California Driftnet Fishery:

The True Costs of a 20th Century Fishery in the 21st Century

The Deadly Impact of the California Driftnet Fishery on Sharks

Turtle Island Restoration Network
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SeaTurtles.Org
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ABOUT TURTLE ISLAND

Turtle Island Restoration Network is a leading advocate for the world's oceans and marine wildlife.

Our work is based on science, fueled by people who care, and effective at catalyzing long-lasting positive change that protects the likes of green sea turtles, whale sharks, and coho salmon.

By working with people and communities, we preserve and restore critical habitats like the redwood forested creek banks of California to the full-of-marine-life waters of the Galapagos Islands.

We accomplish our mission through grassroots empowerment, consumer action, strategic litigation, hands-on restoration, environmental education, and by promoting sustainable local, national, and international marine policies.

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TURTLE ISLAND RESTORATION NETWORK

FIGHTING FOR A BLUE-GREEN PLANET

Terminology

The driftnets in use in the California swordfish fishery are referred to as "drift gill nets" in state and federal technical regulatory documents. In this report, we use the term "driftnet" for these same nets.

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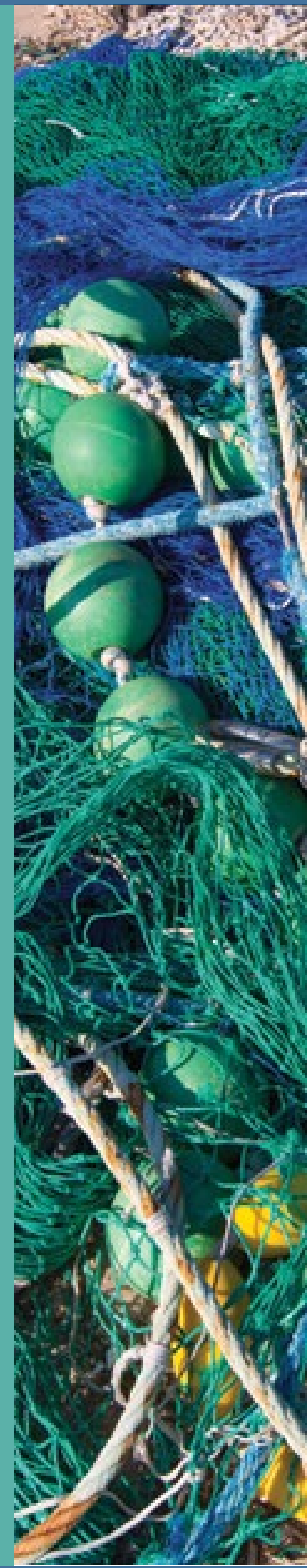
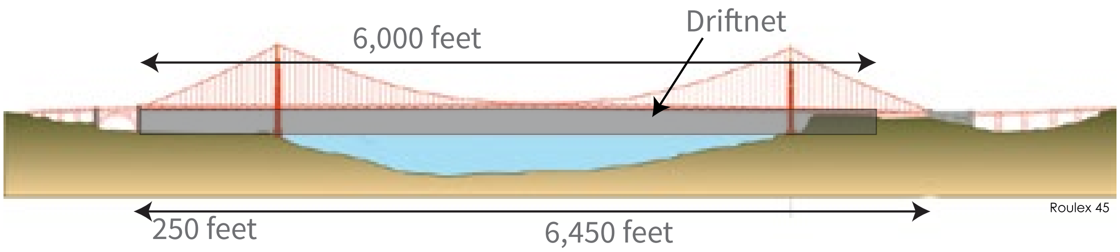


INTRODUCTION

As scientists warn that our ocean ecosystems are on the verge of collapse, leaders are taking action to rein in the world's worst industrial fisheries.[i]

Astonishingly, one of those worst offenders is California's driftnet fishery (also known as the CA Drift Gillnet fishery). Currently, the fishery consists of a small fleet of roughly 20 active boats that set nets the size of the Golden Gate Bridge to drift unattended through our oceans.



While the primary targeted commercial species for this fishery are swordfish and shark, these nets entangle everything in their mile-wide path, resulting in high levels of bycatch.

Over the past ten years, hundreds of air-breathing whales, dolphins, and sea turtles have drowned, while thousands of sharks (that depend on constant movement) have suffocated.

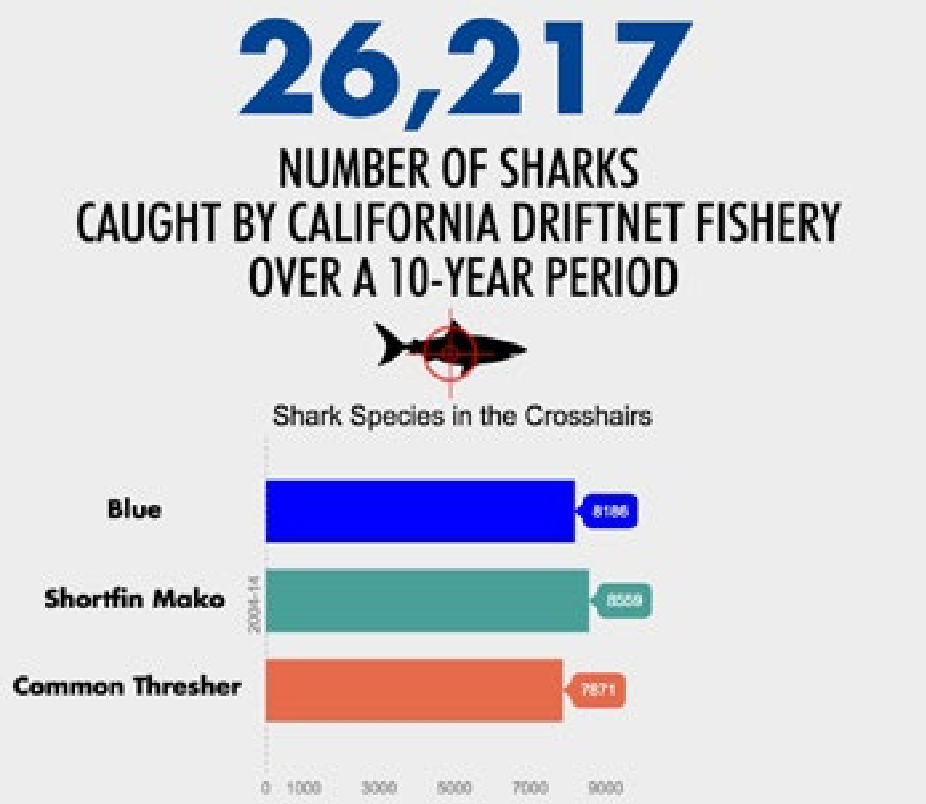
Shark Populations in Decline Globally

Globally, shark species are facing steep declines in many populations. Indiscriminate industrial fishing has reduced the biomass of large predators such as tunas and sharks by up to 90 percent since the 1950s.[1, 2]

This decline has profound impacts on the populations and biomass of a number of other species such as rays and other prey fish. As industrial fishing has depleted shark populations worldwide, the prey species populations kept in check by apex predator sharks have exploded or shifted their ranges across our oceans, disrupting the ecosystems of the species below them in the food webs.[3] Thus, killing large numbers of sharks affects a much broader range of species as the damage done by indiscriminate industrial fishing cascades throughout their marine ecosystems.

Furthermore, as shark populations are severely depleted, the risk increases that these populations will never recover.

Fully 15 percent of the catch in the driftnet fishery are sharks, many of them listed and protected under international treaties and agreements.



Driftnets: Sharks in the Crosshairs

While the California driftnet fishery is mostly known as a commercial swordfish fishery, it also targets common and bigeye thresher sharks. From 2004-2014, these two species made up 14 percent of the marketable catch, or five percent of all animals caught.[4]

In a ten-year period ending in 2014, the California driftnet fishery caught a staggering 26,217 sharks – more than 2,600 every year. This includes thousands of blue sharks, shortfin mako sharks, and common thresher sharks each year. In the case of the blue sharks, of the 8,186 caught, a mere six were retained, the rest discarded. In the 2013-4 fishing season, 72 percent of the blue shark caught was tossed overboard dead, while the rest may or may not have survived after release.

Many sharks and other species often die later as a result of the trauma of being entangled in the fishing nets. Estimates of post release mortality of shark species caught as bycatch range from 35-40 percent [5] to 70 percent. [6, 7, 8] For some species, such as megamouth sharks, post-release mortality is unknown.

Since sharks are both key apex predators and long-lived, slowly reproducing fish, this mortality from the driftnet fishery increases their extinction risk, [9] and could easily have substantial ecological impacts on their prey species and competitors alike, with long-term consequences for overall ecosystem health.

National Marine Fisheries Service observer program

Impacts on California's Rare, Threatened and Endangered Shark Species

Not only is the California driftnet fishery one of the highest bycatch fisheries in the world, but the fishery has a disproportionate impact on threatened species.

Between 2004 and 2014, fully 60 percent of the catch consisted of species listed as threatened or endangered by the International Union for the Conservation of Nature (IUCN), the leading international scientific review organization for endangered wildlife.[10]

The California driftnet fishery threatens 16 different 'Vulnerable' species, including short fin mako sharks and smooth hammerheads.

Many, including the common thresher shark targeted by the fishery, are also protected by international trade agreements under the Convention for the Conservation of Migratory Species of Wild Animals (CMS) or the Convention on International Trade in Endangered Species (CITES).

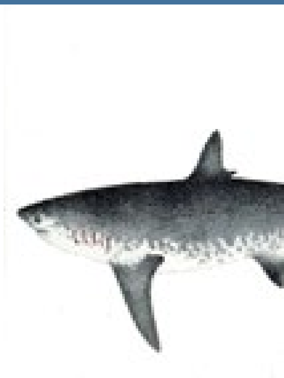
In fact, the California driftnet fishery specifically targets Vulnerable species [11] under the IUCN Red List. Red Listed Vulnerable common thresher sharks, bigeye thresher sharks, longfin mako sharks and shortfin mako sharks together make up 10 percent of the catch and are targeted, retained and sold, despite the fact that industrial fishing is precisely what threatens these species.

In addition, Vulnerable blue sharks make up 5 percent of the catch, but are discarded dead directly overboard. Since these shark species are of little to no economic value,[12] catching them risks disrupting the California marine ecosystem for little benefit. The driftnet fishery also has killed nearly a thousand blue sharks a year over the last decade.

Courtesy of Doug Helton NOAA/NOS/ORR/ERD.

IMPACTS ON SPECIFIC SHARK SPECIES

Common Thresher Shark (Alopias vulpinas) (IUCN Vulnerable)



The California driftnet fishery targets the common thresher shark, comprising roughly 5 percent of the catch. In a ten-year period, the fishery caught 7,871 common thresher sharks.

Ironically, the common thresher shark is listed as Vulnerable by the IUCN in part because of massive overharvesting by the same driftnet fishery. The thresher shark harvest from the California driftnet fishery collapsed from a peak of 1,089.5 metric tons (MT) harvested in 1982 to less than 300 MT by the late 1980s, a crash of roughly 70 percent.[13] The California driftnet fishery is specifically cited by the IUCN as a driver of the decreasing population trends in recent decades.

Concerns of profound depletion of thresher shark populations prompted Washington State to ban driftnets in its waters.[14] Other management authorities, such as the Indian Ocean Tuna Commission, have ordered all vessels covered under its authority to release all thresher sharks alive on account of the severe depletion from historic levels.[15]

Astonishingly, the common thresher shark (*Alopias vulpinas*) is actually IUCN Red Listed as 'Vulnerable' and was extended international protection through listing on Appendix II of the Convention for the Conservation of Migratory Species of Wild Animals at the 11th Conference of the Parties in 2014.[16]

The common thresher shark subpopulation killed by the driftnet fishery is part of an important Pacific population that migrates from Mexico's Baja California peninsula to California's coast. Although the number of fishing boats is greatly reduced from the 1990s, the driftnet fishery still kills approximately 800 sharks a year.

Like many fish shark species, the thresher shark is a long-lived, slow growing species. These long growth times, with relatively low fecundity and slow maturity, make the species susceptible to overfishing and increase the risk of extinction.[17]

F. Schönfeld - Natural history of Victoria F. McCoy

The thresher shark appears to have limited migration among sub- populations, which in part explains why the California thresher shark population has been slow to recover from the massive overfishing in the 1980s. [18]

Bigeye Thresher Shark (Alopias superciliosus) (IUCN Vulnerable)

The bigeye thresher shark (*Alopias superciliosus*) is another threatened species specifically targeted by California's driftnet industry. Over a ten-year period, 970 big eye thresher shark were caught. More than half of this species of shark were thrown back overboard.

The bigeye thresher shark has the slowest population growth rate of any thresher shark and thus a low capacity to recover from exploitation.[19] Even though the target fisheries have reported steady declines in output of this species, the driftnet fishery shows little signs of slowing or stopping. [20] In the 1990s, scientists reported an 83 percent decline in abundance of the thresher shark in the Eastern Central Pacific. [21]

The threatened status of the bigeye thresher sharks globally has prompted significant regulatory action from fishing management agencies worldwide. Bigeye thresher sharks caught in the Atlantic are required to be released alive by the International Convention for the Conservation of Atlantic Tuna and similarly in the Indian Ocean by the Indian Ocean Tuna Commission.[22]

Since over half of all bigeye threshers caught by the driftnet fishery are already dead when hauled from the water, this measure (releasing them after capture) is not a realistic conservation option in California. In the absence of practicable conservation options, the most effective and realistic option is to prohibit the use of this gear. [23]

Blue Shark (Prionace glauca) (IUCN Near threatened)

Blue Shark. NOAA.

The driftnet fishery has consistently killed between approximately 300 and 2,000 blue sharks (*Prionace glauca*) each year for the last decade. Of the 8,186 caught in that time period, a mere six were retained, the rest discarded. Between 2004 and 2015, 65 percent of the blue shark caught was tossed overboard dead.

Although this shark is listed as Near Threatened by the IUCN,concern is growing that the impacts of industrial fishing may pose a more significant threat in the Pacific Ocean than previously understood. [24, 25]

Historically, blue sharks were a bycatch species of low economic value, but with the rise in its value for shark fins, landings have exploded from about 100 MT average globally in the 1980s, to 5,000 MT per year in the 1990s. [26] Today, blue shark landings have hit a reported global total of 45,087 MT in 2007, although studies have indicated 100,000 MT of unreported landings in the Atlantic alone. [27]

Today, blue sharks account for 55 percent of all pelagic shark landings globally, with sharply increasing demand for it meat and fins. [28] Even though blue sharks reproduce at a higher rate than thresher sharks, the rates of removal from driftnets limit their ability to recover, especially against a background of such high rates of exploitation today.

Shortfin Mako (Isurus oxyrinchus)
(IUCN Near threatened)

The driftnet fishery also kills roughly a thousand shortfin makos a year. Over a ten-year period, the fishery caught 8,559 shortfin mako sharks – with more than 94 percent of these animals killed.

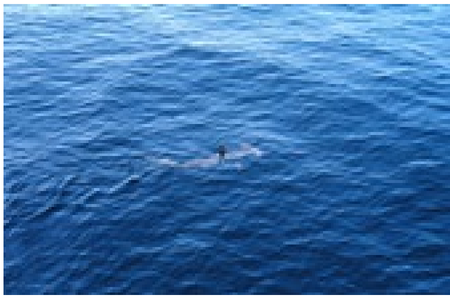
Shortfin mako sharks (*Isurus oxyrinchus*) are listed by the IUCN as Vulnerable as population levels continue to decline. Inadequate management techniques, estimated and inferred declines, and continuing fishing pressures contribute to the listing. Because of its low reproductive capacity and its vulnerability to both longline and driftnet gear, this species is considered highly vulnerable to overexploitation. [29]

The presence of juvenile and young mako in the southern California Bight indicates that the area is an important nursery during the year, and shortfin mako tend to be abundant during the summer as the water temperature increases to above 16°C. With their propensity to forage in surface waters, [30] this species is particularly susceptible to the impacts of driftnet fishing. background of such high rates of exploitation today.

By Mark Conlin, SWFSC Large Pelagics Program [Public domain], via Wikimedia Commons

Smooth Hammerhead (Sphyrna zygaena)
(IUCN Vulnerable, CITES Appendix II)

Commander John Bortniak, NOAA Corps



The smooth hammerhead (Sphyrna zygaena) is among the less common bycatch species affected by California's driftnet industry. In the 2014-5 fishing season based on observer data, of the estimated 91 smooth hammerheads caught, 77 were returned dead – a disturbing 84 percent.

However, the Smooth Hammerhead is listed as Vulnerable by the IUCN, and listed under Appendix II of the CITES, meaning that trade and commercial exploitation is likely to threaten the species with extinction if not regulated.

One of the largest of the hammerhead species, this shark has a wider range than other species of hammerhead. In addition to the risk posed by the California driftnet fleet, this species is under increasing threat from shark finning pressures across the Pacific.

In addition, with increasing frequency of warmer waters in California, the smooth hammerhead's close relative, the endangered scalloped hammerhead is now being seen in California waters where the driftnet fishery operates as well, subjecting it also to threats from the driftnet fleet.

Megamouth (Megachasma pelagias)
(IUCN Data deficient)

Based on projections of observer data, the California driftnet fishery caught an estimated 16 megamouth sharks in the last decade, which would represent 20 percent of all specimens known to science worldwide.

The megamouth shark was only discovered in 1976, and since then fewer than 110 specimens have ever been reported. This species is so rare that there is no adequate data to evaluate the population or conservation impacts of this take by the driftnet fishery.

As one of only three large filter feeding sharks worldwide, the ecological and biological significance of this catch cannot be estimated. For a species as undeniably rare, even small numbers of individuals killed could sharply increase overall mortality rates and threaten the species.

Although the megamouth shark is of virtually no regulatory significance to the Council under U.S. law, biologically the implications of this fact are unavoidable. To our knowledge, no measures have been taken to reduce bycatch of this species.

By FLMNH Ichtyology (FLMNH Ichtyology) [CC BY-SA 4.0 (http://creativecommons.org/licenses/by-sa/4.0)], via Wikimedia Commons

RECOMMENDATIONS

1. California Must Phase Out the Use of Driftnets Immediately
   Provide Funding for a Fishery Transition Plan

2. Employ Only Highly Selective Gear in the Swordfish Fishery
   Transition Away from Harvest of Mercury-laden Fish

3. Keep Protected Areas Closed
   Expand Marine Protected Areas (MPAs) to Better Protect Ocean Biodiversity

ENDNOTES

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10. The IUCN Red List is considered the gold standard of such assessments internationally. www.redlist.org
11. The IUCN considers "A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild", see http://www.iucnredlist.org/static/categories_criteria_3_1#critical
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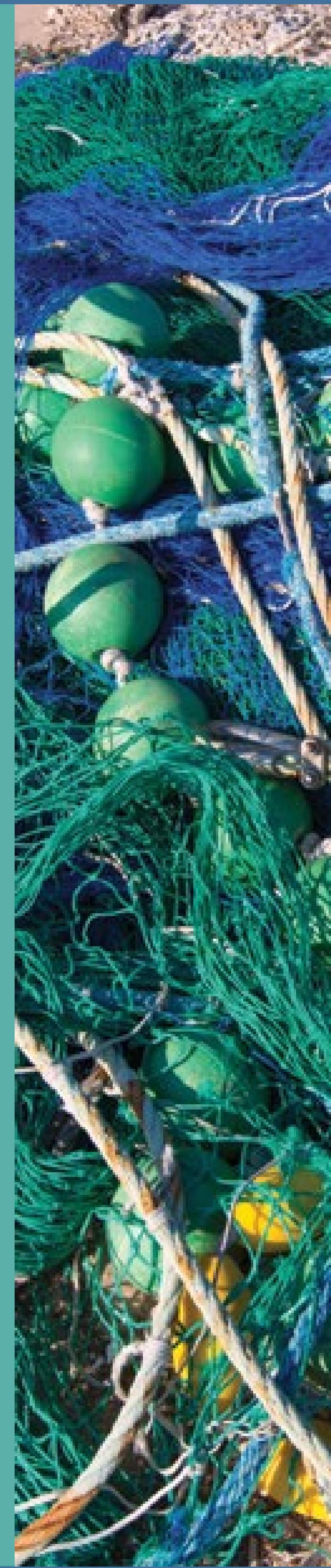

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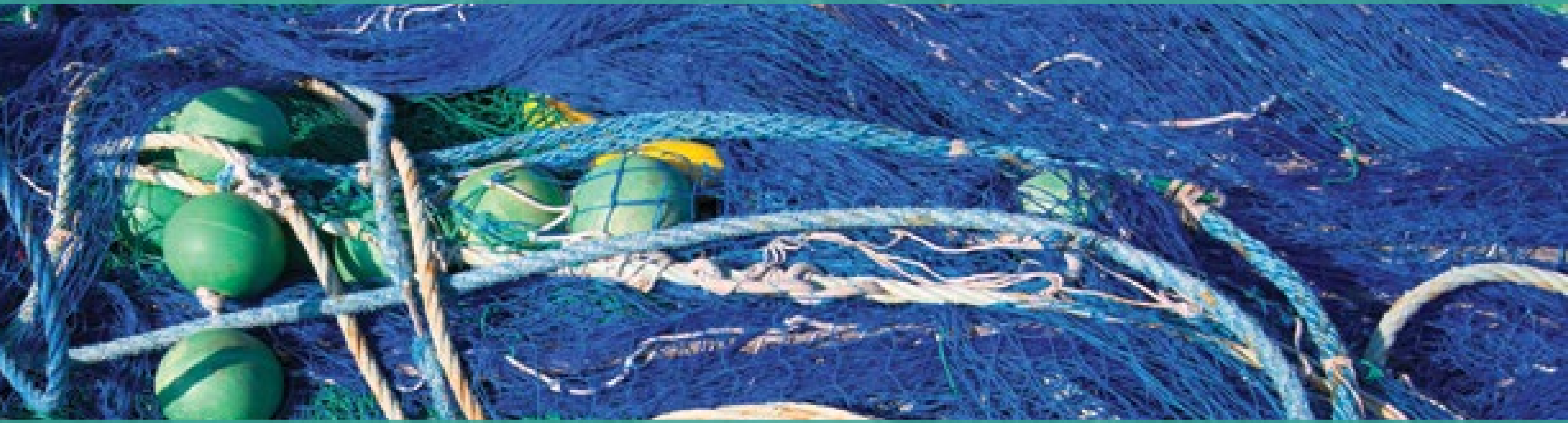

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