

PRELIMINARY TAPHONOMIC STUDIES AT THE TOLO LAKE MAMMOTH SITE NEAR
GRANGEVILLE, IDAHO COUNTY, NORTHERN IDAHO

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Numerous mammoth and several bison bones were discovered in the fall of 1994 during rehabilitation work in the 30 acre bed of Tolo Lake. Subsequent collecting proved this to be one of the largest deposits of mammoth remains in North America with as many 200 individuals present. The lake, of natural but unclear origin, occurs in a young (~6 mya) flow assigned to the Columbian River Basalt Group. The maximum thickness of five lacustrine units recovered during coring totaled 4.6 m. An apparent magnetic reversal occurs near the base and preliminary pollen studies indicate a warm-cool-warm sequence from base to top. The vertebrates were recovered from the middle unit which also contains evidence (mineralized cracks, root casts, filled burrows, oxidized zones) of desiccation and deflation. Two burrows contain volcanic ash (Mazama?) which is otherwise absent in the section. There is no evidence of human association and radiocarbon dating has been unsuccessful because bone collagen is not preserved and charcoal is absent. Based on stratigraphy and faunal associates, we very tentatively assign the remains to the Wisconsinan.

Recovered specimens fall into two unusual taphonomic contexts we informally term offshore and rocky shoreline. A nearly complete (#1) and a partial (#2) mammoth belong to the former. Both are excellently preserved with little or no signs of weathering (<Behrensmeier Stage 1) and no evidence of rodent or carnivore gnawing even though sediment accumulation appears to have been slow. Possible trample marks are present. Most larger bones are nearly horizontal and each individual lies at a single level. Mammoth #1, a large mature male Columbian mammoth, is slightly scattered and lacks many smaller elements such as hyoids, phalanges, and patellae. Several small bones recovered more than a meter from the main scatter. Many limb elements occurred in a subparallel cluster adjacent to the cranium and a group of ribs from the "down side" of the carcass remained in a typical death relationship but lacked vertebrae. Mammoth #2 is fully adult but very small, possibly a woolly mammoth. Recovered remains consist of scattered and vaguely oriented larger elements from both forelimbs plus ribs. The offshore mammoths probably died in lake waters deep enough to discourage scavengers and rodents, prevent desiccation cracks, and ameliorate the effects of sunlight. They may have bloated and floated before grounding on the gradually shallowing lake bottom. Mammoth #1 decayed as a unit while the main carcass of #2 became separated (floated away?) from the forelimbs before completion of decay. Subsequent wave and/or ice action may have partially oriented the remains and removed smaller elements.

The buried rocky shoreline deposit, comprised primarily of locally derived basalt boulders up to a meter in greatest dimension, is continuous with modern shoreline deposits. In the subsurface, bones and bone fragments occur throughout the unit with the majority on top of or nestled among the upper rocks. All except the most extreme weathering stages are present and many specimens are slightly to extremely abraded. One partial Bison cranium, lying dorsal side down, bears large abrasion facets where the horn cores contacted the underlying rocks and several specimens display very rounded spiral fractures. This deposit appears to have formed by wave action transporting bones or partial carcasses to the rocky shoreline where wave action abraded them.

While the rich and unique fossil deposits of Tolo Lake certainly bear additional investigation, costs appear to preclude continued excavations for at least the immediate future.