Selectivity of nets and drumlines used in the Queensland Shark Control Program

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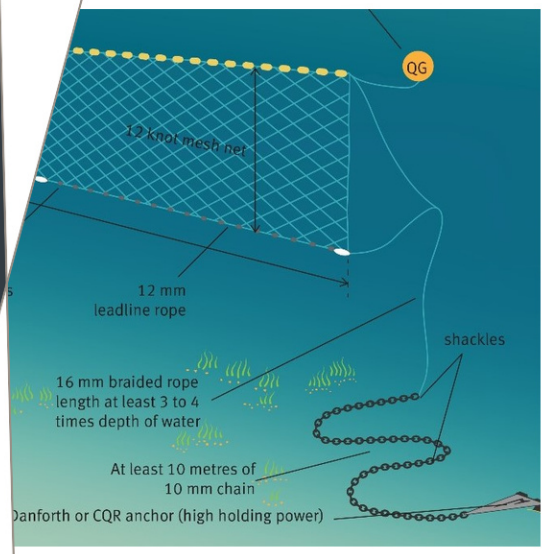

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Executive Summary

The 'Shark Control Program' (SCP) uses nets or drumlines (baited hooks), or a combination of both, to target and catch large sharks in popular areas at 86 beaches in 10 designated regions along the Queensland mainland east coast. Nineteen species of sharks are considered to have potential to bite humans ('target species') but of most concern are the bull whaler (*Carcharhinus leucas*), tiger shark (*Galeocerdo cuvier*) and white shark (*Carcharodon carcharias*). Over time, the area of the SCP has changed as has the nature and quantities of apparatus used. Changes have been in response to a variety of factors including a desire to reduce the impact of the SCP on non-target species. In recent times, nets were removed from 5 of the 7 Cairns SCP beaches in 2013 and from 2 of the Mackay SCP beaches between 2015 and 2017. Nets are currently deployed in addition to drumlines in 4 of the 10 regions (at one beach in Mackay and Rainbow Beach and at 11 beaches at both the Sunshine Coast and Gold Coast).

The Queensland Department of Agriculture and Fisheries (DAF) is investigating potential alternative fishing strategies as well as alternatives to lethal methods of mitigating risk of shark bite that could be considered for the SCP. The Scope of Works (SoW) for this investigation required the analysis of catch in nets and drumlines at SCP beaches to determine patterns in selectivity of target and bycatch species. For each of the regions, specific analyses included:

1. Determining catch per unit effort (CPUE)/yr (separately for drumlines and nets) and total catch/year for taxa at the beach level within and among SCP regions;
2. Determining intra-year patterns in CPUE for drumlines and nets for the three most dangerous target shark species (tiger, bull whaler & white);
3. Estimating survival of non-target species at the beach level;
4. Comparing the ratio of CPUE of drumlines/nets at the beach level and among regions for the following groups (1) the three most dangerous target sharks [tiger, bull whaler & white], (2) other target and non-target sharks, (3) other bycatch);
5. Comparing the ratio of target catch to bycatch for drumlines and nets at the beach level and among regions; and
6. Comparing size frequencies of tiger, bull whaler and white sharks by gear type for each region.

Apart from size frequency distributions these analyses generally examined each beach separately, although grouping of some beaches was done in some regions so that catches between nets and drumlines could be compared at local scales.

All SCP catch data analysed and presented in this report were sourced from the SCP portal within QFish, Fisheries Queensland's publicly available data repository (https://qfish.fisheries.qld.gov.au). Data included catches for the years 2001-2018. Nets are currently deployed in addition to drumlines in 4 of the 10 regions (Mackay, Rainbow Beach, Sunshine Coast and Gold Coast) but were also deployed in Cairns until 2013.

Key findings

Target shark species comprised at least around half, but usually the substantial majority, of total drumline catches across all 10 regions but less than half of the total catches in nets. The catchability of the three main dangerous species differed between nets and drumlines although a caveat is that catches of white sharks in both gear types was low. There was also a regional component to comparative catchability of the two gear types.

Tiger sharks were more prevalent in drumlines than nets where both gear-types were present, and were usually (but not always) the most abundant by far of the target sharks in drumline catches. Bull whalers were usually (but not always) the second-most abundant of the target sharks in drumline catches, and usually the most abundant target shark species in the case of nets. White sharks were not caught by drumline or net in any of the five northern-most regions but were caught by both gears in the five most southern regions. CPUE for tiger sharks in nets was generally much less than for drumlines in all regions apart from Mackay, where CPUE was greater in nets. CPUE for bull sharks in nets was generally much greater than for drumlines apart from Cairns where it was much greater in drumlines at most of the beaches. Although there were few data for white sharks, there were indications that CPUE in nets was generally greater than for drumlines. When these three most dangerous of the target sharks (i.e. bull whaler, tiger and white shark) were considered at a group level, the CPUE ratio (drumlines/nets) at Cairns and Rainbow Beach was >1, indicating drumlines were more efficient than nets at catching this group of sharks as a whole. At the three other regions with nets (Mackay, Sunshine Coast and Gold Coast), the CPUE ratio (drumlines/nets) for this group was much less than 1, indicating nets were more efficient than drumlines at catching this group of sharks as a whole in those regions.

Generally speaking, CPUE for tiger sharks caught by drumlines in most regions was generally less in summer than some or all of the other seasons. The exceptions were at Tannum Sands where CPUE was greatest in December and Gold Coast where CPUE was consistent throughout the year. This pattern was not generally seen for tiger sharks in nets, probably because of low catches generally of this species in nets. The inter-monthly range for CPUE for bull whaler caught by drumlines was generally not as great as for tiger sharks but it was still apparent that CPUE for bull whalers caught by drumlines was generally greater in spring, summer and early autumn compared to other months in all regions apart from the two most southern regions. The same pattern was seen for CPUE for bull whalers caught in nets at Mackay, but at Rainbow Beach it was consistent across months, variable at the Sunshine Coast and greater in Spring, Autumn and early Winter at the Gold Coast. In the southern regions where white sharks were caught, CPUE for drumlines and nets was generally greater in late winter and early spring than for other seasons.

In all regions, the distributions of sizes of bull whaler, tiger and white sharks caught on drumlines or nets included many large sharks (>2 m). There were generally few bull whalers caught on drumlines that were larger than 3 m but there were many tiger sharks greater than this size. This is probably more a reflection of the potential maximum sizes of tiger sharks compared to bull whalers rather than a difference in selectivity.

The distribution of sizes for bull whalers caught in nets was generally similar to that for drumlines at Mackay, Rainbow Beach, Sunshine Coast and Gold Coast. Although fewer tiger sharks were caught in nets generally, it appeared that small tigers (<2 m) were relatively poorly represented in net catches in Mackay, Rainbow Beach, Sunshine Coast and Gold Coast.

Two species of whaler sharks, blacktip reef whaler (*Carcharhinus melanopterus*) and spot-tail whaler (*Carcharhinus sorrah*), and the tawny shark (*Nebrius ferrugineus*) were usually the most abundant non-target species caught by drumline in northern regions. Scalloped hammerheads (*Sphyrna lewini*) were consistently common in net and drumline catches throughout the geographical range of the SCP. Pelagic rays were abundant in net catches and less so in drumline catches, and accounted for greater proportions of the non-target catch in the central and southern regions. Marine mammals and sea turtles were more abundant in catches in southern regions than in northern regions. Dolphins and baleen whales were more readily caught by net than by drumline where both gear-types were present – particularly in the central and southern regions. Green turtles (*Chelonia mydas*) were the species of sea turtle most commonly caught in the northern regions, while loggerhead turtles (*Caretta caretta*) were the sea turtle most commonly caught in the southern regions. CPUE ratios (drumlines/nets) for the entire groups of 'other target and non-target sharks' or 'other bycatch' were generally less than 0.2, indicating that net units were much more (i.e. 5 times on average) efficient than drumlines at catching these taxa.

For drumlines, the ratio of bycatch/target sharks in most regions (i.e. apart from Tannum Sands and Townsville), was close to or less than 0.5 indicating, generally, that roughly twice as many target sharks were caught for every non-target animal in most regions. Of the five regions that had nets deployed in addition to drumlines at some stage between 2001 and 2018, the bycatch ratio for nets was either slightly greater than one (i.e. at Mackay, Rainbow Beach and Sunshine Coast) or much greater than one (i.e. at Cairns and Gold Coast). Irrespective of gear-type, most non-target whalers, hammerheads (*Sphyrna* spp.) and makos (*Isurus* spp.) were almost always found dead on/in the gear (e.g. blacktip reef whalers, spot-tail whalers and scalloped hammerheads). In contrast, demersal species of sharks or rays were found and released alive most of the time when caught by drumline and around half of the time when caught by net (e.g. tawny sharks and zebra sharks)[1]. Pelagic rays such as mantas, devilrays, cownose rays and eagle rays, which were far more commonly caught in nets than by drumline, exhibited variable mortality following capture in nets with roughly half recovered dead. Most marine mammals and sea turtles caught by drumline were usually found alive and subsequently released. In contrast, with few exceptions apart from humpback whales, these species were generally much more likely to be found dead, more than half of the time, when caught by net.

Risks and benefits of removing/replacing nets

Fishing strategies that recognise the different selectivity patterns of the gear can be developed to suit local conditions, although it is recognised that balancing ecological risk and risk to water users is not a simple task. If more nets are to be removed in the future, and potentially replaced by drumlines or alternative gear, from one or more beaches at Mackay, Rainbow Beach, Sunshine Coast or Gold Coast, it is important to understand the risk this poses to water users, as much as the benefits it would have to non-target species. At the regional and beach level, the proportions of total catches of the three most dangerous target shark species (tiger, bull whaler and white) in drumlines and nets, CPUE and size distributions not only allow an

[1] Mortality is recorded when gear is serviced and long-term post-release mortality rates (i.e. delayed impacts of trauma) are not known.

assessment of the current role of nets in reducing risk but also what could be done to compensate for their removal.

By way of example, Harbour Beach in Mackay, currently has 2 nets and 9 drumlines, and the CPUE ratio (drumlines/nets) for catches of the group of the dangerous bull and tiger shark species is 1.15, indicating that each drumline has, on average, caught slightly more of these species than each net. Rainbow Beach currently has 12 drumlines and 3 nets, and the CPUE ratio (drumlines/nets) for catches of the group of the three most dangerous shark species is 1.05, indicating that each drumline has, on average, caught around as many of these sharks as each net. Given the similar CPUE for drumlines and nets, it is conceivable that the total annual catches of these species could be maintained at these beaches if the two nets in Harbour Beach, Mackay and three nets in Rainbow Beach were replaced with two and three additional drumlines respectively (i.e. so that the total number of drumlines was increased from 9 to 11 in Harbour Beach and 12 to 15 at Rainbow Beach). Further, given the CPUE ratio for the groups of 'other target and non-target sharks' is 0.37 in Mackay and 0.04 at Rainbow Beach, and for 'other bycatch' is 0.002 in Mackay and 0.18 at Rainbow Beach, which indicates that the nets have caught around 3 times (Mackay) and 25 times (Rainbow Beach) the number of other shark species and 100s of times more (Mackay) and five times as much bycatch (Rainbow Beach) in the past, the future captures (in the new drumlines) of other sharks and other bycatch would be expected to be reduced by large amounts. Although some of these 'other sharks' are on the target list they are much less dangerous than bull, tiger or white sharks. At Rainbow Beach for example, removing the nets would reduce the capture of other target and non-target sharks by ~80% and other bycatch by ~40%. Using similar logic, the replacement of the two nets at Noosa (Sunshine Coast region) with two additional drumlines (i.e. for an increased total of 5 drumlines) could potentially maintain catches of the group of the three most dangerous target shark species whilst reducing captures of both other sharks and other bycatch by ~97%.

There are other beaches, or groups of beaches, where the CPUE ratio (drumlines/nets) indicated that nets were much more efficient at catching the group of the three most dangerous target shark species and in these cases the replacement of a net with a single drumline would not be expected to be sufficient to maintain catches of this group. For example, the CPUE ratio (drumlines/nets) for catches of the group of the dangerous target shark species within the group of beaches of Surfair, Mudjimba, Twin Waters and Marcoola (Sunshine Coast region) is much less than 1, at 0.333, and as such, three drumlines would be needed to compensate for the potentially lost catches of these species that are likely to occur with the removal of the net. This would also potentially reduce catches of the groups of other sharks and other bycatch at these beaches by > 95%.

Although it would appear that removing nets or replacing them with drumlines would benefit some non-target species, particularly those sharks and other animals that generally die when captured in nets, there is a risk that additional drumlines would not adequately compensate for the catches of the group of the most dangerous target shark species in the nets (i.e. the expected outcome may in fact not materialise). The CPUE ratio (drumline/nets) is only a guide as to how many drumlines would catch the same amount of the most dangerous target species that are caught by nets, and assumes that 'catchability' of sharks among gear is equal. Nets and drumlines function differently. Drumlines capture sharks when they are actively feeding. Nets while also potentially catching sharks as they are actively feeding, can also capture them if they are moving through the area without actively feeding at that time. Variability in the composition of catches among the three most dangerous target species among regions and within regions (i.e. among beaches) as well as variability among species in CPUE for the two gear types also complicates matters. Nets have traditionally caught a large proportion of the totals of bull whalers at Mackay, Rainbow Beach, Sunshine Coast and Gold Coast as well as white sharks at the Gold Coast and the CPUE for these species in nets is generally greater than for drumlines. For example, at Noosa (3 drumlines, 2 nets) the CPUEs for tiger sharks were 1.37 sharks per drumline per year and 0.17 sharks per net per year (almost eight times higher for drumlines), while the corresponding CPUEs for bull sharks were 0.07 and 1.28 sharks per year respectively (more than eighteen times higher for nets). Hence, although the CPUE ratio (drumlines/nets) for the group of the most dangerous target sharks at Noosa would suggest that nets could be replaced by drumlines on a 1:1 basis, in doing so this may reduce the total catch of bull sharks at this beach. Another example is for Harbour Beach (9 drumlines, 2 nets) in the Mackay region where the CPUE ratio (drumlines/nets) for the group of the most dangerous target species was only 1.15 but the CPUE for tiger sharks caught by net was around double that by drumline, and for bull sharks almost six times that for drumline.

Notwithstanding this, there is also seasonality in the catch of the most dangerous three species and risk to some bycatch that could also be considered in alternative fishing approaches. This is particularly applicable at the Gold Coast where the peak migration periods for humpback whales (May-June and September-October) do not correspond closely with any substantial catches of potentially dangerous sharks in nets. Given humpback whales are susceptible to entanglement in nets (and occasional death) there would be little risk to water users if nets were replaced during these months with drumlines (based on an amount per beach

that compensated for catch according to the CPUE ratio, see above). Given there is also a high catch of the non-target juvenile scalloped hammerheads in Gold Coast nets, removal of nets over winter would also help to mitigate impacts to that species.

Considerations regarding changes to risk associated with replacement of nets with alternative non-lethal gear have not been considered as part of this report but further discussion can be found in Cardno (2019).

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1 Introduction

1.1 Background

Since 1962, Queensland has relied upon a 'Shark Control Program' (SCP) for bather protection, using nets and drumlines (baited hooks), or a combination of both, to target and catch large sharks in popular areas along the Queensland coastline. The aim of the SCP, as outlined in the Queensland *Fisheries Act 1994*, is to "reduce the possibility of shark attacks on humans in coastal waters of the State adjacent to coastal beaches used for bathing". In Queensland, nineteen species of sharks are considered to have potential to bite humans and these are considered by the SCP to be 'target sharks'. Target sharks of most concern are the bull whaler (*Carcharhinus leucas*), tiger shark (*Galeocerdo cuvier*) and white shark (*Carcharodon carcharias*) given they have been implicated most in unprovoked shark bite (McPhee, 2014). The other target sharks are comprised of species from various families as well as the great hammerhead shark (*Sphyrna mokarran*), which has been included not so much for its proven bite history in the Queensland context, but for its local abundance. In this report, non-target sharks and other bycatch are referred to as 'non-target' species. For a full list of target and non-target species see **Appendix A**.

Drumlines consist of a baited shark-fishing hook (usually about 14/0) attached by a line to a large float that is anchored on the seabed offshore from a beach (**Figure 1-1**). Typically, a series of drumlines is laid parallel to the beach adjacent to areas where there are bathers (e.g. in front of flagged areas). A shark takes the bait, and becomes hooked. When the gear is serviced for rebaiting, all captured target sharks are euthanised if not already dead, and following compilation of basic biological data (e.g. species type and size) they are disposed of further offshore. Non-target species are released if alive. Units of both gear-types are kept in position via heavy seabed anchors, with topographical features of the seabed, sea conditions and prevailing tides and currents associated with each protected beach determining precise position and distance from shore. The protective nets are designed to entangle sharks swimming into them. As for drumline catches, non-target species are released if alive and target sharks are euthanised if not already dead. Nets are 186 m long (3 x 62 m panels of 500 mm mesh netting) by 6 m deep and are suspended from the surface via a series of surface floats spanned between two or more large plastic marker buoys set adjacent to the shoreline (**Figure 1-2)**.They do not provide a complete barrier to sharks at any one beach and it is often the case that sharks are caught on the inside surface of the nets as they swim away from the beach.

The SCP currently operates at 86 beaches in 10 designated regions along the Queensland mainland east coast and these encompass the main areas where swimming and surfing occur (**Figure 1-3**). Some of the beaches share borders and/or are smaller parts of much larger beaches while there are gaps between others due to rocky headlands or non-beach pieces of coastline (**Figure 1-4** to **Figure 1-6**). Over time, the area of the SCP has changed as has the nature and quantities of apparatus used. For example, although the SCP has been in operation since 1962, gear was initially only installed in four regions and there was less apparatus in these regions than at present. Gear was not installed in Tannum Sands, the last region to be included in the SCP, until 1983. In terms of the types of apparatus, nets have not been used in the four most northern SCP regions, apart from Mackay, for many years. For further detailed information about changes to gear see Cardno (2019).

Gear selectivity is not generally spatially uniform. Fishing strategies that recognise the different selectivity patterns of the gear can be developed to suit local biotic and abiotic conditions, although it is recognised that quantification of both ecological risk and risk to bathers is not a simple task (Sumpton et al. 2011). More recent changes in the SCP have been in response to a variety of factors including a desire to reduce the impact of the SCP on non-target species such as marine reptiles (sea turtles), marine mammals (dolphins and whales), large bony fishes and populations of sharks and rays (Sumpton et al. 2011; Erbe and McPherson 2012).

Recent analysis has shown that the effectiveness of the two gear types varies among regions (Cardno 2019, 2020) probably due to regional differences in ocean conditions and species' ranges. It also varies within regions probably due to the nature by which the apparatus work (i.e. each net covers a large area and entangles animals that inadvertently swim into whereas baited drumlines catch sharks that are actively feeding (Gribble et al. 1998) and attracted to a bait).

The Queensland Department of Agriculture and Fisheries (DAF) is investigating potential alternatives to lethal methods of mitigating risk of shark bite that could be considered for the SCP. DAF commissioned Cardno (NSW/ACT) Pty Ltd (Cardno) to assist with these investigations. Cardno (2019) reviewed alternative non-lethal methods, including a comparative assessment among the methods for potential trial in specific

SCP regions and developed a potential implementation strategy (download at: https://www.publications.qld.gov.au/dataset/queensland-shark-control-program/resource/76358bc5-a2fa-46ce-a8cb-0891c75e971a).

1.2 Scope of Works

The Scope of Works (SoW) for this investigation required the analysis of catch in nets and drumlines at SCP beaches to determine patterns in selectivity of target and bycatch species. It supports Cardno (2019) and Cardno (2020) and provides DAF with the information at the beach- and regional-scale to support decisions relating to future arrangements of shark control gear at SCP beaches.

For each of the regions, specific analyses were to include:

1. Determining catch per unit effort (CPUE)/yr (separately for drumlines and nets) and total catch/year for taxa at the beach level within and among SCP regions;
2. Determining intra-year patterns in CPUE for drumlines and nets for the group of the three most dangerous target shark species (tiger, bull whaler & white);
3. Estimating survival of non-target species at the beach level;
4. Comparing the ratio of CPUE of drumlines/nets at the beach level and among regions for the following groups (1) the three most dangerous target sharks (i.e. tiger, bull whaler & white), (2) all other target and non-target sharks, (3) other bycatch;
5. Comparing the ratio of target shark catch to bycatch for drumlines and nets at the beach level and among regions; and
6. Comparing size frequencies of tiger, bull whaler and white sharks by gear type for each region.

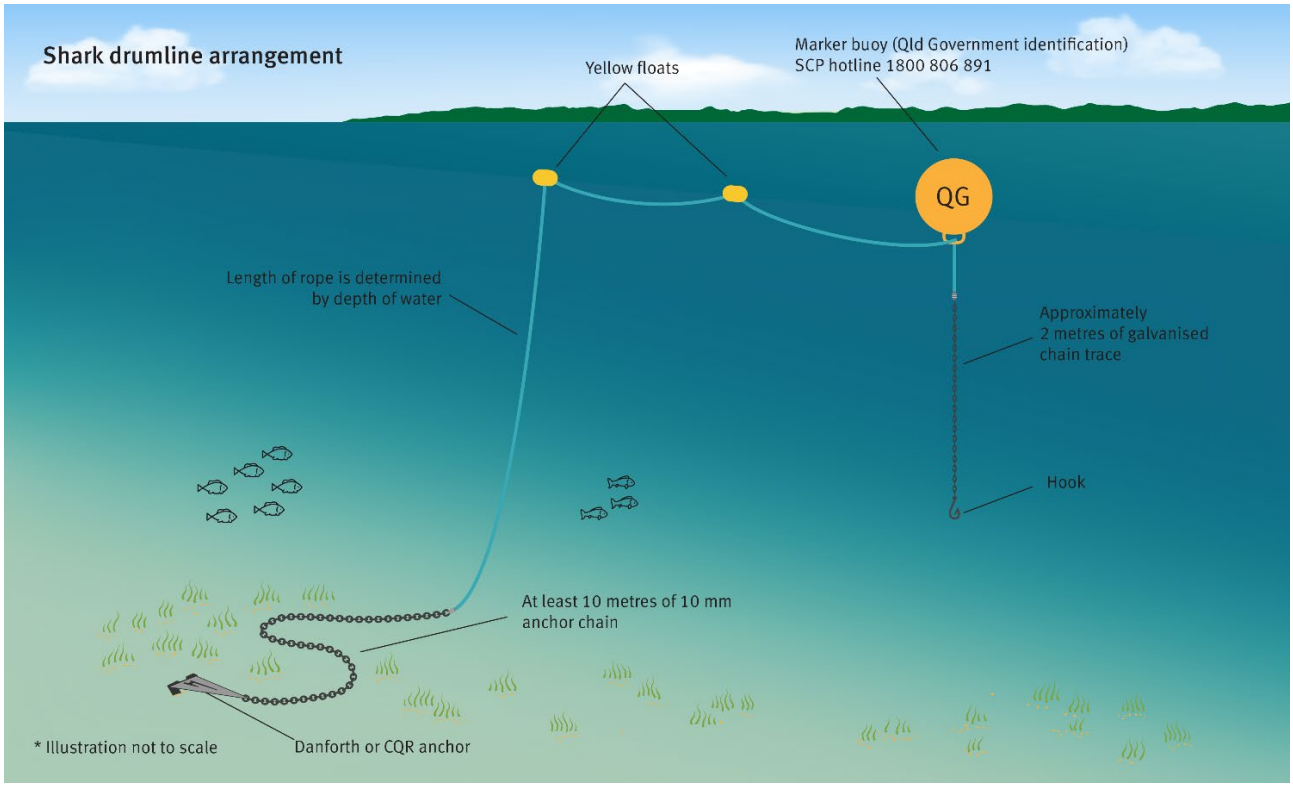

Figure 1-1 Shark Control Program drumline arrangement. Image identifies drumline components (floats, anchor and hook) and dimensions. (Source: Queensland Government)

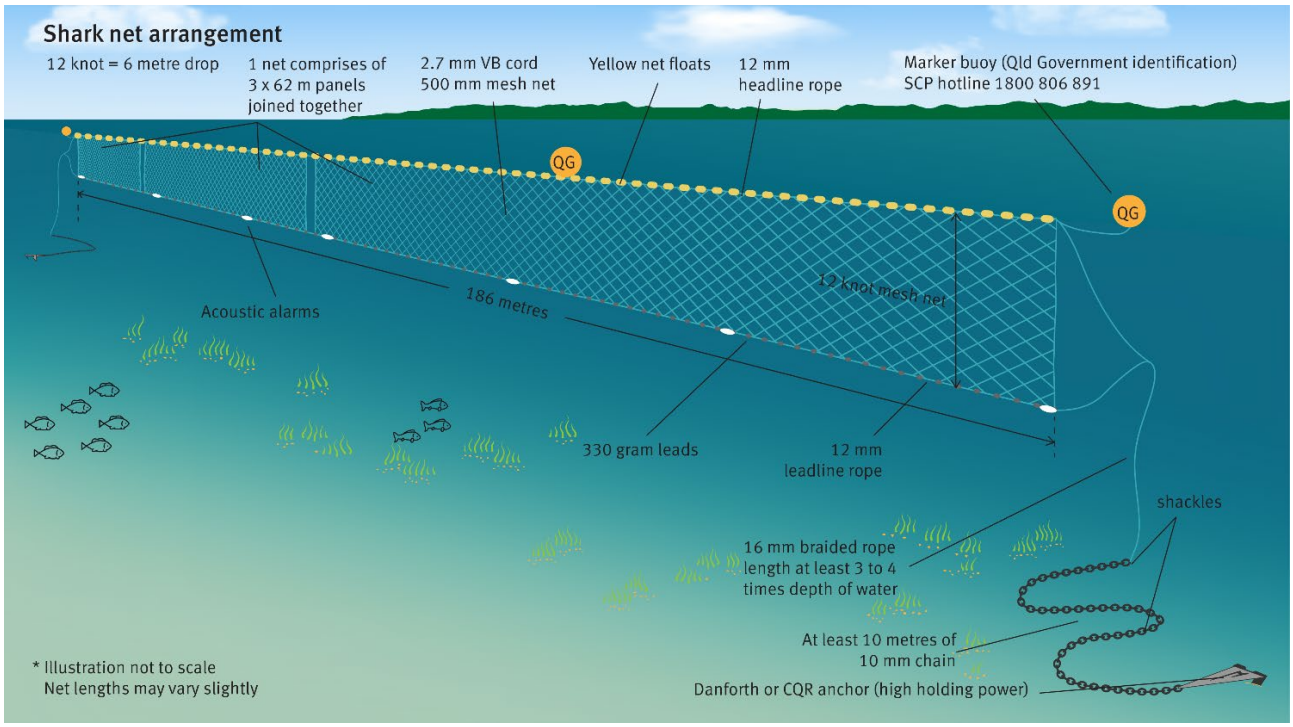

Figure 1-2 Shark Control Program mesh net arrangement. Image identifies net components (floats, shackles and acoustic alarms) and net dimensions. (Source: Queensland Government)

Figure 1-3 Regions subject to the Shark Control Program. NB: Bribie Island is part of the Sunshine Coast SCP region.

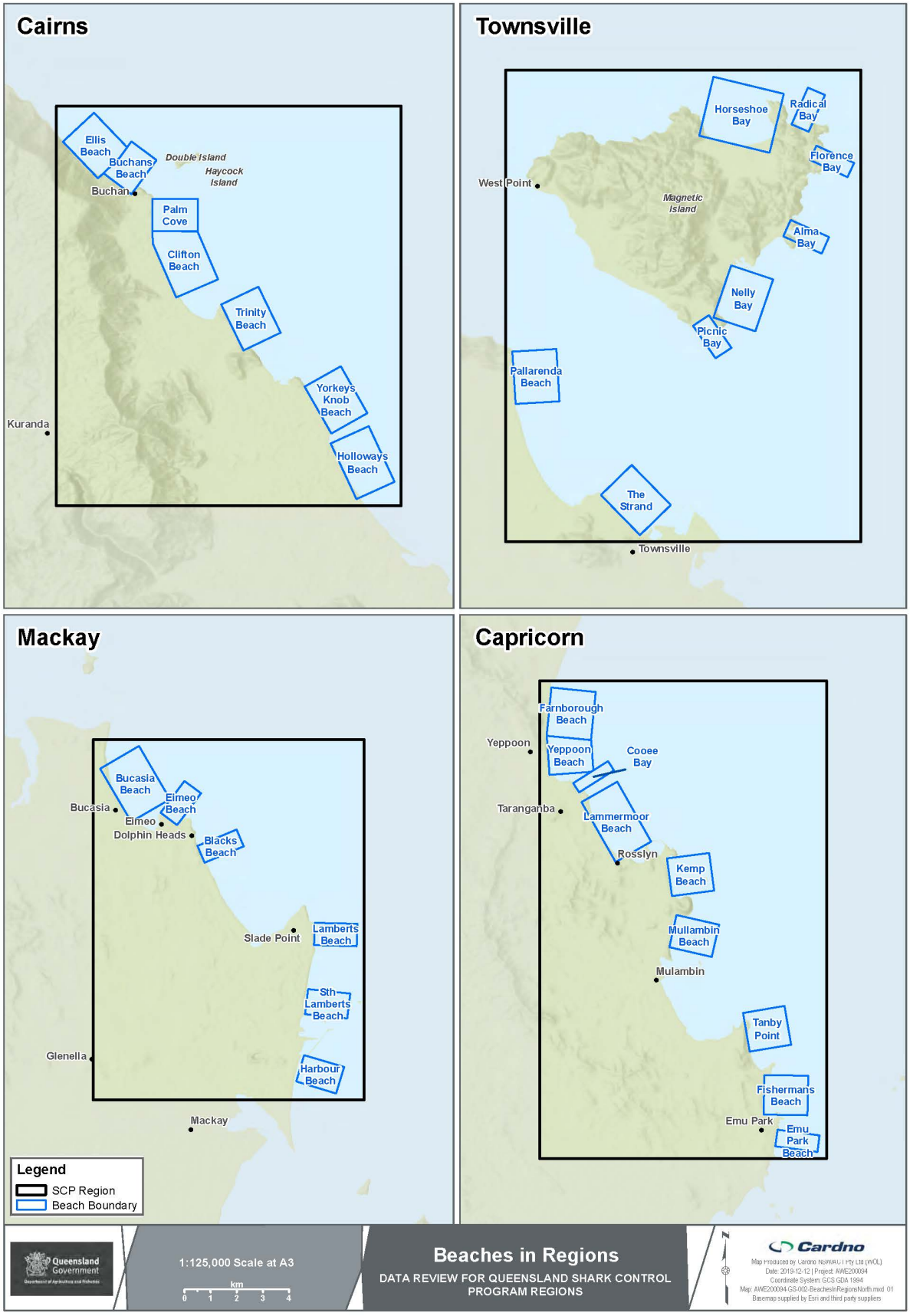

Figure 1-4 Beaches in the SCP regions of Cairns, Townsville, Mackay & Capricorn Coast.

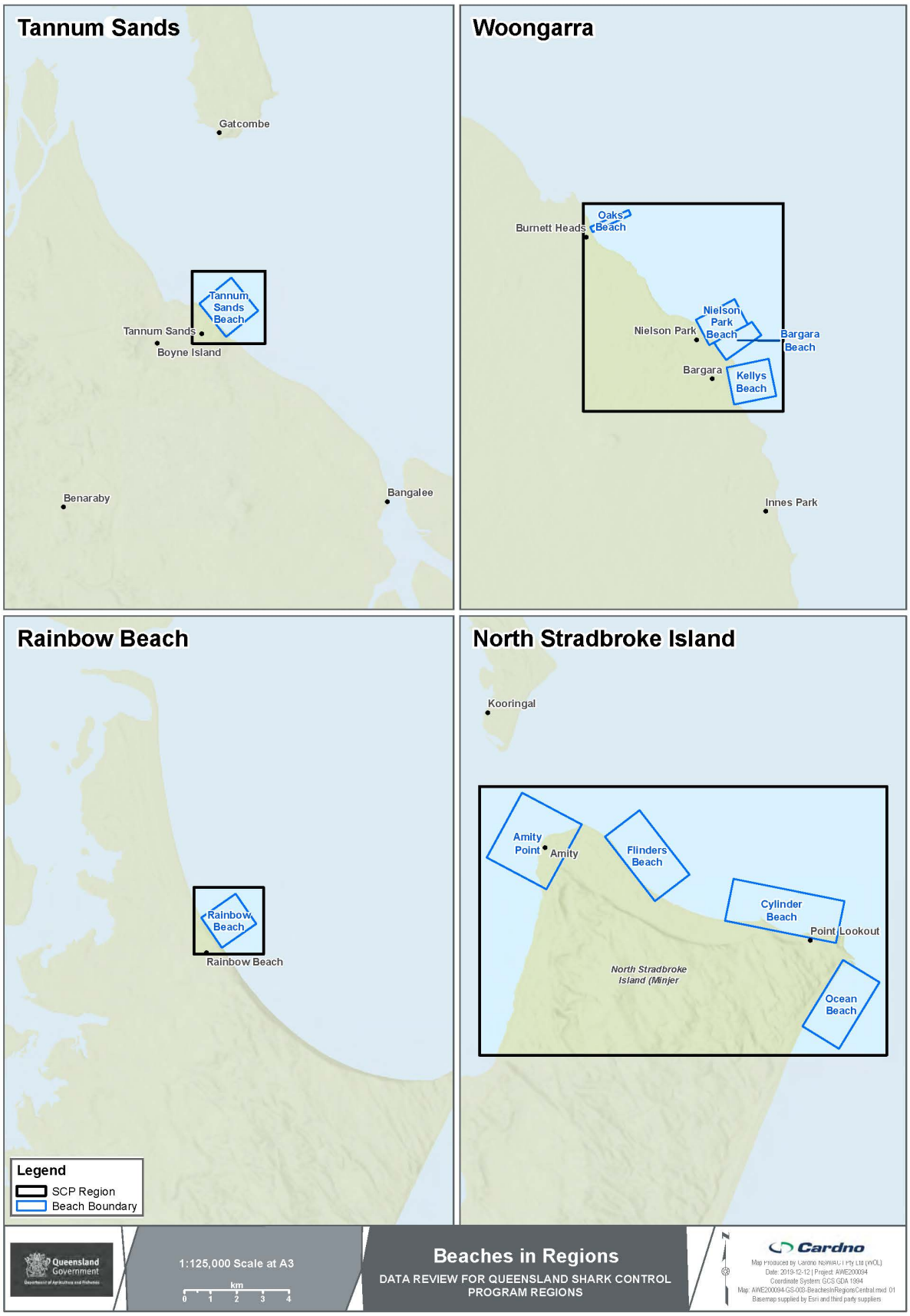

Figure 1-5 Beaches in the SCP regions of Tannum Sands, Woongarra, Rainbow Beach & North Stradbroke Island.

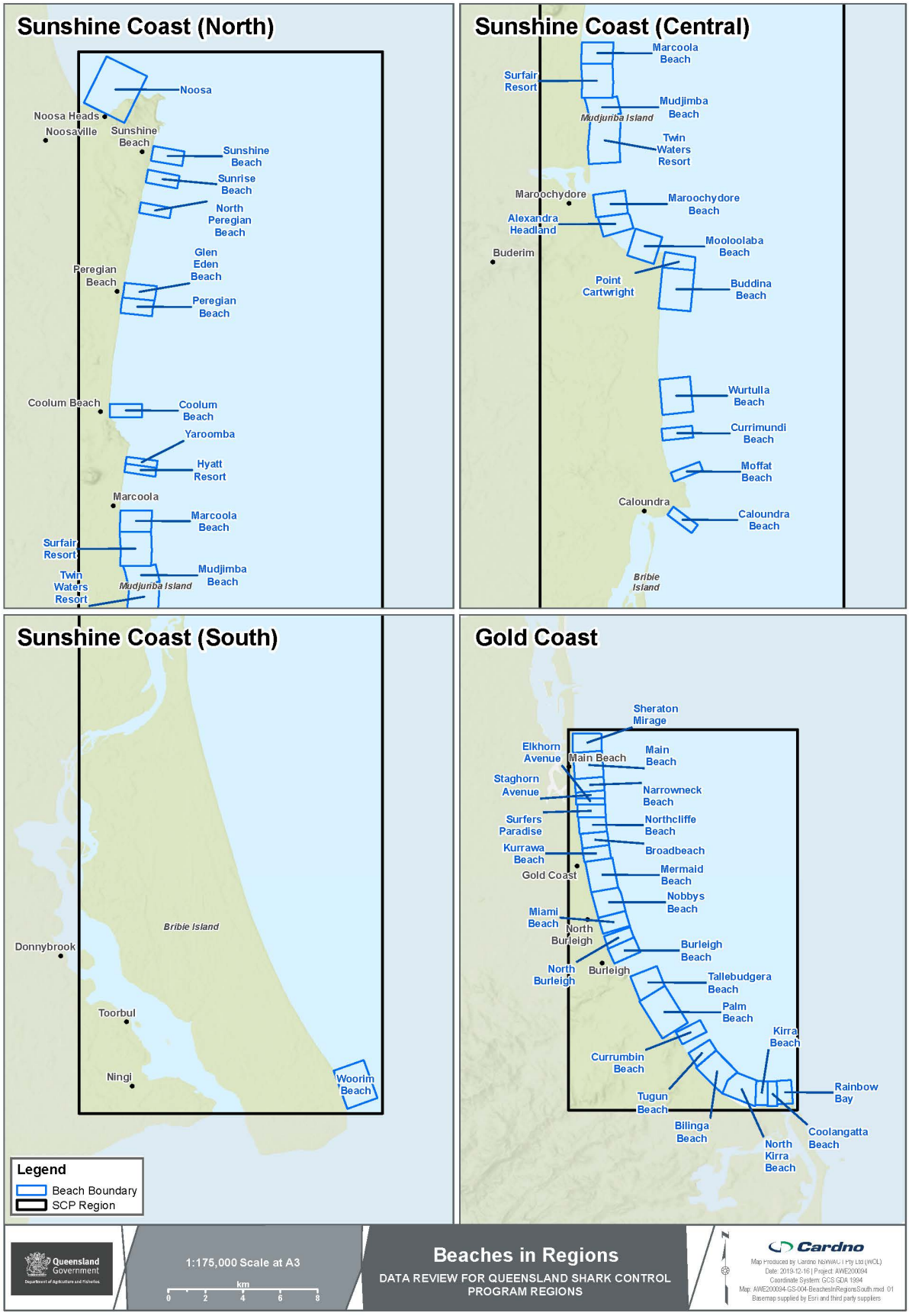

Figure 1-6 Beaches in the SCP regions of Sunshine Coast & Gold Coast.

2 Methods

2.1 Source of Data and Accuracy

All SCP catch data summarised and presented in this report were sourced from the SCP portal within QFish (https://qfish.fisheries.qld.gov.au) – an online repository of datasets and interactive tools that provide public access to information concerning Queensland's fisheries resources and various types of fishing activities (i.e. recreational, commercial and SCP gear). Data included catches for the years 2001-2018 as these data were the only available on QFish at the time this report was written. The accuracy of all summary tables presented in this report depend on the integrity and accuracy of data downloaded from QFish. While reasonable measures were taken to ensure accuracy and integrity of the summary tables, it is acknowledged that some issues within the QFish database (and Cardno's approaches to issues) may have affected accuracy. Cardno has noted some issues with the QFish SCP catch data and further information on our approach to these issues can be found in Cardno (2020).

2.2 Summarising Data

For each of the regions, specific analyses included:

1. Determining catch per unit effort (CPUE)/yr (separately for drumlines and nets) and total catch/year for taxa at the beach level within and among SCP regions;
2. Determining intra-year patterns in CPUE for drumlines and nets for the group of the three most dangerous target shark species (tiger, bull whaler & white);
3. Estimating survival of non-target species at the beach level;
4. Comparing the ratio of CPUE of drumlines / nets at the beach level and among regions for the following groups (1) the three most dangerous target sharks (i.e. tiger, bull whaler & white), (2) all other target and non-target sharks, (3) other bycatch;
5. Comparing the ratio of target shark catch to bycatch for drumlines and nets at the beach level and among regions; and
6. Comparing size frequencies of tiger, bull whaler and white sharks by gear type for each region.

Apart from size frequency distributions these analyses generally examine each beach separately although it is acknowledged that SCP gear set at adjacent beaches probably impacts catches at other nearby beaches, and that the efficiency of drumlines probably affects the catch of nets within beaches and vice-versa.

2.2.1 Total Catch and CPUE

Total catch for each taxon in drumline or net were calculated from the sum of individuals caught between 2001-2018. CPUE for each taxon in drumline or net were described per unit of gear per year, and considered the timing of deployment and/or decommissioning of specific drumline or net units at beaches.

2.2.2 Seasonal CPUE for the three most Dangerous Target Sharks

CPUE for bull whaler, tiger and white sharks, and for a group combining all three species, was estimated for drumlines and nets for each of the calendar months.

2.2.3 Survival of Non -target Taxa

This is only applicable to non-target species given all captured target sharks are euthanised, if not already dead at capture. For all non-target animals captured, their status ('alive' or 'dead') is given in the QFish database. It is assumed that all live captured animals were released however long-term post-release mortality rates (i.e. delayed impacts of trauma) are not known. The status at capture was used to calculate CPUE of taxa that were released alive or dead.

2.2.4 CPUE Ratio (Drumlines/Nets)

For beaches in which nets are currently deployed in addition to drumlines, or were deployed at some point during 2001-2018, the CPUE ratio (drumlines/nets) per unit of gear per year was calculated for the following three groups of taxa:

1. The combined catch of the most dangerous target sharks (bull whaler, tiger and white sharks);

2. The combined catch of all other target and non-target sharks; and
3. The combined catch of all other taxa.

The CPUE ratio was not relevant in some regions where nets were not deployed at any beach between 2001-2108.

In the Gold Coast and Sunshine Coast regions there are beaches where nets are deployed without any drumlines. In order to generate CPUE ratios, and if there was little geographic separation between adjacent beaches, beaches with nets and no drumlines were grouped with one or more nearby beaches where drumlines were deployed.

2.2.5 Bycatch Ratio

The bycatch ratio is the total catch (by number) of all non-target animals / total catch of all target shark species. This was calculated separately for drumlines and nets. In most cases, bycatch ratios were calculated for individual beaches but in some instances, where beaches within regions had been grouped to calculate CPUE ratios (above), the bycatch ratio was calculated for groups of adjacent beaches.

2.2.6 Sizes of the three most DangerousTarget Sharks

Size frequency distributions of bull whaler, tiger and white sharks caught by drumline and nets were compared visually in terms of variation in the ranges of sizes of sharks, shapes of the distributions and proportions of total sharks caught >2 m long.

3 Results

3.1 Inter-regional patterns

3.1.1 Arrangement of Gear

The regions include swimming beaches along the coastline around populated areas. Regions vary in size with the Sunshine Coast and Gold Coast comprising the most beaches where gear is deployed (23 beaches in each), while the Tannum Sands and Rainbow Beach regions each have gear deployed at only one beach (**Figure 1-4** to **Figure 1-6)**.

Between 2001-2018, only drumlines were deployed in the regions of Townsville, Capricorn Coast, Tannum Sands and North Stradbroke Island. Nets were deployed at one or more beaches in the five other regions at some point during 2001-2018, although they are only now deployed at one beach at Mackay and Rainbow Beach and at 11 beaches at both the Sunshine Coast and Gold Coast.

3.1.2 Catch Composition and CPUE

Target shark species comprised at least around half, but usually the substantial majority, of total drumline catches across all 10 regions, ranging between 49.2% (Tannum Sands region) and 87.6% (Mackay region). In contrast, target species consistently comprised less than half of the total catches in nets, ranging between 6.6% (Cairns region) and 48.9% (Rainbow Beach region). There was a substantially greater variety of non-target species of sharks, rays, marine mammals and marine turtles caught by net than by drumline across all regions.

Bull whaler, tiger and white sharks

Totals of 1,687 bull whalers (~94 year^{-1}), 3,640 tiger sharks (~202 year^{-1}) and 108 white sharks (~14 year^{-1}) were caught by SCP gear between 2001 and 2018, with the proportions caught by drumlines being 79.8%, 94.3% and 62.0% for these species, respectively (**Table 3-1**). Some of the large-scale patterns included:

- Tiger sharks were more prevalent in drumlines than nets where both gear-types were present and were usually (but not always) the most abundant by far of the target sharks in drumline catches. The largest catches of tiger sharks in drumlines occurred at Townsville and Mackay and the least were at North Stradbroke Island and Gold Coast.
- Bull whalers were usually (but not always) the second-most abundant of the target sharks in drumline catches, and usually the most abundant target shark species in the case of nets in the northern regions and the second most in the southern regions. The Capricorn Coast recorded the largest mean annual catch from drumlines, which was more than twice the next largest value (Townsville). These, and other northern regions of Cairns, Mackay and Tannum Sands, also recorded bull whaler catches that were greater than for more southern regions. The general pattern for bull whalers caught by nets was consistent with that for drumlines, with the largest mean annual catch recorded in the Mackay region, which is the only northern region that now deploys nets.
- White sharks were not caught by drumline or net in any of the five northern-most regions but were caught in the five most southern regions.
- CPUE for tiger sharks in nets were generally much less than for drumlines in all regions apart from Mackay, where CPUE was greater in nets. CPUE for bull sharks in nets was generally much greater than for drumlines apart from Cairns where it was much greater in drumlines at most of the beaches. Although there were few data for white sharks, there were indications that CPUE in nets was generally greater than for drumlines.

Other target sharks

- Long-nose whalers (*Carcharhinus brevipinna*) were usually the most abundant target shark species caught in nets within the southern regions (see **Appendix B**).

Non-target sharks and rays

- Two species of whaler sharks, blacktip reef whaler (*Carcharhinus melanopterus*) and spot-tail whaler (*Carcharhinus sorrah*), and the tawny shark (*Nebrius ferrugineus*) were usually the most abundant non-target species caught by drumline in northern regions (see **Appendix B**).
- Scalloped hammerheads (*Sphyrna lewini*) (and/or unspecified hammerhead species– most likely scalloped hammerhead) were consistently common in net and drumline catches throughout the geographical range of the SCP.
- Grey nurse sharks (*Carcharias taurus*) have been caught only in the southern-most four regions.
- Pelagic rays such as manta rays (*Manta* spp.), devilrays (*Mobula* spp.), cownoses ray (*Rhinoptera bonasus*) and eagle rays (Family Myliobatidae) were abundant in net catches and less so in drumline catches, and accounted for greater proportions of the non-target catch in the central and southern regions.

Other non-target species

- Marine mammals and sea turtles were more abundant in catches in southern regions than in northern regions – particularly in the case of marine mammals (see **Appendix B**).
- Dolphins (Delphinidae) and baleen whales (Mysticeti) were more readily caught by net than by drumline where both gear-types were present – particularly in the central and southern regions.
- Humpback whales (*Megaptera novaeangliae*) have been caught only in the southern-most four regions.
- Green turtle (*Chelonia mydas*) was the species of sea turtle most commonly caught in the northern regions, while loggerhead turtles *Caretta caretta*) were the species most commonly caught sea turtle in the southern regions and indeed, of all non-target species.

Note that these observations are highly generalised patterns, and there are exceptions, so they should be considered with caution.

Table 3-1 Total catch and mean catch per year (2001-2018) at beaches for bull whaler, tiger and white sharks.

	BULL WHALER				TIGER SHARK				WHITE SHARK			
REGION and BEACH	**Drumlines**		**Net(s)**		**Drumlines**		**Net(s)**		**Drumlines**		**Net(s)**	
	Total	**Mean**	**Total**	**Mean**	**Total**	**Mean**	**Total**	**Mean**	**Total**	**Mean**	**Total**	**Mean**
CAIRNS												
Ellis Beach	45	2.5	0	0.0	164	9.1	3	0.2	0	0.0	0	0.0
Buchans Beach	15	0.9			50	2.9			0	0.0		
Palm Cove	31	1.7	1	0.1	59	3.3	0	0.0	0	0.0	0	0.0
Clifton Beach	11	0.6	1	0.1	33	1.8	0	0.0	0	0.0	0	0.0
Trinity Beach	12	0.7	2	0.2	90	5.3	1	0.1	0	0.0	0	0.0
Yorkeys Knob Beach	11	0.6	6	0.5	17	0.9	1	0.1	0	0.0	0	0.0
Holloways Beach	21	1.2			52	3.1			0	0.0		
Beaches combined	*146*	*8.1*	*10*	*0.8*	*465*	*25.8*	*5*	*0.4*	*0*	*0.0*	*0*	*0.0*
TOWNSVILLE												
Horseshoe Bay	68	3.8			202	11.2			0	0.0		
Radical Bay	30	1.7			117	6.5			0	0.0		
Florence Bay	56	3.1			172	9.6			0	0.0		
Alma Bay	36	2.0			106	5.9			0	0.0		
Nelly Bay	10	0.6			60	3.3			0	0.0		
Picnic Bay	3	0.2			10	0.6			0	0.0		
Pallarenda Beach	14	0.8			16	0.9			0	0.0		
The Strand	51	2.8			16	0.9			0	0.0		
Beaches combined	*268*	*14.9*			*699*	*38.8*			*0*	*0.0*		
MACKAY												
Bucasia Beach	10	0.6	77	4.5	41	2.3	34	2.0	0	0.0	0	0.0
Eimeo Beach	29	1.6	22	1.5	19	1.1	24	1.6	0	0.0	0	0.0
Blacks Beach	47	2.6			81	4.5			0	0.0		
Lamberts Beach	36	2.0			236	13.1			0	0.0		
Sth Lamberts Beach	2	1.0			5	2.5			0	0.0		
Harbour Beach	19	1.1	32	1.9	142	7.9	103	6.1	0	0.0	0	0.0
Beaches combined	*143*	*7.9*	*131*	*7.7*	*524*	*29.1*	*161*	*9.5*	*0*	*0.0*	*0*	*0.0*
CAPRICORN COAST												
Farnborough Beach	53	2.9			46	2.6			0	0.0		
Yeppoon Beach	22	1.2			15	0.8			0	0.0		
Cooee Bay	31	1.7			15	0.8			0	0.0		
Lammermoor Beach	46	2.6			37	2.1			0	0.0		
Kemp Beach	31	1.7			27	1.5			0	0.0		
Mullambin Beach	63	3.5			48	2.7			0	0.0		
Tanby Point	90	5.0			62	3.4			0	0.0		
Fishermans Beach	64	3.6			28	1.6			0	0.0		
Emu Park Beach	110	6.1			38	2.1			0	0.0		
Beaches combined	*510*	*28.3*			*316*	*17.6*			*0*	*0.0*		
TANNUM SANDS												
Tannum Sands	109	6.1			168	9.3			0	0.0		
WOONGARRA COAST												
Oaks Beach	1	0.1			10	0.6			0	0.0		
Nielsen Park Beach	17	0.9			149	8.3			3	0.2		
Bargara Beach	1	0.1			21	1.2			0	0.0		
Kelly's Beach	18	1.0			305	16.9			4	0.2		
Beaches combined	*37*	*2.1*			*485*	*26.9*			*7*	*0.4*		
RAINBOW BEACH												
Rainbow Beach	36	2.0	53	2.9	276	15.3	20	1.1	6	0.3	3	0.2
SUNSHINE COAST												
Noosa	4	0.2	46	2.6	74	4.1	6	0.3	2	0.1	0	0.0
Sunshine Beach	2	0.1			22	1.2			1	0.1		
Sunrise Beach	3	0.2			16	0.9			0	0.0		
North Peregian Beach	1	0.1			19	1.1			0	0.0		
Glen Eden Beach	0	0.0			12	0.7			0	0.0		
Peregian Beach	2	0.1			5	0.3			0	0.0		
Coolum Beach			3	0.2			1	0.1			1	0.1
Yaroomba	0	0.0			10	0.6			0	0.0		
Hyatt Resort	1	0.1			11	0.6			2	0.1		
Marcoola Beach			4	0.2			0	0.0			1	0.1
Surfair Resort	1	0.1			9	0.5			0	0.0		
Mudjimba Beach	0	0.0			6	0.3			0	0.0		
Twin Waters	0	0.0			6	0.3			0	0.0		
Maroochydore Beach			33	1.9			4	0.2			1	0.1
Alexandra Headland			8	0.4			0	0.0			0	0.0
Mooloolaba Beach			3	0.2			0	0.0			0	0.0
Point Cartwright	1	0.1			13	0.7			0	0.0		
Buddina Beach	1	0.1			30	1.7			0	0.0		
Wurtulla Beach			3	0.2			2	0.1			0	0.0
Currimundi Beach	3	0.2			14	0.8			0	0.0		
Moffat Beach	2	0.1			4	0.2			1	0.1		
Kings Beach (Caloundra	14	0.8	7	0.4	30	1.7	0	0.0	2	0.1	0	0.0
Woorim Beach (Bribie I	21	1.2			10	0.6			1	0.1		
Beaches combined	*56*	*3.1*	*107*	*5.9*	*291*	*16.2*	*13*	*0.7*	*9*	*0.5*	*3*	*0.2*
NORTH STRADBROKE ISLAND												
Amity Point	15	0.8			5	0.3			0	0.0		
Flinders Beach	0	0.0			4	2.0			0	0.0		
Cylinder Beach	5	0.3			78	4.3			10	0.6		
Main Beach	8	0.4			40	2.2			6	0.3		
Beaches combined	*28*	*1.6*			*127*	*7.1*			*16*	*0.9*		
GOLD COAST												
Sheraton	3	0.2			9	0.5			1	0.1		
Main Beach			4	0.2			1	0.1			4	0.2
Narrowneck	0	0.0			2	0.1			2	0.1		
Staghorn Avenue	2	0.1			6	0.3			1	0.1		
Elkhorn Avenue	0	0.0			2	0.1			1	0.1		
Surfers Paradise			4	0.2			0	0.0			3	0.2
Northcliffe	2	0.1			5	0.3			2	0.1		
Broadbeach	1	0.1			9	0.5			0	0.0		
Kurrawa			5	0.3			1	0.1			1	0.1
Mermaid Beach			1	0.1			0	0.0			2	0.1
Nobbys Beach	2	0.1			2	0.1			3	0.2		
Miami Beach			3	0.2			1	0.1			1	0.1
North Burleigh	0	0.0			6	0.3			5	0.3		
Burleigh Beach			5	0.3			0	0.0			7	0.4
Tallebudgera			8	0.5			1	0.1			2	0.1
Palm Beach	2	0.1			1	0.1			0	0.0		
Currumbin			7	0.4			0	0.0			4	0.2
Tugun	0	0.0			4	0.2			1	0.1		
Bilinga			4	0.2			0	0.0			2	0.1
North Kirra	0	0.0			6	0.3			1	0.1		
Kirra			2	0.1			3	0.2			7	0.4
Coolangatta			3	0.2			0	0.0			2	0.1
Rainbow Bay	2	0.1			31	1.7			12	0.7		
Beaches combined	*14*	*0.8*	*46*	*2.6*	*83*	*4.6*	*7*	*0.4*	*29*	*1.6*	*35*	*1.9*
Grand Total & Mean	**1347**	**74.8**	**347**	**19.3**	**3434**	**190.8**	**206**	**11.4**	**67**	**3.7**	**41**	**2.3**

3.1.3 Seasonal CPUE for the three most Dangerous Target Sharks

There were some broad geographic patterns in monthly or seasonal CPUE for bull whaler, tiger and white sharks and these can also vary between drumlines and nets.

Generally speaking, CPUE for tiger sharks caught by drumlines in most regions was generally less in summer than some or all of the other seasons. The exceptions were at Tannum Sands where CPUE was greatest in December and Gold Coast where CPUE was consistent throughout the year. This pattern was not generally seen for tiger sharks in nets, probably because of low catches of this species in nets.

The inter-monthly range for CPUE for bull whaler caught by drumlines was generally not as great as for tiger sharks but some patterns were still apparent. In contrast to tigers, CPUE for bull whalers caught by drumlines was generally greater in spring, summer and early autumn compared to other months in all regions apart from the two most southern regions. The same pattern was seen for CPUE for bull whalers caught in nets at Mackay, but at Rainbow Beach it was consistent across months, variable at the Sunshine Coast and greater in Spring, Autumn and early Winter at the Gold Coast.

In the southern regions where white sharks were caught, CPUE for drumlines and nets was generally greater in late winter and early spring than for other seasons.

3.1.4 CPUE Ratio (Drumlines vs Nets) for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Of the five regions that had nets deployed in addition to drumlines at some stage between 2001 and 2018, the CPUE ratio (drumlines/nets) at Cairns and Rainbow Beach was >1 for the group of taxa considered to be the most dangerous of the target sharks (i.e. bull whaler, tiger and white shark) (**Figure 3-1**). This ratio indicates drumlines were more efficient than nets at catching this group of taxa in these regions. This was particularly the case for Cairns where the CPUE ratio of 8.1 $\pm$1.8 indicated an eight-fold greater efficiency. At Rainbow Beach the ratio however, was only marginally greater than 1 (i.e. at 1.1 $\pm$ 0). At the three other regions with nets (Mackay, Sunshine Coast and Gold Coast), the CPUE ratio was much less than 1, indicating nets were more efficient than drumlines at catching bull whaler, tiger and white sharks.

CPUE ratios (drumlines/nets) for the groups of ‘all other target and non-target sharks’ and ‘other bycatch’ were generally less than 0.2, indicating that net units were much more efficient than drumlines at catching these other taxa (**Figure 3-1**). The exception was for all other sharks in Cairns, where the ratio was close to 1, indicating similar efficiency between gear types for this group of taxa.

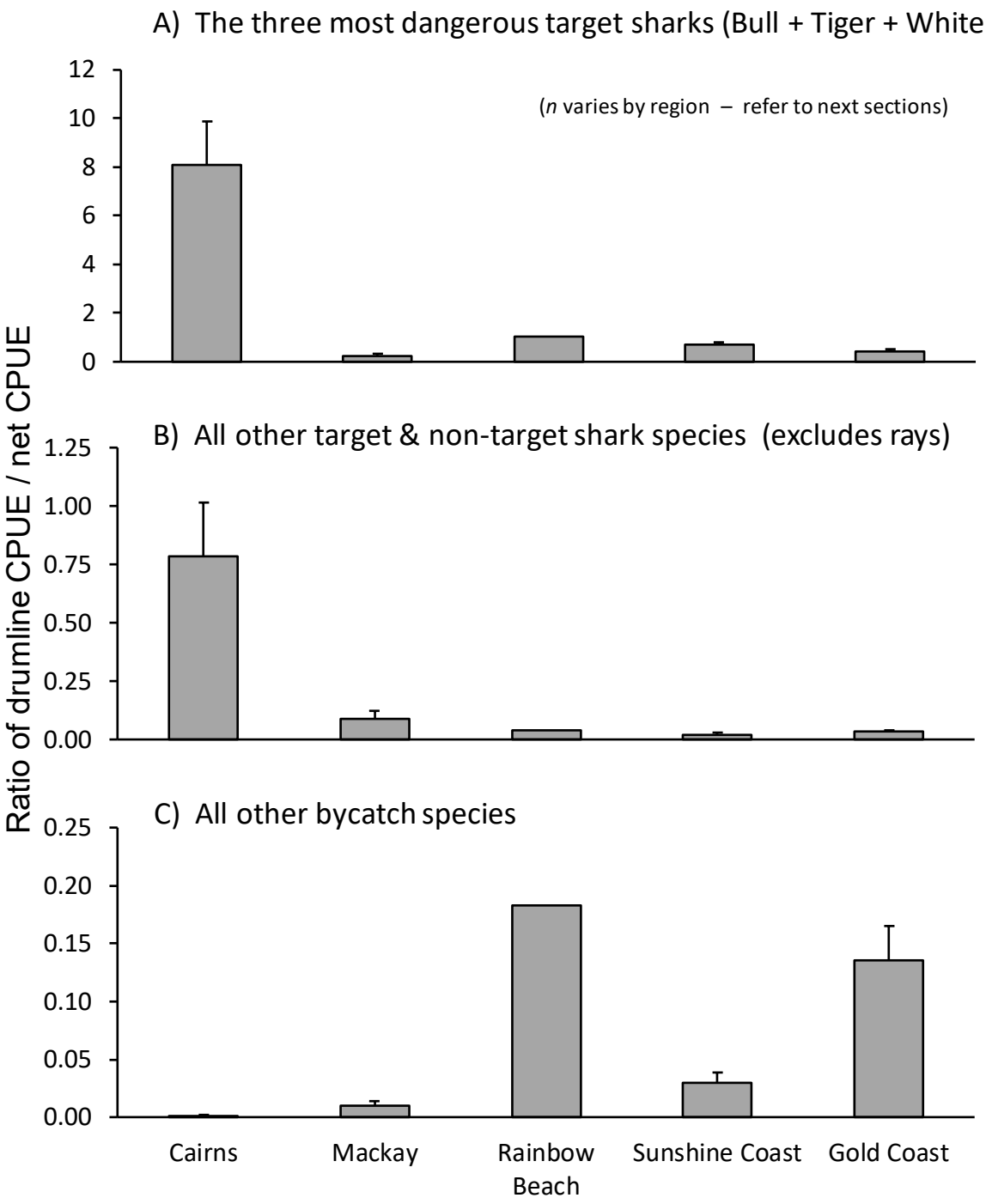

Figure 3-1 Ratio of drumline CPUE / net CPUE in SCP regions for the three most dangerous shark species (bull, tiger & white sharks), all other target and non-target sharks and all other bycatch. NB. Excludes SCP regions where nets were not deployed for any period between 2001-2018.

3.1.5 Survival of Non-target Taxa

General patterns in mortality rates for the more commonly caught non-target species were consistent across all regions. Irrespective of gear-type, most non-target whalers, hammerheads (*Sphyrna* spp.) and makos (*Isurus* spp.) were almost always found dead on/in the gear (e.g. blacktip reef whalers, spot-tail whalers and scalloped hammerheads). In contrast, demersal species of sharks or rays were found and released alive

most of the time when caught by drumline and around half of the time when caught by net (e.g. tawny sharks and zebra sharks. As these species breathe using the buccal pumping method they are able to stay alive when not moving forward. Pelagic rays such as mantas, devilrays, cownose rays and eagle rays, which can also breathe by buccal pumping, and which are far more commonly caught in nets than by drumline, exhibited variable mortality following capture in nets with approximately half recovered dead (see **Appendix B**).

Most marine mammals and sea turtles caught by drumline were usually found alive and subsequently released. In contrast, these species were much more likely to be found dead – more than half of the time – when caught by net, with sea turtles and whales apparently faring slightly better than dolphins, which rarely survived net capture. Teleost species caught, such as barramundi (*Lates calcarifer*), giant trevally (*Caranx ignobilis*, Carangidae) and tuna (Scombridae), were usually found dead when caught by either type of gear.

3.1.6 Bycatch Ratio

For drumlines, the ratio of bycatch / target sharks in most regions (i.e. apart from two exceptions), was close to or less than 0.5 indicating generally that roughly twice as many target sharks were caught for every non-target animal in most regions (**Figure 3-2**). In Tannum Sands and Townsville, however, the ratio was close to one, indicating similar numbers of target and non-target species were caught by drumlines there.

Of the five regions that had nets deployed in addition to drumlines at some stage between 2001 and 2018, the bycatch ratio for nets was either slightly greater than one (i.e. at Mackay, Rainbow Beach and Sunshine Coast) or much greater than one (i.e. at Cairns and Gold Coast). At the Gold Coast, the ratio of 3.5 $\pm$ 0.3 indicated three to four-fold greater numbers of bycatch in nets than target sharks. At Cairns, the bycatch ratio of 24.4 $\pm$ 5.73 indicated a 24-fold difference between bycatch and target sharks.

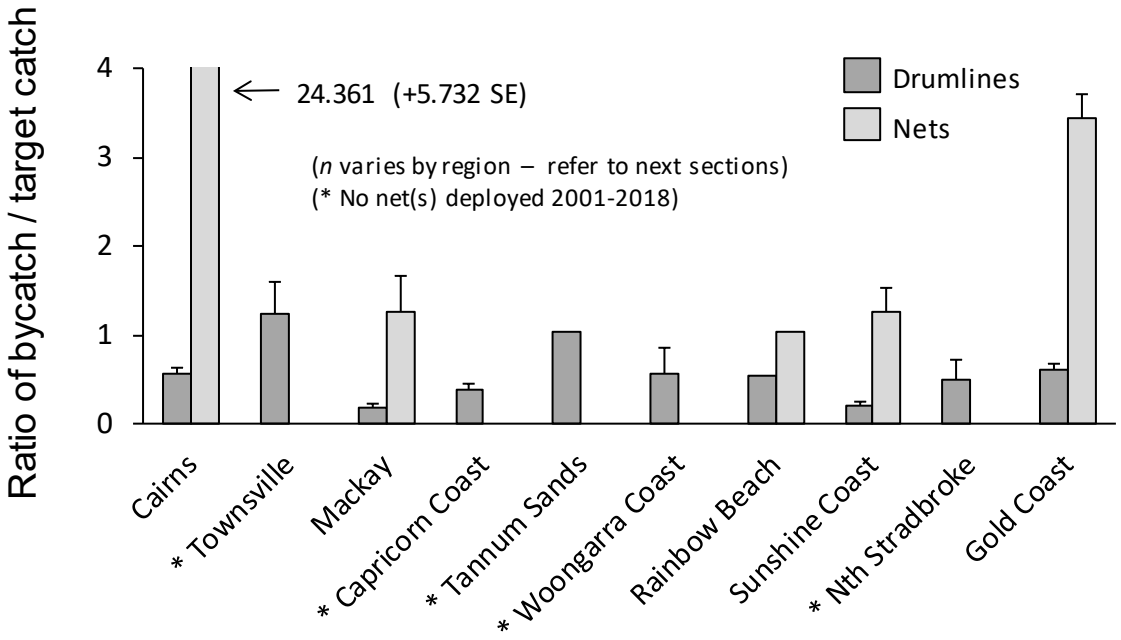

Figure 3-2 Bycatch ratios at SCP regions.

3.1.7 Sizes of the three most Dangerous Target Sharks

In all regions, the distributions of sizes of bull whaler, tiger and white sharks caught on drumlines or nets included many large sharks (>2 m). There were generally few bull whalers caught on drumlines that were larger than 3 m but there were many tiger sharks greater than this size but this is probably more a reflection of the potential maximum sizes of tiger sharks compared to bull whalers rather than a difference in selectivity.

The distribution of sizes for bull sharks caught in nets was very similar to that for drumlines at Mackay, Rainbow Beach, Sunshine Coast and Gold Coast. Although fewer tiger sharks were caught in nets generally, it appeared that small tigers (<2 m) were relatively poorly represented in net catches in Mackay, Rainbow Beach, Sunshine Coast and Gold Coast

3.2 Cairns

3.2.1 Arrangement of Gear

There are seven beaches in the Cairns SCP region. Nets have not been used in Cairns since 2013 but prior to then were deployed at 5 of the 7 beaches. Between 2 and 9 drumlines were deployed at beaches as at 31 December 2018 (**Figure 1-4, Table 3-2**).

Table 3-2 Number of nets and drumlines in Cairns region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Cairns	Ellis Beach	7	
	Buchans Beach	2	
	Palm Cove	9	
	Clifton Beach	4	
	Trinity Beach	6	
	Yorkeys Knob Beach	5	
	Holloways Beach	5	
	TOTAL	***38***	**-**

3.2.2 Total Catch and CPUE

Catch data recorded from SCP units operating at beaches in the Cairns region from 2001 to 2018 comprised 1,073 catch records for drumlines (65.1% of which were target sharks) and 346 for nets (6.6% target sharks). Across the seven Cairns beaches, the proportion of the drumline catch comprising non-target animals ranged between 29.7% (Buchans Beach) and 43.7% (Holloways Beach), while for catches in nets this proportion ranged between 89.4% (Yorkey's Knob) and 97.6% (Palm Beach) (see **Appendix B)**.

Target Shark Species

Tiger sharks were the most commonly caught of the target sharks by drumline (43.3% of total drumline catch; rate of 0.93 drumline^{-1}.year^{-1}), followed by bull whalers (13.6%; 0.29 drumline^{-1}.year^{-1}) and great hammerheads, *Sphyrna mokarran* (3.2%; 0.07 drumline^{-1}.year^{-1}). Bull whalers were the most commonly caught target species in nets (2.9% of total net catch; 0.14 net^{-1}.year^{-1}), followed by great hammerheads (3.2%; 0.08 net^{-1}.year^{-1}) and tiger sharks (3.2%; 0.07 net^{-1}.year^{-1}). Notably, the catch (per unit, per year) of tiger sharks for net units was more than a magnitude lower than for drumline units, while in the case of bull whalers the catch for nets was around half that for drumlines (see **Appendix B**).

Ellis Beach yielded the most bull whalers via drumlines (annual average of 2.50 year^{-1}), followed by Palm Cove (1.72 year^{-1}) and Holloways Beach (1.24 year^{-1}) (see **Appendix B**). Similarly, Ellis Beach drumlines caught the most tiger sharks (9.11 year^{-1}), followed by Trinity Beach (5.29 year^{-1}) and Palm Cove (3.28 year^{-1}). Cairns nets caught far fewer individuals of these species annually, ranging between 0 and 0.46 bull whalers year^{-1} at Ellis Beach and Yorkeys Knob Beach, respectively; and for tiger sharks between 0 year^{-1} (Palm Cove and Clifton Beach) and 0.23 year^{-1} (Ellis Beach).

Non-target Species

The most commonly caught non-target species by drumline across all Cairns beaches were blacktip reef whalers (20.0% of total drumline catch), followed by tawny sharks (5.0%) and scalloped hammerheads (4.7%). No marine mammals or sea turtles were caught by drumline. In contrast, the most commonly caught non-target species in nets were eagle rays (39.3% of total net catch), followed by narrow sawfish, *Anoxypristis cuspidata* (10.7%), scalloped hammerheads (9.0%), tawny sharks (8.7%) and green turtles

(8.1%). At least four species of marine mammals (dolphins and dugong) and four species of sea turtles accounted for a combined proportion of 14.3% of the total net catch from Cairns beaches (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks by drumline was highest at Ellis and Buchan beaches (both 1.61 drumline^{-1}.year^{-1}), followed by Trinity Beach (1.30 drumline^{-1}.year^{-1}), while it was lowest at Yorkey's Knob (0.32 drumline^{-1}.year^{-1}) and Palm Beach (0.43 drumline^{-1}.year^{-1}). The catch rate of bull whaler was also highest at Buchan Beach (0.48 drumline^{-1}.year^{-1}) and Ellis Beach (0.44 drumline^{-1}.year^{-1}), followed by Holloways Beach (0.33 drumline^{-1}.year^{-1}), with the lowest rate at Trinity Beach (0.17 drumline^{-1}.year^{-1}). In nets, the catch rate of bull whaler was highest at Trinity Beach (0.38 net^{-1}.year^{-1}) and lowest at Ellis Beach (none caught).

In the cases of the most commonly captured non-target species, the annual catch rate for blacktip reef whaler caught by drumline ranged between 0.83 and 2.84 year^{-1} at Yorkey's Knob and Ellis Beach respectively. In nets, the annual catch rate for eagle ray ranged between 0 and 3.46 year^{-1} at Buchans Beach and Yorkey's Knob respectively (see **Appendix B**).

3.2.3 Seasonal CPUE for the three most Dangerous Target Sharks

The monthly trend in CPUE for the group of the most dangerous target sharks caught on drumlines In Cairns was driven by tiger sharks. CPUE for tiger sharks caught on drumlines was generally much greater (about double) in autumn and winter months than for other months. CPUE for bull whalers was generally much less than for tiger sharks and relatively consistent all year round. Low CPUE for both species in nets (compared to drumlines) made robust interpretation of patterns difficult (**Figure 3-3**). White sharks were not caught in Cairns.

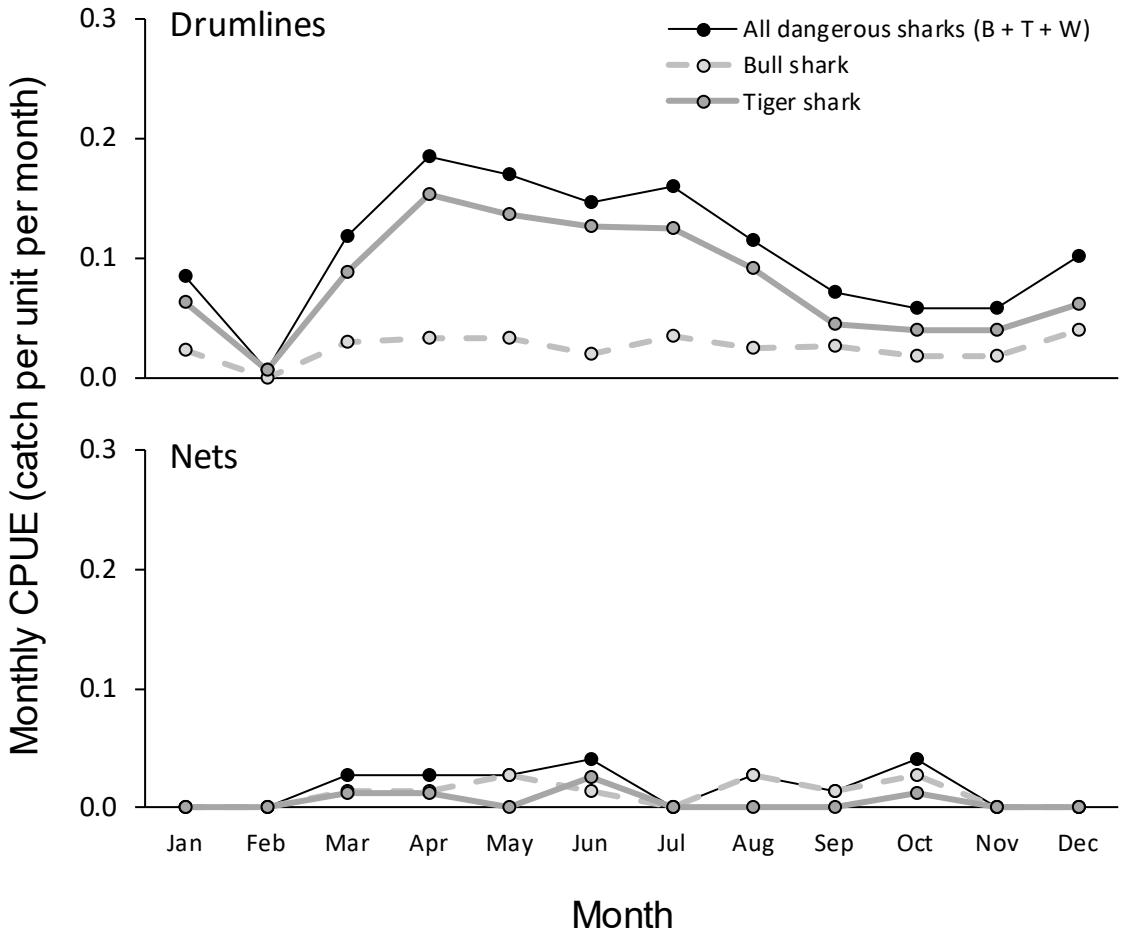

Figure 3-3 Monthly CPUE for bull whaler and tiger sharks in Cairns.

3.2.4 Survival of Non-target Taxa

Non-target Sharks

Close to 100% of the non-target sharks caught on drumlines and nets were found dead. The exceptions were tawny shark and zebra shark of which a large proportion were generally released alive (see **Appendix B**).

Other Taxa

Very few pelagic or demersal species of rays or sawfish were caught on drumline. A greater diversity of these taxa was caught in nets with variable mortality, although overall around half the of the total were released alive (see **Appendix B**).

Marine mammals and sea turtles were generally not caught on drumlines in Cairns but were occasionally caught by net. These species were much more likely to be found dead – more than half of the time – when caught by net, with sea turtles apparently faring slightly better than dolphins, which rarely survived net capture. The single dugong caught in Cairns (Yorkeys Knob) perished in a net. Teleost species caught, such as barramundi (*Lates calcarifer*), giant trevally (*Caranx ignobilis*, Carangidae) and tuna (Scombridae), were usually found dead when caught by either type of gear (see **Appendix B**).

3.2.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Of the five beaches that had nets deployed in addition to drumlines at some stage between 2001 and 2018, the CPUE ratio (drumlines/nets) was generally between 8.9 and 10.8 for the group of taxa comprising the three target sharks considered to be the most dangerous (i.e. bull whaler, tiger and white shark) (**Table 3-3**). This ratio indicates drumlines were much more efficient at catching this group of taxa at these beaches. At Yorkeys Knob, however, the ratio was close to 1, indicating similar efficiency between gear at this SCP beach.

CPUE ratios (drumlines/nets) for the group of ‘all other target and non-target sharks’ were variable among beaches (**Table 3-3**). At three of the beaches the ratio was marginally greater than, or close to 1, indicating similar efficiency for drumlines and nets. The ratios at Ellis Beach and Yorkeys Knob, however were closer to zero, indicating nets were more efficient than drumlines at catching other sharks.

CPUE ratios (drumlines/nets) for the group of ‘other bycatch’ were generally close to or slightly above zero, indicating that nets were much more efficient than drumlines at catching these other taxa (**Table 3-3**).

3.2.6 Bycatch Ratio

The ratio of bycatch/target sharks for drumlines at beaches ranged between 0.42 to 0.80 indicating that more target sharks were caught for every non-target animal (**Table 3-3**). In contrast, the bycatch ratio for nets at all beaches that had nets deployed in addition to drumlines at some stage between 2001 and 2018 (i.e. all apart from Yorkeys Knob), indicated high levels of bycatch (i.e. the ratio ranged between 9.6 and 38).

Table 3-3 Ratio of Drumline CPUE / Net CPUE for three groups (the three most dangerous target sharks [bull whaler, tiger and white], all other target & non-target sharks and other bycatch) at Cairns.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Ellis Beach (7 drumlines, 1 net) (net ceased & 2 drums added in 2013)	8.93	0.20	0.00	0.43	22.25
Buchans Beach (2 drumlines)				0.42	
Palm Cove (9 drumlines, 1 net) (net ceased & 2 drums added in 2013)	10.83	1.01	0.00	0.54	37.00
Clifton Beach (4 drumlines, 1 net) (net ceased in 2012 & various drums added)	10.33	1.44	0.00	0.8-	38.00
Trinity Beach (6 drumlines, 1 net) (net ceased & 3 drums added in 2013)	9.19	0.92	<0.01	0.51	15.00
Yorkeys Knob (5 drumlines, 1 net) (net ceased & 3 drums added in 2013)	1.15	0.37	<0.01	0.56	9.56
Holloways Beach (5 drumlines) (2 drums added in 2013)				0.77	
Mean of ratios (SE) (n = 5-7 beach groupings)	**8.09 (1.77)**	**0.79 (0.23)**	**0.001 (0.001)**	**0.57 (0.056)**	**24.36 (5.73)**

3.2.7 Sizes of the three most Dangerous Target Sharks

The distributions of sizes of bull whaler and tiger sharks caught on drumlines included many large sharks (>2 m). There were no bull whalers caught on drumlines that were larger than 3 m but there were many tiger sharks greater than this size. This is probably more a reflection of the potential maximum sizes of tiger sharks compared to bull whalers rather than a difference in selectivity *per se*. There was a distinct mode in the distribution of sizes for bull whalers at 2.2 m whereas there was no distinct mode for tiger sharks. Tiger sharks between 0.7 and 2.3 m in length were all well represented in the catch but sharks greater than this size were gradually less represented in the catch. There were insufficient numbers of tiger and bull whalers caught in nets to adequately compare differences in the size structure of these species between gear types (**Figure 3-4**).

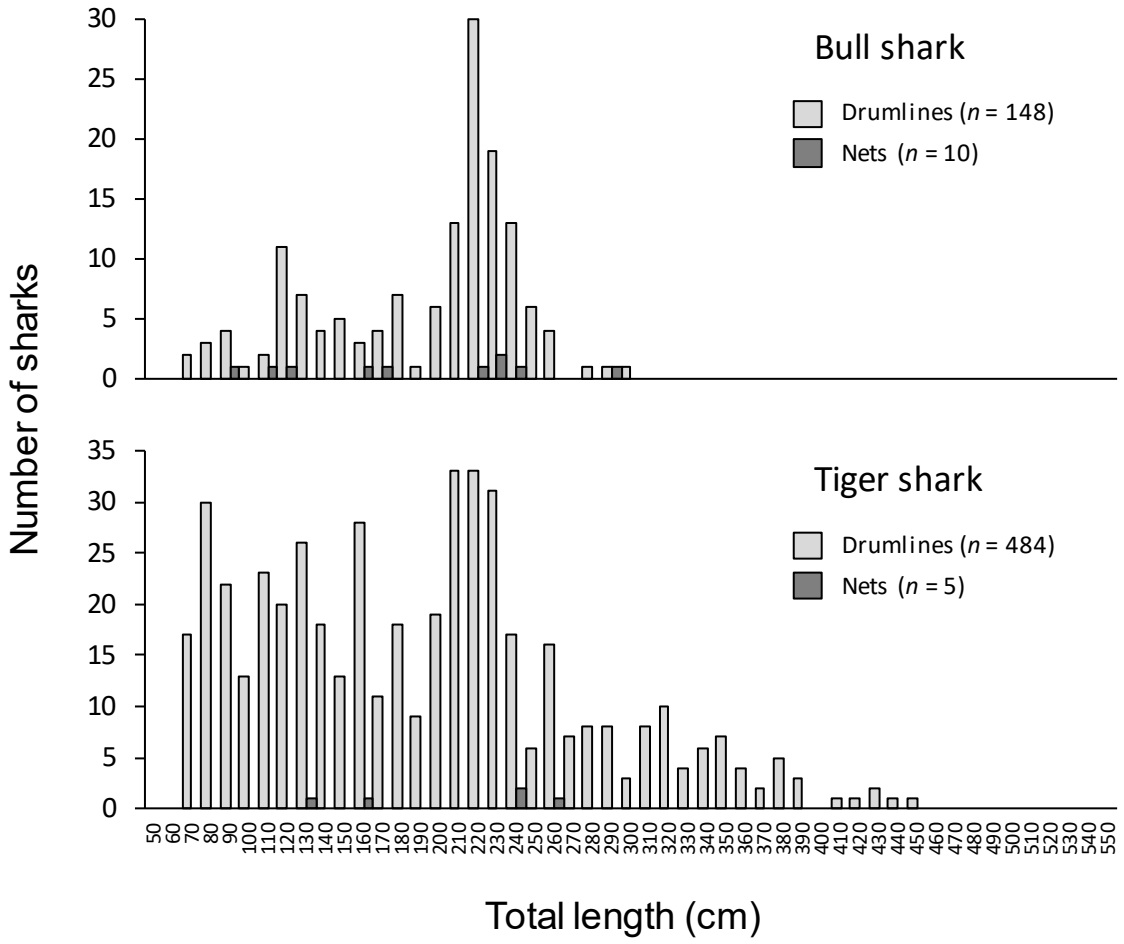

Figure 3-4 Sizes of bull whaler and tiger sharks caught in drumlines and nets in Cairns.

3.3 Townsville & Magnetic Island

3.3.1 Arrangement of Gear

There are eight beaches in the Townsville & Magnetic Island SCP region. Nets have not been used in the region since 2005. As at 31 December 2018, drumlines were in place at only two SCP beaches; 12 at Horseshoe Bay on Magnetic Island and 12 at The Strand on the mainland (**Figure 1-4, Table 3-4**).

Table 3-4 Number of nets and drumlines in Townsville and Magnetic Island region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Townsville & Magnetic Island	Horseshoe Bay	12	
	Radical Bay	5	
	Florence Bay	5	
	Alma Bay	6	
	Nelly Bay	9	
	Picnic Bay	5	
	Pallarenda Beach	3	
	The Strand	9	
	TOTAL	***54***	**-**

3.3.2 Total Catch and CPUE

Catch data recorded from SCP drumlines operating at beaches (or bays) in the Townsville region between 2001 and 2018 comprised a total of 2,125 catch records, with 55.0% of those animals being target sharks. No SCP nets are used in the Townsville region. Across the eight Townsville beaches, the proportion of the catch comprising non-target animals ranged between 29.5% (Radical Bay) and 78.2% (Picnic Bay) (see **Appendix B**).

Target Shark Species

Of the target shark species, the most commonly caught were tiger sharks (32.9% of total catch; 0.73 drumline^{-1}.year^{-1}), followed by bull whalers (12.6%; 0.28 drumline^{-1}.year^{-1}) and great hammerheads (2.9%; 0.06 drumline^{-1}.year^{-1}). These results are very similar to those for drumline catches at Cairns beaches (see **Appendix B**).

Annual drumline catches of bull whalers and tiger sharks were highest at Horseshoe Bay (3.78 and 11.22 year^{-1} respectively) followed by Florence Bay (3.11 and 9.56 year^{-1} respectively) (see **Appendix B**). In contrast, far fewer individuals of these species have been caught by the drumlines at Picnic Bay (0.17 and 0.56 year^{-1} respectively) and Pallarenda Beach (0.78 and 0.89 year^{-1} respectively).

Non-target Species

The most commonly caught non-target species across all Townsville beaches were spot-tail whalers (13.0% of total catch), followed by tawny sharks (10.5%), blacktip reef whalers (6.4%) and an unspecified species of catfish (5.6%). Three species of marine mammals (two species of dolphin and dugong) and two species of sea turtles (loggerhead and green turtles) accounted for a combined proportion of 1.3% of the total catch from Townsville beaches, with green turtles the greatest contributor (1.1%) (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks by drumline was highest at Florence Bay (1.91 drumline^{-1}.year^{-1}), followed by Radical Bay (1.30 drumline^{-1}.year^{-1}) and Alma Bay (1.30 drumline^{-1}.year^{-1}), while it was lowest at Picnic Bay (0.12 drumline^{-1}.year^{-1}) and The Strand (0.10 drumline^{-1}.year^{-1}). Similarly, the catch rate of bull whalers was also highest at Florence Bay, Radical Bay and Alma Bay (0.62, 0.33 and 0.33 drumline^{-1}.year^{-1} respectively), while Picnic Bay (0.04 drumline^{-1}.year^{-1}) had the lowest catch rate for this species.

In the cases of the most commonly caught non-target species, the annual catch rate (fate and gear units combined, per year) for spot-tail whalers ranged between 0.44 and 3.17 year^{-1} at Picnic Bay and Horseshoe Bay respectively. Annual catch rates for tawny sharks ranged between 0.44 year^{-1} (Pallarenda Beach) and 3.06 year^{-1} (Horseshoe Bay), and for blacktip reef whalers between 0.06 year^{-1} (Pallarenda Beach) and 1.78 year^{-1} (Nelly Bay). Most (~65%) of the green turtles recorded were caught at The Strand and Picnic Bay (see **Appendix B**).

3.3.3 Seasonal CPUE for the three most Dangerous Target Sharks

As for Cairns, CPUE for tiger sharks caught on drumlines in Townsville was generally much greater (about double) in most autumn and winter months than for other months. In contrast, the opposite pattern occurred for CPUE for bull whalers, where it was lowest in most autumn and winter months (**Figure 3-5**). White sharks were not caught in Townsville.

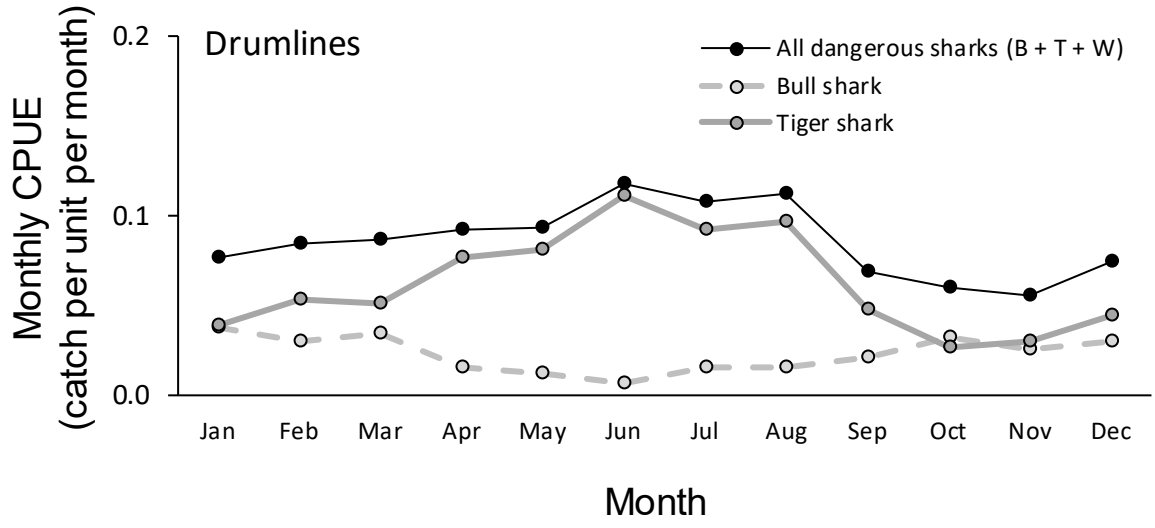

Figure 3-5 Monthly CPUE for bull whaler and tiger sharks at Townsville.

3.3.4 Survival of Non-target Taxa

Non-target Sharks

Close to 100% of the non-target sharks caught on drumlines were found dead. Similar to Cairns, the exceptions were tawny shark and zebra shark of which a large proportion were generally released alive (see **Appendix B**).

Other Taxa

Of the few pelagic or demersal species of rays or sawfish caught on drumline, most were released alive (see **Appendix B**).

Most marine mammals and sea turtles caught on drumlines were released alive. Mortality of teleosts was variable (see **Appendix B**).

3.3.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Given nets were not deployed at any beach between 2001 and 2018, calculations of CPUE ratios (drumlines/nets) for this region were not applicable.

3.3.6 Bycatch Ratio

The ratio of bycatch/target sharks for drumlines at beaches ranged between 0.42 to 3.6, with half of the beaches having ratios <1, and the other half with ratios >1. Beaches with ratios <1 were on the seaward side of Magnetic Island, and the ratios were primarily driven by large numbers of target sharks (particularly tiger sharks) at these beaches (**Table 3-5**).

Table 3-5 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) at Townsville and Magnetic Island. Blank cell = N/A.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Horseshoe Bay (12 drumlines)				0.794	
Radical Bay (5 drumlines)				0.417	
Florence Bay (5 drumlines)				0.437	
Alma Bay (6 drumlines)				0.634	
Nelly Bay (9 drumlines)				1.649	
Picnic Bay (5 drumlines)				3.56	
Pallarenda Beach (9 drumlines)				1.136	
The Strand (3 drumlines)				1.345	
Mean of ratios (SE) (n = 8 beach groupings)				**1.247 (0.365)**	

3.3.7 Sizes of the three most Dangerous Target Sharks

The distributions of sizes of bull whaler and tiger sharks caught on drumlines included many large sharks (>2 m). The distributions for the two species were very similar for the proportions of the total catch that were <2 m. The distributions reflected that there were very few bull whalers caught that were larger than 3 m, in contrast to tigers, where a large part of the distribution included sharks of sizes up to 4.2 m (**Figure 3-6**).

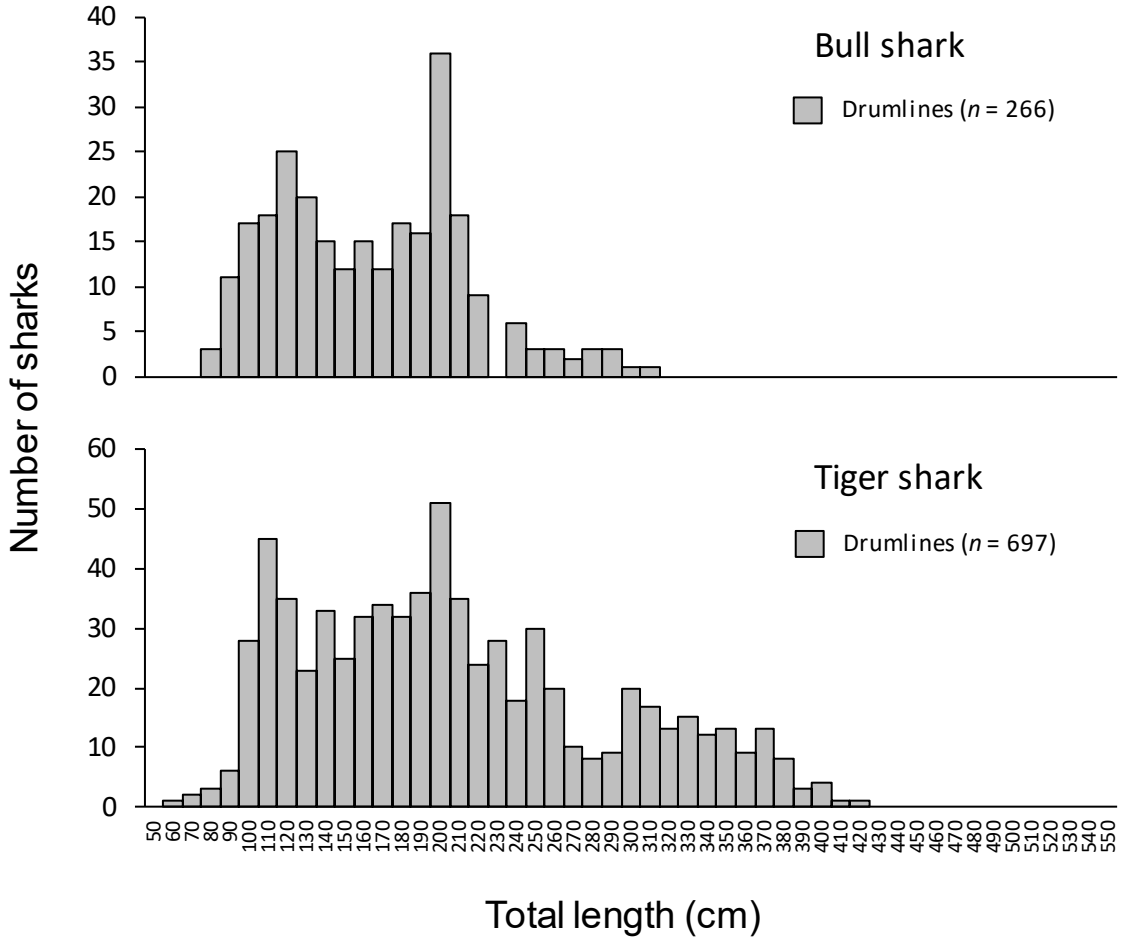

Figure 3-6 Sizes of bull whaler and tiger sharks caught in drumlines in Townsville and Magnetic Island.

3.4 Mackay

3.4.1 Arrangement of Gear

There are six beaches at Mackay that have SCP gear including two nets at Harbour Beach. Two nets were previous deployed at Bucasia Beach but were removed in 2016/17 and one net at Eimeo Beach which was removed in 2015. Between 6 and 12 drumlines were deployed at beaches in the Mackay SCP region as at 31 December 2018. (**Figure 1-4, Table 3-6**).

Table 3-6 Number of nets and drumlines in Mackay region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Mackay	Bucasia Beach	12	
	Eimeo Beach	6	
	Blacks Beach	6	
	Lamberts Beach	6	
	Sth Lamberts Beach	6	
	Harbour Beach	9	2
	TOTAL	***35***	***2***

3.4.2 Total Catch and CPUE

Catch data recorded from SCP units operating at beaches in the Mackay region between 2001 and 2018 comprised a total of 784 catch records for drumlines (87.6% target sharks) and 706 for nets (43.3% target sharks). Across the six beaches, the proportion of the drumline catch comprising non-target animals ranged between 9.3% (Lamberts Beach) and 22.2% (South Lamberts Beach), while for catches in nets this proportion ranged between 47.5% (Eimeo Beach) and 67.5% (Bucasia Beach) (see **Appendix B**).

Target Shark Species

Of the target shark species, by far the most commonly caught by drumline were tiger sharks (66.8% of total drumline catch; rate of 0.85 drumline^{-1}.year^{-1}), followed by bull whalers (18.2%; 0.23 drumline^{-1}.year^{-1}), with no other targeted species exceeding an overall catch rate of 0.01 drumline^{-1}.year^{-1}). Unlike Cairns nets, tiger sharks were the most commonly caught target species in nets (22.8% of total net catch; rate of 1.92 net^{-1}.year^{-1}), with bull whalers second highest (18.6% of total net catch; rate of 1.56 net^{-1}.year^{-1}). Notably, the rates of capture (per unit, per year) for tiger sharks and bull whalers were both much greater for nets than for drumlines – the opposite of the pattern observed for Cairns beaches (see **Appendix B**).

Blacks Beach yielded the highest number of bull whalers via drumlines (2.61 year^{-1}), followed by Eimeo Beach (1.61 year^{-1}) (see **Appendix B**). In contrast, Lamberts Beach drumlines caught by far the highest number of tiger shark (13.11 year^{-1}), followed by Harbour Beach (7.89 year^{-1}). In the case of netted beaches, Bucasia Beach caught the most bull whalers in nets (4.53 year^{-1}), while Harbour Beach caught the highest number of tiger sharks (6.06 year^{-1}).

Non-target Species

The most commonly caught non-target species by drumlines across all Mackay beaches were tawny sharks (5.2% of total drumline catch), followed by blacktip reef whalers (3.2%) and scalloped hammerheads (1.3%). While no marine mammals were caught by drumline, a total of two loggerhead turtles were recorded.

In nets, the most commonly caught non-target species were cownose rays (24.9% of total net catch), scalloped hammerheads (6.4%), tawny sharks (5.8%) and blacktip reef whalers (5.1%). Four species of marine mammals (three species of dolphins and dugong), three species of sea turtles (list) and a total of five saltwater crocodiles accounted for a combined proportion of 5.7% of the total net catch from Mackay beaches (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks by drumline was highest at Lamberts Beach (2.00 drumline^{-1}.year^{-1}), followed by Harbour Beach (0.88 drumline^{-1}.year^{-1}) and Blacks Beach (0.82 drumline^{-}

^{1}.year^{-1}). The lowest rates were at Eimeo Beach and Bucasia Beach (0.18 and 0.34 drumline^{-1}.year^{-1} respectively). The catch rate of bull whalers was highest at Blacks Beach (0.47 drumline^{-1}.year^{-1}) and Lamberts Beach (0.31 drumline^{-1}.year^{-1}), while the lowest rate was at Bucasia Beach (0.08 drumline^{-1}.year^{-1}). In nets the catch rate of tiger sharks was highest at Harbour Beach (2.86 drumline^{-1}.year^{-1}), followed by Eimeo Beach (1.60 net^{-1}.year^{-1}) and Bucasia Beach (1.03 net^{-1}.year^{-1}), while the catch rate of bull whalers was highest at Bucasia Beach (2.33 net^{-1}.year^{-1}) and lowest at Eimeo Beach (1.47 net^{-1}.year^{-1}).

In the case of the most commonly captured non-target species, the annual catch rate (fate and gear units combined, per year) for tawny sharks caught by drumline ranged between 0.11 and 1.00 year^{-1} at Blacks Beach and Lamberts Beach respectively. In nets, the annual catch rate for cownose rays ranged between 1.16 and 7.94 year^{-1} at Harbour Beach and Bucasia Beach respectively. Only a dugong and a turtle were recorded for the Eimeo Beach net, with the remaining 39 mammals and reptiles recorded in nets caught at either Harbour Beach or Bucasia Beach (see **Appendix B**).

3.4.3 Seasonal CPUE for the three most Dangerous Target Sharks

CPUE for tiger sharks caught on drumlines in Mackay peaked in August and was generally greater from late-autumn to mid-spring than for other months. The opposite occurred for bull whalers where CPUE was generally much less in late-autumn to mid-spring than for other months. In summer, when CPUE for drumlines was lowest for tigers and greatest for bull whalers, it was at similar levels for the two species. CPUE in nets followed a similar pattern for both species where, apart from the month of October, there was a broad peak in late winter to spring (**Figure 3-7**). White sharks were not caught in Mackay.

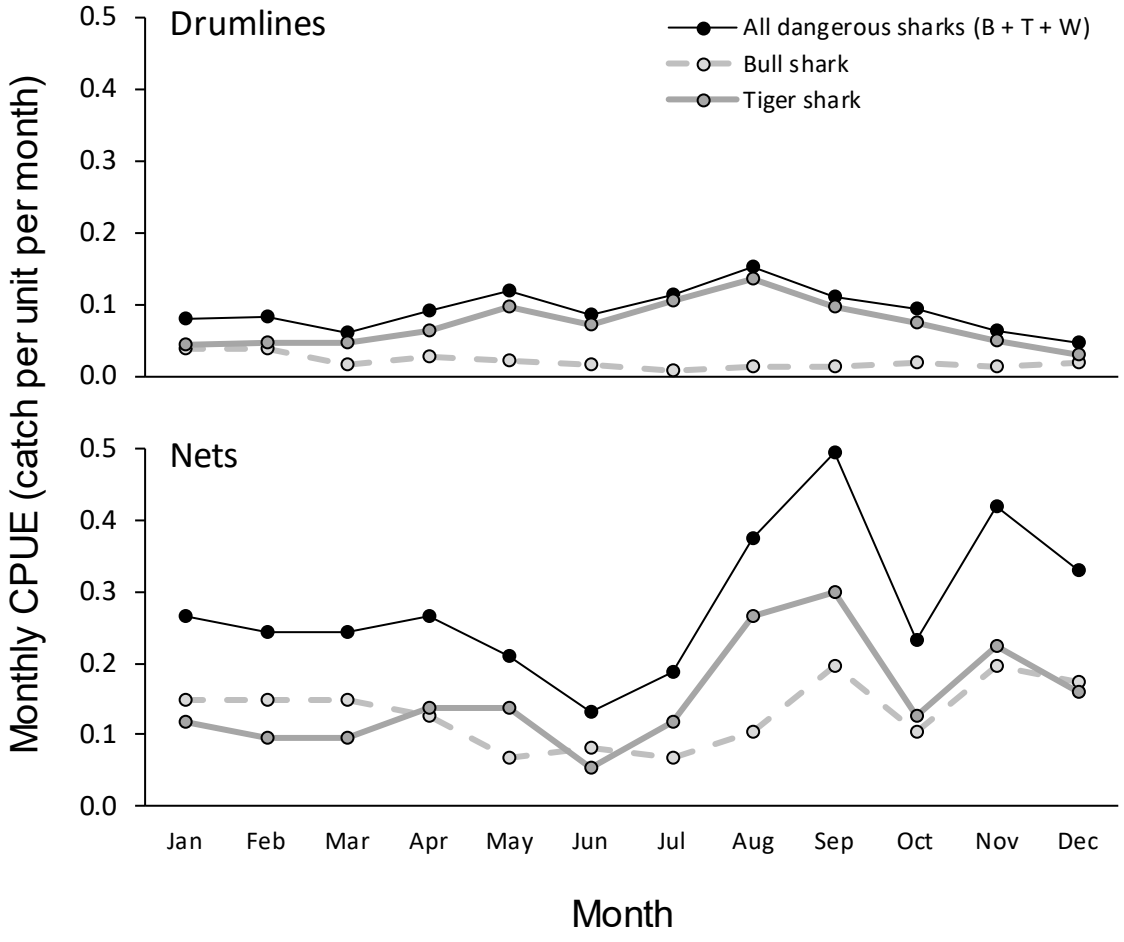

Figure 3-7 Monthly CPUE for bull whaler and tiger sharks at Mackay.

3.4.4 Survival of Non-target Taxa

Non-target Sharks

As for most northern regions, close to 100% of the non-target sharks caught by drumlines or nets were found dead, apart from tawny shark and zebra shark of which a large proportion were generally released alive (see **Appendix B**).

Other Taxa

Very few pelagic or demersal species of rays or sawfish were caught on drumline. In contrast, many pelagic or demersal species of rays or sawfish were caught in nets with variable mortality (i.e. overall around half the of the total were released alive) (see **Appendix B**).

Marine mammals and sea turtles were rarely caught on drumlines in Mackay apart from one loggerhead turtle that was released alive. Capture of marine mammals and sea turtles by net was rare and those that were caught were found dead. There were rare captures of Queensland groper on both types of gear with variable mortality (see **Appendix B**).

3.4.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Of the three beaches that had nets deployed in addition to drumlines at some stage between 2001 and 2018, the CPUE ratio (drumlines/nets) was generally much less than 1 (i.e. between 0.13 and 0.40) for the group of taxa comprising the three target sharks considered to be the most dangerous (i.e. bull whaler, tiger and white shark) (**Table 3-7**). This ratio indicates nets were much more efficient than drumlines at catching this group of taxa at these beaches.

CPUE ratios (drumlines/nets) for the groups of ‘all other target and non-target sharks’ and ‘other bycatch’ were even less (ranging between <0.01 and 0.15 indicating nets were more efficient than drumlines at catching these groups.

3.4.6 Bycatch Ratio

The ratio of bycatch/target for drumlines at beaches ranged from 0.10 to 0.29 indicating that many more target sharks were caught for every non-target animal. The bycatch ratio for nets at beaches that had nets deployed in addition to drumlines at some stage between 2001 and 2018 were close to 1 (Eimeo Beach and Harbour Beach) and 2.1 (Bucasia Beach) (**Table 3-7**).

Table 3-7 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) in Mackay.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Bucasia Beach (12 drumlines, 2 nets) (nets ceased & drumlines from 6-12 in 2016/17)	0.13	0.03	0.01	0.28	2.06
Eimeo Beach (12 drumlines, 1 net) (net ceased in 2015)	0.15	0.15	0.02	0.28	0.91
Blacks Beach (6 drumlines)				0.12	
Lamberts Beach (6 drumlines) (drumlines from 6-12 in 2017)				0.10	
Sth Lamberts Beach (6 drumlines) (drumlines installed 2017)				0.29	
Harbour Beach (9 drumlines, 2 nets)	0.40	0.09	0.01	0.14	0.82
Mean of ratios (n = 3-6 beach groupings)	**0.23 (0.09)**	**0.09 (0.04)**	**0.01 (0.01)**	**0.20 (0.04)**	**1.27 (0.40)**

3.4.7 Sizes of the three most Dangerous Target Sharks

Regardless of gear, the distributions of sizes of bull whaler and tiger sharks included many large sharks (>2 m). The size-structures of bull whalers and tigers caught by drumlines were not dissimilar, although, in contrast to tigers, there were no bull whalers caught that were larger than 3 m. The size distribution of bull whalers caught on drumlines appeared similar to that for nets. In contrast to drumlines, small tigers (<2 m) were relatively poorly represented in net catches (**Figure 3-8**).

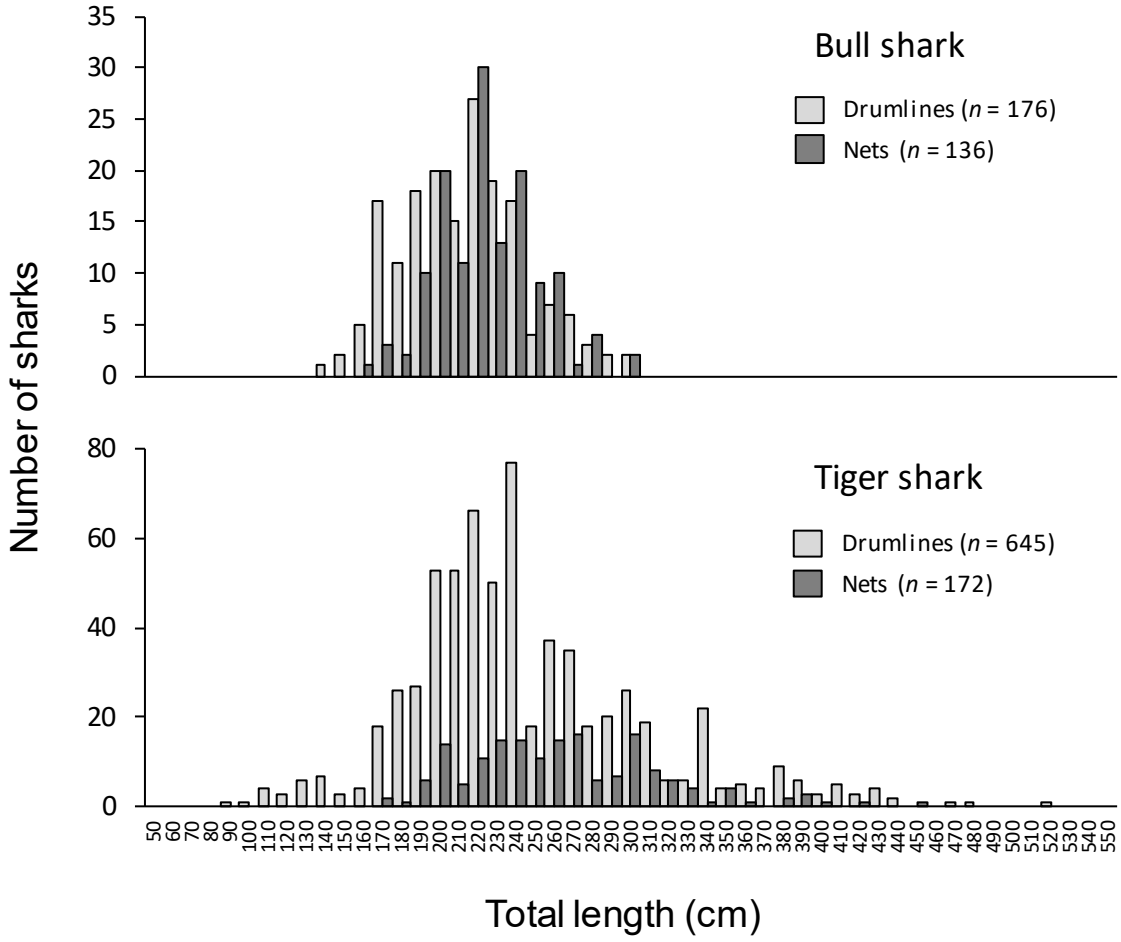

Figure 3-8 Sizes of bull whaler and tiger sharks caught in drumlines and nets in Mackay.

3.5 Capricorn Coast

3.5.1 Arrangement of Gear

There are nine beaches in the Capricorn Coast SCP region. As at 31 December 2018, drumlines were only deployed at Lammermoor Beach (**Figure 1-4, Table 3-8**).

Table 3-8 Number of nets and drumlines in Capricorn region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Capricorn Coast	Farnborough Beach	5	
	Yeppoon Beach	5	
	Cooee Bay	6	
	Lammermoor Beach[1]	10	
	Kemp Beach	6	
	Mullambin Beach	5	
	Tanby Point	5	
	Fishermans Beach	5	
	Emu Park Beach	7	
	TOTAL	***54***	

3.5.2 Total Catch and CPUE

Catch data recorded from SCP drumlines operating at beaches in the Capricorn Coast region between 2001 and 2018 comprised a total of 1,308 catch records, with 72.5% of those animals being target sharks. No SCP nets are used in the Capricorn Coast region. Across the nine Capricorn Coast beaches, the proportion of the catch comprising non-target animals ranged between 17.9% (Kemp Beach) and 35.7% (Farnborough Beach).

Target Shark Species

Of the target shark species, the most commonly caught were bull whalers (39.2% of total catch; rate of 0.52 drumline^{-1}.year^{-1}), followed by tiger sharks (24.3%; 0.32 drumline^{-1}.year^{-1}) and long-nose whalers (4.7%; 0.06 drumline^{-1}.year^{-1}) (see **Appendix B**).

Emu Park Beach drumlines caught the highest number of bull whalers (6.11 year^{-1}), followed by Tanby Point (5.00 year^{-1}) and Fishermans Beach (3.56 year^{-1}) (see **Appendix B**). In the case of tiger sharks, Tanby Point drumlines caught the highest number of tiger sharks (3.44 year^{-1}), followed by Mullambin Beach (2.67 year^{-1}) and Farnborough Beach (2.56 year^{-1}). The least number of individuals for these two species have been caught at Yeppoon Beach (1.22 and 0.83 year^{-1} respectively), Cooee Bay (1.72 and 0.83 year^{-1} respectively) and Kemp Beach (1.72 and 1.5 year^{-1} respectively).

Non-target Species

The most commonly caught non-target species across all Capricorn Coast beaches were blacktip reef whalers (8.9% of total catch), followed by spot-tail whalers (5.0%), tawny sharks and unidentified hammerheads (both 2.5%). At least one species of dolphin and at least two species of sea turtle accounted for a combined proportion of around 1.0% of the total catch from Capricorn Coast beaches, with loggerhead turtles the greatest contributor (0.5%) (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of bull whalers was highest at Tanby Point (1.00 drumline^{-1}.year^{-1}), followed by Emu Park (0.87 drumline^{-1}.year^{-1}) and Mullambin Beach (0.7 drumline^{-1}.year^{-1}), while it was lowest at Yeppoon Beach (0.24 drumline^{-1}.year^{-1}) and Lammermoor Beach (0.26 drumline^{-1}.year^{-1}). The catch rate of tiger sharks was also highest at Tanby Point (0.69 drumline^{-1}.year^{-1}), followed by Mullambin Beach (0.53 drumline^{-1}.year^{-1}) and Farnborough Beach (0.51 drumline^{-1}.year^{-1}), while it was lowest at Cooee Bay (0.14 drumline^{-1}.year^{-1}) and Yeppoon Beach (0.17 drumline^{-1}.year^{-1})

In the cases of the most commonly caught non-target species, the annual catch rate (fate and gear units combined, per year) for blacktip reef whalers ranged between 0.28 and 1.22 year^{-1} at Yeppoon Beach and Farnborough Beach respectively. Annual catch rates for spot-tail whalers ranged between 0.06 year^{-1} (Cooee Bay and Kemp Beach) and 1.17 year^{-1} (Tanby Point). Catches of marine mammals and marine turtles were very low (see **Appendix B**).

3.5.3 Seasonal CPUE for the three most Dangerous Target Sharks

In contrast to all regions further north, CPUE for tiger sharks caught on drumlines in the Capricorn Coast was at its lowest in August. It peaked in May and June but was also high in spring. CPUE for bull whalers caught on drumlines was greatest in the summer months and lowest in winter (**Figure 3-9**). White sharks were not caught in Capricorn Coast.

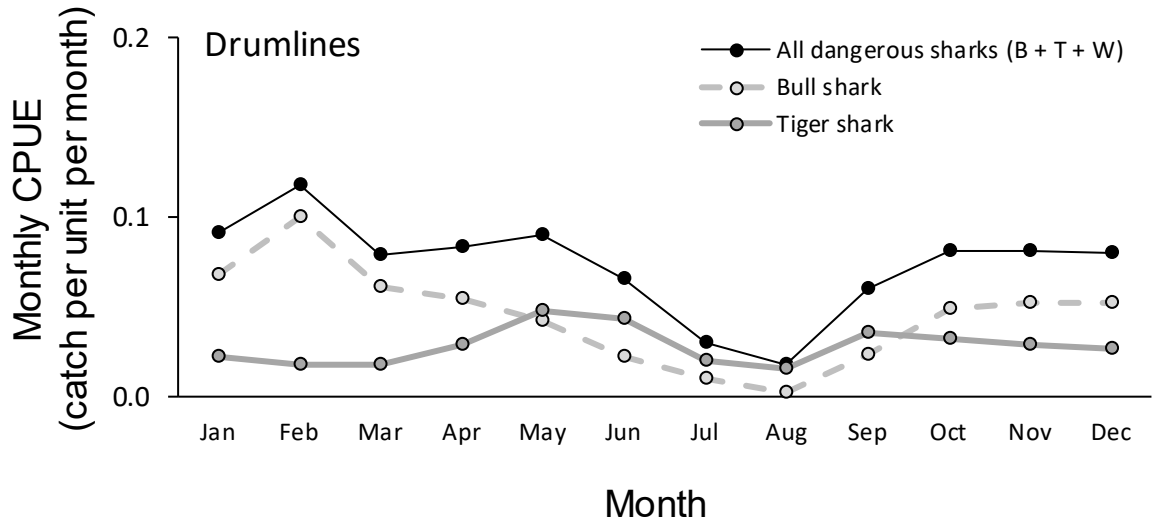

Figure 3-9 Monthly CPUE for bull whaler and tiger at Capricorn Coast.

3.5.4 Survival of Non-target Taxa

Non-target Sharks

There was a greater diversity of non-target sharks caught on drumlines compared to regions further north. None of the pelagic species (including nine whaler and three hammerhead species) survived but nearly all of the demersal tawny shark and grey carpet shark survived. (see **Appendix B** for further detail).

Other Taxa

Very few pelagic or demersal species of rays or sawfish were caught on drumline. For those that were caught, overall around half the of the total were released alive (see **Appendix B**).

Only a few dolphins were caught and all survived. Of the total of 12 sea turtles that were caught on drumlines only one did not survive. Few teleost were caught and mortality was variable (see **Appendix B**).

3.5.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Given nets were not deployed at any beach between 2001 and 2018, calculations of CPUE ratios (drumlines/nets) for this region were not applicable.

3.5.6 Bycatch Ratio

The ratio of bycatch/target sharks for drumlines at beaches were similar, ranging between 0.28 to 0.55 with half of the beaches having ratios <1, and the other half with ratios >1 (**Table 3-9**). These ratios indicate that around two to three target sharks were caught on drumlines for every non-target animal.

Table 3-9 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) in Capricorn Coast .

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Farnborough Beach (5 drumlines) **Yeppoon Beach** (5 drumlines)				0.55	
Cooee Beach (6 drumlines) **Lammermoor Beach** (10 drumlines)				0.52	
Kemp Beach (6 drumlines) **Mullambin Beach** (5 drumlines)				0.30	
Tanby Point (5 drumlines) **Fishermans Beach** (5 drumlines) (+ 2 at FB de-commissioned in 2011)				0.34	
Emu Park (7 drumlines)				0.28	
Mean of ratios (SE) (n = 5 beach groupings)				**0.40 (0.06)**	

3.5.7 Sizes of the three most Dangerous Target Sharks

The range in size of tiger sharks caught by drumlines (0.8- 5.0 m) was much greater than for bull sharks (0.5 – 3.2 m). The peak of the size distribution of tiger sharks caught on drumlines was at 2.3 m and much less for bull whalers at only 1.5 m. Further, only a small portion of the bull whalers caught were >2 m in length, whereas at least half of the distribution of tiger sharks was for sizes >2 m (**Figure 3-10**).

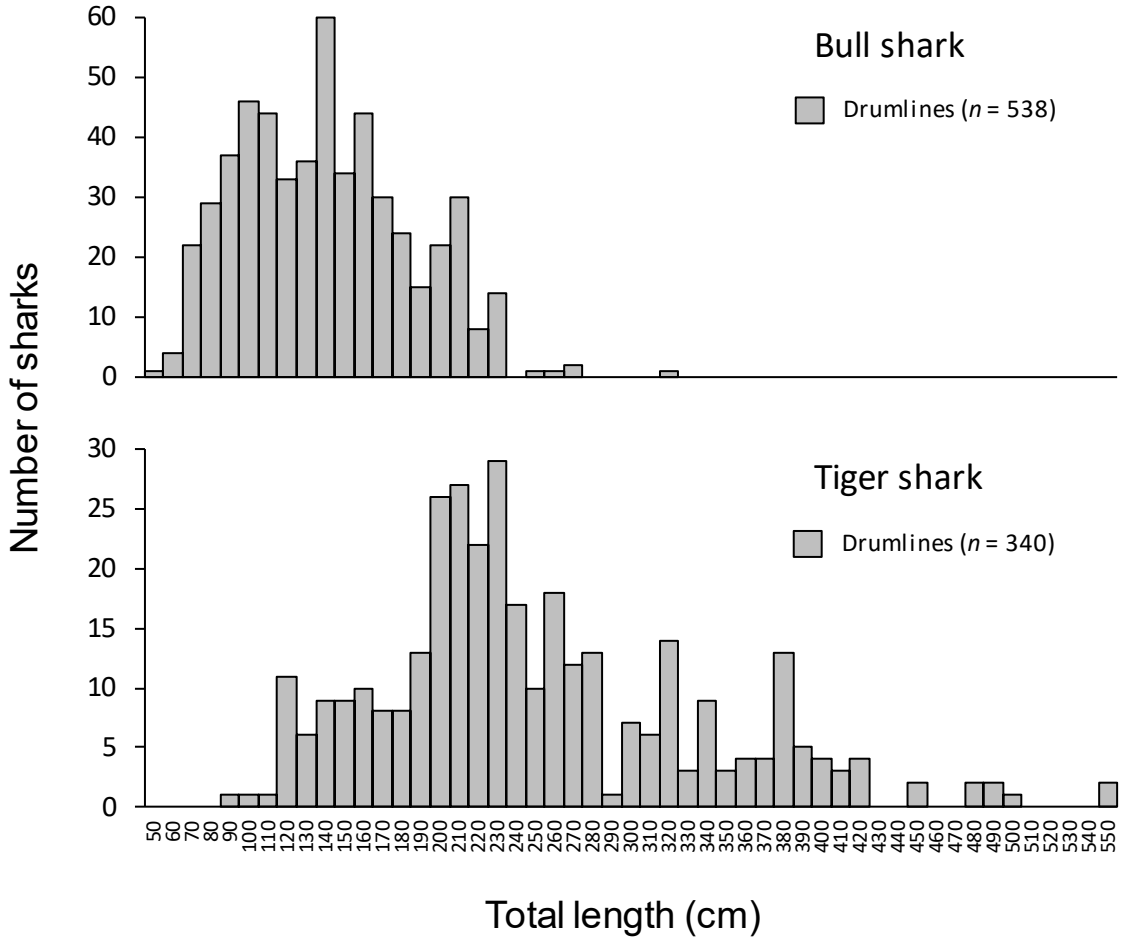

Figure 3-10 Sizes of bull whaler and tiger sharks caught in drumlines in Capricorn Coast.

3.6 Tannum Sands

3.6.1 Arrangement of Gear

There is only one beach in the Tannum Sands SCP region with 12 drumlines and no nets (**Figure 1-5, Table 3-10**).

Table 3-10 Number of nets and drumlines in Tanum Sands region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Tannum Sands	Tannum Sands Beach	12	-

3.6.2 Total Catch and CPUE

The Tannum Sands region comprises only one beach, Tannum Sands. Catch data recorded from SCP drumlines operating in the Tannum Sands region between 2001 and 2018 comprised a total of 900 catch records, with 49.2% of those animals being target sharks and 50.8% non-target animals (see **Appendix B**).

Target Shark Species

Of the targeted shark species, the most commonly caught were tiger sharks (18.7% of total catch; rate of 0.65 drumline^{-1}.year^{-1}), followed by common blacktip whalers (12.3%; 0.43 drumline^{-1}.year^{-1}) and bull whalers (12.1%; 0.42 drumline^{-1}.year^{-1}) (see **Appendix B**).

The average annual catch of bull whaler at Tannum Sands Beach (6.06 year^{-1}) was very similar to that mentioned above for the Emu Park Beach in the Capricorn Coast region (see **Appendix B**). In contrast, the average annual catch of tiger sharks at Tannum Sands Beach (9.33 year^{-1}) was far higher than for any of the Capricorn Coast beaches.

Non-target Species

The most commonly caught non-target species on drumlines in the Tannum Sands region by far were blacktip reef whalers (45.2% of total catch), followed by green turtles (1.6%), and scalloped and unidentified hammerheads (both 0.7%). The annual catch rate (fate and gear units combined, per year) for blacktip reef whalers was 22.61 year^{-1}, which is far in excess of all rates for this species across other regions. While no marine mammals were captured, two species of sea turtles (the 14 green turtles plus four loggerhead turtles) accounted for a combined proportion of around 2.0% of the total catch in the Tannum Sands region (see **Appendix B**).

3.6.3 Seasonal CPUE for the three most Dangerous Target Sharks

At Tannum Sands in December, CPUE for tiger sharks caught on drumlines was almost twice as much as for any other month. It appeared to fluctuate among other months and showed no obvious seasonal patterns. In December and May, CPUE for bull whalers caught on drumlines was at its lowest. It appeared to fluctuate among all other months but the pattern was virtually opposite to tiger sharks, suggesting that it may be influenced by, or influence, the catch of tiger sharks (**Figure 3-11**). White sharks were not caught in Tannum Sands.

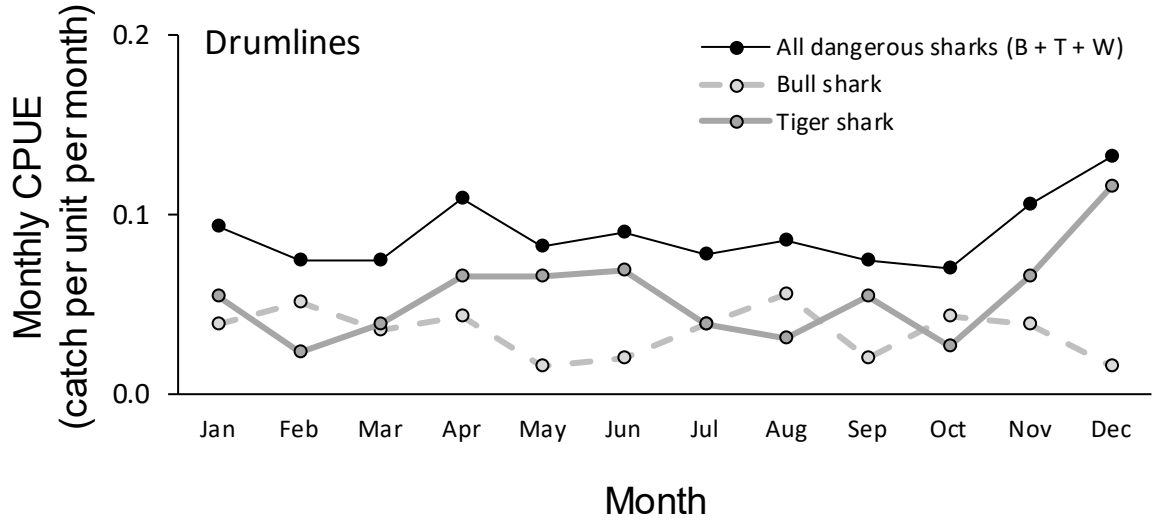

Figure 3-11 Monthly CPUE for bull whaler and tiger sharks at Tannum Sands

3.6.4 Survival of Non-target Taxa

Non-target Sharks

Similar to Capricorn Coast there was a greater diversity of non-target sharks caught on drumlines compared to regions further north. Close to 100% of the non-target sharks caught on drumlines and nets were found dead, apart from the tawny sharks (100% alive) and wobbegong (50% alive) (see **Appendix B**).

Other Taxa

Only two (demersal) rays were caught, one of which died. No marine mammals were caught and all teleost and sea turtles caught were released alive (see **Appendix B**).

3.6.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Given nets were not deployed at Tannum Sands between 2001 and 2018, calculations of CPUE ratios (drumlines/nets) for this region were not applicable.

3.6.6 Bycatch Ratio

The ratio of bycatch/target sharks for drumlines at Tannum Sands was close to 1, indicating equivalent numbers of bycatch to target sharks (**Table 3-11**).

Table 3-11 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) in Tannum Sands.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Tannum Sands (12 current drumlines) (+ 7 drumlines operational 2001-06)				1.03	

3.6.7 Sizes of the three most Dangerous Target Sharks

The range in size of tiger sharks caught by drumlines (0.9- 5.2 m) was much greater than for bull sharks (0.6 – 2.4 m). The peak of the size distribution of tiger sharks caught on drumlines was at 2.2 m and much less for bull whalers at around 1.5 m. Further, only a small portion of the bull whalers caught were >2 m in length, whereas greater than half of the distribution of tiger sharks was for sizes >2 m (**Figure 3-12**).

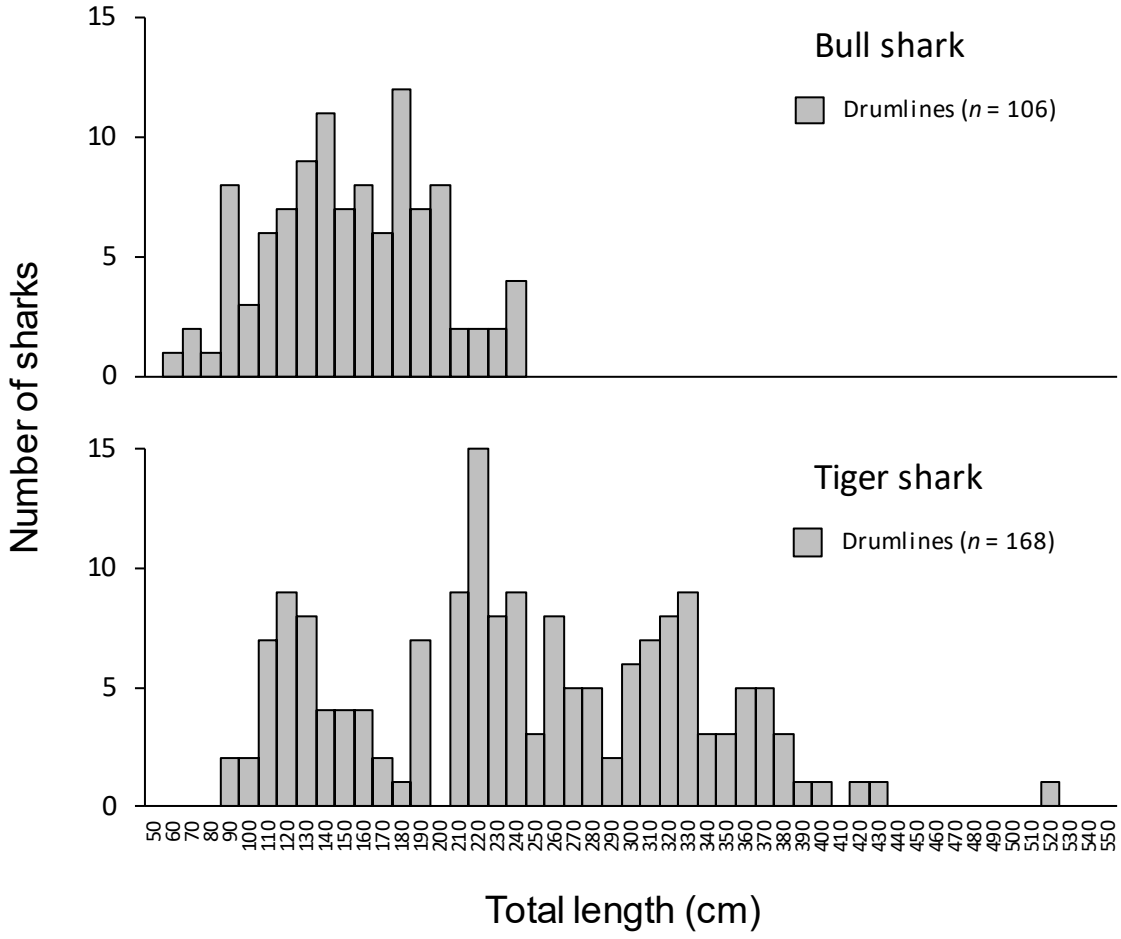

Figure 3-12 Sizes of bull whaler and tiger sharks caught in drumlines in Tannum Sands.

3.7 Woongarra Coast (Bundaberg)

3.7.1 Arrangement of Gear

There are four beaches at Woongarra Coast that have between two and nine drumlines. (**Figure 1-5, Table 3-12**).

Table 3-12 Number of nets and drumlines in Woongarra Coast region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
(Bundaberg)	Oaks Beach	2	
	Nielsen Park Beach	6	
	Bargara Beach	3	
	Kelly's Beach	9	
	TOTAL	***20***	

3.7.2 Total Catch and CPUE

Catch data recorded from SCP drumlines operating at beaches in the Woongarra Coast region between 2001 and 2018 comprised a total of 921 catch records, with 76.9% of those animals being target sharks. No SCP nets are used in the Woongarra Coast region. Across the four Woongarra Coast beaches, the proportion of the catch comprising non-target animals ranged between 15.2% (Kellys Beach) and 53.2% (Oaks Beach) (see **Appendix B**).

Target Shark Species

Of the target shark species, by far the most commonly caught were tiger sharks (52.7% of total catch; rate of 1.35 drumline^{-1}.year^{-1}), followed by sandbar sharks (*Carcharhinus plumbeus*) and sharptooth sharks, also known as lemon sharks (*Negaprion acutidens)* (both 7.8% and 0.20 drumline^{-1}.year^{-1}) and bull whalers (4.0%; 0.10 drumline^{-1}.year^{-1}). Seven white sharks (0.8% of total catch; 0.02 drumline^{-1}.year^{-1}) were also recorded for Woongarra Coast beaches – the furthest north this species has been recorded in SCP catches (see **Appendix B**).

Average annual catches of bull whalers for drumlines at Woongarra Coast beaches were small relative to those beaches in the northern regions, ranging from 0.06 year^{-1} (Oaks Beach and Bargara Beach) to 1.00 year^{-1} (Kelly's Beach) (see **Appendix B**). In contrast, when compared against catches from beaches in regions to the north, Kelly's Beach and Nielsen Park Beach were characterised by large catches of tiger sharks (16.94 and 8.28 year^{-1} respectively) and white sharks (0.22 and 0.17 year^{-1} respectively).

Non-target Species

The two most commonly caught non-target species across all Woongarra Coast beaches were sea turtles, including loggerhead turtles (37 turtles, 4.0% of total catch) and green turtles (30 turtles, 3.3%). Blacktip reef whalers were the third most common non-target species (2.5% of total catch), while a notable quantity of manta rays was also recorded (2.1%). No marine mammals have been captured by SCP drumlines at Woongarra Coast beaches (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks was greatest at Kellys Beach (1.88 drumline^{-1}.year^{-1}) and smallest at Oaks Beach (0.28 drumline^{-1}.year^{-1}). The catch rate of bull whalers was greatest at Neilson Park Beach (0.16 drumline^{-1}.year^{-1}) and smallest at Bargara Beach (0.02 drumline^{-1}.year^{-1}), while catch rates of white sharks were 0.02 and 0.03 drumline^{-1}.year^{-1} at Kellys Beach and Neilson Park Beach, respectively, with no white sharks caught at other Woongarra Coast beaches.

In the cases of the most commonly caught non-target species, the annual catch rate (fate and gear units combined, per year) for loggerhead turtles ranged between 0.33 and 1.00 year^{-1} at Oaks Beach and Neilson Park respectively, while for green turtles it ranged between 0.06 and 0.89 year^{-1} at Bargara Beach and Neilson Park Beach, respectively. Sea turtles were caught across all Woongarra region beaches. Given the importance of the Woongarra region for marine turtle nesting, particularly for loggerheads, high catches of

marine turtles are not surprising. Annual catch rates for blacktip reef whalers ranged from 0.06 year^{-1} (Oaks Beach) to 0.83 year^{-1} (Kellys Beach) (see **Appendix B**).

3.7.3 Seasonal CPUE for the three most Dangerous Target Sharks

In Woongarra Coast, the monthly trend in CPUE for the group of dangerous sharks caught on drumlines was driven by tiger sharks. CPUE for tiger sharks caught on drumlines at Woongarra Coast increased from a low in October to a peak in June, followed by a gradual reduction to October. The CPUE for bull whaler and white sharks was very low compared to tiger sharks and there were no obvious monthly patterns (**Figure 3-13**).

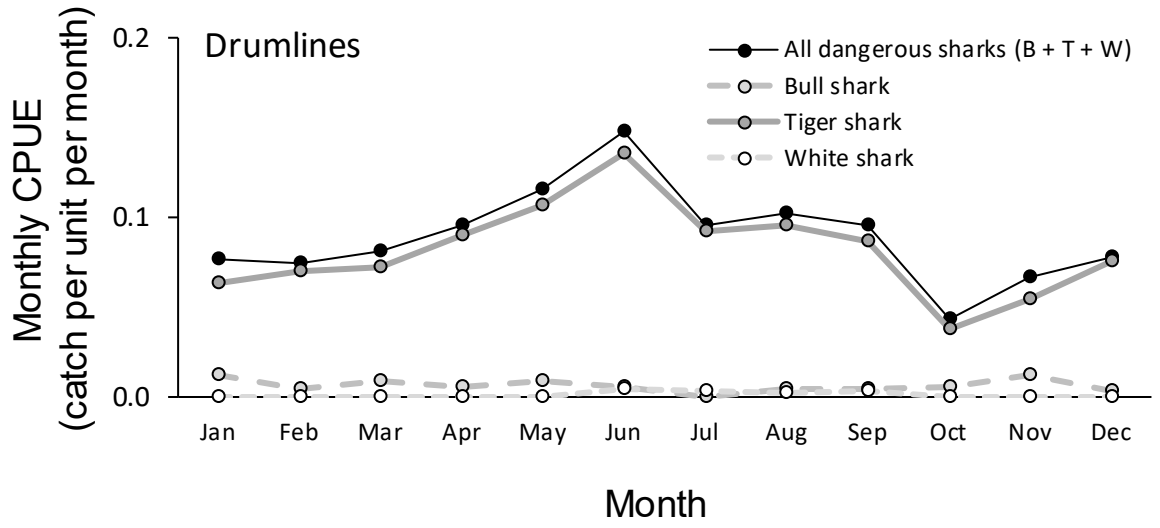

Figure 3-13 Monthly CPUE for bull whaler, tiger and white sharks at Woongarra Coast

3.7.4 Survival of Non-target Taxa

Non-target Sharks

Close to 100% of the non-target sharks caught on drumlines were found dead. The only exception was the demersal tawny sharks of which a large proportion were generally released alive (see **Appendix B**).

Other Taxa

About half of the manta rays were released alive as was one demersal ray. Marine mammals were not caught in this region. All sea turtles at caught at 3 of the 4 beaches were released alive but more than half of the green and loggerhead turtles caught at Oaks beach died. There was variable mortality to any teleost caught (see **Appendix B**).

3.7.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Given nets were not deployed between 2001 and 2018, calculations of CPUE ratios (drumlines/nets) for this region were not applicable.

3.7.6 Bycatch Ratio

The ratios of bycatch/target sharks for drumlines at Woongarra Coast beaches was variable, ranging from 0.19 to 1.14, indicating greater numbers of bycatch compared to target sharks at some beaches but not at others (**Table 3-13**).

Table 3-13 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) in Woongarra Coast.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Oaks Beach (2 drumlines)				1.14	
Nielson Park Beach (6 drumlines) **Bargara Beach** (3 drumlines)				0.42	
Kellys Beach (9 drumlines)				0.18	
Mean of ratios (SE) (n = 3 beach groupings)				**0.58 (0.29)**	

3.7.7 Sizes of the three most Dangerous Target Sharks

Although the peak of the size distribution of tiger sharks caught on drumlines (2.1 m) was similar to that for bull whalers (1.8 m), the range in size of tiger sharks caught by drumlines (0.8- 4.5 m) was much greater than for bull sharks (0.9 – 2.6 m). Further, only a small portion of the bull whalers caught were >2 m in length whereas at least half of the distribution of tiger sharks was for sizes >2 m. The few white sharks caught on drumlines ranged in size between 2.0 and 3.2 m (**Figure 3-14**).

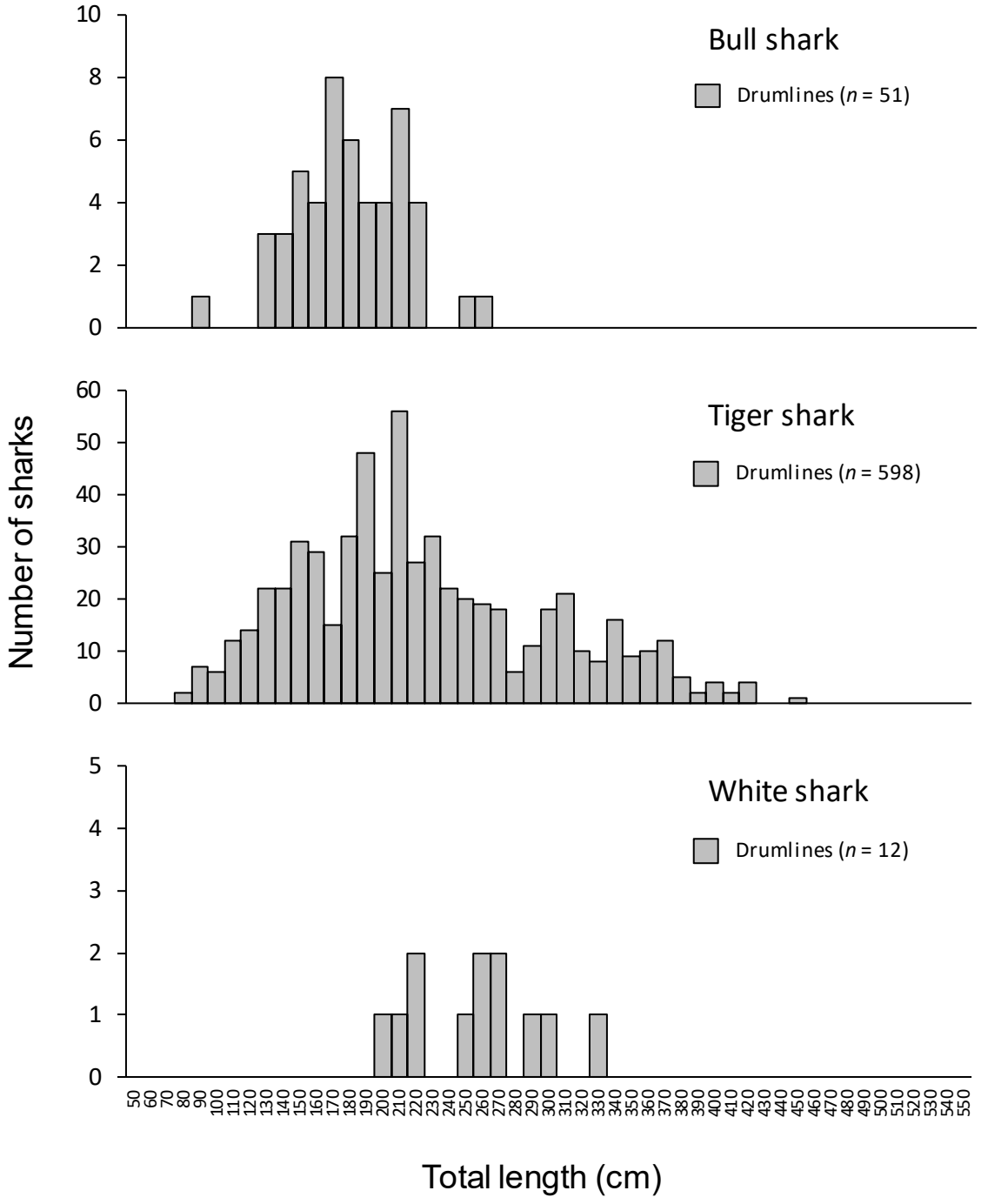

Figure 3-14 Sizes of bull whaler, tiger and white sharks caught in drumlines in Woongarra Coast.

3.8 Rainbow Beach

3.8.1 Arrangement of Gear

There is only one beach in the Rainbow Beach SCP region with 12 drumlines and three nets (**Figure 1-5, Table 3-14**).

Table 3-14 Number of nets and drumlines in Rainbow Beach region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Rainbow Beach	Rainbow Beach	12	3

3.8.2 Total Catch and CPUE

The Rainbow Beach region includes only the one beach, Rainbow Beach, with drumlines and nets both deployed there. Catch data recorded from SCP drumlines operating in the region between 2001 and 2018 comprised a total of 557 catch records, with 64.8% of those animals being target sharks and 35.2% non-target animals. In total, 706 catches were recorded for the nets, with 48.9% for target sharks and 51.1% for non-target animals (see **Appendix B**).

Target Shark Species

Of the target shark species, the most commonly caught by drumline were tiger sharks (49.6% of total drumline catch; rate of 1.28 drumline^{-1}.year^{-1}), followed by bull whalers (6.5%; 0.17 drumline^{-1}.year^{-1}) and dusky whalers (3.6%; 0.09 drumline^{-1}.year^{-1}). Long-nose whalers were the most commonly caught target species in the nets (22.1% of total net catch; rate of 2.89 net^{-1}.year^{-1}), followed by bull whalers (7.5%; 0.98 net^{-1}.year^{-1}), great hammerheads (6.9%; 0.98 net^{-1}.year^{-1}) and dusky whalers, *Carcharhinus obscurus* (6.1%; 0.98 net^{-1}.year^{-1}). Nine white sharks were also captured at Rainbow Beach, with six from drumlines (1.1% of total drumline catch; 0.03 drumline^{-1}.year^{-1}) and three in nets (0.4% of total net catch; 0.06 net^{-1}.year^{-1}) (see **Appendix B**).

The average annual catch of bull whalers by drumline at Rainbow Beach (2.00 year^{-1}) was about two-thirds than for nets (2.94 year^{-1}) (see **Appendix B**). In contrast, the average annual catch of tiger sharks for Rainbow Beach from drumlines (15.33 year^{-1}) exceeded that for nets in the region (1.11 year^{-1}), while more white sharks were also caught in drumlines (0.33 year^{-1}) than in nets (0.17 year^{-1}).

Non-target Species

As was the case for the Woongarra Coast, by far the most commonly caught non-target species on drumlines in the Rainbow Beach region were loggerhead turtles (30.2% of total drumline catch), with an annual catch rate (fate and gear units combined, per year) by drumline of 9.33 year^{-1}. No other species exceeded 1.3% of the total drumline catch. In contrast, tuna of unspecified species was the most commonly caught non-target animal in nets (12.6% of total net catch; annual catch rate in nets of 4.95 year^{-1}), followed by blacktip reef whalers (5.4%; 2.12 year^{-1}) and loggerhead turtles (3.5%; 1.39 year^{-1}). It must be noted also, however, that when combined, 56 individuals from four species of pelagic-swimming ray (manta rays, devilrays, cownose rays and eagle rays) accounted for 7.9% of the total catch from nets (annual catch rate 3.12 year^{-1}), while only one manta ray was caught by drumline. Eight grey nurse sharks were also caught in nets (1.1% of total net catch), with one by drumline. There is grey nurse shark critical habitat at Wolf Rock which is adjacent to Double Island Point, just south of the SCP area.

In addition to the large number of loggerhead turtles mentioned above, two species of dolphins and two other species of sea turtles accounted for a combined proportion of 32.2% of the total drumline catch from Rainbow Beach. Marine mammals (at least five species) and sea turtles (at least three species) also accounted for 11.2% of the catch from nets, with common dolphin a major contributor (2.4% of total net catch; annual catch rate in nets of 0.94 year^{-1}) alongside the net-caught loggerhead turtles mentioned above. Seven humpback whales were also recorded, representing 1% of the total catch in Rainbow Beach nets at an annual catch rate of 0.39 year^{-1}. This is the northern-most record for whales caught by SCP gear (see **Appendix B**).

3.8.3 Seasonal CPUE for the three most Dangerous Target Sharks

At Rainbow Beach, the monthly trend in CPUE for the group of dangerous sharks caught on drumlines was driven by tiger sharks. CPUE for tiger sharks caught on drumlines was distinctly less during the months of November to January than for other times. The pattern was opposite for bull whalers caught on drumlines where CPUE was generally much greater in summer months than for other months.

There was no evidence of similar patterns in CPUE for bull whaler and tiger sharks in nets apart from CPUE for tiger sharks in nets in summer being among the lowest for the year.

Low CPUE for white sharks in drumlines made interpretation of patterns difficult but it would appear that white sharks were only caught in nets in August and September (**Figure 3-15**).

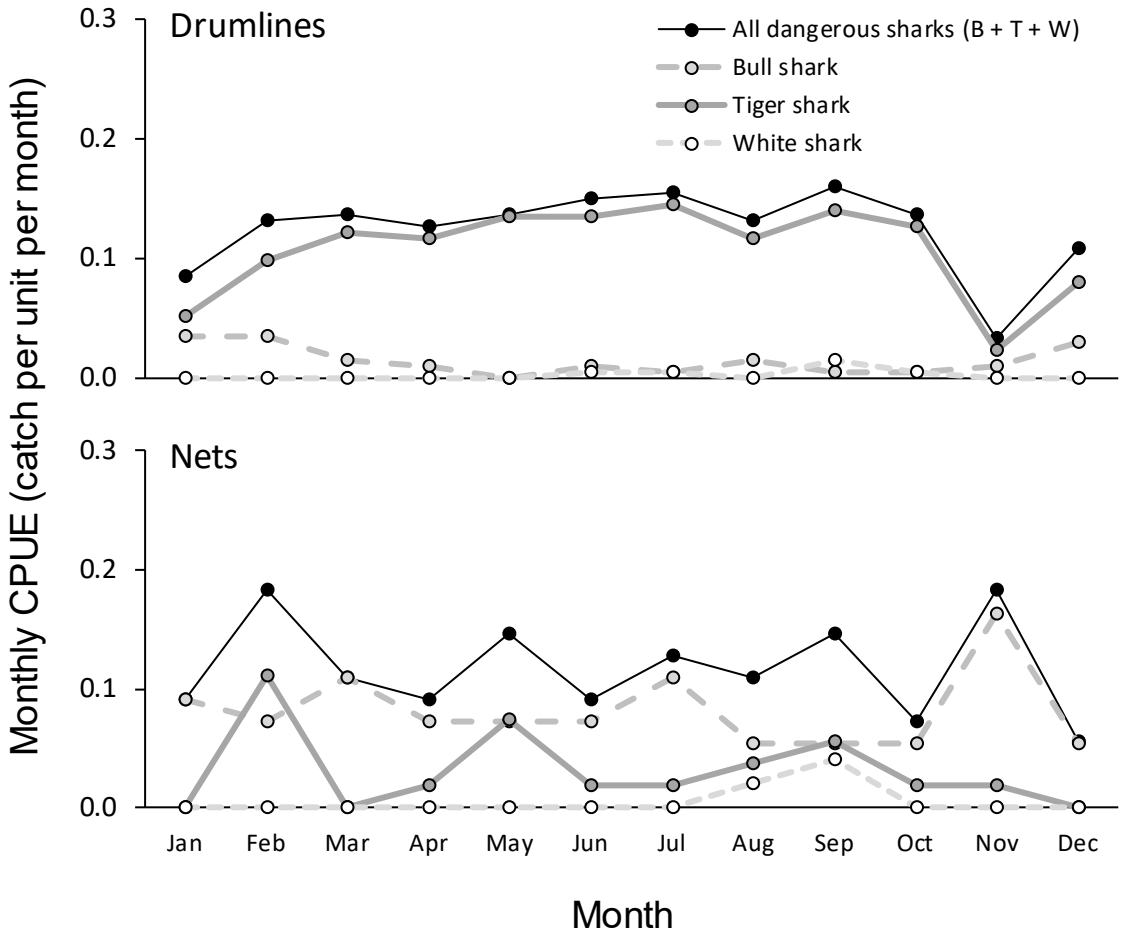

Figure 3-15 Monthly CPUE for bull whaler, tiger and white sharks at Rainbow Beach

3.8.4 Survival of Non-target Taxa

Non-target Sharks

Large proportions of most non-target shark taxa caught on drumlines and nets were found dead, including the threatened grey nurse shark. The exceptions were zebra shark and wobbegong of which a large proportion were generally released alive (see **Appendix B**).

Other Taxa

Only one manta was caught by drumline and this was released alive. Many more pelagic rays were caught in nets, with more than half of individuals surviving. No demersal species of rays or sawfish were caught on drumline and for those taxa caught in nets there was variable mortality (see **Appendix B**).

Most dolphins caught by drumline were released alive but those caught by net generally perished as well as all dugong. One humpback whale caught in a net was released alive. Many sea turtles were caught by both

gear types and most survived. The many teleosts that were caught by nets generally perished (see **Appendix B**).

3.8.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

The CPUE ratio (drumlines/nets) for the group of taxa comprising the three target sharks considered to be the most dangerous (i.e. bull whaler, tiger and white shark) for Rainbow Beach was close to 1, indicating the efficiency of the two types of gear was similar (**Table 3-15**).

CPUE ratios (drumlines/nets) for the groups of ‘all other target and non-target sharks’ and ‘other bycatch’ were 0.04 and 0.18 respectively indicating nets were more efficient at drumlines at catching these groups.

3.8.6 Bycatch Ratio

The ratio of bycatch/target for drumlines at Rainbow Beach was 0.54 indicating that roughly twice as many target sharks were caught for every non-target animal. The bycatch ratio for nets was close to 1 (1.05) (**Table 3-15**).

Table 3-15 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other sharks and other bycatch) at Rainbow Beach.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Rainbow Beach (3 drumlines, 2 nets)	1.05	0.04	0.18	0.54	1.05

3.8.7 Sizes of the three most Dangerous Target Sharks

As for all regions further north, the range in size of tiger sharks caught by drumlines (0.8- 4.7 m) was much greater than for bull sharks (1.3 – 3.4 m) (**Figure 3-16**). However, in contrast to more northern regions at least half of the distribution for bull sharks caught by drumlines was for sizes >2 m. Nets caught no bull whalers <1.7 m in length. The modal size for tiger sharks caught by drumlines (1.4 m) was generally much less than seen further north. The few white sharks caught on drumlines ranged in size between 2.0 and 3.2 m. There were insufficient numbers of tiger sharks caught in nets or white sharks caught in any gear to draw conclusions about selectivity.

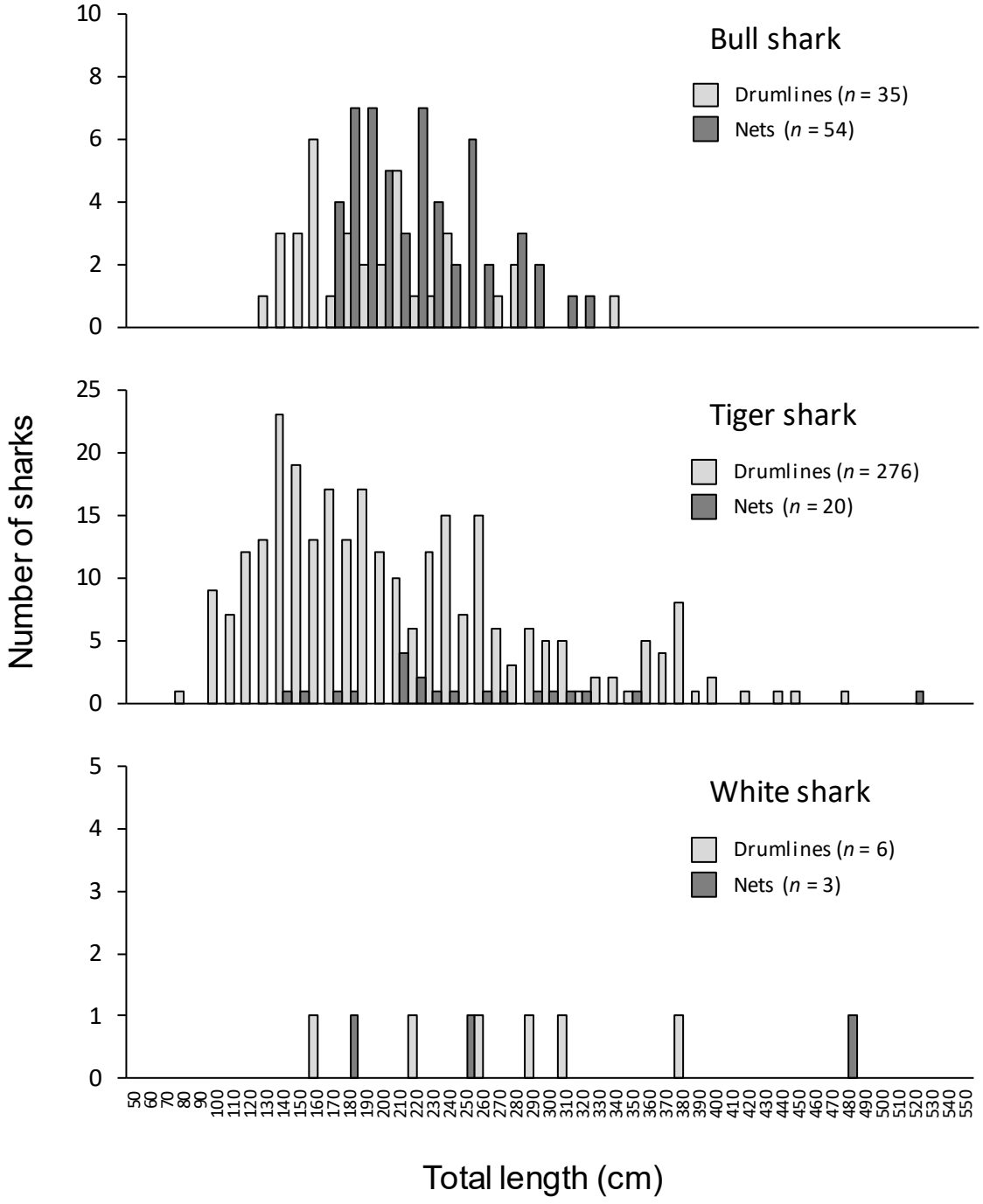

Figure 3-16 Sizes of bull whaler, tiger and white sharks caught in drumlines at Rainbow Beach.

3.9 Sunshine Coast

3.9.1 Arrangement of Gear

There are 22 beaches at Sunshine Coast that have SCP gear. Drumlines are deployed at 17 of the beaches. At most of these beaches, there are between three and six drumlines except for Woorim Beach (Bribie Island) where there are 18 drumlines. Two of the beaches also have one or two nets in addition to drumlines (2 nets at Noosa, 1 net at Kings Beach). There are also six beaches where only nets are deployed (four beaches with one net and two beaches with two nets (**Figure 1-6, Table 3-16**).

Table 3-16 Number of nets and drumlines in Sunshine Coast region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Sunshine Coast	Noosa	3	2
	Sunshine Beach	3	
	Sunrise Beach	3	
	North Peregian Beach	3	
	Glen Eden Beach	3	
	Peregian Beach	3	
	Coolum Beach		1
	Yaroomba	4	
	Hyatt Resort	4	
	Marcoola Beach		1
	Surfair Resort	4	
	Mudjimba Beach	4	
	Twin Waters	4	
	Maroochydore Beach		2
	Alexandra Headland		2
	Mooloolaba Beach		1
	Point Cartwright	3	
	Buddina Beach	6	
	Wurtulla Beach		1
	Currimundi Beach	4	
	Moffat Beach	3	
	Kings Beach (Caloundra)	6	1
	Woorim Beach (Bribie Island)	18	
	TOTAL	***78***	***11***

3.9.2 Total Catch and CPUE

Catch data recorded from SCP drumlines operating at beaches within the Sunshine Coast region between 2001 and 2018 comprised a total of 514 catch records, with 85.1% of those animals being target sharks and 14.9% non-target animals. In total, there were1,218 records for the SCP nets, with 47.8% for target sharks and 52.2% for non-target animals. Across the 17 beaches with drumlines the proportion of the drumline catch comprising non-target animals ranged from 0% (Peregian Beach and Hyatt Resort) to 44.1% (Currimundi), while for catches in nets (at 8 beaches) the proportion ranged from 40.1% (Wurtulla) to 71.4% (Caloundra Beach) (see **Appendix B**).

Target Shark Species

Of the target shark species, the most commonly caught by drumline were tiger sharks (56.6% of total drumline catch; rate of 0.21 drumline^{-1}.year^{-1}), followed by bull whalers (10.9%; 0.04 drumline^{-1}.year^{-1}) and

long-nose whalers (5.6%; 0.02 drumline^{-1}.year^{-1}). As at Rainbow Beach, long-nose whalers were the most commonly caught target species in nets (25.9% of total net catch; rate of 1.67 net^{-1}.year^{-1}), followed by bull whalers (8.8%; 0.57 net^{-1}.year^{-1}) and great hammerheads (6.7%; 0.43 net^{-1}.year^{-1}). Twelve white sharks were recorded, with nine caught by drumline (1.8% of total drumline catch; 0.01 drumline^{-1}.year^{-1}) and three by net (0.2% of total net catch; 0.02 net^{-1}.year^{-1}). CPUE of bull whalers was generally greater in nets than for drumlines and vice versa for tiger sharks (see **Appendix B).**

Woorim Beach (Bribie Island) yielded the highest number of bull whalers using drumlines (1.17 year^{-1}), followed by Kings Beach (0.78 year^{-1}) and Noosa (0.22 year^{-1}) (see **Appendix B**). Noosa drumlines caught the most tiger sharks (4.11 year^{-1}), followed by Buddina Beach and Kings Beach (both 1.67 year^{-1}). For beaches with nets, Noosa and Maroochydore Beach yielded the most bull whalers (2.56 and 1.94 year^{-1} respectively) and tiger sharks (0.33 and 0.24 year^{-1} respectively). Noosa (0.11 year^{-1}), Hyatt Resort (0.11 year^{-1}) and Kings Beach (0.11 year^{-1}) yielded the greatest annual average catch of white sharks in the region (see **Appendix B**).

Non-target Species

Drumline catches in the Sunshine Coast region were characterised by notably low catches of non-target animals, particularly given the relatively large number of units operating. Similar to the two regions to the immediate north, by far the most commonly caught non-target species on drumlines in the Sunshine Coast region were loggerhead turtles (6.8% of total drumline catch), followed by common dolphins, *Delphinus delphis* (1.8%). No other species exceeded 1.0% of the total drumline catch. In contrast, manta ray was the most commonly caught non-target species in nets (6.2% of total net catch), followed by unspecified hammerheads species (5.2%) and unspecified ray species (4.8%). It is worth noting that when combined, four species of pelagic rays (manta rays, devilrays, cownose rays and eagle rays) accounted for 18.1% of the total net catch, while the unspecified hammerheads species and scalloped hammerheads combined accounted for 7.7%. Fifteen grey nurse sharks were also caught in nets (1.2% of total net catch), and three caught by drumline.

In addition to drumline-caught loggerhead turtles and common dolphins mentioned above, at least two other species of marine mammals (including one humpback whale) and at least three other species of sea turtles accounted for a combined proportion of 11.6% of the total drumline catch from Sunshine Coast beaches. In The yield from nets included at least six species of marine mammals (including seven humpback whales) and at least four species of sea turtles and two unidentified birds, accounting in total for 11.0% of the catch from nets, with common dolphins (3.9%), bottlenose dolphins, *Tursiops truncatus* (1.8%) and loggerhead turtles (1.6%) the major contributors (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks by drumline was greatest at Noosa (1.37 drumline^{-1}.year^{-1}) and lowest at Woorim (Bribie Island) (0.03 drumline^{-1}.year^{-1}), while the catch rate of bull whalers was greatest at Caloundra Beach (0.13 drumline^{-1}.year^{-1}) but none were caught at Glen Eden / Marcus Beach, Yaroomba Beach, Mudjimba Beach and Twin Waters Resort. In nets the catch rate of long-nose whalers was greatest at Noosa (3.42 net^{-1}.year^{-1}) and least at Mooloolaba Beach (0.41 drumline^{-1}.year^{-1}), while the catch rate of bull whalers was also greatest at Noosa (1.28 net^{-1}.year^{-1}) and least at Coolum Beach, Mooloolaba Beach and Wurtulla (0.18 net^{-1}.year^{-1}).

In the cases of the most commonly captured non-target species, the annual catch rate (fate and gear units combined, per year) for loggerhead turtles caught by drumline varied, ranging between zero at a number of beaches (e.g. Sunshine Beach, Peregian Beach and Point Cartwright) up to 0.56 year^{-1} at both Buddina Beach and Currimundi. In nets, the annual catch rate for manta rays ranged from 0.06 to 1.94 year^{-1} at Mooloolaba Beach and Noosa, respectively. No clear patterns are apparent among Sunshine Coast beaches with respect to catches of marine mammals and sea turtles in either drumlines or nets, with a more-or-less even spread in the cases of both gear-types (see **Appendix B**).

3.9.3 Seasonal CPUE for the three most Dangerous Target Sharks

At the Sunshine Coast, the monthly trend in CPUE for the group of dangerous sharks caught on drumlines was driven by tiger sharks whereas for nets, it was driven by bull whalers. At the Sunshine Coast, CPUE for tiger sharks caught on drumlines peaked in September and October compared to other times. The pattern was opposite for bull whalers caught on drumlines where CPUE in these months were among the lowest months along with late-winter months.

There were no obvious monthly pattern in CPUE for tiger sharks in nets. Although peak CPUE for bull whalers in nets was in May and June there were no other monthly or seasonal patterns.

CPUE for white sharks in drumline and nets were greatest from late autumn to early spring (**Figure 3-17**).

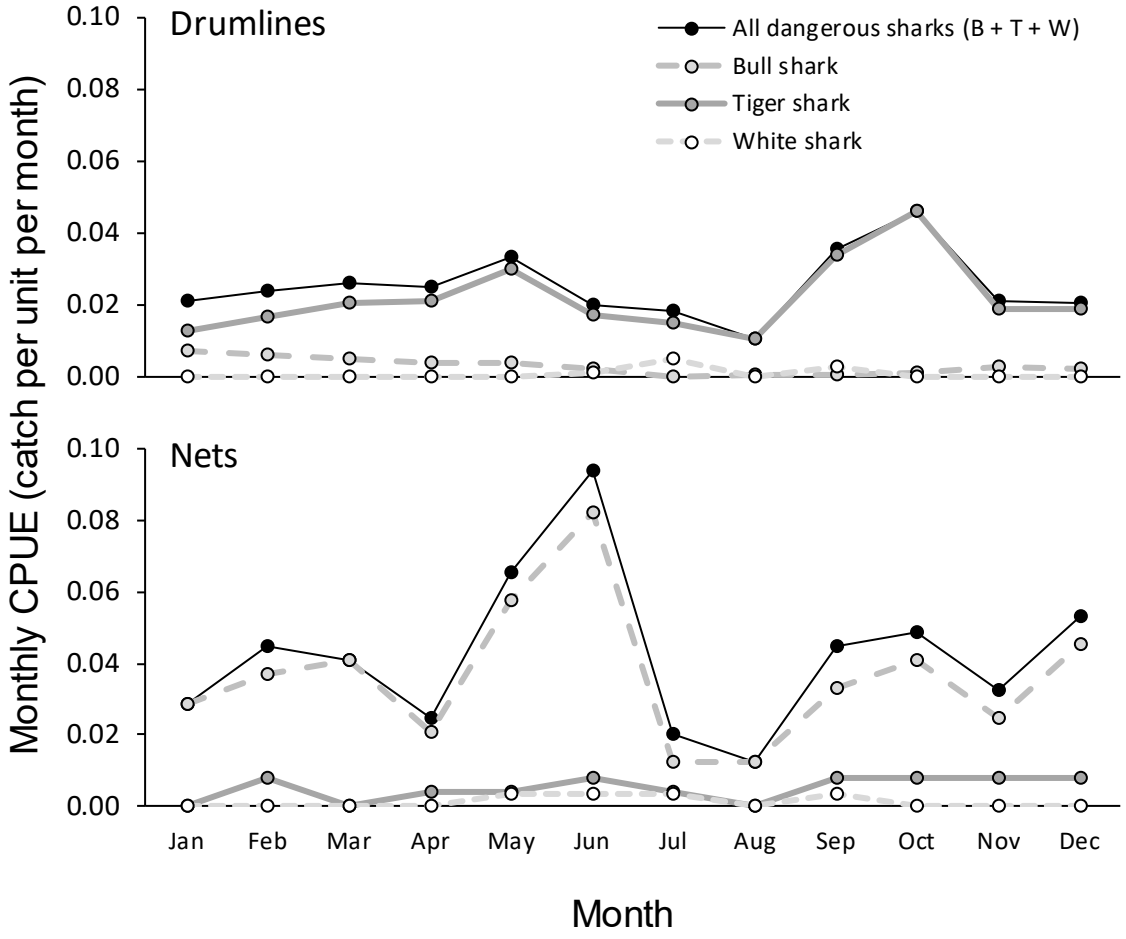

Figure 3-17 Monthly CPUE for bull whaler, tiger and white sharks at Sunshine Coast

3.9.4 Survival of Non-target Taxa

Non-target Sharks

The very few blacktip reef whaler, scalloped hammerhead and grey nurse shark caught on drumlines were nearly all released alive. The exception being a single grey nurse shark. In contrast, when these species were caught in nets, as well as other whalers and hammerheads and a single whale shark, they commonly died. Close to 100% of the non-target sharks caught on drumlines and nets were found dead. All demersal sharks (zebra and Port Jackson sharks) caught in nets were released alive (see **Appendix B**).

Other Taxa

Two manta rays were caught by drumlines with mixed survival. Manta rays caught in nets also had mixed survival, whereas other pelagic rays and benthic rays were more often released alive than dead (see **Appendix B**).

Most dolphins and sea turtles caught on drumlines were released alive although there was some mortality. A single humpback whales entangled on a drumline was released alive. Dolphins caught in nets were much more likely to be found dead whereas there was mixed survival for sea turtles. The few humpback whales caught by net all survived. The various teleost species caught by drumline or net rarely survived (see **Appendix B**).

3.9.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

The CPUE ratios (drumlines/nets) for the group of taxa comprising the three dangerous target sharks for the only two beaches that had nets deployed in addition to drumlines was close to 1 most for Noosa and

Caloundra Beach, indicating drumlines and nets had similar efficiency (**Table 3-17**). CPUE ratios at other groups of Sunshine Coast beaches (i.e. that consisted of adjacent beaches with only nets or drumlines deployed) ranged between 0.33 and 0.62. These CPUE ratios at these groups of beaches indicated nets were at least double the efficiency than drumlines at catching this group of taxa.

CPUE ratios (drumlines/nets) at all beaches, or groups of beaches, for 'all other target and non-target sharks' and 'other bycatch' were generally <0.1 indicating nets were at least 10 times more efficient than drumlines at catching these taxa.

3.9.6 Bycatch Ratio

The ratio of bycatch/target for drumlines at Sunshine Coast beaches ranged was generally <0.6 indicating that more target sharks were caught for every non-target animal (**Table 3-17**). In the extreme case, at Noosa, it was 0.03, indicating a very small proportion of bycatch on drumlines at this beach. The bycatch ratio for nets at beaches, or groups of beaches, that had nets deployed in addition to drumlines at some stage between 2001 and 2018 were generally slightly less or slightly great than 1, indicating similar proportions of bycatch to target species in total catch. The exception was at Caloundra Beach (2.5) which indicated more than double the number of bycatch than target species in nets at this beach.

Table 3-17 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) at Sunshine Coast.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Noosa (3 drumlines, 2 nets)	1.02	0.01	0.01	0.03	0.96
Sunshine Beach (3 drumlines) **Sunrise Beach** (3 drumlines) **Nth Peregian Beach** (3 drumlines)				0.10	
Glen Eden Beach (3 drumlines) **Peregian Beach** (3 drumlines)				0.10	
Yaroomba Beach (4 drumlines) **Hyatt Resort Beach** (4 drumlines) **Coolum Beach** (1 net)	0.55	0.02	0.02	0.18	0.79
Surfair Beach (4 drumlines) **Mudjimba Beach** (4 drumlines) **Twin Waters** (4 drumlines) **Marcoola Beach** (1 net)	0.33	0.01	0.02	0.32	1.17
Pt Cartwright (3 drumlines) **Buddina Beach** (6 drumlines) **Maroochydore Beach** (2 nets) **Alexandra Headland** (2 nets) **Mooloolaba Beach** (1 net)	0.58	0.03	0.04	0.28	1.46
Currimundi Beach (4 drumlines) **Moffat Beach** (3 drumlines) **Wurtulla Beach** (1 net)	0.62	0.02	0.07	0.56	0.67
Caloundra Beach (3 drumlines, 2 nets)	0.98	0.05	0.02	0.11	2.52
Woorim / Bribie Is (18 drumlines)				0.23	
Mean of ratios (SE) (n = 6-9 beach groupings)	**0.68 (0.11)**	**0.02 (0.01)**	**0.03 (0.01)**	**0.21 (0.05)**	**1.26 (0.28)**

3.9.7 Sizes of the three most Dangerous Target Sharks

As for all regions, the range in size of tiger sharks caught by drumlines (0.5- 4.8 m) was much greater than for bull sharks (1.0 – 2.7 m) (**Figure 3-18**). Similar to the regions immediately to the north and south around half of the distribution for bull whaler and tiger sharks was for sizes >2 m and the distribution for tiger sharks was flattened (i.e. there were no distinct tails). The distribution of sizes for bull sharks caught in nets was very similar to that for drumlines. The few white sharks caught on drumlines ranged in size between 2.2 and 4.3 m. There were insufficient numbers of tiger sharks caught in nets or white sharks caught in any gear to draw conclusions about selectivity.

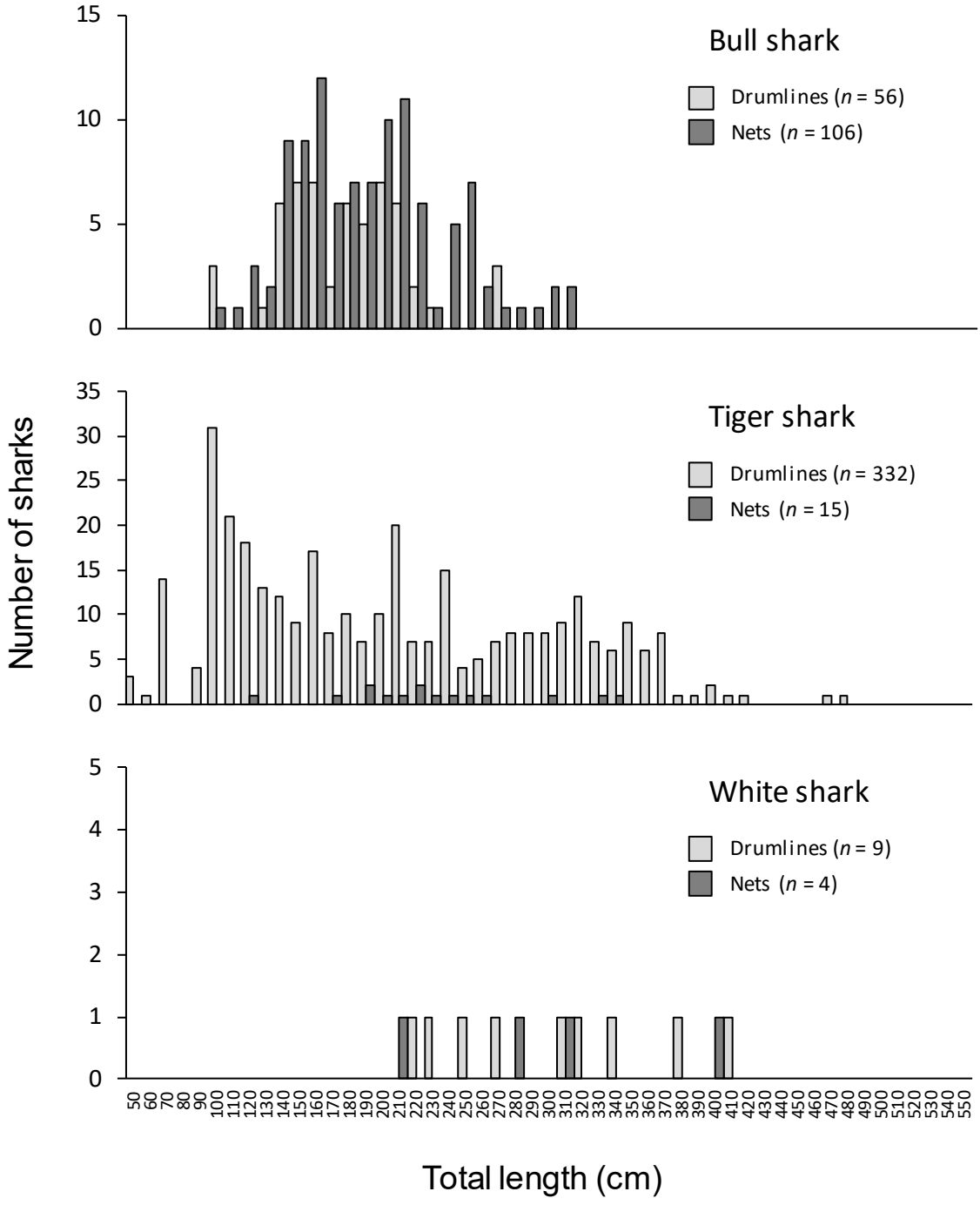

Figure 3-18 Sizes of bull whaler, tiger and white sharks caught in drumlines at Sunshine Coast.

3.10 North Stradbroke Island

3.10.1 Arrangement of Gear

There are four beaches at North Stradbroke Island that have between three and 12 drumlines. (**Figure 1-6, Table 3-18**).

Table 3-18 Number of nets and drumlines in North Stradbroke Island region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
North Stradbroke Island	Amity Point	8	
	Flinders Beach	3	
	Cylinder Beach	12	
	Main Beach	12	
	TOTAL	***35***	**-**

3.10.2 Total Catch and CPUE of Taxa

The North Stradbroke region uses only drumlines and between 2001 and 2018 yielded 338 catch records, with 72.6% comprising target sharks. Among the four North Stradbroke beaches, the proportion of the catch comprising non-target animals ranged between 0% (Flinders Beach, which has only been operational since 2017) and 52.3% (Amity Point) (see **Appendix B**).

Target Shark Species

Of the target shark species the most commonly caught were tiger sharks (37.6% of total catch; rate of 0.27 drumline^{-1}.year^{-1}), followed by dusky whalers (14.8%; 0.11 drumline^{-1}.year^{-1}) and bull whalers (8.3%; 0.06 drumline^{-1}.year^{-1}). Sixteen white sharks (4.7% of total catch; 0.03 drumline^{-1}.year^{-1}) were also recorded for North Stradbroke beaches (see **Appendix B**).

Average annual catches of bull whalers for drumlines for North Stradbroke Island beaches except Flinders Beach, which has only been operating since 2017, ranged from 0.28 year^{-1} at Cylinder Beach to 0.83 year^{-1} at Amity Point (see **Appendix B**). Catches of tiger sharks were larger, ranging from 0.28 year^{-1} at Amity Point to 2.22 year^{-1} at Main Beach and 4.33 year^{-1} at Cylinder Beach. These two beaches account for the entire catch of white shark, with annual averages of 0.33 and 0.56 year^{-1}, respectively.

Non-target Species

The most commonly caught non-target species across all North Stradbroke beaches were loggerhead turtles (60 turtles, 17.8% of total catch), and blacktip reef whalers (3.0%). The Moreton Bay region is known as an important foraging area for loggerhead turtles. Catches of at least one hammerhead species and of manta rays were also recorded. Three marine mammal species (including one humpback whale) and at least three sea turtle species (including loggerhead turtles) accounted for a combined proportion of 20.2% of the total drumline catch from North Stradbroke beaches (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks was greatest at Flinders Beach (0.67 drumline^{-1}.year^{-1}) and least at Amity Point (0.03 drumline^{-1}.year^{-1}), while the catch rate of bull whalers was greatest at Amity Point (0.10 drumline^{-1}.year^{-1}) and least at Flinders Beach (none recorded). Catch rates of white sharks were 0.07 and 0.03 drumline^{-1} year^{-1} at Cylinder Beach and Main Beach respectively, with no white sharks recorded at other North Stradbroke beaches.

In the cases of the most commonly caught non-targeted species, the annual catch rate (fate and gear units combined, per year) for loggerhead turtles ranged between 0 and 1.84 year^{-1} at Flinders Beach and Cylinder Beach respectively, while for blacktip reef whalers annual catch rates ranged between 0 and 1.84 year^{-1}, also at Flinders Beach and Cylinder Beach, respectively (see **Appendix B**).

3.10.3 Seasonal CPUE for the three most Dangerous Target Sharks

At North Stradbroke Island, the monthly trend in CPUE for the group of dangerous sharks caught on drumlines was driven by tiger sharks. CPUE for tiger sharks caught on drumlines at North Stradbroke Island had a peak in October and CPUE was generally higher in spring summer than for autumn and winter. Monthly trends in CPUE for bull whalers were the opposite although the differences were not as clear because of a generally low CPUE for this species. The CPUE for white sharks was greater in the months of September to December compared with other months (**Figure 3-19**).

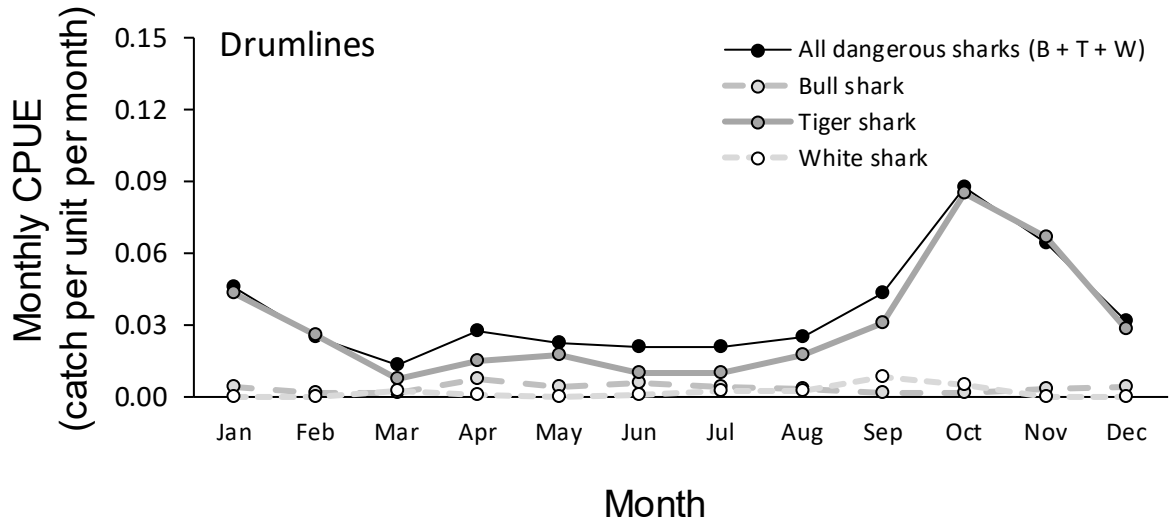

Figure 3-19 Monthly CPUE for bull whaler, tiger and white sharks at North Stradroke Island

3.10.4 Survival of Non-target Taxa

Non-target Sharks

Large proportions of most non-target shark taxa caught on drumlines were found dead (see **Appendix B**).

Other Taxa

Survival of manta rays caught by drumline was variable (see **Appendix B**).

The few dolphins caught by drumline were released alive. Nearly all sea turtles caught on drumlines survived (see **Appendix B**).

3.10.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

Given nets were not deployed between 2001 and 2018, calculations of CPUE ratios (drumlines/nets) for this region were not applicable.

3.10.6 Bycatch Ratio

The ratios of bycatch/target sharks for drumlines at North Stradbroke Island beaches was variable, ranging from 0.22 to 0.92, indicating generally less bycatch compared to target sharks at most beaches, particularly at the group of Amity Point and Flinders Beach (**Table 3-19**).

Table 3-19 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) at North Stradbroke Island.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Amity Pt (8 drumlines)				1.09	
Flinders Beach (3 drumlines) **Cylinder Beach** (3 drumlines)				0.39	
Ocean Beach (3 drumlines)				0.22	
Mean of ratios (SE) (n = 3 beach groupings)				**0.52 (0.21)**	

3.10.7 Sizes of the three most Dangerous Target Sharks

The range in sizes of tiger sharks caught by drumlines (0.7- 4.5 m) was much greater than for bull sharks (1.3 – 3.3 m) (**Figure 3-20**). For both species, close to half of the distribution was for sizes >2 m. Although there was a distinct modal size for bull sharks at about 2 m, this was not the case for tiger sharks which had a much more flattened distribution (i.e. no tails). White sharks caught by drumlines ranged in size between 2,1 – 4 m but there were insufficient numbers caught in nets to draw conclusions about selectivity.

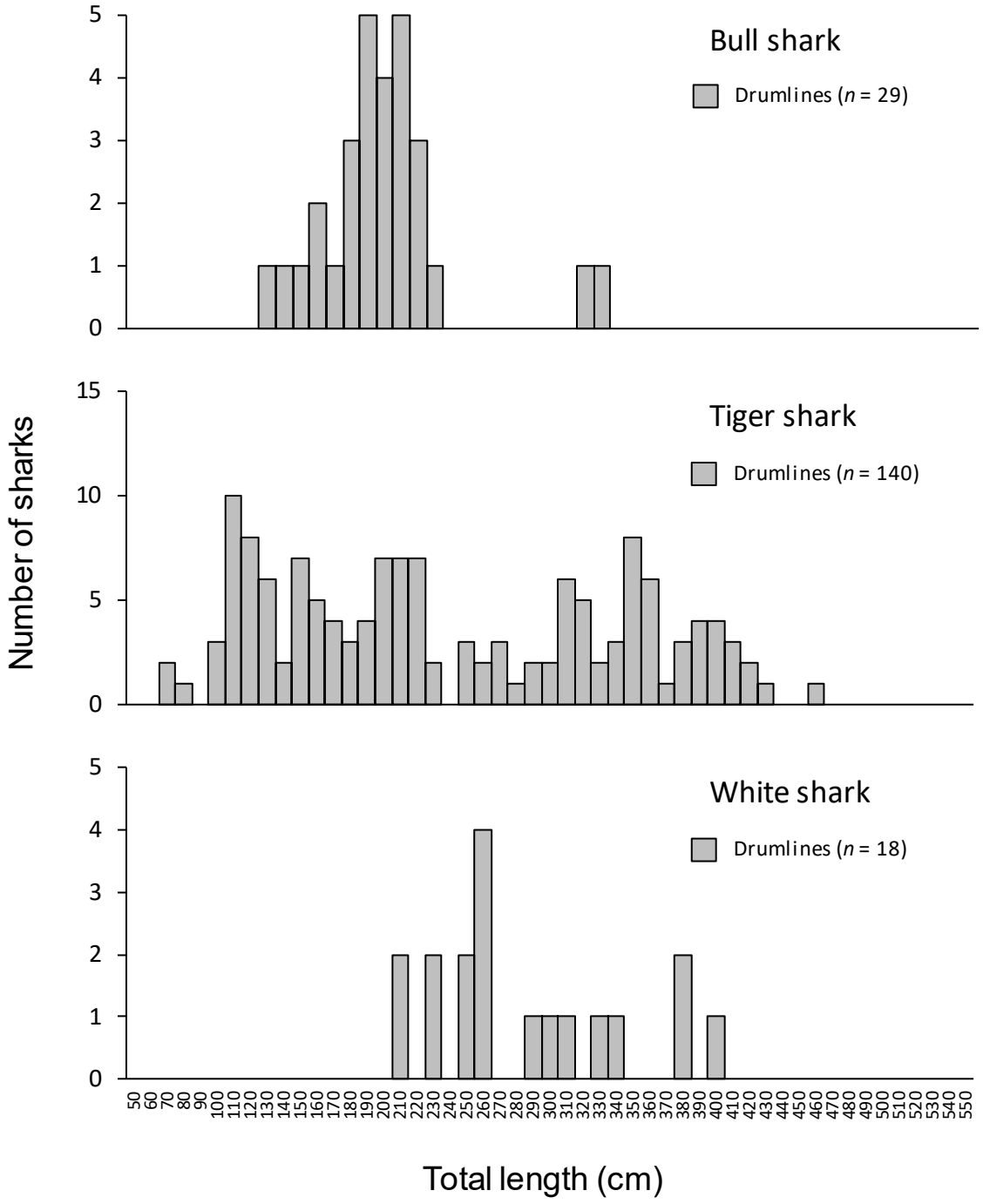

Figure 3-20 Sizes of bull whaler, tiger and white sharks caught in drumlines at North Stradbroke Island.

3.11 Gold Coast

3.11.1 Arrangement of Gear

There are 22 beaches at Gold Coast that have SCP gear. Half (11) of the beaches have drumlines only. Most beaches (7) with drumlines have only two drumlines but two beaches have three drumlines, one has five, and one has eight drumlines. The other half (11) of the beaches have a single net only (**Figure 1-6, Table 3-20**).

Table 3-20 Number of nets and drumlines in Gold Coast region.

REGION	BEACH	AS AT 31 DEC 2018	
		No. of Drumlines	No. of Nets
Gold Coast	Sheraton	5	
	Main Beach		1
	Narrowneck	2	
	Staghorn Avenue	2	
	Elkhorn Avenue	2	
	Surfers Paradise		1
	Northcliffe	3	
	Broadbeach	2	
	Kurrawa		1
	Mermaid Beach		1
	Nobbys Beach	2	
	Miami Beach		1
	North Burleigh	2	
	Burleigh Beach		1
	Tallebudgera		1
	Palm Beach	2	
	Currumbin		1
	Tugun	3	
	Bilinga		1
	North Kirra	2	
	Kirra		1
	Coolangatta		1
	Rainbow Bay	8	
	TOTAL	***35***	***11***

3.11.2 Total Catch and CPUE

Catch data recorded from SCP drumlines operating here from 2001 to 2018 totalled 301 catch records, with 64.2% of those animals being target sharks and 35.8% non-target animals. In total, 1,425 catches were recorded in the nets, comprising (22.7% target and 77.3% non-target). Among the 12 beaches with drumlines the proportion of the drumline catch comprising non-target animals ranged from 21.7% (Broadbeach) to 60.0% (Elkhorn Ave), while for catches in nets (at 11 beaches) the proportion ranged from 72.4% (Kurrawa Beach) to 83.5% (Mermaid Beach) (see **Appendix B**).

Target Shark Species

Of the target shark species, the most commonly caught by drumline were tiger sharks (27.6% of total drumline catch; rate of 0.13 drumline^{-1} year^{-1}), followed by white sharks (9.6%; 0.05 drumline^{-1} year^{-1}), dusky whalers (7.0%; 0.03 drumline^{-1} year^{-1}), sandbar whalers (5.6%; 0.03 drumline^{-1}.year^{-1}) and bull whalers (4.7%; 0.02 drumline^{-1}.year^{-1}). Long-nose whalers were the most commonly caught target species captured

in nets (10.8% of total net catch; rate of 0.81 net^{-1} year^{-1}), followed by bull whalers (3.2%; 0.24 net^{-1}.year^{-1}), great hammerheads (3.0%; 0.23 net^{-1}.year^{-1}) and white sharks (2.5%; 0.18 net^{-1}.year^{-1}) (see **Appendix B**).

Sheraton – at the northern end of the region – yielded the most bull whalers via drumlines (0.17 year^{-1}), but this equated to only three individuals for the entire 18 year period). Netted beaches in the region yielded larger catches of bull whalers compared with drumlines, with the most from Tallebudgera (0.47 year^{-1}) and Currumbin (0.39 year^{-1}). Rainbow Bay drumlines caught by far the highest number of tiger shark (1.72 year^{-1}), followed by Sheraton and Broadbeach (both 0.50 year^{-1}). For netted beaches, Kirra Beach yielded the most tiger sharks (0.18 year^{-1}) but this equated to only three individuals in total. Rainbow Bay drumlines (0.67 year^{-1}) and nets at Burleigh Beach and Kirra Beach (both 0.41 year^{-1}) caught the most white sharks for those gears in the Gold Coast region.

Non-target Species

Similar to other southern regions, loggerhead turtles were by far the most commonly caught non-target species on drumlines in the Gold Coast region (24.6% of total drumline catch), followed by common dolphin and green turtle (both 2.3%). Cownose ray was the most commonly caught non-target species in nets (26.0% of total net catch), followed by scalloped hammerheads (17.2%), common dolphins (6.7%), shovelnosed rays, *Aptychotrema* spp. (5.5%) and humpback whales and eagle rays (both 3.4%). When combined, four species of pelagic-swimming rays (manta rays, devilrays, cownose rays and eagle rays) accounted for 33.8% of the total catch using nets. Six grey nurse sharks were caught in nets (0.4% of total net catch), with none caught by drumline.

In addition to the marine mammals and sea turtles mentioned above, at least one other species of dolphin and two other species of sea turtles accounted for a combined proportion of 32.1% of the total drumline catch of non-target species. At least three other species of marine mammals (including an Antarctic Minke whale) and four species of sea turtle accounted for 16.2% of the non-target catch from nets (see **Appendix B**).

Patterns Among Beaches

The catch rate (per gear unit, per year) of tiger sharks from drumlines was greatest at Broadbeach (0.25 drumline^{-1}.year^{-1}) and smallest at Palm Beach (0.03 drumline^{-1}.year^{-1}), while the catch rate of white sharks was greatest at North Burleigh (0.14 drumline^{-1}.year^{-1}) and smallest at Broadbeach and Palm Beach (none caught). The catch rate of bull whalers by drumline was greatest at Staghorn Ave, Nobby's Beach and Palm Beach (0.06 drumline^{-1}.year^{-1}) and smallest at Narrowneck Beach, Elkhorn Ave, North Burleigh, Tugun Beach and North Kirra Beach (none caught). In nets the catch rate of long-nose whalers was greatest at Bilinga Beach (1.47 net^{-1}.year^{-1}) and smallest at Surfers Paradise (0.35 net^{-1}.year^{-1}), while the catch rate of bull whalers was greatest at Tallebudgera Beach (0.47 net^{-1}.year^{-1}) and smallest at Mermaid Beach (0.06 net^{-1}.year^{-1}). The catch rate of white sharks in nets was greatest at Burleigh Beach and Kirra Beach (0.41 net^{-1}.year^{-1}) and smallest at Kurrawa Beach and Miami Beach (0.06 net^{-1}.year^{-1}).

For non-target species, the annual catch rate for loggerhead turtles caught by drumline ranged between 0.11 year^{-1} (Sheraton Mirage, Palm Beach, Tugun Beach and North Kirra Beach) up to 1.56 year^{-1} at Rainbow Bay. In nets, the annual catch rate for cownose rays ranged between 0.18 and 3.05 year^{-1} at Surfers Paradise and Currumbin Beach, respectively. No clear patterns among Gold Coast beaches are apparent with respect to catches of marine mammals and sea turtles in drumlines or in nets, with an approximately even spread in the cases of both gear-types (see **Appendix B**).

3.11.3 Seasonal CPUE for the three most Dangerous Target Sharks

At the Gold Coast, there was no obvious monthly variation in CPUE for tiger sharks caught on drumlines. For bull whalers however, CPUE indicated that they were far more likely to be caught on drumlines between January to July than for other months. Similarly white sharks were far more likely to be caught on drumlines between May to November than for other months.

For nets, measurable numbers of tiger sharks were only caught between September and October or December to January. CPUE for bull whalers in nets was lower between the months of August to November. Although white sharks could be caught in nets in most seasons apart from autumn, the CPUE was substantially higher between August and October (**Figure 3-21**).

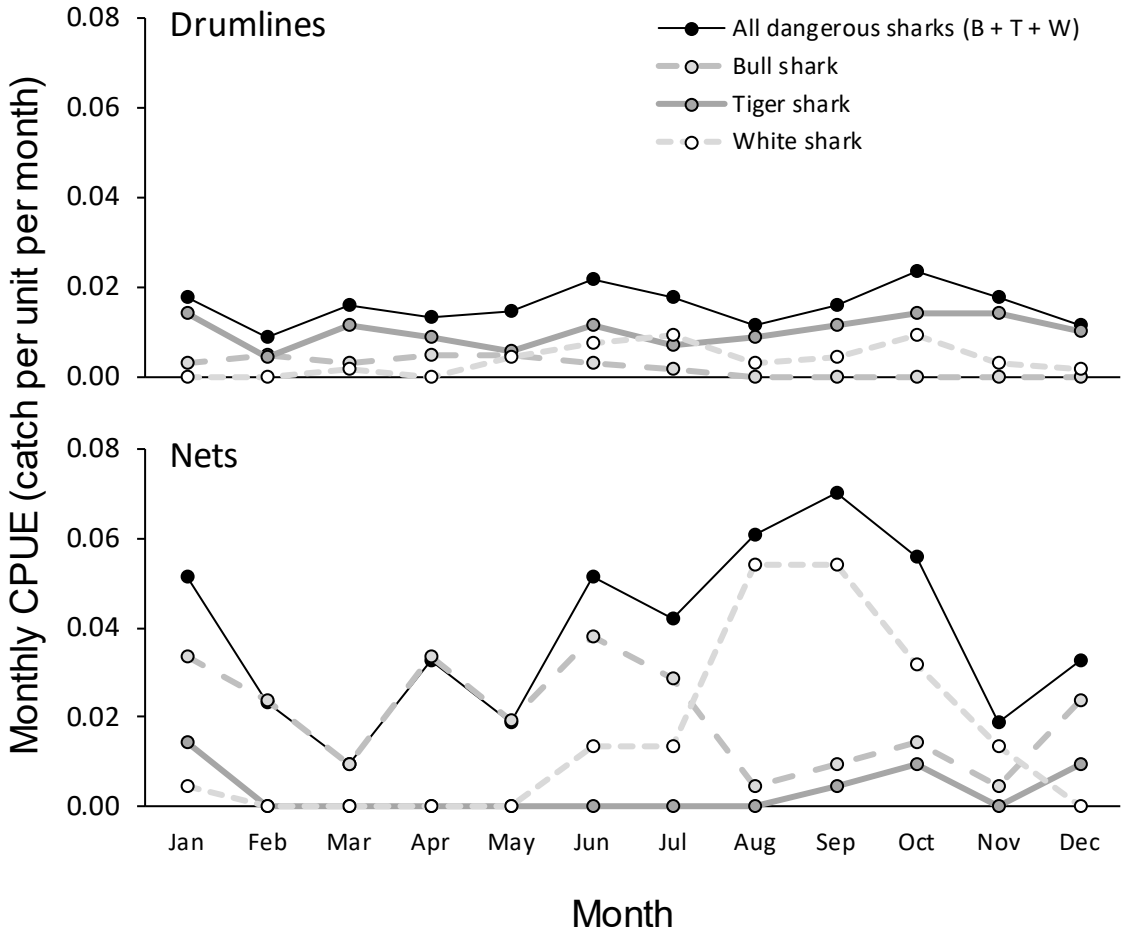

Figure 3-21 Monthly CPUE for bull whaler, tiger and white sharks at Gold Coast

3.11.4 Survival of Non-target Taxa

Non-target Sharks

Most non-target whaler shark and hammerhead taxa caught on drumlines or nets generally died. Grey nurse sharks, however, were a notable exception given all but one individual were released alive. More than half of the tawny or zebra sharks caught were generally released alive (see **Appendix B**).

Other Taxa

More than half of the pelagic rays caught by net were released alive. The two manta rays caught on drumline were each released alive. Demersal rays were generally caught in nets and overall about half survived (see **Appendix B**).

All dolphins caught by drumline were released alive whereas a large proportion of those caught by net generally perished. Five of the 34 humpback whales caught by net did not survive as did one minke whale. There was variable survival of sea turtles caught in nets whereas most caught on drumlines were released alive. The many teleosts that were caught by nets generally perished (see **Appendix B**).

3.11.5 CPUE Ratio for the three most Dangerous Target Sharks, all Other Target & Non-target Sharks & Other Bycatch

The CPUE ratios (drumlines/nets) for the group of taxa comprising the three dangerous target sharks for the groups of beaches analysed were variable (0.14 to 0.75), but all <1, indicating that nets were the more efficient gear for catching this group of taxa (**Table 3-21**).

CPUE ratios (drumlines/nets) at all beaches, or groups of beaches, for ‘all other target and non-target sharks’ and ‘other bycatch’ were generally <0.1, and only marginally greater than this in a few locations, indicating drumlines caught very few of these taxa compared to nets.

3.11.6 Bycatch Ratio

The ratio of bycatch/target sharks at the groups of beaches were all less than 1 for drumlines and all >1 for nets, indicating that more target sharks were caught for every non-target animal in drumlines and the opposite for nets (**Table 3-21**). For drumlines the smallest ratio of 0.29 occurred at the Nth Burleigh/Burleigh group of beaches indicating there were about three times as many target sharks caught than bycatch animals. For nets the largest ratio of 5.2 occurred at the Nobbys/Miami group of beaches indicating there were about five times as many bycatch animals caught than target sharks.

Table 3-21 Ratio of Drumline CPUE / Net CPUE for three groups of taxa (the three most dangerous target sharks [bull whaler, tiger and white], other target & non-target sharks and other bycatch) at Gold Coast.

Beach and gear	Ratio of Drumline CPUE / Net CPUE (no. caught per unit per year)			Ratio of Bycatch / Target catch (by number)	
	The three most dangerous target sharks (B+T+W)	All other target & non-target sharks (excl. rays)	Other bycatch	Drumlines	Nets
Sheraton Mirage (5 drumlines) **Main Beach** (1 net)	0.26	0.02	0.07	0.67	3.05
Narrowneck Beach (2 drumlines) **Staghorn Ave** (2 drumlines) **Elkhorn Ave** (2 drumlines) **Surfers Paradise** (1 net)	0.37	0.04	0.14	0.87	2.81
Broadbeach (2 drumlines) **Northcliffe Beach** (3 drumlines) **Kurrawa Beach** (1 net) **Mermaid Beach** (1 net)	0.75	0.05	0.13	0.37	3.37
Nobbys Beach (2 drumlines) **Miami Beach** (1 net)	0.67	0.07	0.31	0.53	5.21
Nth Burleigh Beach (2 drumlines) **Burleigh Beach** (1 net)	0.44	0.04	0.09	0.29	3.10
Palm Beach (2 drumlines) **Tallebudgera Beach** (1 net)	0.14	0.03	0.18	0.89	3.17
Tugun Beach (3 drumlines) **Currumbin Beach** (1 net) **Bilinga Beach** (1 net)	0.19	0.01	0.05	0.63	3.49
North Kirra (2 drumlines) **Rainbow Bay** (8 drumlines) **Kirra Beach** (1 net) **Coolangatta Beach** (1 net)	0.58	0.01	0.11	0.60	3.41
Mean of ratios (SE) (n = 8 beach groupings)	**0.43 (0.08)**	**0.03 (0.01)**	**0.14 (0.03)**	**0.61 (0.08)**	**3.45 (0.26)**

3.11.7 Sizes of the three most Dangerous Target Sharks

As for all regions, the range in size of tiger sharks caught by drumlines (1.0- 3.7 m) was much greater than for bull sharks (1.5 – 2.1 m) (**Figure 3-22**). The range in size of bull whalers caught by nets (1.4- 2.8 m) was greater than for drumlines but this may be reflective of the very small numbers of bull whalers caught by drumlines in this region. Around half of the distribution for tiger sharks were >2 m and like many regions the distribution was flat (i.e. it had no tails). The distributions of sizes of white sharks caught on drumlines and nets were similar with sharks ranging in size between 1.6 and 3.5 m long. The bulk of the distribution for white sharks included sharks >2 m. There were insufficient numbers of tiger sharks caught in nets to draw conclusions about selectivity

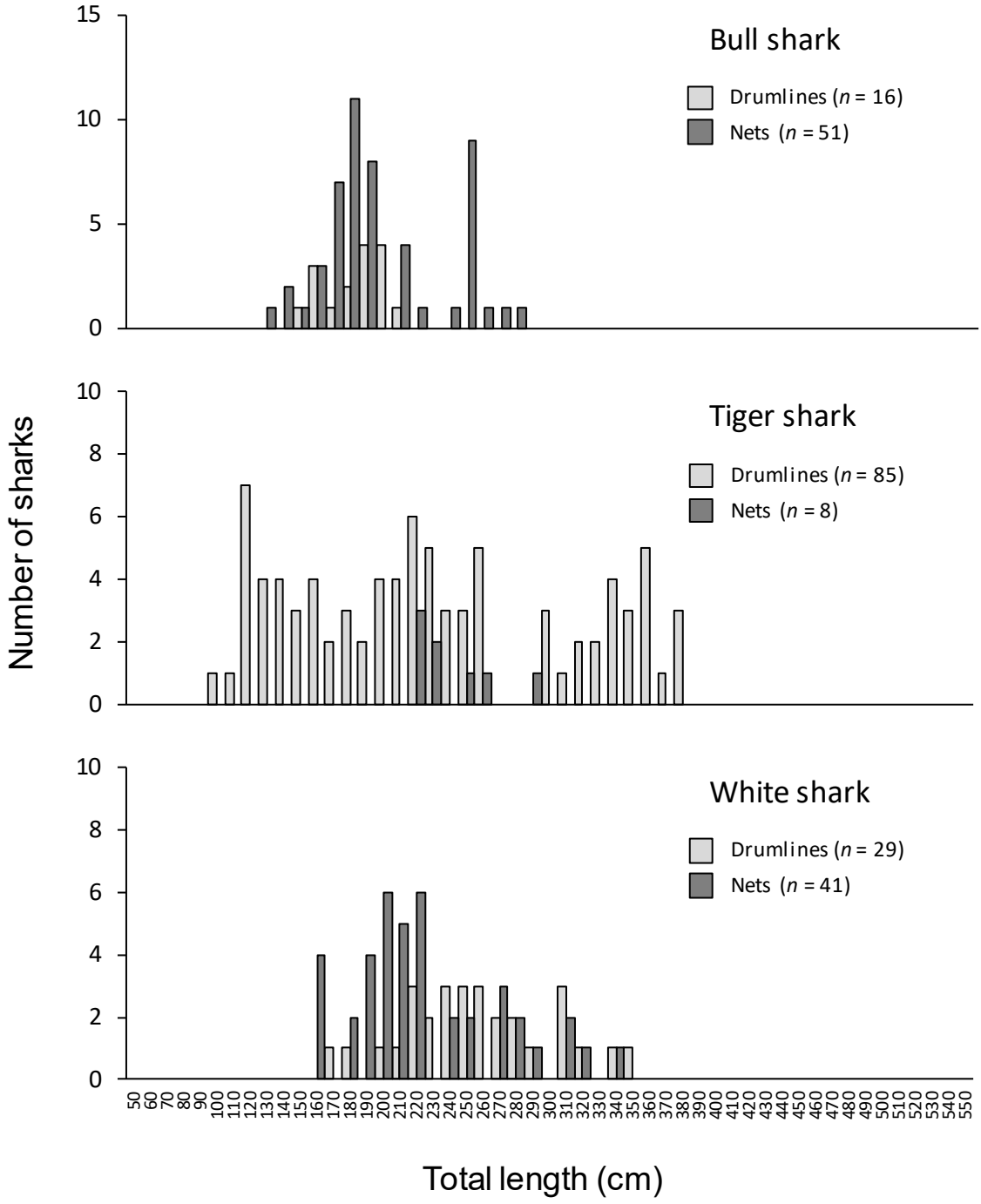

Figure 3-22 Sizes of bull whaler, tiger and white sharks caught in drumlines at Gold Coast.

4 Discussion

A mixed shark control strategy using both nets and drumlines has been recognised as important given the catchability of potentially dangerous sharks varies between gear type (Dudley et al. 1998). However, Sumpton et al. (2011) also recognised that the relative efficacy of each gear would potentially enable managers to refine local programs to reflect risk in terms of both bather protection as well as ecological risk of impacting species of conservation interest. Notwithstanding this, Sumpton et al. (2011) also recognised that this would be more complicated when many target and bycatch species are present in an area. In these cases, they proposed a case-by-case assessment rather than a general recommendation of a universally preferred gear type. We concur with their conclusions.

In Queensland's north, only one beach (in Mackay) still has nets deployed and if more nets are to be removed in the future from Mackay, Rainbow Beach, Sunshine Coast or Gold Coast, it is important to know the risk this would pose to water users and whether it could be managed, as much as the benefits it would have to non-target species. At the regional and beach level, the proportions of total catches and seasonality of the three most dangerous target shark species (tiger, bull whaler and white) in drumlines and nets, CPUE and size distributions not only allow for assessment of the current role of nets in reducing risk but also of strategies that would best compensate for their removal.

By way of example, Harbour Beach in Mackay, currently has 2 nets and 9 drumlines, and the CPUE ratio (drumlines/nets) for catches of the dangerous bull and tiger shark species is 1.15, indicating that each drumline has, on average, caught slightly more of these species than each net. Rainbow Beach currently has 12 drumlines and 3 nets, and the CPUE ratio (drumlines/nets) for catches of the group of the three most dangerous target shark species is 1.05, indicating that each drumline has, on average, caught around as many of these sharks as each net. Given the similar CPUE for drumlines and nets, it is conceivable that the total annual catches of these species could be maintained at these beaches if the two nets in Harbour Beach, Mackay and three nets in Rainbow Beach were replaced with two and three additional drumlines respectively (i.e. so that the total number of drumlines was increased from 9 to 11 in Harbour Beach and 12 to 15 at Rainbow Beach). Further, given the CPUE ratio for the groups of 'other target and non-target sharks' is 0.37 in Mackay and 0.04 at Rainbow Beach, and for 'other bycatch' is 0.002 in Mackay and 0.18 at Rainbow Beach, which indicates that the nets have caught around 3 times (Mackay) and 25 times (Rainbow Beach) the number of other shark species and 100s of times more (Mackay) and five times as much bycatch (Rainbow Beach) in the past, the future captures (in the new drumlines) of other sharks and other bycatch would be expected to be reduced by large amounts. Although some of these 'other sharks' are on the target list they are much less dangerous than bull, tiger or white sharks. At Rainbow Beach for example, removing the nets would reduce the capture of other target and non-target sharks by ~80% and other bycatch by ~40%. Using similar logic, the replacement of the two nets at Noosa (Sunshine Coast region) with two additional drumlines (i.e. for an increased total of 5 drumlines) could potentially maintain catches of the group of the three most dangerous target shark species whilst reducing captures of both other sharks and other bycatch by ~97%.

There are other beaches, or groups of beaches, where the CPUE ratio (drumlines/nets) indicated that nets were much more efficient at catching the group of the three most dangerous target shark species and in these cases the replacement of a net with a single drumline would not be expected to be sufficient to maintain catches of this group. For example, the CPUE ratio (drumlines/nets) for catches of the group of the dangerous target species within the group of beaches of Surfair, Mudjimba, Twin Waters and Marcoola (Sunshine Coast region) is much less than 1, at 0.333, and as such, three drumlines would be needed to compensate for the potentially lost catches of these species that are likely to occur with the removal of the net. This would also potentially reduce catches of the groups of other sharks and other bycatch at these beaches by > 95%.

Although it would appear that removing nets or replacing them with drumlines would benefit some non-target species, particularly those sharks and other animals that generally die when captured in nets, there is a risk that additional drumlines would not adequately compensate for the catches of the group of the most dangerous target shark species in the nets (i.e. the expected outcome may in fact not materialise). The CPUE ratio (drumline/nets) is only a guide as to how many drumlines would catch the same amount of the most dangerous target species that are caught by nets, and assumes that 'catchability' of sharks among gear is equal. Nets and drumlines function differently. Drumlines capture sharks when they are actively feeding. Given the three main species of sharks have different foraging modes and foraging modes that differ with the life history of the animal, you would not expect that a static bait would always have an equal chance of catching all three species (if present). Nets while also potentially catching sharks as they are

actively feeding, can also capture them if they are moving through the area without actively feeding at that time.

Variability in the composition of catches among the three most dangerous target species among regions and within regions (i.e. among beaches) as well as variability among species in CPUE for the two gear types also complicates matters. Nets have traditionally caught a large proportion of the totals of bull whalers at Mackay, Rainbow Beach, Sunshine Coast and Gold Coast as well as white sharks at the Gold Coast and the CPUE for these species in nets is generally greater than for drumlines. For example, at Noosa (3 drumlines, 2 nets) the CPUEs for tiger sharks were 1.37 sharks per drumline per year and 0.17 sharks per net per year (almost eight times higher for drumlines), while the corresponding CPUEs for bull sharks were 0.07 and 1.28 sharks per year respectively (more than eighteen times higher for nets). Hence, although the CPUE ratio (drumlines/nets) for the group of the most dangerous target sharks at Noosa would suggest that nets could be replaced by drumlines on a 1:1 basis, in doing so this may reduce the total catch of bull sharks at this beach. Another example is for Harbour Beach (9 drumlines, 2 nets) in the Mackay region where the CPUE ratio (drumlines/nets) for the group of the most dangerous target species was only 1.15 but the CPUE for tiger sharks caught by net was around double that by drumline, and for bull sharks almost six times that for drumline.

Notwithstanding this, there is also seasonality in the catch of the most dangerous three species and risk to some bycatch that could also be considered in alternative fishing approaches. Recent studies have demonstrated that white, tiger and bull whalers can undertake extensive movements with a seasonal component to these movements, but with significant individual variation in movement patterns (Bruce et al., 2006; Daly et al., 2014; Blaison et al., 2015; Lea et al., 2015; Heithaus et al., 2017). Movement patterns can be influenced by abiotic factors such as temperature, salinity and turbidity (Heupel and Simpfendorfer, 2008; Werry et al., 2018); and size and life history stage of the animals (Weng et al., 2007; Meyer et al., 2009; Werry et al., 2012; Lea et al., 2015), and the possible distribution of prey (Meyer et al., 2009). Daly et al. (2014) describes the pattern of movement of adult bull whalers as temporally and spatially variable residency patterns interspersed with migration events. At the Gold Coast, the peak migration periods for humpback whales, which are susceptible to entanglement in nets (and occasional death), are in May-June and September-October). This does not correspond closely with any substantial catches of either of the three most dangerous target shark species in nets. Although whales were caught in nets at Mermaid, Miami, Burleigh, Tallebudgerra and Bilinga beaches at some point between 2001-2018 only 3, 5, 12, 11 and 6 of the most dangerous target shark species were caught at each beach respectively during the same period. These numbers indicate there would be little risk to water users if nets were replaced by drumlines during these months (based on an amount of drumlines per beach that compensated for catch, according to the CPUE ratios for gear types, see above). Given there is also a high catch of the non-target juvenile scalloped hammerheads in Gold Coast nets, removal of nets over winter would also help to mitigate impacts to that species.

Finally, considerations regarding changes to risk associated with replacement of nets with alternative non-lethal gear have not been considered as part of this report but further discussion can be found in Cardno (2019).

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APPENDIX A
SCP TARGET AND NON-TARGET SPECIES

Cardno
Shaping the Future

TARGET SPECIES		NON-TARGET SPECIES	
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Sharks		**Sharks**	
Australian Blacktip	*Carcharhinus tilstoni*	Aust Sharpnose Shark	*Rhizoprionodon taylori*
Big Nose Whaler	*Carcharhinus altimus*	Blacktip Reef Whaler	*Carcharhinus melanopterus*
Blue Shark	*Prionace glauca*	Creek Whaler	*Carcharhinus fitzroyensis*
Bull Whaler	*Carcharhinus leucas*	Fossil Shark	*Hemipristis elongata*
Common Blacktip Whaler	*Carcharhinus limbatus*	Graceful Whaler	*Carcharhinus amblyrhynchoides*
Dusky Whaler	*Carcharhinus obscurus*	Grey Carpet Shark	*Chiloscyllium punctatum*
Great Hammerhead	*Sphyrna mokarran*	Grey Nurse Shark	*Carcharias taurus*
Grey Reef Whaler	*Carcharhinus amblyrhynchos*	Hardnose Whaler	*Carcharhinus macloti*
Long Nose Whaler (Spinner Shark)	*Carcharhinus brevipinna*	Milk Shark	*Rhizoprionodon acutus*
Longfin Mako	*Isurus paucus*	Nervous Shark	*Carcharhinus cautus*
Shortfin Mako	*Isurus oxyrinchus*	Port Jackson Shark	*Heterodontus portusjacksoni*
Oceanic Whitetip Whaler	*Carcharhinus longimanus*	Slit Eye Shark	*Loxodon macrorhinus*
Pigeye Whaler	*Carcharhinus amboinensis*	Scalloped Hammerhead	*Sphyrna lewini*
Sandbar Whaler	*Carcharhinus plumbeus*	Speartooth Shark	*Glyphis glyphis*
Sharptooth Shark/Lemon Shark	*Negaprion acutidens*	Spot-Tail Whaler	*Carcharhinus sorrah*
Silky Whaler	*Carcharhinus falciformis*	Tasselled Wobbegong	*Eucrossorhinus dasypogon*
Silvertip Whaler	*Carcharhinus albimarginatus*	Thresher Shark	*Alopias sp.*
Tiger Shark	*Galeocerdo cuvier*	Weasel Shark	*Hemigaleus australiensis*
White Shark	*Carcharodon carcharias*	Whale Shark	*Rhincodon typus*
		White-Cheek Shark	*Carcharhinus dussumieri*
		White-tip Reef Shark	*Triaenodon obesus*
		Winged Hammerhead	*Eusphyra blochii*
		Unid. Hammerhead Shark *	*Sphyrna* spp.
		Tawny Shark	*Nebrius ferrugineus*
		Zebra Shark	*Stegostoma fasciatum*
		Rays	
		Bull Ray	*Myliobatis australis*
		Cownose Ray	*Rhinoptera bonasus*
		Devil ray	*Mobula* spp.
		Eastern Shovelnosed Ray	*Aptychotrema rostrata*
		Giant Shovelnosed Ray	Glaucostegus typus
		Green Sawfish	Pristis zijsron
		Manta Ray	*Manta* spp.
		Narrow Sawfish	*Anoxypristis cuspidata*
		Queensland Sawfish	*Pristis clavata*
		Reticulate Whipray	*Himantura uarnak*
		Shark Ray	*Rhina ancylostoma*
		Unidentified Ray	Dasyatidae & Urolophidae
		Unidentified Eagle Ray	Myliobatidae
		Unid Shovelnosed Ray *	Rhinobatidae
		Unidentified Sawfish	Pristidae
		White-Spotted Eagle Ray	*Aetobatus ocellatus*

TARGET SPECIES		NON-TARGET SPECIES	
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
		White-Spotted Guitar	*Rhynchobatus australiae*
		Teleosts	
		Various	Teleostei
		Marine Mammals	
		Antarctic Minke Whale	*Balaenoptera bonaerensis*
		Australian Humpback Dolphin	*Sousa sahulensis*
		Australian Snubfin Dolphin	*Orcaella heinsohni*
		Bottlenose Dolphin	*Tursiops truncatus*
		Common Dolphin	*Delphinus delphis*
		Spinner Dolphin	Stenella longirostris
		Unidentified Dolphin	Delphinidae
		Humpback whales	*Megaptera novaeangliae*
		Dugong	*Dugong dugon*
		Marine Turtles	
		Flatback Turtle	*Natator depressus*
		Green Turtle	*Chelonia mydas*
		Hawksbill Turtle	*Eretmochelys imbricata*
		Leatherback Turtle	*Dermochelys coriacea*
		Loggerhead Turtle	*Caretta caretta*
		Olive Ridley Turtle	*Lepidochelys olivacea*
		Other	
		Mudcrab	*Scylla serrata*

APPENDIX B

SCP CATCH, CPUE & SURVIVAL BY BEACH

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Shaping the Future

Cairns Region SCP catch (2001-2018)

TAXA	ELLIS BEACH						BUCHANS BEACH						PALM COVE BEACH					
	DRUMLINES				NET		DRUMLINES						DRUMLINES				NET	
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			1	1	0.03 (0.03)		0	0			0	0		
Bull Whaler	45	13.7	0.44 (0.15)		0	0			15	14.3	0.48 (0.11)		31	18.1	0.22 (0.04)		1	2.2	0.06 (0.06)	
Common Blacktip Whaler	0	0			0	0			1	1	0.03 (0.03)		1	0.6	0.01 (0.01)		0	0		
Dusky Whaler	0	0			0	0			0	0			2	1.2	0.01 (0.01)		0	0		
Great Hammerhead	11	3.4	0.11 (0.08)		1	1	0.06 (0.07)		2	1.9	0.06 (0.04)		9	5.3	0.07 (0.02)		0	0		
Long Nose Whaler	1	0.3	0.01 (0.02)		0	0			1	1	0.03 (0.03)		4	2.3	0.03 (0.01)		0	0		
Pigeye Whaler	4	1.2	0.04 (0.05)		0	0			2	1.9	0.06 (0.04)		1	0.6	0.01 (0.01)		0	0		
Sandbar Whaler	0	0			0	0			2	1.9	0.06 (0.04)		0	0			0	0		
Sharptooth Shark	3	0.9	0.03 (0.04)		0	0			0	0			4	2.3	0.03 (0.01)		0	0		
Silky Whaler	1	0.3	0.01 (0.02)		0	0			0	0			0	0			0	0		
Tiger Shark	164	50	1.61 (0.34)		3	3.1	0.19 (0.11)		50	47.6	1.61 (0.22)		59	34.5	0.43 (0.06)		0	0		
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Aust Sharpnose Shark	0	0			0	0			0	0			0	0			0	0		
Blacktip Reef Whaler	51	15.5	0.17 (0.09)	2.67 (0.58)	1	1		0.08 (0.08)	17	16.2		1 (0.4)	26	15.2	0.06 (0.06)	1.39 (0.44)	0	0		
Creek Whaler	0	0			0	0			1	1		0.06 (0.06)	3	1.8		0.17 (0.09)	0	0		
Hardnose Whaler	2	0.6		0.11 (0.08)	0	0			1	1		0.06 (0.06)	1	0.6		0.06 (0.06)	0	0		
Milk Shark	0	0			0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Slit Eye Shark	1	0.3		0.06 (0.06)	0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Speartooth Shark	0	0			0	0			1	1	0.06 (0.06)		1	0.6		0.06 (0.06)	0	0		
Spot-Tail Whaler	6	1.8		0.33 (0.18)	0	0			2	1.9		0.12 (0.08)	0	0			0	0		
White-Cheek Shark	1	0.3		0.06 (0.06)	0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Scalloped Hammerhead	18	5.5		1 (0.35)	9	9.3		0.69 (0.33)	4	3.8		0.24 (0.14)	4	2.3		0.22 (0.15)	3	6.7		0.23 (0.12)
Winged Hammerhead	0	0			1	1		0.08 (0.08)	0	0			2	1.2		0.11 (0.08)	0	0		
Unid. Hammerhead Shark *	1	0.3		0.06 (0.06)	1	1		0.08 (0.08)	0	0			0	0			0	0		
Tawny Shark	19	5.8	1.06 (0.34)		12	12.4	0.38 (0.24)	0.54 (0.14)	4	3.8	0.18 (0.1)	0.06 (0.06)	20	11.7	1 (0.33)	0.11 (0.08)	6	13.3	0.15 (0.1)	0.31 (0.17)
Zebra Shark	0	0			1	1	0.08 (0.08)		0	0			0	0			0	0		
Manta Ray	0	0			1	1		0.08 (0.08)	0	0			0	0			1	2.2	0.08 (0.08)	
Unidentified Eagle Ray *	0	0			37	38.1	1.69 (0.49)	1.15 (0.25)	0	0			0	0			13	28.9	0.46 (0.18)	0.54 (0.18)
Cownose Ray	0	0			0	0			0	0			0	0			0	0		
Eastern Shovelnosed Ray	0	0			1	1	0.08 (0.08)		0	0			0	0			0	0		
Unid. Shovelnosed Ray *	0	0			2	2.1	0.15 (0.1)		1	1		0.06 (0.06)	0	0			3	6.7	0.08 (0.08)	0.15 (0.1)
White-Spotted Guitar	0	0			1	1	0.08 (0.08)		0	0			0	0			0	0		
Narrow Sawfish	0	0			13	13.4	0.69 (0.24)	0.31 (0.17)	0	0			0	0			6	13.3	0.23 (0.12)	0.23 (0.12)
Queensland Sawfish	0	0			0	0			0	0			0	0			1	2.2	0.08 (0.08)	
Unidentified Sawfish	0	0			0	0			0	0			0	0			1	2.2		0.08 (0.08)
Unidentified Ray	0	0			0	0			0	0			0	0			0	0		
Teleosts																				
Barramundi	0	0			0	0			0	0			0	0			0	0		
Cod	0	0			0	0			0	0			0	0			0	0		
Giant Trevally	0	0			0	0			0	0			0	0			0	0		
Salmon	0	0			1	1		0.08 (0.08)	0	0			0	0			1	2.2		0.08 (0.08)
Tuna	0	0			1	1		0.08 (0.08)	0	0			0	0			0	0		
Marine Mammals																				
Australian Hb Dolphin	0	0			0	0			0	0			0	0			2	4.4		0.15 (0.1)
Australian Snubfin Dolphin	0	0			0	0			0	0			0	0			0	0		
Bottlenose Dolphin	0	0			0	0			0	0			0	0			0	0		
Dolphin	0	0			0	0			0	0			0	0			1	2.2	0.08 (0.08)	
Dugong	0	0			0	0			0	0			0	0			0	0		
Marine Turtles																				
Flatback Turtle	0	0			2	2.1		0.15 (0.1)	0	0			0	0			0	0		
Green Turtle	0	0			8	8.2	0.54 (0.18)	0.08 (0.08)	0	0			0	0			3	6.7	0.15 (0.1)	0.08 (0.08)
Hawksbill Turtle	0	0			1	1	0.08 (0.08)		0	0			0	0			1	2.2	0.08 (0.08)	
Loggerhead Turtle	0	0			0	0			0	0			0	0			1	2.2		0.08 (0.08)
Other																				
Mud Crab	0	0			0	0			0	0			0	0			1	2.2	0.08 (0.08)	
TOTAL CATCH	**328**				**97**				**105**				**171**				**45**			

Cairns Region SCP catch (2001-2018) (cont.)

TAXA	CLIFTON BEACH								TRINITY BEACH							
	DRUMLINES				NET				DRUMLINES				NET			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			0	0			0	0		
Bull Whaler	11	11.3	0.23 (0.08)		1	2.2	0.08 (0.08)		12	7.2	0.17 (0.05)		2	3.8	0.14 (0.1)	
Common Blacktip Whaler	2	2.1	0.04 (0.03)		0	0			3	1.8	0.04 (0.02)		0	0		
Dusky Whaler	1	1	0.02 (0.02)		0	0			1	0.6	0.01 (0.01)		0	0		
Great Hammerhead	3	3.1	0.06 (0.05)		2	4.4	0.15 (0.1)		4	2.4	0.06 (0.03)		1	1.9	0.07 (0.07)	
Long Nose Whaler	1	1	0.02 (0.02)		0	0			0	0			0	0		
Pigeye Whaler	1	1	0.02 (0.02)		0	0			0	0			0	0		
Sandbar Whaler	0	0			0	0			0	0			0	0		
Sharptooth Shark	2	2.1	0.04 (0.03)		0	0			0	0			0	0		
Silky Whaler	0	0			0	0			0	0			0	0		
Tiger Shark	33	34	0.7 (0.14)		0	0			90	54.2	1.3 (0.19)		1	1.9	0.07 (0.07)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays									1	0.6		0.06 (0.06)	0	0		
Aust Sharpnose Shark	0	0			0	0			36	21.7		2.12 (0.59)	0	0		
Blacktip Reef Whaler	27	27.8		1.5 (0.41)	0	0			1	0.6		0.06 (0.06)	0	0		
Creek Whaler	3	3.1		0.17 (0.12)	0	0			0	0			0	0		
Hardnose Whaler	1	1		0.06 (0.06)	0	0			1	0.6		0.06 (0.06)	0	0		
Milk Shark	0	0			0	0			2	1.2		0.12 (0.08)	0	0		
Slit Eye Shark	1	1		0.06 (0.06)	0	0			0	0			0	0		
Speartooth Shark	0	0			0	0			3	1.8		0.18 (0.1)	0	0		
Spot-Tail Whaler	0	0			0	0			0	0			0	0		
White-Cheek Shark	0	0			0	0			4	2.4		0.24 (0.14)	4	7.5		0.33 (0.19)
Scalloped Hammerhead	8	8.2		0.44 (0.17)	3	6.7		0.25 (0.13)	1	0.6		0.06 (0.06)	1	1.9		0.08 (0.08)
Winged Hammerhead	0	0			0	0			0	0			0	0		
Unid. Hammerhead Shark *	0	0			0	0			6	3.6	0.29 (0.11)	0.06 (0.06)	4	7.5	0.17 (0.11)	0.17 (0.11)
Tawny Shark	3	3.1	0.17 (0.09)		2	4.4	0.17 (0.11)		0	0			0	0		
Zebra Shark	0	0			2	4.4	0.08 (0.08)	0.08 (0.08)	0	0			0	0		
Manta Ray	0	0			2	4.4		0.17 (0.11)	0	0			25	47.2	1.33 (0.26)	0.75 (0.22)
Unidentified Eagle Ray *	0	0			16	35.6	0.83 (0.21)	0.5 (0.19)	0	0			1	1.9	0.08 (0.08)	
Cownose Ray	0	0			0	0			0	0			1	1.9	0.08 (0.08)	
Eastern Shovelnosed Ray	0	0			0	0			0	0			0	0		
Unid. Shovelnosed Ray *	0	0			1	2.2	0.08 (0.08)		0	0			0	0		
White-Spotted Guitar	0	0			0	0			0	0			7	13.2	0.33 (0.14)	0.25 (0.25)
Narrow Sawfish	0	0			4	8.9	0.08 (0.08)	0.25 (0.13)	0	0			0	0		
Queensland Sawfish	0	0			0	0			0	0			1	1.9	0.08 (0.08)	
Unidentified Sawfish	0	0			1	2.2		0.08 (0.08)	0	0			1	1.9	0.08 (0.08)	
Unidentified Ray	0	0			1	2.2		0.08 (0.08)								
Teleosts									0	0			0	0		
Barramundi	0	0			1	2.2		0.08 (0.08)	0	0			0	0		
Cod	0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Giant Trevally	0	0			0	0			0	0			0	0		
Salmon	0	0			0	0			0	0			0	0		
Tuna	0	0			0	0										
Marine Mammals									0	0			1	1.9		0.08 (0.08)
Australian Hb Dolphin	0	0			1	2.2		0.08 (0.08)	0	0			0	0		
Australian Snubfin Dolphin	0	0			1	2.2		0.08 (0.08)	0	0			0	0		
Bottlenose Dolphin	0	0			0	0			0	0			0	0		
Dolphin	0	0			0	0			0	0			1	1.9		0.08 (0.08)
Dugong	0	0			0	0										
Marine Turtles									0	0			1	1.9		0.08 (0.08)
Flatback Turtle	0	0			0	0			0	0			0	0		
Green Turtle	0	0			5	11.1	0.17 (0.11)	0.25 (0.13)	0	0			0	0		
Hawksbill Turtle	0	0			0	0			0	0			1	1.9	0.08 (0.08)	
Loggerhead Turtle	0	0			2	4.4	0.17 (0.11)									
Other									0	0			0	0		
Mud Crab	0	0			0	0										
TOTAL CATCH	**97**				**45**				**166**				**53**			

Cairns Region SCP catch (2001-2018) (cont.)

TAXA	YORKEYS BEACH								HOLLOWAYS BEACH			
	DRUMLINES				NET				DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			1	0.7	0.02 (0.02)	
Bull Whaler	11	18.6	0.21 (0.1)		6	5.7	0.38 (0.22)		21	14.3	0.33 (0.08)	
Common Blacktip Whaler	1	1.7	0.02 (0.02)		0	0			1	0.7	0.02 (0.02)	
Dusky Whaler	1	1.7	0.02 (0.02)		0	0			1	0.7	0.02 (0.02)	
Great Hammerhead	4	6.8	0.08 (0.05)		2	1.9	0.13 (0.09)		1	0.7	0.02 (0.02)	
Long Nose Whaler	1	1.7	0.02 (0.02)		0	0			1	0.7	0.02 (0.02)	
Pigeye Whaler	1	1.7	0.02 (0.02)		0	0			3	2	0.05 (0.03)	
Sandbar Whaler	1	1.7	0.02 (0.02)		0	0			0	0		
Sharptooth Shark	1	1.7	0.02 (0.02)		2	1.9	0.13 (0.09)		1	0.7	0.02 (0.02)	
Silky Whaler	0	0			0	0			1	0.7	0.02 (0.02)	
Tiger Shark	17	28.8	0.32 (0.09)		1	0.9	0.06 (0.06)		52	35.4	0.83 (0.13)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays												
Aust Sharpnose Shark	0	0			0	0			0	0		
Blacktip Reef Whaler	15	25.4		0.83 (0.27)	0	0			43	29.3		2.53 (0.54)
Creek Whaler	1	1.7		0.06 (0.06)	0	0			2	1.4		0.12 (0.08)
Hardnose Whaler	0	0			0	0			0	0		
Milk Shark	0	0			0	0			0	0		
Slit Eye Shark	0	0			0	0			0	0		
Speartooth Shark	0	0			0	0			0	0		
Spot-Tail Whaler	0	0			0	0			7	4.8		0.41 (0.17)
White-Cheek Shark	0	0			0	0			1	0.7		0.06 (0.06)
Scalloped Hammerhead	3	5.1		0.17 (0.09)	12	11.3		0.92 (0.46)	9	6.1		0.53 (0.19)
Winged Hammerhead	0	0			0	0			0	0		
Unid. Hammerhead Shark *	0	0			0	0			0	0		
Tawny Shark	1	1.7	0.06 (0.06)		6	5.7	0.46 (0.18)		1	0.7	0.06 (0.06)	
Zebra Shark	0	0			0	0			1	0.7	0.06 (0.06)	
Manta Ray	0	0			0	0			0	0		
Unidentified Eagle Ray *	0	0			45	42.5	2.15 (0.54)	1.31 (0.26)	0	0		
Cownose Ray	0	0			0	0			0	0		
Eastern Shovelnosed Ray	0	0			0	0			0	0		
Unid. Shovelnosed Ray *	1	1.7	0.06 (0.06)		4	3.8	0.23 (0.12)	0.08 (0.08)	0	0		
White-Spotted Guitar	0	0			0	0			0	0		
Narrow Sawfish	0	0			7	6.6	0.15 (0.1)	0.38 (0.14)	0	0		
Queensland Sawfish	0	0			0	0			0	0		
Unidentified Sawfish	0	0			1	0.9		0.08 (0.08)	0	0		
Unidentified Ray	0	0			0	0			0	0		
Teleosts												
Barramundi	0	0			1	0.9		0.08 (0.08)	0	0		
Cod	0	0			1	0.9	0.08 (0.08)		0	0		
Giant Trevally	0	0			0	0			0	0		
Salmon	0	0			0	0			0	0		
Tuna	0	0			1	0.9		0.08 (0.08)	0	0		
Marine Mammals												
Australian Hb Dolphin	0	0			0	0			0	0		
Australian Snubfin Dolphin	0	0			1	0.9		0.08 (0.08)	0	0		
Bottlenose Dolphin	0	0			2	1.9		0.15 (0.15)	0	0		
Dolphin	0	0			0	0			0	0		
Dugong	0	0			1	0.9		0.08 (0.08)	0	0		
Marine Turtles												
Flatback Turtle	0	0			0	0			0	0		
Green Turtle	0	0			12	11.3	0.69 (0.21)	0.23 (0.17)	0	0		
Hawksbill Turtle	0	0			0	0			0	0		
Loggerhead Turtle	0	0			1	0.9		0.08 (0.08)	0	0		
Other												
Mud Crab	0	0			0	0			0	0		
TOTAL CATCH	**59**				**106**				147			

Townsville Region SCP catch (2001-2018)

TAXA	NELLY BAY DRUMLINES				FLORENCE BAY DRUMLINES				ALMA BAY DRUMLINES				RADICAL BAY DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	14	14.9	0.26 (0.08)		51	25	0.31 (0.04)		3	2.6	0.04 (0.02)		68	11.7	0.31 (0.04)	
Common Blacktip Whaler	3	3.2	0.06 (0.03)		3	1.5	0.02 (0.01)		4	3.5	0.05 (0.02)		3	0.5	0.01 (0.01)	
Dusky Whaler	1	1.1	0.02 (0.02)		0	0			0	0			0	0		
Great Hammerhead	3	3.2	0.06 (0.03)		7	3.4	0.04 (0.02)		4	3.5	0.05 (0.02)		22	3.8	0.1 (0.03)	
Grey Reef Whaler	0	0			0	0			1	0.9	0.01 (0.01)		0	0		
Long Nose Whaler	2	2.1	0.04 (0.03)		2	1	0.01 (0.01)		0	0			7	1.2	0.03 (0.01)	
Pigeye Whaler	2	2.1	0.04 (0.03)		5	2.5	0.03 (0.02)		0	0			12	2.1	0.06 (0.02)	
Sandbar Whaler	0	0			0	0			0	0			2	0.3	0.01 (0.01)	
Sharptooth Shark	3	3.2	0.06 (0.03)		3	1.5	0.02 (0.01)		3	2.6	0.04 (0.02)		9	1.5	0.04 (0.01)	
Tiger Shark	16	17	0.3 (0.07)		16	7.8	0.1 (0.03)		10	8.8	0.12 (0.04)		202	34.6	0.94 (0.1)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																
Blacktip Reef Whaler	1	1.1		0.06 (0.06)	5	2.5		0.28 (0.14)	24	21.1		1.33 (0.34)	17	2.9		0.94 (0.25)
Creek Whaler	0	0			0	0			2	1.8		0.11 (0.08)	0	0		
Graceful Whaler	1	1.1		0.06 (0.06)	3	1.5		0.17 (0.09)	0	0			3	0.5		0.17 (0.12)
Milk Shark	0	0			1	0.5		0.06 (0.06)	0	0			6	1		0.33 (0.14)
Nervous Shark	0	0			0	0			0	0			1	0.2		0.06 (0.06)
Spot-Tail Whaler	20	21.3		1.11 (0.23)	42	20.6		2.33 (0.38)	8	7		0.44 (0.15)	57	9.8		3.17 (0.73)
White-Cheek Shark	1	1.1		0.06 (0.06)	4	2		0.22 (0.15)	0	0			1	0.2		0.06 (0.06)
Unidentified Whaler	0	0			1	0.5	0.06 (0.06)		0	0			0	0		
Scalloped Hammerhead	0	0			0	0			0	0			8	1.4		0.44 (0.15)
Hammerhead Shark *	0	0			0	0			1	0.9		0.06 (0.06)	0	0		
Tawny Shark	8	8.5	0.44 (0.15)		21	10.3	1.17 (0.25)		33	28.9	1.56 (0.36)	0.28 (0.14)	55	9.4	3 (0.49)	0.06 (0.06)
Zebra Shark	0	0			0	0			1	0.9		0.06 (0.06)	2	0.3	0.06 (0.06)	0.06 (0.06)
Unidentified Shark	0	0			0	0			0	0			0	0		
Manta Ray	0	0			1	0.5	0.06 (0.06)		0	0			2	0.3		0.11 (0.08)
Shark Ray	1	1.1	0.06 (0.06)		0	0			0	0			0	0		
Bull Ray	0	0			0	0			0	0			1	0.2	0.06 (0.06)	
Devilray *	0	0			0	0			0	0			1	0.2	0.06 (0.06)	
Giant Shovelnosed Ray	0	0			1	0.5	0.06 (0.06)		0	0			0	0		
Fantail Ray	0	0			0	0			0	0			1	0.2	0.06 (0.06)	
Reticulate Whipray	0	0			1	0.5	0.06 (0.06)		2	1.8		0.11 (0.08)	5	0.9	0.22 (0.1)	0.06 (0.06)
White-Spotted Guitar Fish	4	4.3		0.22 (0.1)	4	2		0.22 (0.13)	0	0			3	0.5	0.06 (0.06)	0.11 (0.08)
White-Spotted Eagle Ray	1	1.1	0.06 (0.06)		0	0			0	0			0	0		
Unidentified Ray	0	0			1	0.5	0.06 (0.06)		3	2.6	0.17 (0.09)		1	0.2	0.06 (0.06)	
Teleosts																
Barracuda	0	0			0	0			0	0			1	0.2		0.06 (0.06)
Catfish	7	7.4	0.06 (0.06)	0.33 (0.11)	17	8.3	0.11 (0.08)	0.83 (0.2)	4	3.5	0.06 (0.06)	0.17 (0.09)	65	11.1	0.5 (0.25)	3.11 (0.96)
Cod	0	0			1	0.5		0.06 (0.06)	0	0			2	0.3	0.06 (0.06)	0.06 (0.06)
Giant Trevally	0	0			3	1.5		0.17 (0.12)	0	0			0	0		
Groper , Qld	6	6.4	0.33 (0.14)		4	2	0.22 (0.1)		2	1.8	0.11 (0.08)		23	3.9	1.28 (0.23)	
Queen Fish	0	0			0	0			0	0			0	0		
Unidentified Fish	0	0			0	0			0	0			0	0		
Marine Mammals																
Australian Snubfin Dolphin	0	0			0	0			0	0			1	0.2	0.06 (0.06)	
Spinner Dolphin	0	0			0	0			0	0			0	0		
Dugong	0	0			0	0			0	0			0	0		
Marine Turtles																
Green Turtle	0	0			7	3.4	0.22 (0.1)	0.17 (0.09)	8	7	0.44 (0.15)		2	0.3	0.11 (0.08)	
Loggerhead Turtle	0	0			0	0			1	0.9	0.06 (0.06)		0	0		
TOTAL CATCH	**94**				**204**				**114**				**583**			

Townsville Region SCP catch (2001-2018) (cont.)

TAXA	NELLY BAY DRUMLINES				FLORENCE BAY DRUMLINES				ALMA BAY DRUMLINES				RADICAL BAY DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	10	4	0.06 (0.02)		56	15.3	0.62 (0.09)		36	13.4	0.33 (0.05)		30	12.1	0.33 (0.06)	
Common Blacktip Whaler	1	0.4	0.01 (0.01)		6	1.6	0.07 (0.03)		3	1.1	0.03 (0.02)		2	0.8	0.02 (0.02)	
Dusky Whaler	0	0			2	0.5	0.02 (0.02)		0	0			0	0		
Great Hammerhead	7	2.8	0.04 (0.02)		5	1.4	0.06 (0.02)		9	3.4	0.08 (0.03)		4	1.6	0.04 (0.02)	
Grey Reef Whaler	1	0.4	0.01 (0.01)		0	0			0	0			0	0		
Long Nose Whaler	6	2.4	0.04 (0.01)		6	1.6	0.07 (0.03)		6	2.2	0.06 (0.02)		3	1.2	0.03 (0.02)	
Pigeye Whaler	3	1.2	0.02 (0.01)		3	0.8	0.03 (0.02)		1	0.4	0.01 (0.01)		7	2.8	0.08 (0.03)	
Sandbar Whaler	1	0.4	0.01 (0.01)		2	0.5	0.02 (0.02)		0	0			1	0.4	0.01 (0.01)	
Sharptooth Shark	5	2	0.03 (0.01)		2	0.5	0.02 (0.02)		3	1.1	0.03 (0.02)		11	4.4	0.12 (0.03)	
Tiger Shark	60	24.1	0.37 (0.05)		172	47.1	1.91 (0.15)		106	39.6	0.98 (0.11)		117	47.2	1.3 (0.13)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																
Blacktip Reef Whaler	32	12.9	0.06 (0.06)	1.72 (0.38)	10	2.7		0.56 (0.18)	26	9.7		1.44 (0.27)	22	8.9		1.22 (0.34)
Creek Whaler	1	0.4		0.06 (0.06)	0	0			0	0			1	0.4		0.06 (0.06)
Graceful Whaler	1	0.4		0.06 (0.06)	1	0.3		0.06 (0.06)	1	0.4		0.06 (0.06)	1	0.4		0.06 (0.06)
Milk Shark	0	0			0	0			0	0			3	1.2		0.17 (0.12)
Nervous Shark	0	0			0	0			0	0			0	0		
Spot-Tail Whaler	47	18.9	0.06 (0.06)	2.56 (0.53)	50	13.7	0.06 (0.06)	2.72 (0.61)	36	13.4		2 (0.48)	17	6.9	0.06 (0.06)	0.89 (0.21)
White-Cheek Shark	4	1.6		0.22 (0.13)	0	0			0	0			0	0		
Unidentified Whaler	0	0			0	0			0	0			0	0		
Scalloped Hammerhead	4	1.6		0.22 (0.13)	7	1.9		0.39 (0.14)	4	1.5		0.22 (0.1)	2	0.8		0.11 (0.08)
Hammerhead Shark *	0	0			0	0			0	0			0	0		
Tawny Shark	39	15.7	2.17 (0.42)		20	5.5	1 (0.21)	0.11 (0.08)	28	10.4	1.5 (0.32)	0.06 (0.06)	20	8.1	1.06 (0.32)	0.06 (0.06)
Zebra Shark	0	0			0	0			0	0			0	0		
Unidentified Shark	1	0.4		0.06 (0.06)	1	0.3		0.06 (0.06)	0	0			0	0		
Manta Ray	1	0.4	0.06 (0.06)		3	0.8	0.17 (0.09)		0	0			2	0.8	0.11 (0.08)	
Shark Ray	1	0.4	0.06 (0.06)		0	0			0	0			0	0		
Bull Ray	0	0			0	0			0	0			0	0		
Devilray *	1	0.4	0.06 (0.06)		0	0			0	0			0	0		
Giant Shovelnosed Ray	0	0			0	0			0	0			0	0		
Fantail Ray	0	0			0	0			0	0			0	0		
Reticulate Whipray	2	0.8		0.11 (0.08)	0	0			0	0			0	0		
White-Spotted Guitar Fish	0	0			0	0			0	0			0	0		
White-Spotted Eagle Ray	0	0			0	0			0	0			0	0		
Unidentified Ray	1	0.4	0.06 (0.06)		0	0			0	0			0	0		
Teleosts																
Barracuda	0	0			0	0			0	0			0	0		
Catfish	7	2.8	0.06 (0.06)	0.33 (0.16)	16	4.4	0.39 (0.18)	0.5 (0.19)	2	0.7		0.11 (0.11)	2	0.8		0.11 (0.08)
Cod	5	2	0.17 (0.09)	0.11 (0.08)	1	0.3		0.06 (0.06)	0	0			0	0		
Giant Trevally	0	0			0	0			0	0			0	0		
Groper , Qld	3	1.2	0.17 (0.09)		2	0.5	0.11 (0.08)		1	0.4	0.06 (0.06)		2	0.8	0.06 (0.06)	0.06 (0.06)
Queen Fish	0	0			0	0			1	0.4		0.06 (0.06)	0	0		
Unidentified Fish	0	0			0	0			2	0.7		0.11 (0.08)	0	0		
Marine Mammals																
Australian Snubfin Dolphin	0	0			0	0			0	0			0	0		
Spinner Dolphin	1	0.4		0.06 (0.06)	0	0			0	0			0	0		
Dugong	0	0			0	0			1	0.4	0.06 (0.06)		0	0		
Marine Turtles																
Green Turtle	3	1.2	0.17 (0.09)		0	0			2	0.7	0.11 (0.08)		1	0.4	0.06 (0.06)	
Loggerhead Turtle	1	0.4	0.06 (0.06)		0	0			0	0			0	0		
TOTAL CATCH	**249**				**365**				**268**				**248**			

Mackay Region SCP catch (2001-2018)

TAXA	BUCASIA BEACH								EIMEO BEACH								BLACKS BEACH			
	DRUMLINES				NET				DRUMLINES				NET				DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			0	0			0	0			1	0.7	0.01 (0.01)	
Bull Whaler	10	14.7	0.08 (0.03)		77	21.3	2.33 (0.34)		29	44.6	0.27 (0.06)		22	25	1.47 (0.42)		47	32.2	0.47 (0.09)	
Grey Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Long Nose Whaler	1	1.5	0.01 (0.01)		2	0.6	0.06 (0.04)		0	0			0	0			0	0		
Pigeye Whaler	0	0			5	1.4	0.15 (0.08)		1	1.5	0.01 (0.01)		0	0			2	1.4	0.02 (0.01)	
Sandbar Whaler	0	0			0	0			0	0			0	0			0	0		
Sharptooth Shark	1	1.5	0.01 (0.01)		0	0			2	3.1	0.02 (0.01)		0	0			0	0		
Tiger Shark	41	60.3	0.34 (0.07)		34	9.4	1.03 (0.18)		19	29.2	0.18 (0.04)		24	27.3	1.6 (0.42)		81	55.5	0.82 (0.12)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	5	7.4		0.28 (0.14)	20	5.5		1.18 (0.36)	4	6.2		0.22 (0.13)	2	2.3		0.13 (0.09)	8	5.5		0.44 (0.2)
Fossil Shark	0	0			1	0.3		0.06 (0.06)	0	0			1	1.1		0.07 (0.07)	0	0		
Spot-Tail Whaler	0	0			0	0			0	0			0	0			1	0.7		0.06 (0.06)
Scalloped Hammerhead	0	0			20	5.5		1.18 (0.26)	3	4.6		0.17 (0.09)	7	8		0.47 (0.17)	1	0.7		0.06 (0.06)
Hammerhead Shark *	0	0			2	0.6	0.06 (0.06)	0.06 (0.06)	0	0			1	1.1		0.07 (0.07)	0	0		
Thresher Shark	0	0			0	0			0	0			0	0			0	0		
Tawny Shark	3	4.4	0.17 (0.09)		24	6.6	0.88 (0.32)	0.53 (0.24)	3	4.6	0.17 (0.12)		0	0			2	1.4	0.11 (0.08)	
Zebra Shark	1	1.5	0.06 (0.06)		11	3	0.53 (0.19)	0.12 (0.08)	0	0			1	1.1	0.07 (0.07)		0	0		
Tasselled Wobbegong	1	1.5	0.06 (0.06)		0	0			0	0			0	0			0	0		
Manta Ray	0	0			4	1.1	0.24 (0.18)		0	0			4	4.5	0.27 (0.27)		0	0		
Eagle Ray *	0	0			1	0.3		0.06 (0.06)	0	0			0	0			0	0		
Cownose Ray	0	0			135	37.4	5.18 (1.77)	2.76 (1.34)	0	0			20	22.7	0.87 (0.38)	0.47 (0.34)	0	0		
Shovelnosed Ray *	1	1.5	0.06 (0.06)		5	1.4	0.18 (0.1)	0.12 (0.08)	3	4.6	0.17 (0.09)		4	4.5	0.13 (0.09)	0.13 (0.09)	2	1.4	0.11 (0.08)	
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Green Sawfish	0	0			1	0.3	0.06 (0.06)		0	0			0	0			0	0		
Sawfish (Ray)	0	0			2	0.6	0.12 (0.08)		0	0			0	0			0	0		
Ray	2	2.9	0.11 (0.08)		1	0.3	0.06 (0.06)		1	1.5		0.06 (0.06)	0	0			0	0		
Teleosts																				
Groper, Qld	2	2.9	0.06 (0.06)	0.06 (0.06)	1	0.3	0.06 (0.06)		0	0			0	0			0	0		
Marine Mammals																				
Australian Hb Dolphin	0	0			2	0.6		0.12 (0.08)	0	0			0	0			0	0		
Australian Snubfin Dolphin	0	0			0	0			0	0			0	0			0	0		
Bottlenose Dolphin	0	0			2	0.6		0.12 (0.12)	0	0			0	0			0	0		
Dugong	0	0			1	0.3		0.06 (0.06)	0	0			1	1.1		0.07 (0.07)	0	0		
Marine Turtles																				
Flatback Turtle	0	0			1	0.3	0.06 (0.06)		0	0			0	0			0	0		
Green Turtle	0	0			4	1.1	0.12 (0.08)	0.12 (0.08)	0	0			0	0			0	0		
Loggerhead Turtle	0	0			3	0.8	0.18 (0.13)		0	0			1	1.1	0.07 (0.07)		1	0.7	0.06 (0.06)	
Other																				
Crocodile	0	0			2	0.6		0.12 (0.08)	0	0			0	0			0	0		
TOTAL CATCH	**68**				**361**				**65**				**88**				**146**			

Mackay Region SCP catch (2001-2018) (cont.)

TAXA	BLACKS BEACH NET				LAMBERTS BEACH DRUMLINES				STH LAMBERTS BEACH DRUMLINES				HARBOUR BEACH DRUMLINES				HARBOUR BEACH NET			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			0	0			0	0			0	0		
Bull Whaler	9	29	0.5 (0.2)		36	11.6	0.31 (0.07)		2	22.2	0.17 (0.11)		19	10.3	0.15 (0.03)		32	12.5	0.89 (0.22)	
Grey Reef Whaler	0	0			1	0.3	0.01 (0.01)		0	0			0	0			2	0.8	0.06 (0.04)	
Long Nose Whaler	0	0			2	0.6	0.02 (0.01)		0	0			0	0			2	0.8	0.06 (0.04)	
Pigeye Whaler	0	0			2	0.6	0.02 (0.01)		0	0			1	0.5	0.01 (0.01)		2	0.8	0.06 (0.04)	
Sandbar Whaler	0	0			3	1	0.03 (0.02)		0	0			0	0			0	0		
Sharptooth Shark	0	0			2	0.6	0.02 (0.01)		0	0			1	0.5	0.01 (0.01)		0	0		
Tiger Shark	21	67.7	1.17 (0.39)		236	75.9	2 (0.22)		5	55.6	0.42 (0.19)		142	76.8	1.36 (0.11)		103	40.1	2.86 (0.41)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			3	1		0.17 (0.09)	1	11.1		0.5 (0.5)	4	2.2		0.22 (0.1)	14	5.4		0.78 (0.22)
Fossil Shark	0	0			0	0			0	0			0	0			0	0		
Spot-Tail Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	0	0			4	1.3		0.22 (0.13)	0	0			2	1.1		0.11 (0.11)	18	7	0.06 (0.06)	0.94 (0.3)
Hammerhead Shark *	0	0			1	0.3		0.06 (0.06)	0	0			0	0			1	0.4		0.06 (0.06)
Thresher Shark	0	0			1	0.3	0.06 (0.06)		0	0			0	0			0	0		
Tawny Shark	1	3.2	0.06 (0.06)		18	5.8	0.94 (0.35)	0.06 (0.06)	1	11.1		0.5 (0.5)	14	7.6	0.61 (0.18)	0.17 (0.12)	17	6.6	0.61 (0.23)	0.33 (0.18)
Zebra Shark	0	0			0	0			0	0			0	0			1	0.4	0.06 (0.06)	
Tasselled Wobbegong	0	0			0	0			0	0			0	0			0	0		
Manta Ray	0	0			0	0			0	0			0	0			12	4.7	0.39 (0.23)	0.28 (0.14)
Eagle Ray *	0	0			0	0			0	0			0	0			2	0.8	0.11 (0.08)	
Cownose Ray	0	0			0	0			0	0			0	0			21	8.2	0.72 (0.24)	0.44 (0.18)
Shovelnosed Ray *	0	0			0	0			0	0			2	1.1		0.11 (0.08)	3	1.2	0.17 (0.09)	
Bull Ray	0	0			0	0			0	0			0	0			2	0.8	0.06 (0.06)	0.06 (0.06)
Green Sawfish	0	0			0	0			0	0			0	0			0	0		
Sawfish (Ray)	0	0			0	0			0	0			0	0			1	0.4	0.06 (0.06)	
Ray	0	0			0	0			0	0			0	0			0	0		
Teleosts																				
Groper, Qld	0	0			1	0.3	0.06 (0.06)		0	0			0	0			0	0		
Marine Mammals																				
Australian Hb Dolphin	0	0			0	0			0	0			0	0			1	0.4		0.06 (0.06)
Australian Snubfin Dolphin	0	0			0	0			0	0			0	0			1	0.4		0.06 (0.06)
Bottlenose Dolphin	0	0			0	0			0	0			0	0			0	0		
Dugong	0	0			0	0			0	0			0	0			4	1.6		0.22 (0.1)
Marine Turtles																				
Flatback Turtle	0	0			0	0			0	0			0	0			2	0.8		0.11 (0.08)
Green Turtle	0	0			0	0			0	0			0	0			8	3.1	0.06 (0.06)	0.39 (0.33)
Loggerhead Turtle	0	0			1	0.3	0.06 (0.06)		0	0			0	0			5	1.9	0.11 (0.08)	0.17 (0.12)
Other																				
Crocodile	0	0			0	0			0	0			0	0			3	1.2		0.17 (0.09)
TOTAL CATCH	**31**				**311**				**9**				**185**				**257**			

Capricorn Coast Region SCP catch (2001-2018)

TAXA	FARNBOROUGH BEACH DRUMLINES				YEPPOON BEACH DRUMLINES				COOEE BEACH DRUMLINES				LAMMERMOOR BEACH DRUMLINES				KEMP BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			0	0	0 (0)		0	0			1	1.2	0.01 (0.01)	
Bull Whaler	53	28.8	0.59 (0.08)		22	32.4	0.24 (0.06)		31	36.9	0.29 (0.06)		46	30.3	0.26 (0.04)		31	36.9	0.29 (0.05)	
Common Blacktip Whaler	0	0			0	0			0	0			0	0			0	0		
Dusky Whaler	1	0.5	0.01 (0.01)		1	1.5	0.01 (0.01)		1	1.2	0.01 (0.01)		2	1.3	0.01 (0.01)		1	1.2	0.01 (0.01)	
Great Hammerhead	1	0.5	0.01 (0.01)		1	1.5	0.01 (0.01)		2	2.4	0.02 (0.01)		3	2	0.02 (0.01)		2	2.4	0.02 (0.01)	
Long Nose Whaler	11	6	0.12 (0.05)		5	7.4	0.06 (0.03)		6	7.1	0.06 (0.02)		10	6.6	0.06 (0.02)		4	4.8	0.04 (0.02)	
Pigeye Whaler	4	2.2	0.04 (0.02)		1	1.5	0.01 (0.01)		3	3.6	0.03 (0.02)		1	0.7	0.01 (0.01)		1	1.2	0.01 (0.01)	
Sandbar Whaler	0	0			0	0			1	1.2	0.01 (0.01)		1	0.7	0.01 (0.01)		1	1.2	0.01 (0.01)	
Sharptooth Shark	0	0			0	0			0	0			0	0			1	1.2	0.01 (0.01)	
Silky Whaler	2	1.1	0.02 (0.02)		0	0			0	0			0	0			0	0		
Tiger Shark	46	25	0.51 (0.09)		15	22.1	0.17 (0.05)		15	17.9	0.14 (0.04)		37	24.3	0.21 (0.04)		27	32.1	0.25 (0.05)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Aust Sharpnose Shark	0	0			0	0			0	0			1	0.7		0.06 (0.06)	0	0		
Blacktip Reef Whaler	22	12		1.22 (0.42)	5	7.4		0.28 (0.11)	11	13.1		0.61 (0.29)	16	10.5		0.89 (0.24)	7	8.3		0.39 (0.14)
Creek Whaler	1	0.5		0.06 (0.06)	0	0			0	0			0	0			0	0		
Graceful Whaler	2	1.1		0.11 (0.11)	0	0			0	0			0	0			0	0		
Hardnose Whaler	0	0			0	0			0	0			3	2		0.17 (0.17)	0	0		
Milk Shark	7	3.8		0.39 (0.18)	1	1.5		0.06 (0.06)	5	6		0.28 (0.14)	3	2		0.17 (0.09)	0	0		
Slit Eye Shark	0	0			0	0			0	0			0	0			0	0		
Spot-Tail Whaler	11	6		0.61 (0.26)	2	2.9		0.11 (0.11)	1	1.2		0.06 (0.06)	2	1.3		0.11 (0.08)	1	1.2		0.06 (0.06)
White-Cheek Shark	1	0.5		0.06 (0.06)	1	1.5		0.06 (0.06)	0	0			3	2		0.17 (0.17)	0	0		
Scalloped Hammerhead	0	0			0	0			1	1.2		0.06 (0.06)	1	0.7		0.06 (0.06)	0	0		
Winged Hammerhead	0	0			0	0			0	0			0	0			0	0		
Hammerhead Shark *	4	2.2		0.22 (0.13)	2	2.9		0.11 (0.08)	2	2.4		0.11 (0.08)	6	3.9		0.33 (0.16)	0	0		
Tawny Shark	1	0.5	0.06 (0.06)		3	4.4	0.17 (0.12)		0	0			0	0			0	0		
Grey Carpet Shark	1	0.5	0.06 (0.06)		0	0			0	0			0	0			0	0		
Unknown Shark	1	0.5		0.06 (0.06)	0	0			0	0			0	0			0	0		
Giant Shovelnosed R	0	0			0	0			0	0			1	0.7		0.06 (0.06)	0	0		
Shovelnosed Ray *	2	1.1	0.06 (0.06)	0.06 (0.06)	0	0			0	0			2	1.3		0.11 (0.08)	1	1.2		0.06 (0.06)
Eagle Ray *	0	0			2	2.9	0.06 (0.06)	0.06 (0.06)	0	0			0	0			0	0		
Reticulate Whipray	1	0.5		0.06 (0.06)	0	0			0	0			4	2.6	0.17 (0.09)	0.06 (0.06)	2	2.4		0.11 (0.11)
Ray	5	2.7	0.11 (0.08)	0.17 (0.12)	4	5.9	0.06 (0.06)	0.17 (0.12)	0	0			4	2.6	0.17 (0.09)	0.06 (0.06)	1	1.2		0.06 (0.06)
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Catfish	0	0			0	0			1	1.2		0.06 (0.06)	1	0.7		0.06 (0.06)	0	0		
Cod	0	0			0	0			0	0			0	0			0	0		
Groper , Qld	0	0			0	0			0	0			1	0.7	0.06 (0.06)		0	0		
Jewfish	0	0			2	2.9		0.11 (0.11)	0	0			1	0.7		0.06 (0.06)	0	0		
Toadfish	4	2.2	0.11 (0.11)	0.11 (0.08)	0	0			1	1.2		0.06 (0.06)	0	0			2	2.4	0.11 (0.11)	
Marine Mammals																				
Australian Hb Dolphin	1	0.5	0.06 (0.06)		0	0			0	0			1	0.7	0.06 (0.06)		0	0		
Dolphin	0	0			1	1.5	0.06 (0.06)		0	0			1	0.7	0.06 (0.06)		0	0		
Marine Turtles																				
Green Turtle	0	0			0	0			1	1.2	0.06 (0.06)		1	0.7		0.06 (0.06)	0	0		
Loggerhead Turtle	2	1.1	0.11 (0.11)		0	0			1	1.2	0.06 (0.06)		0	0			1	1.2	0.06 (0.06)	
Turtle	0	0			0	0			1	1.2		0.06 (0.06)	0	0			0	0		
TOTAL CATCH	**184**				**68**				**84**				**152**				**84**			

Capricorn Coast Region SCP catch (2001-2018) (cont.)

TAXA	MULLAMBIN BEACH DRUMLINES				TANBY BEACH DRUMLINES				FISHERMANS BEACH DRUMLINES				EMU BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			1	0.4	0.01 (0.01)		0	0			1	0.5	0.01 (0.01)	
Bull Whaler	63	38.9	0.7 (0.11)		90	40.4	1 (0.1)		64	48.5	0.6 (0.08)		110	50.2	0.87 (0.1)	
Common Blacktip Whaler	0	0			0	0			0	0			2	0.9	0.02 (0.01)	
Dusky Whaler	0	0			1	0.4	0.01 (0.01)		0	0			0	0		
Great Hammerhead	2	1.2	0.02 (0.02)		2	0.9	0.02 (0.02)		2	1.5	0.02 (0.01)		0	0		
Long Nose Whaler	5	3.1	0.06 (0.03)		3	1.3	0.03 (0.02)		5	3.8	0.05 (0.02)		12	5.5	0.1 (0.03)	
Pigeye Whaler	0	0			2	0.9	0.02 (0.02)		4	3	0.04 (0.02)		6	2.7	0.05 (0.02)	
Sandbar Whaler	1	0.6	0.01 (0.01)		1	0.4	0.01 (0.01)		0	0			1	0.5	0.01 (0.01)	
Sharptooth Shark	1	0.6	0.01 (0.01)		0	0			0	0			1	0.5	0.01 (0.01)	
Silky Whaler	0	0			0	0			0	0			0	0		
Tiger Shark	48	29.6	0.53 (0.08)		62	27.8	0.69 (0.09)		28	21.2	0.26 (0.05)		38	17.4	0.3 (0.05)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																
Aust Sharpnose Shark	1	0.6		0.06 (0.06)	2	0.9		0.11 (0.08)	0	0			2	0.9		0.11 (0.11)
Blacktip Reef Whaler	19	11.7		1.06 (0.43)	20	9		1.11 (0.44)	6	4.5		0.33 (0.14)	10	4.6		0.56 (0.28)
Creek Whaler	0	0			0	0			0	0			1	0.5		0.06 (0.06)
Graceful Whaler	1	0.6		0.06 (0.06)	2	0.9		0.11 (0.08)	0	0			1	0.5		0.06 (0.06)
Hardnose Whaler	0	0			0	0			0	0			1	0.5		0.06 (0.06)
Milk Shark	3	1.9		0.17 (0.09)	4	1.8		0.22 (0.17)	2	1.5		0.11 (0.08)	7	3.2		0.39 (0.18)
Slit Eye Shark	0	0			0	0			0	0			1	0.5		0.06 (0.06)
Spot-Tail Whaler	5	3.1		0.28 (0.14)	21	9.4		1.17 (0.37)	6	4.5		0.33 (0.18)	16	7.3		0.89 (0.23)
White-Cheek Shark	1	0.6		0.06 (0.06)	2	0.9		0.11 (0.11)	0	0			0	0		
Scalloped Hammerhead	0	0			0	0			1	0.8		0.06 (0.06)	0	0		
Winged Hammerhead	1	0.6		0.06 (0.06)	0	0			0	0			1	0.5		0.06 (0.06)
Hammerhead Shark *	4	2.5		0.22 (0.17)	7	3.1		0.39 (0.18)	6	4.5		0.33 (0.14)	1	0.5		0.06 (0.06)
Tawny Shark	3	1.9	0.17 (0.12)		2	0.9	0.06 (0.06)	0.06 (0.06)	3	2.3	0.17 (0.09)		3	1.4	0.17 (0.09)	
Grey Carpet Shark	0	0			0	0			0	0			0	0		
Unknown Shark	2	1.2	0.06 (0.06)	0.06 (0.06)	0	0			0	0			1	0.5	0.06 (0.06)	
Giant Shovelnosed R	0	0			0	0			0	0			0	0		
Shovelnosed Ray *	0	0			0	0			0	0			0	0		
Eagle Ray *	0	0			0	0			0	0			0	0		
Reticulate Whipray	0	0			0	0			0	0			0	0		
Ray	1	0.6		0.06 (0.06)	0	0			0	0			0	0		
Teleosts																
Black Kingfish Cobia	0	0			1	0.4		0.06 (0.06)	0	0			0	0		
Catfish	0	0			0	0			0	0			1	0.5		0.06 (0.06)
Cod	0	0			0	0			0	0			0	0		
Groper , Qld	0	0			0	0			0	0			0	0		
Jewfish	0	0			0	0			1	0.8		0.06 (0.06)	0	0		
Toadfish	1	0.6		0.06 (0.06)	0	0			0	0			0	0		
Marine Mammals																
Australian Hb Dolphin	0	0			0	0			0	0			0	0		
Dolphin	0	0			0	0			0	0			0	0		
Marine Turtles																
Green Turtle	0	0			0	0			3	2.3	0.11 (0.08)	0.06 (0.06)	1	0.5	0.06 (0.06)	
Loggerhead Turtle	0	0			0	0			1	0.8	0.06 (0.06)		1	0.5	0.06 (0.06)	
Turtle	0	0			0	0			0	0			0	0		
TOTAL CATCH	**162**				**223**				**132**				**219**			

Tannum Sands Region SCP catch (2001-2018)

TAXA	TANNUM SANDS BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	15	1.7	0.06 (0.02)	
Bull Whaler	109	12.1	0.42 (0.05)	
Common Blacktip Wha	111	12.3	0.43 (0.06)	
Dusky Whaler	7	0.8	0.03 (0.01)	
Long Nose Whaler	5	0.6	0.02 (0.01)	
Pigeye Whaler	1	0.1	< 0.01	
Sandbar Whaler	21	2.3	0.08 (0.02)	
Sharptooth Shark	6	0.7	0.02 (0.01)	
Tiger Shark	168	18.7	0.65 (0.06)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays				
Aust Sharpnose Shark	1	0.1		0.06 (0.06)
Blacktip Reef Whaler	407	45.2	0.22 (0.13)	22.39 (3.6)
Creek Whaler	1	0.1		0.06 (0.06)
Graceful Whaler	1	0.1		0.06 (0.06)
Hardnose Whaler	1	0.1		0.06 (0.06)
Milk Shark	1	0.1		0.06 (0.06)
Spot-Tail Whaler	3	0.3		0.17 (0.17)
Unidentified Whaler	1	0.1		0.06 (0.06)
Scalloped Hammerhead	6	0.7		0.33 (0.14)
Hammerhead Shark *	6	0.7		0.33 (0.18)
Tawny Shark	3	0.3	0.17 (0.09)	
Wobbegong *	2	0.2	0.06 (0.06)	0.06 (0.06)
Unidentified Shark	1	0.1		0.06 (0.06)
Shovelnosed Ray *	2	0.2	0.06 (0.06)	0.06 (0.06)
Teleosts				
Cod	1	0.1	0.06 (0.06)	
Groper, Qld	2	0.2	0.11 (0.08)	
Marine Turtles				
Green Turtle	14	1.6	0.78 (0.42)	
Loggerhead Turtle	4	0.4	0.22 (0.13)	
TOTAL CATCH	**900**			

Woongarra Region SCP catch (2001-2018)

TAXA	OAKS BEACH DRUMLINES				NEILSON PARK BEACH DRUMLINES				BARAGRA BEACH DRUMLINES				KELLYS BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Australian Blacktip	0	0			0	0			0	0			0	0		
Bull Whaler	1	2.1	0.03 (0.03)		17	5.5	0.16 (0.04)		1	1.4	0.02 (0.02)		18	3.6	0.11 (0.03)	
Common Blacktip Wha	0	0			0	0			0	0			1	0.2	0.01 (0.01)	
Dusky Whaler	0	0			4	1.3	0.04 (0.02)		0	0			0	0		
Long Nose Whaler	0	0			2	0.6	0.02 (0.01)		0	0			6	1.2	0.04 (0.01)	
Pigeye Whaler	4	8.5	0.11 (0.07)		20	6.5	0.19 (0.04)		5	7.2	0.09 (0.05)		43	8.7	0.27 (0.04)	
Sandbar Whaler	5	10.6	0.14 (0.09)		25	8.1	0.23 (0.05)		12	17.4	0.22 (0.08)		30	6	0.19 (0.04)	
Sharptooth Shark	2	4.3	0.06 (0.04)		6	1.9	0.06 (0.02)		1	1.4	0.02 (0.02)		13	2.6	0.08 (0.03)	
Tiger Shark	10	21.3	0.28 (0.1)		149	48.2	1.38 (0.14)		21	30.4	0.39 (0.09)		305	61.5	1.88 (0.13)	
White Shark	0	0			3	1	0.03 (0.02)		0	0			4	0.8	0.02 (0.01)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																
Blacktip Reef Whaler	2	4.3	0.06 (0.06)		11	3.6		0.67 (0.29)	4	5.8		0.17 (0.09)	16	3.2		0.83 (0.38)
Spot-Tail Whaler	0	0			4	1.3		0.22 (0.1)	1	1.4		0.06 (0.06)	1	0.2		0.06 (0.06)
Whaler	1	2.1			3	1	0.06 (0.06)	0.06 (0.06)	1	1.4			3	0.6		0.17 (0.09)
Scalloped Hammerhead	0	0		0.06 (0.06)	7	2.3		0.39 (0.16)	1	1.4		0.06 (0.06)	4	0.8	0.06 (0.06)	0.28 (0.14)
Hammerhead Shark *	0	0			0	0			0	0			0	0		
Tawny Shark	1	2.1		0.06 (0.06)	5	1.6	0.28 (0.14)		1	1.4	0.11 (0.08)		10	2	0.5 (0.17)	0.06 (0.06)
Zebra Shark	0	0			0	0			0	0			1	0.2		0.06 (0.06)
Unknown Shark	1	2.1			3	1		0.28 (0.14)	1	1.4			14	2.8		0.83 (0.33)
Manta Ray	2	4.3		0.11 (0.08)	7	2.3	0.28 (0.11)	0.11 (0.11)	1	1.4	0.06 (0.06)		6	1.2	0.33 (0.14)	
Shark Ray	0	0			1	0.3		0.06 (0.06)	0	0			0	0		
White-Spotted Guitar	1	2.1			3	1	0.06 (0.06)	0.06 (0.06)	1	1.4		0.06 (0.06)	1	0.2		
Teleosts																
Catfish	0	0			2	0.6		0.17 (0.09)	1	1.4		0.11 (0.11)	0	0		
Groper , Qld	0	0			0	0			2	2.9	0.11 (0.08)		1	0.2	0.06 (0.06)	
Snapper	0	0			2	0.6		0.11 (0.08)	6	8.7	0.06 (0.06)	0.33 (0.16)	2	0.4		0.11 (0.08)
Toadfish	2	4.3	0.06 (0.06)	0.17 (0.17)	5	1.6		0.28 (0.16)	1	1.4		0.06 (0.06)	1	0.2		0.06 (0.06)
Marine Turtles																
Green Turtle	11	23.4	0.39 (0.16)	0.5 (0.19)	13	4.2	0.89 (0.42)		1	1.4	0.06 (0.06)		5	1	0.33 (0.18)	
Loggerhead Turtle	4	8.5	0.11 (0.08)	0.22 (0.13)	16	5.2	1 (0.33)		7	10.1	0.44 (0.2)		10	2	0.56 (0.33)	
Unidentified Turtle	0	0	0.06 (0.06)		1	0.3	0.06 (0.06)		0	0			1	0.2	0.06 (0.06)	
TOTAL CATCH	**47**				**309**				**69**				**496**			

Rainbow Beach Region SCP catch (2001-2018)

TAXA	RAINBOW BEACH							
	DRUMLINES				NET			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	36	6.5	0.17 (0.03)		53	7.5	0.98 (0.17)	
Common Blacktip Whaler	4	0.7	0.02 (0.01)		0	0		
Dusky Whaler	20	3.6	0.09 (0.02)		43	6.1	0.8 (0.13)	
Great Hammerhead	1	0.2	<0.01		49	6.9	0.91 (0.15)	
Grey Reef Whaler	1	0.2	<0.01		0	0		
Long Nose Whaler	6	1.1	0.03 (0.01)		156	22.1	2.89 (0.36)	
Mako	0	0			6	0.8	0.11 (0.04)	
Pigeye Whaler	5	0.9	0.02 (0.02)		5	0.7	0.09 (0.04)	
Sandbar Whaler	2	0.4	0.01 (0.01)		4	0.6	0.07 (0.04)	
Sharptooth Shark	1	0.2	<0.01		6	0.8	0.11 (0.04)	
Silky Whaler	2	0.4	0.01 (0.01)		0	0		
Silver Tip Whaler	1	0.2	<0.01		0	0		
Tiger Shark	276	49.6	1.28 (0.1)		20	2.8	0.37 (0.08)	
White Shark	6	1.1	0.03 (0.01)		3	0.4	0.06 (0.03)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays								
Blacktip Reef Whaler	7	1.3	0.11 (0.08)	0.28 (0.14)	38	5.4	0.06 (0.06)	2.06 (0.57)
Graceful Whaler	0	0			1	0.1		0.06 (0.06)
Hardnose Whaler	0	0			1	0.1		0.06 (0.06)
Unidentified Whaler	2	0.4		0.11 (0.08)	0	0		
Scalloped Hammerhead	1	0.2		0.06 (0.06)	41	5.8	0.06 (0.06)	2.22 (0.55)
Unidentified Hammerhead Shark *	0	0			14	2		0.78 (0.29)
Grey Nurse Shark	1	0.2		0.06 (0.06)	8	1.1	0.17 (0.09)	0.28 (0.14)
Zebra Shark	0	0			9	1.3	0.33 (0.14)	0.17 (0.12)
Unidentified Wobbegong *	1	0.2	0.06 (0.06)		0	0		
Unidentified Shark	2	0.4		0.11 (0.11)	1	0.1		0.06 (0.06)
Manta Ray	1	0.2	0.06 (0.06)		15	2.1	0.67 (0.23)	0.17 (0.12)
Devilray *	0	0			14	2	0.5 (0.29)	0.28 (0.14)
Cownose Ray	0	0			14	2	0.28 (0.14)	0.5 (0.34)
Eagle Ray *	0	0			13	1.8	0.39 (0.16)	0.33 (0.16)
Shovelnosed Ray *	0	0			4	0.6	0.17 (0.12)	0.06 (0.06)
White-Spotted Guitar Fish	0	0			1	0.1		0.06 (0.06)
Bull Ray	0	0			4	0.6	0.17 (0.09)	0.06 (0.06)
Stingaree	0	0			2	0.3	0.06 (0.06)	0.06 (0.06)
Unidentified Ray	0	0			1	0.1		0.06 (0.06)
Teleosts								
Groper , Qld	1	0.2	0.06 (0.06)		0	0		
Mackeral	0	0			1	0.1		0.06 (0.06)
Marlin	0	0			6	0.8		0.33 (0.14)
Queen Fish	0	0			1	0.1		0.06 (0.06)
Snapper	1	0.2		0.06 (0.06)	1	0.1		0.06 (0.06)
Tuna	0	0			89	12.6	0.06 (0.06)	4.89 (0.95)
Wahoo	0	0			2	0.3		0.11 (0.08)
Marine Mammals								
Humpback Whale	0	0			7	1	0.39 (0.14)	
Australian Hb Dolphin	0	0			11	1.6	0.06 (0.06)	0.56 (0.35)
Bottlenose Dolphin	5	0.9	0.28 (0.16)		5	0.7		0.28 (0.14)
Common Dolphin	1	0.2		0.06 (0.06)	17	2.4		0.94 (0.25)
Unidentified Dolphin	0	0			3	0.4		0.17 (0.09)
Dugong	0	0			4	0.6		0.22 (0.1)
Marine Turtles								
Green Turtle	2	0.4	0.11 (0.11)		6	0.8	0.28 (0.11)	0.06 (0.06)
Leatherback Turtle	3	0.5	0.17 (0.09)		1	0.1	0.06 (0.06)	
Loggerhead Turtle	168	30.2	9.11 (2.37)	0.22 (0.13)	25	3.5	1.28 (0.37)	0.11 (0.08)
Unidentified Turtle	0	0			1	0.1	0.06 (0.06)	
TOTAL CATCH	**557**				**706**			

Sunshine Coast Region SCP catch (2001-2018)

TAXA	NOOSA BEACH								SUNSHINE BEACH				SUNRISE BEACH			
	DRUMLINES				NET				DRUMLINES				DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0			0	0			0	0			0	0		
Bull Whaler	4	4.2	0.07 (0.04)		46	9.5	1.28 (0.23)		2	6.3	0.04 (0.03)		3	12.5	0.06 (0.03)	
Dusky Whaler	2	2.1	0.04 (0.03)		6	1.2	0.17 (0.07)		3	9.4	0.06 (0.03)		1	4.2	0.02 (0.02)	
Great Hammerhead	0	0			49	10.1	1.36 (0.34)		0	0			0	0		
Grey Reef Whaler	0	0			10	2.1	0.28 (0.11)		0	0			0	0		
Long Nose Whaler	5	5.3	0.09 (0.04)		123	25.5	3.42 (0.59)		1	3.1	0.02 (0.02)		0	0		
Mako	2	2.1	0.04 (0.03)		0	0			1	3.1	0.02 (0.02)		1	4.2	0.02 (0.02)	
Pigeye Whaler	0	0			3	0.6	0.08 (0.05)		0	0			1	4.2	0.02 (0.02)	
Sandbar Whaler	1	1.1	0.02 (0.02)		2	0.4	0.06 (0.04)		0	0			0	0		
Sharptooth Shark	0	0			0	0			0	0			0	0		
Silky Whaler	2	2.1	0.04 (0.03)		2	0.4	0.06 (0.06)		0	0			1	4.2	0.02 (0.02)	
Tiger Shark	74	77.9	1.37 (0.17)		6	1.2	0.17 (0.06)		22	68.8	0.41 (0.09)		16	66.7	0.3 (0.07)	
White Shark	2	2.1	0.04 (0.03)		0	0			1	3.1	0.02 (0.02)		0	0		
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																
Blacktip Reef Whaler	0	0			0	0			0	0			0	0		
Fossil Shark	0	0			0	0			0	0			0	0		
Hardnose Whaler	0	0			1	0.2		0.06 (0.06)	0	0			0	0		
Weasel Shark	0	0			3	0.6		0.17 (0.12)	0	0			0	0		
Whaler	0	0			0	0			0	0			0	0		
Scalloped Hammerhead	0	0			11	2.3	0.06 (0.06)	0.56 (0.32)	0	0			0	0		
Hammerhead Shark *	0	0			33	6.8		1.83 (0.56)	0	0			0	0		
Whale Shark	0	0			1	0.2		0.06 (0.06)	0	0			0	0		
Grey Nurse Shark	0	0			3	0.6	0.11 (0.08)	0.06 (0.06)	1	3.1	0.06 (0.06)		0	0		
Tawny Shark	0	0			0	0			0	0			0	0		
Zebra Shark	0	0			4	0.8	0.22 (0.13)		0	0			0	0		
Port Jackson Shark	0	0			1	0.2	0.06 (0.06)		0	0			0	0		
Unknown Shark	0	0			1	0.2		0.06 (0.06)	0	0			0	0		
Manta Ray	1	1.1		0.06 (0.06)	35	7.2	0.44 (0.25)	1.5 (0.54)	0	0			0	0		
Devilray *	0	0			21	4.3	0.11 (0.08)	1.06 (0.42)	0	0			0	0		
Cownose Ray	0	0			7	1.4	0.33 (0.2)	0.06 (0.06)	0	0			0	0		
Eagle Ray *	0	0			19	3.9	0.78 (0.27)	0.28 (0.14)	0	0			0	0		
White-Spotted Eagle Ray	0	0			1	0.2	0.06 (0.06)		0	0			0	0		
Shark Ray	0	0			0	0			0	0			0	0		
White-Spotted Guitar	0	0			1	0.2	0.06 (0.06)		0	0			0	0		
Shovelnosed Ray *	0	0			14	2.9	0.5 (0.19)	0.28 (0.11)	0	0			0	0		
Bull Ray	0	0			1	0.2	0.06 (0.06)		0	0			0	0		
Ray	0	0			18	3.7	0.44 (0.28)	0.56 (0.28)	0	0			0	0		
Teleosts																
Black Kingfish Cobia	0	0			1	0.2	0.06 (0.06)		0	0			0	0		
Bonita	0	0			0	0			0	0			0	0		
Cod	0	0			0	0			0	0			0	0		
Giant Trevally	0	0			1	0.2		0.06 (0.06)	0	0			0	0		
Jewfish	0	0			0	0			0	0			0	0		
Mackeral	0	0			0	0			0	0			0	0		
Queen Fish	0	0			0	0			0	0			0	0		
Salmon	0	0			0	0			0	0			0	0		
Snapper	0	0			0	0			0	0			0	0		
Sweetlip	0	0			0	0			0	0			0	0		
Tuna	1	1.1		0.06 (0.06)	19	3.9	0.17 (0.12)	0.89 (0.24)	0	0			0	0		
Marine Mammals																
Humpback Whale	0	0			2	0.4	0.11 (0.08)		0	0			0	0		
Australian Hb Dolphin	0	0			1	0.2		0.06 (0.06)	0	0			0	0		
Bottlenose Dolphin	0	0			6	1.2		0.33 (0.14)	1	3.1	0.06 (0.06)		0	0		
Common Dolphin	0	0			17	3.5	0.06 (0.06)	0.89 (0.2)	0	0			0	0		
Spinner Dolphin	0	0			2	0.4		0.11 (0.08)	0	0			0	0		
Dolphin	0	0			2	0.4		0.11 (0.08)	0	0			0	0		
Dugong	0	0			2	0.4		0.11 (0.08)	0	0			0	0		
Marine Turtles																
Green Turtle	0	0			2	0.4	0.11 (0.11)		0	0			0	0		
Hawksbill Turtle	0	0			1	0.2	0.06 (0.06)		0	0			0	0		
Leatherback Turtle	0	0			0	0			0	0			0	0		
Loggerhead Turtle	1	1.1	0.06 (0.06)		3	0.6	0.17 (0.09)		0	0			1	4.2	0.06 (0.06)	
Unidentified Turtle	0	0			0	0			0	0			0	0		
Birds																
Unidentified Bird	0	0			2	0.4		0.11 (0.11)	0	0			0	0		
TOTAL CATCH	**95**				**483**				**32**				**24**			

Sunshine Coast Region SCP catch (2001-2018) (cont.)

TAXA	NTH PEREGIAN / CASTAWAYS BEACH DRUMLINES				GLEN EDEN / MARCUS BEACH DRUMLINES				PEREGIAN BEACH DRUMLINES				COOLUM BEACH NET				YAROOMBA BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0			0	0			0	0			0	0			0	0		
Bull Whaler	1	3.4	0.02 (0.02)		0	0			2	15.4	0.04 (0.03)		3	2.4	0.18 (0.1)		0	0		
Dusky Whaler	2	6.9	0.04 (0.03)		1	5.3	0.02 (0.02)		3	23.1	0.06 (0.03)		2	1.6	0.12 (0.08)		0	0		
Great Hammerhead	0	0			0	0			0	0			9	7.1	0.53 (0.21)		0	0		
Grey Reef Whaler	0	0			0	0			1	7.7	0.02 (0.02)		4	3.1	0.24 (0.18)		2	8.3	0.03 (0.02)	
Long Nose Whaler	1	3.4	0.02 (0.02)		1	5.3	0.02 (0.02)		1	7.7	0.02 (0.02)		48	37.8	2.82 (0.5)		4	16.7	0.06 (0.03)	
Mako	1	3.4	0.02 (0.02)		0	0			0	0			2	1.6	0.12 (0.08)		1	4.2	0.01 (0.01)	
Pigeye Whaler	0	0			0	0			0	0			0	0			0	0		
Sandbar Whaler	0	0			0	0			0	0			1	0.8	0.06 (0.06)		0	0		
Sharptooth Shark	0	0			0	0			0	0			0	0			0	0		
Silky Whaler	0	0			2	10.5	0.04 (0.03)		1	7.7	0.02 (0.02)		0	0			1	4.2	0.01 (0.01)	
Tiger Shark	19	65.5	0.35 (0.09)		12	63.2	0.22 (0.06)		5	38.5	0.09 (0.04)		1	0.8	0.06 (0.06)		10	41.7	0.14 (0.04)	
White Shark	0	0			0	0			0	0			1	0.8	0.06 (0.06)		0	0		
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Fossil Shark	0	0			0	0			0	0			0	0			0	0		
Hardnose Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	0	0			0	0			0	0			2	1.6		0.12 (0.08)	0	0		
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	0	0			0	0			0	0			3	2.4		0.18 (0.13)	0	0		
Hammerhead Shark *	0	0			0	0			0	0			5	3.9		0.29 (0.14)	0	0		
Whale Shark	0	0			0	0			0	0			0	0			0	0		
Grey Nurse Shark	0	0			0	0			0	0			2	1.6	0.06 (0.06)	0.06 (0.06)	1	4.2	0.06 (0.06)	
Tawny Shark	0	0			0	0			0	0			0	0			0	0		
Zebra Shark	0	0			0	0			0	0			0	0			0	0		
Port Jackson Shark	0	0			0	0			0	0			0	0			0	0		
Unknown Shark	0	0			0	0			0	0			1	0.8		0.06 (0.06)	0	0		
Manta Ray	0	0			1	5.3	0.06 (0.06)		0	0			10	7.9	0.29 (0.19)	0.29 (0.14)	0	0		
Devilray *	0	0			0	0			0	0			1	0.8		0.06 (0.06)	0	0		
Cownose Ray	0	0			0	0			0	0			2	1.6		0.12 (0.12)	0	0		
Eagle Ray *	0	0			0	0			0	0			3	2.4	0.06 (0.06)	0.12 (0.08)	0	0		
White-Spotted Eagle Ray	0	0			0	0			0	0			1	0.8	0.06 (0.06)		0	0		
Shark Ray	0	0			0	0			0	0			0	0			0	0		
White-Spotted Guitar	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	0	0			0	0			0	0			4	3.1	0.18 (0.1)	0.06 (0.06)	0	0		
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	0	0			0	0			0	0			4	3.1	0.18 (0.13)	0.06 (0.06)	0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Bonita	0	0			0	0			0	0			0	0			0	0		
Cod	0	0			0	0			0	0			0	0			0	0		
Giant Trevally	0	0			0	0			0	0			0	0			0	0		
Jewfish	0	0			0	0			0	0			0	0			0	0		
Mackeral	0	0			0	0			0	0			0	0			0	0		
Queen Fish	0	0			0	0			0	0			0	0			0	0		
Salmon	0	0			0	0			0	0			0	0			0	0		
Snapper	1	3.4		0.06 (0.06)	0	0			0	0			0	0			0	0		
Sweetlip	0	0			1	5.3		0.06 (0.06)	0	0			0	0			0	0		
Tuna	0	0			0	0			0	0			7	5.5	0.06 (0.06)	0.35 (0.15)	1	4.2		0.06 (0.06)
Marine Mammals																				
Humpback Whale	0	0			0	0			0	0			2	1.6	0.12 (0.08)		0	0		
Australian Hb Dolphin	0	0			0	0			0	0			0	0			0	0		
Bottlenose Dolphin	0	0			0	0			0	0			2	1.6		0.12 (0.12)	0	0		
Common Dolphin	1	3.4	0.06 (0.06)		0	0			0	0			0	0			0	0		
Spinner Dolphin	0	0			0	0			0	0			0	0			0	0		
Dolphin	0	0			0	0			0	0			2	1.6		0.12 (0.12)	0	0		
Dugong	0	0			0	0			0	0			0	0			0	0		
Marine Turtles																				
Green Turtle	2	6.9	0.11 (0.08)		0	0			0	0			2	1.6	0.06 (0.06)	0.06 (0.06)	0	0		
Hawksbill Turtle	0	0			0	0			0	0			2	1.6	0.06 (0.06)	0.06 (0.06)	0	0		
Leatherback Turtle	0	0			0	0			0	0			0	0			1	4.2	0.06 (0.06)	
Loggerhead Turtle	1	3.4	0.06 (0.06)		1	5.3	0.06 (0.06)		0	0			1	0.8		0.06 (0.06)	3	12.5	0.11 (0.11)	0.06 (0.06)
Unidentified Turtle	0	0			0	0			0	0			0	0			0	0		
Birds																				
Unidentified Bird	0	0			0	0			0	0			0	0			0	0		
TOTAL CATCH	**29**				**19**				**13**				**127**				**24**			

Sunshine Coast Region SCP catch (2001-2018) (cont.)

TAXA	HYATT RESORT BEACH DRUMLINES				MARCOOLA BEACH NET				SURFAIR RESORT BEACH DRUMLINES				MUDJIMBA BEACH DRUMLINES				TWIN WATERS RESORT BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0			0	0			0	0			0	0			0	0		
Bull Whaler	1	6.3	0.01 (0.01)		4	3.9	0.24 (0.14)		1	6.7	0.01 (0.01)		0	0			0	0		
Dusky Whaler	0	0			3	2.9	0.18 (0.13)		1	6.7	0.01 (0.01)		0	0			1	7.7	0.01 (0.01)	
Great Hammerhead	0	0			2	2	0.12 (0.08)		0	0			0	0			0	0		
Grey Reef Whaler	1	6.3	0.01 (0.01)		1	1	0.06 (0.06)		1	6.7	0.01 (0.01)		0	0			0	0		
Long Nose Whaler	1	6.3	0.01 (0.01)		30	29.4	1.76 (0.33)		0	0			0	0			2	15.4	0.03 (0.02)	
Mako	0	0			0	0			0	0			0	0			0	0		
Pigeye Whaler	0	0			3	2.9	0.18 (0.13)		0	0			1	11.1	0.01 (0.01)		0	0		
Sandbar Whaler	0	0			1	1	0.06 (0.06)		0	0			0	0			0	0		
Sharptooth Shark	0	0			2	2	0.12 (0.08)		0	0			0	0			0	0		
Silky Whaler	0	0			0	0			0	0			0	0			0	0		
Tiger Shark	11	68.8	0.15 (0.05)		0	0			9	60	0.13 (0.04)		6	66.7	0.08 (0.04)		6	46.2	0.08 (0.03)	
White Shark	2	12.5	0.03 (0.02)		1	1	0.06 (0.06)		0	0			0	0			0	0		
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Fossil Shark	0	0			0	0			0	0			0	0			0	0		
Hardnose Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Hammerhead Shark *	0	0			7	6.9		0.41 (0.17)	0	0			0	0			0	0		
Whale Shark	0	0			0	0			0	0			0	0			0	0		
Grey Nurse Shark	0	0			3	2.9	0.06 (0.06)	0.12 (0.08)	0	0			0	0			1	7.7		0.06 (0.06)
Tawny Shark	0	0			0	0			0	0			0	0			0	0		
Zebra Shark	0	0			0	0			0	0			0	0			0	0		
Port Jackson Shark	0	0			0	0			0	0			0	0			0	0		
Unknown Shark	0	0			0	0			0	0			0	0			0	0		
Manta Ray	0	0			8	7.8	0.06 (0.06)	0.41 (0.35)	0	0			0	0			0	0		
Devilray *	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Cownose Ray	0	0			2	2		0.12 (0.12)	0	0			0	0			0	0		
Eagle Ray *	0	0			1	1	0.06 (0.06)		0	0			0	0			0	0		
White-Spotted Eagle Ray	0	0			0	0			0	0			0	0			0	0		
Shark Ray	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
White-Spotted Guitar	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	0	0			7	6.9	0.18 (0.13)	0.24 (0.18)	0	0			0	0			0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Bonita	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Cod	0	0			0	0			2	13.3	0.11 (0.08)		0	0			0	0		
Giant Trevally	0	0			0	0			0	0			0	0			0	0		
Jewfish	0	0			0	0			0	0			0	0			0	0		
Mackeral	0	0			0	0			0	0			0	0			0	0		
Queen Fish	0	0			0	0			0	0			0	0			0	0		
Salmon	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Snapper	0	0			0	0			0	0			0	0			0	0		
Sweetlip	0	0			0	0			0	0			0	0			0	0		
Tuna	0	0			13	12.7		0.76 (0.36)	0	0			0	0			0	0		
Marine Mammals																				
Humpback Whale	0	0			0	0			0	0			0	0			1	7.7	0.06 (0.06)	
Australian Hb Dolphin	0	0			0	0			0	0			0	0			0	0		
Bottlenose Dolphin	0	0			1	1		0.06 (0.06)	0	0			0	0			0	0		
Common Dolphin	0	0			2	2		0.12 (0.08)	1	6.7	0.06 (0.06)		0	0			0	0		
Spinner Dolphin	0	0			0	0			0	0			0	0			0	0		
Dolphin	0	0			0	0			0	0			0	0			1	7.7	0.06 (0.06)	
Dugong	0	0			0	0			0	0			0	0			0	0		
Marine Turtles																				
Green Turtle	0	0			0	0			0	0			0	0			0	0		
Hawksbill Turtle	0	0			0	0			0	0			0	0			0	0		
Leatherback Turtle	0	0			0	0			0	0			0	0			0	0		
Loggerhead Turtle	0	0			4	3.9	0.24 (0.11)		0	0			2	22.2	0.06 (0.06)	0.06 (0.06)	1	7.7	0.06 (0.06)	
Unidentified Turtle	0	0			0	0			0	0			0	0			0	0		
Birds																				
Unidentified Bird	0	0			0	0			0	0			0	0			0	0		
TOTAL CATCH	**16**				**102**				**15**				**9**				**13**			

Sunshine Coast Region SCP catch (2001-2018) (cont.)

TAXA	MAROOCHYDORE BEACH NET				ALEXANDRA HEADLAND BEACH NET				MOOLOOLABA BEACH NET				PT CARTWRIGHT BEACH DRUMLINES				BUDDINA BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0			0	0			0	0			0	0			0	0		
Bull Whaler	33	21.6	0.76 (0.15)		8	5.9	0.23 (0.09)		3	8.3	0.18 (0.13)		1	5.9	0.02 (0.02)		1	2.1	0.01 (0.01)	
Dusky Whaler	2	1.3	0.06 (0.04)		1	0.7	0.03 (0.03)		2	5.6	0.12 (0.12)		0	0			0	0		
Great Hammerhead	7	4.6	0.21 (0.07)		9	6.6	0.26 (0.09)		1	2.8	0.06 (0.06)		0	0			1	2.1	0.01 (0.01)	
Grey Reef Whaler	3	2	0.09 (0.06)		0	0			0	0			0	0			0	0		
Long Nose Whaler	24	15.7	0.68 (0.16)		24	17.6	0.69 (0.2)		7	19.4	0.41 (0.15)		2	11.8	0.04 (0.03)		1	2.1	0.01 (0.01)	
Mako	0	0			0	0			0	0			0	0			0	0		
Pigeye Whaler	0	0			0	0			0	0			0	0			1	2.1	0.01 (0.01)	
Sandbar Whaler	1	0.7	0.03 (0.03)		0	0			0	0			0	0			0	0		
Sharptooth Shark	0	0			1	0.7	0.03 (0.03)		0	0			0	0			0	0		
Silky Whaler	0	0			1	0.7	0.03 (0.03)		0	0			0	0			0	0		
Tiger Shark	4	2.6	0.12 (0.06)		0	0			0	0			13	76.5	0.24 (0.08)		30	63.8	0.28 (0.06)	
White Shark	1	0.7			0	0			0	0			0	0			0	0		
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Fossil Shark	1	0.7		0.06 (0.06)	1	0.7		0.06 (0.06)	1	2.8		0.06 (0.06)	0	0			0	0		
Hardnose Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	0	0			1	0.7		0.06 (0.06)	0	0			0	0			0	0		
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	6	3.9		0.35 (0.17)	6	4.4		0.33 (0.11)	0	0			0	0			1	2.1		0.06 (0.06)
Hammerhead Shark *	3	2	0.06 (0.06)	0.12 (0.08)	4	2.9		0.22 (0.13)	1	2.8			0	0			0	0		
Whale Shark	0	0			0	0			0	0			0	0			0	0		
Grey Nurse Shark	1	0.7	0.06 (0.06)		4	2.9		0.22 (0.13)	0	0			0	0			0	0		
Tawny Shark	0	0			0	0			0	0			0	0			0	0		
Zebra Shark	0	0			0	0			0	0			0	0			0	0		
Port Jackson Shark	0	0			0	0			0	0			0	0			0	0		
Unknown Shark	0	0			0	0			0	0			0	0			0	0		
Manta Ray	8	5.2	0.18 (0.13)	0.29 (0.11)	8	5.9	0.11 (0.08)	0.33 (0.18)	1	2.8		0.06 (0.06)	0	0			0	0		
Devilray *	2	1.3		0.12 (0.08)	12	8.8	0.28 (0.18)	0.39 (0.23)	1	2.8		0.06 (0.06)	0	0			0	0		
Cownose Ray	7	4.6	0.24 (0.14)	0.18 (0.1)	13	9.6	0.17 (0.09)	0.56 (0.41)	3	8.3	0.12 (0.08)	0.06 (0.06)	0	0			0	0		
Eagle Ray *	13	8.5	0.59 (0.19)	0.18 (0.1)	9	6.6	0.44 (0.12)	0.06 (0.06)	2	5.6	0.12 (0.08)		0	0			0	0		
White-Spotted Eagle Ray	0	0			0	0			0	0			0	0			0	0		
Shark Ray	0	0			0	0			0	0			0	0			0	0		
White-Spotted Guitar	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	2	1.3	0.06 (0.06)	0.06 (0.06)	0	0			0	0			0	0			0	0		
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	7	4.6	0.24 (0.14)	0.18 (0.13)	15	11	0.28 (0.11)	0.56 (0.28)	2	5.6	0.12 (0.12)		0	0			0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Bonita	0	0			0	0			0	0			0	0			0	0		
Cod	0	0			0	0			0	0			0	0			0	0		
Giant Trevally	0	0			0	0			0	0			0	0			0	0		
Jewfish	0	0			3	2.2		0.17 (0.12)	0	0			0	0			0	0		
Mackeral	0	0			0	0			0	0			0	0			0	0		
Queen Fish	1	0.7		0.06 (0.06)	0	0			0	0			0	0			0	0		
Salmon	0	0			0	0			0	0			0	0			0	0		
Snapper	0	0			0	0			0	0			0	0			0	0		
Sweetlip	0	0			0	0			0	0			0	0			0	0		
Tuna	2	1.3	0.06 (0.06)	0.06 (0.06)	6	4.4		0.33 (0.2)	0	0			0	0			0	0		
Marine Mammals																				
Humpback Whale	1	0.7	0.06 (0.06)		0	0			1	2.8	0.06 (0.06)		0	0			0	0		
Australian Hb Dolphin	0	0			2	1.5		0.11 (0.08)	0	0			0	0			0	0		
Bottlenose Dolphin	5	3.3		0.29 (0.14)	1	0.7		0.06 (0.06)	0	0			0	0			0	0		
Common Dolphin	11	7.2	0.12 (0.08)	0.53 (0.17)	2	1.5		0.11 (0.08)	2	5.6		0.12 (0.08)	0	0			1	2.1	0.06 (0.06)	
Spinner Dolphin	0	0			0	0			0	0			0	0			0	0		
Dolphin	1	0.7		0.06 (0.06)	1	0.7		0.06 (0.06)	1	2.8		0.06 (0.06)	0	0			1	2.1	0.06 (0.06)	
Dugong	0	0			1	0.7		0.06 (0.06)	1	2.8		0.06 (0.06)	0	0			0	0		
Marine Turtles																				
Green Turtle	2	1.3	0.06 (0.06)	0.06 (0.06)	1	0.7		0.06 (0.06)	0	0			0	0			0	0		
Hawksbill Turtle	0	0			1	0.7	0.06 (0.06)		4	11.1	0.12 (0.08)	0.12 (0.08)	1	5.9	0.06 (0.06)		0	0		
Leatherback Turtle	1	0.7	0.06 (0.06)		0	0			0	0			0	0			0	0		
Loggerhead Turtle	3	2	0.18 (0.1)		1	0.7	0.06 (0.06)		3	8.3	0.12 (0.08)	0.06 (0.06)	0	0			10	21.3	0.5 (0.34)	0.06 (0.06)
Unidentified Turtle	1	0.7		0.06 (0.06)	0	0			0	0			0	0			0	0		
Birds																				
Unidentified Bird	0	0			0	0			0	0			0	0			0	0		
TOTAL CATCH	**153**				**136**				**36**				**13**				**47**			

Sunshine Coast Region SCP catch (2001-2018) (cont.)

TAXA	WURTULLA BEACH NET				CURRIMUNDI BEACH DRUMLINES				MOFFAT BEACH DRUMLINES				COLOUNDRA BEACH DRUMLINES				COLOUNDRA BEACH NET			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0			0	0			0	0			0	0			0	0		
Bull Whaler	3	2.8	0.18 (0.13)		3	8.8	0.04 (0.02)		2	10.5	0.04 (0.03)		14	23.3	0.13 (0.04)		7	9.5	0.44 (0.2)	
Dusky Whaler	0	0			0	0			1	5.3	0.02 (0.02)		0	0			1	1.4	0.06 (0.06)	
Great Hammerhead	4	3.7	0.24 (0.11)		0	0			0	0			0	0			1	1.4	0.06 (0.06)	
Grey Reef Whaler	3	2.8	0.18 (0.1)		0	0			1	5.3	0.02 (0.02)		2	3.3	0.02 (0.01)		1	1.4	0.06 (0.06)	
Long Nose Whaler	48	44.9	2.82 (1.05)		2	5.9	0.03 (0.02)		4	21.1	0.07 (0.04)		3	5	0.03 (0.02)		11	14.9	0.69 (0.24)	
Mako	0	0			0	0			1	5.3	0.02 (0.02)		0	0			0	0		
Pigeye Whaler	2	1.9	0.12 (0.08)		0	0			0	0			3	5	0.03 (0.02)		0	0		
Sandbar Whaler	0	0			0	0			0	0			0	0			0	0		
Sharptooth Shark	2	1.9	0.12 (0.08)		0	0			0	0			0	0			0	0		
Silky Whaler	0	0			0	0			1	5.3	0.02 (0.02)		0	0			0	0		
Tiger Shark	2	1.9	0.12 (0.08)		14	41.2	0.19 (0.06)		4	21.1	0.07 (0.04)		30	50	0.28 (0.05)		0	0		
White Shark	0	0			0	0			1	5.3	0.02 (0.02)		2	3.3	0.02 (0.01)		0	0		
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Fossil Shark	0	0			0	0			0	0			0	0			0	0		
Hardnose Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	1	0.9		0.06 (0.06)	0	0			0	0			0	0			1	1.4		0.06 (0.06)
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	0	0			0	0			0	0			0	0			3	4.1		0.19 (0.14)
Hammerhead Shark *	3	2.8		0.18 (0.18)	0	0			0	0			0	0			7	9.5		0.44 (0.16)
Whale Shark	0	0			0	0			0	0			0	0			0	0		
Grey Nurse Shark	1	0.9		0.06 (0.06)	0	0			0	0			0	0			1	1.4		0.06 (0.06)
Tawny Shark	0	0			0	0			0	0			1	1.7	0.06 (0.06)		0	0		
Zebra Shark	1	0.9	0.06 (0.06)		0	0			0	0			0	0			0	0		
Port Jackson Shark	0	0			0	0			0	0			0	0			0	0		
Unknown Shark	0	0			0	0			0	0			0	0			2	2.7		0.13 (0.09)
Manta Ray	2	1.9	0.06 (0.06)	0.06 (0.06)	0	0			0	0			2	3.3	0.06 (0.06)	0.06 (0.06)	4	5.4		0.25 (0.14)
Devilray *	3	2.8		0.18 (0.13)	0	0			0	0			0	0			7	9.5		0.44 (0.32)
Cownose Ray	3	2.8	0.06 (0.06)	0.12 (0.08)	0	0			0	0			0	0			4	5.4	0.13 (0.09)	0.13 (0.09)
Eagle Ray *	0	0			0	0			0	0			0	0			9	12.2	0.25 (0.14)	0.31 (0.15)
White-Spotted Eagle Ray	0	0			0	0			0	0			0	0			2	2.7	0.06 (0.06)	0.06 (0.06)
Shark Ray	0	0			0	0			0	0			0	0			0	0		
White-Spotted Guitar	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	1	0.9	0.06 (0.06)		0	0			0	0			0	0			0	0		
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	3	2.8	0.12 (0.12)	0.06 (0.06)	0	0			0	0			0	0			2	2.7		0.13 (0.09)
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Bonita	0	0			0	0			0	0			0	0			0	0		
Cod	0	0			0	0			0	0			0	0			0	0		
Giant Trevally	0	0			0	0			0	0			0	0			0	0		
Jewfish	0	0			0	0			0	0			0	0			0	0		
Mackeral	0	0			0	0			0	0			0	0			0	0		
Queen Fish	2	1.9		0.12 (0.08)	0	0			0	0			0	0			0	0		
Salmon	0	0			0	0			0	0			0	0			0	0		
Snapper	0	0			0	0			2	10.5		0.11 (0.08)	0	0			0	0		
Sweetlip	0	0			0	0			0	0			0	0			0	0		
Tuna	6	5.6		0.35 (0.19)	0	0			0	0			0	0			0	0		
Marine Mammals																				
Humpback Whale	0	0			0	0			0	0			0	0			0	0		
Australian Hb Dolphin	0	0			0	0			0	0			0	0			0	0		
Bottlenose Dolphin	3	2.8		0.18 (0.1)	0	0			0	0			0	0			4	5.4	0.06 (0.06)	0.19 (0.1)
Common Dolphin	11	10.3		0.65 (0.23)	1	2.9	0.06 (0.06)		0	0			2	3.3	0.11 (0.08)		2	2.7		0.13 (0.09)
Spinner Dolphin	0	0			0	0			0	0			0	0			0	0		
Dolphin	0	0			0	0			0	0			0	0			1	1.4		0.06 (0.06)
Dugong	0	0			0	0			0	0			0	0			0	0		
Marine Turtles																				
Green Turtle	0	0			0	0			0	0			0	0			0	0		
Hawksbill Turtle	0	0			0	0			1	5.3	0.06 (0.06)		0	0			1	1.4	0.06 (0.06)	
Leatherback Turtle	1	0.9	0.06 (0.06)		0	0			0	0			0	0			0	0		
Loggerhead Turtle	2	1.9	0.06 (0.06)	0.06 (0.06)	10	29.4	0.56 (0.32)		1	5.3	0.06 (0.06)		1	1.7	0.06 (0.06)		3	4.1	0.13 (0.09)	0.06 (0.06)
Unidentified Turtle	0	0			4	11.8	0.22 (0.17)		0	0			0	0			0	0		
Birds																				
Unidentified Bird	0	0			0	0			0	0			0	0			0	0		
TOTAL CATCH	**107**				**34**				**19**				**60**				**74**			

Sunshine Coast Region SCP catch (2001-2018) (cont.)

TAXA	WOORIM / BRIBIE ISLAND BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0		
Bull Whaler	21	43.8	0.06 (0.02)	
Dusky Whaler	0	0		
Great Hammerhead	0	0		
Grey Reef Whaler	2	4.2	0.01 (0)	
Long Nose Whaler	1	2.1	<0.01	
Mako	0	0		
Pigeye Whaler	1	2.1	<0.01	
Sandbar Whaler	3	6.3	0.01 (0.01)	
Sharptooth Shark	0	0		
Silky Whaler	0	0		
Tiger Shark	10	20.8	0.03 (0.01)	
White Shark	1	2.1	<0.01	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays				
Blacktip Reef Whaler	1	2.1		0.06 (0.06)
Fossil Shark	0	0		
Hardnose Whaler	0	0		
Weasel Shark	0	0		
Whaler	0	0		
Scalloped Hammerhead	0	0		
Hammerhead Shark *	0	0		
Whale Shark	0	0		
Grey Nurse Shark	0	0		
Tawny Shark	0	0		
Zebra Shark	0	0		
Port Jackson Shark	0	0		
Unknown Shark	0	0		
Manta Ray	0	0		
Devilray *	0	0		
Cownose Ray	0	0		
Eagle Ray *	0	0		
White-Spotted Eagle Ray	0	0		
Shark Ray	0	0		
White-Spotted Guitar	0	0		
Shovelnosed Ray *	0	0		
Bull Ray	0	0		
Ray	0	0		
Teleosts				
Black Kingfish Cobia	0	0		
Bonita	0	0		
Cod	0	0		
Giant Trevally	0	0		
Jewfish	0	0		
Mackeral	0	0		
Queen Fish	0	0		
Salmon	0	0		
Snapper	0	0		
Sweetlip	0	0		
Tuna	0	0		
Marine Mammals				
Humpback Whale	0	0		
Australian Hb Dolphin	0	0		
Bottlenose Dolphin	0	0		
Common Dolphin	3	6.3	0.11 (0.08)	0.06 (0.06)
Spinner Dolphin	0	0		
Dolphin	0	0		
Dugong	0	0		
Marine Turtles				
Green Turtle	0	0		
Hawksbill Turtle	0	0		
Leatherback Turtle	2	4.2	0.11 (0.08)	
Loggerhead Turtle	3	6.3	0.11 (0.08)	0.06 (0.06)
Unidentified Turtle	0	0		
Birds				
Unidentified Bird	0	0		
TOTAL CATCH	**48**			

North Stradbroke Island Region SCP catch (2001-2018)

TAXA	AMITY PT BEACH DRUMLINES				FLINDERS BEACH DRUMLINES				CYLINDER BEACH DRUMLINES				OCEAN BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Big Nose Whaler	0	0			0	0			1	0.6	0.01 (0.01)		1	0.6	0.01 (0.01)	
Blue Shark	0	0			0	0			0	0			0	0		
Bull Whaler	15	32.6	0.1 (0.03)		0	0			5	3.1	0.03 (0.01)		5	3.1	0.03 (0.01)	
Dusky Whaler	0	0			0	0			16	10	0.11 (0.03)		16	10	0.11 (0.03)	
Great Hammerhead	0	0			0	0			1	0.6	0.01 (0.01)		1	0.6	0.01 (0.01)	
Mako	0	0			0	0			1	0.6	0.01 (0.01)		1	0.6	0.01 (0.01)	
Sandbar Whaler	0	0			0	0			1	0.6	0.01 (0.01)		1	0.6	0.01 (0.01)	
Sharptooth Shark	2	4.3	0.01 (0.01)		0	0			1	0.6	0.01 (0.01)		1	0.6	0.01 (0.01)	
Tiger Shark	5	10.9	0.03 (0.02)		4	100	0.67 (0.33)		78	48.8	0.51 (0.08)		78	48.8	0.51 (0.08)	
White Shark	0	0			0	0			10	6.3	0.07 (0.02)		10	6.3	0.07 (0.02)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																
Blacktip Reef Whaler	1	2.2		0.06 (0.06)	0	0			6	3.8		0.33 (0.11)	6	3.8		0.33 (0.11)
Scalloped Hammerhead	0	0			0	0			1	0.6		0.06 (0.06)	1	0.6		0.06 (0.06)
Manta Ray	0	0			0	0			3	1.9	0.11 (0.08)	0.06 (0.06)	3	1.9	0.11 (0.08)	0.06 (0.06)
Marine Mammals																
Australian Hb Dolphin	0	0			0	0			1	0.6	0.06 (0.06)		1	0.6	0.06 (0.06)	
Marine Turtles																
Green Turtle	1	2.2	0.06 (0.06)		0	0			0	0			0	0		
Leatherback Turtle	0	0			0	0			2	1.3	0.11 (0.08)		2	1.3	0.11 (0.08)	
Loggerhead Turtle	21	45.7	1.17 (0.47)		0	0			33	20.6	1.78 (0.57)	0.06 (0.06)	33	20.6	1.78 (0.57)	0.06 (0.06)
Unidentified Turtle	1	2.2	0.06 (0.06)		0	0			0	0			0	0		
TOTAL CATCH	**46**				**4**				**160**				**160**			

Gold Coast Region SCP catch (2001-2018)

TAXA	SHERATON MIRAGE SOUTHPORT BEACH DRUMLINES				MAIN BEACH NET				NARROWNECK BEACH DRUMLINES				ELKHORN BEACH DRUMLINES				STAGHORN AVE BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	3	12	0.03 (0.02)		4	5.2	0.24 (0.14)		0	0			0	0			2	10.5	0.06 (0.04)	
Common Blacktip Whaler	0	0			0	0			0	0			0	0			0	0		
Dusky Whaler	1	4	0.01 (0.01)		0	0			0	0			0	0			1	5.3	0.03 (0.03)	
Great Hammerhead	0	0			3	3.9	0.18 (0.1)		0	0			0	0			0	0		
Long Nose Whaler	1	4	0.01 (0.01)		7	9.1	0.41 (0.21)		1	7.1	0.03 (0.03)		0	0			0	0		
Mako	0	0			0	0			0	0			1	10	0.03 (0.03)		1	5.3	0.03 (0.03)	
Pigeye Whaler	0	0			0	0			0	0			0	0			0	0		
Sandbar Whaler	0	0			0	0			2	14.3	0.06 (0.04)		0	0			1	5.3	0.03 (0.03)	
Silky Whaler	0	0			0	0			0	0			0	0			0	0		
Tiger Shark	9	36	0.1 (0.03)		1	1.3	0.06 (0.06)		2	14.3	0.06 (0.04)		2	20	0.06 (0.04)		6	31.6	0.17 (0.09)	
White Shark	1	4	0.01 (0.01)		4	5.2	0.24 (0.11)		2	14.3	0.06 (0.04)		1	10	0.03 (0.03)		1	5.3	0.03 (0.03)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			1	1.3		0.06 (0.06)	0	0			0	0			0	0		
Weasel Shark	0	0			0	0			0	0			0	0			0	0		
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	1	4		0.06 (0.06)	10	13		0.59 (0.24)	1	7.1		0.06 (0.06)	0	0			0	0		
Hammerhead Shark *	1	4		0.06 (0.06)	0	0			0	0			0	0			0	0		
Grey Nurse Shark	0	0			0	0			0	0			0	0			0	0		
Tawny Shark	0	0			0	0			0	0			0	0			0	0		
Zebra Shark	0	0			0	0			0	0			0	0			0	0		
Unknown Shark	0	0			0	0			0	0			0	0			0	0		
Manta Ray	0	0			2	2.6	0.06 (0.06)	0.06 (0.06)	0	0			0	0			0	0		
Devilray *	0	0			2	2.6	0.06 (0.06)	0.06 (0.06)	0	0			0	0			0	0		
Cownose Ray	0	0			6	7.8	0.29 (0.14)	0.06 (0.06)	0	0			0	0			0	0		
Eagle Ray *	0	0			0	0			0	0			0	0			0	0		
White-Spotted Eagle	0	0			0	0			0	0			0	0			0	0		
Giant Shovelnosed R	0	0			0	0			0	0			0	0			0	0		
Eastern Shovelnosed	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	0	0			9	11.7	0.47 (0.17)	0.06 (0.06)	0	0			0	0			0	0		
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	0	0			0	0			0	0			0	0			0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Marlin	0	0			0	0			0	0			0	0			0	0		
Tuna	0	0			1	1.3		0.06 (0.06)	0	0			0	0			0	0		
Wahoo	0	0			0	0			0	0			0	0			0	0		
Marine Mammals																				
Humpback Whale	0	0			5	6.5	0.29 (0.11)		0	0			0	0			0	0		
Antarctic Minke Whale	0	0			0	0			0	0			0	0			0	0		
Australian Hb Dolphin	0	0			0	0			0	0			0	0			0	0		
Common Dolphin	3	12	0.17 (0.09)		15	19.5		0.88 (0.27)	0	0			1	10	0.06 (0.06)		1	5.3	0.06 (0.06)	
Bottlenose Dolphin	1	4	0.06 (0.06)		1	1.3		0.06 (0.06)	0	0			0	0			0	0		
Spinner Dolphin	0	0			0	0			0	0			0	0			0	0		
Dolphin	0	0			1	1.3		0.06 (0.06)	0	0			0	0			0	0		
Marine Turtles																				
Green Turtle	1	4	0.06 (0.06)		2	2.6	0.06 (0.06)	0.06 (0.06)	0	0			0	0			0	0		
Leatherback Turtle	1	4		0.06 (0.06)	3	3.9	0.12 (0.08)	0.06 (0.06)	0	0			0	0			0	0		
Loggerhead Turtle	2	8	0.11 (0.08)		0	0			6	42.9	0.33 (0.23)		5	50	0.28 (0.16)		6	31.6	0.22 (0.13)	0.11 (0.08)
Olive Ridley Turtle	0	0			0	0			0	0			0	0			0	0		
TOTAL CATCH	**25**				**77**				**14**				**10**				**19**			

Gold Coast Region SCP catch (2001-2018) (cont.)

TAXA	SURFERS BEACH NET				NORTHCLIFFE BEACH DRUMLINES				BROADBEACH BEACH DRUMLINES				KURRAWA BEACH NET				MERMAID BEACH NET			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	4	6.6	0.24 (0.11)		2	8.7	0.04 (0.03)		1	4.3	0.03 (0.03)		5	5.7	0.28 (0.14)		1	1.1	0.06 (0.06)	
Common Blacktip Whaler	0	0			0	0			0	0			0	0			0	0		
Dusky Whaler	2	3.3	0.12 (0.12)		1	4.3	0.02 (0.02)		3	13	0.08 (0.05)		0	0			2	2.2	0.11 (0.08)	
Great Hammerhead	0	0			4	17.4	0.07 (0.04)		0	0			6	6.8	0.33 (0.14)		3	3.3	0.17 (0.12)	
Long Nose Whaler	6	9.8	0.35 (0.15)		1	4.3	0.02 (0.02)		1	4.3	0.03 (0.03)		10	11.4	0.56 (0.2)		7	7.7	0.39 (0.14)	
Mako	1	1.6	0.06 (0.06)		0	0			0	0			0	0			0	0		
Pigeye Whaler	0	0			0	0			0	0			0	0			0	0		
Sandbar Whaler	0	0			2	8.7	0.04 (0.03)		3	13	0.08 (0.05)		1	1.1	0.06 (0.06)		2	2.2	0.11 (0.11)	
Silky Whaler	0	0			0	0			1	4.3	0.03 (0.03)		0	0			0	0		
Tiger Shark	0	0			5	21.7	0.09 (0.05)		9	39.1	0.25 (0.09)		1	1.1	0.06 (0.06)		0	0		
White Shark	3	4.9	0.18 (0.1)		2	8.7	0.04 (0.03)		0	0			1	1.1	0.06 (0.06)		2	2.2	0.11 (0.08)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	0	0			0	0			0	0			0	0			0	0		
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	11	18	0.06 (0.06)	0.59 (0.23)	0	0			0	0			9	10.2		0.5 (0.26)	18	19.8	0.11 (0.08)	0.89 (0.27)
Hammerhead Shark *	1	1.6		0.06 (0.06)	0	0			0	0			1	1.1		0.06 (0.06)	0	0		
Grey Nurse Shark	0	0			0	0			0	0			0	0			0	0		
Tawny Shark	0	0			0	0			0	0			0	0			0	0		
Zebra Shark	2	3.3	0.12 (0.08)		0	0			0	0			1	1.1		0.06 (0.06)	0	0		
Unknown Shark	0	0			0	0			0	0			0	0			0	0		
Manta Ray	4	6.6	0.18 (0.1)	0.06 (0.06)	0	0			0	0			1	1.1	0.06 (0.06)		5	5.5	0.11 (0.08)	0.17 (0.09)
Devilray *	0	0			0	0			0	0			1	1.1	0.06 (0.06)		1	1.1	0.06 (0.06)	
Cownose Ray	3	4.9		0.18 (0.13)	0	0			0	0			24	27.3	0.94 (0.43)	0.39 (0.23)	26	28.6	0.89 (0.55)	0.56 (0.29)
Eagle Ray *	0	0			0	0			0	0			5	5.7	0.22 (0.13)	0.06 (0.06)	4	4.4	0.17 (0.09)	0.06 (0.06)
White-Spotted Eagle	0	0			0	0			0	0			0	0			0	0		
Giant Shovelnosed R	0	0			0	0			0	0			0	0			0	0		
Eastern Shovelnosed	0	0			0	0			0	0			3	3.4	0.17 (0.12)		0	0		
Shovelnosed Ray *	3	4.9	0.12 (0.08)	0.06 (0.06)	0	0			0	0			2	2.3		0.11 (0.08)	4	4.4	0.22 (0.13)	
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	0	0			0	0			0	0			0	0			0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Marlin	0	0			0	0			0	0			0	0			0	0		
Tuna	0	0			0	0			0	0			4	4.5		0.22 (0.17)	3	3.3		0.17 (0.09)
Wahoo	0	0			0	0			0	0			0	0			0	0		
Marine Mammals																				
Humpback Whale	5	8.2	0.29 (0.14)		0	0			0	0			6	6.8	0.22 (0.1)	0.11 (0.08)	3	3.3	0.11 (0.11)	0.06 (0.06)
Antarctic Minke Whale	0	0			0	0			0	0			0	0			0	0		
Australian Hb Dolphin	0	0			0	0			0	0			0	0			0	0		
Common Dolphin	9	14.8	0.12 (0.08)	0.41 (0.12)	1	4.3	0.06 (0.06)		0	0			1	1.1		0.06 (0.06)	3	3.3	0.06 (0.06)	0.11 (0.08)
Bottlenose Dolphin	1	1.6		0.06 (0.06)	1	4.3	0.06 (0.06)		0	0			1	1.1		0.06 (0.06)	0	0		
Spinner Dolphin	1	1.6		0.06 (0.06)	0	0			0	0			3	3.4		0.17 (0.09)	0	0		
Dolphin	3	4.9		0.18 (0.18)	0	0			0	0			0	0			3	3.3		0.17 (0.12)
Marine Turtles																				
Green Turtle	2	3.3	0.06 (0.06)	0.06 (0.06)	0	0			0	0			0	0			1	1.1	0.06 (0.06)	
Leatherback Turtle	0	0			0	0			1	7.1	0.06 (0.06)		0	0			1	1.1	0.06 (0.06)	
Loggerhead Turtle	0	0			4	17.4	0.22 (0.1)		4	21.4	0.22 (0.1)		1	1.1	0.06 (0.06)		2	2.2	0.11 (0.08)	
Olive Ridley Turtle	0	0			0	0			0	0			1	1.1	0.06 (0.06)		0	0		
TOTAL CATCH	**61**				**23**				**23**				**61**				**91**			

Gold Coast Region SCP catch (2001-2018) (cont.)

TAXA	NOBBYS BEACH DRUMLINES				MIAMI BEACH NET				NTH BURLEIGH BEACH DRUMLINES				BURLEIGH BEACH NET				TALLEBUDGERRA BEACH NET			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	2	6.9	0.06 (0.04)		3	2.5	0.18 (0.1)		0	0			5	3	0.29 (0.17)		8	5.5	0.47 (0.17)	
Common Blacktip Whaler	0	0			0	0			0	0			0	0			0	0		
Dusky Whaler	3	10.3	0.08 (0.05)		0	0			3	11.1	0.08 (0.05)		1	0.6	0.06 (0.06)		1	0.7	0.06 (0.06)	
Great Hammerhead	0	0			4	3.4	0.24 (0.11)		0	0			4	2.4	0.24 (0.14)		5	3.4	0.29 (0.14)	
Long Nose Whaler	1	3.4	0.03 (0.03)		7	5.9	0.41 (0.19)		4	14.8	0.11 (0.07)		21	12.5	1.24 (0.28)		14	9.6	0.82 (0.37)	
Mako	2	6.9	0.06 (0.04)		3	2.5	0.18 (0.1)		2	7.4	0.06 (0.04)		2	1.2	0.12 (0.08)		2	1.4	0.12 (0.08)	
Pigeye Whaler	1	3.4	0.03 (0.03)		0	0			0	0			1	0.6	0.06 (0.06)		0	0		
Sandbar Whaler	5	17.2	0.14 (0.07)		0	0			1	3.7	0.03 (0.03)		0	0			2	1.4	0.12 (0.08)	
Silky Whaler	0	0			0	0			0	0			0	0			0	0		
Tiger Shark	2	6.9	0.06 (0.04)		1	0.8	0.06 (0.06)		6	22.2	0.17 (0.06)		0	0			1	0.7	0.06 (0.06)	
White Shark	3	10.3	0.08 (0.06)		1	0.8	0.06 (0.06)		5	18.5	0.14 (0.06)		7	4.2	0.41 (0.21)		2	1.4	0.12 (0.08)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	0	0			1	0.8		0.06 (0.06)	0	0			0	0			0	0		
Whaler	1	3.4	0.06 (0.06)		0	0			0	0			0	0			0	0		
Scalloped Hammerhead	1	3.4		0.06 (0.06)	22	18.6		1.29 (0.48)	0	0			25	14.9	0.06 (0.06)	1.41 (0.4)	33	22.6		1.94 (0.45)
Hammerhead Shark *	0	0			1	0.8		0.06 (0.06)	0	0			1	0.6		0.06 (0.06)	0	0		
Grey Nurse Shark	0	0			0	0			0	0			1	0.6	0.06 (0.06)		1	0.7	0.06 (0.06)	
Tawny Shark	0	0			0	0			0	0			1	0.6	0.06 (0.06)		0	0		
Zebra Shark	0	0			2	1.7	0.12 (0.08)		0	0			2	1.2	0.12 (0.08)		3	2.1	0.18 (0.1)	
Unknown Shark	0	0			0	0			0	0			0	0			0	0		
Manta Ray	0	0			4	3.4	0.06 (0.06)	0.18 (0.1)	0	0			5	3	0.18 (0.1)	0.12 (0.12)	7	4.8	0.12 (0.08)	0.29 (0.14)
Devilray *	0	0			3	2.5	0.12 (0.08)	0.06 (0.06)	0	0			3	1.8	0.06 (0.06)	0.12 (0.12)	1	0.7	0.06 (0.06)	
Cownose Ray	0	0			45	38.1	1.82 (1.17)	0.82 (0.32)	0	0			47	28	1.94 (1.16)	0.82 (0.26)	34	23.3	1.47 (0.39)	0.53 (0.35)
Eagle Ray *	0	0			4	3.4	0.24 (0.11)		0	0			6	3.6	0.29 (0.14)	0.06 (0.06)	3	2.1	0.12 (0.12)	0.06 (0.06)
White-Spotted Eagle	0	0			0	0			0	0			0	0			0	0		
Giant Shovelnosed R	0	0			1	0.8	0.06 (0.06)		0	0			1	0.6	0.06 (0.06)		1	0.7	0.06 (0.06)	
Eastern Shovelnosed	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	0	0			4	3.4	0.24 (0.14)		0	0			4	2.4	0.06 (0.06)	0.18 (0.13)	7	4.8	0.41 (0.17)	
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	0	0			0	0			0	0			0	0			0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Marlin	0	0			0	0			0	0			0	0			0	0		
Tuna	0	0			0	0			0	0			3	1.8		0.18 (0.1)	2	1.4		0.12 (0.08)
Wahoo	0	0			0	0			0	0			0	0			0	0		
Marine Mammals																				
Humpback Whale	0	0			3	2.5	0.18 (0.13)		0	0			4	2.4	0.24 (0.14)		1	0.7	0.06 (0.06)	
Antarctic Minke Whale	0	0			0	0			0	0			0	0			0	0		
Australian Hb Dolphin	0	0			0	0			0	0			0	0			0	0		
Common Dolphin	1	3.4	0.06 (0.06)		3	2.5		0.18 (0.1)	0	0			16	9.5	0.06 (0.06)	0.88 (0.24)	9	6.2	0.06 (0.06)	0.47 (0.23)
Bottlenose Dolphin	0	0			0	0			0	0			0	0			0	0		
Spinner Dolphin	0	0			0	0			0	0			3	1.8		0.18 (0.13)	0	0		
Dolphin	0	0			0	0			0	0			0	0			0	0		
Marine Turtles																				
Green Turtle	0	0			2	1.7	0.06 (0.06)	0.06 (0.06)	0	0			1	0.6	0.06 (0.06)		1	0.7		0.06 (0.06)
Leatherback Turtle	0	0			1	0.8	0.06 (0.06)		0	0			1	0.6		0.06 (0.06)	0	0		
Loggerhead Turtle	7	24.1	0.39 (0.18)		3	2.5	0.12 (0.08)	0.06 (0.06)	6	22.2	0.33 (0.14)		3	1.8	0.18 (0.1)		8	5.5	0.47 (0.15)	
Olive Ridley Turtle	0	0			0	0			0	0			0	0			0	0		
TOTAL CATCH	**29**				**118**				**27**				**168**				**146**			

Gold Coast Region SCP catch (2001-2018) (cont.)

TAXA	PALM BEACH DRUMLINES				CURRUMBIN BEACH NET				TUGUN BEACH DRUMLINES				BILINGA BEACH NET				NTH KIRRA BEACH DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	2	11.8	0.06 (0.04)		7	4.1	0.39 (0.16)		0	0			4	2.3	0.24 (0.11)		0	0		
Common Blacktip Whaler	0	0			0	0			0	0			0	0			0	0		
Dusky Whaler	2	11.8	0.06 (0.04)		2	1.2	0.11 (0.08)		2	15.4	0.04 (0.03)		0	0			1	7.1	0.03 (0.03)	
Great Hammerhead	0	0			7	4.1	0.39 (0.16)		0	0			3	1.8	0.18 (0.1)		1	7.1	0.03 (0.03)	
Long Nose Whaler	2	11.8	0.06 (0.04)		20	11.8	1.11 (0.29)		0	0			25	14.6	1.47 (0.32)		0	0		
Mako	0	0			1	0.6	0.06 (0.06)		0	0			1	0.6	0.06 (0.06)		1	7.1	0.03 (0.03)	
Pigeye Whaler	0	0			0	0			0	0			0	0			0	0		
Sandbar Whaler	2	11.8	0.06 (0.04)		0	0			1	7.7	0.02 (0.02)		0	0			0	0		
Silky Whaler	0	0			0	0			0	0			0	0			0	0		
Tiger Shark	1	5.9	0.03 (0.03)		0	0			4	30.8	0.07 (0.04)		0	0			6	42.9	0.17 (0.08)	
White Shark	0	0			4	2.4	0.22 (0.13)		1	7.7	0.02 (0.02)		2	1.2	0.12 (0.08)		1	7.1	0.03 (0.03)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays																				
Blacktip Reef Whaler	0	0			0	0			0	0			0	0			0	0		
Weasel Shark	0	0			0	0			0	0			0	0			0	0		
Whaler	0	0			0	0			0	0			0	0			0	0		
Scalloped Hammerhead	0	0			25	14.7		1.39 (0.36)	0	0			41	24		2.41 (0.73)	1	7.1		0.06 (0.06)
Hammerhead Shark *	0	0			0	0			0	0			0	0			0	0		
Grey Nurse Shark	0	0			1	0.6	0.06 (0.06)		0	0			2	1.2	0.06 (0.06)	0.06 (0.06)	0	0		
Tawny Shark	0	0			0	0			0	0			0	0			0	0		
Zebra Shark	0	0			3	1.8	0.11 (0.08)	0.06 (0.06)	0	0			0	0			0	0		
Unknown Shark	0	0			0	0			0	0			0	0			0	0		
Manta Ray	0	0			3	1.8	0.11 (0.08)	0.06 (0.06)	0	0			2	1.2	0.06 (0.06)	0.06 (0.06)	0	0		
Devilray *	0	0			1	0.6	0.06 (0.06)		0	0			2	1.2		0.12 (0.08)	0	0		
Cownose Ray	0	0			55	32.4	2.61 (1.81)	0.44 (0.27)	0	0			40	23.4	1.53 (0.64)	0.82 (0.26)	0	0		
Eagle Ray *	0	0			6	3.5	0.17 (0.09)	0.17 (0.09)	0	0			8	4.7	0.29 (0.17)	0.18 (0.1)	0	0		
White-Spotted Eagle	0	0			0	0			0	0			0	0			0	0		
Giant Shovelnosed R	0	0			1	0.6	0.06 (0.06)		0	0			1	0.6	0.06 (0.06)		0	0		
Eastern Shovelnosed	0	0			0	0			0	0			0	0			0	0		
Shovelnosed Ray *	0	0			8	4.7	0.17 (0.12)	0.28 (0.11)	1	7.7	0.06 (0.06)		13	7.6	0.53 (0.15)	0.24 (0.11)	0	0		
Bull Ray	0	0			0	0			0	0			0	0			0	0		
Ray	0	0			0	0			0	0			0	0			0	0		
Teleosts																				
Black Kingfish Cobia	0	0			0	0			0	0			0	0			0	0		
Marlin	0	0			1	0.6		0.06 (0.06)	0	0			0	0			0	0		
Tuna	0	0			3	1.8		0.17 (0.09)	0	0			4	2.3		0.24 (0.11)	0	0		
Wahoo	0	0			0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Marine Mammals																				
Humpback Whale	0	0			6	3.5	0.28 (0.11)	0.06 (0.06)	0	0			1	0.6	0.06 (0.06)		0	0		
Antarctic Minke Whale	0	0			0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Australian Hb Dolphin	0	0			0	0			0	0			1	0.6		0.06 (0.06)	0	0		
Common Dolphin	0	0			9	5.3		0.5 (0.15)	0	0			10	5.8		0.59 (0.19)	0	0		
Bottlenose Dolphin	1	5.9	0.06 (0.06)		1	0.6		0.06 (0.06)	0	0			1	0.6		0.06 (0.06)	0	0		
Spinner Dolphin	0	0			1	0.6		0.06 (0.06)	0	0			1	0.6		0.06 (0.06)	0	0		
Dolphin	0	0			0	0			1	7.7	0.06 (0.06)		0	0			0	0		
Marine Turtles																				
Green Turtle	5	29.4	0.28 (0.18)		1	0.6	0.06 (0.06)		0	0			1	0.6	0.06 (0.06)		0	0		
Leatherback Turtle	0	0			0	0			0	0			1	0.6	0.06 (0.06)		1	7.1	0.06 (0.06)	
Loggerhead Turtle	2	11.8	0.11 (0.11)		4	2.4	0.17 (0.09)	0.06 (0.06)	2	15.4	0.11 (0.08)		5	2.9	0.24 (0.14)	0.06 (0.06)	2	14.3	0.11 (0.08)	
Olive Ridley Turtle	0	0			0	0			1	7.7	0.06 (0.06)		0	0			0	0		
TOTAL CATCH	**17**				**170**				**13**				**171**				**14**			

Gold Coast Region SCP catch (2001-2018) (cont.)

TAXA	KIRRA BEACH NET				COOLANGATTA BEACH NET				RAINBOW BAY DRUMLINES			
Target species	**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**		**Total no.**	**% Total**	**No./unit/yr (SE)**	
Bull Whaler	2	1.2	0.12 (0.08)		3	1.9	0.17 (0.09)		2	2.3	0.01 (0.01)	
Common Blacktip Whaler	2	1.2	0.12 (0.08)		0	0			0	0		
Dusky Whaler	1	0.6	0.06 (0.06)		4	2.5	0.22 (0.1)		4	4.6	0.03 (0.02)	
Great Hammerhead	6	3.5	0.35 (0.17)		2	1.2	0.11 (0.08)		0	0		
Long Nose Whaler	20	11.6	1.18 (0.25)		17	10.5	0.94 (0.24)		0	0		
Mako	4	2.3	0.24 (0.14)		3	1.9	0.17 (0.09)		4	4.6	0.03 (0.01)	
Pigeye Whaler	0	0			0	0			0	0		
Sandbar Whaler	0	0			0	0			0	0		
Silky Whaler	0	0			0	0			0	0		
Tiger Shark	3	1.7	0.18 (0.1)		0	0			31	35.6	0.22 (0.04)	
White Shark	7	4	0.41 (0.17)		2	1.2	0.11 (0.08)		12	13.8	0.08 (0.03)	
Non-target species	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**	**Total no.**	**% Total**	**RELEASED No./yr (SE)**	**DEAD No./yr (SE)**
Sharks & Rays												
Blacktip Reef Whaler	0	0			0	0			0	0		
Weasel Shark	0	0			0	0			0	0		
Whaler	0	0			0	0			0	0		
Scalloped Hammerhead	30	17.3		1.76 (0.5)	21	15.6		1.17 (0.26)	1	1.1		0.06 (0.06)
Hammerhead Shark *	0	0			1	0		0.06 (0.06)	0	0		
Grey Nurse Shark	0	0			1	0.6	0.06 (0.06)		0	0		
Tawny Shark	0	0			0	0			0	0		
Zebra Shark	3	1.7	0.12 (0.08)	0.06 (0.06)	2	1.9	0.06 (0.06)	0.06 (0.06)	0	0		
Unknown Shark	0	0			1	0		0.06 (0.06)	0	0		
Manta Ray	7	4	0.35 (0.15)	0.06 (0.06)	3	1.9	0.06 (0.06)	0.11 (0.08)	2	2.3	0.11 (0.08)	
Devilray *	1	0.6		0.06 (0.06)	5	0.6	0.22 (0.13)	0.06 (0.06)	0	0		
Cownose Ray	43	24.9	1.53 (0.92)	1 (0.54)	48	34.4	2.11 (0.83)	0.56 (0.18)	0	0		
Eagle Ray *	4	2.3	0.12 (0.08)	0.12 (0.08)	8	3.8	0.33 (0.14)	0.11 (0.11)	0	0		
White-Spotted Eagle	0	0			2	0	0.06 (0.06)	0.06 (0.06)	0	0		
Giant Shovelnosed R	0	0			2	0.6	0.11 (0.11)		0	0		
Eastern Shovelnosed	0	0			0	0			0	0		
Shovelnosed Ray *	8	4.6	0.29 (0.11)	0.18 (0.1)	6	5	0.11 (0.08)	0.22 (0.1)	0	0		
Bull Ray	0	0			0	0			1	1.1	0.06 (0.06)	
Ray	0	0			1	0	0.06 (0.06)		0	0		
Teleosts												
Black Kingfish Cobia	0	0			1	0	0.06 (0.06)		0	0		
Marlin	4	2.3		0.24 (0.18)	0	0.6			0	0		
Tuna	4	2.3		0.24 (0.11)	0	1.9			0	0		
Wahoo	0	0			0	0			0	0		
Marine Mammals												
Humpback Whale	6	3.5	0.35 (0.15)		8	3.8	0.44 (0.2)		0	0		
Antarctic Minke Whale	0	0			0	0			0	0		
Australian Hb Dolphin	0	0			0	0			0	0		
Common Dolphin	9	5.2		0.53 (0.17)	12	5.6		0.67 (0.18)	0	0		
Bottlenose Dolphin	0	0			0	0.6			0	0		
Spinner Dolphin	0	0			0	0.6			0	0		
Dolphin	0	0			0	0			0	0		
Marine Turtles												
Green Turtle	4	2.3	0.18 (0.1)	0.06 (0.06)	5	0.6	0.22 (0.13)	0.06 (0.06)	1	1.1	0.06 (0.06)	
Leatherback Turtle	0	0			2	0	0.11 (0.08)		1	1.1	0.06 (0.06)	
Loggerhead Turtle	5	2.9	0.24 (0.14)	0.06 (0.06)	2	2.5	0.11 (0.08)		28	32.2	1.5 (0.39)	0.06 (0.06)
Olive Ridley Turtle	0	0			0	0			0	0		
TOTAL CATCH	**173**				**162**				**87**			