

Taphonomy—Bone Modification

Distribution of Mammalian Osteological Elements Recovered from Waterscreened Features, House Fill, and Overburden of the Wall Ridge Earthlodge (13ML176), Mills County, Iowa

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Matrix from the Wall Ridge site (Glenwood culture, Nebraska phase: A.D. 1,000–1,300, Green 1990), partially but systematically waterscreened in 1984 by the Office of the State Archaeologist of Iowa, produced 19 species of mammals (Table 1). As both mega- and micromammal remains were recovered from many excavation units, this faunal sample appeared ideal to (1) compare the relative abundance of species between the three major interpretive components (house fill, feature fill and overburden) in the lodge and (2) to evaluate possible differences in interpretation resulting from two counting techniques used to establish MNI from NISP. In Table 1 (bottom) the MNI values for each excavation unit were calculated independently, assigned to their interpretive components (feature, house fill, or overburden) and totaled. MNI values also were derived from the combined NISP for each of the three major components in the lodge (Table 1-top). The latter technique reduced the MNI by approximately 55%. The reduction did not apply equally to all taxa. *Bison* (bison), *Castor* (beaver), *Odocoileus* (deer), *Ondatra* (muskrat), *Procyon* (raccoon) and *Scalopus* (mole) were reduced by more than 70%; *Cervus* (wapiti), *Mustela* (mink), *Peromyscus* (deer mouse), *Synaptomys* (bog lemming), and *Microtus* spp. (vole) were unaffected. However, an χ^2 test of each data set indicated that there is no significant difference in either faunal composition or relative abundance of species between the features, house fill, and overburden. Although the absolute χ^2 values and probabilities vary between the two tests, uniformity of the vertebrate sample between the three components is documented by both counting procedures. The results imply that the specimens recovered from the house fill, feature fill, and the overburden in this earthlodge are genetically related and thus represent the time of occupation. Moreover, these data suggest

that vertebrate samples collected from waterscreened features in previously excavated Glenwood lodges may be regarded as representative for the entire associated lodge.

Both NISP and MNI values decrease toward the surface at Wall Ridge. If a significant portion of the micromammal sample from the lodge was impacted by burrowing in the manner characterized by the "rodent zone" concept of Bocek (1986), it would be expected that micromammal density would be greatest in the overburden. Even with approximately 1000 years of accumulation time available for intrusion and bioturbation, the opposite was observed; micromammal remains were scarce near the surface, as projected by Morlan (in press), and concentrated in features, primarily refuse-filled pits, either on or beneath the house floor. Concentration of micromammal remains below the rodent zone, also noted in the late-prehistoric Walth Bay earthlodges (Semken and Falk 1991), is reinforced at Wall Ridge by total bone counts (identified plus unidentified): 2,353 bones were recovered from topographically lower features, 1,337 from house fill, and 111 from overburden. Thus post-depositional burrowing, which clearly can be responsible for both intrusive remains and site bioturbation (Johnson 1989), does not appear to be a major factor in rodent-bone accumulation and distribution in Glenwood earthlodges.

Most of the features in the Wall Ridge earthlodge represent large refuse-filled pits, and the contained vertebrate remains apparently were deposited into the pits along with the associated cultural debris. Refuse similar to that in the lodge undoubtedly surrounded the subsurface lodge at the time of occupation; erosion from the peripheral midden after lodge destruction probably accounts for the similar taxonomic distribution in the overburden. The presence of a deer thoracic vertebra (too large for upward transport) and a rice-rat element (apparently extirpated from southwest Iowa post A.D. 1200) in the overburden supports this interpretation.

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Table 1. Minimum number of individuals of mammals (alphabetically arranged) recovered from the Wall Ridge Earthlodge. **Table 1A:** MNI based on combined sample recovered from each interpretive unit. **Table 1B:** MNI calculated by summation of the MNI from each excavation unit assigned to an interpretive unit. *Blarina brevicauda*, recovered during Phase I excavations, along with some other identified specimens, are site specific but can not be assigned to one of the analyzed components. It is listed in Table 1 to provide a complete faunal list for Wall Ridge earthlodge.

| Taxon | Features | | | House Fill | | | Overburden | | | Total | |
|-------------------------|----------|------|------------------|------------|------|------------------|------------|------|------------------|-------|------|
| | Obs. | Exp. | Chi ² | Obs. | Exp. | Chi ² | Obs. | Exp. | Chi ² | % | Obs. |
| Bison bison | 1 | 0.61 | 0.26 | 0 | 0.32 | 0.32 | 0 | 0.08 | 0.08 | 1.32 | 1 |
| Blarina brevicauda | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0.00 | 0 |
| Canis sp. | 2 | 1.82 | 0.02 | 1 | 0.95 | 0.00 | 1 | 0.24 | 0.24 | 3.95 | 4 |
| Castor canadensis | 1 | 1.21 | 0.04 | 1 | 0.63 | 0.21 | 0 | 0.16 | 0.16 | 2.63 | 2 |
| Cervus elaphus | 0 | 0.61 | 0.61 | 1 | 0.32 | 1.48 | 0 | 0.08 | 0.08 | 1.32 | 1 |
| Geomys bursarius | 7 | 6.66 | 0.02 | 3 | 3.47 | 0.06 | 1 | 0.87 | 0.02 | 14.47 | 11 |
| Microtus ochrogaster | 7 | 5.45 | 0.44 | 1 | 2.84 | 1.19 | 1 | 0.71 | 0.12 | 11.84 | 9 |
| Microtus pennsylvanicus | 1 | 0.61 | 0.26 | 1 | 0.32 | 0.32 | 0 | 0.08 | 0.08 | 1.32 | 2 |
| Microtus pinetorum | 0 | 1.21 | 1.21 | 2 | 0.63 | 2.96 | 0 | 0.16 | 0.16 | 2.63 | 2 |
| Mustela vison | 1 | 1.21 | 0.04 | 1 | 0.63 | 0.21 | 0 | 0.16 | 0.16 | 2.63 | 2 |
| Odocoileus sp. | 2 | 2.42 | 0.07 | 1 | 1.26 | 0.05 | 1 | 0.32 | 1.48 | 5.26 | 4 |
| Ondatra zibethicus | 3 | 4.24 | 0.36 | 3 | 2.21 | 0.28 | 1 | 0.55 | 0.36 | 9.21 | 7 |
| Oryzomys palustris | 10 | 9.08 | 0.09 | 4 | 4.74 | 0.11 | 1 | 1.18 | 0.03 | 19.74 | 15 |
| Peromyscus leucopus | 3 | 2.42 | 0.14 | 1 | 1.26 | 0.05 | 0 | 0.32 | 0.32 | 5.26 | 4 |
| Procyon lotor | 1 | 0.61 | 0.26 | 0 | 0.32 | 0.32 | 0 | 0.08 | 0.08 | 1.32 | 1 |
| Scalopus aquaticus | 1 | 1.21 | 0.04 | 1 | 0.63 | 0.21 | 0 | 0.16 | 0.16 | 2.63 | 2 |
| Sciurus sp. | 1 | 1.21 | 0.04 | 1 | 0.63 | 0.21 | 0 | 0.16 | 0.16 | 2.63 | 2 |
| Sylvilagus sp. | 4 | 4.24 | 0.01 | 2 | 2.21 | 0.02 | 1 | 0.55 | 0.36 | 9.21 | 7 |
| Synaptomys cooperi | 1 | 1.21 | 0.04 | 1 | 0.63 | 0.21 | 0 | 0.16 | 0.16 | 2.63 | 2 |
| Total | 46 | | 3.93 | 25 | | 8.26 | 7 | | 4.19 | 100. | 78 |

| Taxon | Features | | | House Fill | | | Overburden | | | Total | |
|-------------------------|----------|-------|------------------|------------|------|------------------|------------|------|------------------|-------|------|
| | Obs. | Exp. | Chi ² | Obs. | Exp. | Chi ² | Obs. | Exp. | Chi ² | % | Obs. |
| Bison bison | 4 | 2.37 | 1.12 | 0 | 1.27 | 1.27 | 0 | 0.36 | 0.36 | 2.40 | 4 |
| Blarina brevicauda | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0.00 | 0 |
| Canis sp. | 5 | 4.374 | 0.01 | 2 | 2.54 | 0.11 | 1 | 0.72 | 0.11 | 4.79 | 8 |
| Castor canadensis | 5 | 4.15 | 0.17 | 2 | 2.22 | 0.02 | 0 | 0.63 | 0.63 | 4.19 | 7 |
| Cervus elaphus | 0 | 1.19 | 1.19 | 1 | 0.63 | 0.21 | 0 | 0.18 | 3.75 | 1.20 | 1 |
| Geomys bursarius | 11 | 11.26 | 0.01 | 6 | 6.03 | 0.00 | 2 | 1.71 | 0.05 | 11.38 | 19 |
| Microtus ochrogaster | 7 | 5.34 | 0.52 | 1 | 2.86 | 1.21 | 1 | 0.81 | 0.05 | 5.39 | 9 |
| Microtus pennsylvanicus | 1 | 1.19 | 0.03 | 1 | 0.63 | 0.21 | 0 | 0.18 | 0.18 | 1.20 | 2 |
| Microtus pinetorum | 0 | 1.19 | 1.19 | 2 | 0.63 | 2.94 | 0 | 0.18 | 0.18 | 1.20 | 2 |
| Mustela vison | 1 | 1.19 | 0.03 | 1 | 0.63 | 0.21 | 0 | 0.18 | 0.18 | 1.20 | 2 |
| Odocoileus sp. | 7 | 8.30 | 0.20 | 4 | 4.44 | 0.04 | 3 | 1.26 | 2.41 | 8.38 | 14 |
| Ondatra zibethicus | 12 | 14.82 | 0.54 | 8 | 7.93 | 0.00 | 5 | 2.25 | 3.38 | 14.97 | 25 |
| Oryzomys palustris | 17 | 15.41 | 0.16 | 8 | 8.25 | 0.01 | 1 | 2.34 | 0.76 | 15.57 | 26 |
| Peromyscus leucopus | 3 | 2.37 | 0.17 | 1 | 1.27 | 0.06 | 0 | 0.36 | 0.36 | 2.40 | 4 |
| Procyon lotor | 6 | 3.56 | 1.68 | 0 | 1.90 | 1.90 | 0 | 0.54 | 0.54 | 3.59 | 6 |
| Scalopus aquaticus | 6 | 5.34 | 0.08 | 3 | 2.86 | 0.01 | 0 | 0.81 | 0.81 | 5.39 | 9 |
| Sciurus sp. | 4 | 3.56 | 0.06 | 2 | 1.90 | 0.00 | 0 | 0.54 | 0.54 | 3.59 | 6 |
| Sylvilagus sp. | 9 | 11.86 | 0.69 | 10 | 6.35 | 2.10 | 1 | 1.80 | 0.35 | 11.98 | 20 |
| Synaptomys cooperi | 1 | 1.19 | 0.03 | 1 | 0.63 | 0.21 | 0 | 0.18 | 0.18 | 1.20 | 2 |
| Total | 99 | | 7.87 | 53 | | 10.52 | 14 | | 14.81 | 100. | 166 |