ATLANTIC TRAWL GEAR TAKE REDUCTION TEAM (ATGTRT)
September 19 – 22, 2006
Providence, RI

Meeting Summary

ATTENDEES
See attached participant list.

DAY 1 – TUESDAY, SEPTEMBER 19

WELCOME, INTRODUCTIONS, AND GETTING ORGANIZED
Mary Colligan and David Gouveia of the National Marine Fisheries Service (NMFS), which convened the meeting, welcomed the participants and gave an overview of the meeting objectives. The Atlantic Trawl Gear Take Reduction Team (ATGTRT) was convened with the goal of developing consensus recommendations to guide NMFS in creating a Take Reduction Plan (TRP). The impetus behind the Team's formation was a settlement agreement between NMFS and the Center for Biological Diversity.

Meeting Purpose
The TRP will focus on reducing serious injury and mortality (bycatch) of long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), white-sided dolphins (*Lagenorhynchus acutus*), and common dolphins (*Delphinus delphis*) in several trawl gear fisheries in the Atlantic Ocean. These marine mammal species are known to interact with the Mid-Atlantic Mid-water Trawl fishery, which is classified on the MMPA List of Fisheries (LOF) as a Category I fishery (i.e., one that has frequent incidental mortalities or serious injuries of marine mammals). These marine mammal species are also known to interact with the Mid-Atlantic Bottom Trawl, Northeast Mid-water Trawl, and the Northeast Bottom Trawl fisheries, which are classified as Category II fisheries (i.e., those that have annual mortality and serious injury greater than 1 percent and less than 50 percent of the PBR level) on the MMPA LOF.

Under the framework of section 118 of the Marine Mammal Protection Act (MMPA), the ATGTRT will aim to draft a TRP that reduces bycatch of these stocks to insignificant levels approaching a zero mortality and serious injury rate (known as the Zero Mortality Rate Goal, or ZMRG), taking into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans, within five years of implementation. NMFS has identified ZMRG as ten percent of the Potential Biological Removal (PBR) rate, which is defined as the maximum level of mortality (excluding natural deaths) that will not harm a particular stock.

Mr. Gouveia pointed out that the ATGTRT is in the unique situation of designing a take reduction plan for cetacean populations that are currently below their respective PBR levels; thus, rather than working to achieve PBR within six months of implementing the TRP, the Team can focus on the five-year goal of reaching ZMRG. Another unique characteristic of the Team is

that it is gear-based rather than species-based. Although white-sided dolphins were not originally included in the settlement agreement, when looking at the data, NMFS found that the bycatch rate of this species was below PBR, but above the insignificant threshold, similar to the other species addressed in the settlement agreement. NMFS is including white-sided dolphins in the list of stocks under the ATGTRT's purview to proactively address bycatch of this stock before it potentially exceeds PBR. NMFS used a similar approach with the Pelagic Longline TRT (PLTRT) by adding Risso's dolphins to the list of species that the TRT considered.

Sea Turtles
Mr. Gouveia noted that while sea turtles are not under consideration by the ATGTRT, sea turtles are a protected species and the Team must consider the impacts any mitigation strategies may have on sea turtles. Accordingly, representatives working on a national sea turtle strategy were invited to give presentations on mitigation measures for sea turtles in order to allow the ATGTRT to work in coordination with that effort.

Future Meetings
Ms. Colligan emphasized that while NMFS staff will do their best to obtain funding for future face-to-face meetings, the federal budget has yet to be determined, so funding for additional meetings is not guaranteed. However, if future in-person meetings are not funded, NMFS intends to continue consulting with the TRT through conference calls, email, and perhaps small meetings of ATGTRT members in geographic proximity, which would be attended by NMFS staff.

Team Composition
Mr. Gouveia noted that Team members were appointed by Dr. William Hogarth, the NOAA Assistant Administrator for Fisheries, based on recommendations from the NMFS Northeast Regional Office. The MMPA requires that all TRTs include an equitable balance among representatives of resource user and non-user interests. Members shall include representatives of federal agencies, each coastal State which has fisheries that interact with the species or stocks, appropriate Fishery Management Councils, interstate fisheries commissions, academic and scientific organizations, environmental groups, all commercial and recreational fisheries groups and gear types which incidentally take the species or stock, Alaska Native organizations or Indian tribal organizations, and others as the Secretary of Commerce deems appropriate (MMPA section 118(f)(6)(C)). Given that most of the interactions relevant to the Team occur in federal and not state waters, NMFS decided not to formally appoint state representatives to the Team, but invited them to attend the meeting to provide input. Mr. Gouveia added that the agency considers the states valuable partners, but is concerned with keeping the size of the Team manageable. He then invited members' comments on the Team composition.

The group discussed the potential addition of another conservationist as well as representatives of certain states. Considerations mentioned included:

- o The importance of balancing the number of representatives from the fishing industry with those from conservation groups.
- o The number of fishermen in the current makeup is reflective of the structure of the industry.

- o When considering the appointment of an additional conservationist to the Team, it was suggested that an individual representing both a national and international perspective would be useful to the Team. It was suggested that the Whale and Dolphin Conservation Society would provide such a perspective.
- o State representatives could bring research and development and enforcement resources to the table.
- o It is difficult for states to have meaningful input to the Team as an observer. If states are not added to the Team, they would like to receive the meeting summary and information about subsequent meetings.
- o Increasing the size of the Team could be detrimental to its ability to function efficiently.
- o It may not be worthwhile to add Team members if another face-to-face meeting will not be held.

In response to a Team member's question, Mr. Gouveia clarified that an additional seat for the fishing industry had not been added; an invited member had declined a seat, so another fishing industry representative was appointed for that seat.

After putting the question of additional TRT members on hold and returning to it on the third day of the meeting, the ATGTRT recommended to NMFS that additional representatives be added from a conservation organization and appropriate states based on further analysis by NMFS of the data. NMFS staff directed interested parties to send their credentials to NMFS NER staff (i.e., David Gouveia or Mark Minton) and Dr. Hogarth, who will decide whether to approve and appoint additional Team members.

Ground Rules
Mr. Robin Roberts of RESOLVE, meeting facilitator, reviewed the draft ground rules intended to guide the group's interactions. Mr. Roberts reviewed the agenda and proposed meeting structure. Team members agreed to accept the ground rules as the operating protocol for the ATGTRT.

Breakout Groups
Mr. Roberts and Mr. Gouveia encouraged group members to consider how they would like to structure the breakout groups planned for the third day of the meeting. Due to the uncertainty of future meetings, they also highlighted the importance of making the work group sessions as productive as possible. The questions for breakout groups to address were printed under the Thursday agenda; NMFS developed a template reporting form to facilitate the discussion.

PRESENTATION 1: DETERMINING STOCK STRUCTURES
Presenter: Patricia Rosel, NMFS Southeast Fisheries Science Center (SEFSC)

In her presentation, Dr. Patty Rosel summarized completed and ongoing studies analyzing the stock structure of four species of cetaceans in the North Atlantic. Accurately identifying the marine mammal stock is important for these reasons: 1) if a population is identified as one large group but is actually two separate groups, then PBR will be set too high, potentially placing a heavy burden on one population and risking the loss of genetic diversity; and 2) if two populations are defined, but they actually constitute one large group, then regulations on the

fisheries could be too restrictive. Thus, accurate stock structure delineation allows for accurate abundance estimates and appropriate bycatch limits.   The main results from the studies of each species are as follows:

- o **Atlantic white-sided dolphins**: Nothing is known about their stock structure in the northwest Atlantic.
- o **Common dolphins**: There are two species of common dolphin – short-beaked and long-beaked. Only short-beaked dolphins occur in the north Atlantic. The one existing study (Westgate 2005) did not find significant differences between samples split north and south of 39° N in the northwest Atlantic or those found closer or farther from the shore, but there are significant differences between the stocks in the northeast and northwest Atlantic. Due to their high genetic diversity, a study with a much larger sample size should be conducted.
- o **Long- and short-finned pilot whales**: Long-finned pilot whales are found primarily in the northern part of the North Atlantic and short-finned pilot whales are found primarily in the southern portion, but the two species overlap in the mid-Atlantic. These two species show a distinct difference in their preference for water depth, which is perhaps due to temperature. Genetic studies suggest that the greatest area of overlap occurs between 38°N and 40°N, where long-finned pilot whales are present in winter and summer and short-finned pilot whales are present at least in summer. Further studies are needed to nail down the exact boundaries in this region, both spatially and temporally, and to determine whether there are different populations of long-finned pilot whales in the North Atlantic.
- o **Harbor porpoises**: Scientists have a better understanding of harbor porpoises than the other three species discussed. The populations across the Atlantic are quite different, and within the northwest Atlantic there are four distinct stocks.

Discussion and Observations on Presentation 1: Determining Stock Structures

Participants posed a variety of questions, ranging from the date of the stock assessments to the reasons for the geographic distribution of long- and short-finned pilot whales. Noting the relatively low numbers of cetacean bycatch per pound of fish caught, as cited in a study of mid-water trawl fisheries, a participant questioned whether the impact on the species under consideration was significant enough to require action, and, if so, what mitigation measures could be taken to reduce marginal bycatch numbers.

Acknowledging that the final take reduction goal could be a small number, Ms. Colligan outlined the procedure for determining the necessary level of bycatch reduction: after establishing the population estimate for a stock, the benchmark of ten percent of PBR is calculated, which indicates the take reduction goal across all gear types. Takes by gear type also can be estimated in order to arrive at goals for specific gear types.

Patricia Rosel and Debbie Palka of NMFS Northeast Fisheries Science Center (NEFSC) answered participants' questions as follows:

- o The last stock assessment estimate of white-sided dolphins was made in 1999. A new abundance survey of white-sided dolphins and harbor porpoises was undertaken in the

summer of 2006, though new estimates are not yet available. NMFS researchers will send the survey results to the Atlantic Scientific Review Group in January 2007.

o The findings of different levels of diversity in the stocks of common dolphins and pilot whales likely have different meanings. It is probable that the population of common dolphins is large, resulting in maintenance of high levels of diversity. In the case of pilot whales, their matrilineal social structure may limit the level of variability in the genetic marker (mitochondrial DNA) used.

o New data on pilot whales, using a different genetic marker, will allow the NMFS scientists to do a Bayesian analysis of the stock structure and determine if there are any environmental factors that are associated with the two stocks. If there are, then it will probably be possible to estimate abundance and bycatch of each stock.

o It is possible that long- and short-finned pilot whales are drawn to different water temperature zones by their respective prey. If that is the case, NMFS has not yet investigated this hypothesis using stomach samples of the pilot whales. There could be other factors attracting the whales to specific water temperatures.

o NMFS has the data on which fisheries were involved in pilot whale takes.

o NMFS can provide a table containing information on whether the pilot whale samples were obtained from trawl or longline fisheries to interested members. Owing to the difficulty of collecting samples from longline fisheries, however, 90% of the pilot whale samples are taken from trawl fisheries. The samples are not representative of interactions by gear type.

o The ATGTRT will not be considering harbor porpoises, as bycatch of this species does not readily occur in trawl fisheries and this species is also addressed under the Harbor Porpoise TRT.

PRESENTATION 2: OVERVIEW OF MMPA & ESA REQUIREMENTS
Presenter: Mark Minton, NMFS

Mark Minton reviewed the relevant legal frameworks for the ATGTRT; notably, the MMPA and, to a lesser extent, the Endangered Species Act (ESA). The goals of the MMPA are to maintain marine mammal stocks at their optimum sustainable population (OSP) and as functioning elements in the ecosystem of which they are a part; to restore depleted stocks to OSP; and to reduce mortality and serious injury (bycatch) of marine mammals incidental to commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate. The MMPA's mandates related to marine mammal bycatch, which is implemented by NMFS, consists of the following elements:

o Preparing stock assessment reports (SARs)
o Categorizing fisheries according to levels of bycatch (MMPA List of Fisheries)
o Registering fisheries in Category I ("frequent" bycatch), II ("occasional" bycatch) fisheries through the Marine Mammal Authorization Program
o Monitoring Category I and II fisheries (observer program)
o Requiring reporting of all injuries and mortalities
o Developing take reduction plans (TRPs)

NMFS estimates PBR level for marine mammals, which the MMPA defines as:

"The maximum number of animals, excluding natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population."

The minimum population estimate, the estimated productivity rate of the stock, and a "recovery factor" are the components used in calculating PBR.

When human-caused mortality to marine mammal stocks exceeds PBR, or when a species is listed or likely to be listed as threatened or endangered under the ESA or as depleted under the MMPA, a stock is considered strategic. The designation of a strategic stock then initiates the TRP process.

Take Reduction Teams are charged with developing Take Reduction Plans for marine mammals interacting with a Category I or II fishery. The Team submits a draft TRP that includes both recommended regulatory or voluntary measures, as well as estimates of the anticipated bycatch reduction that will be achieved by those measures.

The MMPA states that TRPs shall be developed by consensus, but if consensus cannot be reached then the group's majority and minority views should be included in the plan. NMFS will take the TRTs recommendations and develop a draft take reduction plan, which will be available for public comment. Then, NMFS will consider any public comments in developing a final TRP. Usually, the TRT continues to meet every six months after the plan's release to monitor its implementation, or as needed. The immediate goal of the TRP is to reduce bycatch levels below PBR within six months of its implementation; the long-term goal is to reduce bycatch to ZMRG levels within five years.

Discussion and Observations on Presentation 2: Overview of MMPA & ESA Requirements

ATGTRT members asked questions on the calculation of PBR; potential take reduction measures; the designation process for the MMPA List of Fisheries (LOF); and the inclusion of white-sided dolphins as one of the stocks the TRT is considering. NMFS staff made the following responses:

o The recovery factor that is used to calculate PBR allows the population to return to OSP levels, taking variability into account. It is a value between 0.1 and 1, depending on the status of a species (e.g., 0.5 for depleted species and 0.1 for endangered). A Team member commented on the development of the calculation, noting that the recovery factor is a conservative way to account for the uncertainty regarding the animals' reproductive rates. It is intended to prevent overestimation of how quickly a species can reproduce.

o The examples of bycatch reduction measures listed in the presentation came from other TRTs/TRPs. Even if quotas or closures are implemented, bycatch may still occur. NMFS has made an effort to solicit ideas on gear modifications that reduce or eliminate bycatch by convening gear workshops, looking to other TRTs for ideas, and inviting international participants to describe their experiences and successes with gear modifications.

o The MMPA LOF is reviewed and updated annually based on a variety of data sources many of which are contained in SARs. If the amount of bycatch in a fishery changes, that

fishery's status may be updated in subsequent versions of the LOF. Fisheries are
categorized using five-year averages, so data from a single year may not cause a fishery
to be reclassified from one category to another. On the other hand, as the overarching
category of "bottom trawl fisheries" and "mid-water trawl fisheries" were broken down
into geographic components, some of the subdivided fisheries could potentially be
reclassified.

o A fishery's categorization is determined by the stock with the highest level of bycatch.
   NMFS is currently working on the timing of the MMPA LOF to better reflect its
   connection to the SARs and to clarify which stocks are driving a fishery's categorization.

o Take reduction measures are evaluated based on bycatch estimates presented in the
   SARs, which are updated annually. If bycatch does not decrease, then NMFS would
   reevaluate those measures and possibly reconvene the TRT.

o At the time of the settlement agreement that triggered the current TRT process, common
   dolphins and pilot whales were designated as strategic stocks. However, the most recent
   data show takes are no longer above PBR and thus these stocks are no longer designated
   as strategic; therefore, the Team is working toward reducing bycatch to levels
   approaching ZMRG. The MMPA allows 11 months for developing a plan and five years
   for its implementation.

**PRESENTATION 3: OVERVIEW OF OBSERVER PROGRAM AND SUMMARY OF OBSERVER DATA
FOR TRIPS WITH MARINE MAMMAL INTERACTIONS**
Presenters: Amy Van Atten and Marjorie Rossman of NMFS NEFSC

Amy Van Atten described the main features of the Northeast fisheries observer program. Based
out of the NMFS NEFSC, the program currently has 55 certified observers. Observer coverage
of Northeast fisheries is sufficient to provide statistically reliable bycatch estimates that are
based on the following variables: geographic area fished, mesh size, trip length, target species,
and gear type.

To obtain certification, the observers take part in a three-week training program. Once trained,
their role is to collect scientific data to be used for research projects and management needs. The
data they collect include the following types of information:

o Trip and economic
o Gear
o Haul
o Catch
o Incidental take
o Sighting
o Biological sampling

Marjorie Rossman then gave an overview of observer coverage of Northeast and mid-Atlantic
bottom and mid-water trawl fishing trips. She noted that observer coverage of trips had
significantly increased in 2003-04 due to increased funding. Generally, observer coverage for
protected species is allocated proportional to commercial fishing trips. Ms. Rossman also
displayed a list of the observed takes from 2000 to 2004 by gear type that were used in the
mortality analyses.

Discussion and Observations on Presentation 3: Overview of the Observer Program and Summary of Observer Data for Trips with Marine Mammal Interactions

Ms. Van Atten and Ms. Rossman responded to participants' questions on the observer program on the following topics:

- o Observers collect a standard set of data but do not perform the analysis. NMFS analysts later use the data to discern patterns and trends. When a take is observed, the observer makes detailed records and an analyst later determines which takes will be used in the mortality analyses based on the level of decomposition of the carcass. Only takes of live or freshly dead animals are included in trawl bycatch estimates.
- o Observers also log fishing practices and the methods for using the gear. For example, if changes in hauling practices have taken place that are characterized by variables presently on observer logs, they are recorded by the observer, and therefore incorporated into the analysis.
- o Observer coverage spiked in 2004 because of increased Congressional funds available to monitor the groundfish fisheries following the 2001 lawsuit filing that NMFS had violated provisions of the Magnuson Stevens Act and the implementation of Amendment 13. Funds were used to meet a court-ordered coverage level in the 2004 Settlement Agreement.
- o Observer coverage in the herring fishery increased from less than 1 percent to 20 percent in early 2004 due to concern about marine mammal incidental takes as a result of several whale carcasses floating in areas coinciding with the fishery. Observers were trained to watch for marine mammals, as well as to record any obvious discards and the total kept catch. By mid-2004, due to an enforcement case documenting illegal haddock mixed in herring offload, interest shifted to observing the pumped catch for small haddock and other groundfish. Modification to the sampling protocols and technique allowed the observer to watch for marine mammal interactions, as well as sample the fish catch during herring trips.

Some participants expressed concern that the current observer data form does not adequately capture changes in fishing practices. They will continue to discuss this topic with Ms. Van Atten. Other participants registered concern about the methods for selecting vessels for observer coverage, noting that some vessels seem to experience more coverage than others.

PRESENTATION 4: MARINE MAMMAL STOCK ASSESSMENTS / ABUNDANCE ESTIMATES
Presenter: Debi Palka, NMFS NEFSC

Dr. Debi Palka gave an overview of the information required in a SAR and the methods for calculating the PBR level and estimating abundance. The SARs include information on species abundance, biology, mortality, an estimate of the PBR level, and whether the stock is strategic or non-strategic. The PBR is calculated using an estimate of the species' minimum population size, the estimated maximum productivity rate, and a recovery factor that attempts to account for uncertainties other than those incorporated into the abundance estimate. When estimating abundance, researchers use censuses with photo identification, the capture-recapture method, and, most commonly, the line transect method. The line transect method can be conducted by

boat or plane and involves two observers (which helps to ascertain the number of animals missed).

Discussion and Observations on Presentation 4: Marine Mammal Stock Assessments / Abundance Estimates

In the ensuing discussion, Dr. Palka clarified that N^{min}, or the minimum population estimate used in calculating PBR, is determined by a function that incorporates researchers' confidence levels in order to assure that the true stock size is equal to or greater than the estimate. When a participant questioned the table listing high levels of abundance for some species in some years and not in others, Dr. Palka replied that higher abundance estimates in 2004 were based on improved methodology and a change in the timing of the abundance surveys.

One member observed that the PBR level for pilot whales actually represents two different species and advocated separating out the estimates for each species of pilot whale.

PRESENTATION 5: MARINE MAMMAL MORTALITY ESTIMATES
Presenters: Debi Palka and Marjorie Rossman, NMFS NEFSC

Dr. Palka explained the method for estimating bycatch and detailed the estimates for mid-water trawl fisheries, while Ms. Rossman outlined the estimates for bottom trawl fisheries. Observer data are used to calculate the bycatch rate, which is the number of dead animals per unit of fishing effort. Once the rate is determined, it is expanded to encompass the entire fishery and so arrive at the total bycatch estimate. In order to do this, fishing hauls are divided into stratum with similar bycatch rates, where the strata are defined by a regression model. Analysts select variables that are potential predictors of the bycatch rate (which could be spatial, temporal, environmental, or characteristics of the gear), choose the best model, and use it to predict the bycatch rate.

Having described the method used, Dr. Palka displayed tables with the bycatch estimates from the mid-water trawl fishery during 2003-04. She pointed out that because there were only four observed takes in the mid-water trawl fisheries during that time period, the estimates should be considered preliminary. They will be re-estimated when new data from 2005-06 are added to the regression model.

In her discussion of bottom trawl fisheries, Ms. Rossman highlighted significant factors for predicting bycatch rates for pilot whales, white-sided dolphins, and common dolphins. While cautioning that there may not be a causal link between a particular variable and bycatch rates, she invited the participants to reflect on potential reasons the variables might be predictors of bycatch. The most important variables for each species were:

   o Pilot whales: vessel horsepower and bottom slope
   o White sided-dolphins: sea surface temperature and bottom depth
   o Common dolphins: Statistical Area

She also displayed a table of the number of observed takes from January 2005 through May 2006 by gear type and species, noting that the numbers were at least double those from the previous

four years. She added that observer coverage had also increased, so it is unclear whether the increase in observed takes indicates that more takes are occurring.

Discussion and Observations on Presentation 5: Marine Mammal Mortality Estimates

Dr. Palka explained that the number of hours that fishing gear is exposed to the water is used as a proxy for fishing effort in the bycatch estimates. One participant noted that inexperienced fisherman are more likely to leave their gear exposed inefficiently, and therefore suggested the number of fish caught as a better proxy.

Dr. Palka concurred that pounds of fish caught was a possible proxy, one that she had investigated, as documented in her paper on mid-water trawl bycatch estimates. She found, however, that days fished was more reliable as a proxy for cetacean bycatch. Another member speculated that the connection between vessel horsepower and bycatch may be related to "rope" (the amount of tow cable deployed) and tow speed.

Remarking on the difference in the population size of common dolphins in the UK and the US, a participant noted that reliable population estimates are crucial when evaluating the impact of the bycatch estimates.

At the request of TRT members, Amy Van Atten displayed a chart with the number of sea days and observed trips from 2000 to 2004. She also has the numbers for 2005, as well as for January through May of 2006. The corresponding 2005-06 cetacean takes were in the last slide in Marjorie Rossman's presentation. The participants also were interested in seeing the 2005 bycatch numbers, but the data have not yet been analyzed and without performing the calculations, the raw data could be misleading.

Dr. Palka and Ms. Rossman also made the following clarifications:
- o   The observed take of an unidentified dolphin did not result in a bycatch estimate.
- o   Fishing trips in the VTR database are categorized by the most commonly caught species, while fishing trips in the observer data can be categorized as either by the target species the vessel initially intended to catch or by the most-caught species.
- o   The bycatch estimates have not yet been completed for the 2005 data, but most will be included in the next SAR.
- o   Although there was an increased number of observed takes in 2005, there also was much higher observer coverage, so it is too early to say whether the increased number of takes will result in a higher bycatch estimate. For example, if the increased observer coverage took place only in a *specific* area with a high bycatch rate, then, the *overall* bycatch rate could still be low.
- o   The bycatch data from the mid-water trawl and bottom trawl fisheries were analyzed separately. Tables displaying the results for both fisheries were not intended to imply that the two types of gear were analyzed together.
- o   Annual estimates of an animal's mortality have a higher coefficient of variation (CV) than a mean estimate over a period of several years because adding more years to the equation gives an expanded data set and thus a greater confidence level, so the CV decreases accordingly.

DAY 2 – WEDNESDAY, SEPTEMBER 20

Mr. Roberts welcomed the group and reviewed the second day's agenda. Due to Team member interest, a short presentation on the Atlantic PLTRT was added to the beginning of the day's agenda. He also reminded the Team to reflect on the organization of the work groups for the following day.

PRESENTATION 6: SUMMARY OF ATLANTIC PELAGIC LONGLINE TRT
Presenter: Laura Engleby, NMFS Southeast Regional Office (SER)

At the request of members, Laura Engleby summarized the status of the TRT. The Atlantic PLTRT was established in June 2005, met four times, and submitted a final draft TRP to NMFS in 2006. The TRT's goal was to reduce significant injury and mortality of long- and short-finned pilot whales and Risso's dolphins to insignificant levels approaching zero in the Mid-Atlantic portion of the pelagic longline fishery. After examining the factors that contribute to marine mammal interactions, the Team found that the interactions generally occurred in the following circumstances:

- o Within the geographic area of the Mid-Atlantic Bight (MAB)
- o Within 40 kilometers of the shelf
- o In water with an average temperature of 70 to 80 degrees Fahrenheit
- o With vessels using mainlines longer than 20 miles

The group recommended both regulatory and non-regulatory measures for reducing bycatch. The non-regulatory measures included:

- o Increasing observer coverage;
- o Encouraging vessel operators to maintain communications with other vessels;
- o Updating marine mammal handling guidelines;
- o Distributing quarterly bycatch reports to Team members; and
- o Conducting research and collecting data to evaluate the plan.

Recommended regulatory measures were:

- o Designating Cape Hatteras as a special research area (i.e., to fish there, vessels must be willing and able to carry an observer);
- o Instituting a 20-mile limit on the length of mainlines (while not limiting the number of mainlines set);
- o Requiring that the voluntary marine mammal handling guidelines are on deck and in the wheelhouse; and
- o Instituting a mandatory certification program.

The next steps for the PLTRT include publishing the draft and final plans, incorporating public comments, and reconvening at least annually to evaluate progress.

Discussion and Observations on Presentation 6: Summary of Atlantic Pelagic Longline TRT

Some participants raised the issue of how the small number of takes will be allocated between trawl and longline fisheries. Noting it is important to determine which fisheries are involved in taking which species, they requested that NMFS clarify if and how takes will be apportioned between the PLTRT and ATGTRT. NMFS staff noted that PBR is based on a stock-specific approach and that achieving the short-term PBR and long-term ZMRG goals is evaluated on a stock-specific reduction of takes. A Team member noted that in order for a fishery to not be subject to a management under the TRP, it must be a Category III fishery (mortality/serious injury ≤ 1% PBR).

One member observed that the PLTRT emphasized research, a component that also could benefit the ATGTRT, as it is essential to understand why the bycatch is occurring.

Finally, members discussed whether switching to circle hooks in the pelagic longline fishery had impacted the number of takes. Although there are some ongoing experiments, results are not yet available.

PRESENTATION 7: SEA TURTLE TAKE ESTIMATES IN TRAWL FISHERIES -- OVERVIEW OF SEA TURTLE STRATEGY AND OVERVIEW OF SEA TURTLE TAKES
Presenter: Ellen Keane, NMFS Northeast Regional Office (NER)

Ellen Keane summarized the NMFS Strategy for Sea Turtle Conservation in relation to Atlantic and Gulf of Mexico Fisheries (Strategy). The Strategy addresses sea turtle bycatch across similar gear types rather than fishery by fishery. As sea turtles are highly migratory, widely distributed, and prone to be captured by certain gear types, the Strategy aims to ensure a comprehensive and integrated plan across all fisheries of concern. Some of the efforts underway include characterizing state fisheries; consolidating sea turtle, fishery, regulatory, and oceanographic information into an electronic database; conducting research on turtle excluder devices (TEDs) and other gear modifications for trawl gear; and monitoring specific fisheries for sea turtle interaction information. The results of this research will help in developing and implementing bycatch reduction strategies.

Presenter: Kimberly Murray, NMFS NEFSC

Kimberly Murray gave an overview of turtle takes in bottom otter trawl gear from 1994-2004, an estimate of total bycatch, and the potential implications of mitigation efforts for marine mammals on sea turtles. Ms. Murray described the results of observer data for the time period from 1994-2004. In the observed interactions, eight occurred in trawls equipped with TEDs, in most cases when the device was blocked. All the incidents occurred prior to 2000. In some of the interactions, turtles' flippers became entangled in the mesh. In estimating total bycatch, researchers found that significant factors influencing bycatch rates were latitude zone, depth, sea surface temperature, and whether the trawl was equipped with a working TED. The greatest number of interactions occurred in southern latitudes in warm, shallow waters. Finally, the ATGTRT should consider whether marine mammal mitigation strategies would cause a shift in fishing effort to areas where turtle takes have been documented, which could potentially lead to an increase in turtle bycatch.

Discussion and Observations on Presentation 7: Sea Turtle Take Estimates in Trawl Fisheries – Overview of Sea Turtle Strategy and Overview of Sea Turtle Takes

A Team member pointed out that changes in fishing practices may have had an effect on the number of takes over the last four to five years. The trawl fisheries proposed to be managed under the Atlantic Trawl TRP rarely fish in the areas that require turtle excluders (south of the "turtle TED line"), and so it is important to take such changes into account when analyzing data. The fishing industry has also experienced mandated changes to gear composition (i.e., net mesh size and TED escape vent size) that should be considered in future data analyses. Another participant requested a copy of the data on the percentage of observed trips for each fishery. Ms. Murray agreed to share this with the Team. NMFS staff responded to participants' questions as follows:

- o The NMFS SEFSC conducted a leatherback stock assessment that is scheduled to be completed this year or next.
- o In the bycatch estimate, only takes of live or freshly dead animals are included.
- o Although one turtle take did occur in 1994 in a net equipped with an unclogged TED, the reason for the entanglement was not clear. Since then, however, the mesh size has changed and such takes have not recurred.

PRESENTATION 8: OVERVIEW OF ONGOING GEAR RESEARCH TO MITIGATE MARINE MAMMAL TAKES IN TRAWL GEAR
Presenter: Henry Milliken, NMFS NEFSC

The Cetacean and Sea Turtle Trawl Interaction Mitigation Workshop took place in December 2005 and included representatives of NMFS, the fishing industry, and the University of Rhode Island (URI), the contractor charged with holding the workshop and conducting an initial pilot study. The goal of the workshop was to identify potential gear solutions to address the problem cetacean and sea turtle bycatch, to build communication between the industry and NMFS, and to discuss how best to test any Bycatch Reduction Technology (BRT).

This workshop focused mainly on cetacean bycatch. There will be a follow-up workshop on sea turtle bycatch that will be held in January 2007. Participants discussed the pros and cons of TEDs and heard presentations summarizing recent research on different exclusion strategies and "smart pingers." Group members identified the following options for reducing cetacean bycatch in trawl fisheries:

- o Using video cameras to examine the behavior of fish and cetaceans in the trawl nets;
- o Conducting research into soft V-grids;
- o Using a combination of noise or visual deterrents and escape openings designed to alert cetaceans without blocking the net;
- o Employing smart deterrents, such as pingers;
- o Providing a simple opening with no excluder;
- o Using flexible grids that may be deployed from net drums more easily; and
- o Making operational changes such as methods of hauling back, setting, turning the boat during towing operations, and using the acoustics of the boat to alert cetaceans.

Because of the size of grid that would be needed in the large offshore nets, several fishing industry participants expressed concern that hard grids comparable to TED technology would be difficult to operate and potentially dangerous for the crew; they should be considered as a last resort.

The group developed a plan to evaluate the soft V-grids as well as document animal behavior in the nets. As several different gear types are under consideration, the fisheries involved will pursue different avenues while working to converge on solutions. Since the meeting was held, four video systems have been purchased. Efforts to use them in the mackerel fishery, however, have thus far been unsuccessful. The cameras have proven useful in collecting data on mitigating sea turtle bycatch with TEDs. NMFS will continue to coordinate experiments with commercial fishermen throughout 2006-07.

Discussion and Observations on Presentation 8: Overview of Ongoing Gear Research to Mitigate Marine Mammal Takes in Trawl Gear

Referring to the list of workshop participants, one Team member observed that it is important to include biologists with an understanding of marine mammal and sea turtle behavior when working to develop gear modifications. Mr. Milliken explained that while there were several NMFS SEFSC staff with sea turtle expertise in attendance, the workshop's primary goal had been to take begin to identify potential solutions from industry to reduce the bycatch of marine mammals in trawl gear. Mr. Milliken further clarified that NMFS intended to bring other experts into the process as a next step.

Several participants raised concerns about the potential for regulations to require TEDs in all fisheries. NMFS staff assured the group that the feasibility of using TEDs with different trawl types was merely under investigation; they noted industry should voice their concerns if they consider TEDs to be unviable. Furthermore, the marine mammal workshop did not focus on sea turtles and TEDs, which will be the subject of the subsequent workshop.

Industry members also expressed concern that the sea turtle workshop had not been adequately publicized and that workshop attendance would not accurately reflect industry interest. One suggestion was to circulate a permit holder letter to publicize the workshop invitation. NMFS staff acknowledged the concerns, assured members that they would work to better publicize the event, and distributed copies of the meeting announcement to the Team.[1]

PRESENTATION 9: OVERVIEW OF ONGOING GEAR RESEARCH TO MITIGATE MARINE MAMMAL TAKES IN TRAWL GEAR – INTERNATIONAL
Presenter: Alice Mackay, University of St. Andrews, Scotland

Alice Mackay briefed the group on research into mitigation strategies for common dolphin bycatch in the United Kingdom's bass (*Dicentrarchus labrax*) pair trawl fishery. The work is mainly focused on exclusion devices and was undertaken at the request of industry, due to their concerns with the high rates of bycatch of common dolphins. Ms. Mackay cited this

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[1] On Thursday, September 21, NMFS staff announced the workshop would be postponed until a more convenient date, allowing time to circulate a notice of the meeting to fishermen.

collaborative effort involving the industry, net manufacturers, the government, and researchers as key to the success of the project.

In looking at patterns of bycatch, researchers noticed that the animals seem to be attracted to the nets, although they are not pursuing the target catch because bass was not found in stomach content analysis of bycaught dolphins. Furthermore, until 2003 all the entangled animals were recovered from the back end of the net's extension piece.

Drawing on these observations, researchers tested two types of mitigation devices – acoustic deterrents and exclusion grids. While studies showed the former to be ineffective (or they yielded inconsistent results), experiments with exclusion grids resulted in significant decreases in bycatch. Ms. Mackay noted that the use of a live video feed with the exclusion device was essential, allowing researchers to observe the workings of the gear and the behavior of the dolphins, and fishermen to see if fish were escaping.

As a result of these initial successes, the project will conduct further trials of the escape hatches. Researchers will explore additional modifications, such as methods for rendering the escape routes more obvious and net designs that will provide animals with more areas from which to exit the trawl net.

Discussion and Observations on Presentation 9: Overview of Gear Research to Mitigate Marine Mammal Takes in Trawl Gear – International

Ms. Mackay offered the following responses to participants' questions:

- Skippers appreciated the ability to see what was happening in the nets with the live feed; if fish losses occurred, they could adjust the grid and escape hole panel accordingly.
- Of the steel and flexi grids, the flexi proved easier for the crew to handle. Any differences in fish losses between the two grids were not evident because the skippers adapted immediately.
- French researchers experimented with a small panel area made of bungee – some animals escaped, while others failed to find or use the escape route. The 360-degree bungee panel, which will be tested in the 2006/2007 season, will give the animals alternatives for escape. Observations of dolphins in the net showed that while some tried to go out the sides or bottom, most swam upwards to escape.
- Although studies of exclusion grids conducted in New Zealand in the 1990s showed some injuries to escaping animals, the cause was likely to be caused by some other part of the fishing gear rather than the grid itself, as such injuries were also seen in bycaught seals where a grid was not present. After the dolphins escaped from the nets in the UK study, researchers observed them swimming strongly. They always seemed aware of the grid and did not appear to hit the grids at all.
- The common dolphin stock assessment for the northeast Atlantic was compiled from a number of studies taking place over ten years in Europe. In 2005, a second Small Cetacean Abundance in the North Sea and adjacent waters (SCANS) study repeated a 1994 abundance survey using ships, hydrophones, and planes. The results will be available early next year.

o Ms. Mackay did not have data available on the weight of the fish in the codend, but she can provide that information.

PRESENTATION 10: REVIEW OF MARINE MAMMAL BEHAVIOR THAT MAY RESULT IN FISHERY INTERACTIONS
Presenters: Damon Gannon, Mote Marine Lab, and William McLellan, UNC Wilmington

Dr. Gannon and Mr. McLellan described the field identification characteristics, geographical location, life history, and behavior of short- and long-finned pilot whales and common and white-sided dolphins. Very little is known regarding the life history of the two species of dolphins (although Andrew Westgate's study of common dolphins is forthcoming). For pilot whales, the calving interval is of long duration. Female long-finned pilot whales, for example, can produce a maximum of eight calves in their lifetime.

The Team members framed their discussion with the following questions on fishery / cetacean interactions:

o Are the animals just in the wrong place at the wrong time, or are they attracted to the trawls?
o If they target the trawls, what cues do they use to locate the gear?
o If they are targeting the trawls, at what point do they interact with the gear?

They noted that because there are four different species under consideration, the answers may not be simple and may be different for the different species. It also was noted that unfortunately, very little is known about cetacean behavior.

It was suggested that sound is likely an important cue for attracting animals to the trawls. In addition to passive hearing, cetaceans have a finely-honed echolocation capacity that allows them to distinguish very small differences between objects. Depending on what the animals are targeting, however, they may not be using echolocation to detect the trawls. Scientists are currently preparing to conduct field research into the hearing capacity of cetaceans.

Discussion and Observations on Presentation 10: Review of Marine Mammal Behavior that May Result in Fishery Interactions

The group discussed possible reasons and mechanisms drawing the animals to the nets, as well as options for deterrence. In addition to their sensitivity to sound, Dr. Gannon noted that the animals have good vision. Mr. McLellan pointed out that they generally know their habitat and only use their echolocation capacity about ten percent of the time in order to locate an object.

In a discussion on what type of exclusion device is easiest for cetaceans to detect, Alice Mackay said that the dolphins could detect all three types of grid used in the UK experiments – so the challenge was to design the nets to allow for ease of escape. Dr. Gannon added that experiments to make gillnets more acoustically detectable resulted in a reduction in harbor porpoise bycatch.

Participants speculated that dolphins may be playing around the nets rather than feeding in them. Although stomach biopsies have not revealed that cetaceans are feeding off the target species, another possibility is that the cetaceans are feeding on prey that slips through the codend of the

net. One experiment in Canada filmed a minke whale following the net and picking prey off the codend.

Team members suggested deterrence methods such as projecting bright lights or using a pinger emitting killer whale sounds to frighten off the dolphins. Researchers did not know if the animals would avoid the lights or if they would habituate to the killer whale sounds.

PRESENTATION 11: SIGNIFICANT VARIABLES RELATED TO MARINE MAMMAL INTERACTIONS
Presenters: Debi Palka and Marjorie Rossman, NMFS NEFSC

Debi Palka and Marjorie Rossman highlighted the factors that may, or may not, be correlated to the bycatch rate. They aimed to identify gear characteristics, fishing practices, or environmental factors correlated to bycatch and thus might be useful in drafting a take reduction plan. In relaying these correlations to the Team, the presenters hoped to benefit from the members' experience and knowledge of fishing practices to distinguish which variables may be meaningful.

Dr. Palka explained the method for determining significant variables. Logistic regressions, the same technique used in the bycatch rate model, were used to find variables that are highly correlated to the bycatch rate. The highly correlated variables are those with low AIC (Akaike Information Criteria) values; only the lower values (those with no more than a difference of eight from the best value) have a significant correlation. Displaying the variables for mid-water trawl in tables and graphs, Dr. Palka laid out the following caveats:

o Some factors are correlated with others, so there may not a cause-and-effect relationship between the bycatch rate and each correlated factor.
o Sometimes a few "outlier" values can drive that relationship.
o The amount of data may be too small to reliably indicate a relationship. A correlation based on a small amount of data has two conflicting interpretations – the link could be a coincidence or, alternatively, it could be extremely significant.

The most significant correlations by gear type and species were follows[2]:

o Mid-water trawl, white-sided dolphins and pilot whales: time of day (night); codend twine type and codend material (single twine and Spectra, or a combination of materials); bottom slope (steep, i.e., ≥0.5°); and target species and latitude (mackerel in mid-Atlantic on shelfbreak and herring in the Northeast on northern edge of George's Bank).
o Bottom trawl, white-sided dolphins: sea surface temperature and month (March and April); depth (>110 meters), wire out (>~150 fathoms); and area and latitude (Northeast, specifically areas 514, 515, 521 and 522).
o Bottom trawl, pilot whales: vessel horsepower (≥1265 hp), bottom slope (very steep, i.e., ≥3.9°), bottom depth (~300-600m), and codend mesh size (<70 mm).
o Bottom trawl, common dolphins: Statistical Area and latitude (622, 627, 525); bottom slope (steep); and target species (Loligo and Silver Hake).

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[2] They also presented a summary of this data on Thursday, September 21, so the information from the two presentations is combined here, as are the comments in the discussion section below.

Discussion and Observations on Presentation 11: Significant Variables Related to Marine Mammal Interactions

Looking at the data, Team members offered several suggestions on interpreting the correlations:

o Codend sizes do not differ that much – they are unlikely to be significant.
o In the data analysis, it is important to connect scope or depth with wire out as the two are related.
o The time of day and weather variables should be broken down into more specific categories to account for cloudy versus sunny days, as well as cloudy nights versus those with a full moon. Crepuscular periods also should be taken into account. These factors affect fish behavior, so they are likely to also affect cetaceans.
o Ilex and Loligo fisheries are two different fisheries using different gear types and should be separated.
o On the issue of slope, it is important to indicate whether the fishing gear is heading upslope or downslope, as the gear works differently in those two cases.

Some TRT members raised the issue of trying to draw conclusions from two-year-old data, which could be significantly altered by the inclusion of 2005-06 data. Although the 2005-06 data have not yet been fully analyzed, Dr. Palka and Ms. Rossman indicated that a preliminary look at the 2005 data suggested that the same variables could be relevant.

One TRT member observed that it will be difficult to make management decisions with the available data in the time allotted, suggesting it might instead be feasible to lay out research priorities. Another TRT member expressed concerns that the group would leap to the conclusion that time / area closures are necessary. A NMFS representative responded, reminding the Team that the goal is to reach ZMRG within five years of implementing the TRP, which gives the Team time to obtain additional information and consider the options carefully without jumping to conclusions.

Other comments included:

o TRT members would like to see graphs that more clearly delineate the frequency of the variable under consideration. While a jiggered graph can convey this idea, some Team members felt it was not descriptive enough.
o In response to the observation that the average foot rope length is a characteristic of many boats in the fishery, Ms. Rossman pointed out that such a correlation would indicate that average vessels are the ones experiencing interactions. Foot rope length, however, was not a highly ranked variable.
o A participant suggested separating the mid-water trawl data into pair and single trawls when more data are available.

PRESENTATION 12: CHARACTERIZATION OF THE MA AND NE MID-WATER TRAWL AND BOTTOM TRAWL FISHERIES
Presenters: Chris Orphanides and Gisele Magnusson, NMFS NEFSC

Chris Orphanides and Gisele Magnusson provided an overview of the trawl fishery from 1996-2004, describing the location of fishing activity, the gear types employed, the species targeted,

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and changes in economic value. Mr. Orphanides drew on the vessel trip reports (VTRs) for data to characterize the bottom trawl (fish otter and other otter) and mid-water (paired and single) fisheries.

To calculate fishing effort, he uses the number of days fished, which is the product of the average soak time and the number of hauls. The two types of fisheries differ in their scale, geographic location, target species, and vessel characteristics.

Some notable changes over the time period studied include:

- o Fishing effort declined in both fisheries.
- o While vessel size changed little in the bottom trawl fishery, the mid-water trawl fishery witnessed an increase in vessel size after 2000.
- o Average revenues for the mid-water trawl fishery increased, although the growth was due to an increase in landings, not in price. (Cost information was not available, however, so the data do not reflect profitability.[3])
- o There was a spike in revenues for mid-water trawl in 2004. Participants speculated that this likely occurred for vessels targeting mackerel / herring and could be attributed to good weather that year.
- o For bottom trawl, the highest revenues were obtained in the area of George's Bank, which experienced growth while the other regions remained steady.

PRESENTATION 13: CURRENT REGULATORY MEASURES FOR ATLANTIC TRAWL FISHERIES
Presenter: Mark Minton, NMFS

Mark Minton gave an overview of regulatory measures currently in place for Atlantic trawl fisheries. Mr. Minton noted that under the four broad MMPA LOF fisheries being addressed by the ATGTRT, there were in fact several different fisheries regulated under different fishery management plans (FMP) under the Magnuson-Stevens Act.

Under the Mid-Atlantic Mid-water Trawl Fishery (Category I) several fisheries are regulated under the Squid, Mackerel, and Butterfish Fishery Management Plan (FMP) developed by the Mid-Atlantic Fishery Management Council. Under the Mid-Atlantic Bottom Trawl Fishery (Category II), several fisheries are regulated under the Summer flounder, Scup, Black Sea Bass FMP. For the Northeast Bottom Trawl Fishery (Category II), a number of fisheries are regulated through several FMPs developed by the New England Fishery Management Council, including the Northeast Multispecies Groundfish FMP as well as the Monkfish FMP. Under the Northeast Mid-water Trawl Fishery (including pair-trawl) (Category II), a number of regulatory measures are in place under the Atlantic Herring FMP. The general categories of regulatory measures implemented by these various FMPs include: area/seasonal closures, quota/harvest limits; state specific allocation; seasonal quotas; trip limits (scup); minimum size limits; gear/mesh size requirements; limited entry; permit requirements; reporting requirements; observer coverage, vessel monitoring system (VMS) requirements; days-at-sea; vessel size/horse power restrictions, and total allowable catch limits.

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[3] In response to a participant's question on how she will calculate the economic feasibility of potential mitigation strategies, Dr. Magnusson said she will obtain cost information from observer data.

Discussion and Observations on Presentation 13: Current Regulatory Measures for Atlantic Trawl Fisheries

A participant posed a question about the relevance of state regulations. Generally, the measures are the same; if state regulations differ from federal regulations, then the most stringent measures apply.

Referring to the maps indicating the closure areas, Team members suggested adding all types of closures, including seasonal ones, in order to compile a comprehensive, up-to-date map of closure areas.[4] Mr. Minton noted that the maps are in the process of being updated.

Other comments included:
- o The slide on the butterfish fishery was misleading because it should not be classified exclusively as Category I.
- o There could be jointly-managed state fisheries without observer coverage that interact with sea turtles.

PRESENTATION 14: ECONOMIC MODELS
Presenter: Gisele Magnusson, NMFS NEFSC

The goal of Dr. Magnusson's presentation was to explain the role of economics in the TRT process and describe an economist's view of a take reduction plan. In evaluating options, economists are concerned with optimizing for efficiency. Their goal is to maximize the present value of net benefits to society, subject to constraints.

In order to evaluate the alternatives for a TRP, an economist must consider their potential benefits (including the non-use value of a protected species, which is difficult to measure) and their potential costs to consumers and producers, both direct and indirect. To incorporate equity concerns into the analysis, an economist must consider the following impacts of a proposed change:

- o Who will be affected? (by vessel size / fishery)
- o Where will the impact be felt? (by state / port)
- o How big is the impact? (on vessel profits and industry / sector profits)

Dr. Magnusson used the example of reducing takes of white-sided dolphins in the Northeast to illustrate an economist's method of analysis. Using this approach, economists can help identify the alternatives that provide the greatest benefits at the lowest costs. She cautioned, however, that the least-cost alternative may not be the best option.

Discussion and Observations on Presentation 14: Economic Models

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[4] Team members gave examples of the closures to be included: those below Cape Hatteras; closures for herring spawning; periodic flynet closure off the North Carolina coast; trawl area closures at the heads of several canyons due to the Monkfish FMP; the Horseshoe Crab no-trawl sanctuary off of New Jersey and Delaware; the trawl Gear Restricted Areas (GRAs) for scup/squid in the mid-Atlantic; and the MMPA TRT-related gillnet area closures.

Several Team members expressed concern that the economic model would fail to properly account for the costs to fishermen of displacement from current fishing areas or their economic losses due to regulatory changes. Some also mentioned that it may unfairly discount the value of the industry or overestimate the benefits of non-use values to society.

NMFS staff emphasized that the economic model would be used to evaluate alternatives in the context of achieving ZMRG, allowing the TRT to look at the cost of the various options. The idea of the presentation was simply to give members an idea of the role of economics in the process. Dr. Magnusson added that economists will not assign a dollar value to non-use value, but can be aware of it. However, the value of seafood to consumers can be incorporated into the analysis by looking at expected changes in price, which reflects the value people accord to it.

One participant questioned the map showing the areas of white-sided dolphin bycatch in the Gulf of Maine and suggested that the geographical management unit used in this analysis was too large to generate practical management (take reduction) conclusions because it covers such an extreme diversity of habitats and fisheries. The participant suggested that the focus should instead be on the precise location (habitat) of actual takes and the specific fisheries involved (e.g., gear and target species), rather than attempting to draw broad, statistically-generated conclusions about the entire Gulf of Maine ecosystem and fisheries. Ms. Magnusson clarified that the data came from Marjorie Rossman's analysis of the white-sided dolphin bycatch rate. Ms. Rossman pointed out that the model fit the collected data, so the map accurately reflects where the takes are occurring.

Dr. Magnusson confirmed that she would be present for the rest of the meeting and invited TRT members to consult with her during the work group sessions. She also encouraged them to use the work groups to communicate their economics-related issues to the larger group.

PRESENTATION 15: OVERVIEW OF OBSERVER REPORTS
Presenter: Amy Van Atten, NMFS NEFSC

At the group's request, Ms. Van Atten distributed samples of the records from observer trips from 2000-2005 and briefed the Team on their content. The entanglement records revealed that white-sided dolphins were mainly trapped in the belly of the trawl and the codend, while common dolphins and pilot whales were mostly caught in the codend. Looking at the notes from the biological samplings, she noted that many of the pilot whales taken seemed to be smaller ones, often juveniles.

Discussion and Observations on Presentation 15: Overview of Observer Reports

In reviewing the reports, several members were concerned that dead animals may be double-counted. Ms. Van Atten emphasized that only freshly dead or live animals are counted in the bycatch estimates. Observers do not make the determinations themselves, but take records, photos, and notes and relay that information to the analysts, who decide whether the animal should be classified as freshly dead.

Observers also undergo training to help them describe an animal's state of decomposition. One clear indication that the animal was previously taken by another vessel is the presence of a rope around their tailstock, which fishermen intentionally tie to an animal to lift it off vessel and back into the water. To improve the quality of observer comments, a marine mammal serious injury working group is coordinating a team of veterinarians to review the observer comments and provide a list of diagnostic injuries for observers to record so serious injury determination can be made in the future.

In addition, when an observer encounters a dead animal, it is tagged before being returned to the water to ensure it is not counted again. If an animal is taken during a trip without an observer present, however, it would not be tagged. Several fishing representatives suggested that NMFS could issue tags to fishermen to do the procedure themselves and others approved of the idea, affirming that fishermen would participate in such a program. Ms. Van Atten will follow up with them offline.

The group also discussed the body temperature measurement recorded in the biological samples. Some participants advocated using body temperature to determine the time of the animal's death. Others objected to the idea, pointing out that it would not be a reliable measure because 1) the instruments used are not precise enough; and 2) some studies have recorded a dramatic rise in body temperature just before death, which complicates the use of body temperature as measure of time of death.

Asked about the priority of taking stomach samples, Ms. Van Atten confirmed that it is a high priority for the observers. She mentioned that it can be difficult to take samples in practice because:

- o Some pilot whales are not brought on board;
- o Observers do not always reach the animals before they are thrown overboard; or
- o The animal is severely decomposed.

A TRT member inquired whether there was a correlation between bycatch and sightings of animals near the vessels. Ms. Van Atten replied the data are not available because recorded sightings are opportunistic rather than systematic and are therefore difficult to quantify or analyze.

DAYS 3 & 4 – THURSDAY & FRIDAY, SEPTEMBER 21-22

WORK GROUP SESSIONS ON DATA ANALYSIS AND MANAGEMENT NEEDS

On the third day of the meeting, the TRT divided into sector-specific work groups (i.e., the fishing industry; conservation NGOs; and scientists, fishery council, and Marine Mammal Commission members) to identify additional research topics and data gaps that need to be addressed in order for the TRT to work toward formulating consensus recommendations for a TRP. On the last day of the meeting, these research topics and data gaps were further discussed and revised.

The following list represents the topics discussed on the third and fourth day. The list is organized by sector-specific work groups. The fishing industry further subdivided their list into over-arching and specific data needs, as well as dividing them by fishery type. All the work groups requested that NMFS provide certain materials or information for the next meeting, which are designated with an asterisk below.

The group reached consensus in its recommendation that another face-to-face meeting of the ATGTRT be held.

FISHING INDUSTRY

Over-arching Issues
- Issue of settlement agreement
  - Clarify timeline and requirements under MMPA for the development of a Take Reduction Plan for stocks that are non-strategic (i.e., does 11-month timeline for development of a plan and 5-year timeline for achieving ZMRG apply?).[5]
  - What is the TRT's responsibility for common dolphins since take is near ZMRG (+/- 1)?*
  - Clarify how and why white-sided dolphins were added to the TRT's purview and what the TRT's responsibilities are under MMPA to address takes in this stock (i.e., does 11-month requirement for development of TRP and 5-year timeline to achieve ZMRG apply?).*

Specific Data Needs
- Re-categorize gear type based on fish species caught, as reported in the vessel trip report (VTR)
- Determine directed fishery by gear description or species caught (not species targeted)
- Improve description of gear in VTR for all fisheries

Mid-water Trawl (single, herring)
- Analyze takes by depth*
- Break down hauls by day/night/transition*
- Clarify tow duration (brakes "on" and "off")*
- Document how many turnarounds vessels make during a haul (from observer reporting)

Mid-water Trawl (single, mackerel)
- Analyze takes by depth*
- Break down hauls by day/night/transition*
- Clarify tow duration (brakes "on" and "off")*
- Document how many turnarounds vessels make during a haul (from observer reporting)

Mid-water trawl (pair, herring)
- Clarify tow duration (brakes "on" and "off")*

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[5] * Denotes materials / information that NMFS will provide for the next meeting.

- Categorize catch by species caught in VTR*
- Include just the most recent data (2000-2005)*
- Break out joint venture (JV) data separately in database*
- Document how many turnarounds vessels make during a haul (from observer reporting)

Mid-water trawl (pair, mackerel)
- Clarify tow duration (brakes "on" and "off")*
- Categorize catch by species caught in VTR*
- Include just the most recent data (2000-2005)*
- Break out joint venture (JV) data separately in database*
- Document how many turnarounds vessels make during a haul (from observer reporting)

Bottom Trawl
- Re-categorize fisheries as Loligo offshore, Loligo inshore, Ilex*
- Identify time of day*

Bottom Trawl Multi-species/Groundfish (consider sub-categories/fisheries as appropriate*)
- Account for fishery in flux – (e.g., vessel buyout, effort reduction, shifting effort, closures, etc.)
- Get frequency distribution of vessel horse power by target species*
- Analyze takes by depth, remove slope (slope is not relevant)*
- Further analyze interactions by specific gear types (consider sub-categories/fisheries as appropriate)*
- Characterize bottom substrate (e.g., hard, sandy, muddy)*
- Use cameras and other technologies to document animal behavior around trawls – this will/could lead to best ways to avoid interactions – information needed to inform viable mitigation options
    - o Identify funding sources and research priorities*
- Investigate mechanical/acoustical deterrent options (e.g., excluder panels in mouth of the net, pingers)
    - o Identify funding sources and research priorities*
- Use only data from the last 5 years (at most) because of multiple changes due to fishery management and days at sea*
    - o Show data separately so that changes can be documented*
- Analyze 2005/2006 observer data
    - o Provide basic information on 2005/2006 observer data as available*
- Improve communication between TRT members and other researchers on reasons for bycatch, technologies & techniques
- Break down the observer data to show specific individual takes used in the take analysis and make this information available to the industry*
- Analyze takes in conjunction with weather conditions, time of day, moon phase (e.g., sea state, wind direction, cloud cover)
- Expand stomach content analysis data and compare to target species -- will inform our understanding of marine mammal behavior (e.g., depredating target species, playing)

- Increase observer collection of marine mammal body temperatures
- Provide a summary of the current regulatory/management measures in place in Canada*
- Photo-document activity of animals around nets to show the prevalence of marine mammals in close proximity to fishing vessels
    - Underwater
        - Develop practical protocol*
        - Develop research plan*
    - Surface behavior
- Dedicate observers exclusively to marine mammals (see also NGO recommendation, below)
    - Industry has concerns about cost of additional marine mammal observers
- Initiate trainings for captains – avoidance and mitigation, observer sensitivity (e.g., need for biopsy, temperatures of taken marine mammals, stomach samples)
    - Outreach documents : color species identification, TRT process (post on website)*
- Improve communication within industry regarding bycatch "hotspots"
- NGOs conduct outreach to constituencies on industry efforts to limit bycatch
- Improve descriptions in observer data on nets and configuration*
- Recognize concern: mitigation measures dependent on safety
- Improve characterization of depth and depth range (consider "beginning tow depth" & "end tow depth" as range for analysis)*
- Use technology (digital photography/video) to evaluate marine mammal presence (as opposed to people looking out of "bubble windows" on aerial surveys)
    - Make sure techniques used in abundance estimates are state-of-the-art
- List of Fisheries analysis – revisit characterization of trawl fisheries, provide updated tier analysis for trawl fisheries*

CONSERVATION NGOS
- Provide information on areas 515, 521, and 522*
    - Where are the takes occurring? (Are 513, 514 correct?)*
    - Fisheries in March & April in 521 & 522. What is going on regarding effort in the rest of year in those areas?*
    - Are areas closed in March & April? Is something unique going on with dolphins in those areas that may contribute to the bycatch?*
    - Hard bottom vs. soft bottom: how might there be differences in gear fished on these bottoms that contribute to bycatch?*
- Provide information on area 622*
    - Description of fisheries and marine mammal interactions*
- Relationship of vessel horsepower & takes (e.g., speed, noise, other contributors related to large boats)
- Dedicate observers exclusively to marine mammals to describe marine mammal interactions around the nets (don't count fish)
- Retraining of observers working up marine mammals (i.e., biopsies, temperatures)*
- Run models looking at combination of variables*
    - This may ID other research needs*

- Pilot whales
  - Which species are impacted?
  - Importance of biopsy samples
  - Match existing biopsy with fishery to see with which stock is interacting*
- Run 2005 data
  - Deeper exploration of factors that look significant
- Re-run all analyses including 2005/2006 data
  - Estimate bycatch for each marine mammal species by these variables:
    - Mid- (pair & single) & bottom trawl
    - Northeast & Mid-Atlantic
    - Steep vs. shallow slope
    - Seasonal
  - AIC values
    - Give directions on which are most significant
  - Multivariate analysis (various combinations of variables)
- For different fisheries, look at where in the net are marine mammals are caught *
- Look in detail at what is going on in places where analysis (with small dataset) shows some possible clues*
  - White-sided dolphin in bottom trawl -- low SST, mid-depth/deep (especially Northeast)*
  - White-sided dolphin in mid-water trawl – mid-Atlantic pair, mackerel, night trawls*
  - Mid-water trawl -- look at adequacy of observer coverage and placement for pair trawl (i.e., do we need observers on both vessels?)*
- Better define differences within the fisheries (characteristics)
  - Mid-water: pair & single
  - Bottom: northeast & mid-Atlantic
- In short term, show where and when for 2005/2006 data (distribution of animals, bycatch, fishing effort?)*
  - Show graphically*
- Describe fishing patterns: density of vessels in an area and the way they fish
- Split longfin & shortfin pilot whales for Science Review Group (SRG)
  - Get biopsy samples from 100% observed pilot whale mortalities onboard

SCIENTISTS
- Look at observer/catch data from JV and foreign fishing observer data to see what might come out, supplement what we have
  - Present readily available data*

FISHERIES COUNCILS & COMMISSION MEMBERS
- Incorporate/look at thermal fronts*
- Survey in regions/seasons where we don't have information from marine mammal surveys
- Compare seasonal distribution/density of mammals with seasonal distribution & density of effort
- Use acoustics to look at animals around nets

- Perform data analysis: did codend transfer occur during the tow (e.g., JV fishery)? Are we adequately describing the fishery process? How long did the codend sit in the water?
- Look at groundfish closures already in place and any required gear modifications and overlap of spatial/temporal distribution of takes of the three marine mammal stocks*
- Look at fish assemblages associated with targeted catch

MEETING WRAP-UP AND NEXT STEPS

After revising the list of data needs and indicating the immediate next steps for NMFS, the Team members raised a few final questions. One Team member was concerned that the MMPA LOF needs to be updated to accurately reflect each fishery's take and appropriate category. A NMFS representative affirmed that the list is updated annually and that the process for 2007 is currently underway; changes will be implemented where warranted.

Mentioning that the fishery councils and NMFS had been mandated to develop a bycatch reduction prototype for all fisheries, a Team member asked if marine mammal concerns had been addressed in that effort. Although the plan was focused on fish bycatch, NMFS staff answered that marine mammals had been included and that those data would be made available.

Finally, Team members reiterated the importance of the ATGTRT holding another in-person meeting.

In closing, Mr. Gouveia thanked Team members for their hard work and congratulated them on the progress they had made. He reminded members that if they would like to select an alternate for future meetings, they should recommend someone and notify Mark Minton. He assured the Team that another meeting would be held in some form. NMFS staff hopes to receive next year's budget information by October 1st, which would allow the agency to schedule the next meeting. Ideally, Mr. Gouveia would like to plan a meeting for early 2007, but that will be contingent upon the timing of the agency's budget and whether funding for another meeting is included.

APPENDIX A. ATLANTIC TRAWL GEAR TAKE REDUCTION TEAM
LIST OF ATTENDEES

Conservation/Environmental NGO's

Brendan Cummings
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P.O. Box 549
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Jessica Koelsch
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Sharon Young
Humane Society of the United States
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Fishing Industry Reps

Glenn Delaney
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Gregory DiDomenico
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Cape May, NJ 08204

Rick Marks
Roberston, Monagle & Eastaugh
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Fishing Industry – Fishermen

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Marine Mammal Commission

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Academic/Scientific & Gear Specialists

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Fishery Management Council

Patricia Fiorelli
New England Fishery Management Council
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Rich Seagraves
Mid-Atlantic Fishery Management Council
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NMFS

Melissa Andersen
National Marine Fisheries Service
Office of Protected Resources
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Silver Spring, MD 20910

Mark Minton
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One Blackburn Dr.
Gloucester, MA 01930

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APPENDIX B.
ATLANTIC TRAWL GEAR TAKE REDUCTION TEAM (ATGTRT)
Proposed Agenda
September 19 – 22, 2006
Providence, RI

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<u>**MEETING OBJECTIVES**</u>
- Introduce TRT members and project support staff
- Review and adopt ground rules for the ATGTRT
- Review goal of the TRT process and roles of TRT members
- Present and discuss data and management questions
- Review potential mitigation options
- Plan for next ATGTRT meeting

Day 1, Tuesday, September 19, 2006 (10:00 AM – 5:30 PM)

<u>**BACKGROUND / MANDATE(S)**</u>

10:00-12:00   Welcome, Introductions and Getting Organized (RESOLVE, NERO)
          1) Opening comments
          2) Introductions
          3) Review agenda
          4) Review meeting purpose
              a) Reduce interactions between commercial fisheries and pilot whales, common dolphins and Atlantic white-sided dolphins
              b) Review details of the settlement
          5) Review goal of the TRT process and roles of TRT members
          6) Review and adopt ground rules

12:00-12:15   BREAK

12:15-1:00   Presentation and Discussion: Determining Stock Structures (e.g., Pilot Whale) (SEFSC - Rosel)
          1) Methodology (e.g., genetics)

1:00-2:00   LUNCH

2:00-3:15   Presentation: Overview of MMPA & ESA Requirements (NERO)
          1) Section 117 of MMPA (SARS, SRG, serious injury and mortality guidelines, etc.)
          2) Section 118 of MMPA (PBR, ZMRG, strategic vs. non-strategic stocks, etc.)
          3) Endangered Species Act
          4) TRT Composition
          5) Generic TRP outline

REVIEW OF DATA

3:15-4:00   **Presentation: Overview of Observer Program and Summary of Observer Data for Trips with Marine Mammal Interactions (NEFSC)**
1) Overview of observer program (VanAtten)
2) Summary of observer coverage by gear type (Rossman)

3:00-4:00
(including break)   **Presentation and Discussion: Marine Mammal Stock Assessments/Abundance Estimates (Stock Assessment Reports) (NEFSC - Palka)**

4:00-5:00   **Presentation and Discussion: Marine Mammal Mortality Estimates (by gear type/species) (NEFSC** – Rossman and Palka**)**
1) Marine mammal mortality and serious injury estimates (by gear type/species)
2) Overview of methodology for deriving take estimates (observed vs. estimated)
3) Preliminary 2005 observed takes

5:00-5:30   **Discussion: Where are we? PBR/ZMRG?** (RESOLVE, NERO)
How does our first review of the data inform our preliminary thoughts about potential fishery management options?

5:30 Adjourn Day 1

Day 2, Wednesday, September 20, 2006 (8:30 AM – 5:30 PM)

8:30-9:00   **Overview: Today's Agenda and Summary of Day 1 Discussions (e.g., goal of TRT (ZMRG), summary of what is known about interactions, summary of research, etc.) (RESOLVE)**

9:00-10:00   **Presentation and Discussion: Sea Turtle Take Estimates in Trawl Fisheries**
1) Overview of sea turtle strategy (Dobrzynski)
   a) Overview of sea turtle takes (Murray)

10:00-10:15   **BREAK**

MANAGEMENT QUESTIONS

10:15-12:00   **Presentation and Discussion: Overview of Ongoing Gear Research to Mitigate Marine Mammal Takes in Trawl Gear**
1) Industry/NMFS funded (Milliken)
   a) Summary of Industry Gear Workshop
2) Update on status of gear research
3) International (MacKay TBC)

12:00-1:00	**LUNCH**

1:00-2:00   **Presentation and Discussion: Review of Marine Mammal Behavior that May Result in Fishery Interactions** (Gannon TBC)
1) Dolphin (common, Atlantic white-sided)
2) Pilot whale

2:00-3:00   **Presentation and Discussion: Significant Variables Related to Marine Mammal Interactions (NEFSC** – Palka and Rossman)
1) Temporal and spatial patterns
2) Significant factors/variables in takes (e.g., depth, vessel size, etc.)

3:00-3:15   **BREAK**

3:15-4:00   **Presentation and Discussion: Characterization of the MA and NE Mid-Water Trawl and Bottom Trawl Fisheries (NEFSC)**
1) Effort trends (Orphanides)
2) Economic value (Magnusson)

4:00-4:30   **Presentation and Discussion: Current Regulatory Regime (NERO)**
1) Fishery management plans
2) ASMFC plans
3) Other relevant TRPs/TRTs (e.g., PLTRT)

4:30-5:00   **Economic Models** (NEFSC – Bisack and Magnusson)

5:00-5:30   **Wrap-up and Next Day Preview (RESOLVE, NERO)**
1) Introduction to breakout work groups

5:30 Adjourn Day 2

Day 3, Thursday, September 21, 2006 (8:30 AM – 5:30 PM)

8:30-9:00   **Overview: Today's Agenda and Summary of Day 2 Discussions (RESOLVE, NERO)**

9:00-10:00   **Discussion: (RESOLVE)**
1) How does our first review of the management concerns inform our preliminary thoughts about potential mitigation options?

10:00-10:15   **BREAK**

10:15-12:00   **Breakout Work Group Discussions: Potential Mitigation Options**
1) Give charge of identifying options (Guiding questions, 2-3 options)
2) Break into workgroups by gear/fishery

12:00-1:00   **LUNCH**

1:00-4:15   **Workgroup Discussions**
(including break)   **NOTE -- Guiding Questions for Breakout Group Discussions**
1) Mitigation options (short term vs. long term)
2) By gear type and fishery
    a. Impact of mitigation
        i. Known
        ii. Unknown
3) Mitigation measure marine mammal reduction potential by species
    a. Positive (benefits one or more marine mammal species)
    b. Adverse (e.g., measure may have negative affect on one or all marine mammal species)
    c. Unknown
4) Technological feasibility of measure/option
5) Economic feasibility of measure/option
6) Research needs
7) Ancillary impacts of options to sea turtles
    a. Positive impact
    b. Adverse impact
    c. Unknown
8) Enforceability

4:15-5:15   **Workgroups Report Out**

5:15-5:30   **Wrap-up**

5:30 Adjourn Day 3

Day 4, Friday, September 22, 2006 (8:30 AM – 2:00 PM)

8:30-9:00   **Overview: Today's Agenda and Summary of Day 3 Discussions (RESOLVE, NERO)**

9:00-12:00   **Strategy/Next Steps (RESOLVE)**
(including break)
1) Summary of mitigation options/breakout group discussions (e.g., gear modifications, time/area closures, other)
2) Preparation of draft TRP
3) Continued work group discussions (remote, email, phone)
4) Distribution of workgroup – work products to full team
5) Identify information needs and next steps
6) Schedule next meeting
7) Summary of meeting results

12:00-1:00   **LUNCH**

1:00-2:00   **Strategy/Next Steps (RESOLVE)** *(continued)*

2:00 Adjourn Day 4