

**Atlantic Large Whale Take Reduction Team  
Co-Occurrence Model Work Group Meeting #1  
January 25, 2011  
10:30am-5:00pm**

**Meeting Summary**

**I. Background:**

During its November 2010 meeting the ALWTRT Northeast Subgroup suggested numerous refinements to NMFS' Co-occurrence model. The work group was established to discuss the potential refinements to the model and act as a sounding board for NMFS as they continue to develop the model. The purpose of the meeting was to:

- Clarify the intent of the proposed refinements;
- Discuss feasibility of incorporating proposed refinements to the Co-occurrence model;
- Confirm refinements to be undertaken/pursued (i.e., identify those not considered feasible); and
- Plan next steps for (1) reporting back to full NE subgroup and (2) identifying potential management areas.

The intent of this meeting summary is to inform the Northeast Subgroup and full ALWTRT of the recommendations provided to NMFS by the Working Group and inform the Northeast Subgroup and full ALWTRT of the next steps.

**II. Summary:**

NMFS reminded the work group of the working group timeframe outlined at the Fall 2010 Subgroup meeting (see Attachment 1). The timeframe is aggressive over the next couple of months and will require the work group to have additional meetings/conference calls. NMFS reviewed the list of potential refinements (see Attachment 2) and reiterated the importance of considering the feasibility of the refinements in light of the aggressive timeframe noted above. The list of refinements is extensive and the work group was reminded of the long-term goals of the Team and asked to decide if each refinement is necessary to move forward.

Primary discussion points during the Refinements to the SPUE Data:

1. Industrial Economics folded data from the North Atlantic Right Whale Consortium (NARWC) database into the co-occurrence model. The same trends that existed in the Northeast Fisheries Science Center (NEFSC) data are evident in the NARWC data. However, the data is broader and covers the years 1978-2010. For example, the maps now depict more whales distributed in Cape Cod Bay in March-May.
2. The data was broken out month by month and then presented by overall average. There was some question about whether it would be important to look at abundance trends on a year by year basis. The group decided that an anomaly in a certain year would be averaged out with a large data set so it wasn't necessary or appropriate to look at the data year by year.

3. NMFS was unsure as to how NEFSC and NARWC shared data. They'll need to further discuss with Richard Pace and Bob Kenney whether the NARWC includes all the NEFSC data. Also, B. Kenney needs to provide a description of what is included in his database (effort, platforms, etc).
4. The group discussed what species layers they would like to see in the model. What species data best characterizes the trends of the whales?

#### Outcomes/Action Items

- NMFS will set up a call with its contractor (Industrial Economics), Dr. Richard Pace of the NEFSC, and large whale database curator and ALWTRT member Bob Kenney to discuss overlap in data between the NEFSC and NARWC.
- Industrial Economics will obtain effort only data from B. Kenney and share with work group.
- The work group agreed to use the NARWC data as the layer for the SPUE data in the model as long as it is confirmed that the NEFSC data is included in the NARWC database.
- The work group will focus on choosing management areas based on viewing the humpback whale and right whale layer separately and then combined. The fin whale layer will be used as an overlay to make sure the areas chosen don't inadvertently affect fin whales.

#### Primary discussion points during the Refinements to the Gear Characterization Data:

1. The group discussed the impact of the shift to sector management for gillnet fishery. The change in management occurred in May 2009. There is a time lag so the effort data under sectors is not currently included in the model. The sectors only affect the gillnet fishery and the focus of the Northeast subgroup is on trap/pot gear. NMFS will monitor how this change in management scheme affects fishing effort in certain areas.
2. NMFS asked for clarification on what type of sensitivity analysis the subgroup was requesting. The group agreed that the data from Maine is robust but most of the other fishing effort data comes from best professional judgment and it would be difficult to conduct a sensitivity analysis on this data. The group discussed the Northeast Subgroup's suggested sensitivity analysis, which was suggested to help the group feel more confident about the model. They felt that perhaps a distributional analysis would be better than a sensitivity analysis. There was also discussion about updating the description of what exactly went into the assumptions for the gear characterization to provide the full Team at the Fall 2011 meeting.
3. The group discussed soak time for both trap/pot and gillnet fisheries. NMFS noted that the analysis provided at the Fall 2010 Northeast Subgroup meeting indicated that the volume of endlines was driven by the trap/pot fisheries in the Northeast and that the gillnet are more significant for the Mid-Atlantic and Southeast portions of the coast. As discussed above in #1, for the Northeast NMFS agreed to monitor how the change in the gillnet management scheme would affect gillnet fishing effort in certain areas. Additionally, NMFS agreed to estimate northeast gillnet soak time as best as it could and agreed to further break out the gillnet effort for the April 2011 meeting of the Mid-Atlantic and Southeast Work Group. The trap/pot soak time would be based on the gear

characterization information submitted by the states and through NMFS FVTR log book submissions

4. It was noted that the MA buoy line data is ready to be entered into the model. MA Division of Marine Fisheries has the data by statistical reporting area, pot fishery, and month. E. Burke will provide Industrial Economics with the data.
5. The group discussed the potential problem with latent effort undermining whatever conservation gain occurs as a result of the potential vertical line rule. The question of latent effort is one that can't be answered by the ALWTRT and instead should be handled by those managing the FMPs. After the group chooses potential management areas the latent effort in these areas will be identified and monitored.
6. NMFS reminded the group that it cannot manage recreational fisheries based on the limitations of the MMPA. Recreational fishing data could be looked at after a management area is chosen. Since the ALWTRP doesn't regulate recreational fishing it is not appropriate to include this as a layer to consider when deciding on management areas.

#### Outcomes/Action Items

- NMFS will monitor how the shift to sectors affects fishing effort.
- Industrial Economics will provide the full team with updated documentation on the caveats, limitations, and assumptions of the gear characterization.
- After management areas are chosen, available data on latent effort and recreational fishing in these areas will be described in the NEPA analysis and monitored as part of future monitoring plans.
- E. Burke will provide Industrial Economics with MA buoy line data for incorporation into the model.

#### Primary discussion points during the Refinements to the Co-occurrence Data:

1. Industrial Economics presented the group with a GIS map displaying the additional layers requested at the Subgroup meeting (bathymetry, hotspots, and locations of known entanglements). These layers can be overlaid on the chosen management areas. Some members wanted to see indication of which of the entanglements were anchored entanglements. The group accepted the current layers and requested no additional layers.
2. The group discussed what outputs they would like to see for the co-occurrence data. They decided on Right Whales, Humpbacks, and a combined unweighted display month by month and then by seasons. Jooke Robbins suggested seasons for humpbacks and Scott Kraus will suggest potential seasons for right whales. The question of weighting each species was brought up, but it was decided that weighting was unnecessary at this point.
3. At this time it is not feasible to have the model run real-time "what if" scenarios. Industrial Economics needs time to quality check the outputs. Instead it would be best to try and come up with scenarios ahead of time. S. Kraus asked to see a map for the change in fishing effort presented at the fall TRT.
4. Sensitivity analysis as it relates to co-occurrence was discussed. The group is comfortable with the current layers provided they see the SPUE effort data from B. Kenney and the gear characterization documentation is updated as previously discussed.
5. The group considered alternative methods to scaling or binning the co-occurrence data. Industrial Economics reminded the group that the each layer to the model is scaled within

its own data set on the same scale. There was some discussion on replacing the “0”s for “1”s in the underlying SPUE data. Since whales are distributed everywhere the scale should not make it appear with certainty that there are areas where there is no risk of entanglement. While the group agreed with this statement many felt it was unwarranted to manipulate the existing data. Agreement was not reached on this topic. It was mentioned that the NMFS should follow up with B. Kenney and William McClellan since they raised the original concern at the Subgroup meeting.

6. The issue of looking at data shoreward of the exemption line was raised. While there is some fishing effort data available there is minimal SPUE data in this area. Available SPUE data is limited but a probabilistic approach may be possible using data gained from tagging studies and acoustics. J. Robbins and S. Kraus will think of a parallel means to evaluate SPUE data shoreward of the exemption line.
7. The group began to discuss the question of what years to use for the baseline in the model. The SPUE data exists from 1978-2010. Industrial Economics showed the Northeast Subgroup fishing effort data from 2008. They are preparing to show the Mid-Atlantic/Southeast Subgroup data from 2008 as well. For the full TRT meeting in the Fall 2011 they will have 2008 and 2009 federal data available. There is a possibility that 2009 state data from the Northeast will be inputted in the model by then as well. As the rule is developed 2010 fishing effort data could be used for the rule.

#### Outcomes/Action Items

- NMFS will update the entanglement layer to indicate where anchored entanglements occurred.
- Industrial Economics will create maps displaying co-occurrence for right whales, humpback whales, and combined month by month and for a yearly average.
- Industrial Economics will create maps displaying humpback whales by seasons (Jan-Mar/Apr-Jun/Jul-Sept/Oct-Dec).
- S. Kraus will propose possible seasons for right whales
- Industrial Economics will have a map of the change in fishing effort available for the full TRT meeting in Fall 2011.
- The question of replacing “0”s with “1”s for SPUE in the co-occurrence layer is tabled.
- J. Robbins, S. Kraus, and B. Kenney will think of a parallel means to evaluate SPUE data shoreward of the exemption line.
- Industrial Economics will continue to input fishery effort data as it becomes available.

### **III. Next Steps:**

With the exception of the topics discussed above, the work group did not suggest new model refinements. NMFS will confirm proposed recommendations with the work group before presenting them to the Northeast Subgroup. The work group will meet in late February or early March to review the recommendations and identify potential management areas.

#### **IV. Participants:**

##### **Working Group**

Bill Adler  
Sarah Cotnoir  
Scott Kraus  
David Laist  
Patrice McCarron  
Dan McKiernan  
Jooke Robbins  
Bonnie Spinazzola  
Sharon Young

##### **Industrial Economics**

Bob Black                      Brian Morrison  
Neal Etre  
Dan Hudgens  
Jen Kassakian

##### **NMFS**

Mary Colligan  
David Gouveia  
Kate Swails

##### **Observers**

Erin Burke  
Erin Summers  
Dominique Walk

## Attachment 1

### *Work Group Timeframe*

Below is a summary of the proposed timeframe for Work Group deliberations. The table also shows the fit with broader Team deliberations and alternative proposal development by states and other entities. The first Work Group meeting is expected to be held in late January or early to mid-February 2011.

January/April	Initial Work Group deliberations, with focus on informing NMFS work on: <ul style="list-style-type: none"> <li>• Data layers (whales, gear, habitat/depth, etc.) and methodologies</li> <li>• Model runs to delineate updated co-occurrence areas</li> <li>• Proposed areas to focus vertical line-related management actions</li> </ul>
April/May	Discussion with full Northeast Subgroup to review, confirm and, as necessary, revise approaches developed in discussion with Work Group; to be conducted via email or webinar <ul style="list-style-type: none"> <li>• Lock in areas for NMFS scenario development</li> </ul>
May/July	NMFS develops scenarios outlining different management strategies for reducing vertical lines <ul style="list-style-type: none"> <li>• NMFS work informed by ongoing input from Work Group</li> <li>• Follow-on webinar/email communication with full subgroup to review approach</li> </ul>
January - November	States and others develop, if they wish, “equivalency proposals” to scenarios to be put forward by NMFS in summer 2011 * NMFS to distribute proposal format and criteria to Northeast Subgroup members by January 2011
Fall 2011 Meeting <sup>1</sup>	Full Team, in-person meeting (both Northeast and Southeast/Mid-Atlantic Subgroups) <ul style="list-style-type: none"> <li>• Review refined co-occurrence model and NMFS scenarios</li> <li>• Review and consider merits of “equivalency proposals” put forward by states and others</li> </ul>

Team members will be provided updates on significant changes to the schedule and approach outlined above.

<sup>1</sup> Based on funding constraints, this meeting may be delayed from November 2011 until early 2012.

**Attachment 2**  
**ALWTRT Northeast Subgroup Meeting**  
**Northeast Subgroup Recommended Refinements to the Co-Occurrence Model**

Below is a summary of potential model refinements generated as part of the Northeast Subgroup's (Subgroup) deliberations during its November 30 to December 3, 2010, meeting in Providence, Rhode Island. These proposed refinements represent a "wish list" identified and confirmed by members at the Northeast Subgroup meeting and will need to be expanded upon and ground-truthed in discussions with and between Northeast Region staff, Industrial Economics, the Northeast Region Science Center and the follow-on Northeast Subgroup Work Group. It is not assumed that each and every potential refinement will be adopted.

**Recommended Refinements to the SPUE Data:**

- Broaden SPUE to fold in data from Consortium database
  - Show inter-annual variation
  - Include data up and down Atlantic Coast (and not just for Northeast)
  - Consortium database to be provided to Science Center by Bob Kenney
- Provide expanded time series – both backwards looking and accessing most recent data
- As possible, create a more comprehensive picture of whale distribution data by layering in additional data sets. At minimum, as noted in the Co-Occurrence section below, portray these additional data as on/off layers that can be looked at as overlays on top of a refined co-occurrence model
  - Historic SAMs/DAMs
  - Entanglement data
  - Whale "hot spots"<sup>2</sup>

**Recommended Refinements to the Gear Characterization:**

- Assess impact of shift in management strategy to sectors
  - Impact on gillnet soak time
  - Other
- Incorporate sensitivity analysis to measure variability in gear characterizations
  - Mean trawl length, number of buoys, etc.
- Account for latent effort in each state
- Consider Massachusetts buoy line data
  - Both to refine model and, importantly, to assess model accuracy
- Update model to account for upwards shift in Rhode Island fishing effort due to increase in black sea bass trap/pot fishery
- Update time series
  - Expanded data (both past and more current) for trap pot
  - Expanded data (forward looking) for gillnet due to shift to sectors

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<sup>2</sup> Other ideas discussed but not captured in the synthesis reviewed and confirmed by the Subgroup at the meeting included acoustic monitoring, satellite telemetry and other non-systematic information on distribution.

- Fold in recreational fishing data, as possible, for Cape Cod Bay, Coastal Maine, East Side/Cape Cod
  - Intent is to understand impact of recreational fishing vertical lines on co-occurrence; probably best incorporated as a data layer that can be turned on and off

### **Recommended Refinements to the Co-Occurrence Model:**

- Refine model to show co-occurrence as outlined below:
  - Right whale alone
  - Humpback alone
  - Fin whale alone
  - Right whale and humpback together
  - Right whale, humpback and fin whale together
- Refine model to weight results by whale species (relative to PBRs or levels of serious injury and mortality)
- Refine model to allow for real-time (or near-real time) “what if” scenario testing:
  - Subgroup interest is to see the potential impact on vertical lines, in real-time, based on proposed closures and/or vertical line reductions.
- Refine model to fold in sensitivity analysis
- As possible, create more comprehensive picture by layering in additional data related to the following (best incorporated with on/off toggle):
  - Historic SAMs/DAMs
  - Entanglement data (distinguish, as possible, between ground and vertical line)
  - Whale “hot spots”
- Refine model to add bathymetry and habitat type layers
- Consider more meaningful way to scale and bin co-occurrence data
  - Initial discussion centered on looking at different indexes (mean v. max) or a log-normal distribution
  - Later discussion focused on testing model to see impacts of swapping out “0’s” for “1’s” (or some other representation greater than “0”) in the underlying SPUE data. The intent is to recognize that it is not possible to discern if and where there are no true zeroes for occurrence, because whales are, to some extent, distributed everywhere in the region and the scale should not make it appear – with certainty – that there are areas where there is no risk of entanglement possible.
- Test model to see ramifications of looking at co-occurrence shoreward of the ALWTRP exemption line.

### **Recommended Refinements to Scenarios:**

- Express vertical line percentage reductions relative to the entire Northeast Study Area<sup>3</sup> (and not only in the “boxes” where management changes are proposed). These changes could also be expressed as changes in co-occurrence.

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<sup>3</sup> The Northeast Study Area refers to Federal waters north of 40-degrees latitude.