Project Completion Report
Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Analysis of wildlife movements in relation to Denali Park Road traffic.

Project Code: UMT-197, J9836070003

Type of Project: Research

Funding Agency: National Park Service

Partner University: University of Montana

NPS Agreements Technical Representative:
Dr. Melissa Snover
Denali National Park and Preserve
Box 9
Denali Park, AK 99755
melissa_snover@nps.gov
(907) 683-6542

Principal Investigator:
Dr. Mike Mitchell
Montana Cooperative Wildlife Research Unit
205 Natural Sciences Bldg.
University of Montana
Missoula, MT 59812
mike.mitchell@umontana.edu
406-243-4390

Researcher: Rick Mace

Start Date of Project: January 01, 2007

End Date of Project: June 30, 2010

Funding Amount:

FY 2007:	$97,325
FY 2008:	$32,324
FY 2009:	$32,324
total:	$161,973

Number of Students Involved, and Type of Student (Undergraduate, Graduate, Post Doctorate): No students were involved in this project.

Project Summary, including descriptions of project deliverables, work accomplished and/or major results:

The relationships between grizzly bear movements and vehicular traffic were investigated in Denali Park and Preserve in 2006. Hourly locations were obtained from May through September from global positioning system (GPS) collars fitted to 20 bears. To our knowledge, this was the first telemetry study to investigate relationships between brown bears and vehicular traffic along a single unpaved road with relatively low traffic volumes in a national park setting.

Based on telemetry locations, bears were classified as either inactive or moving during the early season or late season. Inactive bout length averaged 2 hrs for both sexes and differed by sex and season. There was no clear timing of inactive bouts during the early season, but during late season bears were more likely to be active during daylight hours. Seventy-one percent of inactive bouts (both sexes and seasons) occurred in the mountain land type. Thirteen percent of all locations were within 1 km of the Denali Park Road. During both seasons, bears were, on average, closest to the road during mid-afternoon hours. Conversely, bears were furthest from the road between midnight and 0900. The fact that our study bears were most active during periods of high traffic, suggest that bears were not measurably altering their temporal patterns of activity to avoid human disturbance from the road. Periods of inactivity were more confined to hours of darkness. We documented 444 crossing of the Denali Park Road by 11 grizzly bears. The number of crossings varied among individuals from 2 to 136. Bears crossed the Denali Park Road during all hours of the day, but crossings were more frequent during the period when most vehicles were on the road.

Several behavioral effects of the road were inferred from telemetry data. First, bears moved faster when crossing the road than immediately before or after the crossing. Second, while in the inactive state, distance to the road increased with bout length and we concluded that bears were uncomfortable resting for prolonged periods near the road. These findings corroborate previous observational studies suggesting that some individual bears react negatively to vehicular traffic at relatively fine spatial and temporal scales, while others do not.