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NATIONAL OFF-HIGHWAY VEHICLE CONSERVATION COUNCIL

How Off-Highway Vehicles Affect Elk

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OVERVIEW

In the past two decades, numerous topics have appeared in research papers, dissertations, theses and journals covering the effects of snowmobiles, trail bikes and other forms of off highway vehicles on our environment. These have covered many large mammals such as mountain sheep, elk, mule deer and white-tailed deer. The geographical areas include several states, predominately in the north-eastern, north-western, Rocky Mountain states, and California.

This fact sheet provides a summary of each article available for elk. The articles are divided into five year increments.

1982 TO 1987

For the period from 1982 to 1987 only one article is available. This article (Witmer and deCalesta 1985) addresses the effects of forest roads on habitat use by the Roosevelt elk. The intensities of road operations are a source of concern because of the potential for harassment to elevate metabolism, which depletes energy available for production and storage.

The radio locations of six Roosevelt elk cows were monitored for a one year period in the central Coast Range of Oregon. Data collection was accomplished during the day due to the sensitivity of the elk to night surveillance. The elk wore radio collars and their locations were plotted by triangulations using a receiver and a two element yagi antenna. Ninety-five percent of the elk locations were within 1.6 kilometers of the investigator.

All roads in the study area were open to the public with the exception of the spur road system in the south band's area. Spur roads were numerous in the area. Paved roads were not as numerous. The elk could hardly escape proximity to spur roads but could position themselves at somewhat greater distances from paved roads.

The study indicated that fewer elk locations occurred in the 0-125 and 126-250 meter distance intervals than expected for each band. Elk use was reduced to approximately 50 percent of the expected use on a 500 meter wide band of habitat associated with a paved road. Distribution of elk was less affected by spur roads. Significantly fewer north band elk locations occurred in the 0-622 meter interval from spur roads. Elk distributions were affected by roads more in some seasons than others.

Avoidance of roads was exhibited more during the south band's calving season than at other times. However, the cows in the north band avoided the roads more during rut season. The results of this study indicated that human activity on forest roads alters the distributions of the Roosevelt elk habitat use. This impact may be mitigated by road closures, especially during rut and calving seasons.

1977 TO 1982

Three articles are available for 1977 to 1982. One U.S. Forest Service study (Ward 1980) dealt with the effects of activity and human disturbance on the heart rate of three elk. During the summer of 1975 and fall/winter of 1976, a telemetry technique was tested on two adult cows and a yearling male elk in the field on Pole Mountain, and three adult cows at the Sybille Wildlife Unit in Wyoming.

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(over)

The investigation was to evaluate elk reaction to human disturbances by monitoring their heart rate and activity. It was noted that some heart rates are more rapid during playing and breeding. The elk population in the Pole Mountains is estimated at 50. The area is also a popular recreation and hunting area. A heart rate and activity monitoring telemetry system was installed on the test elk. The system consisted of an implanted heart-pulse transmitter, a repeater neck collar for long-range transmissions, and a data recording system for heart rate.

Five types of activity were categorized from watching elk at Sybille: rest/ruminating, feeding, walking, alerted but still, and alerted and moving. The study found that events such as humans on foot and gunshots produced a high percentage of positive heart rate reactions. When a definite hazard was sensed, they ran. This reaction happened at a distance of 400 meters for gunshots, human on foot and car horns. The distance which produced flight was much less.

It was determined that elk react most strongly to sonic booms, gunshots, people on foot, and stopped vehicles. They show less concern for airplanes, steady traffic on interstate highways and abandoned vehicles. It also showed that motorcycles which keep moving on the trail tend to disturb elk much less than many other possible disturbances.

Habitat Effectiveness for Elk as Influenced By Roads and Cover (Lyon, 1979) was published in the Journal of Forestry. It outlined a study of the decline in elk use of habitat adjacent to forest roads. The author utilized data from an eight-year study of elk pellet distributions in western Montana to develop a model habitat effectiveness in relation to roads and cover density and a method for estimating effectiveness under various levels of road density and cover.

During August and September of 1970 through 1977, pellet-group counts were conducted on 80 square miles of forested elk range in western Montana. They were counted in continuous belt transects, four feet wide, located along the contour every 500 vertical feet from 3,500 to 6,500 feet elevation. Areas were classified as no trees, canopy under 25 percent, 25 to 75 percent and more than 75 percent. In addition the distance from each transect segment to the nearest road was determined annually.

The study determined that the area avoided increased where the density of tree cover is low. Forest roads open to traffic caused available habitat to be less than fully effective.

An article from the Journal of Wildlife Management, Responses of National Park Elk to Human Activity (Schultz and Bailey, 1978) reports on the responses of Rocky Mountain National Park elk to human activities. The study took place in the autumn of 1974 and winter-spring of 1975. The area was controlled by Park Service regulations prohibiting elk-watching and hiking off established trails, use of elk calls, and shining headlights or spotlights at elk. Visual observation was the method used.

In autumn, variables measured were numbers of elk visible, bugles, times at which elk arrived or departed from open meadows, movements, and human activities. The winter-spring, responses of elk to different levels of disturbance were compared by arranging harassment on alternate weeks.

Responses of elk to four types of disturbances were quantified. Types of disturbance were approach by auto, approach by foot, approach by auto with spotlight and approach on foot with flashlight. Results suggested small effects of traffic volume upon elk, but no trends were statistically significant. People approaching animals off roads usually caused elk to leave open areas. Harassing elk in two meadows on alternate weeks during winter and spring had no effect on their distribution.

Elk made greater use of areas near roads as the winter-spring study progressed, suggesting slight avoidance of roads when forage was more abundant earlier in winter. Wintering elk often used a residential area at night when human encounters were minimal. During winter and spring, elk were approached significantly closer during darkness with artificial lights than during daylight. These elk, which experienced little or no hunting, were very visible and were disturbed little, if any, by normal on-road visitor traffic.

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