Status Assessment of the Cook Inlet Belugas:

An Independent Review

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Report prepared for the

Centre for Independent Experts

I. Executive Summary

The numbers of the Cook Inlet belugas have been reduced from a supposed 1,300 to a present level probably between 250 and 300, apparently mostly by hunting, which was closed in 1999. The assessment report presents information on the history and present status of the population. Data on total numbers, from aerial survey, and harvested numbers are available; data on the age or sex composition of the standing stock, suitable for input to quantitative modelling, are not. The report presents in detail a mathematical model of the dynamics of the population, which is fitted by Bayesian methods to these data series. The model is sex- and age-structured, but with only one adult (i.e. reproducing) age class. Birth rates are constant over all adult ages, and death rates over all ages. The same model, with the fitted values of life-history parameters, is used to project the population forward for up to 3 centuries, and results of the projection, expressed as probabilities that the population will be even less, or will be extinct, under various scenarios of predation or possible catastrophic mortality, are presented.

The assessment concludes that the Cook Inlet belugas are a Distinct Population Segment. This finding is based on the best available science and is soundly based. The assessment also concludes, from the modelled forward projections, that the population is at significant risk of further reduction or of extinction, even in the absence of hunting, particularly if it is subjected to predation, even at low level, or to catastrophic mortality events, even if rare. This finding is greatly dependent on the input data on the data on numbers and harvest. However, the modelled population trajectories do not fit the survey data very well, descending too steeply during the period when there was hunting and not steeply enough after it was closed, as though the data body itself is internally inconsistent. The assessment report does not fully present information on the model performance and the fit to the data; nor does it explore the sensitivity of the results from the modelling to possible failings in the data such as underestimating the numbers of belugas not seen on surveys, bias in harvest statistics, continued (and continuing) improvements in survey counting; nor does it express the caveat that modelling results assume that life history variables will retain their recent average values for decades or longer.

Notwithstanding these reservations, which relate mostly to presentation, the modelling represents good science, and the model structure is overall well tailored to the available data. Principal reservations about the data—such as the possibility that aerial survey skill has been increasing, or about the model extrapolations from the survey data, such as that values of life-history variables may change or that the model tends to fit low-turnover, and therefore low-variability, population dynamics—would imply that extinction risks are if anything under- and not over-estimated. Calculated extinction probabilities should, however, not be seen as more than indicative; their *relative* values, indicating the importance of predation or the improbability that the population is really increasing, are of more significance.

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 represents the best available science, although not necessarily the best imaginable. Data applied to the question of whether the Cook Inlet belugas are a Distinct Population Segment is the best available science. Data on harvests, present population composition, and trends in numbers are the best available, but leaves something to be desired and the sensitivity of the estimated risks of extinction to various possible failings in the data should be examined.

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

The analytical methods and modelling are adequate and appropriate, and represent good science. The model formulation that has been applied is quite simplified, and the sensitivity of results to some of its assumptions—independent binomial births and deaths; age-independent death rates—should be explored.

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 main shortcoming from a scientific point of view is the concentration, in the presentation of results, on the quantitative estimates from the modelling, with little review of the model performance or fit to the data, or the effects of departures from underlying assumptions. In particular, the assumption that life-history parameters will retain, for decades or centuries, their average values of the last 13 or so years is central to the estimated probabilities.

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 current knowledge of beluga biology in general and of Cook Inlet belugas in particular is thoroughly reviewed. It could be improved, particularly by commenting more deeply on the relative likelihood and consistency of the different estimates for life-history parameters that are tabulated, and by more thorough reference to the experiences of other jurisdictions in attempting to recover beluga populations that have been reduced in numbers.

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 model is an adequate representation of the population-dynamic processes and appropriate to the available data, although it is simplified. The processes driving the updating of the prior distributions of birth- and death-rate—which are confounded in their effect on average population growth rate—probably depend on fitting the variation in the survey series, and the posterior distributions of these two variables control the variability in population dynamics. Variability in population dynamics probably affects extinction risk.

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 does not consider the effect on the estimates of the risk of extinction of failures of some assumptions or faults in some data: for example, it is assumed that the tabulated corrected survey counts are unbiased and have no trend in bias, that harvest numbers are well known, and that life-history parameters have had no trend over the span of the data and will have no trend in future.

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

The status review concludes, from the model extrapolation of the survey data, that the population is facing a significant risk of extirpation. The problems that might be considered to exist in the data, modelling and analysis tend, if anything, to cause extinction risks to be underestimated; these analyses also do not fully include as quantitative factors the small and confined range that the population now occupies. The conclusions are supported by the scientific information, although the specific estimated probabilities should probably be tabulated only to one significant digit.

III. Peer Review Findings

Assessment–the basic questions

The assessment turns chiefly on two questions. The first is whether this population is a ‘Distinct Population Segment’. The data used in answering this question represent a comprehensive investigation of the structure of Alaska beluga populations and best available science.

The second question is whether the 'Distinct Population Segment' is at risk of extinction. This question is more complex and difficult to answer.

Review of data on beluga biology and Cook Inlet beluga status

Data used quantitatively in the assessment come from three sources:

- literature surveys of possible values of parameters for the life history of belugas, including in particular age at first birth;
- aerial surveys of the Cook Inlet population; as used here confined to total numbers, corrected for visibility using behavioral data from tags;
- data on harvests, hunting, and other mortality including reported takes, a limited set of data on the sex ratio and age structure in the harvest, qualitative information on loss ratios in hunting, and data on (numbers of) beach-cast carcasses;

Some other kinds of data are also available and are used qualitatively to inform the assessment. Among them are:

- data on the (contracting) range used by the population, including movement data from radio tags;
- seasonal information on the presence of various prey species in beluga stomachs;
- information on the presence of killer whales in beluga range in Cook Inlet and possible levels of predation;
- data on contaminant levels in beluga tissues;

The two sets of data that are critically important in evaluating the risk of extinction are the harvest data (including the assumed loss rates in hunting) and the survey series (including corrections for visibility and an assumption that the results are comparable over the entire series). Little to no data is available, and none has been used in the assessment, on the age or sex structure of the Cook Inlet population itself, or on other life-history parameters such as pregnancy or birth rates. For most status evaluations of endangered species, data on population structure and other life history parameters would be sought and used. It is recognised that the situation and status of the Cook Inlet beluga population restrict opportunities for gathering data for use in assessing its status.

The survey data used represent the result of painstaking and continued work to improve the survey counts and analyses, and represent the best available science. The harvest data are probably the best available, although not perhaps the best imaginable. It looks as though closer monitoring of the hunts could have repaid itself in the form, eventually, of better information on the underlying population dynamics. The assessment could be improved by an analysis of the sensitivity of the assessment of the extinction risk to possible flaws in the data, such as over- or under-estimation of the scale or effect of the harvest, progressive improvement in the skill with which aerial surveys are carried out, and so on. Aerial survey records might be combed for usable data on population composition. Given the great importance of the harvest and survey data in generating the quantitative estimates of extinction risk, the assessment report could usefully review them more thoroughly.

The tabulated review of previously published values of population-dynamics parameters for the species is complete enough, but the accompanying text review assessing the (relative) credibility of the various estimates is insufficient. There is a fair amount of knowledge of beluga biology that is not well reviewed, including experience in other jurisdictions of trying to recover depleted and endangered populations of this species, as well as on the distinctness of stocks.

Model structure and analysis

The detailed model is presented carefully and in detail; I will go into it in more detail later. However, a more basic underlying model is obscured. This model may be written:

$$R_1 = \hat{D}_1 + H$$

and

$$R_2 = \hat{D}_2$$

where R_1 and R_2 are rates of population decline under harvest (1994–1999) and without harvest (1999 onwards), $\hat{D}_1$ and $\hat{D}_2$ are corresponding estimates of the basic rate of population decline D, and H is the (average) rate of decline due to harvest. A simple estimate of D then looks like:

$$\hat{D} = \frac{1}{2}\left(R_1 + R_2 - H\right)$$

with a proviso that a best estimate would require a weighting of the two estimates of D. The detailed population-dynamics model with Bayesian fitting provides a way of estimating an average D with appropriate weighting and with allowance made for the effect of adult harvest on population structure, and of projecting forward under various scenarios of killer whale predation, Allee effect, etc. The estimation of extinction risk is basically a forward projection of D, but the simple model above shows that in estimating D, the survey data and the harvest data are both important.

There appears to be a problem that the two piecewise estimates of D are different. In effect, the data appear to be internally inconsistent. The fitted population trajectories, consequently, do not fit the survey series well. They descend more steeply than the survey estimates before 1999 and less steeply after, so a simple regression analysis of the survey data from 1999 through 2006 estimates a faster decline than the full-model analysis.

This apparent inconsistency could be due to random error. If not, it could have several possible causes. For example, the effect of the harvest might be overestimated by the harvest data when compared with what the survey series shows; or the surveys might *consistently* underestimate numbers (which would make the harvest a smaller proportion of the stock); or alternatively population-dynamics parameters, instead of being constant since 1994 as the model assumes, could have been deteriorating. However, in any of these cases, extinction risks based on forward projections would tend to be underestimated. It seems that good knowledge of past harvests for getting at estimates of the underlying population dynamics in the absence of harvest is more important than might have been expected.

Population modelling requires a compromise between fidelity and practicality. The detailed model presented as the main basis for estimation of extinction risk (Hobbs's model) is quite simplified. It is sex-structured and has age-structured mean birth-rates, which are however constant throughout adulthood, but with age-independent death rates. The relationship of adult birth-rate to death-rate is modelled as deterministic, given a population rate of growth. Numbers of births are modelled as binomial draws independent of females' reproductive histories, and realised death-rate is modelled as age-independent binomial draws.

This formulation of a population dynamic model in this way for such a species is orthodox and, with the provisos of the following two paragraphs, an adequate representation of the dynamics of the population. The comments relate to the likely effects of taking binomial draws for births and deaths and of using a single age-independent death-rate for the entire population.

Once harvesting stops, the population model only incorporates variability in the population-dynamic process as the random binomially distributed numbers of births and deaths. In a stationary population with low birth- and death-rates, the independently generated, but on average equal, numbers of births and deaths might both be considered approximately Poisson with variance equal to mean. This result is that the year-to-year variation in numbers would depend on the birth- and death-rates: low values for both will produce population trajectories with lower variation than high rates for both, even though the average rate of population change might be the same. Population dynamics with low variability are probably easier to fit to data, especially in this unusually well-behaved survey series with its low year-to-year variations in numbers. This could be why the joint posterior of birth- and death-rates appears to be constrained by the low-value boundary of the joint prior, with a concentration of values at low population turnover and associated low variability in population dynamics. Resulting population trajectories may be too close to deterministic, and extinction risk therefore underestimated, although I note that the survey series itself, since 1999, has a strikingly low variability. The population age structure that results from low turnover may be on average over-weighted with adults and perhaps therefore insensitive to Allee-type effects as modelled.

The use of a single survival parameter for all ages tends to cause the survival at prime ages, near the age of first birth, to be lower than it would be under most realistic age-specific survival schedules, since the survival of prime-aged animals near the age at first birth is usually, in reality, higher than at other times of life. This form of survival schedule therefore maximises the sensitivity of other life-history parameters to change in the age at first birth. Some simple form of age-dependence for the death-rate—e.g. Siler-type—could be included in the model.

The fitting of the model by Bayesian methods using the SIR algorithm is also orthodox, although the repeated use of uniform priors without much justification for regarding them as uninformative is a little bit questionable. Uniform priors for binomial parameters *can* be considered informative, and the use of a uniform prior for the parameter in the negative-binomial sampling for the number lost in the hunts might be more closely examined.

Model presentation and results

The analytical methods and modelling in themselves are sound enough. However, simpler analyses (e.g. simple regression of the survey series since the closing of the hunt) have been ignored. The extinction risks and other predictions from the population modelling are presented without much review of underlying assumptions and their tenability, or an analysis of model performance, posterior distributions of parameters, or fit to the data.

The model fits population-dynamics parameters to the survey estimates of numbers and the harvest data and to very little else, and it assumes that the values of these parameters have been (on average) constant over the span of the data. The extinction-risk analysis uses the fitted parameter values to extrapolate population trajectories forward for decades or centuries, under an assumption that the values will remain the same for so long; i.e. that the situation in which the population finds itself will not change.

However, we do not know the situation in which the population finds itself. The birth rate in this population is unknown; if it is reduced, it is not known why. Similarly, for death rates, age at death is unknown, and if the death rate is elevated it is not known which age classes are affected or for what reason. The results from the modelling do not and cannot inform on birth rate or death rate independently as their functions are, must be, confounded. This makes it difficult to assert with any confidence that the situation of the population *will* remain the same.

It would be appropriate to clarify, in presenting the estimated risks of extinction, that the calculations include uncertainty of estimation of values of population-dynamic parameters, as well as uncertainty of prediction of the population trajectory using these values, but that the calculations do not include the additional uncertainty of their future evolution. There is no particular reason to suppose that they must necessarily evolve for the better, so the calculated extinction risks are probably underestimates. It is obviously very difficult to arrive at any quantitative estimate of the likelihood of changes in either direction, or of any given size, in population-dynamics parameters, but some warning of the effect of omitting this source of uncertainty would be well placed.

The results of the model are presented without reviewing the prior and posterior distributions of key variables such as birth- and death-rates or hunting loss ratios, and without reviewing the quality of the fit of population trajectories to the survey data. Instead there is a rather bald presentation of extinction risks for a number of different environmental scenarios and different projection horizons. Some presentation of model performance and fit would normally be considered appropriate and if included would help to support the reliance which this assessment places on the model results.

Conclusions

The Cook Inlet population is so clearly separated from other world beluga populations, both geographically and genetically, that its status as a Distinct Population Segment should be seen as beyond discussion.

The forward projections of numbers on which the calculations of extinction risk depend assume that the population-dynamic variables, reflecting the population's situation, will retain their currently-estimated values throughout the prediction period. Uncertainty as to the future evolution of the population-dynamics variables—whether for better or worse—is not incorporated, and this probably means that the risk of extinction is underestimated. That the population is now growing at less than the rate that would be expected for a normal healthy beluga population does not necessarily mean that its dynamics can be expected to move in a favorable direction in any definable future. However, while it would be possible to model extinction risk for different scenarios of drift or change in life-history parameters, supporting any particular scenario on a scientific basis would be practically impossible, since so little is known about present values of life-history parameters or what is controlling them.

The model formulation is valid, with some slight reservations, but other formulations, equally valid, could be envisaged, and they would estimate different risks of extinction. The estimates tabulated in this assessment should be regarded as indicative.

The conclusions of the status assessment are that there is a high likelihood that the population has now, and for some time, has had,a negative basic[1] rate of change, and under all likely scenarios there is some, or a significant, risk that the population will be extirpated in a not very distant future. Of the comments and criticisms made in the present review, those that affect these findings indicate that the status assessment is, if anything, likely to be too optimistic in this respect. So the general conclusion that the population is at risk is 'supported by the scientific information presented', although the specific probabilities presented should be regarded as indicative.

In particular, the modelled population trajectories do not fit the survey series between 1999 and 2006 very well, but show a lower rate of decline than the survey series. Therefore, a criticism that the population modelling underestimates the rate of decline of recent years and therefore also the risk of extinction would be easily made and difficult to refute.

IV. Further Analyses and Evaluations

No further analyses have (yet) been carried out; some suggestions are included in the 'Recommendations'.

VI. Additional Comments

I thank Dr Hobbs and Dr Wade for their hospitality, patience, and clear explanations. I have not devoted space to Dr Wade's model, but as this review tries to show the concerns are more with the data and the assumptions and the fit of the Hobbs model to the data, than with the validity of the forward projections.

V. Recommendations

Given the importance of the hunt and survey data to the estimation of extinction risk, it would be of interest:

- to review the posterior distribution of the loss-rate parameter and more generally to analyse sensitivity of the results to faults in the harvest data;
- to examine the sensitivity of the model fit and outputs to a multiplier on the survey data, either by fitting a multiplier and seeing whether its prior is updated

[1] i.e. independent of hunting.

and the fit to the data improved, or by using trial values of (say) 5, 10, 20% increase in survey numbers and comparing Bayes factors;
- to examine the sensitivity of the model fit and outputs to a trend in presumed survey performance;
- to examine extinction risks based on fitting only to survey data after the hunt was closed;

Given that the model appears to have some tendency to construct populations with low turnover and low year-to-year variation in numbers, it would be of interest to, for example, constrain birth-rates (and therefore consequently also death-rates) to be higher, inducing more variability in stock trajectories, and examine the effect on the fit of the model to the data and on estimates of extinction risks.

Other recommendations made in the foregoing text are here recapitulated:

- aerial survey records might be combed for usable data on population composition, such as calf counts;
- the report document could review and present the harvest and survey data more thoroughly;
- the text review assessing the (relative) credibility of the various estimates of life-history parameters could be strengthened, and some review of experience in other jurisdictions of recovering depleted populations of this species might be included;
- the inclusion in the model of a simple form of age-dependence (e.g. Siler-type) for the death-rate could be explored;
- the priors used should be explained and justified;
- clarify, when presenting results in the report, that life-history parameters are modelled as keeping their present average values through the projection horizon;
- present some analyses of model performance and fit.

VI. Reviewer Statements

This review provides an accurate and independent summary of my views on the issues that it covers.

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.*