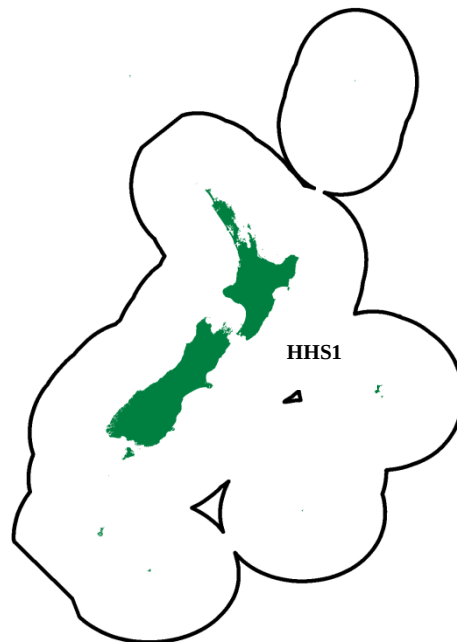


SMOOTH HAMMERHEAD SHARK (HHS)

(*Sphyrna zygaena*)



1. FISHERY SUMMARY

Smooth hammerhead sharks (*Sphyrna zygaena*) are not currently managed under the QMS. No assigned fishing allowances exist. However, as hammerhead shark has recently been listed as an Appendix II species under CITES it is appropriate to include it in this document.

The Western and Central Pacific Fisheries Commission (WCPFC) has listed hammerhead sharks (as a group) as a key shark species, and the management of smooth hammerhead sharks throughout the western and central Pacific Ocean (WCPO) is the responsibility of the WCPFC. As such New Zealand (which is a signatory to the WCPFC) is responsible for ensuring that the management measures applied within New Zealand fisheries waters are compatible with or better than those of the Commission, and that our data collection requirements will allow New Zealand to report catches of hammerhead sharks as required.

1.1 Commercial fisheries

There are no target fisheries for hammerhead sharks in New Zealand. However, they are caught as bycatch in several commercial fisheries within New Zealand fishery waters.

The majority of small hammerhead sharks are caught in inshore setnet and bottom longline fisheries. The distribution of hammerhead shark catches around New Zealand is shown in Figures 1-3. A small number of large hammerheads are caught as bycatch in the surface longline fisheries targeting highly migratory species. Surface longline fishing effort is distributed along the east coast of the North Island and the south west coast South Island fishery. The west coast South Island fishery predominantly targets southern bluefin tuna and rarely catches hammerhead sharks, whereas the fishery on the east coast of the North Island targets a range of species including bigeye tuna, swordfish, and southern bluefin tuna.

It is unknown what proportion of hammerhead sharks are released alive from the surface longline fishery.

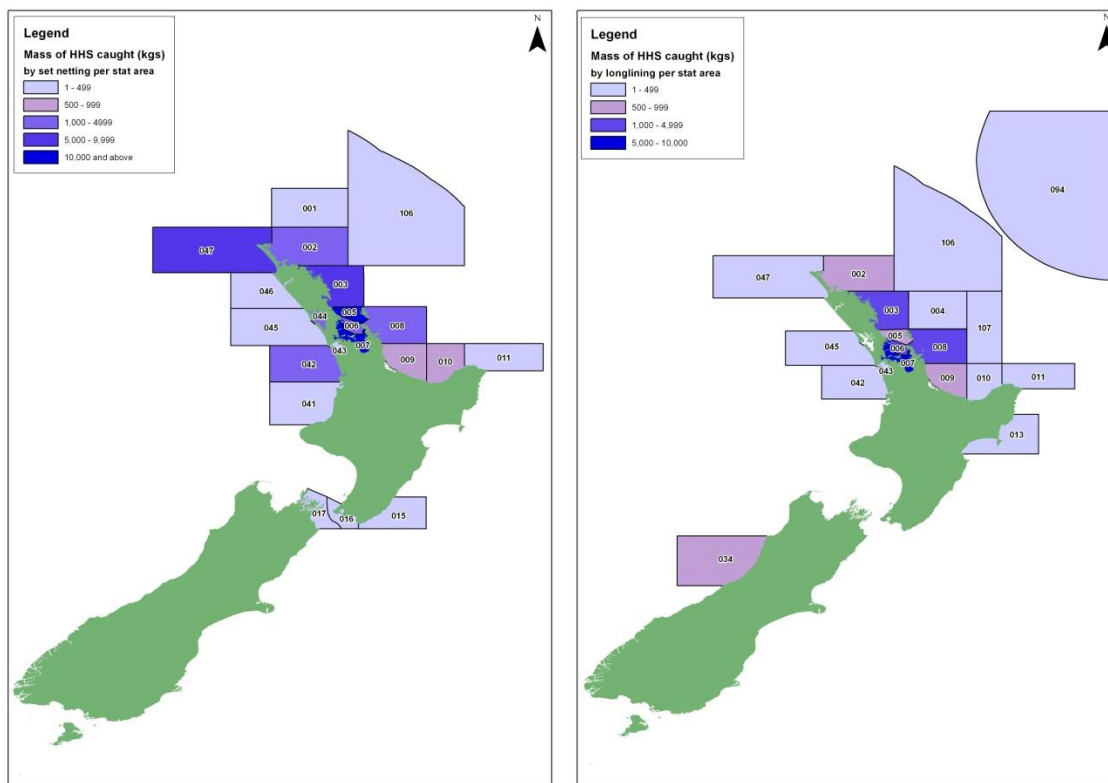


Figure 1: Mass of hammerhead shark per statistical area caught by set net [left] and longline [right] fisheries. These maps have been produced using data extracted from the catch effort database. HHS data from 1 Dec 1989 – 30 June 2013 have been mapped. Only captures where the primary method was set net or longline are included. Data were plotted using the fishing event start position. If no statistical area was supplied, then it was derived using the latitude and longitude. Only records that reported the weight of HHS have been mapped (if no weight was reported, then this is not included on the map).

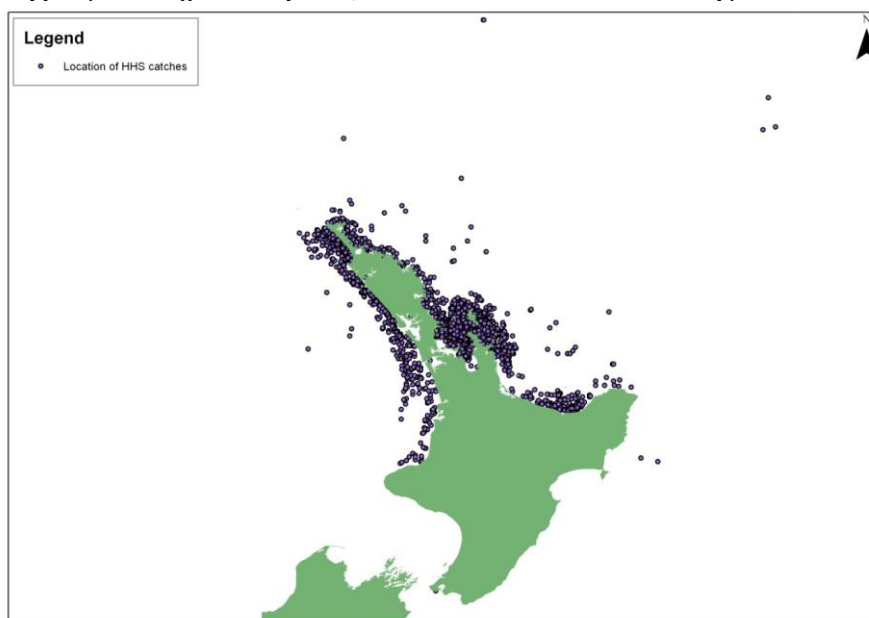


Figure 2: Location of hammerhead shark catches throughout the New Zealand Exclusive Economic Zone. This map has been produced using data extracted from the catch effort database. HHS data from 1 Dec 1989 – 30 June 2013 have been mapped. Data were mapped using the fishing event start position. Only records that reported by latitude and longitude have been included.

SMOOTH HAMMERHEAD SHARK (HHS)

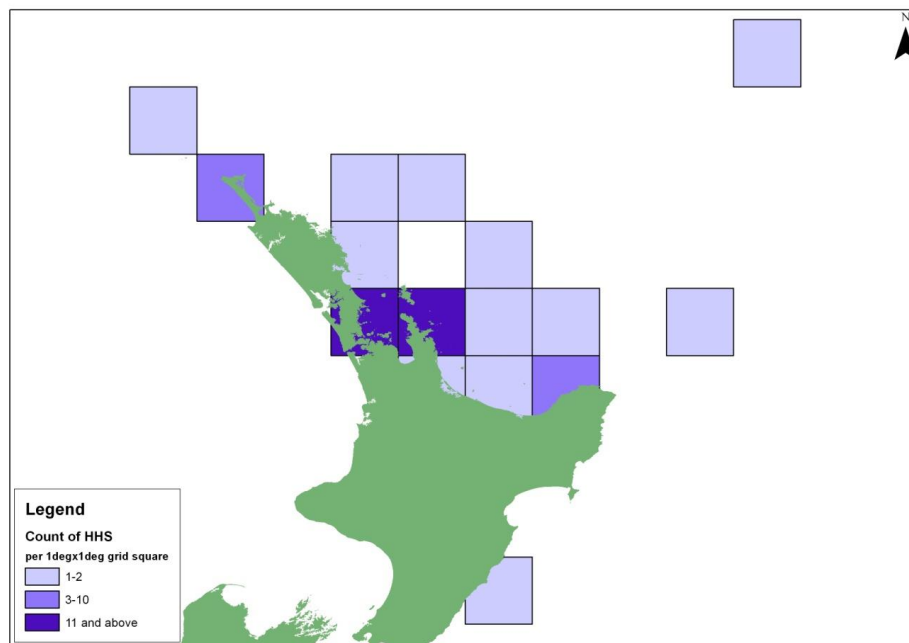


Figure 3: Number of hammerhead shark caught per one degree by one degree grid square. This map has been produced using data extracted from the COD database. HHS data for all years (up to 30 June 2013) have been included. The data have been plotted using the start position of the fishing event. Only records that reported the number of HHS caught have been included.

1.2 Recreational fisheries

Hammerhead sharks are rarely targeted by recreational fishers. There may be considerable cryptic bycatch of juveniles in recreational setnets.

1.3 Customary non-commercial fisheries

There is no customary non-commercial fishery for hammerhead shark.

1.4 Illegal catch

There is no known illegal catch of hammerhead shark.

1.5 Other sources of mortality

The proportion of sharks discarded dead is unknown. Mortality rates of hammerhead sharks tagged and released by the New Zealand Gamefish Tagging Programme are also unknown.

2. BIOLOGY

Only one species of hammerhead shark (*S. zygaena*) has been recorded from New Zealand waters. Several tropical and subtropical species occur in Australia and the South Pacific Ocean and these may occasionally visit New Zealand.

Juvenile *S. zygaena* are common in shallow coastal waters of the northern North Island, but are rare further south. Coastal waters appear to serve as a nursery for this species, with highest concentrations occurring in the Firth of Thames, Hauraki Gulf, eastern Bay of Plenty and 90-Mile Beach. Other areas are probably also important (e.g. Kaipara and Manukau Harbours) but data to confirm this are sparse.

Length-frequency data from research trawl surveys showed that new-born young first occur in coastal waters during summer at a total length of around 60 cm. These young grow to about 70 cm by the following spring. Larger sharks up to 150 cm probably represent the 1+ and 2+ age classes (Francis 2016). Aerial survey observations indicate that juveniles of 150–200 cm total length are

abundant off the west coast of North Island. The habitat of adult hammerheads is unknown (Francis 2016).

Although few data are available on the smooth hammerhead's life-history characteristics, it is a large hammerhead shark and presumably at least as biologically vulnerable as the scalloped hammerhead shark (*Sphyrna lewini*) (Casper et al 2005).

3. STOCKS AND AREAS

Genetic studies show that there is significant population structuring of this species among ocean basins, and in some cases within ocean basins (e.g. between the southwest and southeast Pacific Ocean); however there is no genetic structuring between New Zealand and Australia, suggesting the existence of gene flow across the Tasman Sea (Hernandez 2013).

4. ENVIRONMENTAL AND ECOSYSTEM CONSIDERATIONS

Hammerhead sharks are primarily taken as bycatch in setnet and bottom longline fisheries.

4.1 Role in the ecosystem

The smooth hammerhead shark (*Sphyrna zygaena*) is found worldwide in temperate and tropical seas (Casper et al 2005). It is coastal-pelagic and semi-oceanic and occurs on the continental shelf, to 200 m depth (Ebert 2003). The smooth hammerhead is an active-swimming predator, predominantly feeding on squid and teleosts (Casper et al 2005). Based on specimens caught by recreational anglers off New South Wales, Australia, Stevens (1984) reported that 76% of specimens with food in their stomachs contained squid and 54% teleosts.

5. STOCK ASSESSMENT

There is insufficient information with which to conduct a stock assessment of hammerhead sharks.

5.1 Hammerhead shark

5.1.1 Estimates of fishery parameters and abundance

No estimates of fisheries parameters or abundance are available for this species.

5.1.2 Biomass estimates

No estimates of biomass are available for this species.

5.1.3 Yield estimates and projections

Yield estimate and projections have not been estimated for *S. zygaena*.

6. STATUS OF THE STOCKS

Hammerhead sharks in New Zealand are likely to be part of a wider southwestern Pacific Ocean stock. The text below relates only to the New Zealand component of that stock.

Stock Status	
Year of Most Recent Assessment	No assessment
Assessment Runs Presented	-

SMOOTH HAMMERHEAD SHARK (HHS)

Reference Points	Target: Not established Soft Limit: Not established by WCPFC; but HSS default of 20% SB_0 assumed Hard Limit: Not established by WCPFC; but HSS default of 10% SB_0 assumed Overfishing threshold: Not established
Status in relation to Target	Unknown
Status in relation to Limits	Unknown
Status in relation to Overfishing	Unknown
Historical Stock Status Trajectory and Current Status	
N/A	

Fishery and Stock Trends	
Recent trend in Biomass or Proxy	Unknown
Recent trend in Fishing Intensity or Proxy	Unknown
Other Abundance Indices	Unknown
Trends in Other Relevant Indicators or Variables	Unknown
Projections and Prognosis	
Stock Projections or Prognosis	Unknown
Probability of Current Catch or TACC causing Biomass to remain below or to decline below Limits	Soft Limit: Unknown Hard Limit: Unknown
Probability of Current Catch or TACC causing Overfishing to continue or to commence	Unknown

Assessment Methodology and Evaluation		
Assessment Type	-	
Assessment Method	-	
Assessment Dates	Latest assessment: N/A	Next assessment: none planned
Overall assessment quality rank	-	
Main data inputs (rank)	-	-
Data not used (rank)	-	-
Changes to Model Structure and Assumptions	-	
Major Sources of Uncertainty	-	
Qualifying Comments		
This fishery is largely a bycatch fishery.		
Fishery Interactions		
-		

7. RESEARCH NEEDS

The key research needs are to determine the link between the New Zealand stock and the wider Pacific stock, and to assess the trends in the stock status for this species.

8. FOR FURTHER INFORMATION

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