

DPIRD GAME FISH TAGGING PROGRAM

REPORT 2022-2023



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Cover image: Well known fishing identity Chloe Laurence releasing a healthy tagged Striped Marlin off southern NSW.

INTRODUCTION

The New South Wales Department of Primary Industries and Regional Development (DPIRD) Game Fish Tagging Program was officially launched in December 1973 and has been in continuous operation since then. Similar cooperative tagging programs operate in other countries including the United States, New Zealand, South Africa and Kenya but in terms of numbers of pelagic fish tagged, the NSW Program is the largest in the world.

During 2022/23 a total of 10,470 fish were tagged under the Program – a marked increase on the previous year's tally of 8,340 and very close to the average annual number of fish tagged over the entire 50 years of the program. The number of recaptured fish reported in 2022/23 was 238 – the fourth highest in the history of the Program.

HIGHLIGHTS OF THE 2022/23 TAGGING YEAR

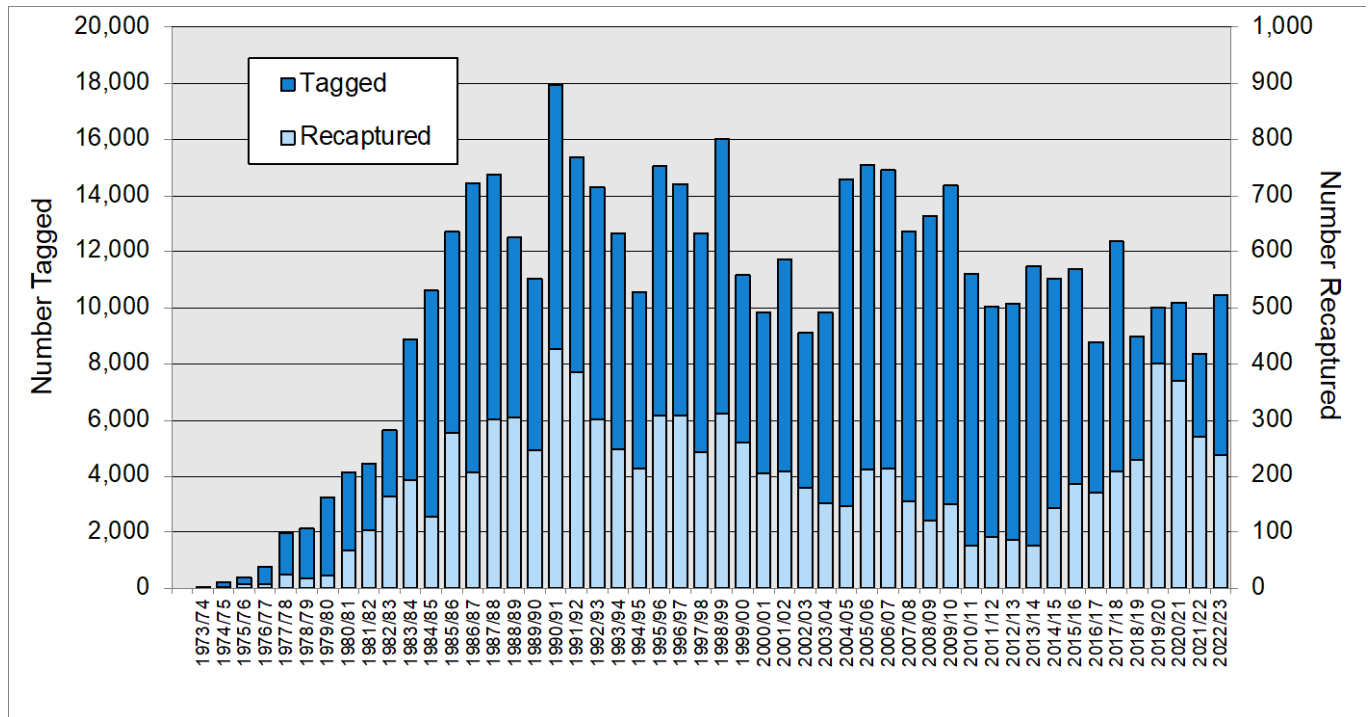
Even though the Program has a long history, every year, new information is added to our store of knowledge on marine gamefish species. Some of the highlights for the 2022/23 season are listed below and are expanded in the text of the report.

- The first ever trans-Tasman recapture of a Striped Marlin for the Program
- A record year for the number of Blue Marlin tagged (1,153)
- Three significant Blue Marlin recaptures – Gold Coast to Phillipines, Rabaul Papua New Guinea to Phillipines and Tonga to New Zealand
- Black Marlin topped the list with 3,246 tagged, nearly one third of the total of all fish tagged for the year and second highest total for the past 16 years
- 45 Black Marlin recaptures reported for the year, the second highest number in the history of the Program
- A Black Marlin tagged off Bermagui NSW recaptured in French Polynesia
- A Southern Bluefin Tuna tagged off southern Tasmania recaptured off the southeastern coast of New Zealand
- Six Yellowtail Kingfish tagged in South Australia or Victoria recaptured in New South Wales
- A Yellowtail Kingfish tagged off Mallacoota Victoria recaptured at the Gascoyne Seamount 300 nautical miles off the NSW coast
- A Yellowtail Kingfish recaptured after 8 years
- A Whaler Shark also recaptured after 8 years

THE GAME FISH TAGGING PROGRAM TO DATE

The numbers of fish tagged and recaptured each year since the origin of the Program are shown in Figure 1. Numbers tagged in any given year may vary for many reasons, not least being the availability of different species to the recreational fishery at different times and locations and/or level of fishing effort.

FIGURE 1. NUMBER OF FISH TAGGED AND RECAPTURED EACH YEAR SINCE THE ORIGIN OF THE PROGRAM



As at the end of June 2023, the grand totals of fish tagged and recaptured within the Program stood at 518,946 and 9,716 respectively (Table 1), continuing the Program's status as the largest of its kind in the world.

The species tagged in the highest numbers within the Game Fish Tagging Program continues to be Black Marlin (81,543 tagged, 15.7% of all releases) followed by Yellowtail Kingfish (44,176, 8.1% and Yellowfin Tuna (38,628, 7.4%). Other prominent key species are Sailfish (7.2% of all releases), Striped Marlin (6.7%), Southern Bluefin Tuna (6.4%) and Dolphinfin (5.4%).

TABLE 1. TOTAL NUMBERS OF FISH TAGGED AND RECAPTURED 1974-2023

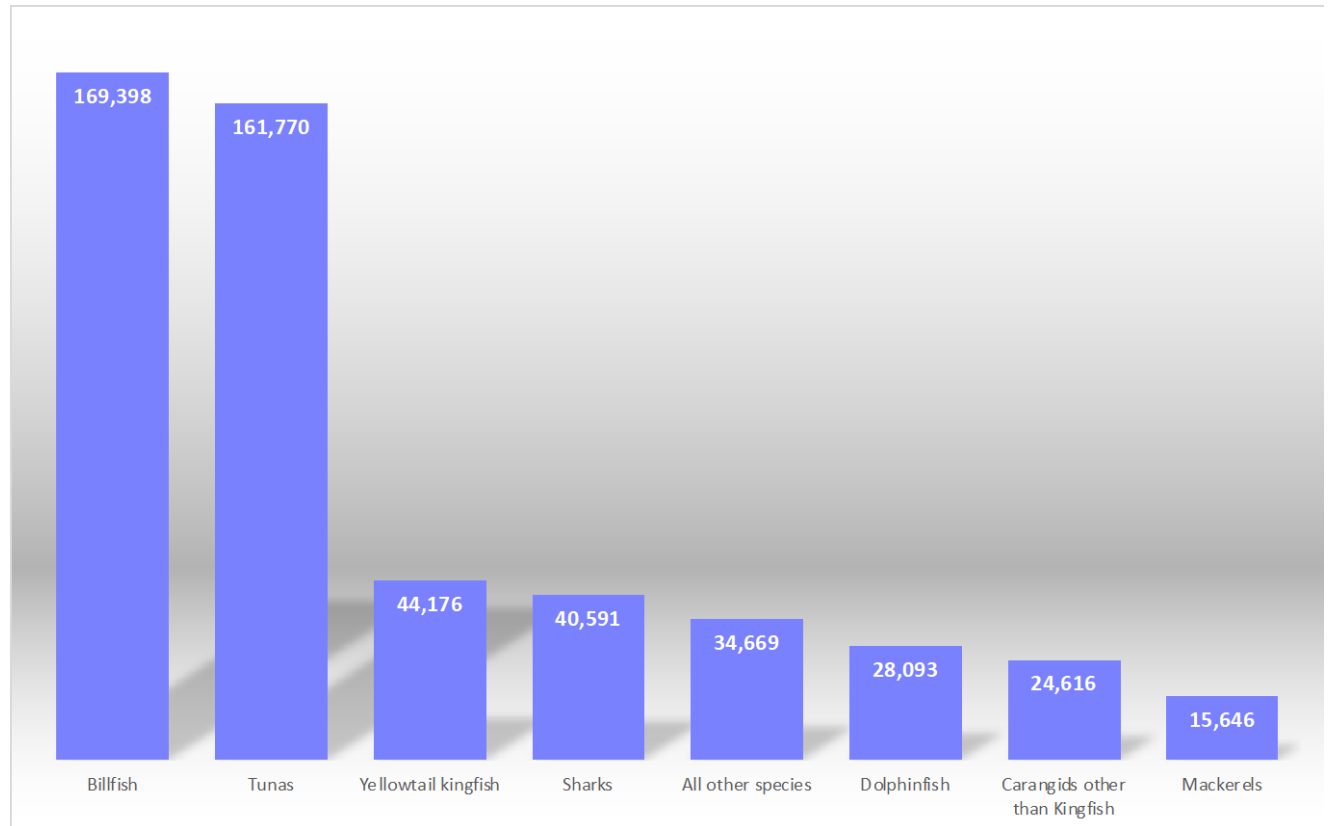
Species	Total Tagged	Total Recaptured	% Recapt
BLACK MARLIN	81,543	665	0.82
YELLOWTAIL KINGFISH	44,176	3,559	8.06
YELLOWFIN TUNA	38,628	710	1.84
SAILFISH	37,442	366	0.98
STRIPED MARLIN	34,543	289	0.84
SOUTHERN BLUEFIN TUNA	33,443	293	0.88
DOLPHINFISH	28,093	264	0.94
ALBACORE	22,578	172	0.76
STRIPED TUNA	21,735	68	0.31
MACKEREL TUNA	21,178	62	0.29
WHALER SHARKS*	15,756	327	2.08
BONITO	13,256	219	1.65
BLUE MARLIN	14,996	52	0.35
AUSTRALIAN SALMON**	10,627	639	6.01
SPANISH MACKEREL	10,207	105	1.03
MAKO SHARK	8,856	194	2.19
SILVER TREVALLY**	7,215	202	2.80
HAMMERHEAD SHARKS	6,074	62	1.02
BLUE SHARK	5,346	79	1.48
LONGTAIL TUNA	5,387	62	1.15
TAILOR**	4,034	122	3.02
QUEENFISH	3,767	10	0.27
SAMSON FISH	4,035	193	4.78
BARRACUDA	3,477	6	0.17
TREVALLY	3,543	33	0.93
GIANT TREVALLY	2,822	37	1.31
OTHER SPECIES COMBINED	36,189	926	2.56
TOTAL	518,946	9,716	1.87

*'Whaler Sharks include the following tag card entries: Whaler, bronze whaler, bull shark, black tip whaler, white tip shark, oceanic white tip shark and Galapagos shark.

**Some species, such as Tailor, Silver Trevally and Australian Salmon, were tagged in large numbers in the past, but have since been removed from the list of desirable species to tag.

Overall, Billfish as a group continue to be tagged in the largest numbers (169,398 or 32.6% of the total), compared with Tunas as a group (160,182 or 31.5% of the total). A single species, Yellowtail Kingfish, with over 44,000 tagged, accounts for 8.5% of all releases while the total numbers of Sharks combined (40,591) constitute 7.8% of all fish tagged for the Program.

FIGURE 2. TOTAL NUMBERS OF FISH TAGGED AS SPECIES GROUPINGS, 1974-2023



SUMMARY OF TAGGING ACTIVITY FOR 2022/23

The breakdown of species or species groups tagged and recaptured during 2022/23 is shown in Table 2. The top five tagged species for the year were, in order, Black Marlin, Southern Bluefin Tuna, Blue Marlin, Striped Marlin and Yellowtail Kingfish. Positions on the 'leaderboard' may change from year to year depending on the relative abundance of species as well as avidity of anglers tagging them in different areas.

TABLE 2. NUMBERS OF ALL SPECIES / SPECIES GROUPS TAGGED AND RECAPTURED DURING 2022/23

Species	Total Tagged	Total Recaptured
BLACK MARLIN	3,246	45
SOUTHERN BLUEFIN TUNA	1,270	21
BLUE MARLIN	1,153	4
STRIPED MARLIN	1,147	5
YELLOWTAIL KINGFISH	965	134
SAILFISH	566	
DOLPHINFISH	334	4
WHALER SHARKS	370	6
SPANISH MACKEREL	142	2
TIGER SHARK	128	5
MACKEREL TUNA	120	
QUEENFISH	82	
GUMMY SHARK	77	2
YELLOWFIN TUNA	74	
HAMMERHEAD SHARK	69	
SAMSON FISH	66	
ALBACORE	65	
SHARK MACKEREL	56	
SPOTTED MACKEREL	53	
COBIA	52	7
GOLDEN TREVALLY	50	1
AUSTRALIAN SALMON	49	2
BLUE SHARK	47	
MAKO SHARK	37	
LONGTAIL TUNA	35	
EAGLE RAY	27	
SCHOOL SHARK	27	
GOLD SPOTTED TREVALLY	23	
STRIPED TUNA	23	
BARRACUDA	19	
SKIPJACK TUNA	18	
BROAD BARRED MACKEREL	16	
BROADBILL SWORDFISH	14	
SCHOOL MACKEREL	14	
GIANT TREVALLY	9	
SHORTBILL SPEARFISH	7	
MISCELLANEOUS OTHER SPECIES	20	
TOTAL	10,470	238

MAIN SPECIES TAGGED 2022/23

BLACK MARLIN

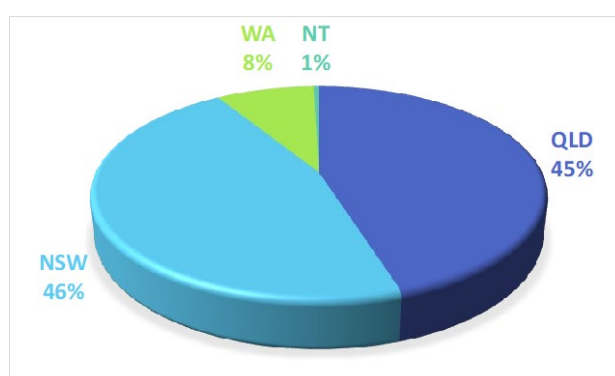
The top species tagged this year was Black Marlin with an impressive total of 3,246 tagged and released. This was a large increase since the previous season (1,201) and also considerably higher than the average annual number tagged for the previous 10 years (2,373).

The number of Black Marlin tagged on the Australian east coast in any given year is strongly influenced by the presence of juvenile fish in their first year of life. In years of high abundance, the juveniles of 5 to 15 kg, appear in July and August inside the Great Barrier Reef between Cairns and Townsville. They make their way south in ensuing months to south-east QLD and then into northern and central NSW. By February the following year their average weight will have increased to around 30 kg. The occurrence and strength of recruitment pulses of young Black Marlin are unpredictable, sometimes occurring in consecutive years and sometimes separated by as much as 5-7 years.

Around 500 young-of-the-year Black Marlin (5-30kg) were tagged during the previous season (2021/22), which is considered a weak recruitment pulse in comparison to the 2022/23 season when 2,250 juveniles were tagged, making it one of the strongest recruitment seasons on record.

Figure 3 shows that 91% of the Black Marlin tagged in 2022/23 were evenly divided between Queensland and New South Wales waters. Regarding other areas, the number of Black Marlin tagged in Western Australian waters in 2022/23 was similar to the past two seasons (273 compared with 315 and 218 respectively). As usual, most of those (242) were tagged off Exmouth with an average estimated size of 38 kg. Small numbers were also tagged off Broome and Dampier, WA. Other areas where Black Marlin were tagged were off Weipa, western Cape York (26) and the Northern Territory, mainly off Darwin (14).

FIGURE 3. PROPORTIONS OF BLACK MARLIN TAGGED BY REGION 2022/23



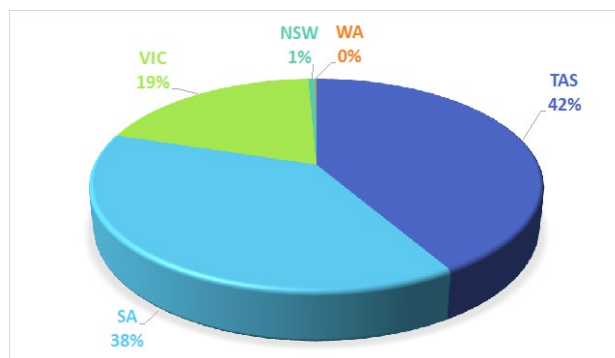
For many years, hundreds of Black Marlin were tagged during the spawning aggregation along the outer Great Barrier Reef each Spring. However, over the past decade or so charter captains have increasingly opted not to tag fish, but to 'free-release' them instead. This has resulted in a steady decline in the number of tag cards received from this important fishery, with only 28 tags recorded for 2022/23, the second lowest on record. The actual number of adult fish now being free-released in the fishery is unknown but would number in the hundreds.

SOUTHERN BLUEFIN TUNA (SBT)

The second top species tagged this year was Southern Bluefin Tuna (SBT) with a total of 1,270 tagged and released. This was considerably less than the tally for the previous season (2,121) but only a little down on than the average number tagged for the previous 10 years (1,620).

Figure 4 shows that 42% of SBT tagged in 2022/23 were released in Tasmania, followed by South Australia (38%). Numbers increased somewhat in Victoria, with 19% tagged there. In contrast, just eight SBT were tagged in NSW.

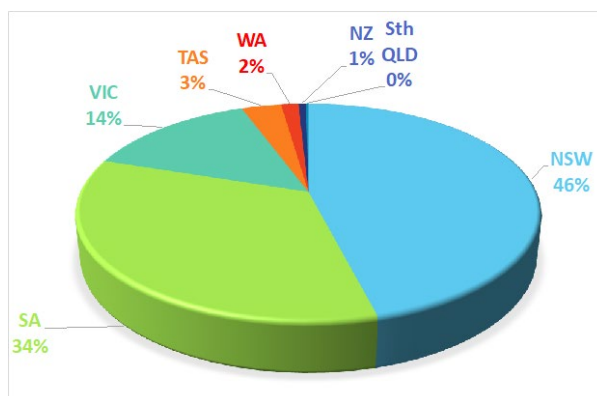
FIGURE 4. PROPORTIONS OF SOUTHERN BLUEFIN TUNA TAGGED BY STATE, 2022/23



YELLOWTAIL KINGFISH

A total of 965 Yellowtail Kingfish were tagged during 2022/23, about 200 fewer than the previous year but still higher than the average number tagged over the past 10 years (867). Figure 5 shows that of this total, 46% were tagged off NSW and 34% off South Australia (the latter, mostly larger fish in the 10kg to 30kg range). The number of kingfish tagged in Victorian waters was 138, down a little from the previous year (150). Historically, kingfish have been uncommon catches in Tasmania, but in recent years numbers encountered by anglers have been increasing, likely due to climate change. This year, 32 were tagged in that State, nine more than the previous year.

FIGURE 5. PROPORTIONS OF YELLOWTAIL KINGFISH TAGGED BY STATE, 2022/23

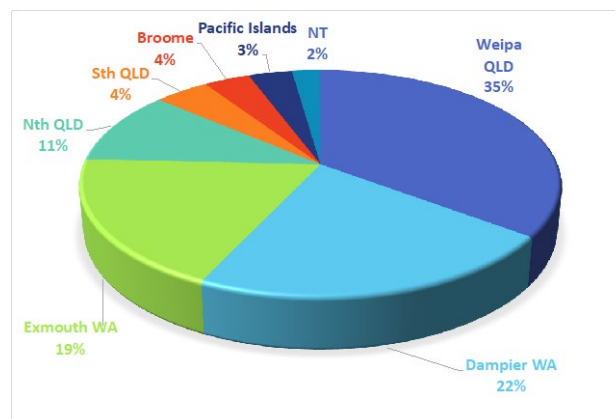


SAILFISH

The total number of Sailfish tagged in 2022/23 (566) was less than the previous two years (~650 for both years) and less than the average number tagged over the previous 10 years (858). The presence of Sailfish in any given region tends to be unpredictable from year to year, hence the high annual variability of the totals tagged across the board.

This year, the fishery out of Weipa, QLD had a particularly good Sailfish season with 203 tagged, accounting for 35% of the total for the Program. In Western Australia, Sailfish were also tagged in good numbers from both Dampier and Exmouth (126 and 108 respectively), while an additional 21 were tagged off Broome. For many years in the past, hundreds of Sailfish were tagged off Broome, but due to a decision of the local fishing club, these are now released without being tagged. Free-release cards are being used in the region, but these are not yet included in the tagging database. As well, many Sailfish are tagged each year off Groote Eylandt in the Gulf of Carpentaria (NT), but with tags supplied by the US-based Billfish Foundation. Those data are also not included in the NSW tagging database. These factors should be noted when considering long-term trends in numbers of Sailfish tagged in Western Australia, the Northern Territory and overall.

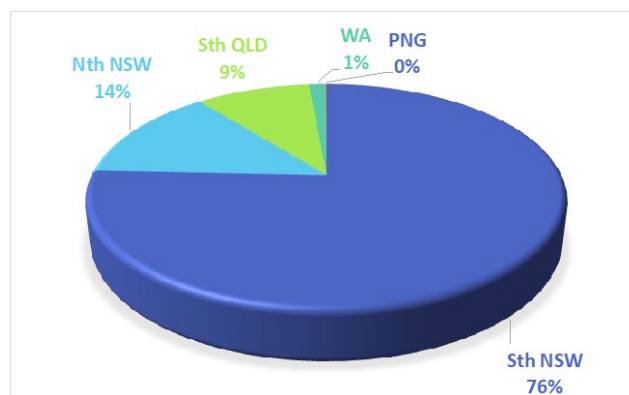
FIGURE 6. PROPORTIONS OF SAILFISH TAGGED BY REGION, 2022/23



STRIPED MARLIN

A total of 1,147 Striped Marlin were tagged in 2022/23, nearly double the number for the previous year and a little above the average for the past 10 years (1,036). As usual, the vast majority of Striped Marlin tagged for the season were released off NSW (90%). As was also the case last year, a far higher proportion were tagged in southern waters, (south of Sydney) compared with the rest of the State, which includes the 'hot-spot' of Port Stephens (Figure 7). Smaller numbers of Striped Marlin were also tagged in 2022/23 off southern QLD (107) and Exmouth, WA (15).

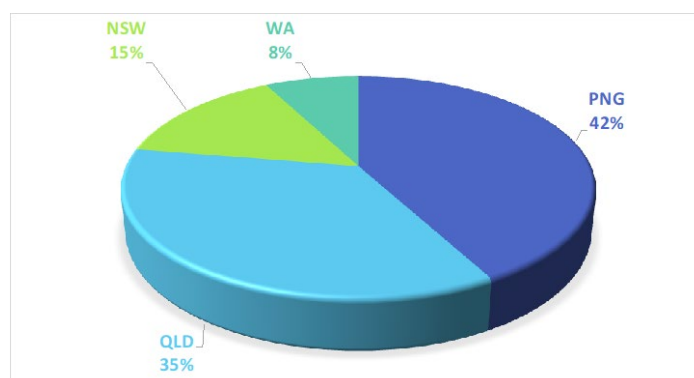
FIGURE 7. PROPORTIONS OF STRIPED MARLIN TAGGED BY REGION, 2022/23



BLUE MARLIN

This year a new record was set for the number of Blue Marlin tagged in a year, with a total of 1,153 released – three times the total for the previous season and nearly double the average for the past 10 years (642). This result was partly due to a record year for tagging Blue Marlin in Papua New Guinea (531 released), but was also contributed to by a strong season off southern Queensland resulting in 448 fish tagged there (Figure 8).

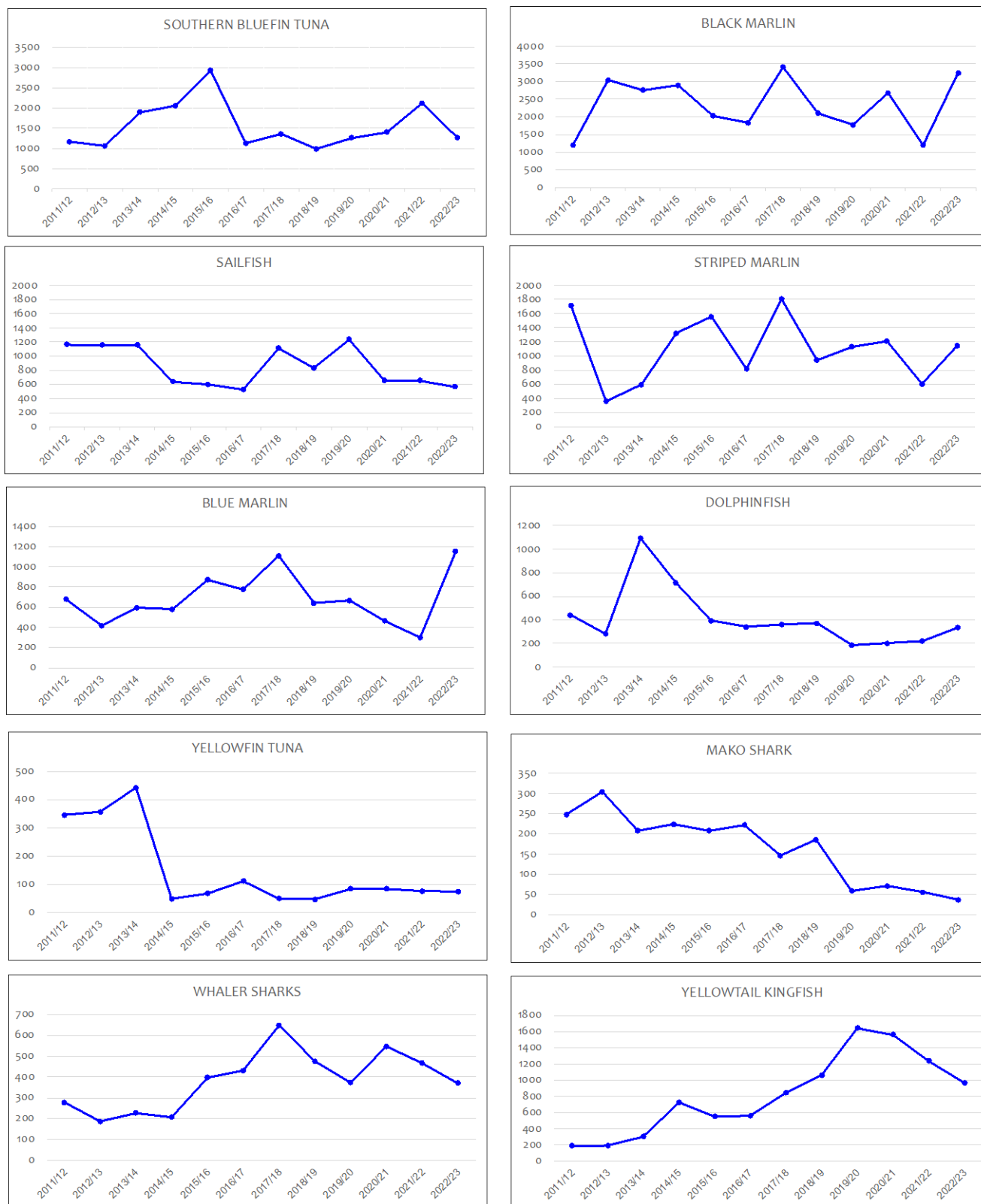
FIGURE 8. PROPORTIONS OF BLUE MARLIN TAGGED BY REGION, 2022/23



TAGGING TRENDS THROUGH TIME

Reviewing the numbers of different species of gamefish tagged each year over this long running Program, it is clear that these can and do fluctuate quite widely over time, sometimes showing long-term trends, and sometimes indicating marked shifts from one year to the next. Such changes may reflect the true abundance of particular species over these periods, or they may simply be due to changes in availability of those species to the recreational fishery in different regions, or to changes in targeting practices of the fishery. For example, the number of Black Marlin tagged within the Program each year is strongly influenced by the presence or absence of ‘pulses’ of juvenile fish in their first year of life on the Australian east or west coasts. In order to consider these fluctuations in more detail, the numbers of the 10 key gamefish species or species groups tagged over the past 12 years are shown in Figure 9.

FIGURE 9. NUMBERS OF KEY GAMEFISH SPECIES TAGGED OVER THE PAST 12 YEARS



While it is clear from Figure 9 that numbers tagged of each of these species may be quite variable from year to year, no marked trends are evident in annual numbers tagged for Southern Bluefin Tuna, Black Marlin, Sailfish, Striped Marlin, Blue Marlin and Dolphinfin.

On the other hand, for Yellowfin Tuna, there has been a dramatic decline in numbers tagged over time. In the 1990s and 2000s Yellowfin Tuna was one of the main species tagged under the Program, with numbers often exceeding 2,000 and even 3,000 in some years. Numbers then dropped sharply in the late 2000s followed by another sharp and sustained drop in numbers tagged since 2014/15. After an all-time low of just 47 tagged in 2017/18, less than 100 Yellowfin Tuna per year have been tagged over the past nine years, including 2022/23, continuing a very low and sustained trend.

The number of Mako Sharks tagged has also been on a decline from a peak 10 years ago. While this trend may indicate a decline in the stock, it is also likely to be influenced at least in part by the level of fishing effort directed at sharks in general by game fishers. Targeted fishing for sharks appears to have declined considerably over the past decade or more, although this supposition could be studied in greater detail via data collected under the long-running Gamefish Tournament Monitoring program of NSW DPI.

Interpretation of tagging trends for Whaler Sharks (combined *Carcharhinus* species) is confounded by the fact that different species occur and are caught in widely different areas. For example, there is a small but active fishery for bronze whalers in South Australia while Galapagos Whaler Sharks are sometimes tagged in high numbers at Lord Howe Island by visiting mainland game fishing vessels.

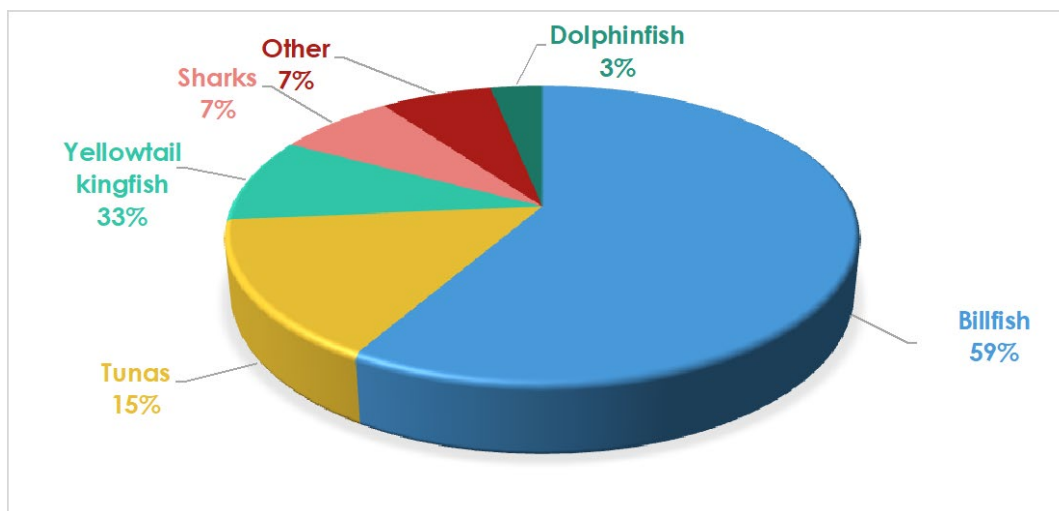
Lastly, following a dip in numbers tagged in the early 2010s, Yellowtail Kingfish releases climbed steadily to relatively high levels in the late 2010s, early 2020s.

Focusing now on lumped proportions of species or species groups tagged in 2022/23, Figure 10 shows that Billfish as a group constituted nearly 60% of all fish released, well up from 33% in the previous season.

The proportion of Tunas tagged in 2022/23 represented 15% of all species – very similar to the long term average. As mentioned, in the past, Yellowfin Tuna was the dominant tuna species tagged, but with very few of that species being tagged over the past nine years, fluctuations in the proportions of Tunas released are now largely due to changes in numbers of Southern Bluefin Tuna tagged each year.

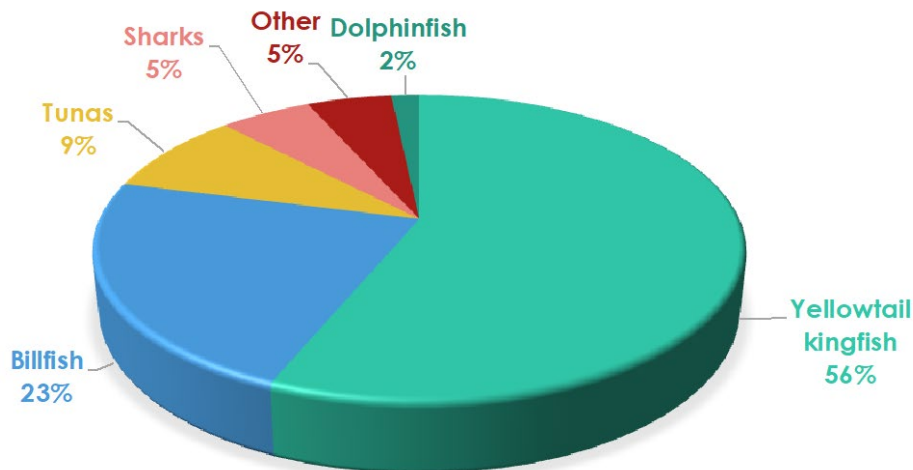
Sharks constituted 7% of all fish tagged in 2022/23, a decrease from 9% in the previous year but in line with the long term average annual proportion.

FIGURE 10. SPECIES GROUPS TAGGED IN 2022/23



Now considering recaptured species or species groups, Figure 11 shows the proportions of the major species groups recaptured in 2022/23. As is usually the case, quite different proportions of species or species groups are recaptured compared with those tagged. As usual, Yellowtail Kingfish dominated the recapture list, representing 56% of all recaptures reported for the year. The big shift in proportion of recaptures this year was for Billfish, which represented 23% of reported recaptures compared with just 5% for the previous year. This was almost entirely due to the large number of recaptures of Black Marlin this year (45).

FIGURE 11. SPECIES GROUPS RECAPTURED IN 2022/23



RECAPTURE HIGHLIGHTS IN 2022/23

The full list of completed recaptures reported in 2022/23 is shown in Appendix I. Some of the highlights of these recaptures are detailed below. Because of the interest among anglers, we tend to emphasise some of the longer times at liberty and/or longer distances moved by tagged fish, however, these may often be exceptions to the rule. In contrast, many fish are also recaptured relatively close to their points of release, often, but not always within relatively short times.

Therefore, it is stressed that information gained from these less 'spectacular' recaptures is just as important to our understanding of the movements and growth of game fish as are longer term, longer distance recaptures.

BLACK MARLIN

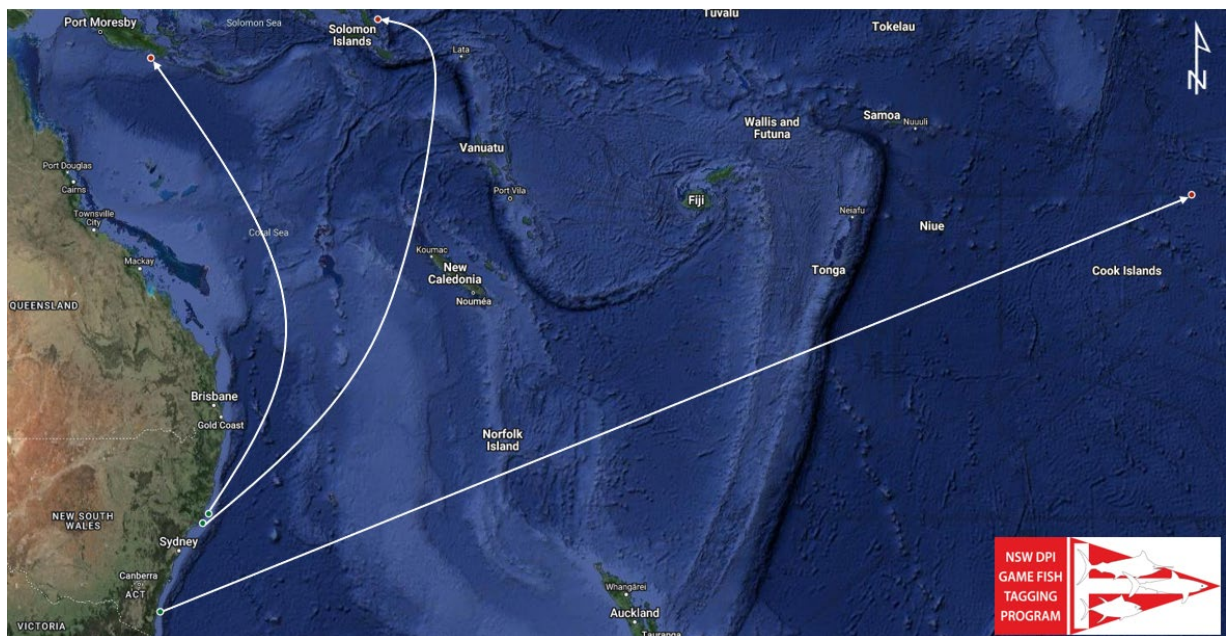
A high total of 45 Black Marlin recaptures were reported during 2022/23, 35 more than the previous year. Times at liberty ranged from 0 to 844 days (2 years 4 months) and minimum distances travelled from 0 to 3,213 nautical miles. A total of 25 of the recaptured Black Marlin had been tagged in QLD waters and 20 off NSW. Just two of the recaptured marlin were caught by distant water foreign commercial vessels, another was likely caught by an artisanal fisherman in the Solomons while the remaining 42 were recaptured by Australian recreational fishers, all of those between southern QLD and southern NSW.



Image: Matt Millauro releases an estimated 40 kg Black Marlin off Seal Rocks in February 2023. The fish was recaptured just 79 days later in the Brumner Trench off Baxter Harbour, Papua New Guinea and weighed 58 kg.

Figure 12 shows the three long distance Black Marlin movements away from Australia recorded this year, while Figure 13 shows movements of recaptured fish along eastern Australia. The longest distance recorded by a Black Marlin in 2022/23 was for a fish tagged off Bermagui NSW in February 2023 and recaptured 16 months later by a commercial longline vessel near Maupiti Island, French Polynesia, a minimum swim of 3,213 nautical miles (Figure 12). When tagged, this fish was estimated to weigh 55 kg but no size was recorded at recapture. Another long distance journey was undertaken by a Black Marlin tagged off Seal Rocks NSW, also in February 2023, and recaptured by a longline vessel south of the eastern tip of Papua New Guinea (PNG) 79 days later. That fish was estimated at 40 kg on release and weighed 58 kg at recapture. The third distant water recapture of a Black Marlin was a fish tagged off Gibber Reef NSW in March 2023 and recaptured 107 days later, most likely by an artisanal fisherman, just off the island of Malaita in the Solomon Islands.

FIGURE 12. LONG-DISTANCE MOVEMENTS OF BLACK MARLIN AWAY FROM AUSTRALIA RECORDED IN 2022/23



During the 2022/23 season, the longest recorded distance travelled by a Black Marlin along the eastern Australian coast was 1,007 nautical miles. The marlin was tagged off Oyster Reef, northern QLD in August 2022 and recaptured 200 days later at Gibber Reef, NSW (Figure 13). This fish was estimated at 15 kg at release and 27 kg at recapture.

The Black Marlin at liberty for the longest time was tagged off the Gold Coast QLD in November 2020 and recaptured off Bermagui NSW in March 2023, 2 years 3 months later. When released it was estimated at 70 kg and at recapture, at 100 kg.



Image: Mitch Lockie and Chrisian Bosschieter recaptured and re-released this small Black Marlin off Southwest Rocks NSW in October 2022. Records showed it had been originally tagged inside Fraser Island QLD 85 days earlier at an estimated size of just 10 kg.

Of the other Black Marlin recaptured along the east coast, six had been at liberty for more than one year, and nine were at liberty for between three and 11 months. Interestingly, 13 of the remaining recaptured fish had been at liberty for less than one week, with seven of those recaptured the same day they were released.

FIGURE 13. LONG-DISTANCE MOVEMENTS OF BLACK MARLIN ALONG THE EASTERN AUSTRALIAN COAST RECORDED IN 2022/23



BLUE MARLIN

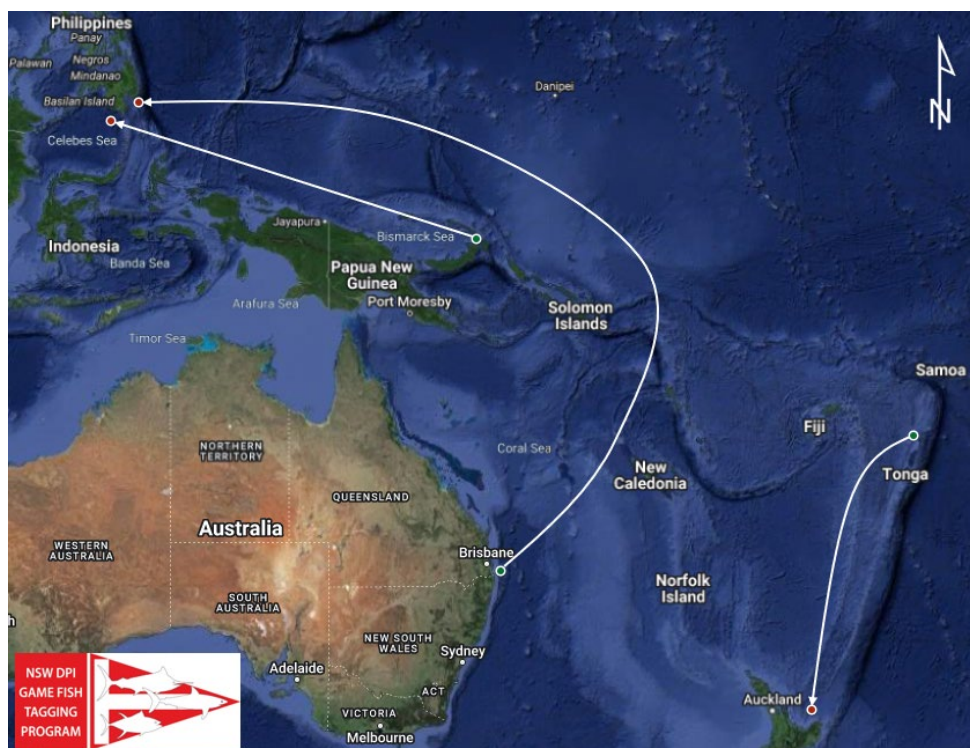
There were four Blue Marlin recaptures reported during 2022/23, three of which had moved considerable distances (see Figure 14). The furthest distance travelled was by a fish tagged off the Gold Coast (QLD) and recaptured by a commercial vessel in the Daveo Gulf in the eastern Philippines. The straight-line distance between those two points is just over 2,600 nautical miles, but that path cuts through northern Australia and West Papua. Therefore, skirting land masses, the shortest distance this fish could have travelled is in fact close to 3,000 nautical miles. When tagged, the Blue Marlin was estimated at 140 kg and at recapture 16 months later, weighed 160 kg.

Another Blue Marlin was recaptured in the Philippines by a commercial vessel after 2 years and 10 months at liberty. That fish was tagged off Rabaul (PNG) in November 2021 and moved over 1,856 nautical miles to the west where it was recaptured off the Moro Gulf. The fish was estimated at 60 kg at release and at recapture, weighed 170 kg.

Interestingly, these two Blue Marlin are the 5th and 6th to be recaptured off the eastern Philippines in the past three years. Three of the previous four had been tagged off Lae (PNG) and the fourth, off Rabaul (PNG).

The third long distance Blue Marlin recapture this year was originally tagged in Tongan waters, near the island of Vava'u, back in July 2018. In March 2023, exactly 1,700 days (4 years 8 months) later it was recaptured off the Bay of Plenty, New Zealand. When tagged, it was estimated at 80 kg and had grown to an estimated 140 kg at recapture.

FIGURE 14. MOVEMENTS BY RECAPTURED BLUE MARLIN RECORDED IN 2022/23



STRIPED MARLIN

Five Striped Marlin recaptures were recorded in 2022/23, all initially released off NSW between Coffs Harbour and Eden. Four of these were recaptured along the NSW coast after periods at liberty of between 24 and 68 days, having moved 21 to 215 nautical miles. The fifth fish set a new mark for the Program – the first Striped Marlin tagged off Australia to be recaptured in New Zealand waters – even though nearly 35,000 have been tagged and 289 recaptured since the Program commenced in 1973. On the other side of the Tasman, the New Zealand (NZ) tagging program has seen over 28,000 Striped Marlin tagged and 111 recaptured, with four or five having crossed the Tasman to Australian waters, so the recording of this one fish crossing in the opposite direction is an important event. The fish in question was tagged off Port Macquarie (NSW) in late December 2022 and recaptured off Hokianga (northern NZ) by a recreational angler 113 days later (see Figure 15). At release, it had been estimated at 85 kg and at recapture, it was boated and weighed in at 104.6 kg.

SOUTHERN BLUEFIN TUNA

A total of 23 tagged Southern Bluefin Tuna (SBT) were recaptured in 2022/23, compared with just five the previous year and six in 2020/21. The big increase this year is most likely due to the commercial ranching fishery operating off South Australia (SA) resuming full operations post Covid-19 disruptions. That fishery is the primary source of tag returns of SBT. Of the 23 recaptures, 19 were reported by this fishery. Two other recaptures were reported by commercial longline vessels (one Australia, one New Zealander) and two by recreational anglers.

The furthest distance moved by a tagged SBT this season was 1,104 nautical miles for a fish tagged off Recherche Bay (TAS) and recaptured by a longliner off Dunedin (NZ) (Figure 15). That fish was estimated at 15 kg on release and weighed 30 kg on recapture 686 days later. The other longline-caught SBT was tagged off Southport (TAS) and recaptured 383 days (1 year 15 days) later in the Tasman Sea, half way between Australia and New Zealand.

Times-at-liberty for the 19 SBT recaptured by the South Australian commercial ranching fishery ranged from 35 to 942 days (2 years 7 months) (average 1 year 7 months). Nearly all of these had been estimated at less than 10 kg at release and weighed between 12 and 22 kg (dressed) at recapture (Figure 16). It should be noted that times-at-liberty for SBT recaptured and reported by the ranching fishery are somewhat problematic since tagged fish are only reported once the fish are processed, not when they are actually recaptured and penned. This means that the fishery reports a date range of when a recaptured fish was likely to have been caught rather than an actual date.

There were two recreationally recaptured SBT of considerable interest because of their size at release. Both were tagged off Port MacDonnell (SA) from the same vessel nearly a year apart, estimated at 95 kg and 110 kg respectively. The first was recaptured 74 days later in the same vicinity, weighing in at 92 kg, while the second was recaptured 60 days after release, again in the same vicinity and estimated at the same weight of 110 kg.

FIGURE 15. OFFSHORE MOVEMENTS BY TAGGED SOUTHERN BLUEFIN TUNA (WHITE LINES) AND STRIPED MARLIN (RED LINE) IN 2022/23

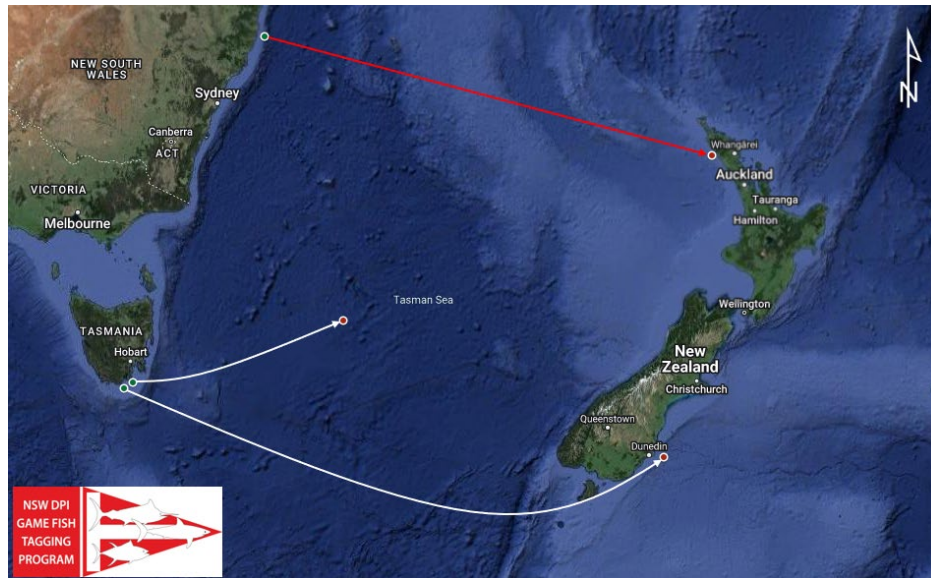
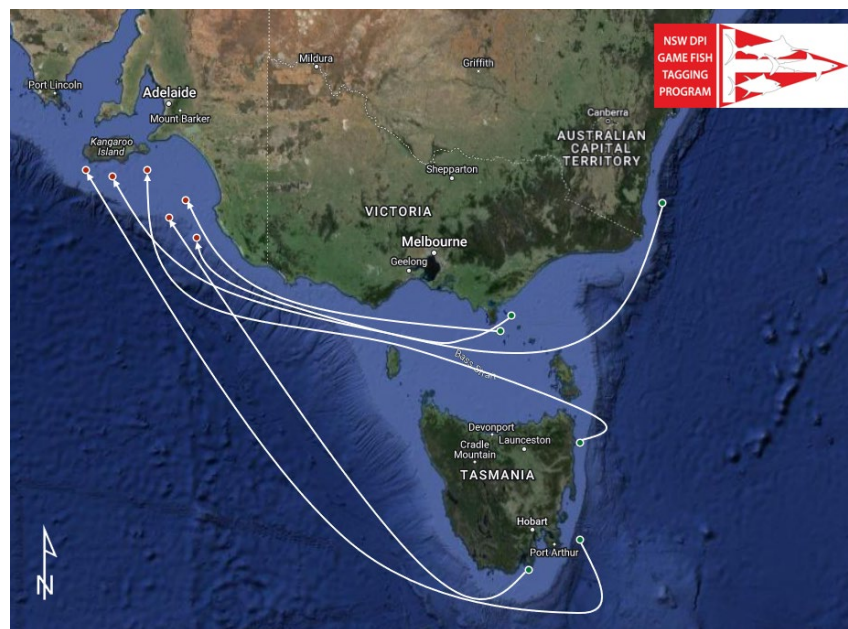


FIGURE 16. MOVEMENTS OF SOUTHERN BLUEFIN TUNA TAGGED IN NEW SOUTH WALES, VICTORIA AND TASMANIA AND RECAPTURED IN SOUTH AUSTRALIA, 2022/23



SAILFISH

Even though there have been more than 560 tagged Sailfish recaptured since the commencement of the tagging program, very few have been recorded as moving any appreciable distance. This year continued that pattern with four recaptures reported – three moving apparent distances of less than 10 nautical miles, and the other, just 26 nautical miles. The latter fish was tagged off Exmouth (WA) and had been at liberty for nearly six months. The other three had all been tagged off Weipa in the Gulf of Carpentaria and were recaptured after 416 days (1 year 51 days), 599 days (1 year 8 months) and 1,421 days (3 years 11 months).

YELLOWTAIL KINGFISH

Over the life of the Program, recapture rates of tagged Yellowtail Kingfish have always ranked very highly compared with other species. The overall recapture rate stands at 8.06%, with the species accounting for 36.6% of all recaptures, even though it represents 8.5% of total numbers of fish tagged. As a result of this relatively high recapture rate, every year, many reports of tagged kingfish are received, always adding incrementally to our knowledge of the species, but often providing surprises as well.

During the 2022/23 season, 134 recaptures of tagged kingfish were reported, 75 fewer than the previous year. Times at liberty ranged from zero days (10 fish were recaptured the day of their release) to 2,928 days (8 years 6 days). The latter fish had been tagged off Coffin Bay (SA) and recaptured near Port Augusta (SA) at the head of Spencers Gulf, a distance of 151 nautical miles. Twenty-seven other recaptured kingfish had been at liberty for more than 1,000 days (2 years, 9 months), 22 of which were tagged in SA waters, the other five off NSW.

The longest straight line distance recorded for a tagged kingfish in 2022/23 was by a fish tagged off Greenly Island (SA) and recaptured 3 years 7 months later off Mowarry Point, southern NSW. The minimum distance moved by any fish recaptured within this Program is normally the distance of the straight line between the release and recapture points. In this case, that distance is 754 nautical miles, however, when land masses are taken into account, the minimum distance travelled by this fish around the coast, if it passed through Bass Strait, would have been approximately 870 nautical miles. In fact, using similar calculations, two other fish would have covered a greater distance. Both were tagged off Port Augusta (SA) and both were recaptured at Seal Rocks (NSW), a distance around the coast of just over 1,200 nautical miles (Figure 17a).

Movements of tagged kingfish from SA to NSW have now been regularly recorded for a multiple years, indicating that fish from both areas form a single stock. This is further supported by the fact that the fish making these long journeys are larger, adult fish in the 12 to 25 kg size range. It is possible therefore that these recaptures represent part of a spawning migration of SA kingfish into NSW waters.

In contrast to these longer distance movements, 45% of the recaptured kingfish this year were recaptured at their release locations, 17% had moved between 1 and 10 nautical miles and 16.4% had moved between 11 and 100 nautical miles. Of the remaining fish that had moved more than 100 nautical miles (30 fish), 22 had been tagged in SA waters, 7 in NSW waters and one in Victorian (VIC) waters.

Two other recaptures of kingfish this year are also worthy of mention. The first was a fish tagged off Mallacoota (VIC) in May 2022 and recaptured by a commercial vessel fishing on the Gascoyne Seamount 300 nautical miles east of Batemans Bay (NSW) (see Figure 17b). It had been at liberty for 1 year and 14 days, and increased in length from 52 to 80 cm. This was the second kingfish to be recaptured at this location, the first having been both tagged and recaptured over the Seamount during the 2021/22 season. The second was a kingfish recaptured not once but twice. That fish, measuring 105 cm, was originally tagged in January 2022 off Port Welshpool Victoria, and caught again 6 days later in the same area and re-released. Fast forward another 309 days and the fish was recaptured a second time, on this occasion by a spearfisherman who took the fish off Sydney – 385 nautical miles north of its initial release location.



Image: The original release (top left), first recapture (top right) and second recapture (lower) of this well-travelled Yellowtail Kingfish.

FIGURE 17A. MOVEMENTS OF YELLOWTAIL KINGFISH FROM SOUTH AUSTRALIA AND VICTORIA TO NEW SOUTH WALES, RECORDED DURING 2022/23

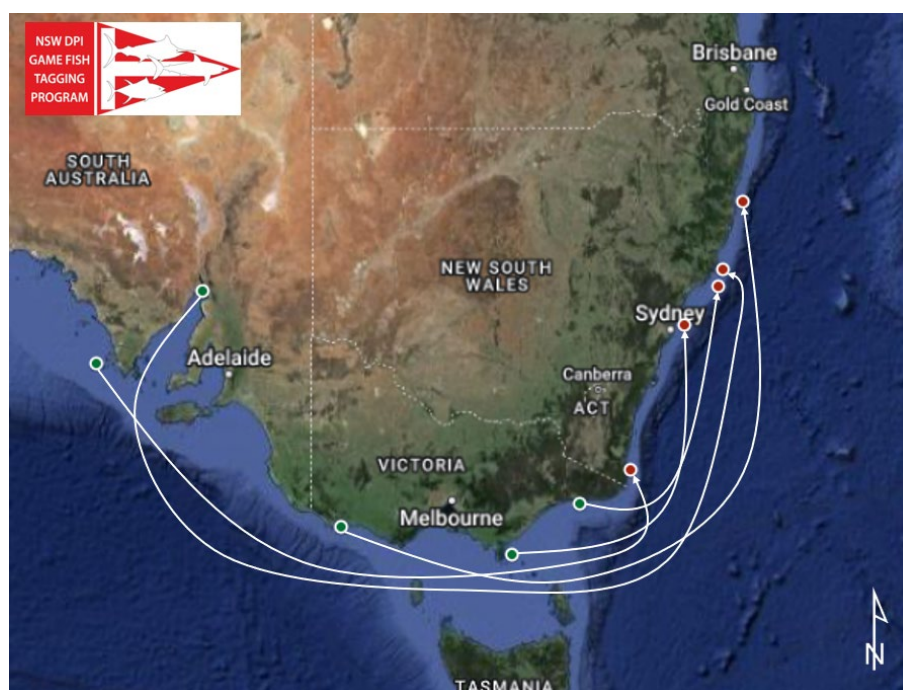
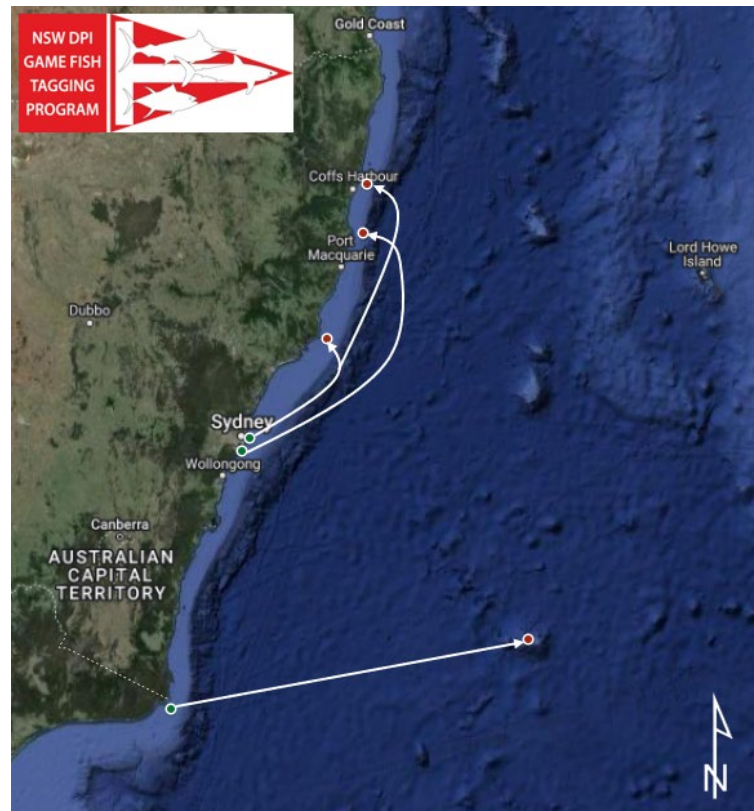


FIGURE 17B. LONG DISTANCE MOVEMENTS OF YELLOWTAIL KINGFISH, SOUTH EASTERN AUSTRALIA, 2022/23



SAMSON FISH

Following a trend in recent years, tagged Samson fish continued to be recaptured after extensive times at liberty, but showing very little apparent movement. This year, five more were recaptured, four in South Australia and one in New South Wales. All of the South Australian Samson fish had been tagged near islands off the Lower Eyre Peninsula (SA) and recaptured within 9 miles of their release points after periods of 2 years, 2 years 9 months, 5 years 11 months and 6 years 6 days. When tagged, these fish were estimated at 6 to 10 kg and at recapture, were 12 to 25 kg in size. The fifth recapture was of a Samson fish tagged off the Sandon River NSW and recaptured 18 months later just 7 nautical miles away. That was a smaller fish, estimated at 2.4 kg at release and around 5 kg at recapture.

COBIA

The Cobia is a recognized gamefish, being the only species in its own genus, *Rachycentron*. While not commonly tagged for the Program, this year 52 were released and seven recaptures reported – a recapture rate of 19%, which is very high compared with most other species, including the next highest rate of 8% for Yellowtail Kingfish. Tagging locations for Cobia ranged from Yamba (NSW) to a spate of small Cobia released in Lake Macquarie (NSW).

One of the recaptures of particular interest was a fish released off South West Rocks (NSW) and recaptured 122 days later at Double Island Point (QLD). This was a large fish, estimated at 25-30 kg at release, and weighing in at 27.8 kg when recaptured. It set a record for the Program, for the furthest distance moved by a Cobia (300 nautical miles) out of 35 recaptures from 1,405 fish tagged.



Image: Russell Cleaver holds a large cobia prior to releasing it off South West Rocks NSW in July 2022. The fish was recaptured 122 days later off Double Island Point QLD and weighed 27.8kg.

SHARKS

A total of 14 tagged sharks were recaptured in 2022/23. These consisted of five Tiger Sharks, three Bronze Whalers, two gummy sharks, two School Sharks, a Bull Shark and an unspecified Whaler Shark.

The furthest distance moved by any of these sharks was by a School Shark released off the tip of Yorke Peninsula SA and recaptured 667 nautical miles away, off Scamander, northeastern Tasmania. This shark had also been at liberty for the second longest period of any recaptured shark this year – 6 years, 10 months. During that time it had grown from an estimated 20 kg to 28 kg, reinforcing evidence for slow growth rates for this species. The longest time at liberty was recorded for a recaptured Whaler Shark (species not specified) that was tagged off Burrum Heads QLD in May 2015 and recaptured just 23 nautical miles away almost exactly 8 years later.

Another interesting recapture was a Bull Shark tagged inside Sydney Harbour in March 2022. A week shy of one year later, it was recaptured in virtually the same location suggesting that it had not moved during that time. However, studies by DPIRD researchers using acoustic and satellite tags have shown that bull sharks released in Sydney Harbour often make extensive movements well to the north, even as far as the Great Barrier Reef, before returning to the Harbour on an annual basis. Details for these and all other recaptured sharks are listed in Appendix I.

RECAPTURES WITH MISSING TAG CARDS

Each year, the Program receives notification of recaptures of some fish for which no tag card has been received. In many cases, the missing card is eventually located, but in some instances, efforts fail to locate the missing cards. This disappointedly means potentially valuable information is lost. This year, we received recaptured details on 17 fish for which no matching tag card had been received at the time of writing this report. These are shown in Table 4 below in the hope that the cards might be located, and to encourage the return of any completed tag cards, regardless of when the fish were released.

We ask you to take a careful look at Table 4, and if you have tagged any of the species listed at any time, please check to make sure there are no completed tag cards with matching numbers sitting in a drawer on a boat or at home. Note that the recapture location may be very different from where a fish was originally tagged.

TABLE 4. DETAILS OF FISH RECAPTURED IN 2022/23 FOR WHICH NO TAG CARD HAS SO FAR BEEN RECEIVED

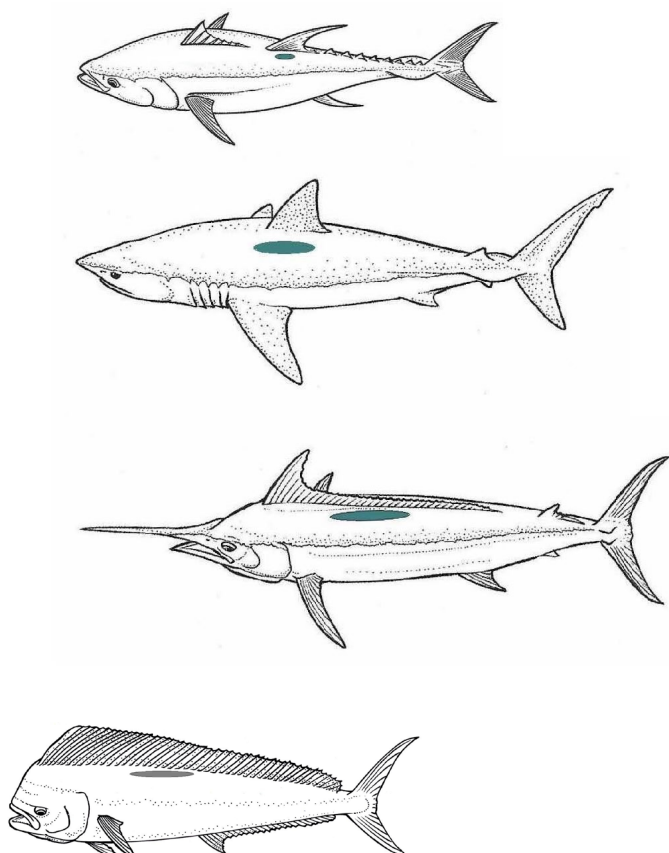
Tag No.	Species	Where recaptured	Date Recaptured	Recap Length (cm)	Recapt Weight (kg)
B178527	BLACK MARLIN	GIBBER REEF (PT STEPHENS) NSW	2/2/2023		30
B186523	BLACK MARLIN	TATHRA CANYONS (NSW)	20/2/2023	270	80
B183023	BLACK MARLIN	MOOLOOLABA (10 MILE REEF)	24/3/2023	120	18
A394919	DOLPHINFISH	BOTANY BAY WIDE FAD (NSW)	3/3/2023	71	
S261222	MAKO SHARK	NORAH CANYON SOUTH (NSW)	17/6/2023		120
A627370	STH BLUEFIN TUNA	CAPE HART (16NM SE) (SA)	28/3/2023		13.4
A668623	SPANISH MACKEREL	WOOLI (WILSON HEAD 2NM E) (NSW)	17/3/2023	105	8.6
B156669	STRIPED MARLIN	GREEN CAPE (10NM E) (NSW)	27/3/2023		75
B150119	STRIPED MARLIN	BERMAGUI (BAIT HOLE 11 NM SE) (NSW)	29/3/2023	180	80
B144373	STRIPED MARLIN	SYDNEY TRENCH (NSW)	17/4/2023		110
A663452	YELLOWTAIL KINGFISH	SOUTH WEST ROCKS (FISH ROCK) (NSW)	18/9/2022	98	7
A632883	YELLOWTAIL KINGFISH	PORT AUGUSTA (OUTLET CHANNEL) (SA)	28/9/2022	148	32
A646811	YELLOWTAIL KINGFISH	PORT AUGUSTA (OUTLET CHANNEL) (SA)	9/10/2022	147	27.5
A647729	YELLOWTAIL KINGFISH	PORT AUGUSTA (OUTLET CHANNEL) (SA)	11/10/2022	140	
A655171	YELLOWTAIL KINGFISH	12 MILE REEF (NSW)	12/10/2022	90	7.5
A664084	YELLOWTAIL KINGFISH	SOUTH WEST ROCKS (FISH ROCK) (NSW)	19/10/2022	82	4
A657121	YELLOWTAIL KINGFISH	12 MILE REEF (NSW)	19/10/2022	91	5.5
A630248	YELLOWTAIL KINGFISH	COFFIN BAY (SA)	6/11/2022	135	
A650359	YELLOWTAIL KINGFISH	SOUTH HEAD (NSW)	10/11/2022	85	
A663455	YELLOWTAIL KINGFISH	SOUTH WEST ROCKS (FISH ROCK) (NSW)	20/11/2022	103	9
A639457	YELLOWTAIL KINGFISH	PORT AUGUSTA (OUTLET CHANNEL)	20/11/2022	138	
A664083	YELLOWTAIL KINGFISH	SOUTH WEST ROCKS (FISH ROCK) (NSW)	23/11/2022	92	5
A639022	YELLOWTAIL KINGFISH	EDITH BREAKER (SEAL ROCKS) (NSW)	25/11/2022	110	11
A646774	YELLOWTAIL KINGFISH	PORT AUGUSTA (OUTLET CHANNEL) (SA)	27/11/2022	134	
A510425	YELLOWTAIL KINGFISH	CABBAGE PATCH (SA)	22/12/2022	117	13
A669554	YELLOWTAIL KINGFISH	CLARKE ISLAND (SYDNEY HARBOUR) (NSW)	11/6/2023	48	
A670106	YELLOWTAIL KINGFISH	SOUTH WEST ROCKS (FISH ROCK) (NSW)	26/6/2023	97	6.2

SCIENTIFIC VALUE OF THE GAME FISH TAGGING PROGRAM

Data accumulated in the Tagging Program is often sought for a broad range of studies into many aspects of the biology and fisheries of pelagic fishes. **Appendix III** shows the impressive list of reports, university theses and peer-reviewed scientific papers that have utilised data from the Program in some way. It is not just information derived from recaptures of tagged fish that makes the Program so valuable. Understanding changes in availability of fish or fishing activities of the recreational sector would not be possible in the absence of the Program. Thus, the tagging database is widely recognised as a vital source of information on long term trends in the relative abundance of pelagic fish, and is used wherever possible for studies on changes in catches in relation to historic environmental variables such as temperature, chlorophyll, sea height and El Niño/La Niña cycles. Such studies' reports and publications are also included in Appendix III.

TAGGING TIPS

RECOMMENDED TAGGING AREAS



HOW TO TAG LARGE GAME FISH

- Once the angler brings the fish within range, the fish should be traced and led alongside the boat so that it presents a broad tagging target. It is usually best to keep the boat moving slowly forwards to enable better control of the fish.
- Once the fish is in position for tagging, the person handling the tag pole should take position behind the person tracing the fish to allow for a clear tag shot.

- An attempt to apply the tag should only be made if the fish is calm or subdued. The tag should be placed towards the middle of the fish, well above the lateral line towards the dorsal fin.
- For Billfish and most sportfish, the fish should be tagged with a firm, well-aimed stroke—simply place the tag against the fish's flank and push. Do not stab. Sharks will require a firm jab in order to penetrate their tough skin.
- Once the tag has been placed, remove the hook if possible (a de-hooker can facilitate this) or cut the trace close to the fish's mouth.
- Revive any fish that appear to be exhausted or are struggling to remain upright in the water. A commonly used approach for Billfish is to hold the fish firmly by its submerged bill whilst the boat moves forwards at 2 to 3 knots. This ensures a good flow of water over the fish's gills.
- The fish should only be released when it shows strong signs of life and displays improved skin colour, which may take several minutes or more. Exercise caution, especially in rough weather. Alternatively, use a snooter. This is a safe and effective tool for reviving Billfish.
- Fill out the tag card immediately and return to DPIRD (or your fishing club recorder) as soon as possible, otherwise tagging is of no value.

HOW TO TAG SMALL GAME/SPORT FISH

Smaller pelagic species may be removed from the water before tagging. This enables improved accuracy of tagging and may simplify hook removal. Often holding the fish on its back will lessen its 'flapping'. Try to prevent the fish damaging itself on hard, hot, or dry surfaces. A wet foam mat or similar is ideal (or a wet towel will suffice) for on-boat tagging.

Pelagic tags should be inserted using a hand tagger or short pole since they are designed to lock behind the bony structures of the dorsal fin or second dorsal fin in order to stay in position. Carefully insert the tag into the fish's back, close to the base of the fin and angled in so that it passes between the bony structures at the base of the fin. Try to insert the tag at an angle of at least 45° to reduce water friction and then twist the tag pole before removing it. In effect, you should be trying to hook the barb of the tag around one of these spines, which then locks the tag in place.

TAGGING AND IMPROVED SURVIVAL TIPS

Elect one crew member as the person in charge of the tagging equipment, to ensure that:

- The number of the tag in position on the tag pole matches that on the tag card
- Details of the tagging are promptly recorded on the card
- The card is handed to the fishing club recorder or mailed to DPIRD as soon as possible.
- Use non-offset circle hooks whenever possible when using live or dead baits. These hooks minimise deep hooking, foul hooking and bleeding and promote the survival of tagged fish.
- Keep your tag cards in an orderly bundle. This will help to ensure that tags do not become loose and fall out of their corresponding tag card.
- Load your tagging pole with a tag before you hook a fish to ensure that it is attached properly and is readily available whenever you wish to tag a fish.

- Check the length of your Billfish tag applicator 75mm is the optimal length for most Billfish —this ensures that the tag is placed at the correct depth and reduces the risk of the tag being shed by the fish.
- Do not attempt to tag very active fish, especially if the fish is jumping at the side of the boat. Poor tag placement can injure fish or result in the tag being shed. The recommended tagging areas are shown below. It is better to release the fish without tagging, if accurate tag placement is not possible.

ESTIMATING THE SIZE OF TAGGED FISH

This may be done by estimating the weight of the fish or by measuring the fish when it is in, or alongside the boat. If the fish is less than a metre in length it may be carefully brought on board and measured using a standard measuring tape. However, larger fish should remain in the water. If you estimate the size of the fish (especially fish weight), get a consensus from all the crew immediately after release, and record immediately (first impressions are always best!).

For measuring length of fish in the water, it is best to rig up a simple tape measure. It helps if it is flexible, and at least 4 metres long. Attach a tennis ball to the zero end and when a fish is alongside, or being held at the back of the boat, float the tennis ball to the tail fork and get a measurement to the fish's snout, or to the tip of the lower jaw for Billfish. For Billfish, it is important that the recorded measurement should state where the fish was measured from and to (i.e. lower jaw to tail fork length or total length - tip of bill to end of tail).

REPORTING A PREVIOUSLY TAGGED FISH

If an earlier tag is noticed on a fish, should the tag be retrieved and the fish re-tagged, or leave the tag in place? If the tag is well secured and the tag number can be read whilst attached to the fish the fish can be returned after first carefully recording the tag number (taking a clear photo is a good way to record the number) and measuring/and or estimating the weight of the fish. If it is difficult to read the tag or the fish is not enabling you to easily see the tag number, cut off the tag and replace with another if you have tagging equipment on board.

If the fish is small enough to measure, then this should be done, ideally from the tip of the snout to the tip of the tail (or if a Billfish, from the tip of the lower jaw to the tail fork).

One other point regarding reporting recaptures of tagged fish should be kept in mind. In these days of nearly 100% release of Billfish, previously tagged fish are quite often caught and re-released without being able to retrieve the earlier tag. If you do hook and release a fish which has a previous tag in place, you should definitely record the details of the event (even though the tag number is unknown) and report the incident to DPIRD as a genuine recapture. In this way, better statistics on actual recapture rates of Billfish will be able to be maintained.

CONTACT THE PROGRAM

If you would like to contact the game fish tagging Program either to obtain further information on the Program, tags, or to report a recapture directly, call +61 (02) 6691 9602 or email gamefish.tagging@dpi.nsw.gov.au or head to the DPIRD website and find the online reporting form.

ACKNOWLEDGEMENTS

The Game Fish Tagging Program, operated by DPIRD, is generously supported by the NSW Recreational Fishing Trust through funds raised from the Recreational Fishing Licence in that State. We also acknowledge the thousands of anglers, club officials, captains and crew who participate in the Program. Without this continued effort, our knowledge of the biology of pelagic fish would be much the poorer. This report was prepared with the assistance of Dan Bloom, Clay Hilbert, Emma Simpson and Phil Bolton of DPIRD.

APPENDIX I: ALL RECAPTURES OF TAGGED FISH REPORTED IN 2022/23

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
AMBERJACK	18/5/2023	SOUTH WEST ROCKS (BLACK ROCKS)	18	47	W
AUSTRALIAN SALMON	4/2/2023	MERIMBULA	138	183	WSW
AUSTRALIAN SALMON	17/2/2023	MERIMBULA BAY	47	0	NW
BLACK MARLIN	17/2/2023	BERMAGUI (12 MILE REEF)	114	3213	E
BLACK MARLIN	25/2/2023	SEAL ROCKS (3NM NE)	79	1247	NW
BLACK MARLIN	14/8/2022	OYSTER REEF (QLD)	200	1007	SSE
BLACK MARLIN	14/8/2022	OYSTER REEF (2NM W)	97	640	SSE
BLACK MARLIN	18/11/2020	GOLD COAST (SPOT X)	844	548	SSW
BLACK MARLIN	25/10/2022	ROONEYS POINT	103	520	SW
BLACK MARLIN	12/11/2022	FRASER ISLAND (BREAKSEA SPIT 3NM E)	91	484	S
BLACK MARLIN	11/11/2022	FRASER ISLAND (BREAKSEA SPIT NTH)	100	472	S
BLACK MARLIN	30/10/2022	WATHUMBA (PLATYPUS BAY) FRASER IS	98	457	S
BLACK MARLIN	7/10/2022	ROONEYS POINT	85	362	S
BLACK MARLIN	22/12/2022	CAPE MORETON (9 NM N)	35	349	SW
BLACK MARLIN	14/12/2022	CAPE MORETON TRENCH	64	329	SW
BLACK MARLIN	11/11/2022	FRASER ISLAND (BREAKSEA SPIT NTH)	128	224	SE
BLACK MARLIN	14/1/2023	PORT STEPHENS (CAR PARK 2NM E)	14	174	SSW
BLACK MARLIN	14/11/2022	ROONEYS POINT	130	106	SE
BLACK MARLIN	20/3/2023	FINGAL HEAD (11NM E)	11	100	NW
BLACK MARLIN	25/1/2023	THE WHALE (LONG REEF) SYDNEY	36	91	NNE
BLACK MARLIN	13/11/2022	ROONEYS POINT (FRASER ISLAND)	8	90	S
BLACK MARLIN	3/1/2023	GOLD COAST (25 FATH E)	73	82	N
BLACK MARLIN	9/1/2023	SOUTH WEST ROCKS (TRIAL BAY)	75	81	ESE
BLACK MARLIN	9/1/2023	POINT PLOMER (4 NM E)	25	80	SSW
BLACK MARLIN	13/1/2023	MOOLOOLABA WIDE FAD	13	78	S
BLACK MARLIN	16/12/2022	CAPE MORETON TRENCH	192	50	SSE
BLACK MARLIN	19/11/2022	CAPE MORETON TRENCH	76	26	NNW
BLACK MARLIN	10/9/2022	FRASER ISLAND (SANDY CAPE 2NM E)	40	15	SW
BLACK MARLIN	18/2/2023	URALLA REEF (PORT STEPHENS)	1	14	ENE
BLACK MARLIN	4/2/2023	BOOMERANG POINT (1NM E)	25	11	SSW
BLACK MARLIN	1/1/2023	SEAL ROCKS (3NM NE)	60	11	SW
BLACK MARLIN	3/2/2023	GIBBER REEF (EAST)	33	11	NNW
BLACK MARLIN	11/11/2022	FRASER ISLAND (BREAKSEA SPIT 4 NM E)	1	11	NW
BLACK MARLIN	4/2/2023	GIBBER REEF (2NM N)	27	8	NE
BLACK MARLIN	11/11/2022	FRASER ISLAND (BREAKSEA SPIT NTH)	2	7	S
BLACK MARLIN	18/6/2023	FRASER ISLAND (SANDY CAPE)	6	4	N
BLACK MARLIN	8/3/2023	GIBBER REEF (2NM N)	1	3	SSW
BLACK MARLIN	18/3/2023	MOOLOOLABA (18 MILE)	6	3	ESE

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
BLACK MARLIN	21/2/2022	GIBBER REEF (PT STEPHENS)	349	3	W
BLACK MARLIN	24/2/2023	PORT STEPHENS (GIBBER REEF)	5	3	NNE
BLACK MARLIN	31/5/2023	FRASER ISLAND (SANDY CAPE 1NM NE)	11	0	NW
BLACK MARLIN	2/3/2023	MOOLOOLABA (8 MILE REEF)	9	0	NW
BLACK MARLIN	24/3/2023	MOOLOOLABA (18 MILE)	17	0	NW
BLACK MARLIN	10/3/2023	BERMAGUI (12 MILE REEF)	13	0	NW
BLACK MARLIN	3/2/2023	GIBBER REEF (PT STEPHENS)	0	0	NW
BLACK MARLIN	28/1/2023	GIBBER REEF (PT STEPHENS)	5	0	NW
BLACK MARLIN	11/11/2022	ROONEYS POINT	28	0	NW
BLACK MARLIN	28/2/2023	GIBBER REEF (PT STEPHENS)			
BLACKTIP SHARK	24/11/2022	MACLEAY RIVER	111	4	NW
BLUE MARLIN	11/4/2021	GOLD COAST (KINK)	477	2614	NW
BLUE MARLIN	12/11/2019	RABAU (ST GEORGES CHANNEL)	1039	1856	WNW
BLUE MARLIN	20/7/2018	VAVA'U (EAST)	1700	1096	SE
BLUE MARLIN	8/4/2023	LAE (BRAVO 12) PNG	8	0	NW
BRONZE WHALER	11/6/2022	FORRESTER'S BEACH	290	54	NNE
BRONZE WHALER	28/12/2022	GRANITE ISLAND	68	31	SSW
BRONZE WHALER	10/12/2022	MARION BAY (SA)	75	7	E
BULL SHARK	12/3/2022	SYDNEY HARBOUR (YURULBIN POINT)	358	1	E
COBIA	12/7/2022	SOUTH WEST ROCKS (WRECK 140M)	122	300	NW
COBIA	23/3/2022	NORTH SOLITARY ISLAND	403	25	NE
COBIA	19/5/2023	LAKE MACQUARIE (PULBAH ISLAND)	7	2	N
COBIA	17/5/2023	LAKE MACQUARIE (WANGI WANGI BAY)	27	1	W
COBIA	10/4/2023	PULBAH ISLAND (LAKE MACQUARIE)	8	0	NW
COBIA	24/2/2023	SOUTH WEST ROCKS (FISH ROCK)	0	0	
COBIA	10/4/2023	PULBAH ISLAND (LAKE MACQUARIE)	37	0	NW
DOLPHINFISH	26/2/2023	PORT STEPHENS (MINE FIELD)	51	86	SSW
DOLPHINFISH	13/1/2022	BOTANY BAY WIDE FAD	381	0	NW
DOLPHINFISH	4/2/2021	BOTANY BAY WIDE FAD	724	0	NW
DOLPHINFISH	11/1/2023	HAT HEAD FAD	10	0	NW
GOLDEN TREVALLY	24/10/2021	DAMPIER (EAGLEHAWK ISLAND)	287	0	NW
GUMMY SHARK	12/10/2022	APOLLO BAY (VIC)	210	11	SSW
GUMMY SHARK	26/11/2022	FRANKLIN CHANNEL	3	8	NNE
SAILFISH	21/3/2022	EXMOUTH (STH MUIRON IS WIDE)	171	26	WSW
SAILFISH	24/3/2021	WEIPA (ALBATROSS BAY 15NM)	599	8	NE
SAILFISH	11/8/2021	WEIPA (9 MILE REEF)	416	5	W
SAILFISH	20/7/2019	WEIPA (FALSE PERA HEAD 15NM W)	1421	4	SW
SAMSON FISH	6/3/2020	ROCKY ISLAND (SA)	1023	9	NE
SAMSON FISH	5/10/2021	SANDON (4NM E)	534	7	ESE

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
SAMSON FISH	12/1/2017	ROCKY ISLAND (SA)	2197	2	NNE
SAMSON FISH	25/3/2017	GREENLY ISLAND (SA)	2167	1	SSW
SAMSON FISH	14/2/2021	CABBAGE PATCH (SA)	711	0	NW
SCHOOL SHARK	18/4/2016	PONDALOWIE (SA)	2498	667	ESE
SCHOOL SHARK	7/7/2019	STREAKY BAY (SA)	1325	26	NNW
SOUTHERN BLUEFIN TUNA	2/5/2021	PORT MACDONNELL (5NM S)	635	1223	NNE
SOUTHERN BLUEFIN TUNA	22/5/2021	RECHERCHE BAY (5NM E)	686	1104	SE
SOUTHERN BLUEFIN TUNA	28/4/2022	PORT MACDONNELL (10NM SE)	396	865	ESE
SOUTHERN BLUEFIN TUNA	4/6/2022	EAGLEHAWK NECK (18 NM E)	362	635	WNW
SOUTHERN BLUEFIN TUNA	13/2/2023	BURNIE (3NM NNW)	104	590	SE
SOUTHERN BLUEFIN TUNA	25/5/2022	CLOUDY BAY (EAST)	256	566	NW
SOUTHERN BLUEFIN TUNA	28/10/2021	MERIMBULA (17 NM E)	444	557	SW
SOUTHERN BLUEFIN TUNA	18/6/2020	PORT WELSHPOOL (10NM S)	942	472	NW
SOUTHERN BLUEFIN TUNA	21/5/2022	SOUTHPORT (TAS)	383	424	ENE
SOUTHERN BLUEFIN TUNA	26/6/2021	ST HELENS (PULFERS BANK)	607	401	NNW
SOUTHERN BLUEFIN TUNA	26/6/2021	ST HELENS (PULFERS BANK)	607	401	NNW
SOUTHERN BLUEFIN TUNA	2/5/2021	EAST MONCOEUR ISLAND (2NM S)	655	400	NW
SOUTHERN BLUEFIN TUNA	22/5/2022	PORTLAND (10NM S)	240	378	WNW
SOUTHERN BLUEFIN TUNA	18/6/2022	PORT MACDONNELL (10NM SE)	205	334	WNW
SOUTHERN BLUEFIN TUNA	19/5/2022	PORT MACDONNELL (6NM S)	233	328	WNW
SOUTHERN BLUEFIN TUNA	18/6/2022	PORT MACDONNELL (5NM S)	232	214	WNW
SOUTHERN BLUEFIN TUNA	4/4/2022	VICTOR HARBOUR (7 MILE REEF)	431	191	W
SOUTHERN BLUEFIN TUNA	19/11/2022	PORT MACDONNELL (15NM S)	35	190	NW
SOUTHERN BLUEFIN TUNA	2/5/2021	PORT MACDONNELL (5NM S)	635	185	NW
SOUTHERN BLUEFIN TUNA	9/4/2022	CABBAGE PATCH (SA)	302	163	SE
SOUTHERN BLUEFIN TUNA	21/5/2022	PORT MACDONNELL (15NM S)	239	100	NW
SOUTHERN BLUEFIN TUNA	11/5/2022	PORT MACDONNELL (10NM SE)	74	7	WNW
SOUTHERN BLUEFIN TUNA	3/4/2023	PORT MACDONNELL (5NM S)	60	2	WNW
SPANISH MACKEREL	16/8/2019	DAMPIER (COD BANK)	1071	15	WSW
SPANISH MACKEREL	15/1/2023	CALOUNDRA (12 MILE REEF)	12	1	N
STRIPED MARLIN	27/12/2022	PORT MACQUARIE (11 NM E)	113	1028	ESE
STRIPED MARLIN	28/12/2022	SOUTH SOLITARY ISL (4NM SE)	28	215	SSW
STRIPED MARLIN	3/1/2023	SHELLHARBOUR (20NM E)	68	47	SSW
STRIPED MARLIN	8/2/2023	BATEMANS BAY CANYONS	24	37	NE
STRIPED MARLIN	28/3/2023	EDEN (19 NM E)	26	21	SSW
TIGER SHARK	3/12/2022	ROCKINGHAM (2NM W)	21	14	N
TIGER SHARK	25/3/2022	SEASCAPES BEACH (WA)	295	13	WNW
TIGER SHARK	29/1/2022	ROCKINGHAM	315	5	ESE
TIGER SHARK	14/1/2023	ROCKINGHAM (3NM W)	1	1	E

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
TIGER SHARK	13/8/2022	DAMPIER (MERMAID STRAIT)	0	0	NW
WHALER SHARK	4/5/2015	BURRUM HEADS (QLD)	2919	23	W
YELLOWTAIL KINGFISH	4/3/2019	GREENLY ISLAND (SA)	1355	754	SE
YELLOWTAIL KINGFISH	1/11/2020	PORT AUGUSTA (OUTLET CHANNEL)	755	745	E
YELLOWTAIL KINGFISH	26/11/2018	PORT AUGUSTA (OUTLET CHANNEL)	1447	738	E
YELLOWTAIL KINGFISH	17/12/2021	PORTLAND (MINERVA REEF)	379	715	ENE
YELLOWTAIL KINGFISH	16/1/2022	PORT WELSHPOOL (LIGHTHOUSE POINT)	309	386	NNE
YELLOWTAIL KINGFISH	13/1/2021	MARLO REEF (VIC)	640	375	NNE
YELLOWTAIL KINGFISH	1/5/2022	MALLACOOTA (STAR BANK)	379	314	NE
YELLOWTAIL KINGFISH	23/9/2021	MIDDLE HARBOUR	369	240	NNE
YELLOWTAIL KINGFISH	4/12/2020	POINT LOWLY (SA)	665	219	NW
YELLOWTAIL KINGFISH	3/9/2022	PORT HACKING RIVER	63	206	NNE
YELLOWTAIL KINGFISH	22/2/2023	PORT AUGUSTA (OUTLET CHANNEL)	-61	198	SSW
YELLOWTAIL KINGFISH	24/4/2021	GREENLY ISLAND (SA)	523	196	ENE
YELLOWTAIL KINGFISH	26/4/2018	HUMMOCKS (SA)	1662	192	NE
YELLOWTAIL KINGFISH	20/5/2022	LONG REEF	116	191	NNE
YELLOWTAIL KINGFISH	28/3/2021	HUMMOCKS (SA)	576	191	NE
YELLOWTAIL KINGFISH	30/7/2022	LONG REEF	40	191	NNE
YELLOWTAIL KINGFISH	28/3/2021	ROCKY ISLAND (SA)	602	187	ENE
YELLOWTAIL KINGFISH	18/10/2021	COFFIN BAY	384	170	NE
YELLOWTAIL KINGFISH	27/10/2019	PORT AUGUSTA (OUTLET CHANNEL)	1072	170	SW
YELLOWTAIL KINGFISH	10/10/2021	PORT AUGUSTA (OUTLET CHANNEL)	390	170	SW
YELLOWTAIL KINGFISH	16/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	343	170	SW
YELLOWTAIL KINGFISH	3/11/2017	COFFIN BAY	1790	170	NE
YELLOWTAIL KINGFISH	20/12/2020	THE PASSAGE (SA)	663	167	NNE
YELLOWTAIL KINGFISH	2/1/2019	THE PASSAGE (SA)	1376	167	NNE
YELLOWTAIL KINGFISH	6/10/2018	COFFIN BAY	1518	152	ENE
YELLOWTAIL KINGFISH	6/11/2015	COFFIN BAY	2590	151	ENE
YELLOWTAIL KINGFISH	1/11/2014	COFFIN BAY	2928	151	ENE
YELLOWTAIL KINGFISH	24/12/2020	THISTLE ISLAND (SA)	716	145	NNE
YELLOWTAIL KINGFISH	13/10/2022	PARRAMATTA RIVER	201	111	NNE
YELLOWTAIL KINGFISH	12/6/2022	MIDDLE HARBOUR	272	106	NNE
YELLOWTAIL KINGFISH	10/5/2022	LONG REEF	82	96	NE
YELLOWTAIL KINGFISH	27/5/2022	MARLEY POINT	185	52	NNE
YELLOWTAIL KINGFISH	14/12/2021	THISTLE ISLAND (SA)	301	50	WNW
YELLOWTAIL KINGFISH	13/11/2022	GOAT ISLAND (SYDNEY)	28	40	SSW
YELLOWTAIL KINGFISH	24/9/2022	PORT AUGUSTA (OUTLET CHANNEL)	51	39	S
YELLOWTAIL KINGFISH	16/1/2022	KILLARNEY (HELEN ROCK)	376	32	NW
YELLOWTAIL KINGFISH	26/11/2022	POINT LOWLY (SA)	30	28	NW

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
YELLOWTAIL KINGFISH	15/9/2022	PORT AUGUSTA (OUTLET CHANNEL)	85	28	S
YELLOWTAIL KINGFISH	24/8/2022	PORT AUGUSTA (OUTLET CHANNEL)	90	28	S
YELLOWTAIL KINGFISH	22/9/2022	PORT AUGUSTA (OUTLET CHANNEL)	59	28	S
YELLOWTAIL KINGFISH	13/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	378	28	S
YELLOWTAIL KINGFISH	27/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	371	28	S
YELLOWTAIL KINGFISH	24/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	363	28	S
YELLOWTAIL KINGFISH	16/11/2020	PORT AUGUSTA (OUTLET CHANNEL)	750	28	S
YELLOWTAIL KINGFISH	19/7/2019	NAMBUCCA HEADS (6NM E)	1142	26	NE
YELLOWTAIL KINGFISH	20/2/2022	PORT WELSHPOOL (WHITE ROCK)	356	20	WSW
YELLOWTAIL KINGFISH	19/2/2023	PORT WELSHPOOL (VIC)	71	16	SSE
YELLOWTAIL KINGFISH	5/8/2022	MAROUBRA (2 NM E)	103	13	N
YELLOWTAIL KINGFISH	29/8/2022	NORTH HEAD (13 NM E)	14	13	W
YELLOWTAIL KINGFISH	2/9/2020	PARRAMATTA RIVER	1010	12	ESE
YELLOWTAIL KINGFISH	28/10/2022	PORT AUGUSTA (SA)	24	11	NW
YELLOWTAIL KINGFISH	26/11/2018	PORT AUGUSTA (OUTLET CHANNEL)	1390	11	NW
YELLOWTAIL KINGFISH	3/10/2017	PORT AUGUSTA (SA)	1822	11	NW
YELLOWTAIL KINGFISH	16/10/2022	TEXAS REEF	191	10	WSW
YELLOWTAIL KINGFISH	8/2/2023	LONG REEF	63	9	S
YELLOWTAIL KINGFISH	10/4/2021	LONG REEF	686	9	SW
YELLOWTAIL KINGFISH	24/6/2022	LONG REEF	169	9	SW
YELLOWTAIL KINGFISH	6/8/2022	SOUTH HEAD	39	6	NE
YELLOWTAIL KINGFISH	23/8/2022	LONG REEF	182	6	SW
YELLOWTAIL KINGFISH	7/8/2021	MIDDLE HARBOUR (SEAFORTH BLUFF)	399	6	NE
YELLOWTAIL KINGFISH	10/3/2020	LONG REEF	1203	6	SSW
YELLOWTAIL KINGFISH	18/7/2022	MINNIE WATER (10NM E)	29	5	WSW
YELLOWTAIL KINGFISH	25/1/2021	LONG REEF	821	5	SSE
YELLOWTAIL KINGFISH	2/10/2022	BLUEFISH POINT	28	4	N
YELLOWTAIL KINGFISH	2/9/2022	BLUEFISH POINT	63	4	N
YELLOWTAIL KINGFISH	27/5/2022	MARLEY POINT	107	4	NW
YELLOWTAIL KINGFISH	18/2/2023	SYDNEY HARBOUR (BOTTLE & GLASS)	34	4	SE
YELLOWTAIL KINGFISH	14/11/2022	LONG REEF	115	3	SW
YELLOWTAIL KINGFISH	6/4/2023	PORT HACKING RIVER	9	3	ESE
YELLOWTAIL KINGFISH	15/10/2022	PARRAMATTA RIVER	69	2	E
YELLOWTAIL KINGFISH	19/9/2022	PORT HACKING (LILLI PILLI)	70	2	E
YELLOWTAIL KINGFISH	12/11/2022	THE BANKS	141	2	W
YELLOWTAIL KINGFISH	29/3/2022	PORT HACKING	182	2	WNW
YELLOWTAIL KINGFISH	28/3/2022	PORT HACKING	271	2	W
YELLOWTAIL KINGFISH	15/9/2019	PARRAMATTA RIVER	1054	2	E
YELLOWTAIL KINGFISH	24/9/2021	PORT HACKING RIVER	307	2	E

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
YELLOWTAIL KINGFISH	18/9/2022	GYMEA BAY	76	1	SE
YELLOWTAIL KINGFISH	28/2/2023	LONG REEF	12	0	NW
YELLOWTAIL KINGFISH	10/11/2022	LONG REEF	4	0	NW
YELLOWTAIL KINGFISH	28/12/2022	SOUTH WEST ROCKS (10NM NE)	0	0	
YELLOWTAIL KINGFISH	23/12/2022	12 MILE REEF	142	0	NW
YELLOWTAIL KINGFISH	2/11/2022	FISH ROCK (SOUTH WEST ROCKS)	0	0	
YELLOWTAIL KINGFISH	23/8/2022	LONG REEF	35	0	NW
YELLOWTAIL KINGFISH	11/8/2022	LONG REEF	12	0	NW
YELLOWTAIL KINGFISH	6/8/2022	SOUTH HEAD	41	0	NW
YELLOWTAIL KINGFISH	6/8/2022	SOUTH HEAD	91	0	NW
YELLOWTAIL KINGFISH	23/8/2022	LONG REEF	84	0	NW
YELLOWTAIL KINGFISH	10/10/2022	LONG REEF	25	0	NW
YELLOWTAIL KINGFISH	24/7/2022	LONG REEF	30	0	NW
YELLOWTAIL KINGFISH	23/7/2022	LONG REEF	35	0	NW
YELLOWTAIL KINGFISH	15/4/2023	MIDDLE HARBOUR	18	0	NW
YELLOWTAIL KINGFISH	6/8/2022	SOUTH WEST ROCKS (FISH ROCK)	0	0	
YELLOWTAIL KINGFISH	17/9/2022	SOUTH WEST ROCKS (FISH ROCK)	0	0	
YELLOWTAIL KINGFISH	20/8/2022	FISH ROCK (SOUTH WEST ROCKS)	0	0	
YELLOWTAIL KINGFISH	4/6/2022	SOUTH WEST ROCKS (FISH ROCK)	146	0	NW
YELLOWTAIL KINGFISH	30/6/2022	SOUTH WEST ROCKS (FISH ROCK)	75	0	NW
YELLOWTAIL KINGFISH	13/8/2022	SOUTH WEST ROCKS (FISH ROCK)	0	0	
YELLOWTAIL KINGFISH	1/8/2022	NORTH SOLITARY ISLAND	45	0	NW
YELLOWTAIL KINGFISH	18/11/2022	FISH ROCK (SOUTH WEST ROCKS)	0	0	
YELLOWTAIL KINGFISH	24/8/2022	PORT AUGUSTA (OUTLET CHANNEL)	90	0	NW
YELLOWTAIL KINGFISH	3/5/2022	LONG REEF	225	0	NW
YELLOWTAIL KINGFISH	1/10/2021	SOUTH WEST ROCKS (FISH ROCK)	405	0	NW
YELLOWTAIL KINGFISH	20/10/2021	SOUTH WEST ROCKS (FISH ROCK)	328	0	NW
YELLOWTAIL KINGFISH	18/10/2021	SOUTH WEST ROCKS (FISH ROCK)	330	0	NW
YELLOWTAIL KINGFISH	5/4/2022	THE PEAK	326	0	NW
YELLOWTAIL KINGFISH	7/8/2021	MIDDLE HARBOUR	354	0	NW
YELLOWTAIL KINGFISH	8/7/2021	12 MILE REEF	619	0	NW
YELLOWTAIL KINGFISH	29/4/2022	LONG REEF	249	0	NW
YELLOWTAIL KINGFISH	10/4/2022	NORTH HEAD (13 NM E)	0	0	
YELLOWTAIL KINGFISH	5/10/2022	PORT AUGUSTA (OUTLET CHANNEL)	11	0	NW
YELLOWTAIL KINGFISH	9/10/2022	PORT AUGUSTA (OUTLET CHANNEL)	0	0	
YELLOWTAIL KINGFISH	23/4/2022	PORT AUGUSTA (OUTLET CHANNEL)	140	0	NW
YELLOWTAIL KINGFISH	13/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	320	0	NW
YELLOWTAIL KINGFISH	28/8/2022	SOUTH SOLITARY ISLAND	26	0	NW
YELLOWTAIL KINGFISH	18/10/2021	12 MILE REEF	384	0	NW

Species	Date tagged	Release location	Days at liberty	Distance moved (nmi)	Direction
YELLOWTAIL KINGFISH	22/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	361	0	NW
YELLOWTAIL KINGFISH	21/11/2021	POINT LOWLY (SA)	361	0	NW
YELLOWTAIL KINGFISH	11/10/2022	PORT AUGUSTA (OUTLET CHANNEL)	24	0	NW
YELLOWTAIL KINGFISH	15/11/2022	PORT AUGUSTA (OUTLET CHANNEL)	1	0	NW
YELLOWTAIL KINGFISH	20/12/2019	12 MILE REEF	1241	0	NW
YELLOWTAIL KINGFISH	5/10/2022	PORT AUGUSTA (OUTLET CHANNEL)	34	0	NW
YELLOWTAIL KINGFISH	8/12/2019	PORT AUGUSTA (OUTLET CHANNEL)	1055	0	NW
YELLOWTAIL KINGFISH	6/11/2022	PORT AUGUSTA (OUTLET CHANNEL)	0	0	NW
YELLOWTAIL KINGFISH	14/10/2022	PORT AUGUSTA (OUTLET CHANNEL)	24	0	NW
YELLOWTAIL KINGFISH	21/10/2021	PORT AUGUSTA (OUTLET CHANNEL)	385	0	NW
YELLOWTAIL KINGFISH	10/11/2019	PORT AUGUSTA (OUTLET CHANNEL)	1110	0	NW
YELLOWTAIL KINGFISH	7/10/2019	PORT AUGUSTA (OUTLET CHANNEL)	1139	0	NW
YELLOWTAIL KINGFISH	2/10/2018	PORT AUGUSTA (OUTLET CHANNEL)	1431	0	NW
YELLOWTAIL KINGFISH	7/11/2020	PORT AUGUSTA (OUTLET CHANNEL)	694	0	NW
YELLOWTAIL KINGFISH	15/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	374	0	NW
YELLOWTAIL KINGFISH	15/11/2021	PORT AUGUSTA (OUTLET CHANNEL)	374	0	NW
YELLOWTAIL KINGFISH	22/10/2020	PORT AUGUSTA (OUTLET CHANNEL)	729	0	NW
YELLOWTAIL KINGFISH	4/10/2019	PORT AUGUSTA (OUTLET CHANNEL)	1096	0	NW
YELLOWTAIL KINGFISH	9/11/2017	PORT AUGUSTA (OUTLET CHANNEL)	1782	0	NW
YELLOWTAIL KINGFISH	2/10/2018	PORT AUGUSTA (OUTLET CHANNEL)	1486	0	NW
YELLOWTAIL KINGFISH	30/9/2018	PORT AUGUSTA (OUTLET CHANNEL)	1466	0	NW
YELLOWTAIL KINGFISH	7/11/2018	PORT AUGUSTA (OUTLET CHANNEL)	1454	0	NW
YELLOWTAIL KINGFISH	21/10/2017	PORT AUGUSTA (OUTLET CHANNEL)	1847	0	NW
YELLOWTAIL KINGFISH	17/11/2016	PORT AUGUSTA (OUTLET CHANNEL)	2120	0	NW
YELLOWTAIL KINGFISH	3/11/2020	PORT AUGUSTA (OUTLET CHANNEL)	700	0	NW

APPENDIX II: TOP TAGGING BOATS AND ANGLERS FOR 2022/23

DPIRD would like to recognise the boats and anglers that have provided exceptional contributions to the Program over the past season. These boats and anglers are shown in the table below with the numbers of fish that they tagged over the 2022/23 season. We will continue to develop these end of season summaries and acknowledge the strong supporters of the tagging Program in future years.

Species	Top boat	Runner up boat
Billfish combined	224 – <i>Freedom</i> (NSW) Central Coast GFC	125 – <i>Redonkulous</i> (QLD) Gold Coast GFC
Black Marlin	220 – <i>Freedom</i> (NSW) Central Coast GFC	92 – <i>Redonkulous</i> (QLD) Gold Coast GFC
Blue Marlin (International)	78 – <i>Black Label</i> (PNG) Lae GFC	71 – <i>Rage On</i> (PNG) Lae GFC
Blue Marlin (Australia)	23 – <i>Redonkulous</i> (QLD) Gold Coast GFC	19 – <i>Little John II</i> (NSW) Sydney GFC
Striped Marlin	98 – <i>She Left</i> (NSW) Merimbula BG & LAC	34 – <i>Bad Billy</i> (NSW) Bermagui BGAC
Sailfish	45 – <i>Wine Down</i> (QLD) Weipa Billfish Club	41 – <i>No Bull</i> (QLD) Weipa Billfish Club
Shortbill Spearfish	2 – <i>El Nino</i> (NSW) Newcastle & Port Stephens GFC, <i>Seahog</i> (NSW) Merimbula BG & LAC	1 – Multiple Vessels
Swordfish	6 - <i>Seismic</i> (TAS) GFC of Northern Tasmania, <i>Terminator</i> (TAS) GFC of Northern Tasmania	1 - Multiple Vessels
Shark combined	28– <i>Black Ops</i> (WA) Perth GFC	25 – <i>Micx</i> (WA) King Bay GFC

Species	Top boat	Runner up boat
Mako Shark	5 – <i>Baitwaster</i> (VIC) Warrnambool Offshore FC, <i>Makajax II</i> (TAS) GFC of Northern Tasmania	3 – <i>Offshore Account</i> (TAS) St Helens GFC, <i>The Hulk</i> (NSW) Eden S & GFC
Blue Shark	10 – <i>Battle Axe</i> (VIC) Victoria GFC	5 – <i>Perfect Game</i> (VIC) Victoria GFC, <i>Wet Dream</i> (NSW) Shellharbour GFC
Tiger Shark	22 – <i>Black Ops</i> (WA) Perth GFC	8 – <i>Rock n Roll</i> (WA) Perth GFC
Whaler Shark	23 - <i>Micx</i> (WA) King Bay GFC	17 – <i>Spawn of Hourn</i> (WA) Exmouth GFC
Hammerhead Shark	5 – <i>French Maid</i> (WA) Nickol Bay SFC	4 – <i>Wet Dreams</i> (WA) King Bay GFC
Thresher Shark	1 – <i>Maritime Blue</i> (TAS) GFC of Northern Tasmania, <i>Seismic</i> (TAS) GFC of Northern Tasmania	
Tuna combined	76 – <i>Heat Seeker</i> (SA) GFC of South Australia	59 – <i>Obsession</i> (SA) GFC of South Australia
Yellowfin Tuna	9 – <i>Enigma</i> (QLD) Moreton Bay GFC	6 – <i>True Lies</i> (QLD) Bribie Island GFC, <i>Wet ones</i> (NSW) Shellharbour GFC
Southern Bluefin Tuna	76 – <i>Heat Seeker</i> (SA) GFC of South Australia	59 – <i>Obsession</i> (SA) GFC of South Australia
Bigeye Tuna		
Albacore Tuna	13 – <i>Little Devil</i> (NSW) Batemans Bay GFC	10 – <i>Playtime</i> (TAS) GFC of Northern Tasmania,

Species	Top boat	Runner up boat
		<i>The Ledger</i> (TAS) Tuna Club of Tasmania
Longtail Tuna	8 - <i>Micx</i> (WA) King Bay GFC	5 – <i>Hashtag</i> (WA) King Bay GFC
Spanish Mackerel	43 - <i>Anarchy</i> (QLD) Mackay GFC	15 - <i>Rehab</i> (QLD) Mackay GFC
Mahi Mahi (Dolphinfish)	43 – <i>Hooked Up</i> (NSW) Port Hacking GFC	14 – <i>Court Case</i> (NSW) South Sydney AFA
Yellowtail Kingfish	159 - <i>Fishabout</i> (NSW) Fishabout Tours	47 - <i>Matrix</i> (VIC) Victorian GFC
Samsonfish	11 – <i>Saily</i> (SA)	10 – <i>Vixen</i> (SA)
Species	Top individual	Runner up individual
Billfish	122 - Tyrone O'Connor (NSW) Merimbula BG&LAC	60 – Adam Argus (QLD) Gold Coast GFC
Shark	18 – Darren Lane(SA), John Holmes (WA) Peth GFC	17 – Shane Hodgens (SA) GFC of South Australia
Tuna	65 - Shane Hodgens (SA) GFC of South Australia	29 - Jenny Snadden (SA) Port MacDonnell Offshore AC
Seriola species	135 - Seamus McCleave (NSW) Fishabout Tours	36 - Jason Taylor (VIC) Victorian GFC

APPENDIX III

SCIENTIFIC PUBLICATIONS UTILISING OR CITING DATA FROM THE TAGGING PROGRAM

- Guillemin, T.A., J.G. Pepperell, H.T. Schilling, J.E. Williamson (2024). 90 years of catch data reveal changes in catch composition in the Australian east coast recreational marlin fishery. *In Review, Reviews in Fish Biology and Fisheries*.
- Osborne, F.E., J.G. Pepperell, R.G. Dwyer, D.J. Smith, S.M. Williams and A. Barnett and B.L. Gilby. (2024). Exploring long-term trends in dolphinfish *Coryphaena hippurus* distribution on the east coast of Australia and Melanesia. *In Review, Fisheries Research*.
- Goddard, B., T.A. Guillemin, H.T. Schilling, J. Hughes, S. Brodie, C.P. Green, R. Harcourt, C. Huveneers, D. Ierodiaconou, I.M. Suthers, M.D. Taylor, S.R. Tracey, V. Camilleri-Asch, T.M. Clarke, R.G. Dwyer, C. Hilbert, J. Holdsworth, J. Mitchell, J.G. Pepperell, E. Simpson, V. Udyawer and F. R. A. Jaine (2023). Half a century of citizen science tag-recapture data reveal stock delineation and cross-jurisdictional connectivity of an iconic coastal pelagic fish. *In Review, Fish and Fisheries*
- Champion, C., A.J. Hobday, X. Zhang and M.A. Coleman (2022). Climate change alters the temporal persistence of coastal-pelagic fishes off eastern Australia. *ICES Journal of Marine Science*, 2022, 0, 1–15. DOI: 10.1093/icesjms/fsac025
- Campbell, R., J. Pepperell and D. Ghosn (2021). Where have all the yellowfin gone? Investigating an apparent disjunct between commercial and recreational catches of yellowfin tuna off southeastern Australia. Report to New South Wales Recreational Fishing Trusts, 114 pp.
- Champion C., S., Brodie and M.A. Coleman (2021). Climate-driven range shifts are rapid yet variable among recreationally important coastal-pelagic fishes. *Frontiers in Marine Science*, 8:622299. doi: 10.3389/fmars.2021.622299.
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- Bolton, P. and J. Pepperell (2020). A summary of tag-recapture and survey information for sharks and rays in recreational fisheries. In: Reina, R., Rogers, P., and Williamson, S. 2020. Sharks and rays in recreational fishing: priority species, handling guidelines, post-release survival, and extension approaches to support cultural change in fishers. Proceedings of the national workshop, Adelaide, South Australia, 26th November 2019. Adelaide, March. 88pp. CC BY 3.0. doi: 10.26180/5f85004cb5782
- Pepperell, J.G. (2020). A review and analysis of the determination of two species of hammerhead sharks as threatened in New South Wales. Report to New South Wales Recreational Fishing Trusts, 54 pp.
- Hillary R. and T. Patterson (2019). Initial estimates of striped marlin Western and Central Pacific Ocean movement dynamics. Tropical Tuna Resource Assessment Group, 12 July 2019.

- Pepperell, J., P. Bolton, C. Hilbert and J. Neilson (2019). In for the long haul. The scientific legacy of five decades of angler-based gamefish tagging in Australia. Keynote address, National Recreational Fishing Conference, Hobart Tasmania December 2019.
- Corrigan, S., A.D. Lowther, L.B. Beheregaray, B.D Bruce, G. Cliff, C.A. Duffy, A. Foulis, M.P. Francis, S.D. Goldsworthy, J.R. Hyde, R. Jabado, D. Kacev, L. Marshall, G.R. Mucientes, G.J.P. Naylor, J.G. Pepperell, N. Queiroz, W.T. White, S.P. Wintner, P.J. Rogers (2018). Population connectivity of the highly migratory shortfin mako (*Isurus oxyrinchus* Rafinesque 1810) and implications for management in the Southern Hemisphere. *Frontiers in Ecology and Evolution*, section Conservation, 6:187, doi: 10.3389/fevo.2018.00187.
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- Brodie S., L. Litherland, J. Stewart, H.T. Schilling, J.G. Pepperell and I.M. Suthers (2018). Citizen science records describe the distribution and migratory behaviour of a piscivorous predator, *Pomatomus saltatrix*. *ICES Journal of Marine Science*, doi:10.1093/icesjms/fsy057
- Tracey, S. and J. Pepperell (2018). Understanding the movement, behaviour and post-capture survival of recreationally caught swordfish from southeast Australia – a pilot study. FRDC Project No 2015/022, 87pp.
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CURRENT UNIVERSITY THESES

The following post-graduate studies utilizing data from the DPIRD Game Fish Tagging Program are currently under way:

- Hammond, Matthew. Charles Darwin University. Movements and hot-spots of billfish habitat use in the emerging recreational fishing grounds of northern Australia. Ph.D Program.
- Guillemin, Tristan. Macquarie University. Evolution of the blue marlin fishery off the east coast of Australia. Ph.D Program.
- Smith, Laura. University of Queensland. Population structure of sailfish (*Istiophorus platypterus*) and its ecology and distribution in the Indo-Pacific. Ph.D Program.
- Osborne, Felicity. University of Southern Queensland. The interactive effects of anthropogenic impacts on coastal fisheries value and condition. Ph.D Program.

PREVIOUS UNIVERSITY THESES

The following theses have all been successfully completed, most of them relying heavily on data from the DPIRD Game Fish Tagging Program:

- Cameron Baber, James Cook University. Examining the impacts of environmental factors on the distribution of the shortfin mako shark, *Isurus oxyrinchus*, from eastern Australia. M.Sc., 2018.
- Samuel Williams, University of Queensland. The global biology, ecology and phylogenetic status of Black Marlin (*Istiompax indica*) Ph.D. 2018.
- Shane Ovington, University of Queensland. The distribution and size structure of blue marlin (*Makaira nigricans*) along the East Coast of Australia, modelled from recreational capture and tagging data. B.Sc. Honours 2017.
- Stephanie Brodie, University of New South Wales. The ecology and distribution of two pelagic fish: Yellowtail Kingfish *Seriola lalandi* and Dolphinfish *Coryphaena hippurus*. Ph.D. 2016.
- Bonnie Holmes, University of Queensland. The biology and ecology of the tiger shark (*Galeocerdo cuvier*) on the east coast of Australia. Ph.D 2015.
- Nicholas Hill. James Cook University. Variability in the distribution and movement of black marlin (*Istiompax indica*) determined via environmental conditions along the East Coast of Australia using recreational tag data. B.Sc. Honours, 2014.
- Samuel Williams, University of Queensland. Genetic population structure of black marlin (*Istiompax indica*) within the central Indo-Pacific: Breeding populations defined despite mitonuclear discordance. B.Sc. Honours, 2014.
- Ronan Lynch, University of Queensland. Variability in the spatial and temporal occurrence, and size composition of sailfish (*Istiophorus platypterus*) in eastern Australian waters, and the influence of environmental conditions. B.Sc. Honours, 2012.
- Richard Keller Kopf, Charles Sturt University. Age, growth and reproductive dynamics of striped marlin, *Kajikia audax*, in the southwest Pacific ocean. Ph.D., 2010.
- Tom Bridge, University of Sydney. Effects of environmental variables on the recruitment and distribution of juvenile black marlin, *Makaira indica*, off the east coast of Australia. B.Sc. Honours, 2007.
- John Hoolihan, University of New South Wales, Biology and stock structure of sailfish in the Persian Gulf. Ph.D., 2005.
- Danielle Williams, University of New South Wales. Variations in the size composition and occurrence of yellowfin tuna (*Thunnus albacares*) in eastern Australian waters through time, inferred from a unique recreational-based dataset. B.Sc. Honours, 2003.
- Ricky Chan, University of New South Wales. Biology of pelagic sharks off New South Wales. Ph.D., 2001.

Joanne Bennett, University of New South Wales. Ecology of dolphin fish (*Coryphaena hippurus*) and other large pelagic species: Environmental influences on their distribution. B.Sc. Honours, 2000.

PREVIOUS ANNUAL REPORTS

Detailed Annual Reports on the Game Fish Tagging Program have been regularly published throughout its history, originally in hard copy, and digitally over the past decade. These are all available at <https://www.dpi.nsw.gov.au/fishing/recreational/resources/fish-tagging/game-fish-tagging/game-fish-tagging-annual-reports>