ATLANTIC TRAWL GEAR TAKE REDUCTION STRATEGY (ATGTRS) RESEARCH NEEDS AND PRIORITIES

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WORKING MATRIX

Background

In September 2006, the NOAA's National Marine Fisheries Service (NMFS) convened the Atlantic Trawl Gear Take Reduction Team (ATGTRT) to address the incidental mortality and serious injury of long-finned pilot whales (Globicephala melas), short-finned pilot whales (Globicephala macrorhynchus), common dolphins (Delphinus delphis), and Atlantic white-sided dolphins (Lagenorhynchus acutus) in several trawl gear fisheries operating in the Atlantic Ocean. These marine mammal species are known to interact with the Mid-Atlantic mid-water trawl, Mid-Atlantic bottom trawl, Northeast mid-water trawl, and Northeast bottom trawl fisheries. The development of a formal take reduction plan was not required since none of these marine mammals are considered strategic stocks (e.g., fishery bycatch levels do not exceed PBR) and they are not interacting with Category I fisheries (i.e., fisheries with frequent serious injury and mortality of marine mammals).

However, the ATGTRT recommended a number of voluntary measures for implementation in defined areas for Atlantic trawl fisheries. The ATGTRT also agreed that it would be beneficial to identify and conduct research needed to reduce the serious injury and mortality of marine mammals in trawl fisheries. As such, the ATGTRT established two sub-groups tasked with developing an Education and Outreach Plan, and a Research Plan, which are components of the Atlantic Trawl Gear Take Reduction Strategy (ATGTRS), dated December 2008. The Education and Outreach Plan identifies activities that promote the exchange of information necessary to reduce the bycatch of marine mammals in Atlantic trawl fisheries. The Research Plan identifies needed research to better understand the factors resulting in bycatch in Atlantic trawl fisheries.

The research priorities provided here are those that are identified in the Research Plan. While a formal take reduction plan is currently not in place for trawl fisheries, the research needs focus on finding ways to reduce the serious injury and mortality of short- and long-finned pilot whales, Atlantic white-sided dolphins, and common dolphins in trawl fisheries. The information gleaned from this type of research will be beneficial if future management measures are required for trawl fisheries to reduce marine mammal interactions.

The research needs presented here are divided into two categories: 1) research focusing on fisheries bycatch (including methods for reducing serious injury and mortality and learning more about how the biology of these animals affects interactions) and 2) research focusing on answering questions related to the stock structures of the marine mammal species that interact with trawl fisheries.

Biological Needs Associated with Fisheries Bycatch: This section identifies research needs developed by the ATGTRT that seek to understand the behavior of marine mammals around and within trawl gear as well as research the auditory and visual capacity of the marine mammal species that interact with trawl gear to help identify potential deterrent and exclusion measures.

Serious Injury and Mortality Reduction Resulting from Fisheries Bycatch: This section identifies research needs that seek to develop potential methods/techniques to minimize/mitigate interactions between marine mammals and trawl fisheries, which is one of the top priorities for trawl-related research.

Stock Structure: Relatively little is known about the life histories of the marine mammal species that interact with trawl fisheries, especially common and white-sided dolphins. Accurate abudance estimates are needed for these marine mammal stocks as these numbers then feed into appropriate bycatch limits.

For further information or questions: Please visit the Atlantic Trawl Gear Take Reduction website at www.nero.noaa.gov/prot_res/atgtrp.

Atlantic Trawl Gear Take Reduction Strategy (ATGTRS) - RESEARCH NEEDS AND PRIORITIES

Research Topic	Research Activity	Need for Activity	Priority (1 highest; 5 lowest)*
FISHERY BYCATCH			
Biological Needs	Use cameras and other technologies to document underwater behavior of cetaceans around and within trawl gear	Information on the behavior of marine mammals around and within trawl gear is essential for developing techniques to reduce interactions. It would also help identify the reason for interactions such as whether the animals and gear simply overlap in space and time, or if the animals are attracted to the gear.	1
	Photo-document the activity of cetaceans around nets to show the prevalence of marine mammals in close proximity to fishing vessels and the conditions under which interactions occur. These images should be associated with other data collected about environmental conditions and vessel activities (e.g., hauling back, setting out, vessel turns)	Information on the behavior of marine mammals around and within trawl gear is essential for developing techniques to reduce interactions. It would also help identify the reason for interactions such as whether the animals and gear simply overlap in space and time, or if the animals are attracted to the gear.	1
	Investigate novel technological techniques to document marine mammal behavior (e.g., use of sonar to document marine mammal behavior around and within trawls)	Information on the behavior of marine mammals around and within trawl gear is essential for developing techniques to reduce interactions. It would also help identify the reason for interactions such as whether the animals and gear simply overlap in space and time, or if the animals are attracted to the gear.	1
	Conduct research into the auditory and visual capacity of cetaceans that may be utilized in the development of potential deterrent and exclusion measures	More data should be collected on hearing sensitivities of these species and sample sizes should be increased to learn more. Developing auditory and/or visual deterrents to trawl gear may be an effective means for reducing interactions, although these types of studies can take several years to complete. The lack of these data should not impede the development and experimentation of mitigative techniques, and is thus ranked lower.	3
Serious Injury and Mortality Reduction	Conduct research on gear modifications and/or operating procedures to minimize the incidental capture of marine mammals and reduce serious injury and mortality of such interactions when they do occur (e.g., escape panels, exclusion grids, operational effects on gear performance and net profile)	Research on potential methods/techniques to minimize/mitigate interactions between marine mammals and trawl fisheries is one of the top priorities for trawl-related research.	1
	Investigate the use of visual deterrence techniques to reduce bycatch (e.g., lights, light sticks, reflective twine/rope)	While it would be ideal to collect more data on the hearing sensitivities of these species, these types of studies may take several years to complete and thus should not impede other research. Developing auditory and/or visual deterrents to trawl gear may be an effective means for reducing interactions.	1
	Review domestic and international bycatch reduction research related to trawl fisheries to identify potential techniques that may be employed in Atlantic trawl fisheries in the United States to reduce the take of marine mammals	A number of studies have been conducted overseas such as in the United Kingdom on possible methods to reduce incidental interactions, such as acoustic deterrents and exclusion grids. These studies should be reviewed to determine the ability to transfer such techniques to U.S. trawl fisheries.	1

Research Topic	Research Activity	Need for Activity	Priority (1 highest; 5 lowest)*
Serious Injury and Mortality Reduction (continued)	Coordinate with international and domestic researchers in the identification and implementation of marine mammal bycatch reduction research in Atlantic trawl fisheries	A number of studies have been conducted overseas such as in the United Kingdom on possible methods to reduce incidental interactions, such as acoustic deterrents and exclusion grids. These researchers have the expertise to assist in similar or new studies in Atlantic trawl fisheries.	1
	Investigate the use of acoustical deterrence techniques to reduce bycatch including pingers and predator vocalizations (e.g., killer whale)	While it would be ideal to collect more data on the hearing sensitivities of these species, these types of studies may take several years to complete and thus should not impede other research. Developing auditory and/or visual deterrents to trawl gear may be an effective means for reducing interactions. Some prior studies have indicated that perhaps predator vocalizations might not be a viable option for reducing interactions; however, further studies could be conducted. Pinger devices may be a promising method.	2
	Investigate auditory cues such as vessel operational acoustics (e.g., gear deployment, haul back, engine, etc.) that may increase interactions between trawl fisheries and marine mammals	More data should be collected on hearing sensitivities of these species and sample sizes should be increased to learn more. Sounds from trawl vessels may alert marine mammals to their presence and the presence of trawl gear.	2
	Convene a Trawl Fishery Characterization workshop to facilitate an increased understanding of the different gear configuration and operational practices that exist between various Atlantic trawl fisheries interacting with marine mammal species of concern	A workshop would increase knowledge of the individual trawl fisheries and their operational practices to assist in furthering the understanding of and developing future research initiatives for marine mammal/trawl gear interactions.	3
	Convene a workshop to review ongoing bycatch reduction research and results of field trials, both domestic and international	Such a workshop would help identify measures and best practices that warrant additional investigation as potential techniques and/or methods to reduce interactions between trawl fisheries and marine mammals	3

Research Topic	Research Activity	Need for Activity	Priority (1 highest; 5 lowest)*
STOCK STRUCTURE			
	Improve abundance estimates for all species affected by the ATGTRT by conducting more surveys in the future, by appropriately incorporating data from multiple years, and by using appropriate stock structure boundaries	Relatively little is known about the life histories of the marine mammal species that interact with trawl fisheries, especially common and white-sided dolphins. Accurate abudance estimates are needed for these marine mammal stocks as these numbers then feed into appropriate bycatch limits.	1
	Complete genetic analyses necessary to partition takes of short- and long-finned pilot whales in commercial fisheries to species and establish stock specific PBR rates for each species	Currently not enough data exist to differentiate pilot whale bycatch to either short- or long-finned. As such, one PBR is calculated for both species which precludes identifying separate bycatch limits for each species and determining the effects of interactions on each species.	1
	Conduct winter research cruises to collect biopsy samples and collect habitat data for use in habitat modeling to establish the extent of overlap between the two species of pilot whales in the winter in the Mid-Atlantic region	Currently the amount of overlap between long- and short-finned pilot whales during the winter in the Mid-Atlantic is unknown due to a lack of surveys conducted during the winter. Duke University is currently conducting winter cruises off Cape Hatteras, NC and collecting biopsy samples from pilot whales.	1
	Model environmental and biological factors that may be responsible for the large inter-annual variability in abundance estimates for Atlantic white-sided dolphins	Little is known about the stock structure of white-sided dolphins, and it is possible that there are 3 stocks in the NW Atlantic (Gulf of Maine, Gulf of St. Lawrence, and Labrador Sea). To help address interactions in trawl gear, more must be learned about the reasons (e.g., environmental and/or biological) for the large inter-annual variability in abundance estimates.	2
	Conduct research study utilizing morphometrics and molecular genetic analysis to confirm previous similar research results supporting one stock model of common dolphins in western North Atlantic	Only short-beaked common dolphins are found in the North Atlantic. Earlier finding suggest that there is one stock only. However, the sample size should be increased to confirm the earlier study supporting one common dolphin stock to ensure accurate abundance estimates are calculated and bycatch limits established. Since mortalities of this species are near ZMRG, this research is a lower priority.	3

*Since the ATGTRS focuses on four marine mammal species and four trawl fisheries, the ATGTRT recommended focusing research first on those marine mammal species for which bycatch estimates are closest to the stock's PBR and those fisheries with the highest bycatch levels.