Status Assessment of the Cook Inlet Belugas: Chairman's Summary Report

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Report prepared for the Centre for Independent Experts

I. Executive Summary

The status assessment depends mainly on survey and harvest data, which represent the best available science. Harvest data are, however, imprecise. Survey methods have been specially developed and should be more thoroughly presented in the assessment. Estimates of extinction risk would be sensitive to a possible trend in detection rates in surveys and this possibility should be investigated. Data on population structure and on vital rates are not available.

Biological knowledge of belugas is adequately reviewed, both in general and for Cook Inlet. Better review of knowledge and management experience in respect specifically of depleted populations of the species in other jurisdictions would be useful.

A stochastic model, fitted to the past data by Bayesian methods, is used to project the population forward. This is an appropriate analytical method. Given the available data, the model has been built at an appropriate level of complexity and is a good compromise between realism and simplicity. The only age-structuring is a fixed age at which females start to bear calves; otherwise, birth- and death-rates are constant. Births and deaths are modelled as simple independent binomial draws. There are provisions for density dependence, Allee effects, and fixed predation levels. The forward projection and estimation of extinction risk have covered a reasonable spectrum of scenarios.

However, the fit of the model to the data is in some respects questionable. Since 1999, survey estimates decline faster than the fitted population trajectories. The survey estimates since hunting was stopped should be analysed without the earlier data, at least with simple regression analyses if not with a complete population model. The behaviour of the model in fitting to survey data with different levels of variability has not been explored, although this may affect the future variability of population projections and the estimates of extinction risk. The development of prior distributions for modelled vital rates and their connection to the tabulated values from the literature should be better explained, and a better presentation, and explanation, of posterior distributions is necessary. The reporting of model fit and function contains little information on whether posterior distributions are constrained by priors, or what it means if they are. The effect of including age-specific mortality in the model should be investigated.

The analysis methods are in general valid. However, extinction-risk estimates of this kind are based on long-term extrapolations from relatively short data series and assume that vital rates will, for decades or centuries, stay the same as their averages over the recent past. This assumption may not hold; it, and its significance, needs to be clearly stated. The tabulated estimates of extinction risk probably give qualitatively valid comparisons between different scenarios, but are unlikely to be quantitatively exact.

The status review concludes on the basis of present knowledge and recent data that the population faces a significant risk of extinction. This conclusion is supported by the scientific information presented.

II. Terms of Reference

1. Evaluate whether the adequacy, appropriateness, and application of data used in the assessment represents the best available science.

The data used in the assessment comprise survey and harvest data, and represent the best available science. Data on population structure and on population-dynamics parameters such as birth- and death-rates are not available, and are needed; efforts should be made to get such data. Harvest data, which regrettably are imprecise, may be influential in the model fit and the forward projections. Data on numbers have been acquired through specially developed survey methods, which, as this data are crucial, should be more thoroughly presented in the assessment document. Estimates of extinction risk would be sensitive to any possible trend in detection rates in surveys and this possibility should be investigated.

2. Evaluate whether the adequacy, appropriateness, and application of analytical methods and modeling represents the best available science.

A stochastic model, fitted to the best available past data, and used to project the population forward, is an appropriate analytical method with potential for identifying sensitivity of results to different features of the data. The use of Bayesian methods for fitting the model is appropriate and represents good science.

3. Do the biological data, population data, model structure and assumptions, and the analysis methods applied to the extinction risk assessment represent the best available data and methodology for sound science?

The model has a level of complexity appropriate to the available data and has drawn on an appropriate set of past data. The forward projection and estimation of extinction risk have covered a reasonable spectrum of scenarios. The fit of the model to the data, in some respects questionable, has not been adequately investigated. The estimates of numbers collected since hunting was stopped should be analysed without the earlier data, at least with simple regression analyses if not with a complete population model.

4. Does the status review provide an adequate assessment of the current knowledge regarding the biology of belugas in general and the Cook Inlet beluga population in particular? Comment on the strengths and weakness of the status review in regard to this question.

The review of the biological knowledge is adequate for Cook Inlet belugas and for beluga biology in general. Better review of knowledge and management experience in respect specifically of depleted populations of the species in other jurisdictions would be useful. It should be more clearly explained how the tabulated collection of published vital-rate values is connected with and used in the modelling, extinction-risk estimation, and assessment.

5. Do the population models adequately represent the processes within the population? Comment on the strengths and weakness of the models in regard to this question.

The population models are a satisfactory compromise between realism and simplicity. The only age-structuring is a fixed age at which females start to bear calves; otherwise, birth- and death-rate are constant. There exists no age-structure data for this population and no data on vital rates either. The behaviour of the model in fitting to survey data with different levels of variability has not been explored, although this may affect the future variability of population projections and the estimates of extinction risk. The development of prior distributions for modelled vital rates and their connection to the tabulation of published values should be better explained, and a better presentation, and explanation, of posterior distributions is necessary. There is no, or very little, information on whether any posterior distributions are being constrained by priors, or what it means if they are. The effect of including age-specific mortality in the model should be investigated.

6. Are the analysis methods valid and sufficient to estimate the extinction risk? Comment on the strengths and weakness of the analysis methods in regard to this question.

The analysis methods are in general valid. However, the estimates of extinction risk are conditional on an unstated assumption that the state of the population—i.e. environmental conditions and average birth- and death-rates—will remain for decades or centuries the same as for the most recent 23 years. This may not hold. Uncertainty of prediction of this kind is not included in the forward projections and it is difficult to see how it could be. The tabulated estimates of extinction risk probably give qualitatively valid comparisons between different scenarios, for example of predation level, but for longer-term predictions are unlikely to be more than indicative at the quantitative level.

7. Are the conclusions of the status review supported by the scientific information presented?

The status review concludes, by quantitatively extrapolating data from the most recent 23 years on the basis of present knowledge, that the population faces a significant risk of extinction. This conclusion is supported by the scientific information presented.

III. Peer Review Findings

With respect to whether the Cook Inlet population is a ‘Distinct Population Segment’, the panel agreed that the data and analyses represent the best available science and that the conclusions of the assessment, vis a vis that the Cook Inlet population is indeed a DPS, are well supported by the scientific findings.

The part of the assessment that is concerned with the status of this distinct population, and the reviewers’ comments on it, is considered below.

Data. (ToR 1)

The data used in the status assessment were considered to represent the best available science. This population is for both logistic and conservation reasons inaccessible and direct data on population structure, longevity, birth-rates whether age-specific or not, in fact on any life-history parameter, are unavailable. This lack of data hinders scientific status assessment.

The population modelling represents a method of extrapolating the survey and harvest series forward in time. The reliability of its conclusions depends on the quality of the input data from harvests and surveys.

The harvest data are important for two reasons: firstly, when taken together with the trend in survey estimates from 1994 through 1998 the data inform on the underlying population dynamics; and secondly the harvest is expected to have altered population structure, owing to heavy adult harvests, and so to have affected population dynamics even after hunting was closed. The harvest data from 1994 to 1998 used in the assessment include estimates of the annual numbers landed, imprecise estimates of loss rates, information that only adults were taken, and a single-sample estimate of the sex and age structure. All are used in the model, some as guides in defining prior distributions of corresponding parameters. Although the data are highly uncertain they nevertheless represents the best available science, but closer monitoring of the harvest might have helped the current assessment.

The survey data series is crucial to the assessment. It comes from annual total-count aerial surveys, and it consists of total numbers, with corrections applied for unseen animals. Correction factors have been obtained from several sources. The methods have been developed over several years for this particular population, and these represent the best available science. However, the development of the surveys might have been associated with increasing expertise and a trend (upward) in detection rates that might camouflage a population decline. The survey data are important and should be presented as a part of the assessment report, with an exposition of the underlying methods, the derivation of the visibility corrections, and a discussion of the potential for bias due to a trend in detection ability.

Regrettably, the aerial survey data do not at the moment provide usable data on population structure, and it is recommended that effort is put into using the survey records, which include video recordings, to provide information on population structure, particularly a lower bound on birth rate. Information on population structure can show whether unfavourable population dynamics are to be blamed on poor reproductive success or elevated mortality, and without such knowledge it will be difficult to formulate recovery plans.

Other population-dynamic data available to the assessment included counts of beach-cast carcasses and a tabulation of published vital-rate values for this species. Age at first birth was a structural parameter in the model, but other values were used only to set bounds on prior distributions for the Bayesian population modelling. Although the data and their use were considered to represent the best available science, neither the data, nor the use, were well explained and some misunderstanding arose even among the review panel. The text discussion of the tabulated collection of parameter values should be expanded, with an analysis of their mutual consistency, and a clear presentation of the model's key input parameters and associated data.

The panel also considered that the mapping of the progressive reduction of the area in Cook Inlet used by the belugas was significant and informative and could be included more prominently in the status review.

Modelling and Analysis (ToR 2 & 3)

The future evolution of the population, including the risk of extinction, was estimated quantitatively with a stochastic age- and sex-structured model of the dynamics of a generic beluga population. There was one age-class for each sub-adult year, and one for all adults. The population dynamics were driven chiefly by 3 parameters: female age at first birth; birth-rate of adult females; and death-rate (modelled as uniform). Stochastic behaviour in the model chiefly came from applying birth- and death-rates as binomial trials, respectively to the adult females and to the whole population. Age at first birth was entered as a structural constant, but birth- and death-rates were stochastically estimated by fitting to the past harvest and survey data. The modelling of the harvest included parameters for loss rate and sex ratio, which were also estimated by fitting to the data. The model was fitted by Bayesian methods. The population was projected forward using the same stochastic processes, with birth- and death-rate parameters assumed constant at their estimated values.

The model could also provide for density-dependent reduction in net growth rate—carrying capacity being set as a fixed value—Allee effects at low numbers, predation as a constant number of animals taken yearly, and stochastic catastrophic mortality events.

The model represented the population dynamic processes in a beluga population with a degree of fidelity appropriate to the paucity of data, and is considered to be best available science. A stochastic model, fitted by Bayesian methods, was considered appropriate. Its predictions that the population was at risk of extinction were incontrovertible. Nonetheless the assessment report too simply presented the quantitative results of the model runs, and further analyses, as well as more thorough presentation of the model's characteristics, would be appropriate. The fit of the model to the data was questionable, and in particular the modelled population trajectories did not match the steepness of the downward trend in survey numbers from 1999 to 2006. The survey data since 1999 should be analysed separately.

Another, differently structured model, using a more flexible modelling of Allee effects, that took the stochastic estimates of population growth rate generated by the first model's fit to the data and used them to project the population forward in time produced similar results. It also found that the population was at risk of extinction.

Review of Knowledge (ToR 4)

The review of current knowledge of Cook Inlet belugas represented the best available science, and the tabulation of published values of life history parameters was thorough. However, the connection between the table of published values and the inputs to the population modelling was not clear.

The survey series should be presented as an integral part of the assessment document, with a review of its methods, in more detail.

The descriptions and maps of the contracting range of the population are so compelling as evidence of population decline that they should be included in the assessment report.

Other jurisdictions, notably Canada, also have depleted populations of belugas that they are trying to recover. Some reference to those might be appropriate; data on population structure relevant to the Cook Inlet assessment might be available from studies of those populations.

Model Representation (ToR 5)

Overall, the fitted model is a good compromise between simplicity and realism. The level of age-structuring is minimal, and birth- and death-rates are modelled as independent binomial draws.

Variability in population dynamics might affect extinction risk. The modelling of births and deaths as simple binomial processes apparently resulted in posterior distributions for the governing birth- and death-rate parameters that were weighted toward low values of both, producing population dynamics with low turnover and, therefore, low variability. This could have been due the lack of age-specific survival; or alternatively low-variability population dynamics might fit best to the survey series, which has very low scatter about its trend. (The latter possibility is supported by some simple analyses.) Better understanding of the behaviour of this model formulation in fitting to data series with different levels of variability would help resolve this issue.

Extinction Risk (ToR 6)

To the extent that extinction risk *can* be satisfactorily estimated by extrapolating the recent past over long time horizons, the status assessment is satisfactory. However, the key assumption, that environmental conditions will remain unchanged in the future, which is modelled as an assumption that birth- and death-rates will continue for decades or centuries to have the values estimated from the past 23 years' data, limits the validity of forward predictions and estimates of extinction risk. Uncertainty of knowledge and uncertainty of realisation are included, but uncertainty of prediction is not. This key assumption, and its significance, ought to be clearly stated. The modelling approach is useful for comparing levels of risk under different future scenarios, but the tabulated probabilities of extinction should be regarded as only indicative, and very much so at longer time horizons. Emphasis should mainly be placed on the shorter-term forecasts.

Conclusions (ToR 7)

The assessment concludes that the recent trajectory of the Cook Inlet population does not conform to that expected for a depleted, but otherwise healthy, beluga population, which would be expected to grow at 2–8% a year. On the contrary, the assessment concludes that the population is unlikely to be growing at all and is facing a significant risk of extinction. The review panel concurs with these conclusions. However, the tabulated risks of extinction, although they probably make valid qualitative comparisons between different scenarios, should not be seen as valid, at the quantitative level, for the longer time horizons.

IV. Further Analyses and Evaluations

The construction of trial values for the population-dynamics parameters was not clear, perhaps partly because the procedure is somewhat involved: a value for the population growth rate is drawn from a prior distribution, then a value for the death rate is drawn from a prior that is conditional on the growth rate. Birth-rate is then estimated from growth rate and death rate

through the Lotka equation, and the birth-rate and death-rate that are then used as key parameters in the modelling. The relationship between this process and the presented tabulation of published values of population-dynamics parameters was obscure. An additional table should be included to present the key input parameters and the data used in generating their priors, with figures showing posterior distributions.

The fit of the model to the data caused concern. The overall fit between population trajectories and survey data should be investigated. The fitted population trajectories appear to decline faster than the survey series between 1994 and 1999, but more slowly since 1999: the rate of change in the survey series since the hunt was closed (a decrease of about 4% a year) is barely within the posterior distribution of the population rate of change from the Bayesian fit of the complete model. The harvest data may be having too much influence, given the uncertainties associated with it. An additional analysis based only on the survey series from 1999 through 2006 should be carried out and its results presented.

It was not clear that alteration of the population age structure by the heavy harvests in 1994–1998 would have been properly allowed for in modelling population dynamics after 1998. Including in the assessment a graphic showing changes in simple age-structure statistics with time could allay this concern.

The sensitivity of the model to including some simple form of age-specific variation in death rate should be explored. Possibilities include a simple Siler-type exponential function or making juvenile mortality a multiple of adult mortality.

IV. Additional Comments

There were no additional comments. The review panel thanks Rod Hobbs, Kim Shelden, and Paul Wade for their hospitality during the review, and for their helpfulness in making presentations of data and methods and in getting background documents.

V. Recommendations

Present the survey data as a part of the assessment report, with an exposition of underlying methods, the derivation of the visibility corrections, and a discussion of the potential for bias due to trend in detection ability;

Use the survey records, which include video records, to provide information on population structure, particularly a lower bound on birth rate;

Discuss the tabulated collection of published vital-rate values; analyse their mutual consistency; and present the model's key input parameters and associated data;

Include the progressive reduction of the area in Cook Inlet used by the belugas in the status review;

Analyse separately the survey data since 1999;

Refer to recovery of depleted beluga populations in other jurisdictions, and enquire after availability of population structure data from studies on them;

Investigate the influence of variability in data series on the estimation of turnover rates in population models;

State clearly the assumption that environmental conditions will remain unchanged over the projection horizon.

VI. Reviewer Statements

The present report gives a fair summary of four independent reviewer reports, separately submitted to CIE, based on document review, presentations and panel discussions.

Appendix I: Background documents

1. Status Review and Extinction Assessment of Cook Inlet Belugas, November 2006.
2. Revised and updated model result tables of the existing model in the status review by Dr. Rod Hobbs including the abundance estimate for 2006
3. Report on an alternative model by Dr. Paul Wade

Appendix II: Statement of Work

Consulting Agreement between NTVI and Dr. Michael Kingsley

October 17, 2007

Statement of Work

Overview

The National Marine Mammal Laboratory (NMML) of the Alaska Fisheries Science Center (AFSC) requires an independent review of scientific documents, analysis, and the resulting conclusions which support the proposed listing of the Cook Inlet beluga (CIB) as endangered under the Endangered Species Act. Specifically, a review of the background biological data, population data, model structure and assumptions and the analysis methods applied to the extinction risk assessment and the conclusions resulting from that assessment. A revised and updated status review will be published in February 2008 as an AFSC processed report. This revised status review will address scientific issues raised during the public comment period (that closed on August 3, 2007) and update the November 2006 report, Status Review and Extinction Assessment of Cook Inlet Belugas, to account for scientific data and other information that has become available in the interim including abundance estimates from 2006 and 2007. The recommendations from the peer review, including updated and auxiliary analysis, will be addressed in the final revisions prior to publication of the status review in February 2008.

The requested peer review will be conducted by four appointed reviewers from the Center for Independent Experts (CIE), one of which will be selected as the CIE chair for the panel review meeting. The panel will convene at the NMML in Seattle, Washington during November 13-16, 2007 to review the extinction risk assessment for CIB according to the Terms of Reference specified herein. Each reviewer will be provided with the report on Status Review and Extinction Assessment of Cook Inlet Belugas and other documents for review prior to the panel review meeting scheduled in Seattle during November 13-16, 2007. The three independent CIE reviewers and CIE chair will participate during the panel review meeting and provide their peer review reports as stated in the Terms of Reference and Schedule specified herein. The CIE reviewer's primary responsibility is to determine whether the best available science has been utilized, and to provide recommendations for improving the science for the Status Review and Extinction Assessment of Cook Inlet Belugas.

CIE Reviewer Responsibilities

The CIE's deliverables shall be provided according to the schedule of milestones listed below in this statement of work. Three CIE reviewers shall review and provide an

independent peer review each, and the CIE chairperson will provide a summary report. CIE reviewers will review material provided before the panel review meeting, attend the panel review meeting, and prepare final reports according to the scheduled outlined below. The three independent CIE peer review reports and the CIE chair's summary report shall be an accurate representation of the discussions, conclusions and recommendations from the review process.

The three independent CIE reviewers' duties shall occupy a maximum of 14 days per person (i.e., several days prior to the meeting for document review; travel and participation at the panel review meeting in Seattle; and preparation of their review reports after the meeting according to the schedule specified below in this statement of work). The CIE chair's duties shall occupy a maximum of 16 days (i.e., the same schedule as above with the addition of two days to finalize the summary report).

Pre-meeting Documents for CIE Peer Review

The CIE review panel, consisting of three independent CIE reviewers and one CIE chair, shall conduct a peer-review of the following three manuscripts:

4. Status Review and Extinction Assessment of Cook Inlet Belugas, November 2006.
5. Revised and updated model result tables of the existing model in the status review by Dr. Rod Hobbs including the abundance estimate for 2006, available by October 30, 2007.
6. Report on an alternative model by Dr. Paul Wade, available October 30, 2007.

The CIE reviewers are not responsible for any of the above mentioned reports that are distributed to them later than November 2, 2007.

NMML Contact person for pre-meeting review material:
Dr. Roderick Hobbs, email: Rod.Hobbs@noaa.gov, telephone: (206) 526-6278

Terms of Reference for CIE Peer Review

The CIE reviewers shall conduct a peer review of the pre-meeting documents specified above, participate during the panel review meeting, and complete their CIE reports according to the Terms of Reference as stated below:

1. Evaluate whether the adequacy, appropriateness, and application of data used in the assessment represents the best available science.
2. Evaluate whether the adequacy, appropriateness, and application of analytical methods and modeling represents the best available science.

3. Do the biological data, population data, model structure and assumptions, and the analysis methods applied to the extinction risk assessment represent the best available data and methodology for sound science?
4. Does the status review provide an adequate assessment of the current knowledge regarding the biology of belugas in general and the Cook Inlet beluga population in particular? Comment on the strengths and weakness of the status review in regard to this question.
5. Do the population models adequately represent the processes within the population? Comment on the strengths and weakness of the models in regard to this question.
6. Are the analysis methods valid and sufficient to estimate the extinction risk? Comment on the strengths and weakness of the analysis methods in regard to this question.
7. Are the conclusions of the status review supported by the scientific information presented?

The CIE panel should evaluate and indicate as to whether the presented models, analysis, and conclusions are the best available science at this time. The CIE reviewers shall not provide specific management advice. If the panel rejects the models or any components, analysis, results or conclusions, the panel should explain the rejection and provide recommendations for suitable alternatives. According to the schedule outlined below, three CIE reviewers shall submit independent peer review reports and the fourth CIE reviewer acting as Chair during the panel review meeting shall submit a peer review summary report.

Review Panel Meeting Supplementary Instructions for CIE Reviewers

(1) Prior to the meeting

CIE reviewers shall review the three documents (specified above) and any other supporting documents, background documents or reference documents provided before November 2, 2007. It is permissible to request additional information if it is needed to clarify or provide further background.

(2) During the panel meeting

The CIE reviewers shall participate during the panel review meeting and conduct their peer review according to the above Terms of Reference. Three of the CIE reviewers shall provide independent peer reviews, while the fourth CIE reviewer appointed as Chair for the panel review meeting shall provide a peer review summary report. The CIE Chair's duties shall include guidance of the meeting, coordination of presentations and discussion, and facilitation of discussions making sure each Term of Reference is addressed. It is permissible to request

additional materials from the authors, if it is deemed necessary to accomplish the goals of the peer review.

The CIE panel, lead by the CIE chair, will then work through the documents provided and discuss the comments of each reviewer and the points in the documents to complete the review. It is anticipated that the peer review can be completed during the three day panel review meeting, providing the fourth day to complete the draft reports.

(3) After the Panel Review meeting

After the panel meeting, the CIE independent reviewers are responsible for completing their independent peer-review reports with submission of the reports to the CIE program manager according to the schedule specified in the following table. The draft CIE reports will be sent to the CIE Chair who will compile a concise summary report for submission to CIE according the schedule specified below. The CIE reports shall be reviewed by the CIE Steering Committee and forwarded to the COTR at the NMFS Office of Science and Technology for approval according to the schedule specified below.

Schedule

The milestones and schedule are summarized in the table below.

Milestone	**Date**
Pre-meeting documents provided to CIE reviewers no later than	November 2, 2007
CIE reviewers participate during panel review meeting in Seattle WA	November 13-16
CIE independent peer review reports provided to CIE and Chair	November 30
CIE Chair's summary report provided to CIE	December 12
Final CIE reports provided to COTR	December 21
Final CIE reports approved and distributed by COTR to NMML	January 4, 2008

Upon approval of final CIE independent peer-review reports by the COTR, the reports will be distributed to the NMML. The NMML will utilize the reports for updating the revised status review as part of the document package presented for the evaluation of the proposed listing of the CIB as endangered under the ESA.

Submission and Acceptance of CIE Reports

According to the schedule and deadline outline above, the CIE shall provide via e-mail the final CIE independent peer review reports and the CIE chair's summary report to the COTR William Michaels (William.Michaels@noaa.gov) at NOAA Fisheries. The COTR and alternate COTR Dr. Stephen K. Brown (Stephen.K.Brown@noaa.gov) will review

the CIE reports to determine that the Terms of Reference are met, notify the CIE program manager via e-mail regarding acceptance of the reports, and then distribute the reports to the NMML contact person.

Review of Extinction Risk Assessment for Cook Inlet Beluga
Tentative Agenda (Seattle, WA, 13-16 November 2007):

Tuesday November 13

9:00 Introductions, Review Terms of Reference Coordinator, R. Hobbs

Break

10:30 -12:00 Closed session Panel discussions CIE Chair

12:00-13:30 Lunch

13:30-15:00 Hobbs presentation and Q&A session on PVA model CIE Chair.

Break

15:30-17:30 Further discussion on PVA model CIE Chair

Wednesday November 14

9:00-10:30 Wade presentation and Q&A session on Alternative model CIE Chair.

Break

11:00 -12:00 Further discussion on Alternative Model CIE Chair

12:00-13:30 Lunch

13:30-17:30 Other requested presentation and Q&A session CIE Chair

Break as needed

Thursday November 15

9:00-17:30 Summary discussions or Closed session at discretion of panel. CIE Chair
Report preparation. Break as needed

Friday November 16

9:00-17:30 Report preparation at discretion of panel. Break as needed CIE Chair

ANNEX 1:

Contents of CIE Independent Peer Review Reports

I. Executive Summary

An abstract of the independent peer review report.

II. Terms of Reference

List each Term of Reference, and include a clear statement indicating whether or not the criteria in each element of the Terms of Reference are satisfied.

III. Peer Review Findings

Independent peer review findings for each criteria of the Terms of Reference, including recommendations for improvement.

IV. Further Analyses and Evaluations

Analytical requests not previously addressed in TOR discussion above.

VI. Additional Comments

Provide a summary of any additional discussions not captured in the Terms of Reference statements.

V. Recommendations

Provide an independent statement as to whether the best available science was utilized in regard to each of the Term of Reference criteria, including suggestions to improve the Status Review and Extinction Assessment of Cook Inlet Belugas.

VI. Reviewer Statements

Each individual reviewer should provide a statement attesting whether or not the contents of the Independent Peer Review Report provide an accurate and complete independent summary of their views on the issues covered in the review. Reviewers may also make any additional individual comments or suggestions desired.

ANNEX 2:

Contents of CIE Chair's Summary Peer Review Report

I. Executive Summary

An abstract of the summary peer review report.

II. Terms of Reference

List each Term of Reference, and include a concise summary from the panel review discussions and independent CIE reports indicating whether or not the criteria in each element of the Term of Reference are satisfied.

III. Peer Review Findings

Concise summary of *peer review findings from the panel review discussions and independent CIE summary reports for each criteria of the Term of Reference, including recommendations for improvement.*

IV.. Further Analyses and Evaluations

Summary of a*nalytical requests not previously addressed in TOR discussion above.*

IV. Additional Comments

Provide a summary of any additional discussions not captured in the Terms of Reference statements.

V. Recommendations

Provide a summary statement as to whether the best available science was utilized in regard to each of the Term of Reference criteria, including suggestions to improve the Status Review and Extinction Assessment of Cook Inlet Belugas.

VI. Reviewer Statements

Provide *a statement attesting whether or not the contents of the Summary Peer Review Report provide an accurate and concise summary of the panel review discussions and independent reviewer's reviews on the issues covered in the review. Reviewer may also make any additional individual comments or suggestions desired.*