Center of Independent Experts Review of
Loggerhead Turtle Expert Working Group Report
August 4, 2008

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Executive summary

The loggerhead Turtle Expert Working Group (TEWG) was convened by the National Marine Fisheries Service's (NMFS) Southeast Fisheries Science Center (SEFSC) to address the recent declines in loggerhead nesting in the U.S. The TEWG met in December 2006, April 2007 and September 2007. Review of this report by the Center of Independent Experts consisted of a desk review focusing on the adequacy and appropriateness of the data, methods and population models used to address the reasons behind the recent declines and to interpret the implications for the loggerhead population in the north Atlantic.

The major point of concern addressed by this working group is the precipitous decline in the number of loggerhead nests observed in nesting surveys in Florida since 1998. Loggerhead nests in Florida represent as much as 80% of all loggerhead nests and may produce up to 90% of all hatchlings. The index beach survey has monitored loggerhead nesting in a consistent manner from 1989 to the present. The number of nests in the survey peaked in 1998 at 59,918 nests and then declined to 28,074 nests in 2007. Declines have been noted in many other, albeit, smaller nesting areas in the U.S., Mexico, Central America, Caribbean, South America, Africa and sites in the Mediterranean.

The working group is to be commended for bringing together these many and diverse data sets to address the reasons for the recent declines in the number loggerhead nests observed during beach surveys. These data sets may be the best available but were found by the working group to be inadequate to address the underlying reasons for and the implications of the recent declines in loggerhead nesting.

Modeling of population trends based upon data from nesting surveys in the U.S. and Mexico only confirmed the declining trends but did not explain them. There does not seem to be enough reliable data to convert nesting counts to numbers of mature females in the population using remigration rates and the number of clutches/nests per females. Little monitoring information is available of any of the life history stages of females or males to allow the formulation of underlying reasons for declines in the number of nests or predict potential impacts on the population.

All of the research recommendations in the report are in support of obtaining better life history and monitoring information. It is unlikely that funding is available to cover all of the needs identified and priority areas will need to be defined according to obtaining the most benefit from immediate attention.

Background

The Turtle Expert Working Group (TEWG) concept was established by the National Marine Fisheries Service's (NMFS) Southeast Fisheries Science Center (SEFSC) in 1995 at the behest of NMFS to assess the status of turtle species in the Atlantic. The current loggerhead TEWG was initiated to address the recent declines in loggerhead nesting in the U.S. The TEWG met in December 2006, April 2007 and September 2007. The SEFSC has the lead for conducting stock assessments on Atlantic sea turtles, and assembled an international group of government scientists, academics, and NGOs to assess the status of loggerheads.

Review Activities

This review consisted of a desk review of one document, the Loggerhead TEWG (Turtle Expert Working Group) draft report (TEWG 2008) which was developed over a series of three meetings by the working group. Originally, the report was to be ready for review on April 25, 2008 with the CIE reviews to be submitted May 8 (Appendix 2). Delays ensued and the report finally arrived on July 15, 2008. This report (140 pages) contains the compilation and analyses of available data sets on north Atlantic loggerhead turtles many of which came from U.S. sources.

I augmented my review of this document with other papers and reports listed in the Reference section of this review. Websites where appropriate were also used and these are listed in footnotes.

Terms of Reference

1. Evaluate the adequacy, appropriateness, and application of data used in the assessment.

2. Evaluate the general adequacy, appropriateness, and application of methods used in the assessment.

3. Evaluate the adequacy, appropriateness, and application of the methods used to assess population status and trends.

4. Review research recommendations provided in the report and make any additional recommendations warranted.

Summary of the findings

The review of the TEWG report is organized according to the terms of reference laid out by the Center for Independent Experts.

1. Evaluate the adequacy, appropriateness, and application of data used in the assessment.

The working group is to be commended for the thoroughness of their investigation of potential data sources for determining the status of the loggerhead turtles in the Atlantic. As to the adequacy of the data, I can not say it any better than the authors of this report who state that the existing data was "…woefully inadequate to determine the cause(s) of the declines in nesting … or if those declines signal a decline in the adult population." Lack of information on the distribution or variability of remigration rates and the numbers of nests per females makes it difficult to directly link declines in the number of nests to the decline in the number of females in the population. The tagging data mainly came from studies with a range of objectives, not all of them to do with the needs of this study. The stranding data were not very usable for the purposes of this study due the various issues discussed in the report (pages 30 to 37). The working group did the best that it could with the data at hand and was quite candid as to the limitations of using the data for the objectives of this report.

I looked into background material on the Florida nest survey program to understand the differences between what the authors have used here and what had been used in the 2007 leatherback TEWG report. On page 11 of the loggerhead report it states that there were 28 nesting beach surveys areas that had been consistently surveyed since 1989 in the Index Nesting Beach Survey (INBS) Program in Florida. Three more INBS beaches which have been surveyed in a consistent manner since 1997 are discussed in the section on the Northern Gulf of Mexico area. The Florida Fish and Wildlife Commission website[1] refers to 27 index beaches (excluding those added in 1997). The total number of nests for the 27 beaches is given as 45,080 for 2007[2] which is different than presented in Figure 1 of the loggerhead report and different than presented in the figure on the website[1]. Are the index beach survey areas different from index beaches?

2. Evaluate the general adequacy, appropriateness, and application of methods used in the assessment.

I have interpreted this term of reference to refer to methods other than those covered in the following term of reference on methods to assess population trends.

In the appendix of the loggerhead report, models of the relationship between curved carapace length (CCL) and curved carapace width (CCW) which did or did not include an intercept were assessed by comparing R^2 values. Issues with the use of standard estimates of R^2 to discriminate between intercept and no-intercept models are well known in the statistics literature (e.g., Kvålseth 1985, Becker and Kennedy 1992, Anderson-Sprechler 1994). Overall, R^2 is not appropriate for discriminating between these two types of models. Specific tests for the intercept being equal to zero are available in most statistics books and computer packages. While it may seem reasonable to assume that CCL of zero should correspond to a zero for CCW, it is also likely that the relationship

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[1] http://www.floridamarine.org/features/view_article.asp?id=27537

[2] http://research.myfwc.com/engine/download_redirection_process.asp?file=Loggerhead_Nesting_Data__1990-2007.pdf&objid=2411&dltype=article

between these two measurements may not be the same or even linear near the origin. In this case, the recommendation in the text to not use the no-intercept model for measurements less than 15 cm CCL_{std} could be misguided and instead the intercept model could be recommended with the same proviso that it not be used for CCL_{std} of 15 cm.

While concerns about increasing variation in CCW with CCL could be dealt with by using a logarithmic transformation, more flexibility and rigor could be obtained by fitting a generalized linear model with family equal to the gamma distribution and a log link. No explicit transformation of the data is required, hypothesis testing and confidence intervals etc., are straightforward. In particular, the degree to which the variance does increase with large size can be directly evaluated.

Assuming that CCW and CCL have a bivariate normal distribution (i.e., both random variables), the expected value of CCW conditional on a fixed value of CCL is the regression of CCW on CCL with maximum likelihood estimates of the regression parameters equivalent to those used in ordinary least-squares. Following this track then the authors' statement that they are mainly interesting in predicting a CCW given a CCL and therefore use the "Model 1" approach of Y regressed on X is appropriate. Controversy over whether one uses Model 1 or Model 2 seems to occupy the biological literature but not the statistical literature where random effects, mixed effects and multi-level/hierarchical models are routinely employed for measurement error and far more complex situations.

3. Evaluate the adequacy, appropriateness, and application of the methods used to assess population status and trends.

Population trends inferred from nest counts for the loggerhead turtles were evaluated using the methods in Dennis et al. (1991). The standard regression approach and a Bayesian approach were used similar to the work reported for the leatherback turtles (TEWG 2007). The results of this analysis for areas where adequate data were available are presented in Table 2 of the current report.

It is not clear from the text that the regression results and Bayesian results are directly comparable. In the caption of Table 2, the P-level for the regression results are identified with a test of λ being "…statistically significantly different from one." This implies that the null hypothesis was $\lambda=1$, versus the alternative hypothesis $\lambda \neq 1.0$. On the other hand, the results for the Bayesian method are presented in terms of the probability of $\lambda > 1.0$. If detection of population decline is the goal here, then the regression method should be testing the null hypothesis of $\lambda \geq 1.0$ versus the alternative of $\lambda < 1.0$ and the Bayesian probabilities should also be for $\lambda < 1.0$.

The report states that for the Peninsular Florida beaches the analysis indicated an overall decline when using the entire 19-year dataset but a steep decline with a probability of 0.88 when only the last 10 years are used. The estimates of λ were 0.915 and 0.938 from the regression and Bayesian methods, respectively. What is the criterion for defining

these rates as indicating a "steep" decline?[3] Where does the probability of 0.88 come from? The table has a probability of 0.092 for Pr(λ >1.0), that is a probability of 0.908 for the probability of $\lambda \leq 1.0$. However, if λ=0.938 indicates a "steep" decline then the probability that λ is at most 0.938 is 0.5.

When discussing the results for the Northern U.S. beaches the authors switch from reporting λ to percentage decline, that is $100\times(1-\lambda)$. The rate of decline from the regression method was declared to be "… not significant …" and a P-level of 0.120 was reported. Neither this report nor TEWG (2007) discuss the methods for calculating confidence intervals for λ but I assume that these were estimated using the exponential of the confidence intervals for *r* as per equation 68 of Dennis et al. (1991)[4]. Again it is not clear whether the P-value given in the table is for testing λ<1.0, $\lambda \leq 1.0$ or $\lambda \neq 1$ but which ever it is, I have difficulty in reconciling this P-value with the confidence limits. The upper and lower bounds for λ are symmetric (despite being calculated from exp(*r*)), that is 0.983±0.021. Taking exp(*r*±CI) changes the bounds but not the probabilities associated with the bounds. Assuming a one sided test of the null hypothesis $\lambda \geq 1.0$, the P-level implies that for the estimate of λ=0.983, the probability of $\lambda \geq 1.0$ was 0.120, while the probability of $\lambda \geq 1.004$ was 0.025 based upon the confidence interval. Given the symmetric confidence interval, it is hard to believe that there was a probability of 0.095 between 1.0 and 1.004.

In Table 2 the Bayesian estimate for λ from the northern U.S. beaches was 0.986 with Pr(λ>1) = 0.078. In the text, the authors state that "…results of the Bayesian state-space model suggest that the decline was likely with a probability of 0.92 (Table 2)." Note that status-quo, i.e., λ=1 is included in this definition of decline.

For Quintana Roo, λ was estimated to be 0.961 (18 year series, ~3.9% decline) by the Bayesian model with Pr(λ>1.0 = 0.053). The report concludes that the population was declining at this rate with a probability of 0.89. Based upon the entries in Table 2, the probability of decline (including status-quo) was 1-0.053 = 0.947 and the probability that the population was declining at a rate of 3.9% or higher was 0.50. Where does 0.89 come from?

On page 13, the Bayesian state-space model was said to indicate a 91% probability that the population was declining for the 12 year case. The Pr(λ>1.0) in Table 2 was 0.009 and therefore the probability of the population declining (including status-quo) was 0.991 not 0.91.

The population viability analysis presented in the document uses the same model as was used to evaluate trends in the population (ref. Dennis et al. 1991). The model is presented in some detail in this section of the report but should be presented earlier in the

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[3] On page 13 of the document a "steep" decline is defined as > 5% for Quintana Roo.

[4] The confidence intervals presented in Dennis et al. (1991) are based on the normal distribution with known variance and are large sample asymptotic intervals which will be over-optimistic for the samples sizes presented in the loggerhead turtle report. The exact confidence intervals for the regression case are available in Bradu and Mundlak (1970).

trends section. The authors reference a paper submitted for review by Snover and Heppell as their source for defining Susceptibility to quasi-extinction (SQE) values using a bootstrap type of approach. The submitted paper appears to be for sea turtles in general but the loggerhead TEWG adopted a three-year running sum of nests based on this paper. In TEWG (2007) a three-year running sum was used to reflect a three-year remigration period for nesting females but the loggerhead report never mentions any assumptions about remigration. Is a three-year period appropriate for loggerheads? The U.S. Fish and Wildlife website[5] states the remigration rates for loggerheads are generally two to three years but can vary from one to seven years. Details provided in Table 10 of the loggerhead report from Heppell et al. (2003) suggest a re-migration rate of 2.5 years. Analysis of the tagging data presented on pages 84 to 85 suggested that four year cycles could be occurring as well. Note also that Holmes (2001) found using the running sum method can severely overestimate the variance when sampling error is present.

The impact of varying female mortalities on SQE was investigated. Although undefined, I assume that m_i represents additional females added or subtracted from the population. Given that the data are based on the number of nests observed, what was the assumption of the number of nests per female for this analysis? I assume that the number of nests per female may vary with age and experience but this was not mentioned as a consideration in the model.

The authors of the report considered five hypotheses to explain the declines in the number of nests. These were:

H_1: The changes reflect natural variation or response to nesting increases of other species

H_2: Life history parameters changed.

H_3: Directed fisheries may cause or contribute to the decline.

H_4: Bycatch in fisheries is the source of the decline:

H_5: Shifts/changes in sex ratios impact productivity.

H_6: Changes in current preferred habitats or preferred diet increase vulnerability to mortality by stage/age class.

There was very little information available to answer H_1, H_3 or H_4. It was noted that there has been strong upsurge in nesting by green turtles and leatherbacks coincident with the decline of nesting by loggerheads in Florida (and a similar trend in Japan) but there is no evidence that the loggerheads have moved their nesting elsewhere. Directed fisheries appear to be of little importance now that Cuba has stopped fishing loggerhead. Data on loggerheads in the bycatch of other fisheries were judged to be minimal and a recent report (Wallace et al. 2008) continues to confirm this lack of data and analysis.

[5] http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/loggerhead-sea-turtle.htm

With respect H_2, there appears to be some evidence for a lower female survival rate for Melbourne Beach based upon the tagging data but issues with the tagging data, unknown or inconsistent effort associated with the recaptures and the lack of data for all regions limit the conclusions that can be drawn from these data.

Evidence for changes in sex ratios[6] was sought in the stranding data but the results and conclusions were qualified with many caveats as to the large number of untested assumptions that needed to be made to interpret the data. Note that the authors refer to accepting or rejecting null hypotheses in their investigation of the various possible patterns for sex ratios. For the frequentist basis of inference there is no mechanism for "accepting" a null hypothesis, instead these tests are set up to reject or not reject the null hypothesis. Not rejecting the null is not the same as accepting it in that evidence is usually gathered in an attempt to disprove the null, not to reinforce it.

The preliminary analysis of the tracking and sighting was well-done and informative to a point. However, given all of the caveats raised by the authors these data appear to have little information on potential changes in current preferred habitats and/or distribution.

4. Review research recommendations provided in the report and make any additional recommendations warranted.

Following is my summary of the research recommendations given in the report.

1. Determine stock/population structure through analysis and modeling of genetic samples collected continuously throughout the range.

2. Develop methods or expand on current programs to determine estimates of population abundance and trends for all life history stages.

    a. Establish a network of study sites in foraging areas, particularly along east coast of the U.S., Gulf of Mexico, Cuba, Yucatán Peninsula and in oceanic foraging areas. Studies in these areas to provide estimates of life history parameters.
    b. Expand or develop new satellite telemetry programs to estimate survival rates for life history stages not easily recaptured.
    c. Augment stranding data collection with forensic and necropsy parameter collection to address demographic parameters as well as mortality risks.
    d. Initiate or expand research on the operational sex ratios by subpopulation to understand the mechanisms that direct sex determination, the response of sex ratios to environmental variation and reasons for sex ratio shifting with respect to sex-specific behavior and seasonal migrations.

3. Determine the spatial and temporal distributions by life history stage to predict habitat use and connections between natal grounds and foraging grounds.

[6] Confusing because ratios are not used, instead proportions of females were reported.

Knowledge of habitat use by life history stage is necessary to assess the potential threats from human and other impacts.

4. Expand research on the effects of bycatch on the population. This is both a domestic and international issue and collaboration amongst nations will to conduct this research is required.

5. Conduct or expand research on the diets of loggerhead turtles to address the impact of trophic changes.

Recommendations 1 through 4 seem straightforward enough but are fairly general in their goals as presented in the text of the report. Funds are likely to be limited for these kinds of research and it would be helpful if the authors of the report could define priority areas where they expect to get the most benefit from immediate attention.

Research recommendation 5 is my wording for the text in the subsection on "Trophic Changes/ Carrying Capacity". This subsection needs to be rewritten to state precisely what research needs to be done and where it should be done. Currently, the message is simply that diet information is important.

Both recommendations 2a and 4 include the need for international collaboration. I assume that this need holds for all of the recommendations to some degree. I noted that 15 of the 16 members of the TEWG were representatives of U.S. organizations, universities and governments with the 16th member representing Mexico.

Respectfully submitted on 4 August 2008,

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Appendix 1: References

Anderson-Sprechler, R. 1994. Model comparisons and R^2. Amer. Statist. 48: 113–117.

Becker, W. and P. Kennedy. 1992. A lesson in least squares and R squared. Amer. Statist. 46: 282–283.

Bradu, D. and Y. Mundlak. 1970. Estimation in log-normal linear models. J. Amer. Statist. Assoc. 65: 198–211.

Dennis, B., P.L. Munholland and J.M. Scott. 1991. Estimation of growth and extinction parameters for endangered species. Ecological Monographs 61:115–143.

Heppell, S.S., L.B. Crowder, D.T. Crouse, S.P. Epperly, and N.B. Frazer. 2003. Population models for Atlantic Loggerheads: Past, present, and future, p 255–273. In: Bolten, A.B. and B.E. Witherington (eds.) Loggerhead Sea Turtles, Smithsonian Institute Press, Washington, D.C.

Holmes, E. E. 2001. Estimating risks in declining populations with poor data. Proceedings of the National Academy of Sciences. 98: 5072–5077.

Kvålseth, T.O. 1985. Cautionary note about R^2. Amer. Statist. 39: 279–285. (and references therein)

Turtle Expert Working Group. 2007. An assessment of the Leatherback Turtle Population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555, 116 pp.

Turtle Expert Working Group. 2008. An Assessment of the Loggerhead Turtle Population in the Northwestern Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-xxx, xx p.

Wallace, et al. 2008. Impacts of fisheries bycatch on loggerhead turtles worldwide inferred from reproductive value analyses. J. Appl. Ecol. 45: 1076–1085.

Appendix 2:

Statement of Work for Stephen Smith
External Independent Peer Review by the Center for Independent Experts
Loggerhead Turtle Expert Working Group Report

TEWG Project Overview

The National Marine Fisheries Service's (NMFS) Southeast Fisheries Science Center (SEFSC) convened a Loggerhead Turtle Expert Working Group (TEWG) to assess the status of loggerhead turtles in the North Atlantic Ocean. Scientists from NMFS, NGOs, and academia with expertise in loggerhead biology and data analysis comprised this group. All members contributed their expertise to the group, with the goal of producing a draft report that assesses loggerhead status in the Atlantic.

The TEWG concept was established by the SEFSC at the behest of NMFS in 1995 to assess the status of turtle species in the Atlantic. Previous TEWG reports addressed loggerhead turtle status in 1998 (TEWG 1998) and 2000 (TEWG 2000). The current loggerhead TEWG was initiated to address the recent declines in loggerhead nest in the U.S. The TEWG met in December 2006, April 2007, and September 2007. The SEFSC has the lead for conducting stock assessments on Atlantic sea turtles, and assembled an international group of government scientists, academics, and NGOs to assess the status of loggerheads.

Overview of CIE Peer Review Process:

The Office of Science and Technology implements measures to strengthen the NMFS Science Quality Assurance Program (SQAP) to ensure the best available high quality science for fisheries management. For this reason, the NMFS Office of Science and Technology coordinates and manages a contract for obtaining external expertise through the Center for Independent Experts (CIE) to conduct independent peer reviews of stock assessments and various scientific research projects. The primary objective of the CIE peer review is to provide an impartial review, evaluation, and recommendations in accordance to the Statement of Work (SoW), including the Terms of Reference (ToR) herein, to ensure the best available science is utilized for the National Marine Fisheries Service management decisions.

The NMFS Office of Science and Technology serves as the liaison with the NMFS Project Contact to establish the SoW which includes the expertise requirements, ToR, statement of tasks for the CIE reviewers, and description of deliverable milestones with dates. The CIE, comprised of a Coordination Team and Steering Committee, reviews the SoW to ensure it meets the CIE standards and selects the most qualified CIE reviewers according to the expertise requirements in the SoW. The CIE selection process also requires that CIE reviewers can conduct an impartial and unbiased peer review without the influence from government managers, the fishing industry, or any other interest group resulting in conflict of interest concerns. Each CIE reviewer is required by the CIE selection process to complete a Lack of Conflict of Interest Statement ensuring no

advocacy or funding concerns exist that may adversely affect the perception of impartiality of the CIE peer review. The CIE reviewers conduct the peer review, often participating as a member in a panel review or as a desk review, in accordance with the ToR producing a CIE independent peer review report as a deliverable.

The Office of Science and Technology serves as the COTR for the CIE contract with the responsibilities to review and approve the deliverables for compliance with the SoW and ToR. When the deliverables are approved by the COTR, the Office of Science and Technology has the responsibility for the distribution of the CIE reports to the Project Contact.

Requirements for CIE Reviewers:

Three CIE reviewers are required to conduct a desk review (no travel is required) of a Loggerhead TEWG draft report (approximate length 120 pages), and each reviewer's duties shall occupy a maximum of 5 days to conduct the peer review and produce a CIE independent peer review report.

The CIE reviewers shall have expertise with current quantitative skill as it relates to an understanding of life histories and stock assessment of large, long-lived, highly migratory marine vertebrates. CIE reviewers shall expertise and experience with generating stock assessments in a data poor situation and in the use of count data as proxies for population size (e.g., number of nests for this report) and population growth rates. The CIE reviewers shall have the requested expertise necessary to complete an impartial peer review and produce the deliverables in accordance with the SoW and ToR herein.

Statement of Tasks for CIE Reviewers:

The CIE reviewers shall conduct an independent peer review of the TEWG loggerhead stock assessments to determine whether the best possible assessment was utilized through the TEWG process. The CIE reviewers shall conduct preparations prior to the peer review, conduct the peer review, and complete the deliverables in accordance with the ToR and deliverable dates as specified.

The reviewers shall evaluate the draft North Atlantic assessment report of the Loggerhead TEWG. Their primary responsibility is to conduct an impartial peer review to ensure that assessment results are based on sound science, and the CIE reviewers shall not comment on management decisions. The reviews shall consider whether the input data, assessment methods, and results are adequate and support the conclusions. If a reviewer finds the assessment to be deficient, then he/she shall recommend remedial measures, including an appropriate approach for correcting and subsequently reviewing the assessment. The evaluation shall explicitly address the following Terms of Reference.

Terms of Reference:

1. Evaluate the adequacy, appropriateness, and application of data used in the assessment.
2. Evaluate the general adequacy, appropriateness, and application of methods used in the assessment.

3. Evaluate the adequacy, appropriateness, and application of the methods used to assess population status and trends.

4. Review research recommendations provided in the report and make any additional recommendations warranted.

5. Prepare a Peer Review Report as described in Annex 1, summarizing the CIE Reviewer's evaluation of the Loggerhead TEWG report and addressing each Term of Reference, including a statement on whether the assessment was based on sound science, appropriate methods, and appropriate data, with a copy each sent to Dr. David Sampson at david.sampson@oregonstate.edu and Mr. Manoj Shivlani at shivlanim@bellsouth.net.

Schedule of Milestones and Deliverables:

10 April 2008	CIE shall provide the COTR with the CIE reviewer contact information, which shall then be sent to the Project Contact
25 April 2008	The Project Contact shall send the CIE Reviewers the Loggerhead TEWG report
8 May 2008	Each reviewer submit independent peer review report to CIE
22 May 2008	CIE shall submit draft CIE independent peer review reports to the COTRs
5 June 2008	CIE shall submit final CIE independent peer review reports to the COTRs
11 June 2008	The COTRs shall distribute the final CIE reports to the Project Contact

Background References:

Turtle Expert Working Group. 1998. An Assessment of the Kemp's Ridley (*Lepidochelys kempii*) and Loggerhead (*Caretta caretta*) Sea Turtle Populations in the Western North Atlantic. NOAA Technical Memorandum. NMFS-SEFSC-409, 96 p.

Turtle Expert Working Group. 2000. Assessment Update for the Kemp's Ridley (*Lepidochelys kempii*) and Loggerhead (*Caretta caretta*) Sea Turtle Populations in the Western North Atlantic. NOAA Technical Memorandum. NMFS-SEFSC-444, 115 p.

Acceptance of Deliverables:
Upon review and acceptance of the CIE reports by the CIE Coordinator and Steering Committees, CIE shall send via e-mail the CIE reports to the COTRs (William Michaels William.Michaels@noaa.gov and Stephen K. Brown Stephen.K.Brown@noaa.gov) at the NMFS Office of Science and Technology by the date in the Schedule of Milestones and Deliverables. The COTRs will review the CIE reports to ensure compliance with the SoW and ToR herein, and have the responsibility of approval and acceptance of the deliverables. Upon notification of acceptance, CIE shall send via e-mail the final CIE reports in *.PDF format to the COTRs. The COTRs at the Office of Science and Technology have the responsibility to distribute the final CIE reports to the Project Contacts.

Request for Changes:

Requests for changes shall be submitted to the Contracting Officer at least 15 working days prior to making any permanent substitutions. The Contracting Officer will notify the Contractor within 10 working days after receipt of all required information of the decision on substitutions. The contract will be modified to reflect approved changes. The Terms of Reference (ToR) and list of pre-review documents herein may be updated without contract modification as long as the role and ability of the CIE reviewers to complete the SoW deliverable in accordance with the ToR are not adversely impacted.

Key Personnel:

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ANNEX 1

Format and Contents of CIE Independent Peer Review Report

1. The reviewer's report shall be prefaced with an executive summary of findings and/or recommendations.

2. The main body of the reviewer's report shall consist of a background, description of the review, summary of findings, and conclusions/recommendations. The summary of findings shall address each Term of Reference. Reviewers are also encouraged to provide any criticisms and suggestions for improvement of the TEWG process.

3. The reviewer's report shall include as separate appendices the bibliography of materials provided for the review of the Loggerhead TEWG draft report and a copy of the CIE Statement of Work.