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Shark Depredation

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Outline

- Background
- Challenges
- Shark Management History
- Status of Commercial Shark Fishery
- Status of Recreational Shark Fishery
- Questions

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Depredation by sharks is not a new phenomenon

Potential Impacts

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

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Shark Depredation

- HMS Mgmt. Div. 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

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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

Jeff Kneebone

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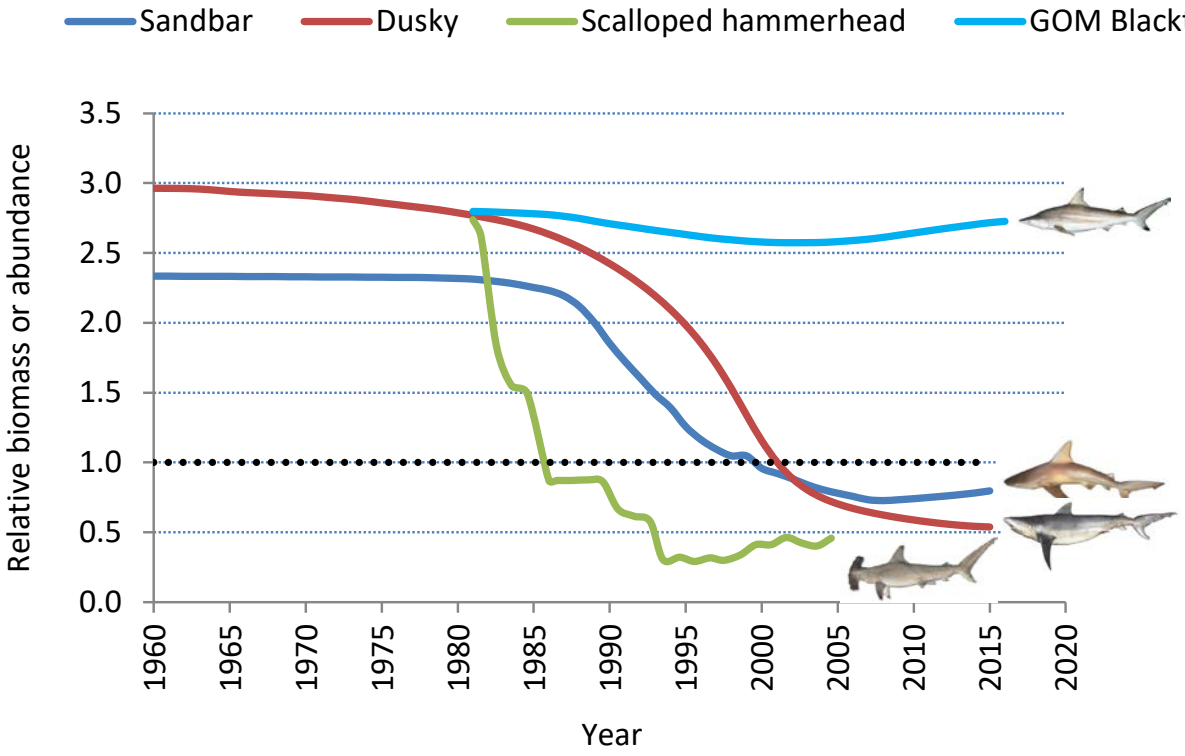
Shark Depredation - Challenges

- Limited Reporting
  - There is no consistent and verifiable reporting of depredation events, which makes it difficult 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
- Increasingly managed at a species level
- Currently manage 42 species (45 stocks)
- From 1993 until 2015 commercial quotas harvested fully (sometimes exceeded) very quickly

Relative biomass (abundance) of large coastal shark stocks



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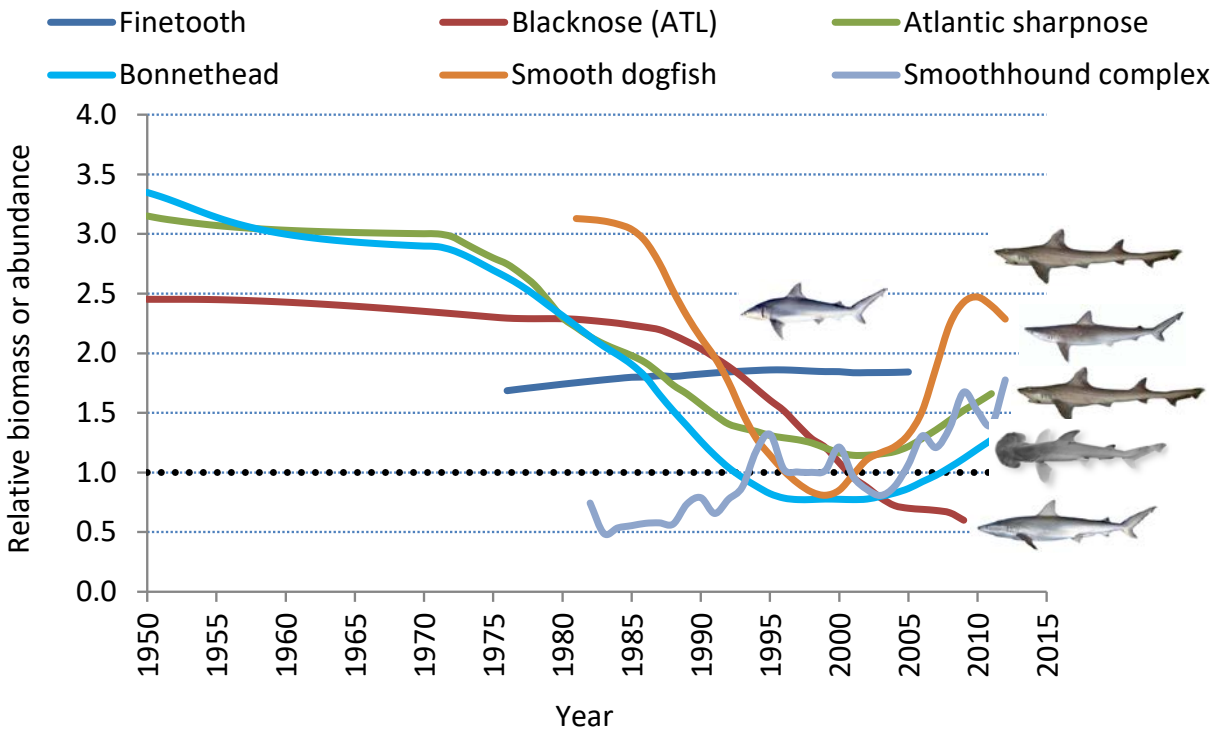
Relative biomass (abundance) of small coastal shark stocks



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Related Actions

- Amendment 14 – Restructuring how shark quotas are established; public comments due Dec 31
- 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 initiative to explore all areas of the shark fishery (commercial, recreational, market, areas of concern, and guidance for future rulemaking)

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Status of the Commercial Shark Fishery

Generally, from 2014-2019…

- The number of active permit holders has declined
- The number of trips landing and targeting sharks has declined
- Mean landings per trip (by weight) have declined
- A small number of shark fishermen account for a large portion of landings

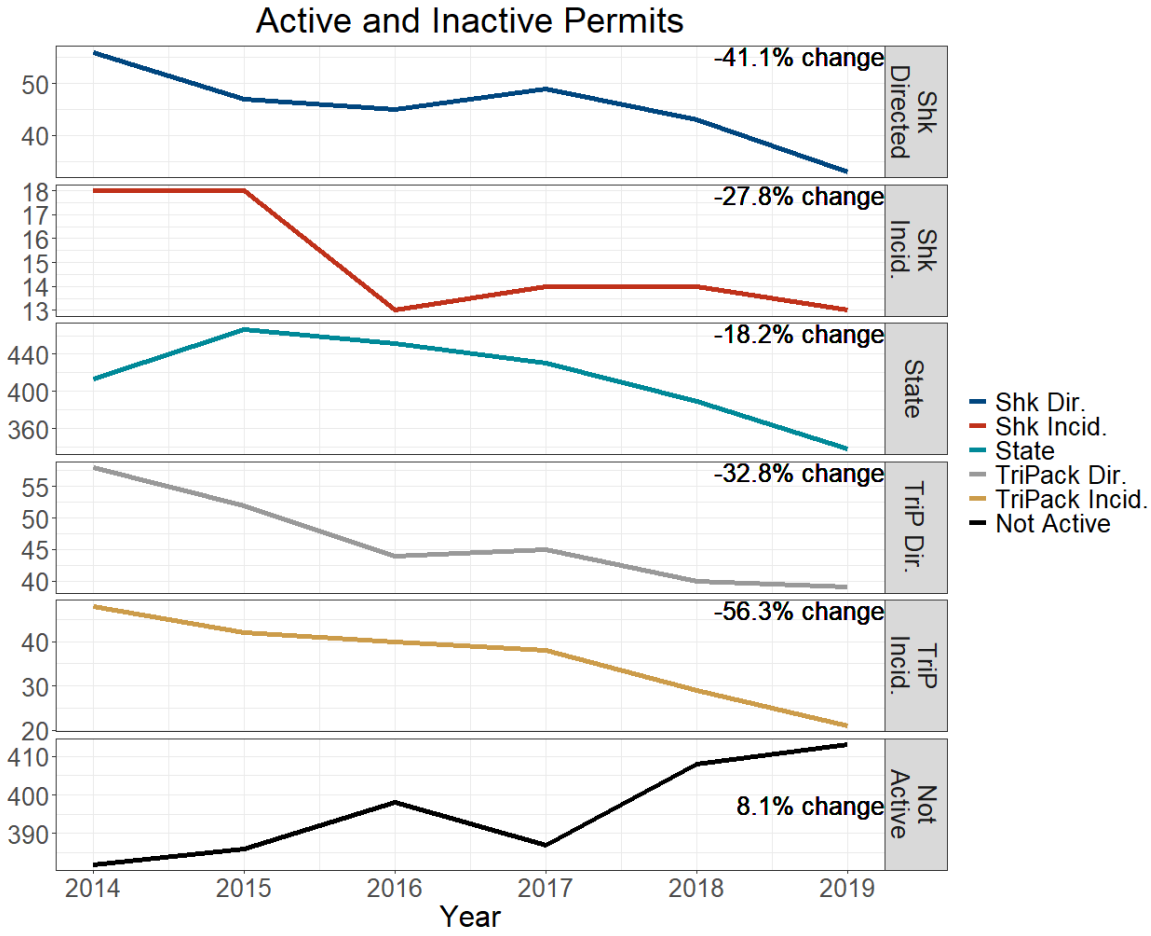
Commercial Permits

- 41% reduction of active permits
- Total number of issued* shark directed and incidental decreased >10%

*Issued permits includes active and inactive

TriPack Dir. = Shark Directed Permit carried with Swordfish and Atlantic Tuna Longline Permits

TriPack Incid. = Shark Incidental Permit carried with Swordfish and Atlantic Tuna Longline Permits



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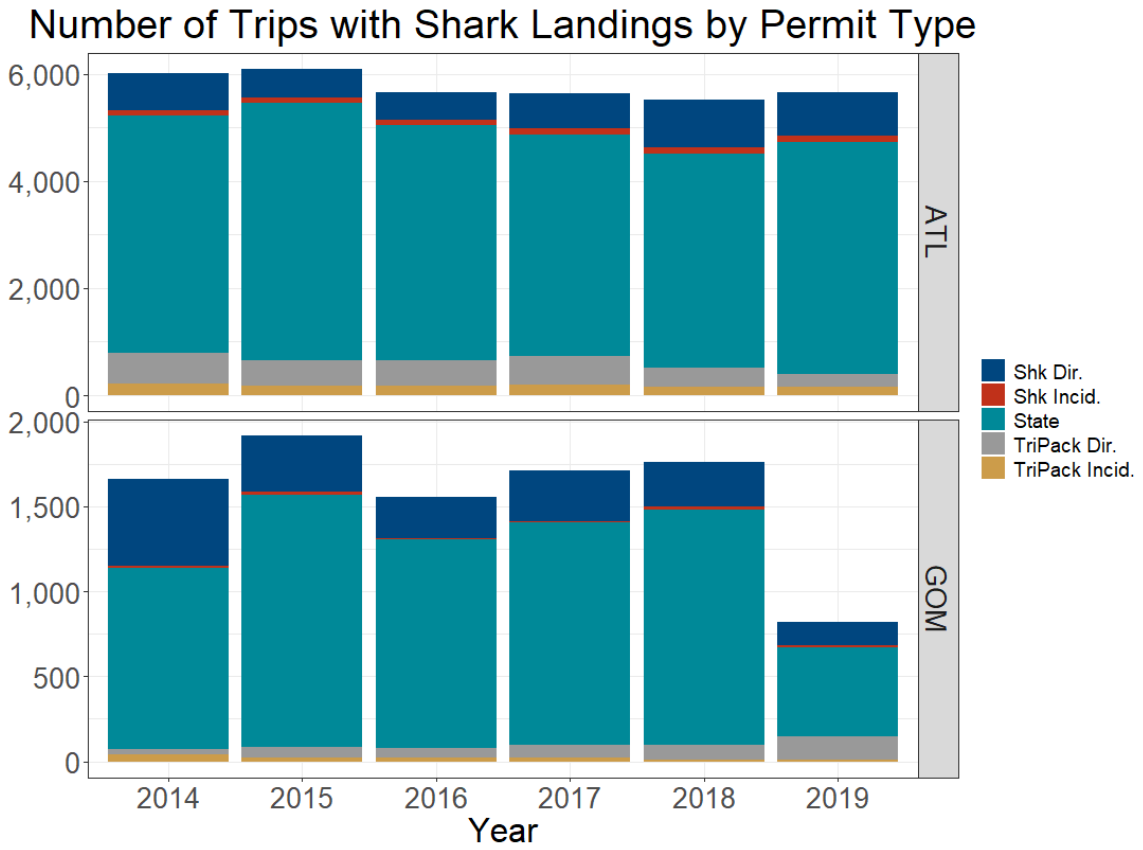
Commercial Trips

- Includes trips with any shark landings
- Most trips conducted by State fishermen
- Large decline in number of trips in Gulf of Mexico in 2019



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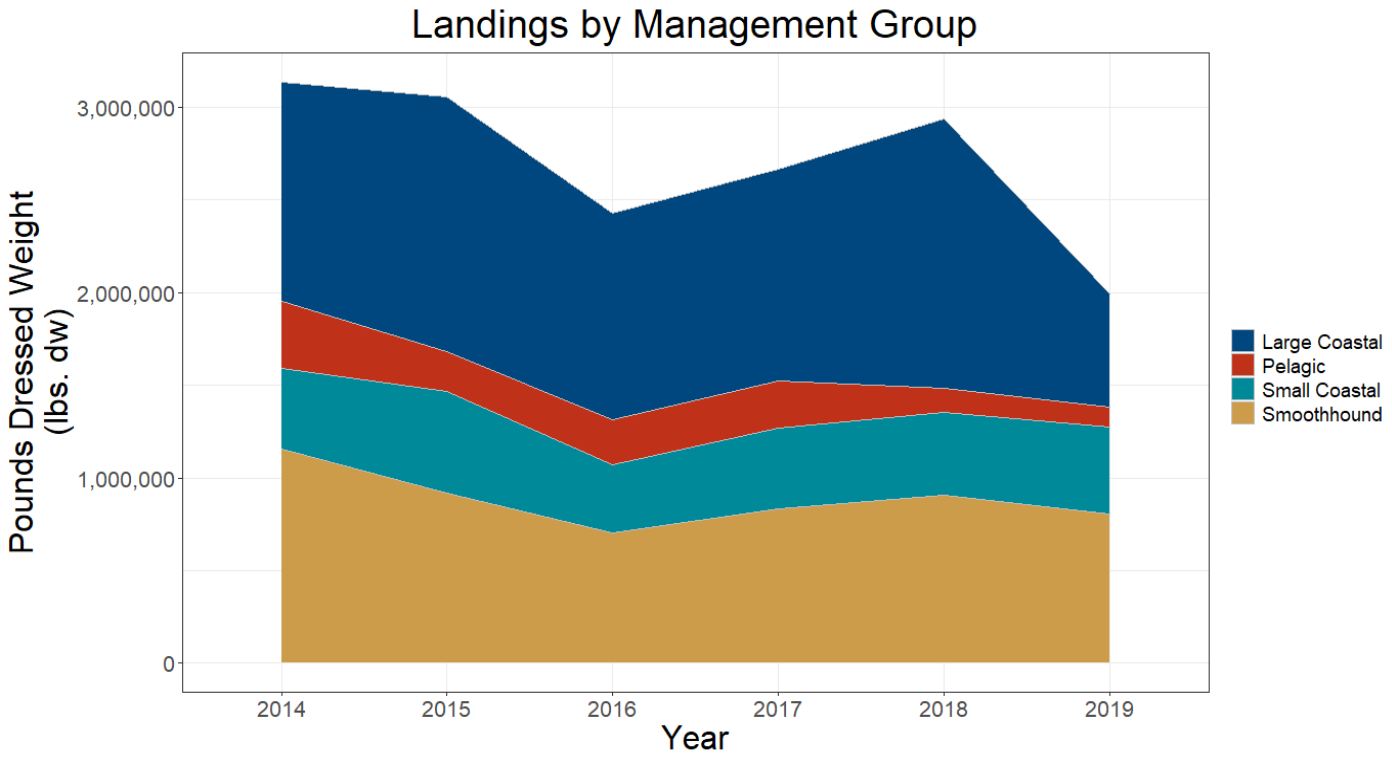
Commercial Landings

Top Species Landed from each Management Group, 2014-2019

Management Group	Species	Dressed Weight (lbs.)
Large Coastal	Blacktip	4,144,076
Large Coastal	Bull	1,223,225
Large Coastal	Spinner	641,420
Pelagic	Shortfin Mako	817,572
Pelagic	Thresher	443,532
Small Coastal	Atlantic Sharpnose	2,059,684
Small Coastal	Finetooth	444,940
Smoothhound	Smooth Dogfish	5,321,260



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Status of the Recreational Shark Fishery

Generally, from 2014-2020…

- The number of permit holders with shark endorsements did not change from 2018 to 2020
- The number of directed shark trips has declined in the last 6 years
- Overall, smoothhound, Atlantic sharpnose, and bonnethead sharks are the most caught shark species
- Most sharks caught are released, and may not be identified to species

Shark Depredation - Questions

- What else to should HMS consider?
- What factors drive depredation events?

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Shark Depredation - Progress

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

- Preliminary research to quantify shark depredation
  - Pelagic Longline
    - Much higher rates of depredation than reef fish
    - Generally stable through time
    - Seasonal and regional variation
  - Gulf Reef Fish
    - Increasing over time
    - W. Gulf with higher rates of shark depredation
    - Seasonal variation exists
    - Bottom longline gear exhibited higher rates of depredation than vertical line

Shark Depredation - Considerations

- HMS Mgmt. Div. is aware of the issue
  - Frequency of reports appears to be increasing
  - The extent of the problem and species involved is difficult to quantify
- We need more data
  - Observer programs, logbooks, EM?
  - Depredation has been identified as a research priority
- Shark 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?

Shark Depredation - Conclusions

We are aware of the issue

We are open to suggestions

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

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