The East Coast Inshore Fin Fish Fishery Synopsis

Prepared by Madison Stewart

2013

Introduction: The ECIFF:

The Queensland East Coast Inshore Fin Fish Fishery is Queensland's largest and most diverse fishery, it is a considerable part of the status of sharks in these waters with the shark component legally removing 600 tonnes, 480 from within the Great Barrier Reef Marine Park and world heritage area, equivalent to approximately 100,000 sharks every year. This document will outline faults in this dedicated shark fishery's management, sustainability and overall operation as a result of the species they catch, the area in which they operate, and the human errors in the application of the fishery.

"The Great Barrier Reef Marine Park Authority themselves suggesting that there should not be a shark fishery on the Great Barrier Reef at all because it can not be clearly demonstrated that it is selective and sustainable (Qld DPI&F 2007b)."

-GBR position statement on the ECIFF, 2007

The ECIFF has been a fishery since 1984, but more recently moved into a dedicated shark component, with catch peaking in the last decade. The presence of a dedicated shark fishery inside the iconic Great Barrier Reef in itself is an occurrence that has sparked much attention from the Australian public and conservation societies. On February the 28th 2012, the East Coast Inshore Fin Fish Fishery was signed off by minister for environment Tony Burke to continue for another 3 years. It now continues to target sharks within and south of the Marine Park and World Heritage Area, despite significant absence of vital information to set the standards for the management on the fishery.

There is no information to credit the sustainability of this fishery, yet much is available to credit its potential risk. The set quota has no scientific foundation and was a self-appointed number. Little information or assessment of individual species caught is available, meaning effects on certain species, even understanding of their fishing pressure threshold, remain currently unknown. A large majority of the catch is by-catch (it has been suggested that this is unavoidable using the current method of fishing), and taking into consideration that in one year an entire population of sharks could be wiped out, there is zero evidence to suggest target species will withstand the next three.

Carcharhiniformes dominate the catch of the ECIFF and it is elasmobranchs of this order that are probably most at risk from the fishery. Many of the species caught by the ECIFF were also identified by risk assessments as among the least likely to be sustainable across other northern Australian fisheries and are also probably affected to some extent by recreational fishing within the GBRWHA. The ECIFF is basing its continuation for another three years on the need to implement new methods, yet the shark component has been going strong for 28 years already with no necessary data collected. In this time several reports from independent societies and researchers have brought out information on their targeted species and the fishery itself, none in favour of its continuation.

We are looking at the most ecologically complex area of Australia's oceans and a fishery of the most significant species, with the least foundation for sustainability. A result of failure to read and act on the warning signs in something as influential as a shark species fishery could prove devastating due to their place in the ecosystem. In examining the outlines for sustainable fishery management in reference to the ECIFF, faults are clear and number in the many. In examining the species harvested and the areas of trade for shark products, the true motives of harvesting an unwanted table fish such as shark become questionable, and attention must be paid to the money made from the byproducts of these animals. This document will outline in particular the catch history and by-catch, sustainable methods applied, the statements and concerns of coral reef based fisheries, as well as examining annual status reports from the ECIFF for faults and proof that this fishery is unsustainable and environmentally negligent.

Significance of sharks and rays

As apex predators, sharks play a key role in maintaining balanced populations of prey species and ecosystem integrity. In simplicity if one species of fish is removed form an ecosystem it is possible that 7 other species do its 'job' or key-role in that ecosystem, the sharks however, have no replacement. As a functional group, sharks and rays have been fulfilling this important role for about 400 million years. Reducing the number of sharks and rays is likely to have significant and unpredictable impacts on other parts of the ecosystem, as recently reported for the northern Gulf of Mexico and along the U.S. East Coast. Sharks and rays are a significant part of the culture and subsistence lifestyle of Indigenous Australians, with some species being totems of some Indigenous groups, and featuring widely in traditional stories and art. Sharks and rays are of value alive to many stakeholders of the Marine Park.

Need for special management of sharks and rays

Sharks and rays need special management to prevent further population declines and facilitate recovery of depleted populations. In recent times sharks and rays in Queensland, as in other parts of the world, have come under increasing pressure. While this pressure arises from a variety of sources (for example coastal development, pollution, gear set for bather protection), the main pressure is from targeted fishing and as a by-catch of increased fishing for other species. Some species are now threatened with extinction, and some sharks and rays have disappeared from areas where they were once found in large numbers, for example sawfish (*Pristis* spp), several species of skate and grey nurse shark.

At a global scale, the 2006 IUCN Red List of Threatened Species is the first comprehensive assessment of sharks and rays. Of the 547 species of sharks and rays assessed, 20 per cent are threatened with extinction. Many shark fisheries around the world have collapsed and the IUCN assessments confirm that sharks and rays are particularly vulnerable to over-fishing and are disappearing at an unprecedented rate across the globe, reinforcing the need for special management. The conservation and management of sharks and rays is also hindered by perceptions of them as dangerous animals or pests that have little ecological or economic value. When taken as by-catch, anecdotal reports indicate sharks and rays may be killed instead of being released alive with care for their welfare, because they are considered unimportant or pest species, or because of difficulties in handling them.

Sharks and rays are particularly vulnerable to overfishing because, in general:

- They are naturally less abundant than most other types of fishes
- They live for a long time, and mature and reproduce very slowly, making it easy to overfish stocks in a short period of time
- They are relatively easy to catch in a variety of fishing gears
- There is documented slow recovery from depletion
- Demand and prices for some shark products, including fins, are relatively high
- Species of sharks and rays captured by fisheries (as target or by-catch) are not identified and the quantities of separate species taken are not recorded
- Compliance is inadequate, particularly associated with trade in shark fins and illegal fishing activities
- There is insufficient information about the biology of species caught and pressures on them
- Widespread species may be caught in two or more fisheries
- Protected species, once outside the area in which they are protected, may be subject to fishing (for example great white shark is protected in Australia but not in all neighbouring countries).

Implications with coral reef fisheries in general;

With gillnets and the use of certain fishing managements, susceptibility of species must be known. Susceptibility includes parameters such as the species distribution with respect to the area of the fishery (the Great Barrier Reef) and the species depth behaviour in relation to the fishing gear, while productivity includes demographic parameters related to growth and reproductive potential. It has long been recognised that the structure of coral reef ecosystems is complex and sensitive and that establishing fisheries is rarely acceptable or tolerable by the ecosystem.

The Great Barrier Reef is recognized as an ecologically sensitive area and being the largest coral reef in the world it is a complex structure of equilibrium, evolution and species status. Managing a fishery to target the apex predator in such an ecosystem proves near impossible, and comes with the obvious and inherent risk of ecosystem devastation and effecting the surrounding environment. Ocean and land based tourism on and around the Great Barrier Reef is worth far more to Australia's economy than fisheries on the Great Barrier reef. In Cairns Australia, each scuba diver spends at least $6000 in the region, most while on dive boats, and rated a shark sighting as No. 1. "Each sighting of a shark by a diver is worth $1375 to our economy" Dr Alastair Birtles JCU stated. The Great Barrier Reef is worth 3.3 Billion dollars annually in tourism alone to our economy, the ECIFF is worth approximately $19.6 million dollars annually.

"Sustainably managing ecosystems is challenging, especially for complex systems such as coral reefs. Coral reefs have proven difficult to manage sustainably, in part because the multispecies nature of reef fisheries, the complexity of trophic interactions, and the times scales on which processes manifest may allow coral reefs to appear healthy long after serious degradation has occurred."
SOURCE: Critical thresholds and tangible targets for ecosystem-based management of coral reef fisheries : *Tim R. McClanahan, Nicholas A. J. Graham, M. Aaron MacNeil, Nyawira A. Muthiga, Joshua E. Cinner, J. Henrich Bruggemann, and Shaun K. Wilson.*

"Removal of sharks directly affects their abundance, size structure and changes population dynamics. Most sharks are predators at or near the top of the food chain. If some sharks are prey, they are prey to other sharks. Therefore, the indirect effects of shark removal involves changes in trophic interactions by removal of key predator (or prey) species, removal of competitors, species replacement and enhancement of food supply through discards (Stevens et al. 2000). For example, reduction of top predators, such as sharks, can lead to increases in the numbers of the prey normally targeted by the those predators and this starts a cascade of changes that cause increases and declines in subsequent trophic levels; this has been termed a trophic cascade effect (Ward and Myers 2005, Myers et al. 2007). While the effects of overfishing, including of shark, was most pronounced in the Caribbean, they were also evident on the Great Barrier Reef."
Source: Source: Jackson et al. (2001) **WWF-Australia's Position Document on the Queensland East Coast Inshore Finfish Fishery, 27 February 2008**

Professor Sean Connolly says "populations of coral reef sharks in the Indo-Pacific, including the Great Barrier Reef, are now severely depleted, coral reefs have proven difficult to manage sustainably, in part because of the multispecies nature of reef fisheries, the complexity of trophic interactions and other factors." **Professor Sean Connolly, James Cook University.**

Gauntlet approach- the fisheries management of the shark species

Sharks cannot be managed in the same manner as teleost fishes, they are basically non-renewable resources, as well as being naturally less abundant than most other types of fish, their longevity and low fecundity make them particularly vulnerable to over-exploitation. Experience has shown that management of shark populations is best achieved by having a clearly defined, strictly managed, relatively small fleet where catch and effort can be easily controlled. Arguably, Australia leads the world in shark fisheries management. The 'gauntlet' approach is said to be a sustainable method of fishing sharks, and is used in the ECIFF. While studies of the most successful shark fisheries using the gauntlet approach (the Southern and Eastern Scalefish and Shark (SESS) fishery for gummy shark) is based on a relatively productive species, the dusky shark fishery in Western Australia suggests that a sustainable take of even highly unproductive species is possible, but only with tight controls and a relatively small catch.

The Queensland East Coast Inshore Fin Fish Fishery is a multi-species, multi-gear fishery. It is Queensland's largest and most diverse fishery, spanning over 5,300 kilometers of coastal foreshores and encompassing around 75 major river systems and numerous smaller waterways. The fishery operates in state and Commonwealth waters off the east coast of Queensland, including in the Great Barrier Reef Marine Park. The total pressure by the ECIFF on sharks and rays is considerable. This is the largest and most diverse fishery in Queensland comprising a commercial sector of about 800 fishers, a large recreational sector of about 800 000 anglers and an Indigenous sector. This fishery does not fall into the category of small or defined and therefore applicable to the gauntlet approach.

A 'gauntlet' approach is where the shark catch is targeted at the younger age classes while providing protection of the breeding biomass. The effectiveness of the gauntlet approach relates to the fact that in sharks, unlike bony fish, there is a much closer relationship between the number of young produced and the adult stock size. The inherent risk of these gauntlet fisheries arises when the sustainable take of the young age classes is not carefully determined. This is where the Gauntlet approach looses all validity within the ECIFF's application. "More than 20 shark species are caught in this fishery, but we know virtually nothing about their natural abundances, birth rates, death rates, or movement patterns," explains Dr William Robbins. "This is the kind of information needed to determine what level of fishing is sustainable, and to set regulations that minimize the risks to the most vulnerable species."- team of Professor Connolly, Professor Howard Choat, Dr William Robbins and Ms Mizue Hisano in a submission to the Queensland Department of Primary Industries and Fisheries East Coast Finfish Fishery (ECIFF) management proposal.

The potential risk of using the gauntlet without the required information is just as great as any blind approach to fishing these sharks. Not only do you need to know the current population status of the sharks, but the exact size of the juveniles, which differs with every species, some growing larger, slower or have different ages of sexual maturity. For example the Scalloped hammerhead takes 15 years for females to reach sexually maturity, at which point they produce 15-31 pups, every other year. There can be no overall measurement of the appropriate juveniles size that will apply to all shark species. If there is overfishing of these juveniles then, depending on the productivity of the individual species, it may be many years before these effects translate into a reduced breeding biomass and are picked up as subsequent reduced recruitment to the fishery. In the case of the highly unproductive dusky shark, that time period is more than 25 years. For the most productive species it would take 2-5 years for overfishing to manifest itself while for many species of medium to low productivity it would take 10-15 years. It is incredibly risky to fish the number of sharks the ECIFF does, without knowing the status and productivity rates of the species, or the suitable amount or size of juveniles.

Another consideration is the inability to regulate catch size with the use of gillnets. In the gummy shark fishery, escapement of mature fish is regulated by restricting mesh size of the gillnets (the larger fish tend to bounce off the nets without meshing). In the Western Australian dusky shark fishery, the catch is restricted to neonate and one year old individuals. In the ECIFF, interaction from species such as the hammerhead are unavoidable due to their migration through the GBR and coral sea. The particular structure of their heads makes them susceptible entrapment in the gillnets, no matter the size of the nets, or the hammerhead.

"Current management proposals include protection of large breeding adults and focusing fishing at smaller individuals. However, without knowledge about sustainable harvest rates, this approach has a high risk of recruitment overfishing which may take a long time to detect. Elsewhere, where the 'gauntlet' approach is used (e.g. WA shark and SESS fisheries), management is supported by stock assessments and substantial monitoring programs. The lack of this supportive evidence in the ECIFF is a concern."
Source: Independent Review Proposed Management Arrangements for Queensland's East Coast Inshore Fin Fish Fishery- By John Gunn, Frank Meere and John Stevens 31/10/2008

"While the majority of the targeted catch in the ECIFF is based on relatively productive species (milk sharks, spot-tail and Australian blacktip) a number of much less productive species are also taken. An added complication is that catches of Australian blacktips (*Carcharhinus tilstoni*) appear to be mixed with the common blacktip (*C. limbatus*). These two species are very difficult to tell apart, however common blacktips are much less productive and their abundance in the catch would increase in southern areas of the fishery."
Gauntlet Fisheries for Elasmobranchs – the Secret of Sustainable Shark Fisheries
Jeremy D. Prince
http://journal.nafo.int/prince.html

Bycatch larger than target

In 2007 results from CSIRO observers on board commercial fishing vessels collected species composition data. A total of 75 species were recorded in 29 fisheries. The risk assessment methodology was based on methods developed by Milton (2001), Stobutzki et al. (2001b, c) and Walker (2004). The sustainability of species was considered to be dependant on:
1) The susceptibility of the species to capture and mortality by the fishery, and
2) The capacity of a population to recover after depletion.

It is noteworthy that the primary target species of shark in the ECIFF (Australian blacktip shark, C. tilstoni and Spot-tail shark, C. sorrah) recorded in the commercial catch during only four observer trips accounted for only 40 per cent of total catch of sharks and rays, with a further 18 species taken. This is a lower proportion of primary target species than found in a previous study of northern sharks. The limited ECIFF observer data indicates the **unselective** nature of the fishing gear used in the ECIFF in relation to the capture of sharks and rays. In addition, the overlapping species distributions of many sharks and rays suggest it would be very difficult to target a particular species without significant by-catch of other species at higher risk of overfishing, particularly if large mesh nets are used.
***Source**: (the Great Barrier Reef Marine Park Authority Position Statement on the conservation and management of sharks and rays in the Queensland East Coast Inshore Finfish Fishery. June 2007)*

The scalloped hammerhead (Sphyrna lewini) was a significant part of the Queensland shark catch (18 per cent of commercial catch in the ECIFF during observer trips), and is one of the species that risk assessments by QDPI&F and CSIRO have identified as having a high sustainability risk. The grey reef shark (C. amblyrhynchos) made up 6.6 per cent of the shark catch. Based on the average catch of sharks from 1990 to 2005 (793 tonnes per year), these proportions equate to estimated catches of 143 tonnes per year for scalloped hammerhead and 52 tonnes per year for grey reef shark. Other species considered to be at high risk in QDPI&F's published assessments include the great hammerhead (S. mokarran) (2.9 per cent of catch) and white-spotted guitarfish (Rhynchobatus djiddensis) (0.4 per cent of catch). By-catch in the ECIFF includes rays (Rhinobatus typus, Dasyatis kuhlii, Himantura uarnak, Rhinotera neglecta), sharks (Loxodon macrorhinus, Eusphyrna blochii, Orectolbus ornatus) and sawfish. Fishing practices will influence the interactions with by-catch species. For example, the capture of benthic dwelling by-catch species such as sawfish and rays may increase when nets are in contact with the seafloor. To date, effective management or gear design measures to address by-catch issues have not been developed.
***Source**: (the Great Barrier Reef Marine Park Authority Position Statement on the conservation and management of sharks and rays in the Queensland East Coast Inshore Finfish Fishery. June 2007)*

Targeted shark species and their status:

Out of the 6 species of shark that have dominated the catch in the ECIFF observer trips:
3 are listed as 'near threatened'
one is listed as 'endangered.'

More than 60 species make up both the by catch and target catch, out of the identified species….
7 are classed "data deficient"
13 "Vulnerable"
18 "Near threatened"
8 "critically endangered"
3 "endangered"
(from the IUCN red list of endangered species, species from annual status reports)

70 per cent of the total shark catch is currently represented by five shark species, two of these species are 'near threatened', one is 'endangered':

- Australian blacktip shark (Carcharhinus tilstoni)
- common blacktip shark (Carcharhinus limbatus)
- spot tail shark (Carcharhinus sorrah)
- scalloped hammerhead (Sphyrna lewini)
- milk shark (Rhizoprionodon acutus)

'Target species' Assessment of the East Coast Inshore Fin Fish Fishery'
February 2012

The second highest caught shark in the ECIFF is the scalloped hammerhead shark (Sphyrna lewini), which is endangered as well as being identified as having a high sustainability risk by CSIRO. They are prone to gender flocking, meaning entire populations of females could be fished out. Size control does not work in gillnets, as their heads are at risk of being caught.

Table 2. Estimates of take of at-risk and/or protected species of shark in the ECIFF.

Species (all non-target)	At risk[2]/protected[3]	Kg taken/yr/700 tonnes
Scalloped hammerhead	Yes/Yes	126 000(2003 = 216 000)
Grey reef shark	Yes/Yes	46 000 (2003 = 79 000)
Great Hammerhead	Yes/Yes	20 300 (2003 = 34 800)
White-spotted giant guitarfish	Yes/Yes	2 800 (2003 = 4 800)
Whitecheek shark	Yes/No	52 000 (2003 = 90 000)
Milk shark	Yes/No	47 600 (2003 = 81 600)
Pigeye shark	Yes/No	33 600(2003 = 57 600)
Spinner shark	Yes/Yes	22 000 (2003 = 37 200)
Whitetip reef shark	Yes/Yes	2 800 (2003 = 4800)
Whitespotted eagle ray	~Yes/Yes	2 800 (2003 = 4800)

Table source: *WWF-Australia's Position Document on the Queensland East Coast Inshore Finfish Fishery, 27 February 2008, Prepared by Leanne Fernandes*

The only thing protecting grey reef sharks is Condition 11 and a limit of one grey reef and one white tip reef shark per boat per trip:

"By 1 July 2009, Fisheries Queensland to introduce a requirement for high risk chondrichthyan species, the condition was met by 2010: Legislation prohibiting the removal of fins from the body of harvested whitespotted guitarfish (Rhynchobatus spp.) shovelnose rays (Rhinobatus spp), whitetip reef sharks (Triaenodon obesus) and grey reef sharks (Carcharhinus amblyrhynchos) took effect on 1 July 2009. It should also be noted that the practice of 'finning' sharks (i.e. keeping the fins and immediately discarding the body of the animal at sea) is prohibited for all shark and ray species in Queensland. It is an offence for a fisher to possess a shark or ray fin on a boat without also possessing the body of the same shark or ray."
East Coast, Inshore Fin Fish Fishery 2011 Progress against SEWPAC conditions and recommendations.

In the Great Barrier Reef ecosystem, including the inshore areas used by the ECIFF, rare quantitative data are available for shark that aren't targeted (but are bycatch): the whitetip and grey reef sharks. Robbins et al (2006) show that these species are in severe, ongoing decline of 7 and 17% per year despite not being targeted for fishing. It bodes ill for shark species that are targeted.
WWF-Australia's Position Document on the Queensland East Coast Inshore Finfish Fishery, 27 February 2008
Prepared by Leanne Fernandes

Concerns surrounding GBR shark populations

There is extremely little species specific data on the status of shark populations in the Great Barrier Reef ecosystem, and what there is, shows that the animals are in collapse (Robbins et al 2006). There was a 75% decline in shark caught in the shark control program 1962-1988. This is a good indicator of populations in decline well before significant commercial take of sharks started. The populations of sharks were already at low levels before both the increases in by-catch of shark accompanying the increasing efforts in the fishery over the last 20 years and the initiation of what is effectively a shark fishery over that time. The shark fishery in Australia overall has increased such that Australia has recently been identified, by TRAFFIC, as being one of the world's top 20 shark catching nations.

In 2006 research concluded that the abundance of these two species, the grey reef shark (Carcharhinus amblyrhynchos) and white tip reef shark (Triaenodon obesus) had declined from un-fished levels by 97% and 80%, respectively, based on visual survey data and demographic analysis. The authors suggested that these species had been overfished within the GBR. Both the white tip and grey reef sharks were listed as 'high risk' species by the ECIFF Scientific Advisory Group. New information backed by the fisheries department themselves stating that the ECIFF does not interact with these reef sharks. However, the grey reef shark was among the 6 species that dominated the catch during observer trips in previous years of the fishery suggesting only that there are no longer reef sharks to catch because they have been wiped from the reefs they remain loyal to in previous years of the fishery.

"The grey reef shark (C.amblyrhynchos) made up 6.6 per cent of the shark catch. Based on the average catch of sharks from 1990 to 2005 (793 tonnes per year), these proportions equate to estimated catches of 143 tonnes per year for scalloped hammerhead and 52 tonnes per year for grey reef shark"
Source*: (the Great Barrier Reef Marine Park Authority Position Statement on the conservation and management of sharks and rays in the Queensland East Coast Inshore Finfish Fishery. June 2007).*

"Robbins et al. (2006) recently raised concern about the population status of grey reef and whitetip reef sharks on the Great Barrier Reef (GBR). They concluded that the abundance of these two species had declined from unfished levels by 97% and 80%, respectively, based on visual survey data and demographic analysis. The authors suggested that these species had been overfished within the GBR and that their populations may be at risk of eco- logical extinction under current rates of exploitation."
Effects of fishing on tropical reef associated shark populations on the Great Barrier Reef Fisheries Research 95 (2009) 350–361

Many arguments about the methods used by Robbins are raised, however in both documents we must realise that a concern over the management of sharks Is present- what it tells us is that even when its expected the sharks have not collapsed to the suggested levels, they have still collapsed. the second statement after Robbins is as follows;

"The ongoing and consistent historical catches of reef sharks in the fishery and effectiveness of no-fishing zones suggest reef shark populations within the Great Barrier Reef are not as depleted as suggested by Robbins et al. (2006). Closed management zones appear to be effective at protecting a portion of the reef shark population from exploitation. It is almost certain given decreased numbers in GU (fished) zones, however, that reef shark populations have declined within the GBR as a result of fishing over many decades and that careful future management is necessary. This analysis suggests declines may have occurred prior to 1989 (the earliest data used in this analysis) and that any further declines more recently have been relatively subtle. Further study is required to better understand reef shark population sizes and status

We recommend further research to refine the results presented both in the current study and by Robbins et al. (2006) to provide greater certainty in estimates of shark abundance and provide best available management advice to the Great Barrier Reef Marine Park Authority and fisheries man- agers."
M.R. Heupel, A.J. Williams, D.J. Welch, A. Ballagh, B.D. Mapstone, G. Carlos, C. Davies, C.A. Simpfendorfer.

The reality remains that we do not have the reliable info telling us how much the reef shark species have declined, nor do we have any saying they are healthy- so without either sides of the information, it is still not suitable to base fisheries on assumptions without this information. What we do know, is that the sharks biology does not allow for significant fishing pressure, and considerations need to be made.

Other statements:

"Many shark species are highly vulnerable to overfishing - and many of the world's shark fisheries are in dire straits as a result. In addition, sharks are highly vulnerable to 'bycatch mortality'; that is, being caught incidentally in fisheries that target other species.For instance, populations of coral reef sharks in the Indo-Pacific, including the Great Barrier Reef, are now severely depleted,"
"Ongoing Collapse of Coral-Reef Shark Populations." Robbins, W.D., Hisano, M., Connolly, S.R., Choat, J.H. Current Biology 16, 2314—2319, December 5, 2006.

"Sharks inhabiting Australia's Great Barrier Reef are in decline due to over fishing" Academics from James Cook University in Queensland said scientific evidence reveal a substantial drop in shark numbers worldwide and some species are in threat of extinction. "Shark declines are quite rapid," Professor Sean Connolly said. Researchers drew evidence by studying the grey reef and whitetip reef sharks' growth rates, reproductive capability and projected morality rates in the Great Barrier Reef. Researchers found that the results using all the various methods of assessing shark populations were in close agreement and that sharks were declining due to fishing.
(September 2011, JCU research)

The researchers say that because sharks are "apex predators" that play an important role in "maintaining healthy reef ecosystems", their decline threatens the overall welfare of the reef ecosystem. As an example, the authors cite overfishing of sharks as a possible contributing factor to the collapse of Caribbean coral-reef ecosystems. Robbins and colleagues say that immediate action is needed to stem shark population decline on the Great Barrier Reef. "The apparent failure of no-take zones to protect sharks makes it clear that the mere legal prohibition of fishing in marine protected areas is inadequate; such prohibitions must be part of statutory or community-based enforcement regimes that achieve nearly universal compliance from reef users", the write. "Our data suggest that for coral-reef sharks, immediate and substantial reductions in shark fishing will be required for their ongoing collapse to be reversed."

Sharks are large, long-lived species that typically have low fecundity, late maturation and long generation times. Ages of maturation range from 6 years to 18 years. Approximately 70% of living sharks and rays bear live young. Gestation periods are typically from 6-22 months with small clutch sizes. For these reasons, amongst others, these animals have naturally low abundance relative to other fish and recover only very slowly from depletion. For these reasons, sharks are vulnerable to human exploitation in the same way as whales, turtles and dolphins are vulnerable. The life history for the individual shark species taken in the ECIFF is not well known but is likely to be consistent with the generic life history characteristics outlined above.

At least part of the issue is that the spatial extent of many of the shark populations that occur in the GBR is unknown; some are certainly known to extend, at least, beyond the area of the ECIFF. That means that many of these populations are not only being impacted by other fisheries within the GBR (e.g. the reef line fishery, the trawl fishery) but are also being impacted by legal as well as illegal, 18 unreported and unknown fishing activity outside the area of the ECIFF. Some of the other legal impacts on ECIFF sharks have been looked at by Salini et al 2007. Their work does not enhance the level of confidence in the sustainability of the use of these shark stocks.
From a population status point of view, where and how the shark is killed is immaterial; a shark's death will still contribute to a decline in the population. And management must take a precautionary approach in how to address this reality.
WWF-Australia's Position Document on the Queensland East Coast Inshore Finfish Fishery
27 February 2008, Prepared by Leanne Fernandes

Shark fin trade of the GBR

Commercial fisherman bill dunn says "sharks up north are not suitable for eating as the sharks caught down south, so fisheries based up north would only profit or operate from the fins"

Export markets exist for mullet roe, **shark fins** and small mackerel products from the fishery. The commercial net fishery occurs in inshore coastal and estuarine waters along the whole Queensland east coast.
Source: *Ecological assessment of the East Coast Inshore Finfish fishery Compiled by: Brad Zeller and Natale Snape (Queensland department of primary industries document)*

Even with sharks caught at the length of 1.5 meters or under the fins are still profitable as they are sold by weight as well as size. As far northern sharks are not the best table fish, and not a huge fishery, then the main focus are the fins, the most profitable part of the shark. With the focus on the fins, trade becomes difficult and driven by the wrong motives. Targeted catch and bycatch are then used for their fins, and the body becomes the byproduct.

20 years ago fishermen were discarding the fins and keeping the body as this would make them a small profit. Now a larger and accessible market surrounding shark fins has created dramatic fishing pressure on sharks. Although Australia has laws against shark finning, it occurs illegally, and the shark fin trade is now far larger than ever before. In 1990, it was estimated that Japanese long-liners in Tasmanian waters were catching 34,000 blue sharks per year, finning and discarding them. US In 1991, the US pelagic longline fleet in Hawaii released around 65,481 blue sharks and kept none. In 1998, 91,228 blue sharks were caught by commercial longliners originating from Hawaii alone. About one-third of these were released, while over 55,400 were finned. By 1999, annual shark catches were estimated to have risen to around 150,000 in Hawaii.

In Australia, finning is banned in all Commonwealth (federal) tuna fisheries, (which cover the area from 3–200 nautical miles from the shore) and in all fisheries in New South Wales (NSW), Victoria and Western Australia. The ban does not apply within the state/territorial waters (out to 3 n.m.) of South Australia, Queensland or the Northern Territory, nor does it apply to non- tuna Commonwealth fisheries. Shark finning is recognized as threat by Australian Fisheries Scientific Committee.

The major source of fins from Australian waters is from the tuna fisheries, which produced an estimated 20mt of dry shark fins in 1999, predominantly from blue sharks. More than 50,000 individuals were caught in that year. Domestic tuna fishermen are reportedly earning up to US$37/kg for wet fins. One member of a Tuna Association is reported to be landing US$260,000 worth of shark fins each year.

A 2000 report on finning in Australian waters describes the process as both wasteful and sometimes cruel. In 1998-99, approximately 6,078mt of landed shark catch was reported from target shark fisheries. It is estimated that a further 4,082mt of sharks were caught, with only the fins utilized. Extrapolating, using average weights of 15-40kg per shark, this would mean that anywhere from 112,500-300,000 sharks are likely to have been finned in Australian waters in just two years. Trade figures for 1998-99 show significant shark fin exports of 83.5mt of dried shark fin, valued at US$2.86 million.

In Australia's northern prawn fishery, bycatch was estimated in 1998 to be 2,370mt and included shovelnose and shark rays. The retention of bycatch, particularly for the fin market, has increased over recent years and much of it has gone unrecorded. Revenue from fins now approaches that from meat. There has been a series of finning bans introduced in some states/territories and in some fisheries.

Australian shark fisheries are generally agreed to be among the best managed in the world, while New Zealand is also believed to manage its fisheries well. However, fisheries experts in the region are the first to acknowledge the significant gaps in understanding of shark fisheries and management.
Source: The end of the line, (second edition) Written, edited and produced by WildAid. 2007

Conclusion:

In many fisheries faults are expected and are usually weaned from the fisheries operation in the starting processes, the ECIFF has been in progress for a very long time, and catches a considerable amount of vulnerable species. With as many faults as this, the reason the fishery is still in continuation can be attributed to the money surrounding shark products, and the demeanor towards sharks held by the general public who would not allow this kind of misconduct to occur in the name of any other species.

The onus of proof that Shark fishing can be sustainable and should be allowed to resume would lay squarely with the fishing industry. This is being overlooked in the ECIFF and sharks are currently extracted in mass numbers with no insight into the effects. The research into these species and fisheries management implementation underway is the only reason such fishing can continue is a stalling process that allows the continuation of fishing for sharks, possibly faster than they can reproduce, thus breeching the precautionary principal. The ECIFF is risking a species not only essential to the survival of the entire ecosystem, but also one incredibly susceptible to over fishing and linked to the entire fisheries and population collapses in the past along other coastlines worldwide.

REFRENCES:

Population Growth Rates of Reef Sharks with and without Fishing on the Great Barrier Reef: Robust Estimation with Multiple Models by Mizue Hisano, Sean R. Connolly and William D. Robbins is published in PLos ONE 6.9, September 2011.
Citation: "Ongoing Collapse of Coral-Reef Shark Populations." Robbins, W.D., Hisano, M., Connolly, S.R., Choat, J.H. Current Biology 16, 2314—2319, December 5, 2006. DOI 10.1016/j.cub.2006.09.044

POSITION STATEMENT
Great Barrier Reef Marine Park Authority Position Statement on the conservation and management of sharks and rays in the Queensland East Coast Inshore Finfish Fishery
[Post publishing note] This Great Barrier Reef Marine Park Authority Position Statement in relation to the Queensland East Coast Inshore Finfish Fishery was developed in June 2007.

Effects of fishing on tropical reef associated shark populations on the Great Barrier Reef
M.R. Heupela,*, A.J. Williamsb, D.J. Welchb,c, A. Ballaghb, B.D. Mapstoned,1, G. Carlose, C. Daviesf, C.A. Simpfendorferb
Fisheries Research 95 (2009) 350–361

Evaluating catch and mitigating risk in a multispecies, tropical, inshore shark fishery within the Great Barrier Reef World Heritage Area
Alastair V. HarryA,E, Andrew J. TobinA, Colin A. SimpfendorferA, David, J. WelchA,B, Amos MaplestonA, Jimmy WhiteA, Ashley J. WilliamsA,C and Jason StapleyD
CSIRO PUBLISHING