POLICY IMPACTING SOUTH AFRICAN SHARKS & RAYS 2022

MANAGEMENT: LEGAL & ILLEGAL GILLNETTING

KEY MESSAGES AND RECOMMENDATIONS

Problem: Gillnetting, which is highly indiscriminate in its nature, has a significant impact on biodiversity. The number of nets is estimated to be 6-8 times larger than it was 10 years ago, while less than 10% of all gillnet catches are legal.

Recommendations:

1. Locate, confiscate, and destroy illegal gillnets deployed around the entire coast, particularly estuaries, as well as the fast-developing, shark-directed gillnetting in the sea.
2. Gradually phase out fishing-rights allocated for gillnetting of harders/mullet and St Joseph in favour of more sustainable, low-bycatch fishing methods.
3. Register all gillnet sales and their ownership.
4. Record all illicit gillnetting and all other fisheries compliance issues in a national register and database.
5. Establish regional task teams to manage the processes outlined in the Recommendations above.

MANAGEMENT:
LEGAL & ILLEGAL GILLNETTING

There are currently 162 right-holders in the commercial gillnet fishery on the South African West Coast. They are all permitted to target mullet/harder, *Chelon richardsonii*, while 80 may also target St Joseph, *Callorhinchus capensis*. There has been a sharp increase in the use of illegal nets in estuaries and the sea along the entire South African coastline. The indiscriminate nature of this fishing gear and its negative impact on a wide variety of marine life, including sharks, rays, linefish, turtles, penguins and other seabirds, seals, and dolphins, is well documented both locally and globally. There is a pressing need for illegal operations to be eradicated and for legal gillnetting to be phased out and replaced by existing and more selective fishing methods with lower bycatch mortalities.

CONTEXT

Gillnets are inexpensive to purchase and to operate in comparison to other fishing gears. Their high catches and ecosystem effects indicate that this fishery cannot be justified as a sustainable, small-scale or subsistence operation. Target and bycatch species are often selected out of their populations before reproductive age, bycatch mortality exceeds 90% and ghost-fishing from lost and discarded gear is exceptionally high. The capture of juveniles is characteristic of gillnetting fisheries. Law enforcement to control illegal gillnetting around the entire South African coast is an enormous challenge with limited enforcement capacity and funding and, as a result, illegal operations are growing at an unprecedented rate. The legal gillnet fishery for harders/mullet, on the west coast also has challenges. These include Total Allowable Effort (TAE) recommendations being exceeded, access being granted to fish in some Marine Protected Areas (MPAs) and competition from illegal gillnet operators. Consequences include overexploitation and collapse of and concomitant loss of livelihoods in this industry. The enormous growth in the illegal gillnet fishery is facilitated by the absence of any controls on the manufacture, importation, or ownership of gillnets in South Africa. There is a need to regulate imports and ownership of gillnets through a licencing system and to maintain a register of nets owned or sold throughout the country.

WHAT IS GILLNETTING?

Gillnetting is a passive form of fishing in which a curtain-like net is suspended vertically in the water, with floats along the head-rope and weights along the bottom. The size of the meshes of the net is determined by the size (body length) of the targeted catch, as it aims to gill (catch by the gills or body depth) any fish that swims into the net. In the past, nets were constructed with cotton and multifilament braided nylon meshes. Currently, almost all nets have a monofilament mesh. Although these nets are not as compact to transport and require more frequent repair than multifilament nets, they are widely regarded as being more efficient at catching fish, because of their low visibility in the water.

Gillnets may be positively or negatively buoyant, depending on where they need to be deployed in the water column and on the target species. This is achieved by adjusting the ratio of flotation, provided by floats on the headrope, to weight in the form of lead along the footrope. In the legal gillnet fishery, nets may be anchored or allowed to drift, thus moving with the current and hence the term drift nets. In both situations, nets may not be left unattended, and one end of the net must be tethered to the vessel throughout the fishing operation. Regulations limit the length and mesh size of all such nets. Illicit gillnets tend to be heavily weighted so that they sink unseen below the surface and their mesh-sizes range outside of legal minima and maxima. To avoid detection and apprehension at landing sites, illicit nets are also often deployed permanently and/or stored in sunken mesh bags at sea. This also results in more nets being lost and an increase in the incidence of ghost-fishing.

The impact of legal and illegal gillnetting (& beach-seining) is well researched in South Africa. This includes a good understanding of ecosystem response, stock assessment of priority species and predicting the consequences of any expansion and increases in fishing power and effort. Compliance monitoring and quantification of "cryptic" catch and Illegal, Unreported and Unregulated (IUU) fishing have been identified as crucial to ongoing assessment and management.

LEGAL GILLNETTING:

WHERE DOES IT OCCUR? WHAT DOES IT TARGET? HOW MANY PARTICIPANTS?

St Joseph is a silvery, bottom-dwelling cartilaginous fish of the family Chimaeridae (ghost sharks, ratfishes, chimaeras) with a bizarre-looking, hoe-shaped snout, which houses a sensory organ for detecting bivalves and other invertebrates in the sediment.

There are only two types of fisheries which are permitted to use gillnets, the Commercial-scale gillnetting in the Western Cape and the KZN bather safety / shark nets – KZN Sharks Board. The legal gill net fishery in the Western Cape is largely confined to the shores of the Western Cape, where there are currently 162 rights-holders with permits awarded solely for the capture of mullet/harder, *Chelon richardsonii*, and St Joseph, *Callorhinchus capensis*.

Gillnets for mullet are surface-set by being positively buoyant and, to minimise bycatch, must be tethered to the vessel at all times irrespective of whether the nets are anchored or drifting. Each gillnet right-holder is restricted to 1–4 nets, depending on the location, between Port Nolloth in the north and Yzerfontein in the south. Most are restricted to two 48–54 mm stretched harder nets, the exception being the Olifants Estuary and the Langebaan MPA where right-holders are restricted to one net each. In St Helena Bay, right-holders are allowed to use either two harder nets or two St Joseph nets (178 mm stretched mesh) but not simultaneously. Exclusion zones of 2 km have been established in the close vicinity of Dassen Island and Robben Island to minimise the bycatch of African penguins, *Spheniscus demersus*. There is a 25 km exclusion zone from Saldanha Bay to Cape Columbine to reduce bycatch and illegal targeting of heaviside's dolphins *Cephalorhynchus heavisidii,* penguins *Spheniscus demersus*, cormorants and sharks, primarily sevengill shark *Notorynchus cepedianus* and smoothhound sharks *Mustelus mustelus*. Each harder net is a maximum of 75 m long by 5 m deep, with a stretched mesh of 48–54 mm. Netting in estuaries is only permitted in the Olifants River, where the operators may only deploy a single net 35 m long. The nets for St Joseph are bottom-set on the seabed and are buoyed and anchored at both ends, and have to be tethered to the vessel. Each net is restricted to 75 m long by 2.5 m deep, with a stretched mesh of 176-180 mm. Deployment of the nets in this fishery is confined to St Helena Bay. The total annual landings in this fishery are estimated at 1 100 tons.

Large-mesh gillnets, colloquially termed shark nets, are also deployed by the KZN Sharks Board at popular swimming beaches on the KwaZulu-Natal (KZN) coast between Richards Bay and Port Edward. They are intended to ensnare large, potentially dangerous sharks in a bather protection programme that was initiated in 1952. There are currently 13 km of nets at 37 locations, with over 30 km of nets having been removed in the last three decades as part of an extensive net reduction initiative. Some of these nets have been replaced by baited hooks, termed drumlines, as an alternative, more selective shark fishing device. Most nets are 212 m long and 6 m deep, with a stretched mesh of 50 cm. They are laid in staggered parallel rows, roughly 500 m offshore and in a water depth of 10-14 m. They are anchored in fixed positions throughout the year and are serviced an average of 20 times per month, sea and weather conditions permitting. Like all gillnets, these nets are not selective and catch rays, dolphins, and turtles, in addition to large (>1.5 m) sharks.

ILLEGAL GILLNETTING:

WHERE DOES IT OCCUR? WHAT DOES IT TARGET? HOW MANY PARTICIPANTS?

Illegal gillnets are generally negatively buoyant and are often set overnight or without surface marker buoys to avoid detection. Illegal gillnetting has escalated in both estuaries and the sea. Vessels used range from primitive craft of polystyrene foam and dugouts carved from tree trunks to high-powered ski-boats and deck-boats with hidden compartments to conceal nets and catch. Such gillnetting is highest in KZN and the Western Cape but expanding from both these provinces into the Eastern Cape. Annual catch in South African estuaries is estimated to exceed 2000 tons, of which only 5% (100 tons) is taken legally in the Olifants estuary. Catches are highest on the west coast from the Orange River to just north of Table Bay (Buffels River) and in northern KZN, from Kosi Bay to Lake St Lucia. Illegal marine gillnet operations are more sophisticated, currently mostly directed at sharks, with catches of 400– >800 t per annum estimated for the Cape south coast.

Illegal estuarine gillnets take a wide variety of fish species, many of which are juveniles and known to utilise estuaries as nurseries. There are areas in the country where illegal nets are supplied by fish buyers and distributors, such as Kosi Lakes and other areas of the iSimangaliso Wetland Park, Wild Coast, Gansbaai and Langebaan Lagoon. Nets in the Western and Eastern Cape are mostly imported from Europe, whereas those in northern KZN are smuggled in from Mozambique and other countries to the north, where they are extremely inexpensive and readily available. These nets originate from Asia and/or from previous misguided attempts by the World Bank to stimulate fisheries in the region.

CONCERNS REGARDING SUSTAINABILITY IN FISHERIES AND IMPACTS ON BIODIVERSITY

Biodiversity and fisheries sustainability concerns for the gillnet fishery include:

- Heavy fishing pressure and the depleted stock status of mullet/harder *Chelon richardsoni* in the Western Cape
- High rates of bycatch of sensitive linefish species
- Targeting of juveniles by fishing in nursery areas, especially in estuaries
- Overfishing of juveniles and breeders

Many permit-holders exceed the limits on the number or length of gillnets for mullet and St Joseph. The St Joseph gillnet fishery has all but collapsed, largely due to the loss of the central and west African market for dried product. The demersal-trawl catch of St Joseph is now 5-10 times that of the directed gillnet fishery. Despite this high fishing pressure, research surveys from the west coast of South Africa show no significant negative trends in abundance indices of St Joseph, and the population trend is estimated to be stable or increasing over the last three generations (22 years). As a result, this species was assessed as Least Concern in terms of the IUCN Red List in 2019. The targeting of linefish species in these two fisheries is prohibited and permissible bycatch is limited to baitfish (sardine, horse mackerel & kin). Attended nets minimise bycatch mortalities if these are released timeously. However, bycatch species are often left to die in gillnets before fishers bother to release them. This may be both intentional and unintentional, as the financial rewards for keeping large linefish far outweigh the low risk of monetary penalty. Other concerns are that misidentification and under-reporting of catches is rife throughout the legal industry.

The 2018 National Biodiversity Assessment revealed a sharp increase in illicit gillnet catches throughout the South African coastline. An analysis of confiscated estuarine gillnet catches in KZN revealed a sharp decline in the length of most of the fish

caught. For example, the mean length of dusky kob *Argyrosomus japonicus* caught in illegal gillnets is currently 29 cm. These are 6–8-month-old fish which only mature at close to 100 cm. Illegal gillnetting is a major source of mortality for many other marine and freshwater species including turtles, dolphins, birds and sharks. Many of these species are used to supply the national and international traditional medicine, including the "muthi" market. Gillnets, especially those unmarked with buoys or deployed as drift nets, which are not anchored, become navigational hazards. If not recovered these nets become 'ghost nets' as they continue to fish.

STUDY RESULTS, CONCLUSIONS AND RECOMMENDATIONS

The legal fishery has been well-researched. Permit conditions make provision for exclusion zones, catch limitations and gear restrictions, based on sound scientific findings. The TAE (Total Allowable Effort) is determined from the stock assessment and provides for an economically viable number of right-holders. Despite this, gillnets are highly unselective. Bycatch species in excess of the limit die before fishers even notice them, and the financial rewards of keeping large linefish far outweigh the low risk of a fine. The number of species vulnerable to capture in gillnets along the West Coast is far greater than reported.

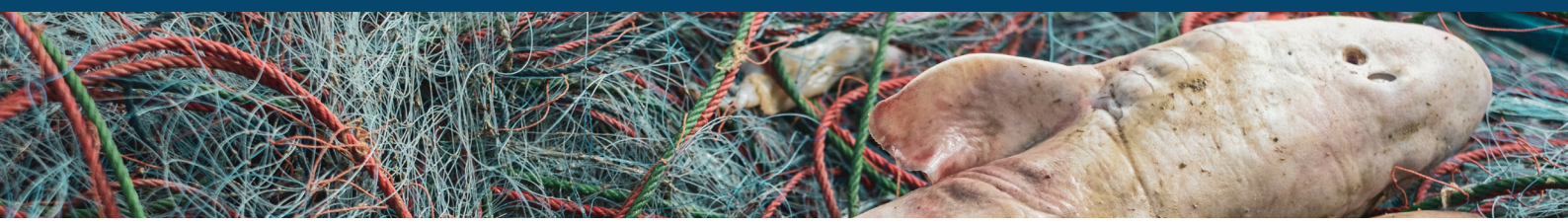
If management strategies aimed at rebuilding linefish stocks are to be successful, bycatch in legal operations will have to be greatly reduced, through increased enforcement and the provision of alternative forms of livelihood for the fishers.

All illegal gillnets need to be removed and destroyed. This can only be achieved through increased enforcement, which is difficult due to reduced capacity in all the nature conservation and law enforcement agencies and the high risks it poses to the enforcing officials, many of whom reside in the same community as the fishers.

Estuaries which are known to be important nursery habitats for a wide variety of linefish species must be the focus of such operations. More sophisticated, illegal, marine gillnetting operations targeting sharks can only be controlled by equally sophisticated monitoring and surveillance, enforcement and the provision of alternative forms of livelihood for the fishers.

Scientific research, monitoring and assessment show that illegal and legal gillnetting have been responsible for extensive overfishing in estuaries and the sea throughout the South African coast.

Eradicating gillnet poaching and phasing out of the legal gillnet fisheries in favour of more economically viable and biologically sustainable alternatives should be prioritised.



RECOMMENDATIONS

1

Locate, confiscate, and destroy illegal gillnets deployed around the entire coast, particularly estuaries, as well as the fast-developing, shark-directed gillnetting in the sea.

Such exercises need to comprise of a co-ordinated, intensive and dedicated drive by law enforcement agencies operating at national, provincial and possibly municipal levels of government. This requires development of monitoring and surveillance techniques as well as training and capacity building at all levels and including prosecutorial processes.

2

Gradually phase out fishing-rights allocated for gillnetting of harders/mullet and St Joseph in favour of more sustainable, low-bycatch fishing methods.

On the west coast plans are being prepared to replace low-value harder/mullet gillnetting with an experimental/exploratory small-boat (<10 m) purse-seine fishery, and St Joseph gillnetting replaced by a directed longline fishery. Both will have a far lower bycatch mortality. The target species will be landed in better condition which will increase the value of the catch. These fishers will also be allowed to target some pelagic shoaling species such as horse mackerel *Trachurus* sp, sardine *Sardinops sagax* and redeye *Etrumeus* sp. Product beneficiation will be emphasized, including smoking, filleting and keeping fish on ice for the high-value, fresh-fish market.

3

Register all gillnet sales and their ownership.

There should be compulsory national registration and permitting of all gillnets (this could include other forms of fishing nets) and all net manufacturers, importers, exporters and sales transactions. Ownership should be restricted to currently registered, commercial gillnet right-holders. Gillnets should be forfeited to the state once their owners' rights or permits are deactivated.

4

Record all illicit gillnetting and all other fisheries compliance issues in a national register and database.

This national database would help quantify cryptic catch and mortality for incorporation into stock-assessments and to identify where compliance initiatives should be directed.

5

Establish regional task teams to manage the processes.

These task teams need to be intergovernmental and interinstitutional to maximise their efficacy.

CONCLUSION

The threat posed by both legal and illegal gillnetting to marine and estuarine biodiversity and ecosystem functioning is very high. The eradication of all illegal activities and the replacement of legal gillnetting of harder/mullet and St Joseph with more sustainable fishing activities are imperative. In particular, a strong focus needs to be placed on estuaries and the nearshore waters, encompassing key nurseries, pupping grounds, spawning areas and known aggregation sites at vulnerable life-history stages. In doing so, there exists a unique opportunity to phase out gillnetting and replace it with sustainable and economically viable alternatives.

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