

Landscape Analysis of the Distribution of Tooth Wear and Breakage in Moose on the Seward Peninsula, Alaska

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Residents of the Seward Peninsula depend heavily on the natural resources of the region, including terrestrial and marine mammals, fish, and birds. Recently, large-scale commercial harvesting of fish, global climate change, and environmental pollution have negatively impacted these subsistence resources. Moose (*Alces alces*) began declining in the late 1980s and have not recovered. In fact, they still are declining on much of the peninsula. The Alaska Department of Fish & Game (ADF&G) began collecting the distal portion of the lower jaw, including incisors, in the early 1970's to look at age composition of the harvest. In the late 1980's biologists realized that the cracked teeth found on many of the samples were unique to the Seward Peninsula and they initiated a tooth scoring system to quantify the damaged teeth (0 = no damage; 1 = 10% crown missing; 2 = 20%; 3 = 30%; 4 = 40%; and 5 = more than 50%). The teeth have exhibited extensive and pervasive breakage throughout the collection period (1990-2002) likely with significant negative impacts on the ability of moose with considerable breakage to forage.

We entered the location of moose kill sites collected during 1990 through 2002 into a geographic information system (GIS). We related the distribution of the sites and associated tooth scores of the harvested moose with landscape variables including aspect, slope, terrain ruggedness, distance to rivers, towns, and mines, habitat type, and general soil type. The goal of the study is to determine whether there is a particular spatial or temporal pattern to the distribution of tooth scores during the study period. Further, we will determine if moose with severe tooth breakage and wear are related to specific terrain, habitat, or soil types or to areas disturbed by humans during activities such as mining.



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