Tab M. No. 4

Shark Depredation

Karyl Brewster-Geisz

Atlantic HMS Management Division

2019

Depredation by sharks is not a new phenomenon

Negative Impacts

- Mortality on target stocks
- Lost Revenues
- Lost Seafood
- Gear Damage
- Negative social impacts

NOAA FISHERIES

Shark Depredation

- HMS is receiving more frequent reports of shark depredation in various fisheries over the last few years
- Impacts are widespread
  - Council-, State-, and HMS-managed fisheries
  - Northeast, Southeast, Gulf of Mexico, and U.S. Caribbean

NOAA FISHERIES

NOAA FISHERIES

Shark Depredation

- South Atlantic and GOM Fishery Management Councils have requested action to solve this problem
- Solutions may be limited by a variety of factors

NOAA FISHERIES

Shark Depredation - Challenges

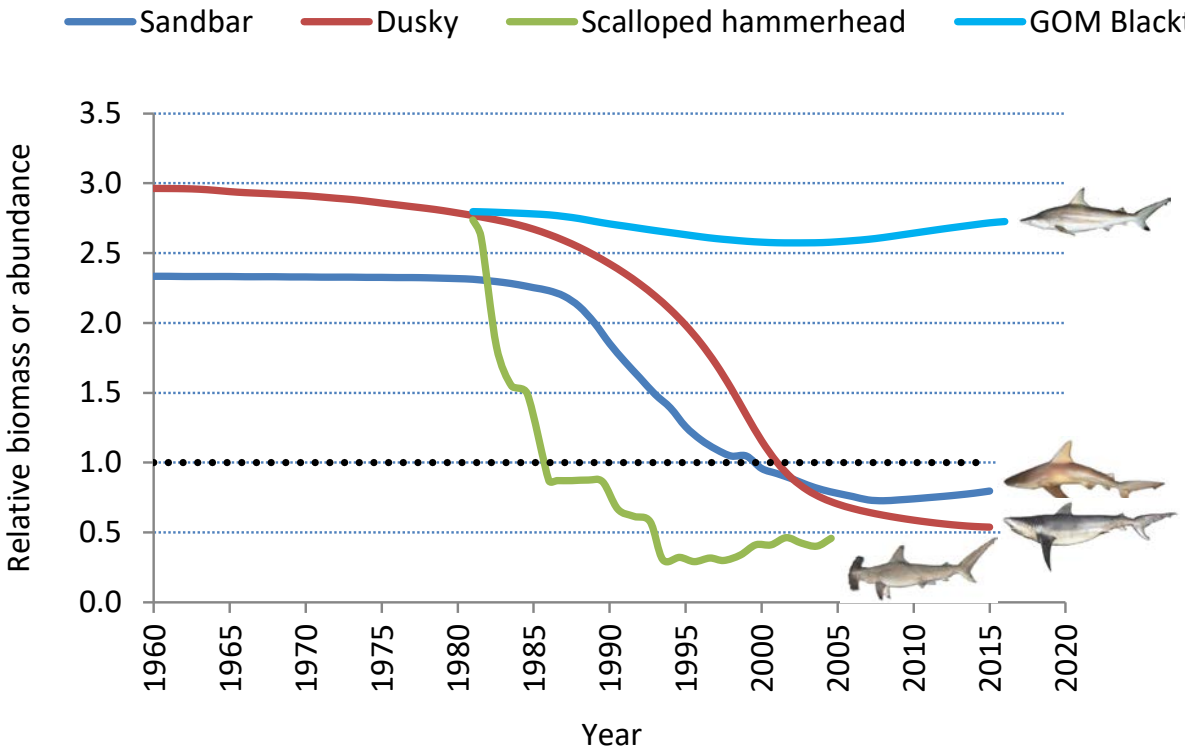
- Limited Reporting
  - There is no consistent and verifiable reporting of depredation events
  - We are unable to quantify the extent of the problem
  - Shark species involved often unknown or difficult to confirm
- Multiple Shark Species Implicated
  - Sandbar, dusky, silky, blacktip, spinner, spiny dogfish, porbeagle, blue, white, bull, tiger, hammerheads, Caribbean reef
  - These species have mixed stock statuses. Some are prohibited species.
  - Several stocks rebuilding
- Multiple Fisheries Affected
  - Northeast/Mid-Atlantic: Groundfish, Striped Bass, Black Sea Bass, HMS
  - Southeast/Gulf/Caribbean: Snapper-Grouper, Dolphin, Wahoo, Mackerel, Shrimp, Tarpon, Jacks, HMS

Shark Management – Brief History

- Managed since 1993
- Established 3 complexes for 39 species
- Limited Access started in 1999
- Managed more and more at a species level
- Currently manage 42 species (45 stocks)
- From 1993 until 2015 commercial quotas harvested fully (sometimes exceeded) very quickly

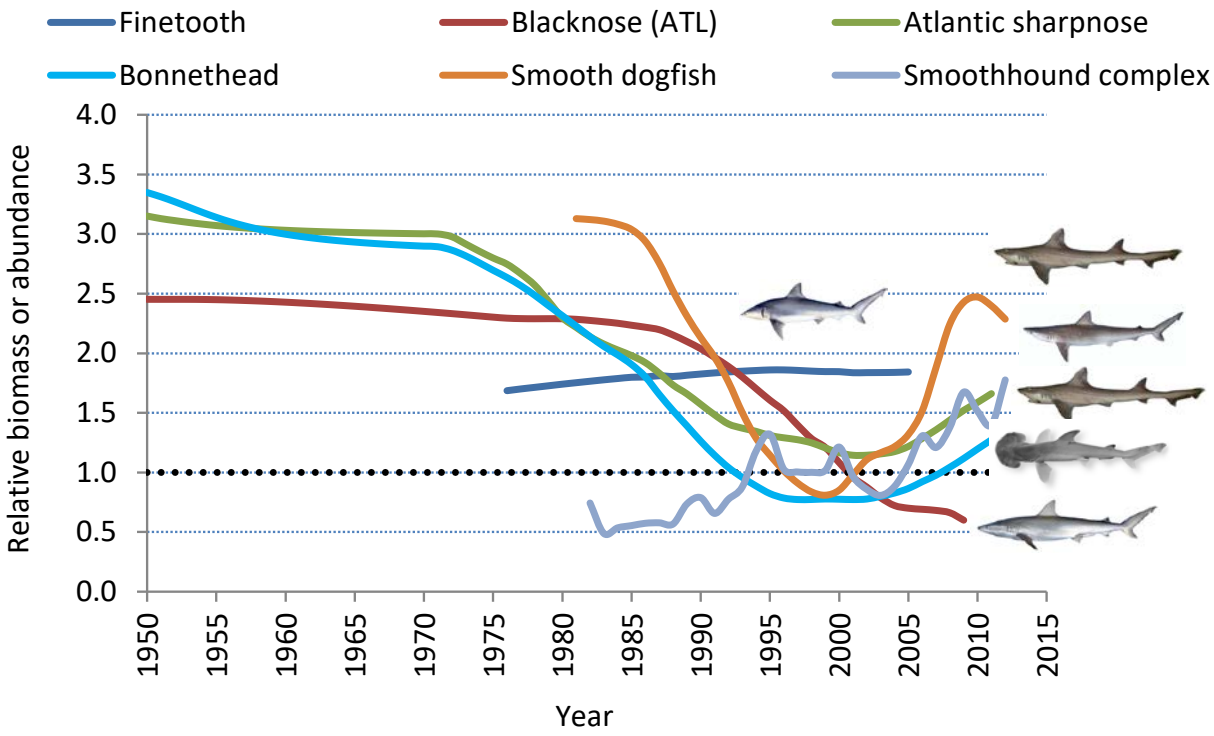
NOAA FISHERIES

Relative biomass (abundance) of large coastal shark stocks



NOAA FISHERIES

Relative biomass (abundance) of small coastal shark stocks



NOAA FISHERIES

Status of the Shark Fishery

- Commercial quotas have not been caught in recent years

2017-2019 Averages

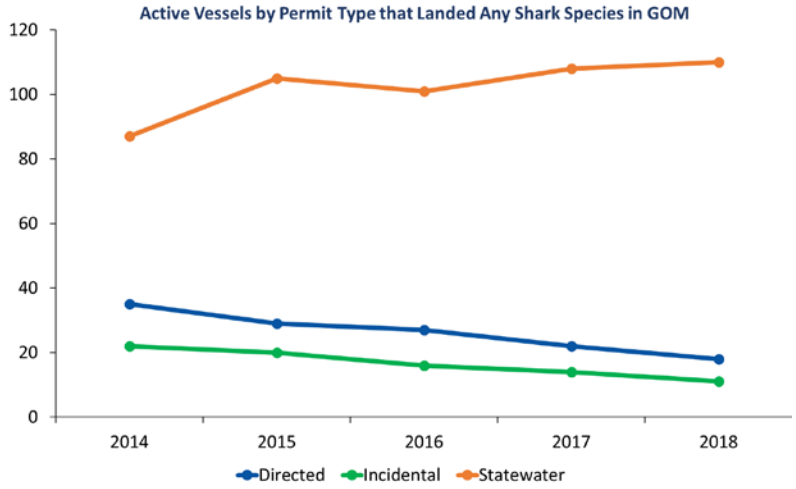
	Species/Complex	Quota	% Landed
WGOM	Blacktip	682,912	62%
	Agg LCS	121,983	98%
	Hammerhead	20,400	46%
EGOM	Blacktip	78,203	70%
	Agg LCS	225,304	71%
	Hammerhead	35,340	70%
GOM	Non-BKN SCS	248,215	56%
	Smoothhound	1,112,441	1%
ATL	Agg LCS	372,552	56%
	Hammerhead	59,736	43%
	Non-BKN SCS	582,333	48%
	Blacknose	37,921	42%
	Smoothhound	3,973,902	21%
No Region	LCS Research	110,230	40%
	SSB Research	199,943	65%
	Blue	601,856	2%
	Porbeagle	3,748	30%
	Other Pelagics	1,075,856	14%

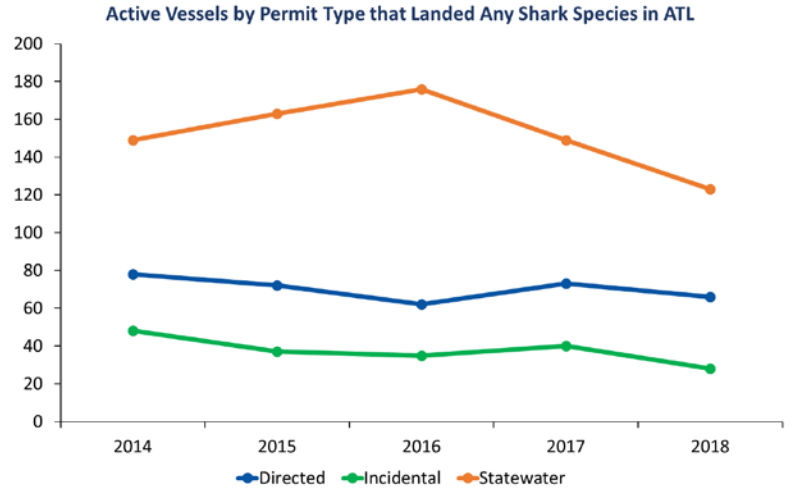
NOAA FISHERIES

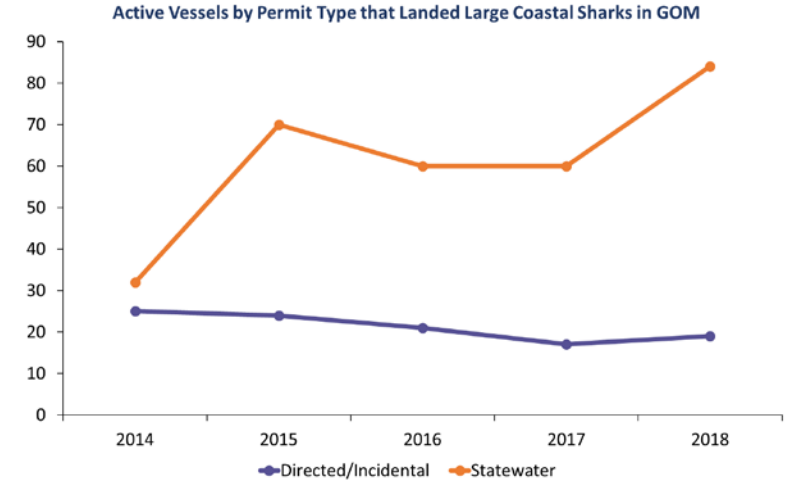
Related Actions

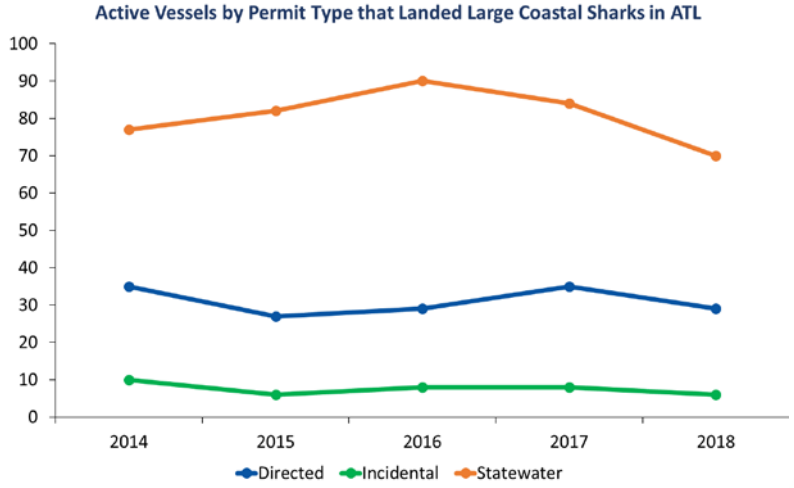
- 2020 Shark Specifications – changed how quotas will be monitored, starting retention limits
- Amendment 14 – Restructuring how shark quotas are established
- Spatial Management and Data Collection – Collecting data from closed areas
- Atlantic blacktip shark assessment – underway
- Hammerhead shark assessment – starting 2021
- Implementation of biological opinions – Oceanic whitetip, scalloped hammerhead (only in Caribbean)
- Shark Fishery Review (SHARE) – Internal HMS initiative to explore fishery-dependent and –independent shark data

NOAA FISHERIES









NOAA FISHERIES

Shark Depredation - Questions

- Are there fishing techniques/strategies that attract sharks?
- Are there specific locations and seasons where depredation is more frequent?
- What are the best practices to quantify the ecological and socioeconomic impacts?

NOAA FISHERIES

Shark Depredation - Progress

- Drymon et al. (2019) developed a genetic method to identify shark species involved with depredation

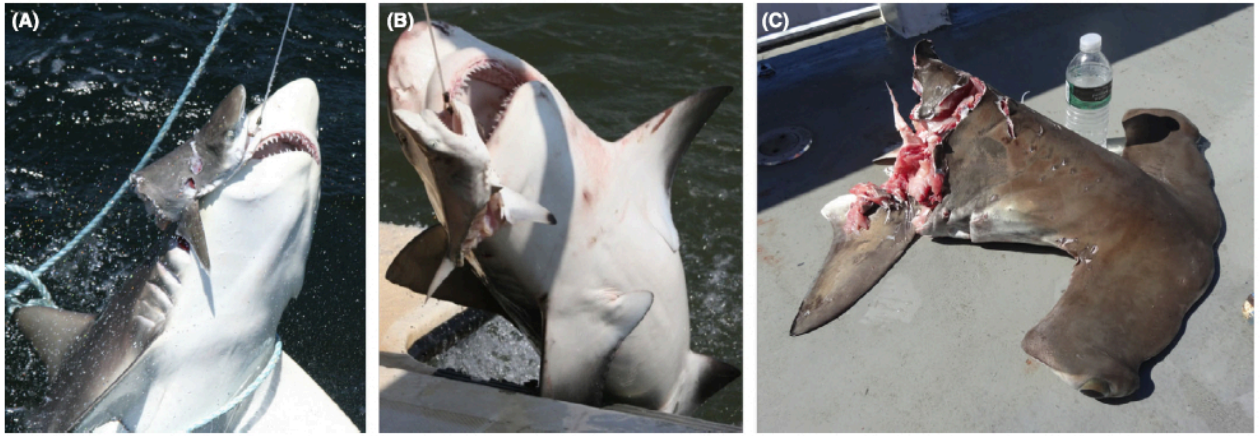


FIGURE 1. Shark depredation by sharks captured during fishery-independent bottom longline surveys. Atlantic Sharpnose Sharks were the most common prey, resulting from interactions with (A) Blacktip Sharks and (B) Bull Sharks, although larger species such as (C) Scalloped Hammerheads were also subject to depredation.

Drymon, JM, PT Cooper, SP Powers, MM Miller, S Magnusson, E Krell, and C Bird (2019) Genetic identification of species responsible for depredation in commercial and recreational fisheries. *North American Journal of Fisheries Management* 39(3):524-534.

NOAA FISHERIES

Shark Depredation - Considerations

- HMS is aware of the issue
  - Frequency of reports appears to be increasing
  - The extent of the problem and species involved is difficult to quantify
- HMS needs more data
  - Observer programs, logbooks, EM?
  - Depredation has been identified as a research priority
- HMS management is bound to MSA requirements
  - Overfished stocks must be rebuilt
  - Overfishing is not permitted
  - Find ways to work within legal constraints to minimize conflicts between sharks and other fisheries
    - Help ensure that optimum yield is attained and quotas are harvested
    - Align fishing seasons between sharks and target species?
    - Shark deterrent technologies?

NOAA FISHERIES

Shark Depredation - Conclusions

We are aware of the issue

We are open to suggestions

- Data collection?
- Research proposals?
- Creative solutions?

- CONTACT: Karyl.Brewster-Geisz@noaa.gov

NOAA FISHERIES