

ANALYSIS OF POTENTIAL SENSITIVE MAMMAL SPECIES
FOR LONG-TERM MONITORING IN GLACIER NATIONAL PARK

Ronald E. Beiswenger
Department of Geography and Recreation
University of Wyoming
Laramie

Objectives

The primary objective of this project is to identify species of mammals in Glacier National Park that are sensitive to environmental change and thus may serve as useful indicators of this change in a monitoring program. Such a procedure involves:

1. Development of a database and bibliography for the mammal species found in Glacier National Park (GNP);
2. Identification of sensitive species that may serve as indicators;
3. Recommendation of procedures for using indicator species in an inventory and monitoring program.

Methods

Collection of information about the mammals found in GNP is currently underway through an analysis of published literature and through consultation with scientists and resource managers. Information being gathered includes data on mammalian life histories, distribution, management status, biogeographic relationships and habitat associations. A summary of the information being collected is presented in Table I. This information will eventually be compiled as a database with an associated bibliography of information sources. Once data collection has been completed, sensitive species will be identified and a recommended monitoring program developed.

Table I. Summary of Species Information for a GNP Biodiversity Database

Source of Information
Trophic class (7 categories)
Reproductive mode (3 categories)
Social behavior (5 categories)
Litter size (number of young per litter)--mean; range
Litters per year (number of litters)--mean; range
Gestation period (length of time in days)--mean; range
Parental care (4 categories)
Time to independence of young (length in days)--mean; range
Age at sexual maturity (age in years)--mean; range
Active period (3 categories)
Management status
 Recovery species
 Federal status
 TNC categories--global and state
 Status in GNP
 Species of special management concern
Biogeographic relationships
 Biogeographic status (4 categories)
 Geographic range
 Narrative description of distribution
 Geographic range in GNP (by drainage basin)
Mobility
 Summer home range area (mean; range)
 Winter home range area (mean; range)
 Migratory distance (mean; range)
 Migration destination (4 categories)
Habitat requirements and elevational range
 Habitats used in summer
 Alpine/subalpine communities
 Forest formations (4 categories)
 Shrub/woodland formations (3 categories)
 Grassland/herbaceous formations (7 categories)
 Low/mid elevation communities
 Forest formations, lowlands (11 categories)
 Shrub/woodland formations, lowlands (7 categories)
 Grassland/herbaceous formation, lowlands (3 categories)
 Barren formations (4 categories)
 Cultivated lands
 Surface waters and associated communities
 Bogs, marshes, fens
 Streams (2 categories)
 Lakes (2 categories)
 Riparian, bottomland, floodplain (7 categories)

Habitats used in winter (repeat above list)
Layers of habitat used
 Feeding loci (10 layers)
 Breeding loci (8 layers)
Special habitat requirements--in a narrative section

Results

The following activities have been completed.

1. Met twice with Kim Keating, Project Coordinator, at Glacier National Park.
2. Developed criteria and format for a mammal database (see Table I).
3. Conducted library research at the University of Wyoming, University of Montana, Montana State University and Glacier National Park.
4. Completed the first phase of a database search at the University of Wyoming Library.
5. Obtained data on GNP mammals from the Montana Natural Heritage Program's Vertebrate Characterization Abstract.
6. Obtained additional information through telephone and in-person contacts with Carl Key and Beth Dunigan of GNP.
7. Discussed the project in interviews with:
James Karr (at 1989 meeting of Society for Conservation Biology)
Hollis Marriott (Wyoming Natural Heritage Program)
David Genter and Margaret Beer (Montana Natural Heritage Program)
D. F. Flath (Montana Department of Fish, Wildlife and Parks)
8. Established a file of published articles and reports acquired from the following sources:

Published articles in professional journals
Glacier National Park publications
Medicine Bow National Forest publications
Great Smoky Mountain National Park publications
Colorado Division of Wildlife
National Ecology Laboratory (Fort Collins, CO)
9. Project staff has collected published information for the GNP mammal database.

Tasks To Be Completed

The following tasks remain to be completed:

1. Development of software for the database and bibliography by the Research Staff at GNP.
2. Completion of library searches, interviews and other information gathering activities of the project staff.
3. Entry of the mammal data and bibliographic information into the database.
4. Identification of sensitive mammal species.
5. Development of recommendations for a system that uses sensitive mammal species as indicators in an inventory and monitoring program for GNP.

Potential Problem

Since the project did not begin until July 1, 1989, I was unable to recruit a graduate research assistant for the summer (the University of Wyoming Summer Session began in early June). This delayed the onset of full-scale data collection until late August. This could affect the completion of the project on schedule, although staff will make every effort to complete the project on time.