



NOAA
FISHERIES

Tab M, No. 4(a)

Shark Depredation Action Plan

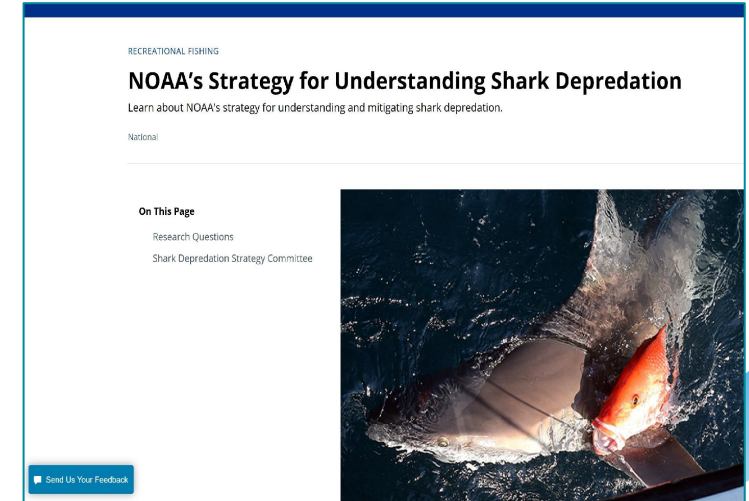
Gulf Council Meeting
October 2026

Goal of the Shark Depredation Action Plan

- Shark depredation consequences range from economic losses from lost or damaged catch, bait, and gear; increased mortality of released fish and degraded fishing experiences
- NOAA has developed a Shark Depredation Action Plan to address many of these issues
- Actions and goals to currently address the shark depredation issue along the U.S. southeast coast and Gulf are consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable statutes

**Actions in this plan may have applicability for use in other Ocean areas*

<https://www.fisheries.noaa.gov/national/recreational-fishing/noaas-strategy-understanding-shark-depredation>



GOALS:

- STOCK ASSESSMENT AND DATA COLLECTION:
 - Goal 1: Sandbar shark stock assessment and scientific monitoring
 - Goal 2: Expand assessment and scientific monitoring to other species hypothesized to be a “high depredation” species (e.g. bull shark)
- RESEARCH:
 - Goal 1: Establish a scientific framework for characterizing/mitigating shark depredation
 - Goal 2: Advance tech innovations for bycatch mitigation/gear selectivity
- MANAGEMENT ACTION:
 - Goal 1. Optimize Sustainable Harvest Opportunities and Management Flexibility

EVENTS

September 2026 HMS Advisory Panel Meeting

NOAA Fisheries will hold a 2-day hybrid meeting of the Atlantic Highly Migratory Species Advisory Panel September 9-10, 2026. This meeting is open to the public and will have a webinar option.

Meeting | New England/Mid-Atlantic, Southeast

Event Info

Date
September 9, 2026 - September 10, 2026

Location
8777 Georgia Avenue
Silver Spring, MD 20910

Key Resources
→ Federal Register Notice

About

What: Atlantic Highly Migratory Species Advisory Panel Fall 2026 Meeting

When: Wednesday, September 9, 2026, 9 a.m. – 5 p.m. ET Thursday, September 10, 2026, 9 a.m. – 3 p.m. ET

Where: The meeting will be held at the DoubleTree by Hilton Silver Spring Hotel, 8777 Georgia Avenue, Silver Spring, MD 20910. The meeting will also be accessible as a webinar/conference call.

Details: The intent of the Atlantic Highly Migratory Species Advisory Panel meeting is to consider options for the conservation and management of Atlantic Highly Migratory Species.

Discussion topics will include:

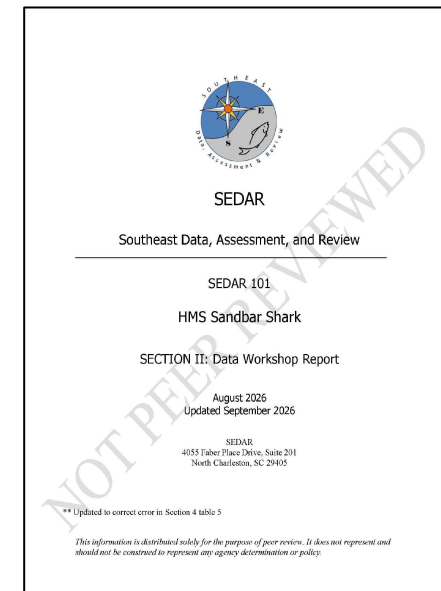
- Atlantic bluefin tuna fishery update (year in review)
- Highly Migratory Species fisheries economics update
- Updates on various shark actions
- Continued discussion on actions under Executive Order 14276

We anticipate having other NOAA Fisheries offices and the U.S. Coast Guard to provide updates, if available, on their activities relevant to Atlantic highly migratory species fisheries. The full agenda will be posted prior to the meeting.

<https://www.fisheries.noaa.gov/event/september-2026-hms-advisory-panel-meeting>

Goal 1: Sandbar shark stock assessment

- Public comments, primarily recreational and commercial fisherman as well as some spearfishing groups, have suggested the stock of sandbar shark has recovered from the overfished status determined in 2018. Sandbar shark are one of the primary species associated with depredation events.
- Efforts underway to determine the status of sandbar shark through a stock assessment conducted under the SouthEast Data, Assessment, and Review (SEDAR)
 - Data Workshop held in April in Charleston, SC
 - Participants: ~55 scientists and representatives from organizations including NOAA Fisheries, FWC, SCDNR, VIMS, Mote Marine Lab, and University of Miami
 - Focus Areas: Reviewing catch statistics, abundance indices, life history parameters, and discard mortality
 - Next Steps: The assessment models are currently being conducted, with peer review via a Center for Independent Experts (CIE).
 - Final results anticipated in early 2027.



Goal 2: Expand assessment and scientific monitoring to other species hypothesized to be a “high depredation” species

- Potential application of a Management Strategy Evaluation (MSE) simulation approach to manage a stock based on a model-based or empirical harvest control rule or strategy
- The Sandbar MSE will allow us to adapt this process and these models for other species of sharks on a shorter timescale (e.g. bull shark)
 - Bull shark have not been assessed through a stock assessment
 - We expect issues with data to be similar across other species
 - Uncharacterized historical landings, life history uncertainty, population scale, etc.
- Work to develop other ways to estimate absolute abundance (e.g. Close Kin Mark Recapture, CKMR)
 - Empirical management procedures are likely to be the most appropriate way to provide management advice for these species

RESEARCH

- Goal 1: Establish a scientific framework for characterizing/mitigating shark depredation
 - Is the trend in depredation increasing and are factors associated with this?
 - Perception vs quantitative evidence
- Very few long-term data sets available
 - Only commercial data examined
 - Research currently underway from a scientific longline survey



REPORT TO CONGRESS

INTERACTIONS BETWEEN BOTTLENOSE DOLPHINS
AND SHARKS AND COMMERCIAL, FOR-HIRE, AND
PRIVATE RECREATIONAL FISHERIES IN THE GULF
OF MEXICO AND SOUTH ATLANTIC

Developed pursuant to: Joint Explanatory Statement accompanying the Consolidated
Appropriations Act, 2021 (Public Law 116-260)



Are shark depredation rates increasing in pelagic longline fisheries?

Sarah Roberts (CIMAS/SEFSC), Marcus Drymon (MS State), Eric Orbesen (NOAA SEFSC), Tobey Curtis (NOAA HMS)

- What else, besides year, can explain regional shark depredation?
 - e.g. Environment, catch composition, location, gear. Can we use these relationships to help avoid depredation?
- Can we predict regional shark depredation in real time?
 - Build predictive models for inputs into mobile-based tool for fishermen to aid in avoiding depredation on the water

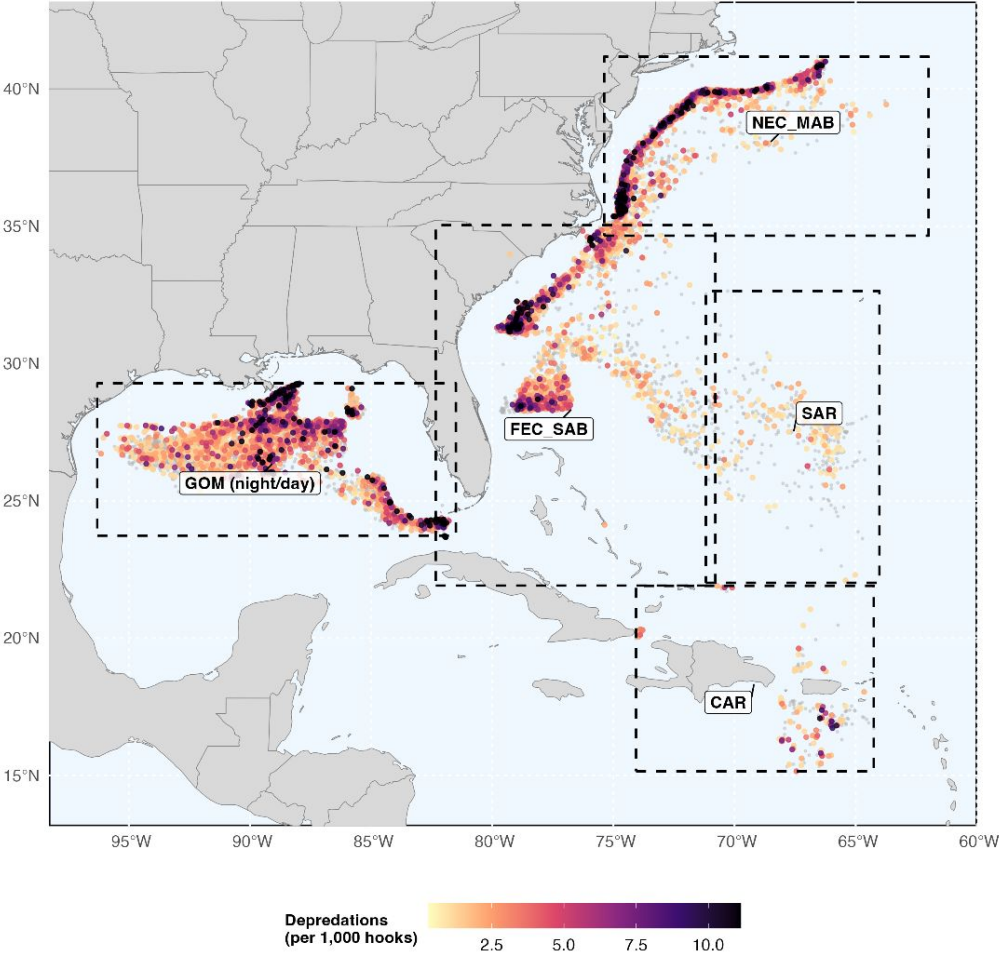


Are shark depredation rates increasing?

Yes, but it is regionally-dependent and sometimes non-linear

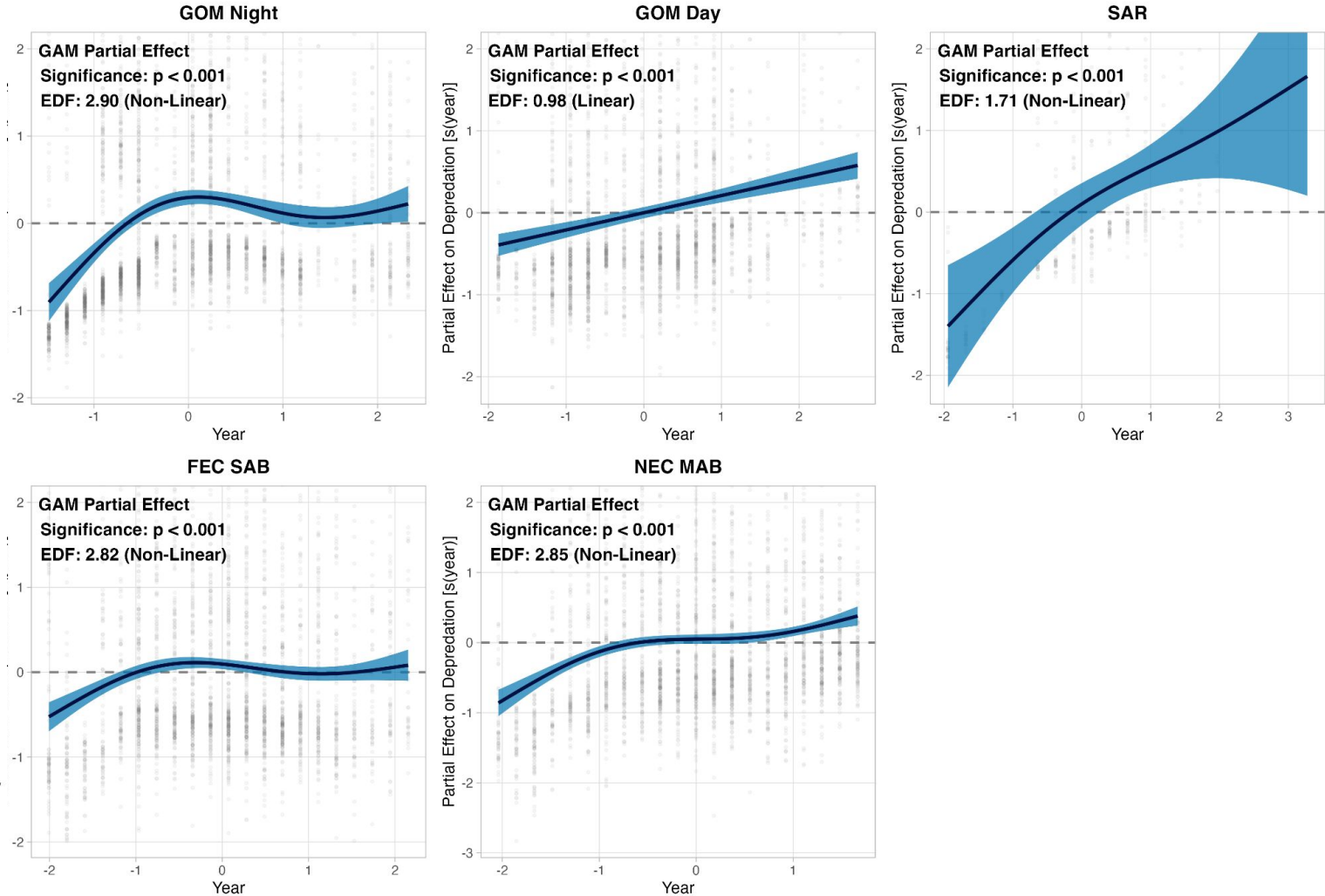
Shark Depredation Rates Across the Northwest Atlantic (2004-2025)

Aggregated Dataset (Training + Testing) | Grey points = Zero Depredation



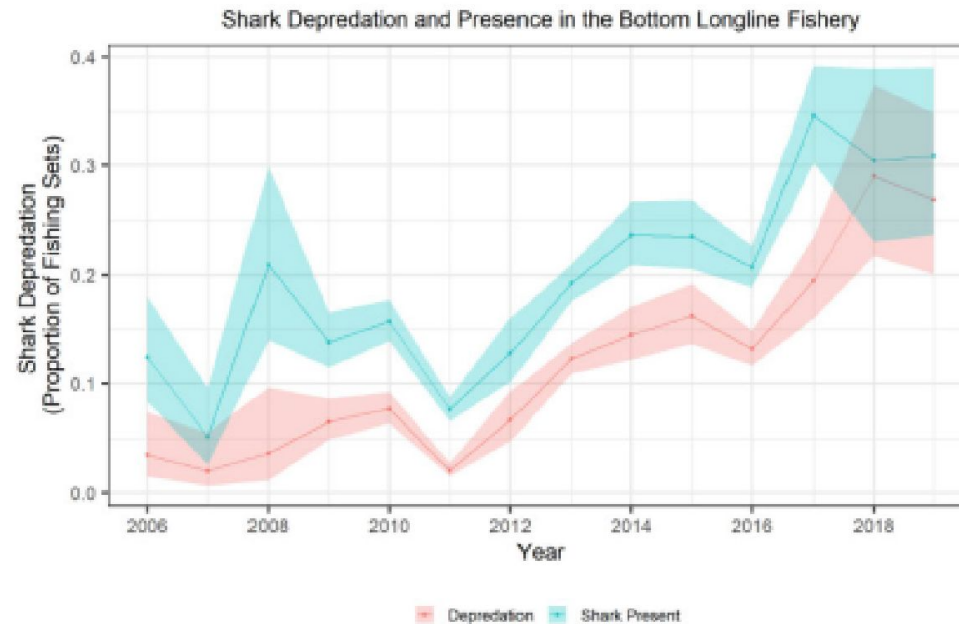
True Spatiotemporal GAM Effects: Year

Grey dots represent partial residuals. Shaded regions are 95% CIs. EDF > 1 indicates a non-linear effect.



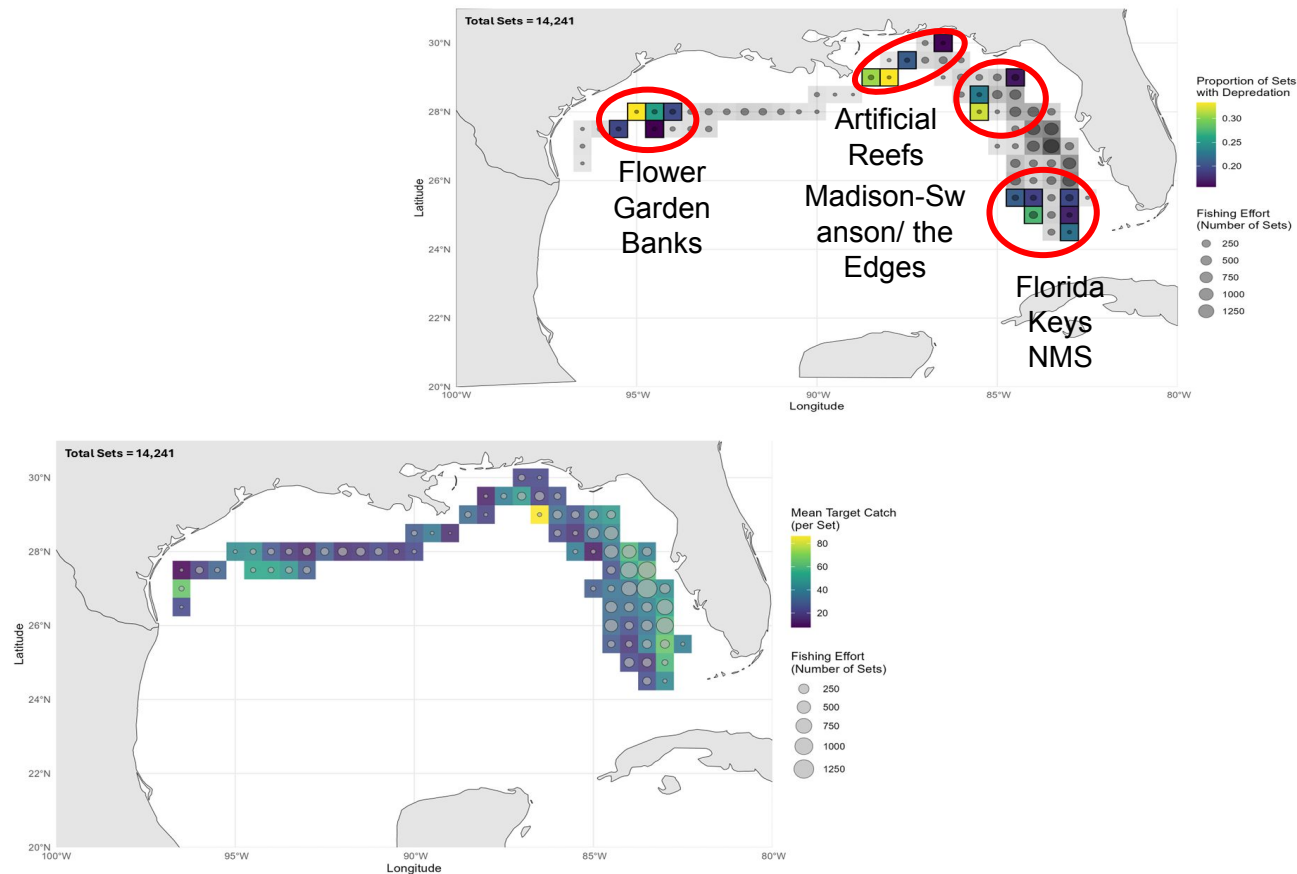
Are shark depredation rates increasing in Gulf reef fish bottom longline fishery?

Kyle King (NOAA/NERTO/SEFSC) , Daniel Coffey (TX A&M), John Carlson (SEFSC)

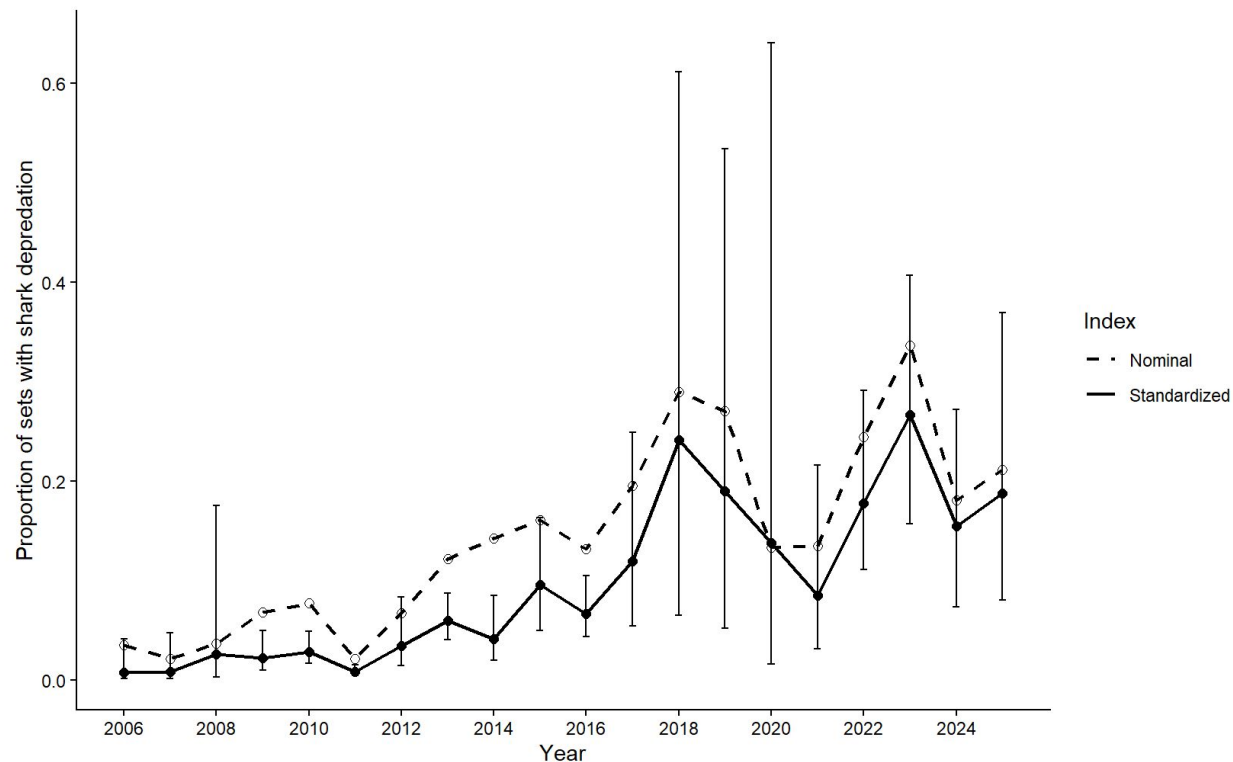


From Duffin et al. unpublished data.

- Data were collected from the Gulf of America commercial bottom longline (BLL) observer program from 2006-2025, with 14,241 total sets.
- Shark depredation was reported as present or absent on each set by observers. Sets ranged from the western Gulf, Brownsville, Texas, to Dry Tortugas, Florida, with variable effort across region and year



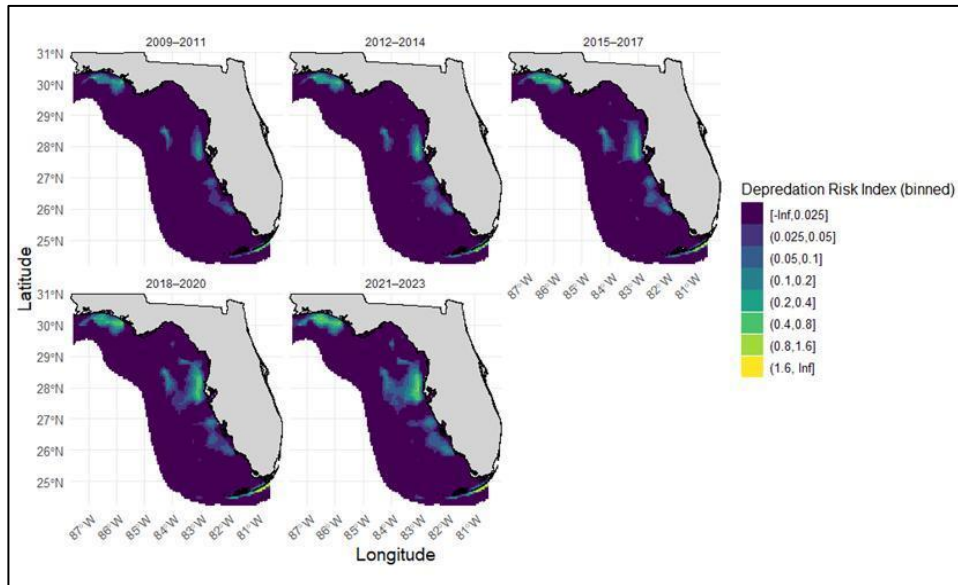
- A binomial generalized linear mixed model with a logit link was used to evaluate the probability of shark depredation while accounting for operational variables soak time, depth, season, and year
- Annual predictors were standardized by averaging predicted probabilities over the same pooled distribution of season, depth, and soak time, with the trip random effect



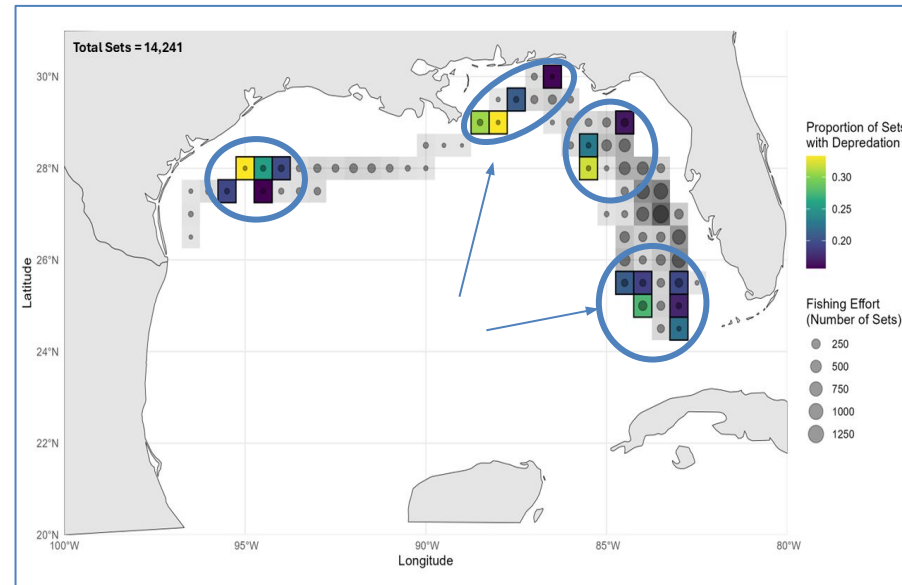
RESEARCH:

Goal 1: Establish a scientific framework for characterizing/mitigating shark depredation

Analysis of data from the reef fish bottom longline fishery suggests “high depredation risk areas”



Aycock et al. 2025



King et al. 2026

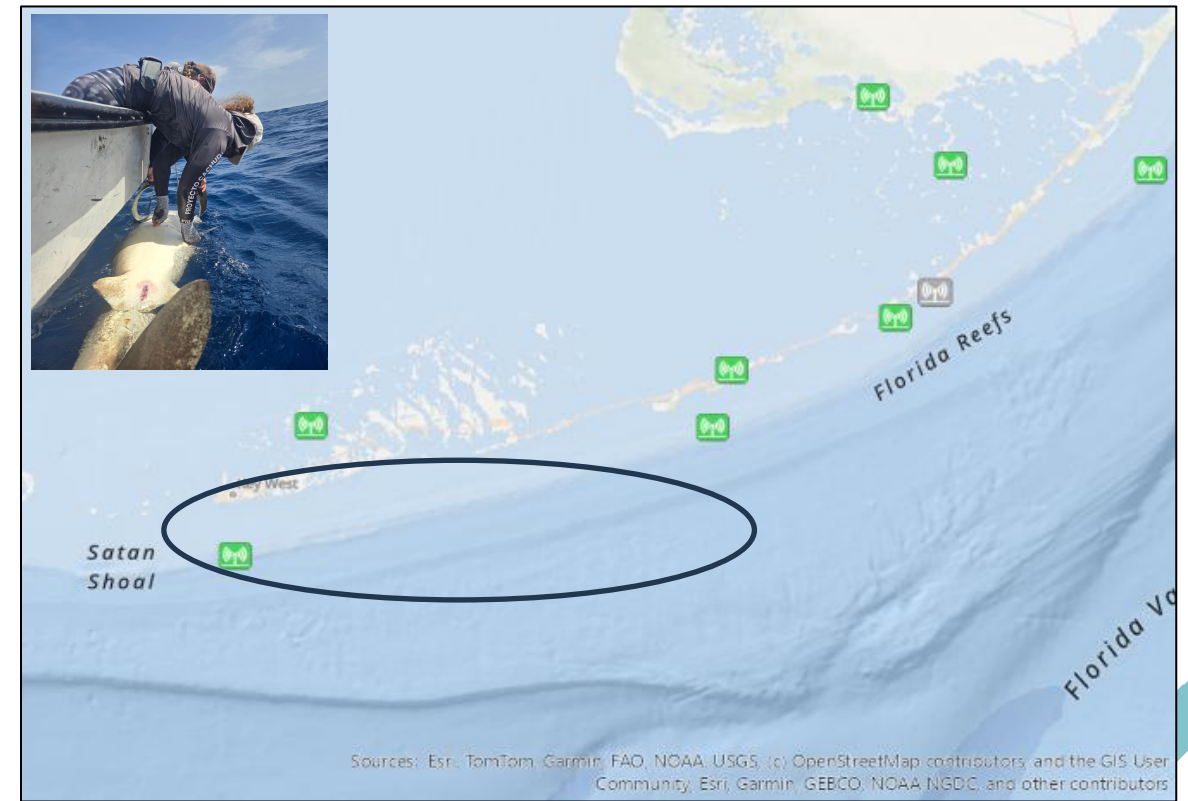
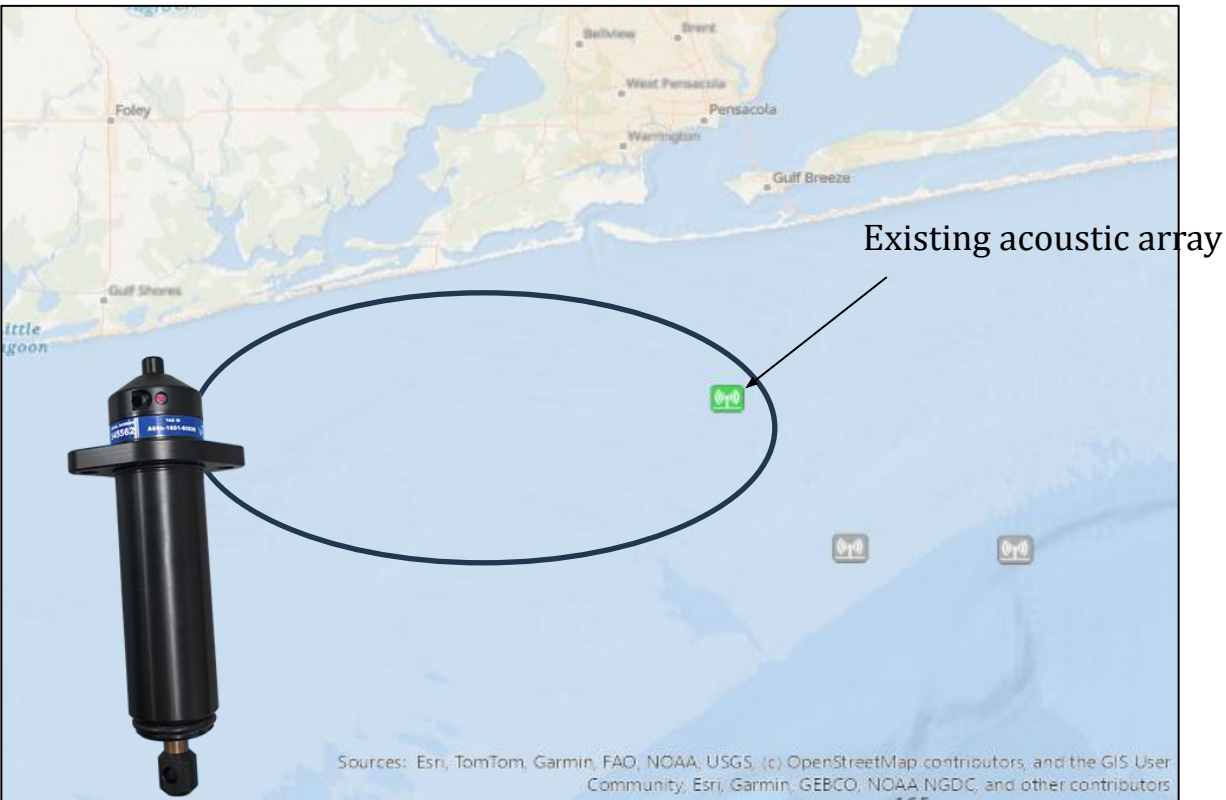
Research: Monitoring residency and movements of sandbar shark

- Is depredation localized or systemic?
- Are there individuals acclimated to depredation (i.e. campground bears)?
- If sharks are not resident, what cues are causing them to move to these areas?
 - Engine noise, struggling fish, discards
- Cooperation with commercial shark fishery and recreational reef fish fishery to monitor fishing activity and depredation rates
- Acoustic and satellite telemetry will be used to monitor shark residency/movement in these “depredation hotspots”. Mobile App development for data collection by recreational fisherman



Research: Monitoring residency and movements of sandbar shark

Proposed research areas



Interested participants: (nmfs.sefsc.sharkdepredation@noaa.gov)

Moving forward with the collaborative research

- Depredation issues in Florida Keys and Everglades National Park
 - Collaboration with Bonefish and Tarpon Trust to examine the status of lemon shark through relative abundance analysis
- Advance tech innovations for bycatch mitigation/gear selectivity
 - Compare and contrast the various “shark deterrents” as a method to reduce shark depredation (15 collaborators)
 - Complete meta-analysis of existing science on deterrents, especially considering economic impacts, and target most promising options for expanded testing and industry feedback
 - Build on existing meta-analysis studi

	A	B	C	D	E	F	G	H	I	J	K
	STUDY (MLA format)	DETERRENT	COST PER UNIT	SIZE (WEIGHT/LENGTH) OF UNIT	LONGEVITY OF UNIT	LABORATORY/FIELD	SPECIES1	LIFE STAGE	SAMPLE SIZE (i.e. number of sharks the deterrent was tested including control)	NUMBER OF TIMES DETERRENT WAS DEPLOYED (i.e. proxy for effort)	EXPERIMENTAL DESIGN/REPLICATION
1	Vardon J, Williams S, Barnett A, Huveneers C, Mitchell J, Dudgeon C, Morgan J, Holmes B (in prep) Evaluating the effectiveness of shark deterrents to mitigate depredation in line-based fisheries	OceanGuardian Fish01	\$1,999 USD	430 mm L x 141 mm W x 141 mm H		Field	Bull sharks, pigeye sharks, grey reef sharks, great hammerhead sharks	Juvenile/Adult		60 fishing sessions ranging from 12 - 50 mins in duration	Y
7	Robbins, W.D., Peddemors, V.M. and Kennelly, S.J., 2011. Assessment of permanent magnets and electropositive metals to reduce the line-based capture of Galapagos sharks, Carcharhinus galapagensis. Fisheries Research, 109(1), pp.100-106.	Electropositive metal magnets	neodymium (\$15.00 to \$35.00 / gram); praseodymium (\$10.00 – \$30.00/gram)			Field	Galapagos sharks	Juvenile/Adult		240 trials, with 30 trials of each of the 8 magnet and electropositive metal combinations	Y
8	Morris, John, et al. "Electrical pulse device delays feeding by sandbar sharks, Carcharhinus plumbeus, a requiem shark frequently implicated in depredation." In prep-August 2026	electronic pulse device (Fishtek SharkGuard)	(\$2800 USD)	0.4" Diameter x 4' long	200 + hours immersion time	Laboratory/Field	Carchahinus plumbeus	Juvenile controlled experiments/Adults field observations	5		

QUESTIONS?

