Minutes of the
Atlantic Scientific Review Group Meeting

Minerals Management Services, New Orleans, Louisiana
12-13 November 2002

The fall 2002 meeting of the Atlantic Scientific Review Group (ASRG) was convened at 8:15 AM on November 12, 2002 at Minerals Management Services, New Orleans, LA. The agenda is in Appendix I, participants are listed in Appendix II, and working papers are listed in Appendix III (and referred to in title of section using shorthand "WP1" for Working Paper 1, etc.).

Day 1: 12 November 2002

1. Introductory stuff

Welcome

Opening remarks and welcomes were presented by Bill Lang (Minerals Management Service) and Robert Kenney (Chair, ASRG). Members and observers introduced themselves. The agenda was reviewed and no changes were made.

Summary of previous recommendations, and responses to them

The ASRG received the responses to the 2001 recommendations in July 2002 and it was noted the responses had more substance than in previous years. The ASRG thanked NMFS for the promptness and thoroughness.

2. Review of draft 2002 SARs; species/stock-specific issues

General issues

Status of 2002 SARS
The ASRG was informed that the SARs were published and waiting for the Federal Register announcement.

Marine Mammal Commission (MMC) comments (Waring) - WP13
Waring reported on five substantial comments. One, MMC suggested pooling species was too conservative and should not be done. The ASRG noted that for some species, such as pilot whales and beaked whales, pooling is a practical issue that, at the present time, cannot be avoided. One suggested way forward was to obtain more biopsies from the species within the species groups and determine a probabilistic model of species id, using for example, location, date, water temperature and depth. This model could then be used to assign a specific species id to animals that are unidentified by-catch and unidentified during abundance surveys. If this

occurred then it would be possible to have a SAR chapter for each individual species. It was also discussed, but not agreed upon, that the PBR for species that are being pooled should be set to undefined.

Two, MMC suggested SARs from all centers should standardize the strategy of pooling species and set levels of needed observer coverage to derive adequate by-catch estimates. It was noted another national meeting to discuss the SARs was planned and that these would be good topics to discuss. The ASRG requested that at least one ASRG member be in attendance to this meeting.

Three, MMC suggested reporting all injuries that could be considered serious and then provide the rationale for discounting them. This could be accomplished by including serious injuries and released alive numbers in the table of observed takes and extrapolated takes (Table 2 generally), or for large whales, note how many non-serious injuries there were (not animal-by-animal details). Then in the text discuss why some are not considered serious and refer to a reference that discusses the protocol of determining serious injury versus other interactions.

Four, MMC noted the observer coverage is low in many fisheries, such as the Squid/Mackerel/Butterfish Trawl fishery. To more explicitly state coverage, the future SARs will reflect the observer coverage by each of these sub-fisheries, which is how the by-catch estimates are calculated. In addition, when possible, power analyses will be reported to provide information on the reliability of these by-catch estimates.

Five, MMC reiterated the MMPA required information on fisheries and noted the Atlantic SAR does not provide all of this information for all fisheries. To incorporate what information is available, the NEFSC suggested that a new appendix be created that describes each fishery, as is done in the Pacific SAR. The fishery information would then be removed from each chapter and be replaced by a reference to this appendix. The ASRG supported this suggestion and requested a look at an example of this appendix at the spring 2003 meeting.

NMFS-HQ Stock Assessment Improvement Plan (Swartz)

Swartz updated the ASRG on the NMFS Stock Assessment Improvement Plan (SAIP). The goal of the SAIP is to describe where NMFS is in assessing marine mammal stocks and to develop a plan to improve these assessments. This process has already involved two meeting, one at the level of regional administrators and the other at the level of the assessment scientists. The objective of the first meeting was to determine what managers need to complete the regulatory documents, including scientific and more subjective information. The second meeting was to look at the above list of needed infomation, and to determine where NMFS is at and what is needed to complete the assessments. One outcome of this meeting was a table of information for each stock, where information was in three tiers. Tier I describes what NMFS is doing now and where the data gaps are. Tier II describes what is needed to do a complete assessment. Tier III describes what is needed to do a more comprehensive multi-species community management plan. A third meeting being planned is going to be a symposium to determine how to work towards the multi-species community management plan.

The ASRG requested reviewing this plan.

Mortality estimates, use of stranding data

The ASRG discussed the advantages and disadvantages of adding into the human-caused mortality estimate the number of strandings with fishery interaction evidence. A major advantage of adding in strandings with fishery interactions from times and areas where there was no or little observer coverage is the mortality estimate is more complete then if the estimate did not include these stranded takes when there is almost no chance of double counting a take. Even adding in these strandings it is assumed the human-caused mortality estimate is under-estimated because not all takes strand and not all strandings are found in good enough condition to determine if there was a fishery interaction. A major disadvantage of including fishery interaction strandings is the mostly voluntary stranding network is not evenly trained and so it is uncertain if the fishery interaction decisions are reliable and consistent. In addition, this task could be viewed as putting the stranding network into an enforcement position.

The ASRG recommended that for small cetaceans the strandings are not added into the human-caused mortality estimate. Instead, add text and tables, if needed, to describe the strandings and the number of possible fishery interactions. In addition, it was recommended that strandings information be used to determine gaps in the observer coverage.

General SAR issues

The ASRG recommended the following:

- Add a chapter for the Atlantic Clymenes (to be written by the SE)
- In all Gulf of Mexico chapters, add text that states the Gulf of Mexico stocks are separate stocks from the Atlantic stocks.
- Make all observer coverage in percentages.
- The distribution list of the draft SARs and related information should be updated and given to Janeen Quintal.
- For all chapters that have CETAP estimates, clarify how those estimates were calculated.
- For all chapters that have by-catch information from JV fisheries, put a footnote in the table stating the 100% coverage is coverage on foreign boats, not US boats supplying the foreign boats.
- Add an appendix with the fishery information and so remove this information from each chapter.
- When possible, add information about the haul that took an animal, for example, what fish were caught, what type of gear was used, etc.
- As suggested in previous meetings, when possible, include a power analysis to determine if the observer coverage is sufficient.
- For appropriate chapters, put a footnote in Table 2 and state in the text of the section on mortality estimates that the by-catch estimates in the Mid-Atlantic coastal gillnet were estimated by month and state.

Atlantic stocks

Right whale

Mortality/entanglement update (Cole) - WP5, WP6, WP7

Cole explained the process of determining the status of each entanglement/stranding record for large whales expands on the GAMMS and serious injury recommendations. In general, the status of an entanglement or stranding is determined by looking at many factors, such as, the information recorded on the paper forms, information obtained from phone follow-up calls, who made observation (expert or lay person), and is there physical evidence (photos, gear, a necropsy, hearsay, etc). Because the quality of the entanglement/stranding records is very variability, assessing the status is difficult in some cases, and impossible in other cases. NEFSC is currently working with the Coast Guard to obtain entanglement data on events in near real time. In addition, NEFSC has started a document that is a detailed description of how these large whale serious injury determinations are made.

A similar process is also used for small cetaceanS, but the process is less rigorous because there is less supporting data and only level A documents are used.

Large whale Take Reduction Plan (Borggaard)

Borggaard explained that since the last ASRG meeting, the NEC created a DAM from April 28 to May 13, 2002 which was triggered by eight right whales, and a DAM from July 1-15, 2002 which was triggered by 77 right whales in the Great South Channel. Voluntary and mandatory gear removal have been implemented due to these DAMs.

There have been several recent gear requirements/rule changes. Effective 01Jan03, for the Northern inshore state lobster waters, a buoy line with diameter of 7/16 inch or less is no longer an option. They have other options to choice from. Effective 23Oct02 in the south Atlantic coastal gillnets, straight sets of gillnets are prohibited at night from November 15 through March 31. In addition, there was a technical amendment for SAM and DAMS that corrected errors and clarified some of the existing rules.

Current and near future work include: the 2002 mortalities and entanglements are being thoughly investigated; additional DAM gear modification rules are being made; the neutrally buoyant line policy statement is being clarified; a response to a petition to increase critical habitat will be submitted; gear workshops and outreach meetings will be held in the mid-Atlantic and New England areas; a new TRT meetings will be held in early 2003 where other fisheries will be added to the team and to the Take Reduction Plan; a comprehensive EIS for SAM will be developed and there will be scoping meetings and public hearings which are expected to start meetings early 2003.

Survival working group (Palka) - WP2

On 09 Sept 2002, the large whale program at NEFSC convened a small working group in Woods

Hole to discuss the issue of right whale survival estimation. The primary objectives were to review recent right whale survival estimates and to discuss methodological or other issues that might bias these estimates. A summary of the findings of this group are: 1) survival estimates continue to suggest a decline in the 1990's, as well as an increase in inter-birth interval; 2) an analysis suggested a correlation between survival/reproduction and the North Atlantic Oscillation (with a two-year lag); 3) the stage-structured work continued to suggest that the largest problem in declining survival lies with mature females; 4) some members of the working group are concerned that heterogeneity of whale distribution and of sampling effort may be impacting the survival estimates; and 5) given the preponderance of evidence, it was felt by all participants that the apparent decline is likely to be a real phenomenon. The meeting recommended a variety of approaches to take in future work, including further testing of the influence of heterogeneity using real and simulated data sets, and development of a model which includes both stage-structured and spatial components.

Ship-strike working group (Wang/Borggaard)

Wang updated the ASRG on work related to ship-strikes. She noted there was not much changed since the last ASRG meeting. The effects of potential regulations such as, change of speed and rerouting traffic is still being investigated to determine which regulations give the most risk reduction. Two different risk assessments came to the conclusion that ship speed should be slowed down to whale speed before there is a reduction in risk. As such, it was decided that for the Mid-Atlantic, the speed of ships within a 30 mile circle around each port will be managed.

Preliminary shipping route analyses in the Southeast (Garrison)

Swartz reported on a risk analyses being used to determine where to place traffic lanes to reduce risk to right whales. There have been several meetings with the public and the Navy to get input on this topic. He explained the purpose of the risk analysis is to evaluate the costs and benefits of different ship tracks, where the best track would be the ones with the lowest cumulative probability of encountering whales. An index of relative strike potential (RSP) is defined as the sum of SPUE (sightings per unit effort) indices of abundances. Preliminary results have shown that it may be possible to have a 60-80% reduction in strike risk relative to the status quo.

SAR chapter

1. Leave Rmax at 0.04, state analyses on this population have never resulted in a rate this high. Do not confuse the definition of Rmax, the maximum growth rate, with the current growth rate. Then in PBR section, say Fr is zero, thus PBR is zero, because the population is declining.
2. In next possible SAR refer to a NMFS Technical Memo about protocols of assessing the entanglement/stranding records.
3. Remove paragraph about ship strike mitigation.
4. Under fishery related mortalities: Remove the sentence that says the dis-entanglement program is good. Maybe say: "Not all whales can be successfully dis-entanglement."

Humpback whale - WP1, WP4

See text for minor comments.

Fin whale - see text for minor comments

Sei whale

1. For next SAR investigate if it is possible to get any abundance estimate. Consider looking at both winter and summer surveys. Consider incorporating fin/sei sightings and proportion them out by the ratio of the identified species.
2. See text for minor comments.

Minke whale

In Table 4, remove the old 1994 and 1995 mortalities.

Long-finned pilot whale

1. Continue stating there is low coverage in the trawl fisheries. Add a power analysis to indicate if this coverage is sufficient.
2. Add a line that says the number of animals that stranded and returned to the sea have an unknown survival rate.
3. Because no 2001 longline estimates will be available in the near future, use the 1996-2000 data to put in table and in total mortality estimate.
4. Put a footnote in Table 2 and state in the text of the section on mortality estimates that the by-catch estimates in the Mid-Atlantic coastal gillnet were estimated by month and state.
5. The ASRG recommended NMFS observe the herring mid-water trawl fisheries in the Gulf of Maine and mid-Atlantic because it is suspected pilot whales are being taken by this fishery.

White-sided dolphin

In Table 1, remove survey numbers that are outdated.

White-beaked dolphin

Remove old abundance estimates from Table 1. It is ok to state the old estimates in the text.

Common dolphin

Life history study (Read) - WP20

Read updated the ASRG on a research project to investigate the population structure and life history of common dolphin in the western North Atlantic. The population structure will be investigated by testing to see if there is a significant systematic variation in the mitochondrial DNA haplotypes and cranial morphology among individuals. The life history will be investigated by looking at a large sample of teeth and reproductive organs. Samples were obtained from the northern and southern pelagic driftnet fishery, foreign mackerel mid-water trawl fishery, biospies, strandings and other sources. It is expected this project will be completed by May 2004.

SAR chapter

1. Check the "Annual Quota Specification" from the Fishing Councils to get number of permits and actual number of participants for the Squid-Mackerel-Butterfish fisheries. Talk to Seagraves for more information. He thought there should be >300 permits to the Loligo fishiery, 480 permits for L. Illex and 73 permits for mackerel, of which only 20 boats are active.
2. Check "Other Mortality" section: is the stranding in NC? If not NC then which state?
3. Make this stock non-strategic and add a statement that states the status has gone back and forth, and mortality is close to PBR, therefore it is necessary to continue updating this chapter annually. List years when it was considered it was strategic. For example, it was strategic during the last 5 of last 7 years.

Harbor porpoise

Take Reduction Plan update (Hopper)

Hopper updated the ASRG on the status of the harbor porpoise Take Reduction Plan and the 2000 law suit. He stated the last TRT was in 2000, and there was no immediate plan to hold another meeting because the estimated by-catch was below PBR. Currently, NERO is developing an experimental fishery rule to be used, for example, to test a higher frequency pinger. The May 2000 Settlement Agreement in CMC v. Daley requires NMFS to provide current estimates of incidental takes of harbor porpoises. On August 7, 2002 the FR notice 67 FR 51234 announced the newest information was available.

SAR chapter

1. Do not include any strandings in the mortality estimate, even if they are in times and areas that are not included in the by-catch estimate based on observer data.
2. It was noted that the Bay of Fundy groundfish observer program was not in operation during 2002. The ASRG suggested that if there were to be a fishery in 2003 then the Canadian govemment should be encouraged to also implement an observer program.
3. Read was going to inquire if there was more information on strandings within Canada. It was suggested NMFS contact Mark Shoal from DFO who was looking at the foreign observer program.

Harbor seal

Report of the Southern New England Sea Group (Waring)

Waring summarized the discussions of a one day workshop on the status of pinnipeds in Long Island Sound, held on 4 October at the Maritime Aquarium at Norwalk, CT. Seal monitoring and stranding responses are now being coordinated by researchers in New York, Connecticut and Rhode Island. Researchers are collaborating on survey design and field dates to ensure a more comprehensive assessment of the number of seals in the region. There was concurrence that the species composition of seals in Long Island Sound has changed over the past two decades. Harbor seals was the sole species sighted or stranded prior to the late ca.1980's. Harp seal strandings increase in the late 1980's and early 1990's. Initially only juveniles were seen, but now adults are showing up. A sharp spike in harp seal stranding occurred in 2001. Researchers at the

Riverhead Foundation are satellite tagging rehabilitated harp seals, and Mystic Aquarium researchers are examining harp seal stranding patterns. Both of these projects involve cooperative work with Canadian DFO researchers in St. John's, Newfoundland. Grey seal sightings are now regular and increasing in number.

Additional studies involve harbor seal scat collection and analysis, long-term monitoring of specific haulout sites to investigate human - seal interactions. Potential human impacts on harbor seal populations are related to a cross sound gas pipe line construction, and harbor improvement projects. Some haulout sites are easily accessible to kayaks and interactions have been documented (i.e., seal in a kayak).

Update on North Sea die-off (Waring)

Waring reported the 2002 North Sea die-off event started at the same place that the 1988 event started. It was hypothesized that grey seals passed the disease to harbor seals. It was thought that grey seals always carry the disease but are not affected by it, but when the harbor seal population is large and overlaps with the grey seals, the harbor seals catch and spread the disease. Tero Harkonen modeled the 2002 die-off using information from the 1988 die-off and found the 2002 die-off followed the model. According to this model the population was cut by about 50% due to the 1988 die-off. Harkonen and others are currently investigating the age-sex composition of dead animals to learn more about the consequences of the die-off.

Pinniped Population Modeling Workshop, January 2003 (Waring)

Waring reported that during 11-13 February 2003 in Woods Hole, MA, there will be an ICES pinniped population modeling workshop, with a specific focus on North Atlantic harp and hooded seal populations. This meeting will be chaired by Richard Merrick and Tore Haug. The objective of the workshop is to review existing ICES harp seal models, compare it to other modeling regimes, and consider including other biological reference points.

SAR chapter

1. Remove numbers from tables that are old.
2. Add recent references from Amy Williams and others.
3. Nmin has a CV estimate and this section should include the standard text that explains how Nmin is estimated.
4. Rmax should not be the actual estimate when it is less than the default. The definition of Rmax is the maximum potential rate. Thus, Rmax should be the default value.
5. On bottom of page one, clarify what the 64.1% increase is.
6. Strandings table should report how many were alive, died later, released alive.
7. In the Other Mortalities section: power plant deaths should be called human interactions not strandings. Check to see if these numbers also include vessel strikes.
8. Can something be said in regards to the by-catch rate versus the total by-catch estimate. Because the population is growing, one would expect the by-catch total to increase. If the by-catch rate is also increasing then there may be an increasing problem. So as appropriate include a statement like "the by-catch rate is the same, even though the total

estimate is going up".

9. Remove sentence about shooting of seals around aquaculture pens.
10. Canadian cod trap statement should be removed.
11. Missing citation from Blair 2000.

Grey seal

Nmin should be the sum of that in the report and that from late May 2001 (1731) in Maine.

Harp seal

1. Nmin is really Nbest. Fix confidence intervals.
2. Fill in question marks.
3. Strandings in 2001 in Other Mortality section: highlight extremely large increase in strandings during 2001. Do not know if population is increasing or decreasing, do not know if population is above or below OSP, there have been several bad ice years so effect of population is unknown, therefore, should keep Fr at 0.5.
4. The 2002 TAC went up, look at web site to obtain the TAC then report it in the chapter.

Hooded seal

Note, change Fr to 0.5 due to ICES recommendations.

Bottlenose dolphin

Update on abundance/mortality estimates (Swartz/Palka)

Palka reported that the 2001/02 by-catch estimates from the Mid-Atlantic gillnet and beach seine fisheries have not been completed. She requested that when the estimates are completed, that the ASRG review the methods.

Swartz reviewed the methods being used to estimate the abundance of coastal bottlenose dolphins. The steps include: estimate the overall density of bottlenose dolphins (a mixture of coastal and offshore morphotype), predict the proportion of coastal bottlenose dolphins in spatial/temporal cells using information on local environmental factors (e.g., water temperature and depth) using a regression model, then estimate the density of coastal bottlenose dolphins within a spatial/temporal cell which is the produce of the overall density and the proportion of coastal bottlenose dolphins. Variance estimates from the density and regression will then be combined to provide an overall estimate of uncertainty.

During the winter of 2002, two replicate sets of aerial abundance survey lines covered the 0-20m and 0-40m depth zones. There were 6411 km of survey track lines, during which 213 bottlenose dolphin groups were sighted which was made up of 2,484 individual animals.

During the summer 2002, again two replicate sets of aerial abundance survey lines covered the 0-20m and 0-40 m depth zones. Additionally, a ship survey was conducted within 1 km of the shore. During the 6,734 km of track lines surveyed by the plane, 192 groups and 2,602 individual bottlenose dolphins were detected. During the 2,069 km of track lines surveyed by the

ship, 127 groups and 1,743 individual bottlenose dolphins were detected.

In addition to the abundance surveys, shipboard and aerial surveys were concentrated in North Carolina waters to collect biopsy samples of bottlenose dolphins. The purpose of these surveys was to determine the spatial-temporal distribution of the coastal and offshore bottlenose dolphins. In the summer a total of 52 biopsies were collected. In the winter, a total of 114 biopsies were collected. Preliminary analyses indicate offshore bottlenose dolphins can come close to shore and there are some coastal animals far from shore.

The goal is to provide a peer-reviewed abundance estimate of the coastal bottlenose dolphins for all seasonal management units by the time the next TRT meets which will be in the spring 2003.

Update on Take Reduction Plan (Wang)

Wang reported to the ASRG that the plan suggested by the TRT did not meet PBR for all seasonal management units. A report would be sent to the team indicating the predicted by-catch when using the plan suggested by the TRT. It is expected that the TRT would meet again in late March or early April, after the new abundance estimates are reviewed and available.

The ASRG suggested NMFS should consider redefining the stock and creating a SAR chapter for each stock, determine if any of the newly defined stocks had been depleted during that the die-off, then adjust the ESA listing accordingly.

The ASRG also recommended that when the new abundance estimates are available the SAR chapter should be updated and reviewed by the ASRG before it is presented to the TRT.

Mid-Atlantic die-off analysis (Eguchi 2001) revisited (Swartz) - WP8, WP17

The Eguchi (2001) paper states the decline due to the die-off ranged from 10-27% when an estimate for undetected strandings was included in the analysis. The ASRG questioned whether the definition of the instantaneous per capita mortality rate from Table 1 should be 0 to infinite and not 0 to 1 as stated in the table. Gilbert was going to contact Eguchi to clarify this question. The ASRG suggested that NMFS should consider using these methods on the newly defined stocks to determine which stock, if any, should be listed.

Florida manatee status (Valada/Brault/Odell) - WP9, WP10

Valada reported that pursuant to State activities, the Florida Fish and Wildlife Conservation Commission is continuing with its status review of the Florida manatee. The Commission has drafted a review which includes a PVA that uses VORTEX. The review is currently in the hands of expert reviewers who include Solange Brault, Douglas De Master, and Helene Marsh. Their comments are due to the Commission at the end of this week. Upon receipt of comments, the comments and review will be presented to the Commissioners for their assessment and possible action.

Concurrent with the State's review, the Commission has agreed to revisit their criteria. The group that drafted the original criteria has been reconvened; they additionally appointed an independent committee to review the 1999 criteria. Any recommendations from these groups will be presented to the Commissioners sometime early next year, after the Florida manatee status review has been concluded. (The Commission's current status review uses the 1999 criteria.)

With regard to Federal activities, the Service announced the publication of a proposed MMPA Special Rule to authorize the take of Florida manatees by watercraft. The proposed rule asserts that, for each of three sub-populations (termed stocks in the rule), takings will be authorized and that such takings are considered to be negligible in light of the fact that these sub-populations meet population benchmarks identified in the current version of the Florida manatee recovery plan and because an analysis of watercraft-related takes over the past five years and projections for the next five years support this. Further substantiation of this finding is forthcoming in a model outlined by Michael Runge (USGS Patuxent) in an appendix contained in the EIS. The MMPA rule also states that the Service will not be providing a 2002 SAR for the West Indian manatee, due to settlement obligations. (The web page where the proposed rule and EIS can be found will be forwarded to the group.)

Manatee and warm water issues were also highlighted. A little less than 2/3 of the manatee population (N_{min} estimated to include 3,276 individuals) relies upon power plant discharges for warmth during the winter. Several of the power plants will shut down during the next several years. What animal response to these shut downs will be is uncertain - a small discharge shut down in northeast Florida resulted in the loss of all animals, barring two animals rescued due to cold-weather related stress. Whether or not a similar response will take place at sites with hundreds of manatees is unknown. Natural winter sites are also compromised: groundwater withdrawals have significantly reduced spring flows at sites used by wintering manatees.

Day 2: 13 November 2002

Gulf of Mexico stocks

New abundance estimates - WP11, WP15

The ASRG was informed that two new papers were being produced that document the abundance of cetaceans in the Gulf of Mexico. These abundance estimates came from 1998-2001 marine mammal abundance data collected during plankton surveys on the shelf and in the oceanic parts of the Gulf of Mexico. One paper reports results from the shelf surveys and the other from the oceanic surveys. These papers though not internally reviewed yet will be put on the private web site for the ASRG members to review.

The ASRG suggested these two papers be made into Lab Reference or Technical Memos as soon as possible so that the background information on the new abundance estimates reported in the SAR chapters are available as a public document.

General SAR issues

1. Remove details of surveys from chapters and refer to a reference.
2. Should say in the SARs that at this time there is no trends in abundance information, because the differences between the surveys are currently under review.
3. The format of the Gulf of Mexico SAR chapters should follow the format used for the Atlantic stock species. Waring and Quintal should send to the SE authors example chapters that illustrate the approved format. Then the SE authors should follow this format for all the Gulf of Mexico chapters.
4. In all applicable chapters, state the abundance survey coverage is to the EEZ and not throughout the entire Gulf of Mexico.
5. In all applicable chapters, state strandings have been reported but have not been investigated and so are not reported in the SAR.
6. In the Other mortality section: use human interaction data for 5 most recent years to add into mortality estimate, if appropriate. But keep text about strandings, gun shots, ship strikes, etc. from any year. Mass strandings also can be added into text, but not into mortality estimate.
7. When possible correction factors used in the abundance estimates, for example availability bias, should be from same ocean body and same species. Also it is best if data is from peer-reviewed papers. If possible, get correction factors that are area- and species-specific to correct abundance estimate. State in SAR correction factors are used.
8. Under fishery interactions: the sentence about pair trawling should be removed. There is pair-trawl fishing in the Gulf of Mexico but it was not observed so it is not necessary to discuss it in the text; maybe include this information in Appendix of fishery information that will be created.
9. Under annual human caused mortality section: remove text at end of first paragraph about MMPA Section 118. Follow the new format.
10. Include in all chapters, a statement that the Gulf of Mexico animals are separated stocks from the Atlantic animals because ... (whatever the reason).

Sperm whale

Put into other mortality section information about acoustic interactions

Kogia

1. Correct spelling of scientific name.
2. The ASRG discussed the option of adding a sentence for any PBR that comes from an abundance estimate that is for mixed unidentifiable species that the PBR is set to undefined. This could also be done for pilot whales and beaked whales. It was not clear if the ASRG agreed to recommend this.

Cuvier

1. Add statement about there are probably acoustically-induced mortalities. Copy statement from Cuviers from Atlantic into Gulf of Mexico chapter.
2. The ASRG discussed the option of adding a sentence for any PBR that comes from an

abundance estimate that is for mixed unidentifiable species that the PBR is set to undefined. This could also be done for pilot whales and Kogia. It was not clear if the ASRG agreed to recommend this.

3. Raise big flag that acoustics could be dangerous.

Bottlenose dolphin

1. Under stock definition section: Update statement on genetics of this species. Perhaps add there are already samples collected, state how many samples have been collected, and when the data may be analyzed. Or drop statement. Or state there is a need to analyze these data.
2. Under Current Population Trend section: check if statement is really increase or decrease. Or better yet, state there is a difference in abundance estimates from the previous surveys and the explanation for this difference is being investigated.
3. Under annual human-caused mortality section: re-define "recent" in first paragraph, state a time frame.

Atl spotted dolphin

Editorial changes other than the above general issues, particularly the trend comments.

Pan-tropical spotted dolphin

1. Under annual Human-caused mortality section: go back to old stranding and check id of which type of spotted dolphin this stranding was.
2. Under first paragraph in Stock definition: see editorial change for all chapters.

Striped dolphin - see text for minor comments.

Spinner dolphin

Make sure Table 1 and picture in Figure 1 are showing same data or else explain that sightings within figure include more than those used in abundance estimate.

Rough-toothed dolphin

Make sure Table 1 and picture in Figure 1 are showing same data or else explain that sightings within figure include more than those used in abundance estimate.

Clymene dolphin in Gulf of Mexico

Fix spelling.

Atlantic Clymene dolphin in Atlantic

Create this chapter.

Fraser's dolphin

No Nmin estimate.

Killer whale

1. Check grammar about individual stocks.
2. Check if Figure 1 is ok.
3. Delete sentence right above Figure. 1991 data are too old.

False killer whale

Check Figure 1. Are two sightings in SW even though there is no abundance estimate?

Pygmy killer whale

1. Same comments for false killer whale.
2. Delete statement that says pygmy and melon-headed are difficult to distinguish.
3. Estimate Nmin and PBR.
4. Fix statement about sperm whales.

Melon-headed whale - see text for minor comments.

Risso's dolphin - see text for minor comments.

Short-finned pilot whale - see text for minor comments.

3. Acoustics

Acoustic impacts on marine mammals; SURTASS-LFA sonar; beaked whale mortalities (Tyack/Lang)

Tyack presented general information on controlled exposure experiments, data from a tag designed to track the behavior of deep diving odontocetes (DTAGs), and results from controlled exposure experiments. Tyack told the ASRG that there is a developing consensus that controlled exposures are the best way to study short-term behavioral reactions to noise. The advantage of controlled exposure experiments is the subject's demography can be selected prior to exposure, the subject is it's own control when behavior patterns before, during, and after an exposure are recorded, and it is possible to monitor the level of exposure. But such experiments require a large, well integrated team that includes remote monitoring of sounds using hydrophone arrays, visual observations of surfacing locations/behavior, archival and radio tagging of individual whales, and the ability to estimate range to whale and to model transmission loss to adjust source level and source vessel movement for desired exposure at whale.

An example of such a controlled experiments was conducted during January 1998 where a paired playback/control design was used to study the effects of a LFA sonar (160-300 Hz) on 1200 migrating gray whales. It was found that during only the playback sessions, the whales avoided the area around the sound source, and that the level of avoidance increased as the received levels increased. Another example is the Phase III experiments of the SURTASS LFA, where the focus

was on singing humpback whales during the breeding season off of Hawaii. In this case, there was a range of responses, from a singing humpback stopping immediately after the first ping and moving directly away, to increasing the song duration, to resuming "normal" activities soon after the first ping. It was found that the maximum received level of the LFA sonar was not a good predictor of the likelihood of song cessation or change in mean song duration. Thus, these data are difficult to interpret and determine if the sound was disruptive.

Another way to monitor the behavior of an animal is to use a digital acoustic recoding tag (DTAG). This technique was developed to measure received level of stimulus at the whale while also measuring behavioral and physiological responses during the animal's dive. The DTAG was used on *Ziphius cavirostris* in June 2001 and October 2002 at a study site in the Gulf of Genoa near Italy, and on sperm whales in July 2001 in the Gulf of Mexico, where sperm whales were exposed to air-guns. In the case of the sperm whale it appears a creaking sound is an indicator of feeding and codas appear to be associated with social behavior between animals, ie. rubbing. Thus, it was possible to see if feeding rates and social behaviors changed with exposure to air guns. During air gun usage, the sperm whales avoided the vessel and decreased the number of creaks per hour during a dive. That is, there appears to of been feeding disruption. But it is not known if this disruption is significant or if the animal used another way to feed and so did not make the creaking sounds.

The DTAG has provided insight into the short-term effects of noise on certain behaviors of several different species. However, there is still more work to be done; such as, more theoretical modeling to integrate cost and benefits and relate to demography parameters.

Right Whale/Ship Strike Working Group acoustic issues (Wang/Borggaard)

Borggaard updated the ASRG on this working group. The terms of reference of this working group is to determine if acoustics can deter ship strikes and would these acoustics negatively affect the whales? It is proposed to have a workshop to address these issues, but the dates and structure of this meeting have not yet been set.

4. Review of recent assessment surveys

NE right whale aerial surveys (Cole) - WP7

Cole reported on the right whale aerial surveys that were conducted from 15 March 2002 to 15 July 2002. These surveys included broad scale surveys and management driven flights. Broad scale surveys were designed to systematically cover waters between Long Island, New York and Grand Manan Island, Canada by track lines that were 20 nmi apart. The management driven flights were designed to seek scientific information needed to accomplish a specific management task or address a management question. Examples include determine if there were right whales still in a DAM or locate an entangled animal. In addition, the NEFSC conducted surveys in the fall (October to December 2002) that were off Delaware Bay and around Georges Bank. In the

future, the NEFSC wants to get 1998 data from NERO and put it into a digital format similar to the more recent data.

NE spring survey for right whales (Cole)

The NEFSC conducted a survey during 29 April to 17 May 2002 that covered waters from the southern part of the Gulf of Maine to Georges Bank. The primary objectives were to photograph and biopsy large whales (targeting right whales), and to determine the cetacean distribution within the Dynamic Area Management (DAM) and Seasonal Area Management (SAM) fishery closures.

Over 800 nmi of track lines were surveyed during the 12 good weather days. A total of 63 right whales were detected, of these approximately 25 were photographed, and 6 right whales not previously sampled were biopsied. In addition, 4 sei whales were photographed out of the 31 detected.

NE July shipboard sea mounts survey (Waring) - WP19

The cruise was conducted during 16 July – 2 August 2002 in the vicinity of Bear Seamount and along the continental slope south of George's Bank. The cruise objectives were twofold: (1) to explore the bio-diversity in the vicinity of Bear Seamount and to collect nekton (especially fish and cephalopod) specimens in bottom and midwater samples from the maximum depths possible, and (2) to collect information on the distributional relationship between cetaceans, particularly beaked whales and sperm whales, oceanographic features, and potential prey.

Deep midwater trawling with double-warp gear was very successful. Additionally, sets of midwater samples were successfully collected in three slope/canyon areas where aggregations of toothed whales were encountered. Preliminary identifications indicate that about 183 species of fishes, at least 33 species of cephalopods, and 152 types of other invertebrates were collected. During the approximately 435 nautical miles of tracklines dedicated to marine mammal watches, 11 species of mammals and 2 of turtles were observed. Sightings were concentrated in slope areas, generally associated with canyons and hydrographic fronts, rather than around Bear Seamount. Another positive result was it was possible to conduct this multi-objective survey, but a longer time frame was needed to accomplish both objectives.

NE July-August experimental aerial survey (Palka) - WP16

This survey was conducted on the NOAA Twin Otter from 19 July to 16 August 2002. The area surveyed was from south of Long Island, New York to the Bay of Fundy, New Brunswick, Canada. The primary objective was to determine the feasibility of the circle-back method that estimates abundance of cetaceans and turtles which includes an estimate of g(0), the probability of detecting a group on the track line.

During 14 days of surveying, 4156 nmi were surveyed in 70 flight hours. Eleven species of identifiable cetaceans, 1 species of seals, and 3 species of turtles were detected. Preliminary results indicate the method can be practically executed in the field, but not all circle-backs were of acceptable quality. A complete analysis is needed to fully determine the feasibility of this method.

NE August large whale shipboard survey (Cole) - WP3

This survey was conducted during 5-28 August 2002 on the *R/V Delaware* in the Scotian shelf region. The objectives included: (1) document the distribution of large whales in this area, (2) photographically identify individual humpback, blue and right whales, and (3) obtain biopsy samples from these same species as well as for various odontocetes.

During 15 days of surveying in good weather, 11 identifiable cetacean and 1 turtle species were detected. Humpbacks were the most commonly seen large whale and so many photos were taken. In addition, photographs of right whales and bottlenose dolphins were also taken. A total of 62 biopsy samples were obtained: 22 humpback whales, 16 right whales, 4 fin whales, 9 bottlenose whales, and 11 common dolphins.

NE August-September aerial photogrammetry survey for right whales (Cole)

This survey was conducted from 20 August to 15 September 2002 on the NOAA Twin Otter. The objective was to locate and photograph as many right whales as possible, where the photographs were from high definition cameras that produce photos that are accurate enough to measure the girth and length of an individual animal. Weather permitted ten days of flying, during which time about 50 individuals were photographed.

Mid Atlantic bottlenose dolphin surveys (Swartz)

This was discussed above under "2. Review of draft 2003 SARs - Atlantic stocks - Bottlenose Dolphins - Update on abundance/mortality estimates".

Mid Atlantic aerial survey for right whales (Swartz) - WP14, WP18

During 22 January to 19 March 2002, aerial surveys were conducted from Savannah, GA to Chesapeake Bay, VA, a region north of the "typical" winter calving grounds. During these surveys six right whales, including four mother/calf pairs were detected. This indicates that some right whales may not move as far south as the protected areas in southern Georgia/northern Florida. Swartz reported that these surveys will be conducted again in 2003, except the survey protocols may be modified to learn more about residence time.

In addition, to these surveys, other aerial surveys were conducted in the winter calving grounds. Between 01 December 2001 and 31 March 2002, over 20,000 miles of on-effort track lines were

flown in sea states of less than four. During these surveys, 82 cow/calf pairs and 23 non-calving whales were detected.

Mid-Atlantic cetacean assessment vessel survey (Swartz) - WP12

This survey was conducted during February to April 2002 and was funded by the SEFSC and the Navy. The objectives were (1) collect both large scale abundance information and more detailed information in smaller areas that were of interest to the Navy, (2) continue development and application of passive hydro-acoustic methods to detect marine mammals and augment visual observations, and (3) opportunistically collect skin biopsy samples, targeting bottlenose dolphins.

During the 4,592 km of track lines, 287 marine mammal groups from 24 taxonomic groups and at least 15 species were detected. Based upon these sightings, minimum estimates of abundance were derived for three major Naval operations areas for the most commonly encountered species.

5. Future surveys

Mid-Atlantic 2003 research plan for bottlenose dolphin studies (Swartz)

Swartz reported the work in progress that will continue in FY03 included tracking currently tagged dolphins by boat and airplane throughout the winter and spring, collecting biopsy samples from other individuals found in groups containing a tagged dolphin, and analyzing the tracks to determine how dolphins have moved and how these movement relate to environmental parameters. During FY03 to address the question 'What is the distribution and relative composition of the three sympatric management units in NC in winter?', it is planned to target existing gaps, both geographic and temporal, in the biopsy sampling along the coast. To address the question 'Do coastal and estuarine dolphins interbreed and what is the relationship of the more robust coastal form?', the SEFSC will use genetics, carbon, nitrogen, oxygen and sulfur stable isotopes and morphometrics.

Research plan for 2003-04 pelagic cetacean surveys (Swartz)

Swartz reported that their plans for future surveys included no winter 2003 surveys, a summer 2003 survey and February-March 2004 survey in the Gulf of Mexico to focus on sperm whales.

Northeast survey plans (Palka)

Cole reported that the NEFSC planned to continue the right whale broad scale and management driven flights in the spring 2003 and perhaps in the fall of 2003. The right whale habitat spring and summer shipboard surveys and the aerial summer photogrammetry flights will also continue in 2003.

Palka reported that the NEFSC had planned to conduct the pelagic Atlantic abundance shipboard

and aerial surveys during the summer of 2003, until they found out the SEFSC could not join in the survey. Because it was planned to coordinate with the SE to cover the entire Atlantic and the SEFSC will not be able to conduct the survey in 2003, the NEFSC was considering conducting the Atlantic abundance survey during 2004 when the SEFSC could also participate.

During July 2003, it is planned to conduct a joint NMFS, MMS and WHOI cruise to apply DTAGs to sperm whales (and other species if possible) in the Atlantic. The objectives are (1) collect dive time pattens to be used to correct visual line-transect abundance estimates of Atlantic deep diving sperm whales (and possible other species) and (2) compare the dive time patterns of Atlantic sperm whales, who are not exposed to the acoustic activity taking place in the Gulf of Mexico, to Gulf of Mexico sperm whales, who are exposed to many acoustic activities.

In addition, a passive hydrophone array is being constructed for the NEFSC to be used to complement visual detections during abundance surveys. This array will be able to record the high frequencies emitted by harbor porpoises as well as the medium frequencies emitted by many dolphins and some whales. It is planned to test this array during the July 2003 sperm whale tagging survey.

6. Other issues

SRG term limits?

The ASRG was informed that the Alaska SRG will be giving their members a 3-year term appointment that is renewable. At the end of appointment, members have the option of renewing. The ASRG was asked if they want to adopt this type of appointment. After discussing it, the ASRG decided they did not want to adopt this type of appointment. They felt this was not necessary. All members knew that if they were no longer able to fully participant as an ASRG member they could quit at any time.

Ocean Biogeographical Information System (Read)

Read reported that the Ocean Biogeographical Information System (OBIS) is part of the Census of Marine Life project. The objective of OBIS is to make data sets and meta data of cetaceans, sea birds, and turtles available on the web for public use. These data include distribution data from sighting surveys, sea turtle nesting sites and stranding data, and telemetry data of turtles and other species. At this time data are being contributed by the SEFSC and NEFSC. Recently the Sea Mammal Research Unit (SMRU) in Scotland also agreed to provide their data. It is planned to start discussions with the SWFSC to determine if, and when, they can provide data.

List of Fisheries

The ASRG was informed that NMFS will be making pot fisheries, like hag fish pots in Atlantic, Category II fisheries. It was also planned to wait till next year to consider elevating the blue crab

pot fisheries in the Gulf of Mexico at which time more data should be available.

Observer coverage

Palka informed the ASRG that there has been a large increase in the coverage of the gillnet and trawl fisheries in the Gulf of Maine/Georges Bank regions for fish by-catch assessment. Also, it was being considered to remove the coverage in the Gulf of Maine gillnets that was usually funded with Protected Species funds, because of the increased fish funded coverage in the same waters, and then use the Protected Species funds to increase the observer coverage in the mid-Atlantic gillnets, particularly in North Carolina and Virginia.

It was noted that observer coverage in mid-Atlantic trawls, has decreased. This includes components of the squid/mackerel/butterfish trawl fishery which are known to take a variety of cetaceans. Presently NEFSC is trying to find additional funds to, at least, get observer coverage back to past levels.

Status of budgets

The ASRG was informed that NMFS funding levels had not yet been finalized. However, it was thought that funding would be approximately the same as last year, except for a 2/3 decrease in the Large Whale Initiative. Even with this decreased amount it was planned to update the Gulf of Maine humpback whale stock information using photo-id and genetic mark-recapture analyses.

*7. **Wrap-up***

Finalize recommendations from this meeting

The ASRG met in private to finalize their recommendations. These recommendations will be sent to NMFS headquarters.

Venue and timing for the spring meeting

The ASRG decided the spring meeting should be in early May 2003. The first choice venue was the Isle of Shoals. If this did not work out then Mote in Florida or someplace in Portland, Maine would be investigated.

Appendix I. Agenda

Atlantic Scientific Review Group
Meeting Agenda: 12–13 November 2002, 08:15–17:30
Minerals Management Service, New Orleans, Louisiana

1. **Introductory stuff**
   - Welcome, housekeeping (Lang)
   - Introductions
   - Agenda review
   - Responses to our November recommendations

2. **Review of draft 2003 SARs; species/stock-specific issues**
   - General issues
     - Status of 2002 SARs
     - Marine Mammal Commission comments (Waring)
     - NMFS-HQ Stock Assessment Improvement Plan (Swartz)
     - Mortality estimates, use of stranding data (deferred from May)
   - Atlantic stocks
     - Right whale (Kenney)
       - Mortality/entanglement update (Cole)
       - Large whale Take Reduction Plan (Borggaard)
       - Survival working group (Palka)
       - Ship-strike working group (Wang/Borggaard)
       - Preliminary shipping route analyses in the Southeast (Swartz)
     - Humpback whale (Kenney)
       - Gulf of Maine stock definition, abundance, and demographics (Clapham et al., in press) (Palka)
       - Mid-Atlantic stock ID (Barco et al., in press) (Palka)
     - Fin whale (Kenney)
     - Sei whale (Kenney)
     - Minke whale (Kenney)
     - Long-finned pilot whale (Mead)
     - White-sided dolphin (Brault)
     - White-beaked dolphin (Brault)
     - Common dolphin (Read)
       - Life history study (Read)
     - Harbor porpoise (Read)
       - Take Reduction Plan update (Hopper)
     - Harbor seal (Gilbert)
       - Report of the Southern New England Seal Group (Waring)
       - Update on North Sea die-off (Waring)

Pinniped Population Modeling Workshop, Jan 2003 (Waring)
Gray seal (Gilbert)
Harp seal (Gilbert)
Hooded seal (Gilbert)
Bottlenose dolphins (no SAR)
Update on abundance/mortality estimates (Swartz/Palka)
Update on Take Reduction Plan (Wang)
Mid-Atlantic die-off analyses revisited (Eguchi, 2002) (Swartz)
Florida manatee status (Valade/Brault/Odell)
Gulf of Mexico stocks
Sperm whale (Odell)
Dwarf sperm whale (Odell)
Pygmy sperm whale (Odell)
Bryde's whale (Kenney)
Cuvier's beaked whale (Mead)
Blainville's beaked whale (Mead)
Gervais' beaked whale (Mead)
Bottlenose dolphin (two stocks) (Wells)
Atlantic spotted dolphin (Wells)
Pantropical spotted dolphin (Wells)
Striped dolphin (Wells)
Spinner dolphin (Wells)
Rough-toothed dolphin (Read)
Clymene dolphin (Read)
Fraser's dolphin (Read)
Killer whale (Brault)
False killer whale (Brault)
Pygmy killer whale (Brault)
Melon-headed whale (Odell)
Risso's dolphin (Odell)
Short-finned pilot whale (Mead)

3. Acoustics

Acoustic impacts on marine mammals; SURTASS-LFA sonar; beaked whale mortalities (Tyack/Lang) [to be the first item on Wednesday morning, then returning to the agenda in order]
Right Whale/Ship Strike Working Group acoustics issues (Wang/Borggaard)

4. Review of recent assessment surveys

NE right whale aerial surveys (Cole)
NE July shipboard sea mounts survey (Waring)
NE July-August experimental aerial survey (Palka)

NE August large whale shipboard survey (Cole)
NE August-September aerial photogrammetry survey for right whales (Cole)
Mid Atlantic bottlenose dolphin surveys (Swartz)
Mid-Atlantic aerial survey for right whales (Swartz)
Mid-Atlantic cetacean assessment vessel survey (Swartz)

5. **Future surveys**
   Mid-Atlantic 2003 research plan for bottlenose dolphin BODO studies (Swartz)
   Research plan for 2003-04 pelagic cetacean surveys (Swartz)
   Northeast survey plans (Palka)
   Review of right whale survey protocols (Cole)

6. **Other issues**
   SRG term limits?
   Ocean Biogeographical Information System (Read)
   List of Fisheries
   Observer coverage
   Status of budgets

7. **Wrap-up**
   Finalize recommendations from this meeting
   Venue and timing for the spring meeting
   Adjourn

APPENDIX II. LIST OF PARTICIPANTS

Baker, Kyle	NMFS SERO, St. Petersburg, FL
Baltz, Donald	Coastal Fisheries Institute, Baton Rouge, LA
Borggaard, Diane	NMFS NERO, Glouster, MA
Brault, Solange	Univ of MA - Boston, Boston, MA
Childs, Jeff	Mineral Management Service, New Orleans, LA
Cole, Tim	NMFS NEFSC, Woods Hole, MA
Fairfield, Carol	NMFS SEFSC, Miami, FL
Fulling, Greg	NMFS SEFSC, Pascagoula, MS
Hopper, Brian	NMFS NERO, Glouster, MA
Kenney, Robert	Univ of RI, Narragansett, RI
Lang, Bill	Mineral Management Service, New Orleans, LA
Mead, James	Smithsonian Institution, Washington DC
Moore, Katie	NMFS SERO, St. Petersburg, FL
Mullin, Keith	NMFS SEFSC, Pascagoula, MS
Odell, Daniel	Hubbs-Sea World Research Institute, Orlando, FL
Palka, Debi	NMFS NEFSC, Woods Hole, MA
Read, Andy	Duke University Marine Lab, Beaufort, NC
Roden, Carol	Mineral Management Service, New Orleans, LA
Seagraves, Richard	Mid-Atlantic Fishery Management Council, Dover, DE
Swartz, Steven	NMFS SEFSC, Miami, FL
Valade, Jim	FWS, Jacksonville, FL
Wang, Kathy	NMFS SERO, St. Petersburg, FL
Waring, Gordon	NMFS NEFSC, Woods Hole, MA
Wells, Randy	Chicago Zoological Society,Sarasota, FL
Young, Sharon	Human Society, US, Sagamore Beach, MA

APPENDIX III. LIST OF MEETING PAPERS

WP1.

Barco, S.G., W.A. McLellan, J.M. Allen, R.A. Asmutis-Silvia, R. Mallon-Day, E.M. Meagher, D.A. Pabst, J. Robbins, R.E. Seton, W. M. Swingle, M.T. Weinrich, and P.J. Clapham. 2003. Population identity of humpback whales, *Megaptera novaeangliae*, in the waters of the U.S. mid-Atlantic states.

WP2.

Clapham, P. Summary of the right whale survival working group meeting, September 9, 2002.

WP3.

Clapham, P. and F. Wenzel. Cruise report. Delaware II large whale survey DE0207. Available from NEFSC, 166 Water St. Woods Hole, MA 02543.

WP4.

Clapham, P., J. Barlow, T. Cole, D. Mattila, R. Pace, D. Palka, J. Robbins and R. Seton. in press. Stock definition, abundance and demographic parameters of humpback whales, *Megaptera novaeangliae*, from the Gulf of Maine.

WP5.

Cole, T. Appendix II. Numbers of confirmed and unconfirmed large whale mortality and serious injury ("SI") events reported along the U.S. Gulf coasts, the U.S. East coast and adjacent Canadian Maritimes from 1997-2001, including a break down of the number of events attributed to entanglement and/or collision with a vessel.

WP6.

Cole, T. SI and Mortality summary table including January 1 - November 8, 2002 in parentheses.

WP7.

Cole, T., P. Clapham, R. Merrick and L. Pomfret. Aerial surveys by the Northeast Fisheries Science Center: an overview for 2002.

WP8.

Eguchi, T. 2002. A method for calculating the effect of a die-off from stranding data. Marine Mammal Science 18(3): 698-709.

WP9.

Florida Fish and Wildlife Conservation Commission. 2002. Preliminary biological status review of the Florida manatee (*Trichechus manatus latirostris*).

WP10.

Florida Fish and Wildlife Conservation Commission. 2002. Population viability analysis of the

Florida manatee (*Trichechus manatus latirostris*).

WP11.
Fulling, G.L., K.D. Mullin and C.W. Hubard. Abundance and distribution of cetaceans in outer continental shelf waters of the U.S. Gulf of Mexico.

WP12.
Garrison, L.P., S.L. Swartz, A. Martinez, C. Burks and J. Stamates. A marine mammal assessment survey in mid-Atlantic waters of the US continental shelf: February - April 2002: MACS-2002. Draft NOAA Technical Memorandum NMFS-SEFSC.

WP13.
Marine Mammal Commission. Letter to Ms. Donna Wieting, Office of Protected Resources, Silver Spring, MD dated July 2002 in regards to a review of the draft 2002 Stock Assessment Reports from the Atlantic, Pacific and Alaska regions.

WP14.
McLellan, W.A, E.M.Meagher, L.G. Torres, G.G. Lovewell, D.A. Pabst. Winter right whale surveys. Savannah, Georgia to Chesapeake Bay, Virginia. January 22, 2002 - March 19, 2002. Contract Report 50WCNF2060001 submitted to National Marine Fisheries Service, Southeast Fisheries Science Center, Miami, FL 33149.

WP15.
Mullin, K.D and G.L. Fulling. Abundance of cetaceans in the oceanic northern Gulf of Mexico, 1996-2001.

WP16.
Palka, D. Aerial survey results. NOAA Twin Otter aircraft. Circle-back method experimental abundance survey. Available from NEFSC, 166 Water St. Woods Hole, MA 02543.

WP17.
Scott, G.P., D.M. Burn and L.J. Hansen. The dolphin dieoff: Long-term effects and recovery of the population.

WP18.
Slay, C., M. Zani, C. Emmons, E. LaBrecque, B. Pike, S. Kraus and R. Kenney. Early Warning System 1994-2002. Aerial surveys to reduce ship/whale collisions in the North Atlantic Right Whale calving ground. Final Report 2002 edition. Contract Report 50WCNF706010PW submitted to US Department of Commerce, National Ocean Service, Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC 29412-9110.

WP19.

Waring, G. Figure 1. Track lines, sperm whale and beaked whale sightings for DE0206 deepwater systematics and marine mammal survey, July 2002.

WP20.

Westgate, A. and A. Read. Population structure and life history of common dolphins (Delphinus sp.) in the North Atlantic.