

Northeast Trawl Advisory Panel, Working Group

Discussion on Restrictor Rope Experimental Design

J. Gartland

July 21, 2021

- The Working Group (WG) of the Northeast Trawl Advisory Panel (NTAP) met on July 21, 2021 from 1-3pm to discuss the details of and begin to develop the sampling design for the restrictor rope experiment proposed by NTAP in March 2021.
- J. Gartland discussed the motivation for this experiment, and presented the objective, timeline, and possible applications of this investigation. Note that both the Mid-Atlantic Fishery Management Council & New England Fishery Management Council voiced their support for this [NTAP Proposed Experiment](#) at their respective meetings in April 2021.
- The objective statement for this experiment was developed as a collaborative effort among VIMS, the *F/V Darana R*, and the NEFSC. This statement was modified slightly during the WG meeting to emphasize the location of the restrictor rope on the NEAMAP trawl gear during this experiment, and the modification is provided in bold:

Implement an ABBA experimental design to evaluate possible changes in catch composition, catch rate (CPUE), and size-distribution due to the addition of a restrictor rope **between the doors** on the 400 x 12cm, three-bridle four-seam survey trawl package used by NEAMAP.

- Gartland, R. Ruhle, and D. Gregg then presented the results from their pilot investigation on the impact of a restrictor rope on catch, which was conducted by NEAMAP during fall 2020. Although only seven paired tows were completed due to the opportunistic (and unfunded) nature of this pilot, the main findings were as follows:
 - A restrictor rope can be safely deployed on the NEAMAP survey trawl.
 - Measurements of headline height, wingspread, and doorspread were less variable when the restrictor rope was used.
 - It was not possible to disentangle the effects of the restrictor rope and depletion (fewer fish caught in second tows) on catch, due to the unbalanced/opportunistic nature of the pilot sampling. A balanced design will be used in the full experiment to isolate the impact of the restrictor rope.
- The discussion then shifted to the design of the restrictor experiment. Specifically, the WG discussed:

- Location: Southern New England, including NEAMAP Survey Regions 1-3, Block Island Sound, and Rhode Island Sound (Figure 1). Conducting this experiment within the NEAMAP sampling frame will ensure relatively consistent trawl performance with and without the restrictor rope, and as such facilitate an effective evaluation of the impact of the restrictor on survey catch. The impact of restrictor rope on catch as a function of a broader depth range could be evaluated in a future experiment.
 - Timing: Two research cruises will be conducted in 2022 for this experiment. The first cruise will occur in early June, immediately following the NEAMAP Spring Survey, and the second in early September, preceding the NEAMAP Fall Survey. This approach will yield the most effective use of the funds available for the experiment, as the Spring Survey concludes and Fall Survey begins in Southern New England.
 - Sampling Intensity: Given the available funds, it will likely be possible to complete approximately 65 paired tows (130 tows in total) for this experiment. WG members discussed applying a power analysis to pilot data to identify requisite sample sizes.
 - Selection of Sampling Sites: WG members recommended using an adaptive sampling approach, as opposed to a stratified random or other sampling design, so as to achieve reasonable sample sizes for the target species of interest. WG members will discuss additional details of the paired sampling approach, including spatiotemporal offsets between restrictor/control pairs, directionality relative to tides & currents, and other concerns at their next meeting.
 - Target Species: WG members briefly discussed target species during this meeting, and highlighted butterflyfish, longfin squid, black sea bass, and scup, among others. Gartland will provide the WG with a list of species encountered in the proposed experimental area during NEAMAP Surveys. This dataset will include total catch by species and frequency of occurrence in NEAMAP Survey tows, permitting identification of additional targets.
 - Data Collection: Information collected during this experiment will include all typical NEAMAP site-level variables, along with trawl geometry, hydrographic, and atmospheric data. Acoustic data will be collected during each tow using the Simrad ES80 system on the *F/V Darana R*. NEAMAP personnel will attempt to acquire side scan images and/or video of the net towed with and without the restrictor rope. Data recorded from the catch will include aggregate weight, count, and individual length measurements, by species.
 - Participants: The field and analytical components of this investigation may occur as a collaborative effort between NEAMAP (i.e., VIMS & *F/V Darana R*) and the NEFSC. This potential collaboration will be discussed further at the next WG meeting.
- Additional details of the sampling design for this restrictor rope experiment will be discussed by the WG at their next meeting in November 2021.

Figure 1. Sampling frame of the NEAMAP Mid-Atlantic / Southern New England Near Shore Bottom Trawl Survey. The proposed restrictor rope experiment would occur in Regions 1-3, Block Island Sound (BIS), & Rhode Island Sound (RIS).

