OCEAN PLANNING IN THE NORTHEAST

Marine Mammal & Sea Turtle Work Group Meeting #2
Wednesday, September 24; 10:00am – 11:30am

Participants

Work Group: Daniel Martin (NOAA), Dan Sampson (MA CZM), Debra Palka (NOAA), Jay Odell (TNC), Tom French (MA DFW), Erin Burke (MA DMF), Leila Hatch (NOAA), Erin Summers (ME DMR)

Marine Life Data & Analysis Team (MDAT): Pat Halpin (Duke), Corrie Curtice (Duke), Jason Roberts (Duke)

NROC: Nick Napoli, Emily Shumchenia, Katie Lund

Welcome, introductions, etc.

After roll call, Emily described the process by which NROC and the MDAT team are following up with work group members who were unable to attend calls. As with the follow-ups from Call #1, members who are absent from future calls will be contacted by Emily or Corrie and given the opportunity to comment on what was discussed during the missed call(s). All comments are documented and shared internally with the MDAT team.

After Call #1, follow-up discussions revolved around additional data sources beyond what MDAT reported was in their current database for density modeling. In follow-ups, work group members discussed the process for making formal requests for data through the North Atlantic Right Whale Consortium (NARWC) (for SPUE data) and the Massachusetts Clean Energy Center (for line-transect data). In addition, MDAT was provided with reports/materials from previous efforts in the region to map marine mammal and sea turtle distribution and abundance using NARWC data. MDAT also received information about potentially collaborating with Mass Audubon to utilize their sea turtle observations.

Species and grouping options

Pat showed a list of cetacean, pinniped and turtle species that can be modeled using the Duke density modeling framework (see SLIDE 6). MDAT proposes to group pilot whales; beaked whales; and seals in order to enable modeling of species within these groups with low numbers of observations or unreliable identification. There are a number of species for which too few observations exist to model that would not be grouped or presented. These groupings and species are identical to the list being used for the Atlantic coast-wide models that Duke is producing for the Navy. Jason noted that he has looked at the number of observations in the Massachusetts Clean Energy study for some of the un-model-able species in the MDAT list and adding those data would not tip the scales toward making them model-able. At this point, Pat also requested input from the work group about particular individuals who may have expertise on the distribution/abundance, life history and behavior of the particular species being modeled who would also be willing to review products for accuracy once drafts are complete.

- **Work group will review list of species that can be modeled, the groupings, and list of species that cannot be modeled and offer any additional comments**
- **Work group will recommend species experts for reviewing draft/final products**

Study area boundary options – slides 7 & 8

The work group discussed the geographic boundaries of the proposed modeling effort. Pat showed a map of the Northeast region and the NY and RI planning areas with several potential project boundary options highlighted. The work group discussed considerations such as including as much of neighboring

regions (Mid-Atlantic and Canadian waters) as possible; any tradeoffs in model accuracy by changing the boundaries; and using an "assessment area" that is larger than the NROC planning area. Jason described that the models will actually utilize observations and data from outside the Northeast region in order to make predictions within the Northeast region. For example, the humpback whale models use all observations north of the Gulf Stream. Data from Canadian waters are usually limited to summer months, and so some models might only offer predictions in Canadian waters for certain seasons – i.e., the geographic boundary would change depending on the species and season. Work group members recommended including Hudson Canyon within the study boundaries because this is an important habitat area. After discussing the pros and cons of a few options, it was decided that MDAT would prepare maps of several options and request comments from the entire work group, as well as comments from the other MDAT PIs, the Avian expert work group and the Fish expert work group.

- **Work group to comment on geographic scope and recommend assessment area boundaries**

Data review – slides 9 - 12

The work group quickly discussed the existing data holdings at Duke (SLIDE 10) and the additional data requests that are pending through NROC (SLIDE 12). Pat described that there may be an opportunity to validate the density models using acoustic monitoring data from NOAA.

- **NROC to coordinate formal data requests from NARWC and MA CEC**
- **MDAT to coordinate with work group members with expertise/interest in the use of acoustic monitoring data for validating or adding additional guidance to model outputs**

Uncertainty products options for density models – slides 13 – 16

Given that the density model inputs and outputs have been established by MDAT, the work group discussed options for uncertainty products related to the density models. Pat showed maps of model standard error, the coefficient of variation, and the 5th and 95th percentiles of the density model outputs. Jason explained how each metric is derived. Work group members recommended that each map of mean density be presented with the coefficient of variation, 5th and 95th percentiles in a 4-panel template (similar to SLIDE 16). Work group members asked if variation on a seasonal basis could be visualized. Pat and Jason described the definition of "season" for most species was based on behavioral season (i.e., only differences in winter/summer), but that yes, they could produce coefficient of variation and 5th/95th percentiles at the highest temporal resolution possible for all species.

- **Work group to provide input and comments on the type(s) of uncertainty products that MDAT may produce from density models**

SPUE and other product options – slides 17 – 27

Pat and Jason presented maps comparing effort and observations from aerial and shipboard surveys for Humpback whales in order to show the differences between these two survey methodologies and how those differences translate to maps of SPUE (SLIDES 18-20). Jason indicated that even among similar aerial survey programs for example, there are significant differences in methodology that affect the detectability of species. Maps displaying SPUE should correct raw observations by species- and survey program-specific detection functions to account for this. Essentially, when species- and/or program-specific detection functions are unavailable, the resulting SPUE maps likely contain survey biases. Pat and Jason described that their density modeling framework uses only data that can be corrected for species- and survey-specific factors, and so the resulting maps are the most reliable estimates of distribution and abundance.

In order to understand how SPUE maps have been used in the region previously, Pat presented a list of projects, reports and resulting data products that were developed using NARWC data (SLIDES 22 and

23). The MDAT team and working group discussed options for "archiving" these existing data products in the database that will be provided by MDAT. The work group then examined and discussed example SPUE maps from the Stellwagen Bank Ecological Characterization report and the NY Offshore study. After seeing these examples, the work group discussed the pros and cons of the two types of potential map product outputs:

	PRO	CON
Duke density models	Correct for species- and survey-specific detectability	Do not include all available data in the region (those data lacking line-transect survey characteristics, which include many nearshore datasets); managers are unfamiliar with these data products
SPUE maps	Include all available data in the region (except opportunistic sightings); managers in the region have been using these products to date and are comfortable with them	Contain biases related to differences in survey methodology; do not correct for species- and survey-specific detectability

Work group members indicated that the low resolution (40 km) of SPUE products (shown on SLIDES 18-20) was undesirable, and asked if these could be made at higher resolutions. Jason explained that resolution could be increased, but reflects a balance between visualizing useful spatial patterns and introducing "noise" into the maps. For example, with smaller pixel sizes (higher resolution), more pixels are blank (showing no survey effort) and tend to reflect localized survey effort rather than the more general trends in an area visible with a larger pixel size. Jason described this as a "swiss cheese effect" where the high resolution maps show high variability and speckling.

The work group then discussed whether previous efforts had merged NARWC SPUE data with other line-transect survey data and/or platform of opportunity data. The group examined a Stellwagen Bank example that mixed NARWC data with Manomet Bird Observatory data (which is not line-transect survey data). Leila Hatch indicated that she would inquire about the exact methodology used to produce those maps (e.g., SLIDE 24).

Finally, Pat presented the option to show raw sightings on a map (SLIDE 27). This option is interpretable at the presence/absence level but is inappropriate for making assumptions about animal density.

The discussion concluded with comments about considering all of these options with respect to how many final products could and should be produced, as well as what would be maximally useful for ocean planning. Recommendations from the work group will be solicited towards addressing these considerations.

- **Work group to provide feedback on potential SPUE and raw sightings product options**

Next work group call

Feedback on species/groupings, study area boundary, uncertainty products and SPUE/sightings products will be sought out and incorporated prior to the next call. The MDAT team will also follow-up with individual experts regarding the use of acoustic monitoring data for validating model outputs.