Science, Service, Stewardship

Scarring Rates Work Group Meeting

April 11, 2011

NOAA FISHERIES SERVICE

NOAA
FISHERIES
SERVICE

Background

- At the April 2009 ALWTRT Northeast Subgroup meeting NMFS was requested to convene a Scarring Rates Work Group.

- The primary purpose of the meeting was to:
  - Discuss how scarring rates can be considered as a an additional measure in the Northeast Fisheries Science Center's proposed approach to monitor the ALWTRP.

NOAA
FISHERIES
SERVICE

Background Information to Frame Discussions

1. Overview of current approach to monitor the effectiveness of the ALWTRP
    - Including the rationale for selecting appropriate metrics and statistical models
2. Overview of existing scarring data available on Gulf on Maine humpback whales and the ways that this data could be utilized to monitor the effectiveness of the ALWTRP.
3. Overview of existing scarring data available on Gulf on Maine humpback whales and the ways that this data could be utilized to monitor the effectiveness of the ALWTRP.

NOAA
FISHERIES
SERVICE

Guiding Questions

- NMFS asked the group to discuss the available data:
  - how it is currently being used;
  - what does the data indicate;
  - how to best use and interpret the data; and
  - consider the various caveats surrounding the data.
- If NMFS and the ALWTRT determine that scarring data are a good indicator of effectiveness
  - NMFS asked the group to consider the best way to utilize the data, as well as what type of studies would be important to continue.

NOAA
FISHERIES
SERVICE

Key Outcomes

Discussions were broken down into three areas:

1. Primary discussion points
2. Discussion points related to next steps not already underway or planned
3. Discussion points related to data needs

NOAA
FISHERIES
SERVICE

Primary Discussion Points

1. Scarring data can provide an estimate of encounters with gear (i.e. the frequency of entanglement events).
   - Scarring studies have looked at changes over time for an individual which can be extended to look at population impacts.
   - Analysis is also based on sampling theory as opposed to opportunistic, haphazard entanglement reports. Spatial impacts/patterns can also be investigated with further development.

NOAA FISHERIES SERVICE

Primary Discussion Points

2. Scar-based studies are most appropriate for evaluating the effectiveness of ALWTRP gear modifications that reduce the frequency of entanglement events.
   - However, some management initiatives that reduce serious injury/mortality to large whales may not reduce the frequency with which they encounter gear (e.g. weak links).
   - Poses a challenge for monitoring programs because animals that might have otherwise died will be detected alive, either carrying gear or scars from gear. In such cases, the apparent severity of the interaction (i.e., serious injury) is particularly important to track.

NOAA
FISHERIES
SERVICE

Primary Discussion Points

3. There are relatively few entanglement events documented each year, and therefore not much power in the data sets currently being considered to look at effectiveness of the ALWTRP.
   - It is going to take a dramatic change in the metrics being considered in order to detect a change.
   - It will take up to five years to determine whether the ALWTRP is effective using the metrics proposed by NMFS.
   - The metrics are not dependent on how much effort (e.g. aerial surveys) occurs, but how much is seen.
   - Scar data can also be used to track entanglement rates over time. Scarring data may be able to provide information earlier than five years.

NOAA
FISHERIES
SERVICE

Primary Discussion Points

4. The availability of humpback and right whale scarring data analysis is currently on approximately the same schedule as the NMFS serious injury/mortality determinations (i.e. approximate 2-3 year lag).
5. Workshop members discussed the apparent increase in entanglement rate reported by Pace for both humpbacks and right whales between 2002 and 2003.
   - Scar-based analyses also suggested an increase during that time period, but a decrease in right whale entanglements. Because the same effect was noted for humpback whales in both reporting data and scar based, it is unlikely an artifact of effort, but could be due to reasons such as environmental factors (e.g. whales and gear overlapped more than in other years).

NOAA FISHERIES SERVICE

Primary Discussion Points

6. Scar-based entanglement rates are estimated as the proportion of individuals with new entanglement injuries out of the total observed.
   - Mark-recapture statistical analyses (such as multi-state models) can provide a robust estimate of entanglement rates.

7. Mark-recapture studies provide important information on impacts on survival and fecundity.
   - Data can be used to compare impacts before and after management actions, as well as changes over some time intervals.
   - However, it is unlikely that there would be enough data to make yearly survival and fecundity comparisons.

NOAA
FISHERIES
SERVICE

Next Steps Not Already Underway

1. Since the probability of detecting an entanglement that has occurred depends on the distribution of observers and what platforms are used, NMFS should investigate whether survey designs and analyses that account for these factors might improve understanding of entanglement rate.
2. NEAq and PCCS are collaborating on a NMFS-funded study to look at the behavioral factors that lead to entanglement (e.g. dive behavior, depth). They will also consider entanglement complexity (e.g. how many body parts involved) to address questions such as why right whales have serious mouth entanglements and humpback whales less so. Information from such a study will help inform future discussions.

NOAA
FISHERIES
SERVICE

Next Steps Not Already Underway

3. It was noted that determining the exact location where a whale became entangled is extremely difficult, if not impossible, if the gear is not recovered and identified to a specific fisher.
   - For humpback whales, it may be possible to explore more general spatial patterns by looking at the known distribution patterns of entangled individuals and apparent the timing of the events.
   - However, this type of approach is unlikely to be useful for right whales, as evidence shows they may travel thousands of miles in a short period of time after an entanglement.
   - PCCS has undertaken preliminary spatial analysis of humpback whale entanglement based on the distribution of whales with unhealed (recent) entanglement injuries, as a percentage of the total individuals examined per unit area. Additional work is required to complete this analysis and NEAq might evaluate whether a similar approach would be appropriate/useful for right whales.

NOAA
FISHERIES
SERVICE

Data Needs

1. Continued support of scarring rate analyses.
2. Additional/continued vessel survey support needed to obtain data for scar analysis (e.g. Bay of Fundy, Great South Channel and Jeffreys Ledge for right whales; Gulf of Maine [US & Canada] for humpback whales).
3. Continued health assessment studies for right whales (and the development of meaningful criteria for humpbacks) are important to assess these populations.
4. Continued/additional analysis of the timing and nature of healing of entanglement injuries would help to clarify the timing of scar-based events.

NOAA
FISHERIES
SERVICE

Data Needs

5. Studies of entanglement survival and fecundity are valuable and should be pursued to the degree possible. Analyses should consider potentially important factors such as age class. NEAq noted the need for analytical support for these and other statistical approaches.
6. If possible, spatial analyses should be undertaken with scarring data to identify possible entanglement hotspots.
7. Routine data collection for scar studies should be expanded to other areas, such as the mid-Atlantic states and the southeast US.
8. Better data on fishing effort (timing, intensity and spatial distribution) is needed to put the scar data into context, and to understand entanglement rates more generally.