

An Important New Dinosaur Bone Bed in the Prince Creek Formation, Colville River, Northeastern Part of the National Petroleum Reserve-Alaska

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Work completed during 1997 and 1998 in the upper part of the Late Cretaceous Prince Creek Formation, north of Umiat, Alaska, has yielded a new dinosaur bone bed (the Tegoseak bed). The site is located on a bluff at the head of a gully along the west bank of the Colville River, 1.7 kilometers north of Kikak Creek and 43 kilometers south of Ocean Point. Fragmentary bone material has been collected at the mouth of the gully since 1988. Bone specimens collected in-situ and as float indicate that at least 4 taxa are present. These include tyrannosaurids, dromaeosaurids, hadrosaurids and the ceratopsian genus *Pachyrhinosaurus*. The dominant taxon in the assemblage is *Pachyrhinosaurus*, which comprises 90% of material identified to date. The *Pachyrhinosaurus* bone elements are of sub-adult proportions.

The bone-bearing bed consists of a grayish-brown, poorly cemented to highly indurated, carbonaceous siltstone. It crops out 2 to 3 meters from the top of the bluff, and extends along the bluff rim for 45 meters. Thickness of the bed ranges from 30 centimeters to 1 meter. Bone concentrations vary within this unit. In some parts of the bed, concentrations are greater than 20 bones per square meter (indicating a bone bed), in other parts, less than five. Most skeletal elements are contained in a highly indurated matrix with isolated occurrences in less indurated zones. All bones show some degree of pre-burial weathering and desiccation. There are two levels of bone preservation with respect to weathering features, those that are highly weathered and those that exhibit only slight pre-burial weathering. Evidence of abrasion on bone surfaces is rare. No evidence of pre-burial breakage or trampling has been observed thus far. All large bone elements exhibit permafrost induced fractures. Most bones show evidence of post-burial fractures due to loading and regional tectonic deformation.

The Tegoseak bed is unique in comparison with the well documented Liscomb bone bed near Ocean Point. The fossil component of the Liscomb bed consists, almost exclusively, of individuals of the hadrosaur genus *Edmontosaurus*. The Tegoseak bed appears to contain a mixture of faunal members, but is dominated by the genus *Pachyrhinosaurus*. Furthermore, skeletal material from the Liscomb bed shows little or no evidence of pre-burial weathering, contrasting with slight to highly weathered specimens from the Tegoseak bed. Lastly, the Liscomb bed crops out low in the bluff, limiting the scale of excavation, while the Tegoseak bed lies within 3 meters of the bluff crest, allowing for large scale excavation. To date, the Tegoseak bed provides the earliest record of the genus *Pachyrhinosaurus* in Alaska and possibly in North America. Occurrences in Alberta indicate that *Pachyrhinosaurus* was restricted to the early Maastrichtian, with one possible occurrence in the late Campanian. This early occurrence in Alaska, combined with the known geographic distribution of the taxon, suggests that the genus *Pachyrhinosaurus* originated at a high latitude and migrated southward.