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STATEMENT OF WORK

Title: Development of a Prototype Long-term Ecological Monitoring Program for National Parks in the Subarctic: Incorporation of Cost Analysis into the Protocol Development Process

Principal Investigator:

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Background:

In 1992, Denali National Park & Preserve (NP&P) was selected as one of four parks where long-term ecological monitoring (LTEM) programs would be developed as prototypes. The Alaska Biological Science Center (ABSC) is working closely with Denali NP&P in this development phase. Their mutual goal is development of an LTEM program that is ecologically relevant, cost-effective and statistically sound.

An important, but often neglected, step in the process of developing monitoring protocols is a consideration of cost. For long-term monitoring programs, cost is an especially important consideration. The chances of the LTEM program being carried out over many years will decline if the costs are too high. Factors that can contribute to the perception of high costs include budget crises, changing park leadership, and economic conditions. Thus, an evaluation of the cost effectiveness of implementing a LTEM program is an important part of the development process.

For each protocol being developed as part of the Denali LTEM program, the ABSC is attempting to follow a procedure for development of long-term resource monitoring programs described by Silsbee and Peterson (1993). One of the final steps in this procedure is to determine whether the cost-per-unit of precision and power is acceptable. To undertake this analysis, basic cost information is necessary. To allow comparison of costs of various elements that might be included in a monitoring program, costs need to be determined in a consistent manner among program elements.

To date, cost has not been explicitly considered or evaluated in development of the Denali LTEM program. For most of the Denali protocols, pilot study data have been collected, so data on variation (needed for power calculations) are available, and realistic costs can be determined based on actual experience. The purpose of this agreement is to bring in the economic expertise needed to evaluate the cost, and eventually, the cost effectiveness, of the current Denali LTEM monitoring protocols and alternatives under development. The results will become part of the overall protocol development process.

The Social, Economic, and Institutional Analysis Section (SEIAS) is uniquely suited to describe and evaluate the costs of the LTEM protocols. The SEIAS has expertise in economic valuation, decision making, and policy analysis. In particular, evaluation of this type is in the province of economics. The SEIAS employs the only research economists in the BRD.

The work is envisioned to occur in three steps:

- 1) Describe and evaluate the costs of the current Denali LTEM protocols.
- 2) Evaluate the cost-effectiveness of the current Denali LTEM protocols.
- 3) Incorporate cost-effectiveness into the power analysis for LTEM.

This statement of work addresses the objectives, tasks and deliverables for accomplishing the first step, during FY 99. Separate statements of work will be developed for steps 2 and 3, in future years.

Step 1: Cost Description

Goal: To describe and evaluate the costs of the current Denali LTEM program.

Objectives:

- 1) Establish a method for assessing economic costs fitted to the Denali LTEM program.
- 2) Develop a preliminary estimate and description of the costs of current monitoring protocols in the Denali LTEM program.
- 3) Demonstrate the methods for incorporating cost information into monitoring protocols.

Tasks:

- 1) Conduct a review of the literature of cost analysis related to long-term monitoring.
- 2) Interview principal investigators, Denali NP&P personnel, and ABSC investigators, as necessary, to determine the categories of cost typical for operations in Denali NP&P, and to describe the actual cost of operation of the monitoring protocols.
- 3) Conduct a review of cost allocation for all protocols.

- 4) Develop a spreadsheet software program and accompanying users' manual to enable scientists to consistently define and measure the costs of monitoring processes in National Parks.
- 5) Peer review: Complete a peer review of the spreadsheet software program to be supervised by the leader of SEIAS.
- 6) Draft Review: Use the Denali LTEM program as a test of the software program by working with the Denali NP&P personnel and ABSC investigators to cross-check and validate data in the model spreadsheet.
- 7) Revise the spreadsheet program for defining and measuring the costs of the current monitoring protocols, based on the Peer and Draft reviews.

Deliverables:

- 1) Literature review of cost issues related to long-term monitoring. Jan. 29, 1999.
- 2) Draft spreadsheet software program for defining and measuring costs for monitoring programs in National Parks. March 31, 1999.
- 3) Peer Review: Submit a report of the peer review committee evaluating the credibility of the software. May 31, 1999.
- 4) Draft review of cost allocation report. Aug. 1, 1999.
- 5) Final cost allocation report and spreadsheet software program with accompanying users manual for defining and measuring costs for monitoring processes in National Parks. Sept. 30, 1999.