Bottlenose Dolphin Take Reduction Team
Conference Call/ Webinar
March 18, 2008
Summary and Key Meeting Outcomes

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Summary

On March 18, 2008, members of the Bottlenose Dolphin Take Reduction Team (BDTRT) and affiliated National Marine Fisheries Service (NMFS) staff participated in a conference call and webinar[1] of approximately three hours (1:30-4:20 EST). Please see attached participant list (Attachment 1).

The primary purpose of the call was to provide updates to the BDTRT about coastal bottlenose dolphin stock structure and mortality estimates as well as begin planning for the next full BDTRT meeting. Key topics covered during the call were:

- A summary of the highlights and accomplishments from the June 2007 meeting
- Updates on stock structure revisions
- Updates on mortality estimates and modeling
- Updates on the North Carolina beach seine fishery
- A discussion about planning for the next BDTRT meeting

The call and webinar included time for questions, comments and discussion. The meeting agenda is appended as Attachment 2.

I. June 2007 Meeting Key Outcomes and Updates on Accomplishments

BDTRT members received a summary of key outcomes from the June 2007 meeting prior to the call (Attachment 3). Stacey Carlson, NMFS, provided an update of accomplishments and developments since the June meeting, noting that for some of these key outcomes, more in-depth updates will be provided later in the call. Key points included:

North Carolina Beach Seine Fishery

- Red Munden will provide a brief update on North Carolina Department of Marine Fisheries (NCDMF) regulations pertaining to the Atlantic striped bass beach seine definition and fishery designation proposed and final regulations.

- The NC Alternative Platform Observer Program worked closely with the Northeast Fishery Observer Program (NEFOP) to enhance observer coverage, especially following a self-reported entanglement by a fisherman in Currituck County on Jan 9.

[1] Short for ***Web****-based sem****inar***, a presentation, lecture, workshop or seminar transmitted over the web.

- Observing the beach seine fishery is challenging because it opens/closes via NCDMF proclamation and NMFS generally does not know until the Friday before if it will be open the following week and, if so, for how long. However, NMFS coordinated among the two observer programs to manage a handful of trips and will continue real-time coordination in the future during this fishery.

Medium Mesh Restrictions for the Winter-Mixed Management Unit

- NMFS is moving forward with the rulemaking process to amend the BDTRP to extend the sunset provision for three years, as recommended by the BDTRT, and will continue to provide updates on the progress.

Summer Northern North Carolina Management Unit

- The BDTRT recommended a pilot research study to examine whether pingers can be used to deter dolphins from nets without increasing depredation rates. This gear research recommendation was included in the Fall 2007 Request for Proposals (RFP) issued by North Carolina Sea Grant (NCSG) and recently awarded to Duke University to conduct associated research during this year's Spanish mackerel fishery.

Gear Research

- NMFS, SER provided funds to Virginia Aquarium to support construction of a modified pound net leader for future research to look at the modified net's potential to reduce dolphin interactions while maintaining the net's catch efficiency.

- Two gear research projects pertaining to the Virginia Pound Net Fishery were also included in the Fall 2007 NCSG RFP. One project was funded and awarded to the Virginia Aquarium to examine using a modified net leader for reducing bottlenose dolphin interactions while maintaining catch efficiency during this season's VA pound net fishery.

Dolphin Stock Structure

- A draft stock structure was presented to the Atlantic Scientific Review Group (ASRG) during their January 2008 meeting. The ASRG provided NMFS with a memo indicating their review of draft revisions to the coastal bottlenose dolphin stock structure and some brief feedback (please see review and response letter from the ASRG here).

Enhanced Monitoring Strategies and Observer Program

- NMFS has been working very closely with the NMFS Northeast Fishery Science Center (NEFSC) to improve measures of fishing effort. Variables to be considered include landings, soak duration, and soak duration by string length.

- To help respond to the issues raised in the June 2007 BDTRT meeting, NMFS provided a document describing the use of landings and other variables as a measure of fishing effort for both harbor porpoise and coastal bottlenose dolphin bycatch rates in gillnet fishing gear (see document here).

- The document explains the statistical and practical steps for determining a measure of fishing effort for an accurate bycatch estimate. Specifically, the document shows statistical relationships with landings, soak duration, and soak duration times string length for both harbor porpoise and coastal bottlenose dolphin takes. Unlike the harbor porpoise, there is no predictable, linear relationship between landings and coastal bottlenose dolphin takes. One potential reason for this is that the number of observed bottlenose dolphin takes is too low to establish a linear relationship between metric tons of fish landed and takes – or, the lack of linear relationship could be real.

- There are practical challenges with using other variables, such as soak duration, as a measure of effort. The document provides a table showing all the data collected by each state affected by the BDTRP; landings are the only consistent data available. The document also mentions the inconsistency with the Vessel Trip Report data.

- NMFS will continue to work with the science center to explore coordination efforts to help meet data requirements mentioned in the document.

Virginia Black Drum Fishery

- NMFS submitted a request to the NEFOP and NEFSC for updated information on the percent of observer coverage and fishing effort for the VA Black Drum fishery both prior to and post plan implementation. Information will be provided prior to the next full BDTRT meeting and be included as an agenda item for discussion.

Mortality Estimates and Modeling

- During the June 2007 meeting, NMFS scientists requested suggestions on ways to improve the analysis used to estimate mortality to ensure it was representative of both the time prior to and following the BDTRP's implementation. Since the discussions at the June 2007 meeting, NMFS has been working closely with the NEFSC regarding the model used to estimate mortality, and the timeframe of data used for these estimates.

- Based on suggestions offered during the June 2007 meeting, NMFS scientists presented a case study to the Joint Scientific Review Group (the three regional scientific review groups met jointly this past January)

looking at coastal bottlenose dolphins and how to monitor takes when takes are rare and observer coverage is low. The intent was to solicit expert feedback on proposed methods for confidently estimating dolphin mortality given these data challenges. More in-depth information will follow later in the call about the information presented to the Joint SRG, its feedback, and next steps for estimating mortality.

II. Stock Structure Revision Update

Lance Garrison and Patricia Rosel presented results from genetic and telemetry studies supporting modifications to the stock structure for coastal Atlantic Bottlenose Dolphins. See their full presentation here.

NMFS also provided this information to the ASRG in January 2008. The ASRG provided NMFS with a memo indicating their review of draft revisions to the coastal bottlenose dolphin stock structure and some brief feedback (please see review and response letter from the ASRG here).

New genetic samples and analyses suggest a second offshore stock and support a distinction between coastal and estuarine stocks. New tagging data suggests a second coastal southern migratory stock. Habitat analysis was used to describe variable stock boundaries and will be used to estimate abundance/PBR. These findings will result in the redefinition of management units as prospective stocks in the 2008 Stock Assessment Report (SAR), with the final stock structure reported in the 2009 SAR following review by the ASRG.

New data still support multiple coastal stocks from New Jersey to Florida. Key points include:

- Coastal Stock Structure
  - Increased sample sizes were attained.
  - New and alternative analyses were utilized.
  - Added some Gulf of Mexico data to have a yardstick for extent of differentiation.
  - A significant level of genetic differentiation was again detected across the region, continuing to support the multiple stock hypotheses.

- Potential Additional Offshore Stock
  - Examining the possibility that there is another offshore stock.
  - Collecting new genetic data sets, findings very preliminary.
  - Findings show three distinctive groupings of the samples rather than the expected two groups (coastal and offshore).
  - Impact of this on the stock structure:

    - The newly discovered group is mitochondrially most similar to the offshore samples but they have their own signature in the nuclear genome, so it raises the question as to whether they are hybrids between the coastal and offshore forms. Further work is ongoing to clarify and verify the distinctiveness of this group. They would not be included in the coastal stock structure SAR, but, if verified as distinct, could impact abundance estimation for coastal stocks.
  - Inshore versus nearshore
    - Work has continued to address the question of how much mixing occurs between estuarine and coastal stocks in the same location and whether there are any seasonal components.
    - Addressed through sampling in coastal and estuarine waters at three locations and in winter and summer seasons: Charleston, southern South Carolina, and southern Georgia. Winter = Nov – April; summer = May – Oct.
    - Field sampling was completed in March 2007 and collection of genetic data in November 2007. The first step in analysis was to look for duplicate samples in data set.
    - 27 matches were found. The longest timeframe between duplicate biopsies of one animal was five years.
  - The 27 matches
    - Most are from sampling in estuaries.
    - No matches between biopsies taken in estuaries and those along the coast.
    - Removed duplicates and tested for differentiation across seasons within each site, which were not significant.
    - Charleston-coastal was the smallest sample set.
    - Overall, data provide support for differentiated estuarine populations.

- Tagging Studies
  - Telemetry studies are satellite tag studies with the goal of identifying large-scale movements.
  - Dolphins tagged in two locations (4 animals in Cape May, NJ; 2 animals in Holden Beach, NC).
  - Tag durations were up to 12 months; at least one hit per day was received from the tags.

- Movement of four animals tagged at Cape May, NJ in September
  - Start late summer near NJ, moved south along the coast in late summer/fall, aggregating around Cape Hatteras during February, then migrating back north and end up off of NJ in June.
    - During the winter months, they aggregate around Cape Hatteras.
    - Data provides confirmation of seasonal migratory movements of the Northern Migratory stock.

- Movement of two animals tagged at Holden Beach, NC in November
  - One migrated as far south as Jacksonville, FL in winter while the other animal roamed along the South Carolina and Southern North Carolina coast.
  - Data only goes through June, so the distribution during summer months (July-September) is unknown.
  - Suggests the presence of a stock that was not previously defined; the southern migratory stock.
  - Southern migratory animals are likely concentrated in NC and southern Virginia during summer; in winter, southern migratory animals likely occur south of North Carolina and as far south as northern Florida.

- Spatial Distribution and Habitat Analysis
  - There was strong inter-annual variability in spatial distribution north of Cape Hatteras during summer months.
  - In particular, during the summer of 2004, animals were distributed further south and were associated with cooler water extending further south.
  - Cluster analysis was used to group dolphin sightings data based on latitude, temperature, depth, and distance from shore.
  - For all three summer survey data sets (1995, 2002, and 2004) two clusters were present with strong separation by habitat variables.
  - Spatially, the two clusters correspond to a "warmer water, southern group" and a "cooler water northern group." These two clusters are presumed to correspond to the southern migratory and northern migratory stocks.
  - The separation between the two is typically just north of the Chesapeake Bay mouth. However, inter-annual variation in water temperatures will result in variation in this boundary.
  - Biopsy samples can be assigned to a cluster based on location and water temperature. Tests of genetic differentiation between these two clusters will be conducted to confirm the assignment to different stocks.

- Proposed stock structure
  - Based upon analysis demonstrating genetic differences between estuarine and coastal animals, the revised stock structure does not include resident estuarine animals.
  - During summer: the northern migratory stock ranges approximately between VA and NJ; the southern migratory stock ranges approximately between southern VA and southern NC; and southern NC, South Carolina, Georgia, Northern FL, and Central FL are left intact as year-round coastal stocks. Inter-annual variability in the

boundaries of the two migratory stocks likely occurs and is related to variability in water temperatures.
  - During winter: Northern and southern migratory stocks move south, but remain separate. Southern NC, South Carolina, Georgia, Northern FL, and Central FL left intact as year-round coastal stocks.
  - Summer months are when the stocks are most separated from one another, and therefore, PBRs are based on summer abundance estimates. There is unresolved spatial overlap between some stocks including the central-northern NC coastal resident animals (i.e., animals going in/out of Pamlico Sound) and the question as to whether there are multiple or single coastal stocks south of central NC. More information is needed about all coastal residents. This will require additional field effort for biopsy collection and possibly telemetry studies.
  - Annual PBRs from the summer abundance estimates replace the formerly used ½-year PBRs and the use of a "mixed North Carolina" management unit in winter months.
  - Need to assign mortality based on these new stocks. However, annual variation in stock boundaries complicates the assignment of mortalities and estimation of effort. Mortality estimates will be listed as "unknown" in the 2008 SAR and finalized in the 2009 SAR when the stock structure is also finalized.

- Next steps on stock structure research include:
  - Compare/confirm assigned spatial clusters with genetic data for the two migratory stocks.
  - Complete analysis to determine southern coastal structure.
  - Complete analysis of coastal morphotype vs. continental shelf vs. offshore dolphin distribution.
  - Evaluate methods to adapt mortality estimation to revised spatial boundaries.

III. Mortality Estimate Update

In June 2007, the BDTRT requested improvements and refinements to the model used to calculate mortality estimates, particularly the possibility of calculating mortality estimates based on takes within the most recent five years of data. An item of concern at the June meeting was whether the method calculating mortality estimates in the Northern North Carolina Management Unit was sufficiently accurate. In response, NMFS has been working closely with the NEFSC regarding the models used to estimate mortality and timeframes of data used in models. The accurate calculation of mortality is difficult, especially when the observed take rate is very low and observer coverage is low. Therefore, NMFS scientists requested guidance from the Joint

Scientific Review Group. The presentation provided to the SRG, *Monitoring Reductions in Mortality When Takes are Rare - Case Study of Northwest Atlantic Coastal Bottlenose Dolphins in the Mid-Atlantic Gillnet Fishery* by Marjorie Rossman and Debra Palka is available here. Key points include:

- This presentation was created for the Joint SRG meeting with the intent to solicit feedback from various members on this topic. There are no mortality estimates in this presentation. Prospective stock structure analysis is still in progress; therefore, we cannot move forward with mortality estimates until that work is complete.

- Feedback from the Joint SRG acknowledged the need for greater observer coverage and suggested that annual data be used despite uncertainty and inter-annual variability.

- Goals:
  - Estimate mortality with precision and accuracy.
  - Determine stock's strategic status.
  - Evaluate effectiveness of Take Reduction Plan (TRP).

- Challenges
  - Takes are rare.
  - Small population sizes and low PBRs.
  - Low fishery observer coverage in small fisheries.
  - Significant changes in fishing practices, particularly in large and medium mesh.

- Seasonal management units (SMU)
  - Data in this presentation is structured under the current, not revised/prospective, stock structures.

- The last 11 years, have seen a significant decline in landings in the winter mixed management unit; nevertheless, it remains the one with the most landings. Landings in Northern NC and Southern NC SMUs are steady, and there are small fluctuations in northern migratory management unit.

- Annual take frequency and % observer coverage
  - There has been much inter-annual variability in take frequency.
  - Average take per year is 0.65 animals.
  - Most observed hauls (99%) have had no takes.
  - Takes are considered binomial, either present or absent.
  - Since 2002, the trend in observer coverage has been increasing across the management units. However, increased percent observer coverage

in the winter mixed area is due to consistent annual declines in landings and not increased observer effort (2006 is an exception).

- Take frequency
  - Between 1996 and 2000, mean take is 2.2 animals/year.
  - Between 2001-2006, mean take is 1 animal/year.
  - All takes in one management unit since 2003 (summer Northern NC MU).

- Detecting mortality
  - If we think mortality is near PBR (20 animals per year) in the summer Northern NC MU, and sampling (observer coverage) remains around the 5-year mean (1.3%), we have a less than a 30% chance of actually observing a take.
    - As bycatch increases, chances of observing a take also increase.
    - If mortality is expected to decrease below PBR, a minimum of 5% coverage would be necessary to observe the reduction in bycatch mortality.
  - We may be able to detect reduction in mortality with increased sampling but this does not imply that we have statistical power.
  - Power is the probability of detecting deviations from what we think is happening in reality (correctly rejecting a false null hypothesis). The smaller the statistical difference one seeks to detect, the more intense sampling is required.

- Past methods used to estimate bycatch
  - Generalized linear model (1996-2000).
  - Ratio-estimator (preliminary 2001-2006).

- Estimating bycatch, future considerations
  - Potential data questions include:
    - 50-100% observer coverage.
    - Use annual data (no pooling across years), accept inter-annual variability and low precision.
    - Wait 3-5 years after plan implementation to estimate bycatch
    - Use historical data with modifications (remove old fishing practices).
  - Potential Methods
    - Regression models.
    - Stratified ratio-estimator.
    - Bayesian techniques.
    - Model averaging (average estimates over two or more methods).

- Feedback from Joint SRG meeting
  - Increase observer coverage.

    - we have taken steps to increase coverage in the summer time in northern NC to 5% this year
  - Stick with annual data if one can accept large inter-annual variability and high CV's.
  - Try different methods.

- Next steps
  - Incorporating stock structure changes into mortality analysis by June 2008.
  - Developing new mortality estimates by the end of July 2008.
  - Different methods will be explored; expect estimates will be averaged over two or more methods.
  - New mortality estimates will be reported in the 2009 SAR when the stock structure is finalized.

IV. Discussion

Participants on the call offered a number of comments and questions in response to the updates provided by Stacey, Lance, Patty, Marjorie, and Debie regarding stock structure and mortality estimates. Among the key questions and comments:

Stock Structure

- Generally, the complexity fits well with what we (Duke) see on the ground in North Carolina and there is a lot of power in comparing data sets. We hope NMFS can mine the photo ID data sets. We are working on a capture/recapture estimate of abundance for North Carolina waters (includes very near shore and estuarine) and should have a new abundance estimates shortly.
  - Yes; southern migratory stock is larger and will be important to understand if animals on the beach differ from animals 3 km from shore. NMFS recently worked to come up with a list of where photo ID data exists, and a challenge is most of it is estuarine with the exception of the North Carolina coast. We are trying to figure out what the genetic data tells us, and back it up with photo ID information.

- Photo ID data sets may be able to inform abundance estimates. Currently NMFS has photo ID data mostly for estuarine waters, except for some places along the North Carolina coast.
  - NMFS is satisfied with sample size for GA estuarine areas that have been sampled and the focus will be on analyzing the existing samples. Resources are not currently available for collecting additional photo ID and genetic data.

- What is known about the movement of the estuarine stocks?
  - In North Carolina, such as in Pamlico Sound, it appears that animals move in and out of the estuary.
  - Important remaining research questions on this topic: How much movement and with what frequency and range is there movement in and out of estuaries?
  - Genetic data do not log day-to-day movement, but instead offer generational information about range and movement. The animals are breeding in the estuarine waters, which makes the difference.

- Is it possible to identify which stock an observed take individual comes from based on genetic information?
  - No – there is the capability to identify animals to stock in some cases but not all, and the confidence intervals are quite large.
  - Given that coastal stocks are still closely related, there is a lot of shared genetic history. We are still looking for ways to refine this analysis.

- Will separate estuarine stocks be included in stock structure recommendations to the SRG?
  - The 2009 SAR will have preliminary definitions of estuarine stocks. However, these estimates are based on photo ID data, which is incomplete.

- This looks like an increasingly complex picture; can you give me a sense of the review process you will use to have the SRG look at this? And what is the plan for review and finalization, and when do you think we will start to look at this to make changes in the TRP?
  - The goal over the next 6-8 months is to take the data in hand (genetic, tagging, photo ID) and generate the best picture; finish analyses of what we have, publish them, have the SRG review them and have them review the SAR in 2009. After the review process, the stocks will be final with the caveat that there is data missing. We can only go so far with the data we have and then need to collect more data over the next several years.

- Guidance on how to proceed with this new structure over the next year?
  - The stock structure will be prospective in the 2008 SAR; the draft is almost done and ready for public comment. It may change between now and 2009, but is a step closer to the final stock structure. The 2009 SAR will be open for public review in spring 2009.
  - Procedurally for the team, we plan to have a full BDTRT meeting when all data are finalized (late summer/early fall 2008) to evaluate the

potential implications for the BDTRP and to determine best next steps.

- If the SRG review is in December, would it make sense for us to wait to meet until we can have the review in hand?
  - The timeframes are difficult; our goal is to have the data fairly well vetted and close to final prior to the BDTRT meeting in Aug/Sept, and perhaps we should consider having the SRG look at things as we get there. We do not want to delay showing it to the team because of timing issues. We can explore the possibility of pushing back the meeting, but our goal now is late summer/early fall.

- There are potentially large implications of stock structure changes on the BDTRP and concerned was expressed about having a BDTRT meeting before the SRG fully reviews final stock structure information. Recommend we consider having the next BDTRT after the SRG meets in 2008.

Mortality Estimates

- Landings are not a great way to estimate effort and subsequently mortality estimates. One observed take could be extrapolated to a number exceeding PBR because of how landings estimates are calculated. Is it possible to improve mortality estimates?
  - NMFS continues to seek better estimates of fishing effort. One challenge is different metrics used by different states.

- Are we actually moving forward in being able to gather information that would be a more accurate reflection of effort?
  - We are exploring the different data sets we have; the states don't collect the same data. That is going to be our next step--try to figure out the best approach to go about this effort.

- Do you have the number of observed trips by state or by fishery from 2002 to present?
  - Marjorie will get back to Greg DiDomenico on this question.

- When figuring observer coverage, how do you weight it in terms of fishery vs. management unit?
  - Observer sea days are assigned proportional to total fishing trips by port and month. Sea day allocations are not based on metric tons of fish landed.

- Are you going to restructure the observer program to fit the new stock structure?
  - Yes, it will be remodeled in light of the new stock structure.

- Are you going to do a retrospective analysis to look at past data, in light of the new stock structure, to see how we did in the past?
  - We have given some thought to that; it is not on the top of the list right now, but we think we can attempt to do this in the future.

- What will we talk about at the upcoming meeting if we don't know whether we are over or under PBR?
  - The intention is to have the new mortality estimates for the prospective stocks in time for the full BDTRT meeting.

- In allocating sampling effort on previous trips, is that based on the prior year or do you use an annual average?
  - It is based on the most recent year's data available. It could be one or two year old data.

- Will you be doing this on a five-year average as in the past?
  - Yes, in the new SAR.

Other Comments

- We are getting quarterly updates from other take reduction teams, can we get a placeholder of some idea of what is changing?
  - Based on the timeframe for the mortality estimates, we can certainly send updates if we push the meeting back past this fall; otherwise, this information will be provided at the meeting.

- When were the last observed mortalities and why the increased sampling in northern North Carolina during the summer?
  - The last mortalities observed were two in summer 2006.
  - We have increased sampling in northern North Carolina in summertime because it is the only SMU with observed interactions.

- What fisheries were those mortalities in?
  - Spanish mackerel and king mackerel.

- If you have done some reprioritizing of observers to hot spots, on the theory of finding a better metric of extrapolation, could you not also focus those data needs to the hot spots?
  - It seems we would need the soak time and string length from every fisherman although perhaps we could do a focused effort in the hot spots to find out a bit more information
  - The only way to get that info is if NCDMF collects it on the trip ticket, and they do not. Trip tickets are filled out by the dealers when the sale is made.

- A pilot study could be considered with a small group of netters. The Northeast Region has been working on electronic logs, which may be helpful in this area.

- How are we going to assign mortality to know if we really have a problem with bycatch?
  - If we can believe the formulas that have been created, then we can go back and look at water temperatures and see if that stock is there. It does involve making numerous assumptions being made, but you can use it going forward.

- It may be worthwhile to contact the commercial fishermen on the BDTRT and see if they would be willing to go the route of electronic logbooks.
  - That is an excellent suggestion.

V. North Carolina Beach Seine Update

Red Munden provided an update about North Carolina Beach Seine issues and spiny dog fishery. Key points:

- Updated definition of beach seine for NCDMF Atlantic striped bass fishery: a net with multi-fiber or multi-filament webbing fished from the beach, launched by a vessel.

- North Carolina Marine Fisheries Commission amended striped bass rules so that fishermen will be required, prior to November 1 of each year, to register and designate which gear type (trawl, gillnet, or beach seine) he will work. Once designated, fishermen are assigned into that gear type for three years. Fishermen representing all three gear types indicated they would like the quota divided equally. The intent is to reduce the amount of effort in all three gear types.

- Potential criteria for restricting beach seine fishing are being investigated including: maximum yardage length, maximum number of meshes, twine diameter size, maximum and minimum mesh size, and soak times.

Questions

- When will these changes for the beach seine fishery take effect?
  - Effective November 2008. The beach seine fishery opens the first or second week of December.

Spiny Dogfish Fishery

- North Carolina has not had this fishery since 2000. There is an emerging dogfish fishery in Virginia.

- The state of NC will ask the Atlantic States Marine Fisheries Commission at its May meeting to consider implementing a state-by-state quota of dogfish so there is an even distribution among Atlantic states.

Questions

- When did the geographic quota allocation for spiny dogfish go into effect?
  - ASMFC took that action last fall.

VI. Next Steps

- What are the next steps in terms of stock structure, mortality estimates, and updating the Take Reduction Plan?
  - In the next 6-8 months, the existing data (photo, genetic and tagging) will be used to develop a best estimate of stock structure, which will be presented to the ASRG during their 2008 meeting (to occur either in December 2008 or January 2009).
  - Mortality estimates will be determined based on newly defined stock structure.
  - The SRG will review the revised stock structure and mortality estimates and provide any comments. The revised stock structure and mortality estimate will be included in the 2009 SAR, at which time the stock structure updates will be final, though will acknowledge missing data.
  - This information will be ready for the next BDTRT meeting.

- It was requested that NMFS consider whether or not a BDTRT meeting is useful prior to publication of the 2009 SAR. If there is no meeting this July, it may be more useful and productive to wait until the ASRG has reviewed the final stock structure and mortality information during their 2008 meeting.
  - NMFS will consider this option.

- NMFS will consider suggestions on how to improve the unit used to measure fishing effort and continue working with the science centers.

- Keystone will put together a brief summary of this call, highlighting the next steps as we move forward.

Attachments (3)