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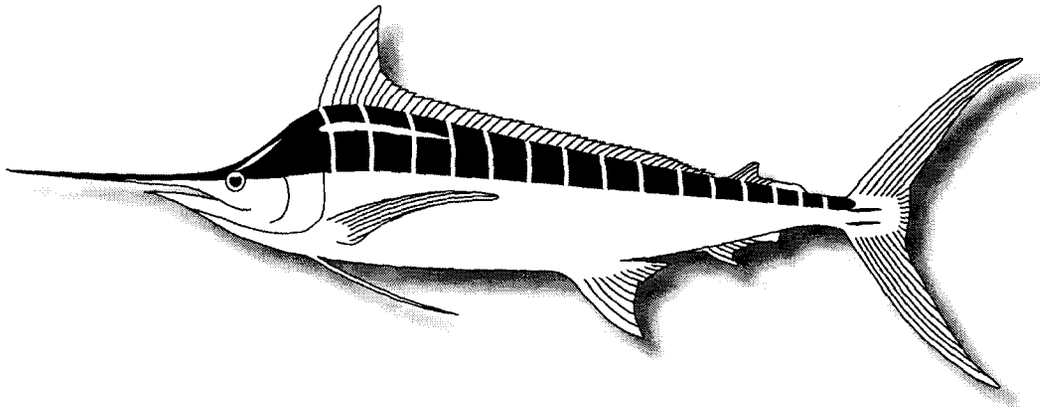
National Tuna Fishery Report 2000 – New Zealand



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Introduction

New Zealand tuna fisheries are based on stocks that occur largely outside of the 200 nautical mile Exclusive Economic Zone (EEZ). In New Zealand waters tuna represent important and valuable seasonal fisheries (currently worth around $NZ 20 million in 1997). No tuna species are included in the Quota Management System and only southern bluefin tuna (*Thunnus maccoyii*), managed by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), is subject to catch restrictions, with a competitive national catch limit of 420 tonnes. Other tuna species of commercial importance to New Zealand are albacore (*T. alalunga*), bigeye (*T. obesus*), skipjack (*Katsuwonus pelamis*) and yellowfin tuna (*T. albacares*). While billfish are also of commercial interest and comprise regular bycatch on tuna longlines, all billfish except swordfish (*Xiphias gladius*) must be released when caught. Swordfish may not be targeted but can be landed by domestic fishers. This species has become increasingly important in the domestic tuna longline fishery as a valuable bycatch species and landings in the last few years have rapidly increased.

In New Zealand, albacore form the basis of a summer troll fishery, primarily on the west coasts of the North and South Island, with annual landings over the past 10 years averaging 4414 tonnes (maximum landing 6524 t). Albacore are also caught throughout the year by longline (usually ≤ 1000 t per year). Bigeye, the second most valuable tuna (per kg), are caught by longline around the northern half of the North Island throughout the spring – autumn period with landings averaging 121 t per year over the past 10 years (maximum landing 390 t). Skipjack are caught in small numbers by trolling with most of the catch by purse seine during summer months. Skipjack landings have averaged 3893 t per year over the past 10 years (maximum landing 7308 t). Southern bluefin tuna traditionally have been caught by handline and trolling during winter months off the West Coast of the South Island from small vessels. These methods are still occasionally used. Most southern bluefin tuna, however, are caught by medium to large (20–50 m) longline vessels in autumn – winter months. Southern bluefin catches, restricted to a national competitive catch limit of 420 t since 1989, have usually been below this limit with landings averaging 295 t per year over the past 10 years (maximum landing 529 t).

Yellowfin tuna, caught in small numbers in the troll and purse seine fisheries, are generally a bycatch of longline sets targeting bigeye in summer months. Landings of yellowfin tuna have averaged 87 t per year over the past 10 years (maximum landing 193 t). Swordfish are a bycatch of longline sets targeting bigeye and southern bluefin tunas around both the North and South Islands. Swordfish landings have averaged 240 t per year over the past 10 years but have been increasing with increased longline effort, especially over the last few years (maximum landing 965 t). Marlins, also a bycatch of longline fishing in northern New Zealand waters, can not be retained and must be released whether alive or dead.

In addition to the tuna target species, several other valuable species together with commonly caught species of little or no value, are bycatch in the longline fishery. Species composition together with estimates of longline bycatch are reported by Francis *et al.* (1999 and 2000). The longline bycatch of other fish species has also focused attention on the potential for

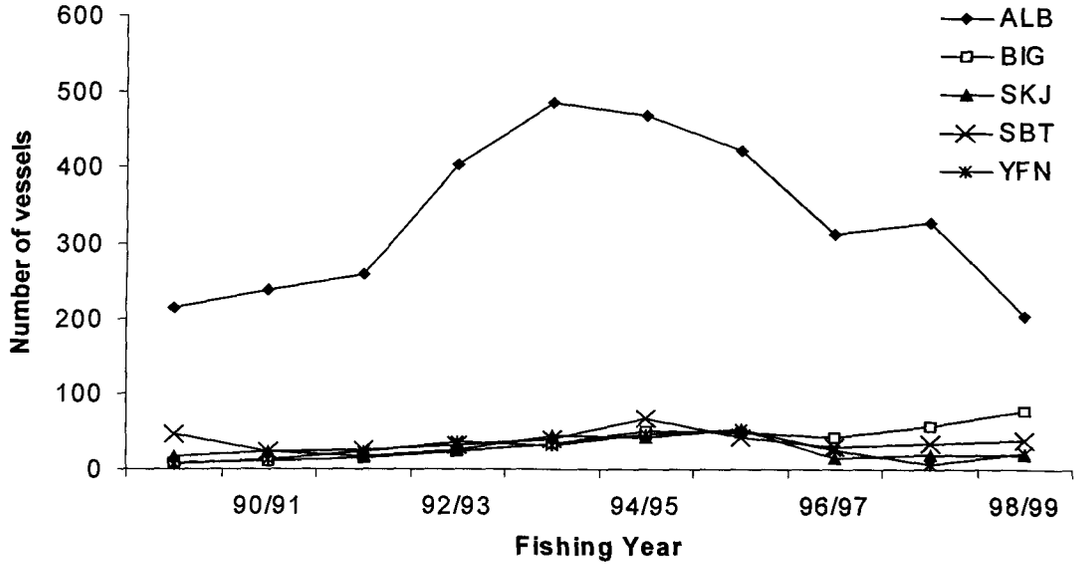
impacts on a range of dependent or associated species, particularly those that are rare, have low fecundity or about which little is known. Similarly, for purse seine fishing in the EEZ a wide range of fish taxa (over 60 species) have been taken as bycatch in sets targeting skipjack tuna (Habib *et al.* 1982). Trolling and other tuna fishing methods do not appear to have an appreciable bycatch.

The New Zealand Tuna Fleet

A wide range of vessel types fish for tuna in the EEZ. Of these, only those engaged in purse seining and some tuna longline vessels are purpose built tuna vessels. Most vessels engaged in tuna fisheries also operate in a range of other fisheries and employ a range of fishing methods. Trolling, purse seining and longlining are the main tuna fishing methods used in New Zealand although handline and pole-and-line are also used. Appendix 1 summarizes the number of vessels reporting tuna catches by target species, gear type and fishing year (1 October – 30 September).

Foreign licensed tuna fishing, primarily for southern bluefin tuna, has been declining since the late 1980s and no foreign licensed vessels have operated in the New Zealand EEZ since 1995–96. At the same time domestic tuna fishing has expanded through the increased use of longline for both southern bluefin and bigeye tunas. A few (usually 5 vessels) Japanese longliners on charter to a New Zealand company have fished each year since 1988–89 except 1990–91 (3 vessels) and 1995–96 (no vessels).

Figure 1. Total number of tuna New Zealand vessels (including chartered vessels) by target species fishing since 1988–89.



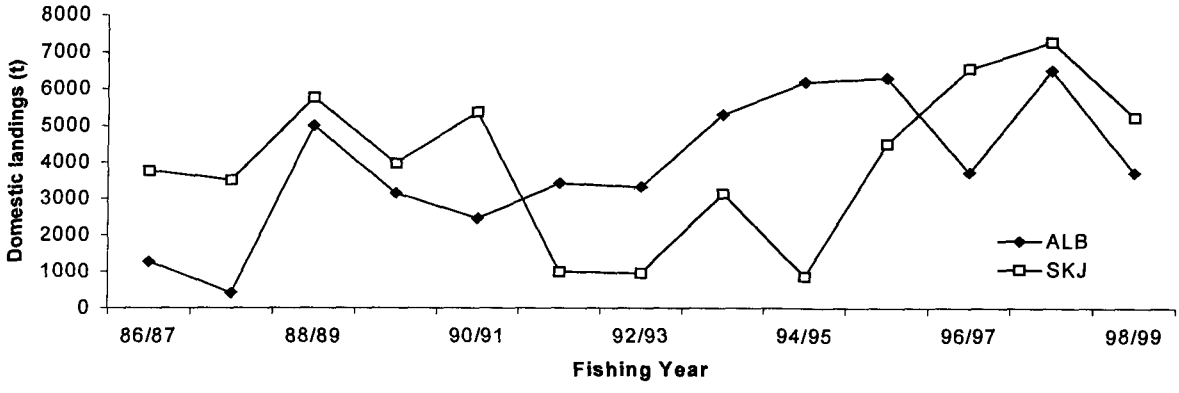
Most vessels fishing for tuna target albacore although the number doing so has declined from the peak of nearly 500 vessels in 1993–94 to around 200 in 1998/99 (figure 1). Fewer than 50 vessels report targeting southern bluefin or yellowfin tunas and while the number of vessels varies each year, there is no trend evident in vessel number for these target species. In contrast the number of vessels targeting bigeye tuna has increased in each of the past two years to nearly 80 vessels. Most of the skipjack catch is taken by 6 medium-sized purse seiners although up to 11 boats report using pole-and-line and up to 44 vessels report trolling for skipjack. Most vessels targeting albacore (93% over the past five years) do so by trolling

while those targeting bigeye and southern bluefin tunas (98% and 74% respectively over the past five years) using longline.

Total Tuna and Swordfish Catches

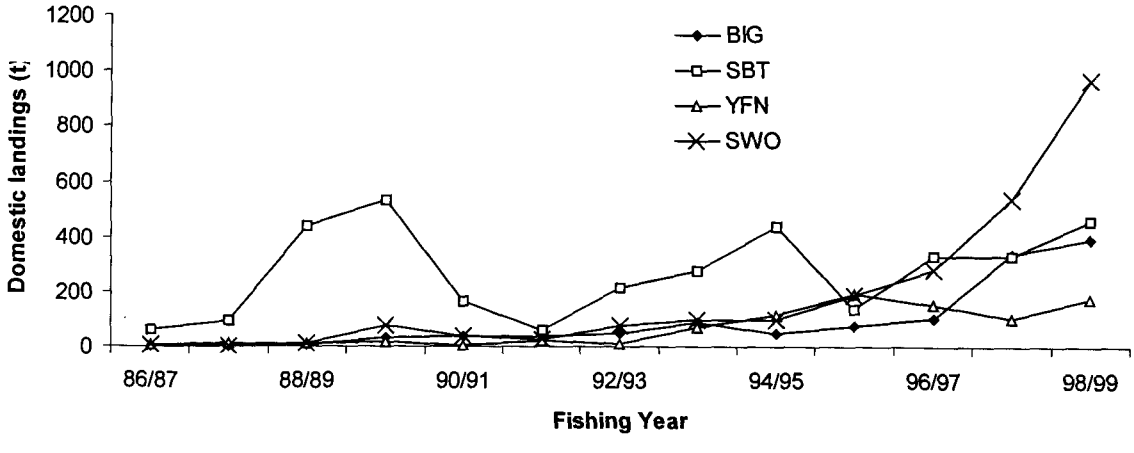
The largest annual landings by species are from the summer surface fisheries for albacore and skipjack tuna. Figure 2 indicates that skipjack landings have been more variable than landings of albacore. With the exception of the period 1991–92 to 1994–95 annual landings of skipjack have been more than 4000 t. Albacore landings in contrast have tended to increase since 1986/87. In the context of the entire stock, New Zealand skipjack landings represent a small fraction of the more than 1,100,000 t annual landings. Whereas New Zealand caught albacore represent roughly half of the surface fishery landings taken from the South Pacific stock in some years.

Figure 2. Domestic landings (tonnes) of albacore and skipjack tuna by fishing year from LFR reports.



The annual landings of species caught primarily by longline are shown in Figure 3. Prior to 1990–91 most tuna longlining was by 3–5 Japanese vessels operating under charter, primarily targeting southern bluefin tuna, with catches of bigeye, yellowfin and swordfish made primarily at the end of the season. Of particular note is the increase in the landings for these species (except yellowfin tuna) with the expansion of the domestic longline fishery starting in 1990–91.

Figure 3. Domestic landings (tonnes) of bigeye, southern bluefin and yellowfin tunas and swordfish by fishing year from LFR reports.



While landings (and catches) of southern bluefin tuna appear quite variable, the fluctuation seen in Figure 3 are exaggerated by the charter vessels reporting the catch on Licensed Fish Receiver Reports (LFRR) in some but not all years. The marked decline in landings of southern bluefin tuna in 1990–91 and 1991–92 are likely to be due to Charter vessels not reporting in these years. Similarly the low landings in 1995–96 is due to no charter vessels operating in the EEZ in that year. The four years since 1982 in which New Zealand exceeded it's southern bluefin tuna catch allocation can also be seen (i.e., 1988–89, 1989–90, 1994–95 and 1998–99).

Estimates of total tuna and swordfish catches are derived from LFRR data for domestic and charter vessels and from TLCER data from foreign licensed vessels. These estimates are summarised in Table 1 for the period 1986–87 to 1998–99. It is clear that foreign licensed catches which had dominated catches in the 1980s, declined since 1991–92 for most species and finished in 1994–95 except for occasional skipjack catches by USA vessels operating under the "US-Pacific States Treaty". The maximum catch of each species during this period was 6524 t for albacore, 649 t for bigeye, 7820 t for skipjack, 1927 t for southern bluefin, 175 t for yellowfin, and 965 t for swordfish. Maximum catches for each of these species, except albacore, would be higher if catches from the early 1980s or earlier were included.

Table 1. Total catches (tonnes) from the New Zealand EEZ, 1986–87 to 1998–99.

Fishing	Albacore			Bigeye			Skipjack		
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign[1]	Total
1986–87	1265.2	668.8	1934.0	0.1	648.7	648.9	3762.6	0.0	3762.6
1987–88	409.6	562.1	971.7	0.0	247.2	247.2	3509.4	0.0	3509.4
1988–89	4999.8	280.4	5280.1	4.0	176.1	180.1	5768.8	2051.0	7819.8
1989–90	3144.3	385.1	3529.4	30.7	344.0	374.7	3971.7	2270.0	6241.7
1990–91	2451.3	404.0	2855.3	36.0	158.9	194.9	5371.1	192.0	5563.1
1991–92	3417.5	296.8	3714.2	41.1	83.7	124.8	988.2	0.0	988.2
1992–93	3322.7	66.8	3389.5	48.8	3.3	52.1	945.6	0.0	945.6
1993–94	5315.2	5.3	5320.5	89.3	0.1	89.3	3136.4	0.0	3136.4
1994–95	6194.8	1.6	6196.4	49.8	0.0	49.8	860.5	0.0	860.5
1995–96	6315.8	0.0	6315.8	79.3	0.0	79.3	4519.5	0.0	4519.5
1996–97	3726.2	0.0	3726.2	104.9	0.0	104.9	6570.8	0.0	6570.8
1997–98	6524.0	0.0	6524.0	339.7	0.0	339.7	7307.6	317.0	7624.6
1998–99	3727.3	0.0	3727.3	391.2	0.0	391.2	5261.4	728.7	5990.1

Fishing	Southern bluefin			Yellowfin			Swordfish		
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
1986–87	59.9	1867.4	1927.3	5.7	139.6	145.3	4.7	496.3	501.0
1987–88	94.0	1059.3	1153.3	12.4	39.8	52.2	0.9	235.6	236.6
1988–89	437.0	760.7	1197.8	13.8	13.8	27.6	11.4	149.9	161.3
1989–90	529.3	880.8	1410.1	17.6	33.1	50.7	78.8	161.9	240.7
1990–91	164.6	905.6	1070.1	6.3	16.1	22.4	40.7	184.9	225.6
1991–92	59.8	585.3	645.1	19.8	0.2	20.0	28.5	160.8	189.2
1992–93	216.4	250.8	467.1	11.8	0.0	11.8	79.0	25.6	104.6
1993–94	277.0	26.2	303.2	69.7	0.0	69.7	102.3	2.3	104.6
1994–95	435.3	37.3	472.5	114.5	0.0	114.5	101.9	0.0	101.9
1995–96	140.5	0.0	140.5	193.4	0.0	193.4	186.8	0.0	186.8
1996–97	333.5	0.0	333.5	156.7	0.0	156.7	282.8	0.0	282.8
1997–98	331.5	0.0	331.5	105.3	0.0	105.3	534.3	0.0	534.3
1998–99	457.7	0.0	457.7	174.7	0.0	174.7	965.2	0.0	965.2

1 estimates provided by SPC from logsheet data collected under the US Multilateral Treaty

Catch by Gear Type

New Zealand tuna fishers are required to report catches of tuna when it is caught as number of fish for each operation, with weight reported for each landing. The catch in weight is provided to the fisher when landed to a licensed fish receiver. Since a mixture of fishing methods can be used on any single fishing trip, except for purse seine vessels, this landed weight does not distinguish catch in weight by gear type unless the weight can be related to the CPUE.

Tuna catch by gear type was estimated as follows:

1. Estimate the CPUE from the catch in number per individual fishing operation of all tuna and swordfish species for each target species-gear type combination using groomed catch and effort data.
2. Estimate the total catch in number by multiplying the CPUE derived by the total number of individual fishing operations from the original data for each species by gear type.
3. Estimate the total catch in weight by multiplying the average weight of each species by gear type by the total catch estimated in step 2.
4. The total catch by gear type is proportionally scaled to the estimate of total landings reported in the LFRR data
5. Steps 1–4 yield an estimate of the total catch in weight by domestic vessels (including charter vessels). To estimate the total catch by gear type by all fleets, the estimates in step 4 should be added to those reported for foreign licensed longliners on TLCER logsheets and by USA purse seine vessels reporting under the US Multilateral Treaty.

Estimates of the weight of the catch by gear type are derived from average weights and estimates of the number of fish caught. Average weights are derived from data collected by observers for the longline fishery and from logsheet data for other lining methods. No conversion from number to weight is required for the purse seine fishery for skipjack or for swordfish since catches are reported in weight rather than number.

Regrettably, late in the reprocessing of catch and effort data, the database was corrupted and the catch estimates by gear are not available for some species and gear types for this meeting.

Troll fishery

The troll fishery primarily catches albacore with minor catches of skipjack, southern bluefin and yellowfin tunas. Since these species are also caught in large numbers at different sizes by other gear types (skipjack primarily by purse seine the remaining species by longline) catches by gear type will be supplied at a later date. The following estimates of albacore troll catches in Table 2 should be regarded as provisional.

Table 2. Provisional catch estimates of albacore catches (tonnes) by troll in the New Zealand EEZ by fishing year.

Fishing Year	Albacore catch	Fishing Year	Albacore catch
1986 - 87	1256	1993 - 94	4914
1987 - 88	405	1994 - 95	5865
1988 - 89	4923	1995 - 96	5914
1989 - 90	2988	1996 - 97	3257
1990 - 91	2385	1997 - 98	5321
1991 - 92	3345	1998 - 99	2396
1992 - 93	3117		

Purse seine fishery

The purse seine fishery in New Zealand is essentially a single species fishery when targeting skipjack with over 99% of its reported catch recorded as skipjack. Table 3 summarizes the catch of skipjack by fishing year in the New Zealand EEZ.

Table 3. Catch of skipjack tuna (tonnes) by purse seine in the New Zealand EEZ by fishing year.

Fishing Year	Skipjack catch	Fishing Year	Skipjack catch
1986 - 87	3763	1993 - 94	3136
1987 - 88	3509	1994 - 95	861
1988 - 89	5769	1995 - 96	4520
1989 - 90	3972	1996 - 97	6571
1990 - 91	5371	1997 - 98	7308
1991 - 92	988	1998 - 99	5261
1992 - 93	946		

Longline fisheries

Longline fisheries are the most variable with respect to area and seasons fished and catch composition changes with target species. This latter factor is also confounded with season and area. Due to the data processing difficulties experienced for this meeting the catch estimates presented in Table 4 should be regarded as provisional.

Table 4. Provisional catch estimates of tuna and swordfish (tonnes) by longline in the New Zealand EEZ by fishing year.

Fishing Year	Albacore	Bigeye	Southern bluefin	Yellowfin	Swordfish
1986 - 87	9	0	60	6	5
1987 - 88	4	0	94	12	1
1988 - 89	76	4	437	14	11
1989 - 90	156	31	529	18	79
1990 - 91	66	36	165	6	41
1991 - 92	72	41	60	20	28
1992 - 93	206	49	216	12	79
1993 - 94	401	89	277	70	102
1994 - 95	330	50	435	114	102
1995 - 96	402	79	140	193	187
1996 - 97	469	105	333	157	283
1997 - 98	1203	340	331	105	534
1998 - 99	1332	391	458	175	965

Data from Observer and Port Sampling Programs

New Zealand has conducted an observer programme on tuna longliners that target bigeye and southern bluefin tunas. Typically, coverage of the domestic longline fleet has been low (generally < 10% of sets) and has focused primarily on Japanese flagged vessels fishing for southern bluefin tuna during winter months (up to 100% of sets covered). There has not been any coverage of either the purse seine or troll fishery for several years. Never-the-less, considerable information has been collected on catch composition, as well as sex ratios, size composition and discard practices on these vessels. Catch composition is reported in Francis et al. (1999 and 2000). In addition a port sampling program has been conducted to monitor size composition in the New Zealand albacore troll fishery. Results from these programs will be covered at the next SCTB meeting.

Markets

The main markets for tuna are for canned skipjack and albacore with canning done outside New Zealand where labor costs are lower. Some skipjack is re-imported to New Zealand under various New Zealand labels. Fresh and frozen bigeye, southern bluefin and yellowfin tunas and swordfish are exported, primarily to the Japanese sashimi market. Domestic consumption of tuna, except for canned skipjack, is limited.

Onshore Developments

The onshore developments supporting the New Zealand tuna fishery include many excellent harbors with easy access to fuel, ice and freezer facilities as well as vessel repair facilities. Air links to markets in Asia, the USA and Europe are excellent. There are no tuna canneries but many licensed export fish processors ship fresh and frozen product tuna regularly.

Future Prospects

Although the seasonal nature of New Zealand's tuna fisheries has limited the scope for domestic development, these fisheries remain an important component of a seafood industry valued at over $NZ 1.2 billion per year and employing over 10,000 people. The value of New Zealand tuna fisheries has increased annually for the last several years and is now over $NZ 20 million. There is no reason to expect that this trend will change in the short term.

Recent Developments

Of note in New Zealand tuna fisheries is the increase in the number of domestic longliners targeting southern bluefin and bigeye tunas. This increase in effort has resulted in a marked increase in swordfish landings in 1998/99. It is also of note that landings from the albacore troll fishery in 1998/99 declined to about half that of the previous year. This was widely attributed to low prices for troll caught albacore rather than to low availability.

Acknowledgments

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Habib, G., I.T. Clement, K.N. Bailey, C.L. Carey, P.M. Swanson and G.J. Voss. 1982: Incidental fish species taken in the purse-seine skipjack fishery, 1975–81. Fisheries Research Division Occasional Publication: Data Series No. 5. 49 pp.

Appendix 1: Number of New Zealand tuna vessels (including chartered vessels) by target species, fishing method and fishing year (1989–90 to 1998–99).

Target	Fishing Yr.	Handline	Pole & line	Purse seine	Longline	Troll	Total
Albacore	1989-90	3	3	0	4	212	215
	1990-91	6	3	0	5	230	237
	1991-92	2	1	0	6	255	259
	1992-93	4	7	0	9	393	402
	1993-94	1	11	0	15	473	485
	1994-95	2	9	0	31	452	468
	1995-96	0	6	0	23	410	422
	1996-97	1	1	0	20	299	313
	1997-98	1	1	0	29	300	328
	1998-99	0	1	0	25	180	203
Bigeye	1989-90	0	0	0	9	0	9
	1990-91	0	0	0	11	0	11
	1991-92	0	0	0	15	0	15
	1992-93	0	0	0	22	1	23
	1993-94	0	0	0	33	0	33
	1994-95	0	0	0	50	1	51
	1995-96	0	0	0	49	0	49
	1996-97	0	0	0	42	2	43
	1997-98	0	0	0	56	3	57
	1998-99	0	0	0	77	1	78
Skipjack	1989-90	0	0	5	2	10	17
	1990-91	0	0	5	0	18	23
	1991-92	0	0	7	0	9	16
	1992-93	0	2	5	0	19	25
	1993-94	0	3	7	0	35	44
	1994-95	1	11	5	0	32	43
	1995-96	0	5	6	1	44	53
	1996-97	0	2	7	0	8	15
	1997-98	0	1	6	1	13	19
	1998-99	0	3	6	0	10	18
Southern bluefin	1989-90	29	0	0	12	17	46
	1990-91	15	0	0	8	9	24
	1991-92	16	0	0	9	6	26
	1992-93	12	0	0	20	6	32
	1993-94	10	0	0	28	5	39
	1994-95	14	0	0	51	7	67
	1995-96	5	0	0	38	4	41
	1996-97	3	0	0	22	7	30
	1997-98	3	0	0	24	10	34
	1998-99	3	0	0	36	4	38
Yellowfin	1989-90	1	0	0	2	5	6
	1990-91	2	0	0	3	9	12
	1991-92	1	0	0	4	19	24
	1992-93	1	0	0	5	32	35
	1993-94	2	0	0	1	29	31
	1994-95	5	3	0	13	34	47
	1995-96	2	1	0	16	36	52
	1996-97	0	1	0	6	20	26
	1997-98	0	0	0	2	5	7
	1998-99	0	0	0	19	3	22