

Protocol Development Summary

Protocol: Caribou –abundance, distribution, and demography

Parks Where Protocol will be Implemented: WRST, DENA, YUCH

Justification/Issues being addressed: The CAKN has adopted a holistic view of network ecosystems and will track the major physical drivers of ecosystem change and responses of the two major components of the biota: plants and animals. Thus, the CAKN has identified *Fauna Distribution and Abundance* as one of its top three Vital Signs. In general, the CAKN wants to know where fauna are distributed across the landscape and to track changes in both their distribution and abundance. The *Fauna Distribution and Abundance* Vital Sign comprises monitoring efforts for a suite of vertebrate species spanning the significant elevation gradient found in CAKN parks, and also including species of specific interest within each park. Caribou occur in all three network parks and are of interest to the network from several perspectives. They are one of 6 keystone large mammal species in interior Alaska which are of great importance to the ecosystem as a whole and to people from both consumptive and non-consumptive viewpoints; (3) Three of four herds have experienced significant recent declines; (4) Subsistence harvest on two herds has been curtailed due to conservation concerns, and providing for the opportunity for subsistence uses is a directive for NPS lands in Alaska; (5) One herd is the subject of intensive interagency management, including the control of predators; (6) One herd is the subject of an international captive rearing conservation program which has significant long-term implications. (7) Long-term research and monitoring on caribou on CAKN lands provide a background against which future patterns may be compared (Mech et al. 1998, Farnell and Gardner 2002).

CAKN contains four separate caribou herds: Denali (DENA), Mentasta (WRST), Chisana (WRST) and Fortymile (YUCH). The Fortymile herd is currently monitored by ADFG, and these efforts should meet CAKN objectives with little required from CAKN (although if the status of ADFG efforts changes, then CAKN involvement may need to be reevaluated). Therefore, the network efforts will focus on the Denali, Mentasta and Chisana herds.

Specific Monitoring Questions and Objectives to be Addressed by the Protocol:

The monitoring questions regarding this species center on knowing the status and trends of the herds occurring in the network parks including the composition of the herds. The specific objectives for this monitoring are:

1. Determine changes in abundance, distribution and demographics of caribou in the CAKN. **Justification:** *Abundance, distribution and demographics of caribou herds are the fundamental parameters of interest for managing this species.*

Collecting only 1 or 2 of these parameters for monitoring could result in erroneous conclusions regarding herd status.

2. Estimate calf survival and recruitment in CAKN. **Justification.** *Low calf recruitment is the primary mechanism of the observed declines in small caribou herds (Adams et al. 1995, Mech et al. 1998, Farnell and Gardner 2002, Schaefer et al. 1999).*
3. Estimate mortality of caribou in and around CAKN. **Justification.** *Mortality of marked animals is an important demographic parameter in understanding population change.*

Basic Approach:

Monitoring of caribou populations in CAKN will employ the use of radiocollars and radiotelemetry to locate groups and to provide a mark/recapture estimate of population size. The use of radiotelemetry is standard throughout Alaska and parts of Canada for monitoring caribou populations, however methodology for population assessment varies (e.g. aerial photocensus (Fancy et al. 1994), stratified random block (Gasaway et al. 1986, Kuzyk and Farnell 1997), and mark-recapture (Adams 1997)). Aerial photocensus is applied only to larger (>5000) herds, and is not an effective method for the three smaller herds in CAKN which number less than 2000. A sample of 30-40 radiocollared cows per herd will be maintained for population assessment. At present all three herds have 30-40 radiocollared cow. Our goal will be to maintain these sample sizes during the program. This will require the addition of about 10-15 radiocollars annually per herd.

Population assessment will be made in two efforts: a post-calving (June) census, when cows are grouped and calf production can be assessed; and a fall (Sept.-Oct.) composition count when bulls associate with cows during the rut. With the mark-recapture estimate of cows from the spring census, and the herd composition obtained from the fall count, herd size, composition, and calf recruitment can be estimated.

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Development Schedule, Budget, and Expected Interim Products: Regional protocols already exist for monitoring caribou populations. Therefore, protocol development will not require field research and will consist primarily of writing a protocol that meets NPS standards (Oakley et al. 2003) and incorporates existing standard protocols. We will need to write new sections in the protocol narrative and SOPs to make the existing protocols specific to CAKN parks, such as describing survey area locations and documenting how data will be entered into NPS computers, analyzed, and reported. We will continue to review pertinent literature and ongoing research to ensure that proposed methodology is consistent with CAKN goals. The protocol should be ready for review by June 2005.

Fiscal Year	Expected Interim Products
FY 2005	Full protocol submitted for review
	Assessment of parameter variation from historical data (determines sampling interval) (Feb. 2005)
FY 2006	Initiate caribou monitoring in all 3 network parks

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