

# Northeast Trawl Advisory Panel Working Group Meeting

Monday, December 5th, 2022

1:00 PM - 3:30 PM

Virtual

-- NOTES --

## I. Participants

### A. NTAP Members:

Name	Affiliation
Kathryn Ford	NEFSC
Anna Mercer	NEFSC
Robert Ruhle	ASMFC Representative
Jim Gartland	MAFMC Scientist
Mike Pol	NEFMC Scientist
Emerson Hasbrouk	MAFMC Stakeholder
Tim Miller	NEFSC

### B. Other Participants:

Name	Affiliation
Katie Burchard	NEFSC
Hannah Hart	MAFMC
Andy Jones	NEFSC

## II. Notes by agenda topic

### Welcome (Anna Mercer)

Thank you to all who contributed. Purpose of today's meeting is to discuss the preliminary analytical methods and results of the restrictive rope research that was recently completed in fall 2022.

### Review analytical methods and preliminary results from restrictor rope experiment (Andy Jones)

Presentation

- Many efforts coordinating and performing the field work including Captain and Crew from F/V Darana R, VIMS staff, RI DEM staff, ROSA staff and NEFSC staff.
- Summary of objectives presented

- Conducted paired tows on the F/V Darana R, with and without 109.5 feet (33.4 m) restrictor rope (distance between bearing points, rope is tenex to reduce stretch).
- Evaluate catch and gear performance
- Collect key metrics
- Two sampling periods, spring and fall; completed 142 paired tows (71 pairs)
- Samples processed using VIMS software and processing protocol
- Net performance measured with Simrad net mensuration system
- Goal was to keep tows as close as possible
  - Only three tows (2%) where mean distance is greater than 400 m.
  - A couple tows appear to cross at various points (~40)
- Gear metric analysis methods/results
  - Series of [violin plots](#) (net height, net width, door width, scope, depth - spring and fall)
  - Mean (or median) net width and door width slightly smaller with restrictor
  - Net height less variable in spring
  - Net height less variable with restrictor, but only in fall season
    - Note that NEAMAP uses same net size specs on all surveys however they did not use the same exact net- this might explain some of the differences between seasons.
  - Variance in performance metrics is greater than expected. Thought restrictor rope would really define the upper limit of the spread. *Note it does limit the door width very well, as hoped for.*
    - Variance in net width may be explained due towing across different tides (fair tide, cross tide, etc.). This can be quantified in the “station data”
    - A little wobble will give you a 1.5 feet variation on each side of net.
    - Unlikely to be explained by sensor accuracy.
    - Expect at least a meter in catenary curve
    - Unlikely to be explained by variation caused by start and stop of the winches at beginning or end of tow
  - Comparing catches in paired tows by plotting catch in two dimensions
    - No clear effect of restrictor in aggregate catches
    - Some effect of season
    - Difference between season in spiny dogfish and fluke
    - Discussion of selecting species based on prevalence and purpose of study
      - Focus of this work was on semi-pelagic roundfish- which were to most likely to be impacted by the rope
      - Butterfish and scup stand out for count, number of tows, and weight; silver hake good too.
    - Some differences found with longfin squid, include it too in analyses.
  - Looking for significance intercepts in model. Statistical rigor rather than just plotting it out. Linear Models suggest that there is no significant difference for butterfish, scup, silver hake. There is a difference for longfin.

- Aggregate weights
  - Close to 1:1 when regressing catches without and catches with the restrictor rope
  - No significant effects in the model we fit
  - Suggest no detectable effect on the restrictor rope.
  - Explored individual lengths for three of the most common roundfish encountered
    - Linear mixed binomial models
    - GAM
  - Scup
    - Linear mixed binomial model:
      - No effect on length, order or season
      - Small positive effect of depth
    - GAM
      - Quasibinomial GAM models for scup
      - Results of model are no effects of depth, order, season, or length
  - Butterfish
    - Linear mixed binomial model:
      - No effect of length, order, or season
      - Small negative effect of depth (decreasing catches within R set)
    - GAM
      - No effect of season, length, depth, or order
  - Silver Hake
    - Linear mixed binomial model:
      - No effect of length, order, depth, or season
    - GAM
      - Effect of order and depth
- Overall Summary
  - Gear comparison
    - Some effect on net width and door width
      - Wider without restrictor
    - Potential effect on net height
      - More work needed to look at variability
  - Aggregate weights
    - No effect on three focal species: butterfish, scup, or silver hake
  - Individual lengths
    - GLMMs: Small effects of depth on catches, but otherwise no detectable effects
    - GAMs: Some hints at non-linearity, but difficult to assess. Potential effect of depth and order in silver hake
    - No consistent effects across GAMs and GLMMs

### Discuss further or refined analyses (Group)

- Questions
  - Other species to include
    - Rescale count/weight graphs to consider adding other species

- Add longfin
- Other ways to explore the data
  - Going back to gear comparison in aggregate weights, run a t-test or Wilcoxon to see what they will show with net parameters with and without the restrictor rope.
  - Look at light availability for spring measured with depth and solar zenith together to try to tease out depth effect being seen in GAM
  - Add tide/tow direction as covariate.
- Other modeling techniques to consider
- Future direction for this research
- Sufficient information for a publication
  - Yes. Should be published.
- Discussion about purpose/goal/future directions
  - Does this support the use of a restrictor rope? If it's a new long term survey it only matters if your net performance is poor. If you're adding to an existing dataset, the data would be comparable from the onset with no effect overtime.
  - Note: this was a brief discussion and does not represent a consensus statement from the working group regarding the utilization of restrictor ropes.

#### **Discuss plan for presenting results to the full Panel (Group)**

- WG think about which of these length based models in preferable
- Dustin and Bobby will discuss gear performance, Andy will present biological analyses
- 15 minutes for presentation, 30 min to 45 minutes for discussion.

#### **Action Items:**

1. Looks at depth with Zenith to see if it helps explaining the depth effect seen in GAMS
2. Add tide/tow direction as a covariate.
3. Run a t-test or Wilcoxon on gear comparison and aggregate weights.
4. Rescale count/weight graphs to consider adding other species; add longfin

#### **Additional Comments** (*received after the meeting*)

- Looking at the plots again, it seems we gave short attention to the effect of the restrictor. I see three interesting things:
  - The rope put an upper limit on the door spread, which did not directly translate into more precise wing spread
  - Net spread in both seasons was more variable with the restrictor than without
  - We aimed for a net spread of 12.9 meters, but we got a little more than that.