14	–	–	–	164	–
1957–58	42	–	23	–	–	–	301	–
1958–59	41	–	29	–	–	–	323	–
1959–60	32	–	29	–	–	–	304	–
1960–61	24	–	21	–	–	–	307	–
1961–62	26	–	15	–	–	–	360	–
1962–63	21	–	26	–	–	–	353	–
1963–64	29	–	34	–	–	–	381	–
1964–65	31	–	41	–	–	–	341	–
1965–66	26	–	30	–	–	–	359	–
1966–67	25	–	22	–	–	–	304	–
1967–68	51	–	23	–	–	–	376	–
1968–69	35	–	26	–	–	–	358	–
1969–70	28	–	20	–	–	–	390	–
1970–71	69	–	30	–	–	–	450	–
1971–72	159	–	48	–	–	–	597	–
1972–73	77	–	30	–	–	–	335	–
1973–74	75	–	42	–	–	–	354	–
1974–75	144	–	94	–	–	–	549	–
1975–76	153	–	90	–	–	–	520	–
1976–77	220	–	102	–	–	–	923	–
1977–78	280	–	164	–	–	–	1 237	–
1978–79	22	–	44	–	–	–	165	–
1979–80	94	–	44	–	–	–	519	–
1980–81	350	–	106	–	–	–	1 799	–
1981–82	480	–	393	–	–	–	2 716	–
1982–83	947	–	367	–	–	–	2 966	–
1983–84*	1 039	–	694	–	0	–	4 776	–
1984–85*	1 030	–	698	–	0	–	4 501	–
1985–86*	851	–	652	–	0	–	3 717	–
1986–87	454	470	224	310	0	10	1 902	2 513
1987–88	516	534	374	441	0	10	2 413	3 106
1988–89	540	534	419	441	0	10	2 319	3 106
1989–90	516	534	371	441	0	10	2 387	3 106

Table 3 [Continued]:

Fishstock	SCH 7		SCH 8		SCH 10			Total
FMA (s)		7		8		10		
	Landings	TACC	Landings	TACC	Landings	TACC	Landings§	TACC
1990–91	420	534	369	441	0	10	2 209	3 106
1991–92	431	534	409	441	0	10	2 508	3 106
1992–93	482	534	484	441	0	10	2 835	3 106
1993–94	473	534	451	441	0	10	2 605	3 106
1994–95	369	534	417	441	0	10	2 567	3 106
1995–96	636	534	521	441	0	10	3 412	3 106
1996–97	543	534	459	441	0	10	3 152	3 106
1997–98	473	534	446	441	0	10	2 917	3 106
1998–99	682	534	533	441	0	10	3 429	3 106
1999–00	639	534	469	441	0	10	3 324	3 106
2000–01	576	534	453	441	0	10	3 193	3 106
2001–02	501	534	449	441	0	10	2 946	3 120
2002–03	512	534	448	441	0	10	3 161	3 120
2003–04	574	534	405	441	0	10	3 126	3 120
2004–05	546	641	554	529	0	10	3 369	3 416
2005–06	569	641	503	529	0	10	3 100	3 416
2006–07	583	641	534	529	0	10	3 180	3 416
2007–08	606	641	497	529	0	10	3 297	3 436
2008–09	694	641	588	529	0	10	3 478	3 436
2009–10	606	641	460	529	0	10	3 269	3 436
2010–11	677	641	587	529	0	10	3 469	3 436
2011–12	612	641	506	529	0	10	3 276	3 436
2012–13	656	641	512	529	0	10	3 165	3 436
2013–14	620	641	459	529	0	10	3 135	3 436
2014–15	610	641	523	529	0	10	3 110	3 436
2015–16	552	641	458	529	0	10	2 920	3 436
2016–17	559	641	352	529	0	10	2 852	3 436
2017–18	596	641	373	529	0	10	3 014	3 436
2018–19	534	641	277	529	0	10	2 734	3 436
2019–20	510	641	236	529	0	10	2 613	3 436
2020–21	622	641	217	529	0	10	2 830	3 436
2021–22	583	641	260	529	0	10	2 407	3 213
2022–23	601	641	273	529	0	10	2 650	3 213
2023–24	520	641	215	529	0	10	2 459	3 213

* FSU data.
§ Includes landings from unknown areas before 1986–87.
Note: Data from 1931 to 1982 are based on reported landings by harbour and are likely to be underestimated as a result of under-reporting and discarding practices. Data include both foreign and domestic landings. Data were aggregated to FMA using methods and assumptions described by Francis & Paul (2013).

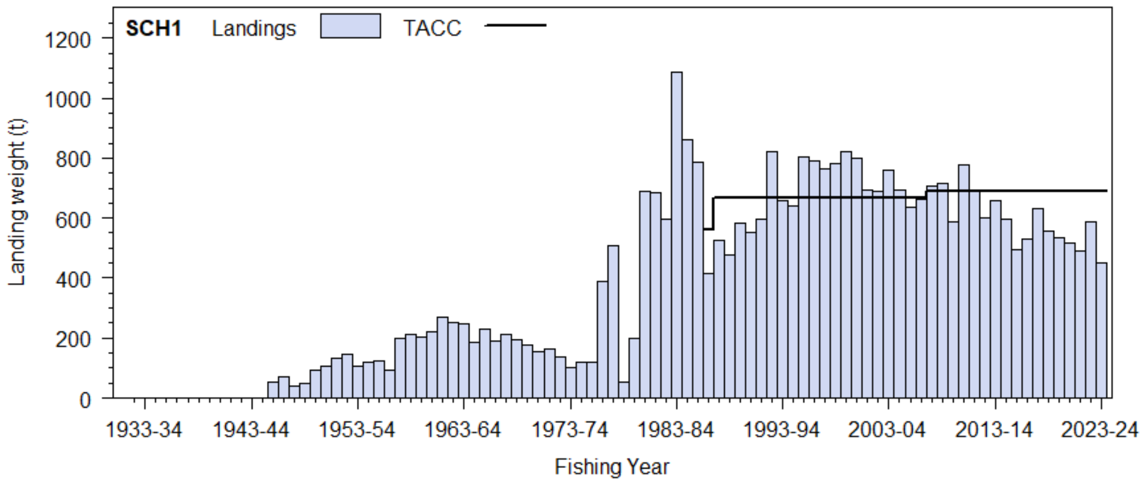


Figure 1: Reported commercial landings and TACC for the seven main SCH stocks. SCH 1 (Auckland East).
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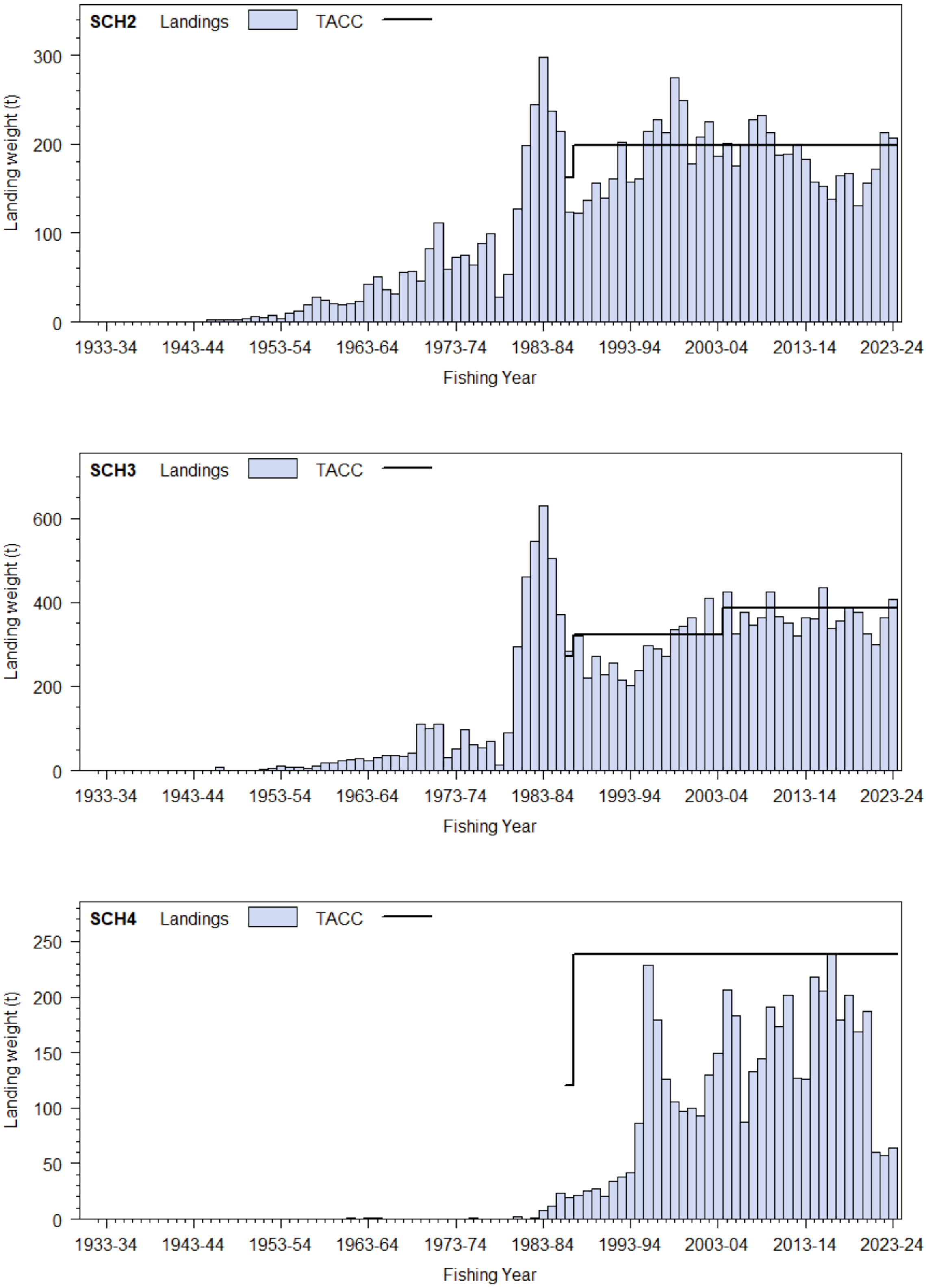


Figure 1 [Continued]: Reported commercial landings and TACC for the seven main SCH stocks. Above: SCH 2 (Central East), SCH 3 (South East coast) and SCH 4 (South East Chatham Rise). [Continued on next page]

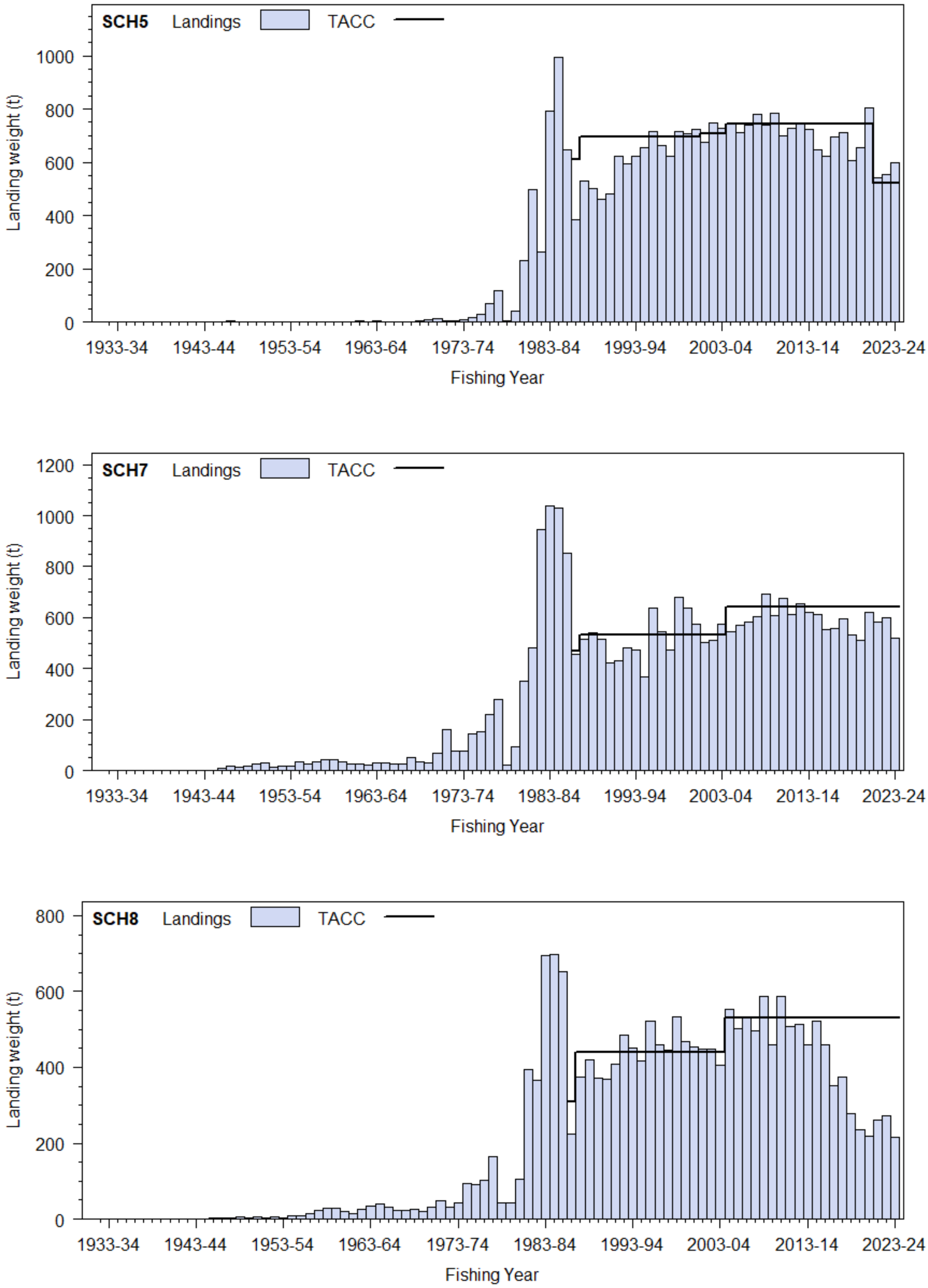


Figure 1 [Continued]: Reported commercial landings and TACC for the seven main SCH stocks. From top to bottom: SCH 5 (Southland), SCH 7 (Challenger), and SCH 8 (Central Egmont).

1.2 Recreational fisheries

Although school shark is a listed gamefish and is regularly caught by recreational fishers, it is not considered to be a particularly desirable target species.

1.2.1 Management controls

The main method used to manage recreational harvests of school shark is daily bag limits. Fishers can take up to 20 school sharks as part of their combined daily bag limit in the Auckland and Kermadec, Central, and Challenger Fishery Management Areas. Fishers can take up to 5 school sharks as part of their combined daily bag limit in the Southland and South-East Fishery Management Areas.

1.2.2 Estimates of recreational harvest

There are two broad approaches to estimating recreational fisheries harvest: the use of onsite or access point methods where fishers are surveyed or counted at the point of fishing or access to their fishing activity; and, offsite methods where some form of post-event interview and/or diary is used to collect data from fishers.

The first estimates of recreational harvest for school shark were calculated using an offsite approach, the offsite regional telephone and diary survey approach. Estimates for 1996 came from a national telephone and diary survey (Bradford 1998). Another national telephone and diary survey was carried out in 2000 (Boyd & Reilly 2002). These estimates are no longer considered to be reliable by the Marine Amateur Fishing Working Group (MAFWG), because the method was prone to 'soft refusal' bias during recruitment of potential participants and overstated catches during reporting (Wright et al 2004). The recreational harvest estimates provided by the 2000 and 2001 telephone-diary surveys were also thought to be implausibly high for many species by the MAFWG.

In response to the cost and scale challenges associated with onsite methods, in particular the difficulties in sampling other than trailer boat fisheries, offsite approaches to estimating recreational fisheries harvest have been revisited. This led to the development and implementation of a national panel survey for the 2011–12 fishing year (Wynne-Jones et al 2014). The panel survey used face-to-face interviews of a random sample of New Zealand households to recruit a panel of fishers and non-fishers for a full year. The panel members were contacted regularly about their fishing activities and catch information collected in standardised phone interviews. The national panel survey was repeated during the 2017–18 and 2022–23 fishing years using very similar methods to produce directly comparable results (Wynne-Jones et al 2019; Heinemann & Gray 2024). Recreational catch estimates from the three national panel surveys are given in Table 4. Note that national panel survey estimates do not include recreational harvest taken on charter vessel trips or under s111 general approvals.

Table 4: Recreational harvest estimates for school shark stocks. The telephone/diary surveys ran from December to November and are denoted by the January calendar year. National panel surveys ran throughout the October to September fishing year and are denoted by the January calendar year.

Stock	Year	Method	Number of fish	Total weight (t)	CV
SCH 1	2012	Panel survey	9 684	–	0.25
	2018	Panel survey	1 076	–	0.56
	2023	Panel survey	3 406	–	0.54
SCH 2	2012	Panel survey	2 739	–	0.54
	2018	Panel survey	1 641	–	0.87
	2023	Panel survey	526		1.01
SCH 3	2012	Panel survey	4247	–	0.39
	2018	Panel survey	563	–	0.47
	2023	Panel survey	252	–	0.73
SCH 5	2012	Panel survey	443	–	0.60
	2018	Panel survey	349	–	1.00
	2023	Panel survey	80	–	0.88
SCH 7	2012	Panel survey	9 996	–	0.35
	2018	Panel survey	1 812	–	0.33
	2023	Panel survey	1 884	–	0.37
SCH 8	2012	Panel survey	1 805	–	0.33
	2018	Panel survey	751	–	0.42
	2023	Panel survey	281	–	0.59

1.3 Customary non-commercial fisheries
Māori fishers made extensive use of school shark in pre-European times for food, oil, and skin. There is no quantitative information on the current level of customary non-commercial take.

1.4 Illegal catch
There is no quantifiable information on the level of illegal catch. There is an unknown amount of unreported offshore trawl and pelagic longline catch of school shark, either landed (under another name, or in 'mixed') or discarded.

1.5 Other sources of mortality
There is an unknown discarded bycatch of juvenile, mainly first-year, school shark taken in harbour and bay setnets. Quantitative information is not available on the level of other sources of mortality.

2. BIOLOGY

School sharks are distributed across the shelf, generally being inshore in summer and offshore in winter. Their depth use in New Zealand extends from surface waters to deeper waters on the upper continental slope, to at least 600 m (Burton 2025a). The capture of school sharks by tuna longliners shows that their distribution extends well offshore, up to 180 nautical miles off the South Island, and 400 nautical miles off northern New Zealand towards the Kermadec Islands. They feed predominantly on small fish and cephalopods (octopus and squid).

Growth rates have been estimated for New Zealand fish (Francis & Mulligan 1998)., Similar to the Australian and South American school shark populations, New Zealand school sharks are slow growing and likely long-lived (Francis & Mulligan 1998, Grant et al 1979, Moulton et al 1992, Olsen 1984, Peres & Vooren 1991). They are difficult to age by conventional methods, but up to 45 vertebral rings can be counted. Growth is fastest for the first few years, slows appreciably between 5 and 15 years, and is negligible at older ages, particularly after 20. Results from an Australian long-term tag recovery suggest a maximum age of at least 50 years. Attainment of maturity in New Zealand has been estimated to be 1280 mm TL or 13.0 years for males and 1375 mm TL or 14.2 years for females (Burton 2025b).

Breeding is not annual; it has generally been assumed to be triennial or a 3-year cycle based on Brazilian and Australian studies (Peres & Vooren 1991, Walker 2005). Fecundity (pup number) increases from 5–10 in small females to over 40 in the largest females. Mating is believed to occur in deep water, probably in winter. Release of pups occurs during spring and early summer (November–January), apparently earlier in the north of the country than in the south. Nursery grounds include harbours, shallow bays, and sheltered coasts. The pups remain in the shallow nursery grounds during their first one or two years and subsequently disperse across the shelf. Several pupping and nursery areas have been identified but the relative importance of each is unknown.

Biological parameters relevant to stock assessment are shown in Table 5.

Table 5: Estimates of biological parameters for school shark.

		Estimate			Source
1. Trait conversion: $y = \exp(\alpha + \beta . \log(x))$					
			Both sexes combined		
			α	β	
y= Total length, natural, straight line (mm)	x= Fork length, straight line (mm)		0.1930	0.992	Burton 2025c
y=Fork length, straight line (mm)	x=Total length, natural, straight line (mm)		-0.190	1.019	Burton 2025c
y=Total body weight (g)	x= Total length, natural, straight line (mm)		-12.95	3.10	Burton (unpub.)
2. Estimate of M for Australia					
		0.1			Grant et al (1979), Olsen (1984)

The combination of late maturity, slow growth, and low fecundity gives a relatively low overall productivity. In Australia, M has been estimated as 0.1.

New Zealand tagging studies have shown that school shark may move considerable distances, including trans-Tasman migrations (see below).

3. STOCKS AND AREAS

Information relevant to determining school shark stock structure in New Zealand was reviewed in 2009 (Smith 2009, Blackwell & Francis 2010, Francis 2010). Primarily based on the tagging evidence, there is probably a single biological stock in the New Zealand EEZ. Genetic, biological, fishery, and tagging data were all considered, but the evidence for the existence of distinct biological stocks is poor. An apparent lack of juvenile school shark nursery areas in SCH 4 and SCH 5 suggests that these Fishstocks are not distinct, but are instead maintained by recruitment from other QMAs.

Spatial-temporal analysis of length data indicated that the size of school shark in the catch at any location was a function of the fishing method, year, sex and season, with setnets catching slightly bigger school shark than bottom longline or bottom trawl. Bigger animals were expected on the Chatham Rise, the north east of the North Island and the south of the South Island. The distribution of different size categories in different parts of New Zealand supports the hypothesis of a single biological stock in the New Zealand EEZ (Mormede & Dunn, in prep).

The most useful sources of information on stock structure are tagging studies that examined school shark movements via satellite telemetry and mark recapture data (Burton 2025a, Francis 2010, Hurst et al 1999). Much of this data became available after the 2009 review. Eleven large female school sharks tagged with satellite tags in the Kaipara Harbour were able to migrate between locations that are widely dispersed within and beyond the latitudinal extent of mainland New Zealand (Burton 2025a). Additionally, satellite tagged females predominantly resided in three locations (Tutamoe, North Taranaki Bight, and Outer Cook Strait, see Burton 2025a for details) that were also frequented by immature and mature school sharks from around New Zealand, as well as a small number of individuals from Australia, that were tagged with dart or loop tags.

Examination of mark recapture movements of school sharks from 1985–1997 (Hurst et al 1999) suggested that female school sharks were slightly more mobile than males, with higher proportions of the former moving to non-adjacent QMAs and to Australia. About 30% of school shark recaptures were reported from outside the release QMA within a year of release, and this was maintained in the second year after release. After 2–5 years at liberty about 60% of recaptured school sharks (both sexes) were reported from outside the release QMA. Recent analysis of data from New Zealand and Australian mark recapture databases revealed that 7.2% of 360 reported recaptures (1985–2024) of school shark tagged in New Zealand came from Australia (Burton 2025a), and 4.2% of 453 reported recaptures (1947–2008) of school shark tagged in Australia came from New Zealand. When reviewing these results it is important to note that exploitation rates have been considerably higher in Australia, than in New Zealand, which results in higher probability of capture for schook shark migrating from New Zealand to Australia, than vice versa.

Thomson et al (2020) estimated the absolute stock size of Australian school shark using close kin mark recapture and found that the adult abundance of their school shark populations was much lower than previously suggested by stock assessment models. They also considered movement to and from New Zealand, but stated “it is clear from the relatively small absolute abundance found in this study that the correspondingly large New Zealand school shark population has not formed part of this abundance estimate, indicating that migration rates are low.” Appendix D of that document concludes that “the small population size indicates that mixing with the New Zealand school shark stock can be discounted”.

In addition to the limited school shark migrations between Australia and New Zealand, there is also some genetic connectivity between Australian and New Zealand school sharks (Devloo-Delva et al

2019; Hernández et al 2015). However, the Australian stock is still depleted following its collapse while the New Zealand stock remains largely stable and is listed as “Least Concern” when assessed using IUCN Red List Categories and Criteria (Finucci et al 2019, Mormede & Dunn, in prep, Woodhams et al 2023). The differences in stock status and the results of tagging studies suggest that exchange between Australian and New Zealand populations is limited.

The current stock management units are a precautionary measure to spread fishing effort; amalgamation of all QMAs into one QMA for the whole EEZ could create local depletion or sustainability risks for sub-stock components.

4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

Previous standardised CPUE series were developed for five fisheries and the three main fishing methods: set net, bottom longline and bottom trawl separately, resulting in 15 CPUE indices. Some of those indices were in agreement with each other, such as in the far north. However, in some other areas such as SCH 2/3N the indices were in conflict with each other and a trend could not be resolved, resulting in no advice for those areas (Tremblay-Boyer 2021).

The school shark fishery characterisation and CPUE standardisation was updated in 2025. As part of this project, a spatial-temporal CPUE standardisation was carried out for the entire school shark stock, using data from all three main fishing methods within a single modelling framework, with a catchability term for each combination of fishing method and target species. The rationale for a single standardisation using all methods was that the New Zealand EEZ represented a single school shark biological stock and that differences in sizes caught by method were reflective of the location of fishing rather than the methods selecting different parts of the population (when fishing in the same area). The analysis resulted in a single stock-based CPUE trend, as well as the ability to extract CPUE by QMA or fishery, and calculate the relative expected selected biomass by QMA / fishery / region.

4.2 Characteriation

Overall characterisation

Set net was historically the most important fishing method for school shark, representing about 60% of landings in the early 1990s, but has been dropping to under 40% by 2024. In contrast, the proportion of school shark landings by bottom longline and bottom trawl has been increasing to about 30% each in 2024. The landings of school shark caught using modular harvesting system (MHS) bottom fishing has been increasing since 2016, to about 8% of total landings, of which 91% was reported from SCH 1, the majority of those targeting tarakihi.

The majority of the school shark catch has come from target set net and bottom longline fishing. Other target fisheries which have caught school shark were mainly rig for set net; and hāpuku, ling or snapper for bottom longline. On the other hand, school shark were caught by bottom trawl targeting a multitude of species depending on location, including in order of decreasing total catch: tarakihi, gurnard, barracouta, school shark, stargazer and trevally. School shark were typically in the top three recorded species for set net and bottom longline, but were highly variable for bottom trawl. School shark catches do not seem to be preferentially in harbours.

Catches of school shark have been highly seasonal for set nets in SCH 3, 5, 7 and 8, with most catches occurring in the summer season when school shark are expected to be closer inshore. These trends were not as clear for bottom longline and not present in bottom trawl where a low proportion of the effort target school shark.

The spatial coverage of school shark catch and effort was different for the three fishing methods. When approximating space with 32 km × 32 km cells, bottom longline covered about 89% of the total catch and effort area covered by all three methods during 2008–2024, bottom trawl 83% and set net 55%. On average, about 25% of the area was covered by set nets in any one year since 2008, 60% by bottom trawl and 50% by bottom longlines.

Statistics and trends in target species reported here refer to the 2019–20 to 2023–24 fishing years.

SCH 1
About 41% of the total SCH 1 catch was taken by bottom trawl, followed by 28% by bottom longline, 19% by MHS bottom fishing, and 11% by setnet. The use of modular harvesting systems has been increasing in this fishery since 2015.

The method / target combinations of most importance were bottom trawl targeting tarakihi (23% of total catches), bottom longline targeting snapper (11%), and MHS bottom fishing targeting tarakihi (11%). Bottom longline, setnet and bottom trawl targeting school shark were the next highest catches at 9, 8 and 6% respectively of total school shark catches in SCH 1. All other method and target combinations caught 5% or less school shark each in SCH 1.

SCH 2
About 41% of the total SCH 2 catch was taken by setnet, followed by 27% by bottom trawl, 20% by bottom longline, and 10% by dahn line.

The method / target combinations of most importance were setnet targeting school shark (23% of total catches), bottom trawl targeting tarakihi (20%), bottom longline targeting school shark (7%) setnet targeting rig (7%), and bottom longline targeting hāpuku (6%). All other method and target combinations caught 5% or less school shark each in SCH 2.

SCH 3
About 52% of the total SCH 3 catch was taken by setnet, followed by 28% by bottom trawl, and 17% by bottom longline.

The method / target combinations of most importance were setnet targeting school shark (24% of total catches) and rig (21%), and bottom longline targeting school shark (8%) and hāpuku (7%), and bottom trawl targeting barracouta (7%). All other method and target combinations caught 5% or less school shark each in SCH 3.

SCH 4
About 93% of the total SCH 4 catch was taken by bottom longline, and 6% by bottom trawl.

The method / target combinations of most importance were bottom longline targeting hāpuku (39% of total catches), school shark (28%), and ling (22%). All other method and target combinations caught 5% or less school shark each in SCH 4.

SCH 5
About 75% of the total SCH 5 catch was taken by setnet, followed by 13% by bottom trawl and 11% by bottom longline.

The method / target combinations of most importance were setnet targeting school shark (71% of total catches) and bottom trawl targeting squid (20%). All other method and target combinations caught 5% or less school shark each in SCH 5.

SCH 7
About 52% of the total SCH 7 catch was taken by bottom longline, followed by 43% by bottom trawl and 4% by setnet.

The method / target combinations of most importance were bottom longline targeting school shark (45% of total catches), and bottom trawl targeting tarakihi (10%), barracouta (8%) and gurnard (8%). All other method and target combinations caught 5% or less school shark each in SCH 7.

SCH 8

About 41% of the total SCH 8 catch was taken by setnet, followed by 31% by bottom longline, 23% by bottom trawl, and 3% by MHS bottom fishing.

The method / target combinations of most importance were setnet targeting school shark (36% of total catches), bottom longline targeting school shark (24%), bottom trawl targeting tarakihi (7%) and bottom trawl targeting school shark (6%). All other method and target combinations caught 5% or less school shark each in SCH 8.

4.3 Survey biomass estimates

The survey biomass estimates are provided in Table 6 and Figure 2.

Table 6: Relative total biomass indices (t) and coefficients of variation (CV) for school shark for the west coast North Island inshore trawl survey, the Tasman and Golden bays (TBGB) inshore trawl survey, the east coast South Island (ECSI) winter trawl survey, the west coast South Island (WCSI) autumn trawl survey, and the Chatham Rise trawl survey. Estimates are shown for the core strata only, as defined within each survey design. * denotes preliminary results.

Region	Year	Trip number	Core strata biomass estimate	CV (%)	Region	Year	Trip number	Core strata biomass estimate	CV (%)
WCNI	1989	KAH8918	138	28	WCSI	1992	KAH9204	878	23
(spring)	1991	KAH9111	1 108	40	(autumn)	1994	KAH9404	1 058	44
	1994	KAH9410	377	44		1995	KAH9504	945	42
	1996	KAH9615	326	28		1997	KAH9701	1 385	26
	1999	KAH9915	107	47		2000	KAH0004	668	15
	2018	KAH1806	109	47		2003	KAH0304	523	22
	2019	KAH1906	279	28		2005	KAH0503	677	15
	2020	KAH2005	33	55		2007	KAH0704	657	23
	2022	KAH2205	65	39		2009	KAH0904	885	18
						2011	KAH1104	895	14
TBGB	1992	KAH9204	56	26		2013	KAH1305	670	11
(autumn)	1994	KAH9404	93	32		2015	KAH1503	628	19
	1995	KAH9504	259	52		2017	KAH1703	848	16
	1997	KAH9701	47	41		2019	KAH1902	544	21
	2000	KAH0004	228	31		2021	KAH2103	590	19
	2003	KAH0304	131	17		2023	KAH2302	318	25
	2005	KAH0503	97	19		2025	KAH2502	*414	*33
	2007	KAH0704	159	36					
	2009	KAH0904	199	25	Chatham	1992	TAN9106	89	44
	2011	KAH1104	260	34	Rise	1993	TAN9212	175	37
	2013	KAH1305	242	34	(summer)	1994	TAN9401	198	41
	2015	KAH1503	160	43		1995	TAN9501	43	100
	2017	KAH1703	85	25		1996	TAN9601	389	37
	2019	KAH1902	176	44		1997	TAN9701	226	37
	2021	KAH2103	119	43		1998	TAN9801	159	44
	2023	KAH2302	36	33		1999	TAN9901	344	34
	2025	KAH2502	*52	*62		2000	TAN0001	923	36
						2001	TAN0101	258	34
ECSI	1991	KAH9105	100	30		2002	TAN0201	351	27
(winter)	1992	KAH9205	104	21		2003	TAN0301	121	43
	1993	KAH9306	369	42		2004	TAN0401	228	43
	1994	KAH9406	155	36		2005	TAN0501	778	28
	1996	KAH9606	202	18		2006	TAN0601	304	41
	2007	KAH0705	538	22		2007	TAN0701	442	29
	2008	KAH0806	411	20		2008	TAN0801	283	23
	2009	KAH0905	254	18		2009	TAN0901	281	34
	2012	KAH1207	292	20		2010	TAN1001	317	36
	2014	KAH1402	529	36		2011	TAN1101	325	63
	2016	KAH1605	369	21		2012	TAN1201	176	65
	2018	KAH1803	251	20		2013	TAN1301	531	48
	2021	KAH2104	276	26		2014	TAN1401	236	39
	2022	KAH2204	411	16		2016	TAN1601	529	31
	2024	KAH2402	274	14		2018	TAN1801	465	31
						2020	TAN2001	515	31
						2022	TAN2201	754	29
						2024	TAN2401	346	34

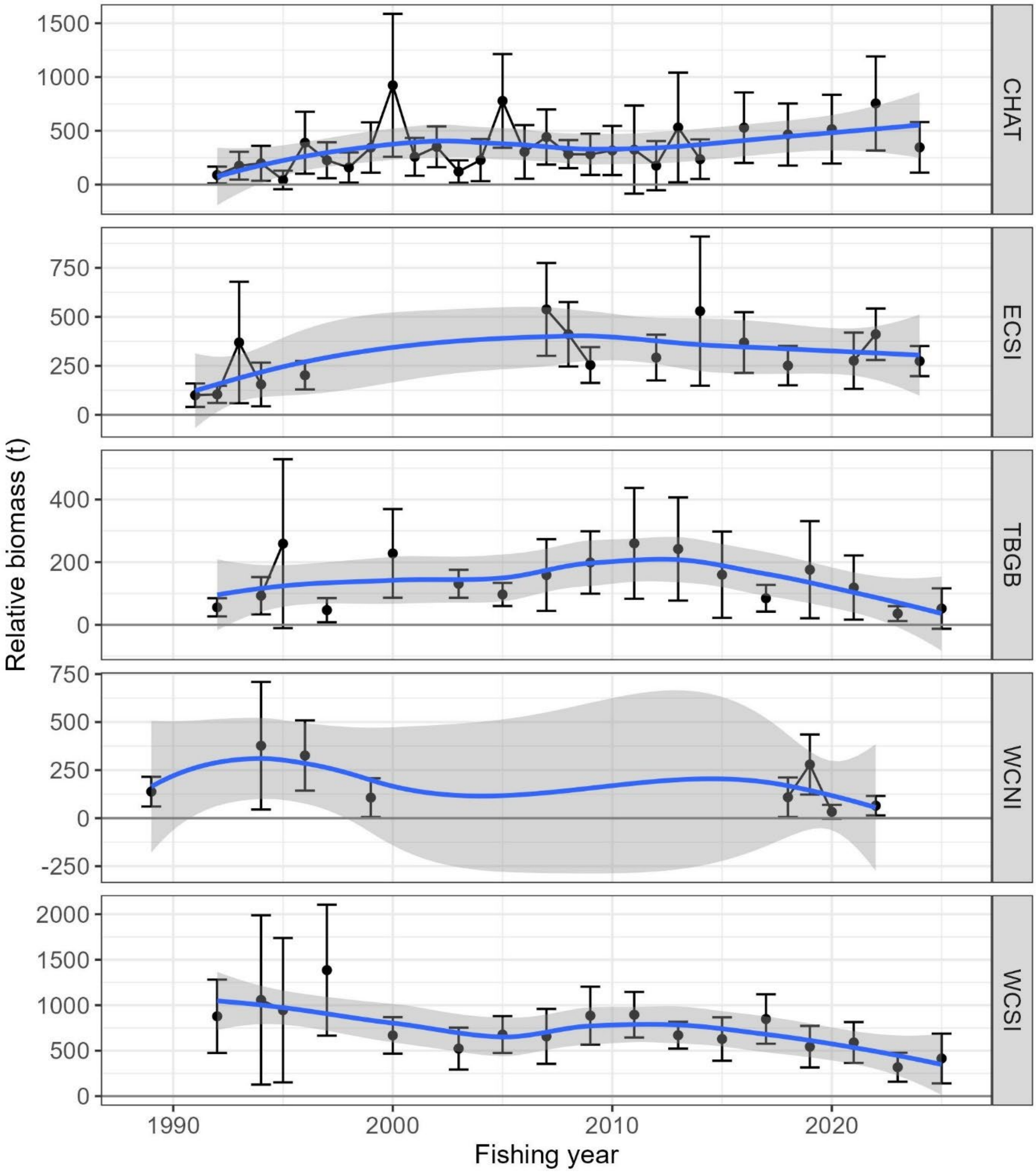


Figure 2: Survey biomass estimates of school shark for the Chatham Rise (CHAT), east coast South Island (ECSI), Tasman Bay Golden Bay (TBGB), west coast North Island (WCNI), and west coast South Island (WCSI), with +/- 2 CV as error bars, and smoother (blue line and grey 95% credible interval of loess smoother with 0.75 span). Note that the WCSI and TBGB 2025 values are preliminary and might change.

WCNI

The west coast North Island (WCNI) inshore trawl survey core area spans the area extending along the northern west coast of the North Island from Scott Point to Airedale Reef in the 10–200 m depth range. It is primarily aimed at estimating relative abundance and distribution for snapper, tarakihi, red gurnard, and John dory. There were five surveys between 1989 and 1999, and the series was recently resumed with surveys in 2018, 2019, 2020, and 2022. The series has been highly variable, limiting the ability to detect a trend. The last two surveys were the lowest of the series.

WCSI

The core west coast South Island (WCSI) inshore trawl survey covered depths of 20–400 m off the west coast of the South Island; and 20–70 m within Tasman Bay and Golden Bay inside a line drawn between Farewell Spit and Stephens Island.

Biomass fluctuated without trend until 2011, after which it began to decline. The 2023 estimated biomass of 354 t (including both WCSI and Tasman Bay/Golden Bay) was half of the previous estimate from 2021 (708 t) and was the lowest in the time series, well below the mean of 908 t. Throughout the time series, most of the biomass has come from the west coast, with only small contributions from Tasman Bay and Golden Bay, but biomass in both regions decreased in 2023.

ECSI

The east coast South Island (ECSI) winter trawl surveys from 1991 to 1996 in 30–400 m were replaced by summer trawl surveys (1996–97 to 2000–01) which also included the 10–30 m depth range, but these were discontinued after the fifth survey in the annual time series because of the extreme fluctuations in catchability between surveys (Francis et al 2001). The winter surveys were reinstated in 2007 and this time included additional 10–30 m strata in an attempt to index elephant fish and red gurnard which were included in the list of target species. Only the 2007, and 2012 surveys onward provide full coverage of the 10–30 m depth range.

Biomass in the core strata (30–400 m) for the ECSI surveys has been variable but was generally higher in years 2007 onward compared with the 1990s, but without a consistent trend. The additional biomass captured in the 10–30 m depth range accounted for only about 3% to 6% of the biomass in the core plus shallow strata (10–400 m) for the 2007, 2012, 2014, and 2016 surveys, and hence the shallow strata (10–30 m) are probably not essential for monitoring school shark biomass.

Chatham Rise

The main survey area for this survey includes strata spread over 200–800 m depths on the Chatham Rise. School sharks were only observed in the shallower strata. The estimated school shark biomass has been increasing over time.

4.4 CPUE standardisation

Spatially and temporally standardised CPUE series were developed for the entire school shark stock using Gaussian Markov random field models implemented using the VAST package (Thorson, 2019). The standardisation was carried out for the 2008–2024 period, which is when positional data were available in sufficient quantities for all capture methods. An investigation to identify suitable models was carried out using VAST (Mormede & Dunn, in prep). It included the following tests:

- including commercial, survey and observer data in a single model or not,
- including bottom trawl, set net and bottom longline in a single model or having one model per method,
- different data aggregation options, both in cell size and by day or month, and using mean or median to summarise the aggregated variables,
- which data distribution modelling approach was most suitable (standard delta modelling approach, Poisson-link delta distribution modelling approach, or Tweedie modelling approach),
- simplifying target as being school shark or not, or selecting a subset of target species by method (creating a method.target covariate), and
- the inclusion of covariates until less than 1% of additional deviance was explained (the covariates tested were vessel, method.target, season, speed, depth, turbidity).

The final accepted model was that using commercial data, aggregated by 32 km by 32 km cell and month (as well as vessel and target) with median positional data, using all three main fishing methods, and including the method.target variable as the only covariate. The standardised CPUE index showed a cyclical trend: a general increase from 2008 to 2010, decrease to 2016 and increase to 2023 (Figure 3). Patterns by QMA were generally similar (Figure 4). The indices were consistent with the previously accepted indices where available. The relative total vulnerable biomass of school shark across the New Zealand EEZ as attributed to each QMA are shown in Figure 5.

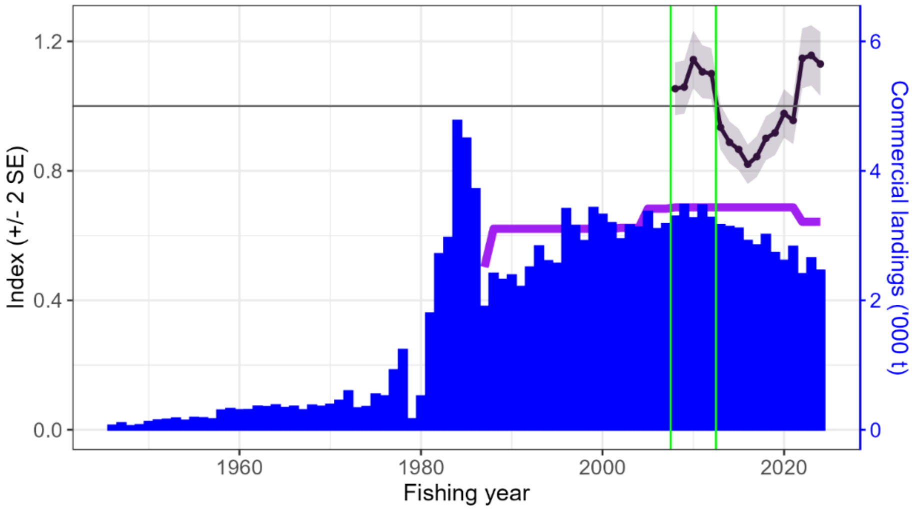


Figure 3: Standardised CPUE for the entire school shark stock (black line and dots) and 2 standard errors (grey area). Also total landings of school shark (blue bars) and TACC (purple line). The management target range (2008–2012) is depicted by the green vertical lines.

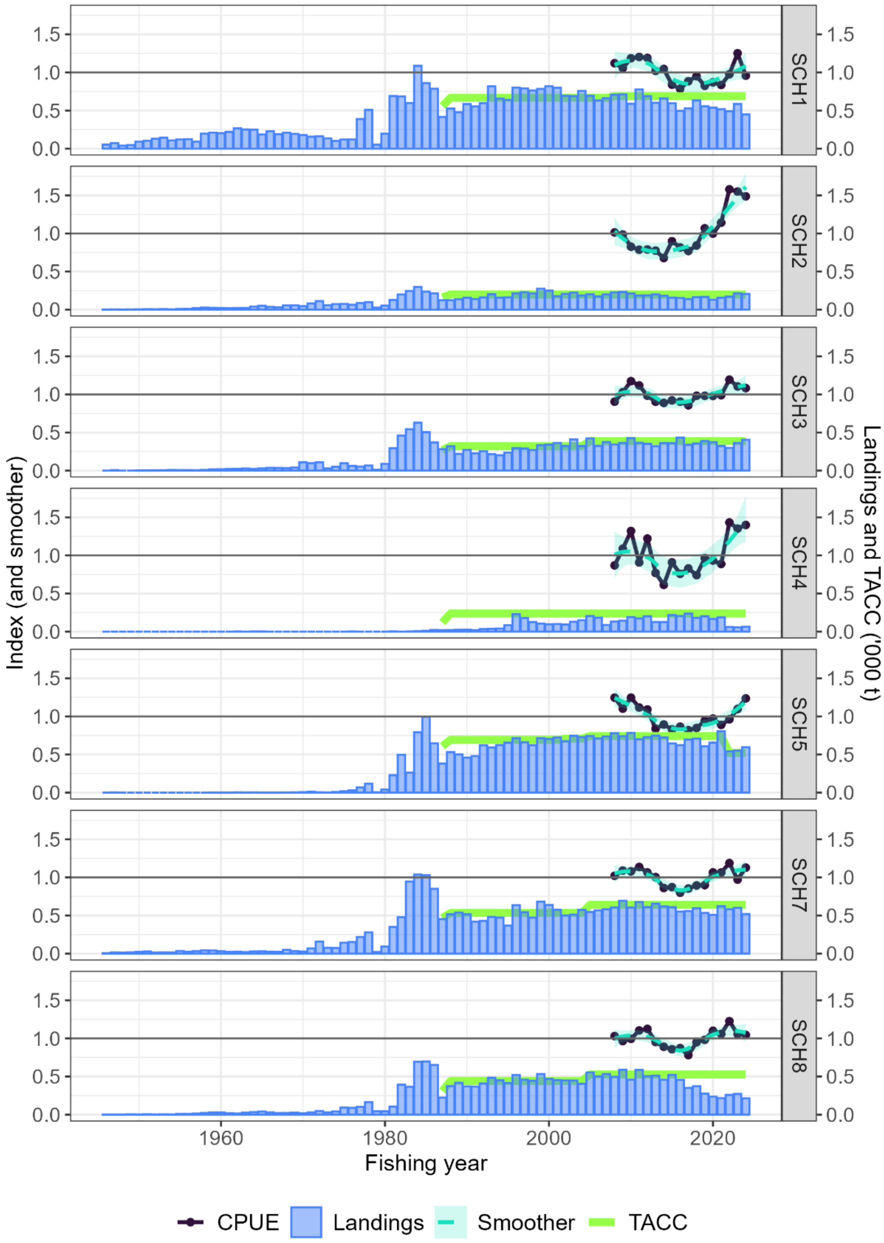


Figure 4: Standardised CPUE for the entire school shark stock, summarised by stock (black line and dots) and smoother (blue line and area). Also landings of school shark by QMA (blue bars) and TACC by QMA (green lines).

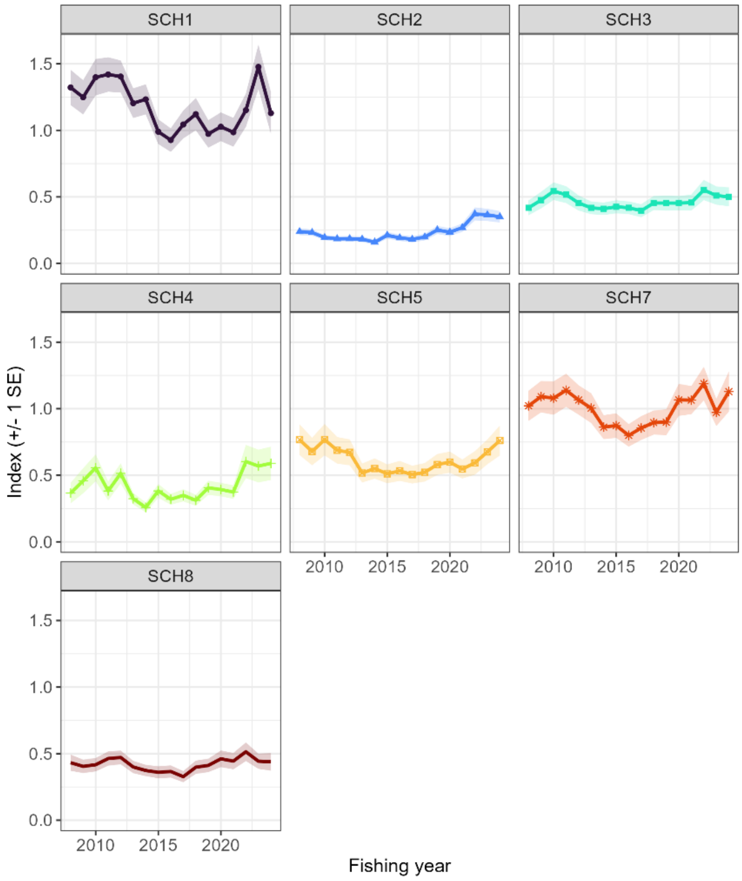


Figure 5: Relative total vulnerable biomass of school shark across the New Zealand EEZ as attributed to each QMA and year by the spatial-temporal model (lines and points) and associated standard error (shaded areas). The scale on the y-axis is identical in all plots and the lines reflect the relative biomass between QMAs.

The spatial-temporal modelling allows for an estimate of the proportion of the vulnerable biomass in each of the QMAs (or any other spatial definition required). Results indicate that the current catch split is similar to the expected distribution of vulnerable biomass between QMAs (Table 7, Figure 6).

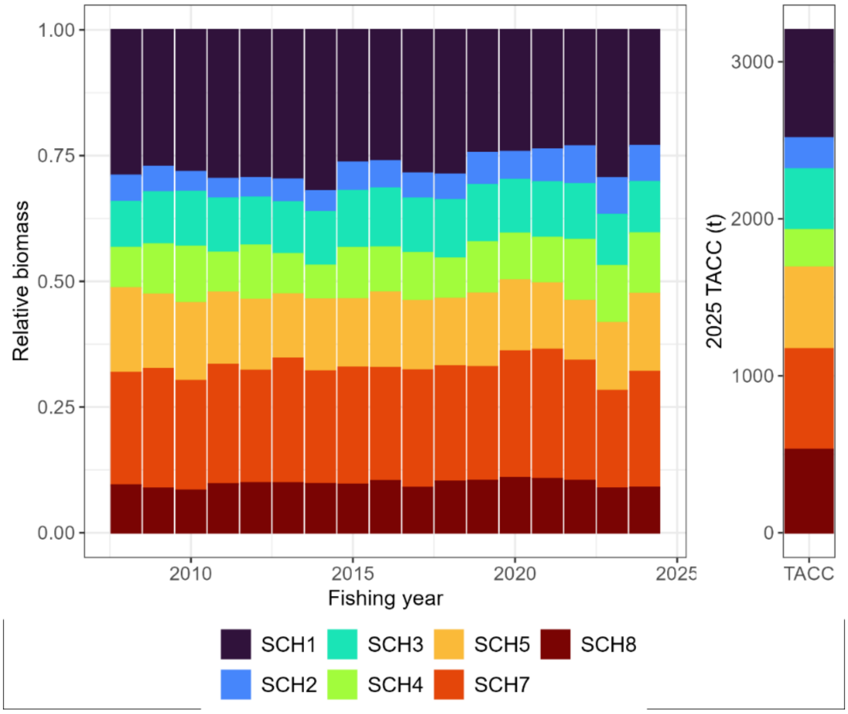


Figure 6: Proportion of the vulnerable biomass attributed to each QMA by year by the spatial-temporal model and proportion of the 2024 TACC in each QMA.

Table 7: Proportion of the vulnerable biomass attributed to each QMA by year by the spatial-temporal model and proportion of the 2024 TACC in each QMA. The model values are the mean over all years, and range of means over all years in brackets.

QMA	SCH 1	SCH 2	SCH 3	SCH 4	SCH 5	SCH 7	SCH 8
Model	27 (23–32)	5 (4–7)	11 (9–12)	10 (7–12)	14 (12–17)	23 (19–26)	10 (8–11)
TAC	22	6	12	7	16	20	17

Establishing interim B_{MSY}-compatible reference points

In 2025, the Working Group accepted the multi-method nationwide VAST series as an index of relative abundance for the New Zealand school shark stock. The mean CPUE for the period 2007–08 to 2011–12 was adopted as an interim B_{MSY}-compatible proxy for the entire school shark stock as this represents a period of high and stable catch and high and reasonably stable abundance (Figure 3). Since the national catch of school shark had been reasonably stable since the inception of the fishery – i.e. no historical high peak as evident for other species – the reference period was more likely to represent a target than a soft limit. The Working Group adopted the default Harvest Strategy Standard definitions for the Soft and Hard Limits of one half and one quarter the target, respectively.

4.5 Other factors

A number of risk assessments have been conducted for New Zealand chondrythians, however, the only quantitative assessment was undertaken by Edwards, 2025), which estimated recent exploitation rate to be 1–3%, depending on the assumptions for catchability for *Kaharoa* trawl surveys. These results are consistent with the results of the current stock assessment regarding overfishing.

4.6 Future research considerations

Spatio temporal modelling of abundance

- Investigate the statistical validity of using multiple fishing methods with different selectivities in a single spatial-temporal CPUE standardisation model using simulations. {relevant for multiple species}
- Explore other model structures and data sources for SCH including
  - QMA-scale spatio temporal models (as a sensitivity test of the assumptions of the nationwide model)
  - modelling of residual variance by method.target, following the approach presented in Grüss & Thorson (2019)
  - putting an autoregressive structure (ideally a first-order autoregressive structure) on spatio temporal variation to account for large changes in the spatial footprint of fishing methods from one year to another
  - QMA specific method.target terms
  - incorporating DHARMa residuals and other spatio temporal modelling advances
  - aggregating data with mean positional data
  - inclusion or exclusion of different data sets (e.g., survey series, SN data, non-target fisheries)
  - using smaller grid sizes (particularly for SN and BLL)
  - the potential of a statistical area resolution model starting in the 1990s
- Investigate the potential for bias in the indices if the spatial effect aliases for vessel effect in spatio temporal CPUE analysis.
  - Identify more rigorously the reasons why vessel ID is not influential in the spatial-temporal model
- Futher exploration of spatio temporal length and sex ratio data.
- Investigate the utility of ageing to determine the age structure in different areas.
- Seek out observer data from setnet vessels.
- Investigate appropriate methods for estimating exploitation rate thresholds for risk assessments.
- Collect more data on female maturity.
- Describe growth of school shark in New Zealand by including reliable estimates of age for older specimens, including investigating DNA methylation.

5. STATUS OF THE STOCKS

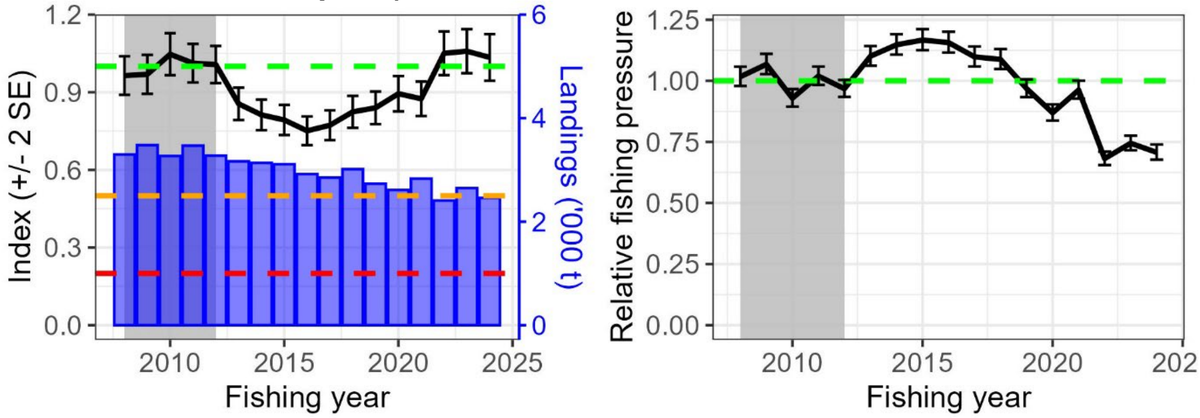
Stock Structure Assumptions

SCH are known from tagging studies to be highly mobile, moving between the North Island and South Island, and as far as Australia. From the tagging evidence, there is probably a single biological SCH stock in the New Zealand EEZ. Differences in average modal length and spatial-temporal length distributions indicate that movement between areas may be variable, with components of the stock aggregating in different areas based on size and season.

In the 2025 assessment, the entire New Zealand school shark stock was considered as a single unit, moving away from the previous analysis by fishery area.

Stock Status		
Most Recent Assessment Plenary Publication Year	2025	
Intrinsic Productivity Level	Low	
Catch in most recent year of assessment	Year: 2023–24	Catch: 2459 t
Assessment Runs Presented	Spatially and temporally standardised CPUE for the entire New Zealand stock using commercial set net, bottom longline and bottom trawl data	
Reference Points	Target: Interim B_{MSY}-compatible proxy based on the mean CPUE from 2007–08 to 2011–12 Soft Limit: 50% of target Hard Limit: 25% of target Overfishing threshold: Interim F_{MSY}-compatible proxy based on the mean relative exploitation rate for the period: 2007–08 to 2011–12	
Status in relation to Target	About as likely as Not (40–60%) to be at or above B_{MSY}	
Status in relation to Limits	Soft Limit: Very Unlikely (< 10%) to be below Hard Limit: Very Unlikely (< 10%) to be below	
Status in relation to Overfishing	Very Unlikely (< 10%) to be occurring	

Historical Stock Status Trajectory and Current Status



Left panel: Biomass index for the entire school shark stock as the spatially and temporally standardised CPUE using commercial data from setnet, bottom longline, and bottom trawl (black line and ± 2 standard error). Also shown is the trajectory of total landed SCH by all methods (blue bars). Horizontal lines represent the target (green dashed line), the soft limit (yellow dashed line), and hard limit (red dashed line). The reference period is shown in grey. Right panel: Annual relative exploitation rate for entire school shark stock from the spatially and temporally standardised CPUE series and ± 2 standard error. The interim F_{MSY}-compatible target is shown by the green dashed line and the reference period in grey.

Fishery and Stock Trends	
Recent Trend in Biomass or Proxy	Reduced to 2014–15 and increased thereafter
Recent Trend in Intensity or Proxy	Relative fishing intensity has been declining since 2014–15

Other Abundance Indices	SN, BLL and BT individual method spatially and temporally standardised CPUE, WCSI and ECSI trawl surveys: Individual CPUE series by method are generally consistent with the all methods CPUE series. Survey series are variable.
Trends in Other Relevant Indicators or Variables	A chondrichthyan risk assessment indicated that the exploitation rate for New Zealand school shark was consistent with the conclusion regarding overfishing.

Projections and Prognosis	
Stock Projections or Prognosis	Unknown
Probability of Current Catch or TACC causing Biomass to remain below or to decline below Limits	Soft Limit: Unlikely (< 40%) for current catch Hard Limit: Very Unlikely (< 10%) for current catch
Probability of Current Catch or TACC causing Overfishing to continue or to commence	Unlikely (< 40%) at current catch

Assessment Methodology		
Assessment Type	Level 2 - Partial Quantitative Stock Assessment	
Assessment Method	Standardised CPUE	
Assessment Dates	Latest assessment Plenary publication year: 2025	Next assessment: 2029
Overall assessment quality rank	1 – High Quality	
Main data inputs (rank)	- Catch and effort data	1 – High Quality
Data not used (rank)	- Observer data - Survey data	2 – Medium or Mixed Quality: insufficient observations 2 – Medium or Mixed Quality: only index parts of the stock
Changes to Model Structure and Assumptions	A spatial-temporal standardisation of the entire stock using setnet, bottom longline, and bottom trawl CPUE was used to index stock status.	

Major Sources of Uncertainty	- Shortness of the time series used, starting in 2008, compared to the length of time the fishery has been operating. - Sole reliance on commercial catch and effort data.

Qualifying Comments
The forced equivalency between the three capture methods within the same model warrants futher investigation.

Fishery Interactions
Between 2020 and 2024, • hāpuku (15% of school shark caught by bottom longlines), ling (14%), spiny dogfish (10%), and northern spiny dogfish (8%) were the only bycatch species of bottom longlines targeting school shark; • rig (16% of school shark landed by setnet), spiny dogfish (10%) and carpet shark (7%) were the only bycatch species of setnet; and • tarakihi (98% of school shark landed by bottom trawl), ghost shark (32%), snapper (30%), spiny dogfish (26%), barracouta (26%), rig (25%), rattail (21%), gurnard (20%), john dory (16%), gemfish (15%), stargazer (14%), smooth skate (11%), spotted gurnard (11%), carpet shark (10%), trevally (8%), silver dory (7%), red cod (6%), and porcupine fish (6%) were the main bycatch species of bottom trawl, each representing over 5% of the school shark catch.

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