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## WILDLIFE MITIGATION AND HUMAN SAFETY FOR STERLING HIGHWAY MP 58-79, KENAI PENINSULA, ALASKA

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**Abstract:** The Sterling Highway is a paved two-lane road which links Alaska's western Kenai Peninsula, to the Seward Highway and Anchorage, the state's largest city. The Kenai National Wildlife Refuge is bisected by the Sterling Highway, which has one of the highest moose (*Alces alces*) vehicle collision rates for a rural highway in the state. The Alaska Department of Transportation and Public Facilities is planning to reconstruct a section of the Sterling Highway between MPs 58 and 79, occurring mostly within the Refuge. A working group was formed in 2005 to collect data on moose movements and review wildlife-vehicle collisions (WVC). The group consists of representatives from the Federal Highway Administration; the Alaska Departments of Transportation and Public Facilities, Fish and Game, and Public Safety; the Alaska Moose Federation (non-profit); and the U.S. Fish and Wildlife Service. The purpose of this cooperative effort is to reduce wildlife-vehicle collisions along the Sterling Highway corridor through the Kenai National Wildlife Refuge while maintaining permeability and enhancing habitat connectivity. In this paper, we describe our study design and provide interim results from 2005-06.

### Introduction

Vehicle collisions with moose are a major problem on the Sterling Highway within the Kenai National Wildlife Refuge (State of Alaska, 1994). The Sterling Highway is part of the National Highway System and is the only highway connecting the western Kenai Peninsula with Anchorage, the state's largest city (Figure 1). Milepost (MP) 58 begins at the junction of the east entrance to Skilak Lake Road (the original Sterling Highway) in the upper Kenai River valley. The highway exits the Kenai Mountains around MP 63 and descends onto the Kenai lowlands - a broad expanse of wetlands, bogs, lakes and boreal forest. Black (*Picea mariana*) and white spruce (*Picea glauca*), mixed with aspen (*Populus tremuloides*), white birch (*Betula papyrifera*) and willow (*Salix* spp.) line the highway except where bogs and muskeg are intersected. The highway crosses the East Fork of the Moose River, an anadromous stream, at MP 71.3. The boundary of the Kenai Refuge is at MP 76 and the project ends at MP 79 near Sterling where the existing four-lane divided highway begins. Elevations range from 91m (300ft) to 191m (625ft). Much of the area surrounding this section of highway was burned in 1947 when the highway was originally constructed. Following the 1947 burn moose numbers reached a peak density of 3.6/km<sup>2</sup> (Bishop and Rausch 1974) in 1971 (Loranger et al. 1991). Densities dropped off quickly after that time.

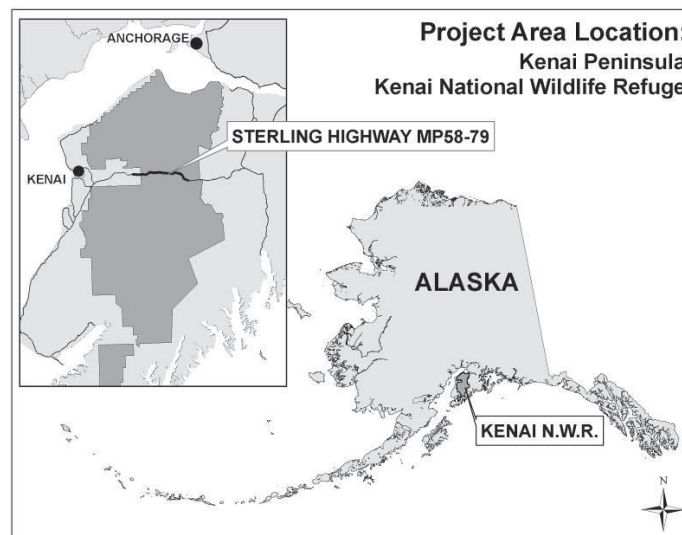


Figure 1. Project location in southcentral Alaska.

Planned improvements to the highway infrastructure include passing lanes, wider shoulders and smoother surface which may result in increased speeds. Increased speeds in conjunction with expected increases in traffic volume may exacerbate the wildlife-vehicle collision problem. Local moose populations may also increase due to recent wildfires and prescribed burns adding to the problem; however, currently moose numbers are low. This highway bisects the Kenai National Wildlife Refuge, further fragmenting the refuge since its creation as the Kenai National Moose Range in December 1941 (U.S. Fish & Wildlife Service 1985). The Moose Range was renamed to the Kenai National Wildlife Refuge and its purposes broadened with the passage of the Alaska National Interest Lands Conservation Act of 1980.

The Kenai Refuge in cooperation with the Alaska Department of Fish and Game submitted a proposal to the Alaska Department of Transportation and Public Facilities and the Federal Highway Administration to look at ways of mitigating impacts to wildlife and provide for improved safety for motorists. The study proposal was submitted in December 2003 and called for the formation of an interagency working group to oversee the study. This group includes members from the Alaska Departments of Transportation and Public Facilities, Fish and Game, Public Safety; the Alaska Moose Federation (non-profit), the Federal Highway Administration, and the U.S. Fish and Wildlife Service. The study proposal was originally designed to collect and analyze wildlife-vehicle collision data and collar up to 35 cow moose for two successive winters to identify crossing areas. Later a third data source was added: getting motorists to call in wildlife sightings as they drive through the area.

### **Funding Sources**

The study is designed in two phases, pre- and post-construction. Presently only the pre-construction phase has been funded. The 2-phase design should determine the success of any wildlife crossing structures and other means of reducing wildlife-vehicle collisions while maintaining habitat connectivity. Funding for the pre-construction phase of the study was provided by a grant from the Alaska Department of Transportation and Public Facilities (\$290,000) and from the U.S. Fish and Wildlife Service (\$25,000).

### **Methods**

Three sources of data are being collected for analysis: (1) monitoring collared moose and caribou to determine highway crossing paths, (2) WVC data from Alaska State Trooper and Alaska Department of Transportation and Public Facilities records, and (3) call-in reports to a wildlife hotline from motorists driving the highway.

### **Global Positioning Satellite Collars**

Alaska Department of Transportation and Public Facilities data on moose-vehicle collisions demonstrated a higher occurrence during winter months. Therefore we decided to program global positioning satellite (GPS) collars (manufactured by Telonics, Inc. of Mesa, Arizona) to record a fix every 30 minutes from October through March, then every two hours until release on June 30. The goal was to get detailed information on where and when moose crossed the road during the winter months while enabling the transmitters to function well past the release date to allow time for retrieval.

Thirty-one adult cow moose were captured and collared in late October and early November of 2005. By July all but one of the collars was retrieved, information was downloaded and the collars were refurbished. In late October and early November of 2006 we captured and deployed collars on 32 cow moose and 5 cow caribou (*Rangifer tarandus*). Collars are still active and will be retrieved in July 2007.

### **Wildlife-Vehicle Collisions**

Data were combined on wildlife-vehicle collisions from two data sources: Alaska Department of Transportation and Public Facilities and the Alaska State Trooper radio logs (compiled by Alaska Department of Fish and Game). Most records were duplicated by each source however there were unique incidents that were only found in one of the two sources.

These data included road kills, accidents where animals were hit but walked off or were not found, and where animals were found dead but not reported by the motorist involved. These data were collected according to some feature of the roadway, usually MP marker, stream crossing, pullout, or junction with another road. Data are now required to be collected with GPS units in latitude and longitude. Half-mile markers were installed along the highway to help improve the accuracy of WVC locations.

### **Wildlife Hotline**

The third data set consists of motorists' observations of wildlife on or near the highway. To aid motorists (especially those not familiar with the area) in establishing their location, we installed half MP markers along the entire 18 miles of the study area within the Kenai Refuge. A large reflective sign warning motorists they are entering a high wildlife crossing area is posted at both east and west ends of the study area. The signs include the "wildlife hotline" phone number.

Numerous local newspaper stories, posters displayed in stores, post offices, visitor centers; printed brochures, and public seminars have been used to inform the local public of our efforts and to encourage calls to the hotline from motorists. We also installed a local AM radio transmitter at MP 62.3 to broadcast a request to motorists to report wildlife sightings and include the following information: what species, how many, between what half MP markers, the date, and time.

**Summary of Findings**

We collected over 247,000 fixes from 29 GPS collared moose between October 2005 and October 2006. The release mechanism on two collars failed and the moose carried them until October 2006. One collar was not retrieved and deemed lost. Four collared moose never crossed the highway. Of the 25 moose that did cross the highway there were 337 crossings and 1199 locations within the 300ft highway right-of-way. The highest number of crossings was between MP 73 and 74 (figure 2). Almost 2 of 3 collared moose crossed the highway at this location, probably because it is the most direct path between two recent fires that are currently the best winter moose habitat. The next highest crossing occurred between MP 70 and 70.5. While 48 crossings occurred at this half mile segment, they involved only four collared moose.

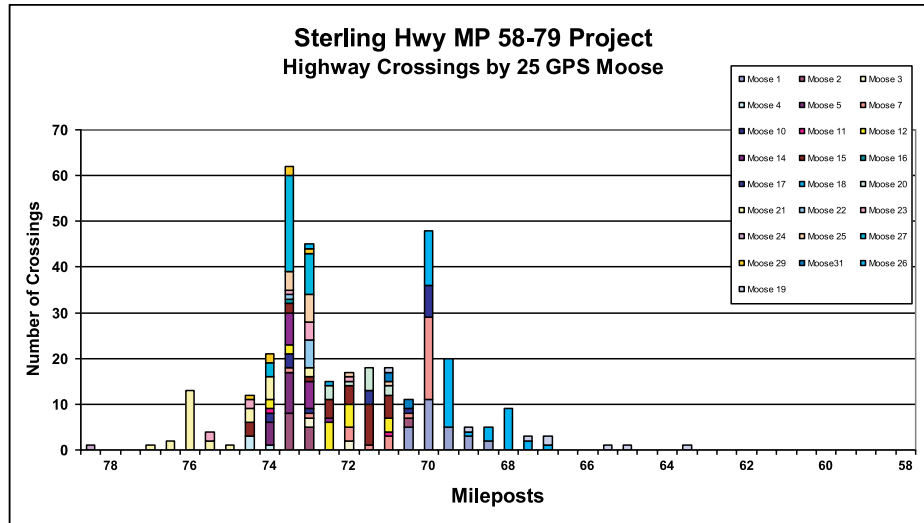


Figure 2. Sterling Highway crossings by GPS collared moose (n=337).

Most of the GPS moose crossings occurred during the months of January and February, typically the darkest months of the year, with bad weather and road conditions (figure 3).

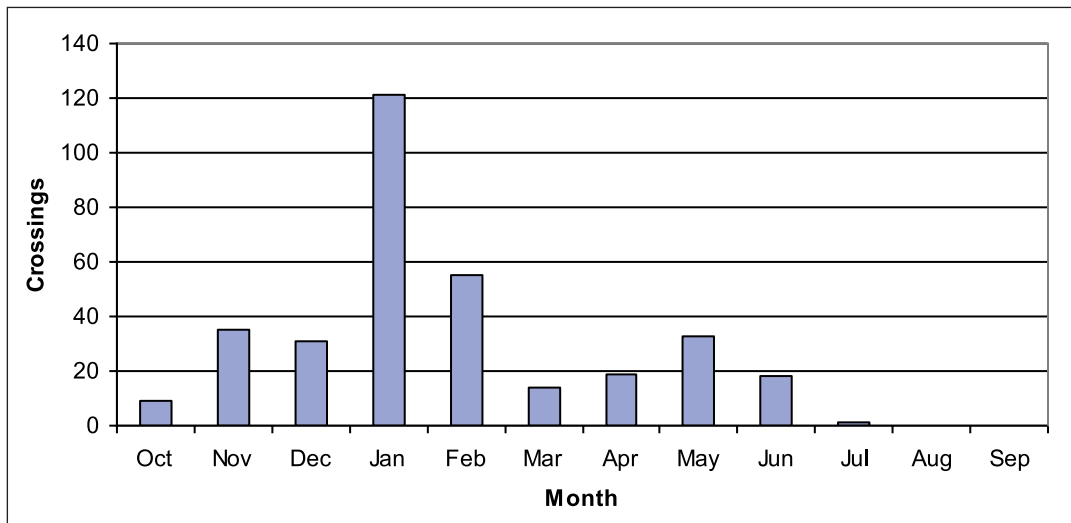


Figure 3. Moose crossings of the Sterling Highway, October 2005 through September 2006 (n=337).

Moose crossings during the hour of the day exhibit a typical dusk to dawn activity. Crossings were least during mid-day (figure 4).

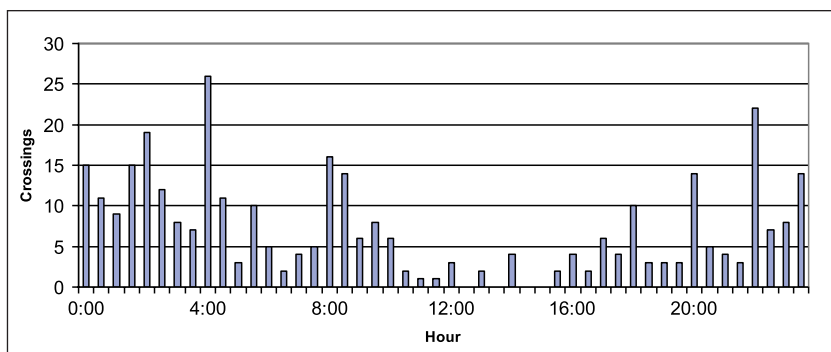


Figure 4. Moose crossings of the Sterling Highway by time of day, Alaska Standard Time (n=337).

The WVC data were compiled from 2000-06 from a combination of Alaska Department of Transportation and Public Facilities as well as from Alaska State Trooper radio logs. There were 134 WVC, an average of 19.1 per year for this section of highway. This collision rate is almost certainly higher as there are unreported accidents. Bangs et al. (1989) suggested the unreported rate was between 75-100% of those reported on the Kenai Peninsula. Tagged moose were killed by vehicles at twice the rate confirmed by troopers. During winters of heavy snowfall, the number of collisions reported in Alaska may triple the number in an average snowfall season (Franzmann and Schwartz 1997).

An interesting note is that while in past years moose made up the vast majority of all WVC, in 2006 bears and caribou made up 35%, a significant increase. Over the past seven years moose make up 84% of the WVC (figure 5).

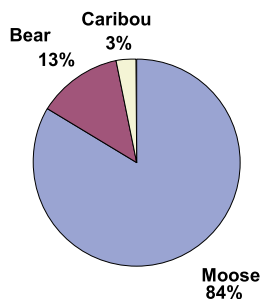


Figure 5. Composition of the wildlife vehicle collisions from 2000 to 2006 (n=134).

The combination of WVC, Wildlife Hotline sightings and GPS moose crossings help to identify some “hot spots” along the 21 miles of the Sterling Highway being studied (figure 6). These data are preliminary and retrieval of the currently deployed GPS collars in July 2007 may alter these locations. We also hope that our wildlife hotline database will also grow over the next year.

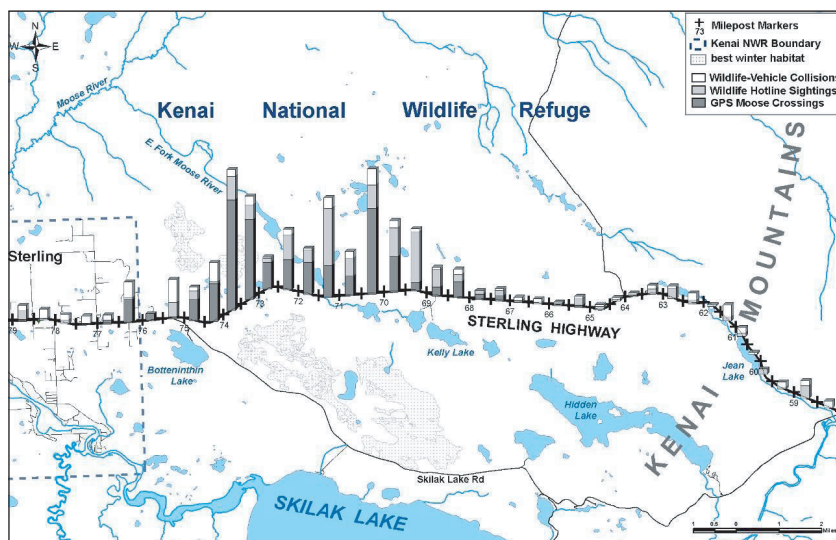


Figure 6. Hot Spots along the Sterling Highway between MPs 58-79. Includes WVC data from 2000 to 2006 (n=134), Wildlife Hotline sightings (n=119), and GPS moose crossings (n=337).

## **Future Research**

This July we will retrieve the currently active GPS collars and add the stored data to the first years GPS crossings. We will continue to summarize WVC data set and Wildlife Hotline calls. Our interagency working group will meet with the Alaska Department of Transportation and Public Facilities to discuss the design, placement and types of wildlife crossing structures and/or other techniques that may help reduce WVC while maintaining the permeability of the highway for wildlife on the Kenai National Wildlife Refuge.

A post-construction study plan will be developed to help document use of any structures as well as wildlife movements. Video cameras to document use of structures and also track counts will be utilized. It is important that long term monitoring of any structures takes place since wildlife require time to adjust and learn to use them.

**Biographical Sketch:** Richard Ernst is a wildlife biologist/pilot for the U.S. Fish and Wildlife Service at the Kenai National Wildlife Refuge in Soldotna, AK. The Kenai Refuge encompasses almost 2 million acres of which two-thirds is wilderness. Rick has been working on improving the safety and mitigating the Sterling Highway which cuts through the refuge for the past four years. He chairs the interagency working group to redesign and reconstruct a more "wildlife friendly" highway. Rick received his B.S. and M.S. from Utah State University.

## **References**

- Bangs, E.E., T.N. Bailey and M.F. Portner. 1989. Survival rates of adult female moose on the Kenai Peninsula, Alaska. *J. Wildl. Manage.* 53(3):557-563.
- Bishop, R.H. and R.A.Rausch. 1974. Moose population fluctuations in Alaska, 1950-1972. *Nat. Can. (Que.)* 101:559-593.
- DelFrate, G.G. and T.H. Spraker. 1992. Moose vehicle interactions and an associated public awareness program on the Kenai Peninsula, Alaska. *Alces* 27:1-7.
- Franzmann, A.W. and C.C. Schwartz. Eds. 1997. Ecology and management of the North American Moose. *Wildlife Management Institute*. Washington, DC.
- Loranger, A.J., T.N. Bailey and W.L. Larned. 1991. Effects of Forest Succession after fire in moose wintering habitats on the Kenai Peninsula, Alaska. *Alces* 27:100-109.
- U.S. Fish and Wildlife Service. 1985. Kenai National Wildlife Refuge Final Comprehensive Conservation Plan. Soldotna, Alaska.