REVIEW OF \_\_\_\_\_\_ BAYESIAN NETWORK MODEL BY [*insert peer reviewer name*]

*[insert date]*, *[insert location of review]*

*This template was developed and is provided by:*

Bruce G. Marcot, Ph.D. Research Wildlife Biologist

USDA Forest Service, Pacific Northwest Research Station

Ecological Process and Function Research Program

620 SW Main St., Suite 502

Portland OR 97208 USA

phone: 503.347.2277

email: bruce.marcot@usda.gov

Following are review comments of the \_\_\_\_\_\_\_\_\_\_ Bayesian network model version “[*insert the computer file name of the model reviewed*]” as developed by [*model developer name*]. This review was provided by [*insert reviewer, title, affiliation, location*], during a face-to-face meeting with [*insert name of model presenter who conducted the peer review*].

The review was conducted as an interactive explanation and discussion session, in which [*insert model presenter name*] presented the current version of the model, displayed its overall structure of variables and links, demonstrated how it runs, and explained its underlying probability organization and sensitivity structure. Review comments were solicited on each of these topics.

Background Information

**Overall purpose** **of the model** (background information): [*insert terse statement of model purpose. An example follows:* to provide a rigorous and repeatable means of determining the combined influences of *environmental conditions*, including climate effects on sea ice, and *anthropogenic stressors* on current and potential future Pacific walrus populations.]

**Reason for using a Bayesian network modeling approach**: [*insert a summary justifying the selection and use of the Bayesian network modeling approach. An example follows:* This model structure allows for representing: expert experience and judgment along with results of empirical studies in one framework; uncertainties in covariates (inputs) and in variable relations; and combined influences and outcomes of environmental conditions and anthropogenic stressors as probabilities. It also provides a structure for dealing with missing data, and provides a means of easily calculating sensitivity of population outcomes to each covariate and model segment.]

**Expected use of the model**: [*insert a summary of the expected use of the model. An example follows:* The model will be run to represent Pacific walrus outcome conditions at five past, present, and future decadal time periods, viz., recent historic (1985-1995), current (1996-2008), early century (2045-2055), mid-century (2070-2080), and end of century (2090-2100). The model will be run under several climate change scenarios, using empirical satellite data on sea ice extent for historic and current conditions, and using a suite of global circulation models to project future conditions under two IPCC climate (greenhouse gas concentration) scenarios (A1B and A2). The model is structured to inform potential outcomes of Pacific walrus populations under each combination of time period and climate scenario, in part displaying potential conditions of four of the main five ESA listing factors, to provide information to USFWS for their listing decision. These outcomes, also displayed as probabilities, along with sensitivity analysis of the model, can lend to its use as risk analysis in a listing evaluation.]

**Overall purpose of this peer review**: [*revise the following text as appropriate.*]

The model provides a means of combining expert knowledge and information on a breadth of environmental conditions and anthropogenic stressors potentially affecting \_\_\_\_\_\_\_\_ populations, in part projected to \_\_\_\_\_ [*e.g., future time periods under alternative climate change scenarios*]. As such, the breadth and complexity of the model exceeds our ability to build, test, and calibrate it strictly with empirical, statistical research data. Short of this, structured peer review provides the best means of helping ensure model credibility and validity. Results of the peer review will be treated by the primary model author similarly to how peer reviews of a journal manuscript are treated by an author, that is, *confidentially* and through explicit attention to, and reconciliation of, each review comment and suggestion.

The overall procedure of using peer review as part of the process of building Bayesian network models has itself been published:

See: Marcot, B. G. 2006. Characterizing species at risk I: modeling rare species under the Northwest Forest Plan. Ecology and Society 11(2):10. [online] URL: <http://www.ecologyandsociety.org/vol11/iss2/art10/>

Marcot, B. G., J. D. Steventon, G. D. Sutherland, and R. K. McCann. 2006. Guidelines for developing and updating Bayesian belief networks applied to ecological modeling and conservation. Canadian Journal of Forest Research 36:3063-3074.

Review Comments

The following topics are intended to help guide the review process, and are only suggestions for topics that the reviewer might address. Any additional review topics that the reviewer wishes to offer are also acceptable.

**Overall Model Structure**

**(Variables and their Linkages; Influence Diagram Structure)**

*Overall Initial Comments*

1.

2.

3.

*Variables Included and Their Representations*

1.

2.

3.

*Linkages Among Variables*

1.

2.

3.

*Other Considerations of Model Structure*

1.

2.

3.

**Probability Values**

*Prior Probabilities of Input Variables*

1.

2.

3.

*Conditional Probabilities of Intermediate and Output Variables*

1.

2.

3.

*Overall Considerations*

1.

2.

3.

**Model Performance**

*Results of Running the Overall Model (Including Influence Runs)*

1.

2.

3.

*Performance of Submodel Segments*

1.

2.

3.

**Model Sensitivity**

1.

2.

3.

**Cautions or Caveats in Use of This Model**

1.

2.

3.

**Additional Sources of Information Useful for This Model**

1.

2.

3.

**Other Topics**

1.

2.

3.