

A reconstruction of steppe bison (*bison priscus*) mobility in the yukon-tanana uplands and implications for prehistoric human behavior

Crystal Glassburn

Abstract

This study seeks to reconstruct steppe bison (*Bison priscus*) behavioral ecology in interior Alaska during the Pleistocene for the purpose of understanding how bison may have moved about the landscape on a seasonal basis, and how this behavior could have structured prehistoric human settlement and subsistence patterns. Steppe bison once roamed across Alaska and other circumpolar regions in great numbers, but became extinct during the late Holocene. Archaeological evidence from the Tanana River Basin indicates that bison were important components of human subsistence economies for at least 7,000 years, but aspects of steppe bison behavioral ecology including location of habitat area, seasonal movement patterns, and responses to environmental change remain largely unexplored in Alaskan archaeology or paleoecology.

This study applies strontium, oxygen, and carbon isotopic analyses to 14 sequentially-sampled and AMS radiocarbon dated steppe bison teeth from two locales in the Yukon-Tanana Uplands in order to reconstruct steppe bison behavior on a seasonal basis. This study is the first of its kind for a prehistoric species in Alaska, and the results indicate that steppe bison did not migrate great distances, but instead, moved between different ecotones seasonally, spending summers in higher elevation regions and winters in lower elevation regions. The results also indicate that steppe bison had greater mobility during periods of warmer climate, including Marine Isotope Stage 3 (MIS3) and the Late Pleistocene.

Bison would have represented a large-bodied and predictable source of food for prehistoric peoples, and these results suggest that human landuse patterns likely incorporated the use of upland regions during the summer and fall, and lowland regions during the winter and early spring. Additionally, the results imply that bison movement on the landscape would have been more predictable during the Late Pleistocene than during the Holocene. As such, settlement and subsistence patterns may have shifted from a more logistically-organized pattern during the Late Pleistocene to greater residential mobility during the Holocene as bison population became more mobile.