**Supplementary Item: Radiocarbon ages, stable isotope data, and species identified from Big Bone Lick, Kentucky**

**Tables 1 to 4**

Table 1. Comprehensive list of radiocarbon ages obtained from terrace and floodplain deposits at Big Bone Lick, Kentucky.

Table 2. Stable carbon and nitrogen isotope values obtained for late Pleistocene and late Holocene vertebrate fossils from Big Bone Lick, Kentucky.

Table 3. Stable carbon isotope data for bulk organic matter from alluvial and lacustrine strata at BBL. Soil carbonate was removed using acid prior to analysis.

Table 4. Species identified in stratigraphic units at Big Bone Lick, Kentucky

Table 1. Comprehensive list of radiocarbon ages obtained from terrace and floodplain deposits at Big Bone Lick, Kentucky.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sample (Taxon) | Lab ID1 | cal yr BP(± 1 | cal yr BP2­(± 2 | Unit | Reference |
| *Conventional β-Decay Counting* |
| Cellulose (Unknown sp.) | W-1357 | < 200 | Modern | 4 | Levin et al. (1965) |
| Cellulose (Unknown sp.) | W-908 | < 200 | Modern | 4 | Rubin and Berthold (1961) |
| Collagen (*Bison bison*) | UGa-4291 | 530 ± 105 | 320-680 | 4 | Tankersley (1985, 1986) |
| Charcoal (Unknown sp.) | Beta-5409 | 2970 ± 250 | 2490-3820 | 4 | Boisvert (1986) |
| Charcoal (Unknown sp.) | Beta-5690 | 3460 ± 80 | 3500-3610 | 4 | Boisvert (1986) |
| Charcoal (Unknown sp.) | Beta-5689 | 3770 ± 80 | 3930-4410 | 4 | Boisvert (1986) |
| Charcoal (Unknown sp.) | Beta-54089 | 4090 ± 60 | 4440-4820 | 4 | Boisvert (1986) |
| Cellulose (Unknown sp.) | W-1358 | 10,600 ± 250 | 11,630-13,030 | 3 | Levin et al. (1965) |
| Cellulose (*Picea sp*.) | W-1617 | 17,200 ± 600 | 19,380-22,290 | 2 | Ives et al. (1967) |
| *Accelerator Mass Spectrometry* |
| Collagen (*Bison bison*) | Beta-257505 | 80 ± 40 | 14-270 | 4 | Storrs et al. (2009) |
| Cellulose (*Carya sp.)* | Beta-259933 | 130 ± 40 | 6-280 | 4 | Storrs et al. (2009) |
| Collagen (*Bison bison*) | CAMS-61264 | 245 ± 30 | 0-430 | 4 | This paper |
| Collagen (*Bison bison*) | CAMS-61265 | 260 ± 30 | 0-430 | 4 | This paper |
| Cellulose (*Juglans nigra*) | Beta-330555 | 310 ± 30 | 300-480 | 4 | This paper |
| Cellulose (Unknown sp.) | Beta-257506 | 560 ± 50 | 510-650 | 4 | Storrs et al. (2009) |
| Cellulose (*Juniperus virginiana*) | Beta-331826 | 4170 ± 30 | 4580-4830 | 4 | This paper |
| Collagen (*Mamut americanum*) | UCI-35590 | 11,020 ± 30 | 12,750-13,000 | 3 | Tankersley et al. (2009) |
| Collagen (*Mamut americanum*) | UCI-35592 | 11,700 ± 35 | 13,480-13580 | 3 | Tankersley et al. (2009) |
| Collagen (*Mamut americanum*) | UCI-35591 | 12,210 ± 35 | 14,040-14,230 | 3 | Tankersley et al. (2009) |
| Collagen (*Proboscidea*)  | CAMS-161263 | 15,6600 ± 180 | 18,560-19,390 | 2 | This paper |
| Cellulose (*Picea sp*.) | Beta-331826 | 20,870 + 90 | 24,870-25,520 | 2 | This paper |

1Beta Beta Analytic Radiocarbon Laboratory,

CAMS Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory

UCI University of California-Irvine Accelerator Mass Spectrometry Laboratory

UGa University of Georgia Radiocarbon Laboratory

W United Stated Geological Survey Radiocarbon Laboratory

2Calibrated using Calib 7.0 and InTCal 13.

Table 2. Stable carbon and nitrogen isotope values obtained for late Pleistocene and late Holocene vertebrate fossils from Big Bone Lick, Kentucky.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Taxon | Sample | Unit | δ13C (‰) | δ15N(‰) | C:N wt(%) | Pretreatmenta  | Source |
| *Bison bison bison*  | collagen | 4 | -23.8 | 5.62 | 2.7 | EDTA | This paper |
| *B. bison bison*  | collagen | 4 | -23.9 | 4.47 | 2.7 | EDTA | This paper |
| *B. bison bison* | enamel | 4 | -15.4b | (range -14.5 to -16.0)c | NA | 2% NaOCl + 0.1N acetic acid | Widga (2006) |
| *B. bison bison*  | enamel | 4 | -13.2b | (range -12.6 to -13.7)c | NA | 2% NaOCl + 0.1N acetic acid | Widga (2006) |
| *Mamut americanum*  | collagen | 3 | -21.2 | 6.78 | 3.2 | ABA | Tankersley et al. (2009) |
| *M. americanum*  | collagen | 3 | -21.9 | 7.5 | 3.9 | ABA | Tankersley et al. (2009) |
| *M. americanum*  | collagen | 3 | -21.1 | 6.36 | 3.3 | ABA | Tankersley et al. (2009) |
| *M. americanum*  | enamel | 2 | -13.3b | NA | NA | H2O2 + Ca buffered acetic acid | This paper |
| *M. americanum*  | enamel | 2 | -12.9b | NA | NA | H2O2 + Ca buffered acetic acid | This paper |
| Proboscidea  | collagen | 2 | -20.9 | 6.42 | 2.7 | EDTA | This paper |

aABA = acid, base, acid (HCl, NAOH, HCl); EDTA = ethylenediaminetetraacetic acid.

bEnamel 13C values are ca. 14.1‰ higher than those in diet and collagen 13C values are ca. 5.5‰ higher than those in diet (Vogel et al. 1990; Cerling and Harris 1999).

cSerially sampled tooth.

Table 3. Stable carbon isotope data for bulk organic matter from fluvial and lacustrine strata at BBL. Soil carbonate was removed using HCl prior to analysis.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample No | Excavation | Depth(m) | Unit | Munsell Soil Color | Texture | 13C2 |
| 1-1 | E | 0.00-1.50 | 4 | 10YR5/4 Yellowish Brown | Friable Silt Clay Loam | -25.1 |
| 1-2a | E | 1.50-2.50 | 4 | 10YR7/4 Very Pale Brown | Silt Loam | -25 |
| 1-2b | E | 2.00-2.25 | 4 | 10YR5/6 Yellowish Brown | Silt Loam | -25.3 |
| 1-3 | E | 2.25-2.60 | 4 | 5YR3/4 Dark Reddish Brown | Sand Loam | -25.1 |
| 1-4 | E | 2.25-2.40 | 4 | 10YR6/1 Gray | Sand Loam | -25.2 |
| 1-5 | E | 2.25-2.50 | 4 | 5YR3/4 Dark Reddish Brown | Sand Loam | -25.2 |
| 1-6 | E | 2.40-2.50 | 4 | 7.5YR4/2 Brown | Sand Loam | -25.6 |
| 1-7 | E | 2.55-2.60 | 4 | Gley 2 7/5B Light Bluish Gray | Clay | -25.6 |
| 1-8 | E | 2.60-2.65 | 4 | 10YR7/4 Very Pale Brown | Sand Loam | -25.4 |
| 1-9 | E | 2.65-2.70 | 4 | 10YR5/4 Yellowish Brown | Loam | -26 |
| 1-10 | E | 2.70-3.00 | 4 | Gley 2 4/5B Dark Bluish Gray | Clay | -25.6 |
| 1-12 | E | 3.20-3.50 | 2 | Gley 2 5/10B Light Gray | Clay | -26.8 |
| 2-1 | N | 0.00-4.50 | 4 | 10YR5/4 Yellowish Brown | Loam | -26.1 |
| 2-2 | N | 4.50-5.00 | 4 | Gley 2 5/5B Bluish Gray | Clay | -25.9 |
| 2-3 | N | 4.75-6.15 | 2 | Gley 2 7/10BG Light Bluish Gray | Clay | -26.5 |
| 2-4 | N | 6.15-6.25 | 2 | Gley 2 7/10BG Light Bluish Gray | Clay | -27.6 |
| 2-5 | N | 6.25-7.00 | 2 | Gley 1 8/N White | Clay | -27.3 |
| 3-1 | R | 0.00-1.20 | 4 | 10YR5/6 Yellowish Brown | Clay | -27.7 |
| 3-2 | R | 1.20-1.50 | 4 | 2.5YR4/8 Red | Loam | -27.2 |
| 3-3 | R | 1.50-2.25 | 4 | 10YR5/4 Yellowish Brown | Gravel Silt Loam | -28 |
| 3-4 | R | 2.25-3.00 | 4 | 2.5YR7/3 Light Reddish Brown | Silt Clay | -27.3 |
| 3-5 | R | 3.00-3.25 | 4 | 10YR6/4 Light Yellowish Brown | Loam | -28.1 |
| 3-6 | R | 3.25-3.46 | 4 | Gley 1 4/5GY Dark Greenish Gray | Clay Loam | -28 |
| 4-1 | M | 0.00-0.45 | 4 | Gley 2 7/5B Light Bluish Gray | Clay | -26.7 |
| 4-2 | M | 0.45-1.00 | 4 | 7.5YR5/8 Strong Brown | Gravel Loam | -27 |
| 5-1 | F | 0.00-2.65 | 4 | 10YR5/4 Yellowish Brown | Sand Clay Loam | -26.7 |
| 5-2 | F | 2.65-2.75 | 4 | 5YR4/4 Reddish Brown | Sand Gravel | -27.1 |
| 5-3 | F | 2.75-3.10 | 4 | 5YR4/3 Reddish Brown | Gravel Sand | -27.6 |
| 5-4 | F | 3.10-3.40 | 4 | 5YR3/2 Dark Reddish Brown | Gravel Sand | -26.8 |
| 5-5 | F | 3.40-4.10 | 4 | Gley 2 5/5B Bluish Gray | Clay | -27.5 |

1See Figures 2 and 4*.*

2The average difference in 13C values for six samples run in duplicate is 0.06‰.

Table 4. Species identified in stratigraphic units at Big Bone Lick, Kentucky.

|  |  |  |  |
| --- | --- | --- | --- |
| Taxon | Common Name | Unit | Source |
| Large Mammals |  |  |  |
| *Bison bison bison* | Modern Bison | 4 | Schultz et al. (1963), Levin et al. (1965), Ives et al. (1967), Tankersley (1986, 1992), Storrs et al. (2009) and this paper |
| *Cervus canadensis* | Elk | 4 | Schultz et al. (1963), Levin et al. (1965), Tankersley (1985), and this paper |
| *Odocoileus virginianus* | White-tailed Deer | 4 | Schultz et al. (1963), Levin et al. (1965), Tankersley (1985) and this paper |
| *Ursus americanus*  | Black Bear | 4 | This paper |
| *Bootherium bombifrons* | Woodland Muskox | 3&2 | Ives et al. (1967), Schultz et al. (1963), Levin et al. (1965) and Tankersley (1985) |
| *Equus complicatus* | Complicated-tooth Horse | 3&2 | Levin et al. (1965), Shultz et al. (1963), Tankersley (1985) and this paper |
| *Mammut americanum* | American Mastodon | 3&2 | Schultz et al. (1963), Tankersley (2009) and Tankersley et al. (2010) |
| *Mammuthus sp.* | Mammoth | 3&2 | Levin et al. (1965) and this paper |
| *Megalonyx jeffersonii*  | Jefferson’s Ground Sloth | 3 | Levin et al. (1965) |
| *B. bison antiquus* | Ancient Bison | 2 | Schultz et al. (1963 and this paper |
| *Cervalces scotti* | Elk-moose | 2 | Schultz et al. (1967) and this paper |
| *Rangifer tarandus* | Caribou | 2 | Rubin and Berthold (1961), Schultz et al. (1963) and this paper |
| Plants |  |  |  |
| *Acer rubrum* | Red Maple | 4 | This paper |
| *Acer saccharinum* | Silver Maple | 4 | This paper |
| *Aesculus glabra* | American Buckeye | 4 | This paper |
| *Carya sp.* | Hickory | 4 | Storrs et al. (2009) and this paper |
| *Juglans cinerea* | Butternut | 4 | This paper |
| *Juglans nigra* | Black Walnut | 4 | This paper |
| *Juniperus virginiana* | Red Cedar | 4 | This paper |
| *Quercus sp.* | Oak | 4 | This paper |
| *Picea sp.* | Spruce | 2 | Ives et al. (1967) and this paper |

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