

Impacts of Baiting Practices on Catch and Bycatch in Gillnets and Design of an Effective Outreach Program to Minimize Seabird Bycatch

Overview

Incidental mortality of seabird species continues in many commercial fisheries, including species impacted by the 2010 Deepwater Horizon oil spill. The Open Ocean Trustees Implementation Group is using settlement money to fund research to restore populations of birds impacted by this oil spill, including great shearwaters (*Ardenna gravis*) found in New England waters. Bycatch of great shearwaters occurs in gillnets targeting spiny dogfish (*Squalus acanthias*) in the waters off Cape Cod, MA. Based on conversations with fishery observers, scientists, and commercial fishermen, it seems likely that changing gillnet baiting practices may reduce shearwater bycatch.

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Collaborating with the
Cape Cod Commercial
Fishermen's Alliance



Data collection on the vessel

Kestrel weather station: To collect data on wind speed and direction, temperature, and barometric pressure

GoPro 1: aimed at vessel stern to collect footage while nets are set

GoPro 2: aimed at vessel starboard bow to collect footage as nets are hauled

Six nets per string are baited and six are not. The order of baiting is randomized.

After hauling, the following data is collected by net:

- Dogfish catch is counted and up to five dogfish per net are sexed and measured.
- Bait (skate racks) is counted.
- Catch weight is estimated by vessel captains.

If seabirds are caught,

- All birds are counted by net and identified to species.
- Up to five dead birds per net are saved for sampling (avian flu) and necropsies.
- Live birds are transported to a rehabilitation group.

Forward baiting

Seabirds are congregating by the hauler where the bait is going overboard.

Bait is dropped over the side of the vessel near the hauler.

Nets are set off the stern of the vessel when the bait is already sinking.

Seabirds are still congregating by the hauler where the bait is going overboard or following the bait until it sinks.

Seabirds do not end up in the nets.

Nets end up set on the bait.

After baiting

Nets are set with no bait.

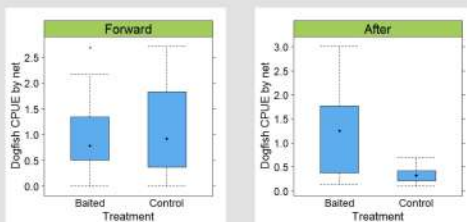
Net-string track is marked on the plotter.

Seabirds do not end up in the nets.

Bait is dropped over the side as the vessel transits over the net-string track.

We completed the first field season during summer and fall 2024 and conducted nine tests of forward baiting and seven tests of after baiting.

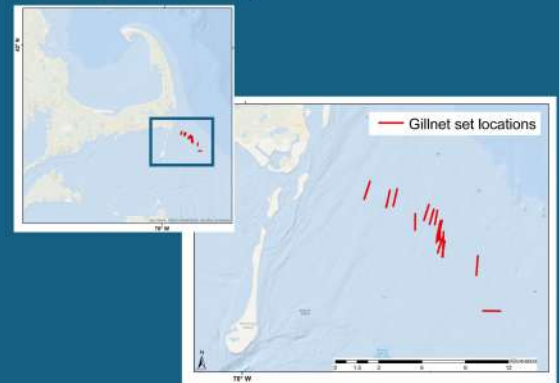
Preliminary catch analysis indicates that after baiting may be a good option for fishermen due to higher target catch rates without seabird bycatch.



Catch per unit effort (CPUE) is defined as the catch per minute of soak time for each net.



Experimental gillnet set locations



No seabirds were caught during any of the fishing trials. Although great shearwater numbers were low throughout all of the trials, other seabirds were present in higher numbers.

Date	Gillnet set	MaxN shearwaters	Total birds
9/10/2024	Set 1	6	94
9/10/2024	Set 2	1	88
9/11/2024	Set 1	4	121
9/11/2024	Set 2	2	245
9/17/2024	Set 1	3	47
9/18/2024	Set 1	4	175

Table shows image sets analyzed to date. MaxN is defined as the maximum number of great shearwaters in one image during the set. Total birds is the total number of birds in the same image.

Research will continue during summer and fall 2025, with a focus on conducting additional tests of both baiting methods and understanding how they impact dogfish catch and shearwater bycatch.

The project outreach campaign is underway to engage the Cape Cod fishing industry in exploring solutions to reduce seabird bycatch.



This research was funded with a USFWS agreement to CFF in support of an Open Ocean Trustee Implementation Group restoration plan to restore natural resources injured by the 2010 Deepwater Horizon oil spill in the Gulf of Mexico.