

LEGION PARK LETTER REPORT

FIELD WORK SUMMARY

July 21-25, 2014

Prepared for

**City of Woodburn
and**

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Prepared by

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LEGION PARK 2014

DISCUSSION OF FIELD WORK (July 21-25)

Field work was conducted within Legion Park during the period of July 21-25, 2014. A small portion of the lower elevation area of the park was inspected. Thus, work was conducted within the southwest portion of the property, adjacent to the utility corridor.

The methods that proved successful in other paleoarchaeological investigations were utilized at this site. Using a backhoe and track hoe, the topsoil and underlying clay layer were removed and stacked to one side. The deeper strata, with the paleontological remains, were then exposed. Working in concert, the backhoe and track hoe stripped each of the deeper layers of sediment, and piled them away from the excavation site. The more recent soils were then returned to the trench, with construction fencing placed around the trenched area.

The work in 2014 began with a trench that had been partially excavated in 1999. That area, labeled as Trench C, had collapsed when only 50% of the intended width was unearthed, so the trench was not worked further. In 2014, however, that trench was reopened, with the contents set aside for reexamination. An additional trench was placed along the east wall of Trench C (figure 1). This new trench was identified as Trench T. It, too, collapsed during excavation. Despite these issues with stability, the contents of both trenches were important. Recovery from these trenches is discussed under “Findings” in this report.

The closest sewer bell (cover), which is located to the south and west of the excavation, was used as the datum from which measurements were taken.¹ The distance from this datum to the excavation was obtained by the use of both metric tape measures and GPS headings. The location data from previous years was obtained by running a tape

¹ This cover has been previously used by IAS as datum #1, and appears as such on maps included in past IAS reports.

measure from the utility cover to each of the excavation areas, using an offset of ten degrees to the east of true north. Thus, the same datum and headings were utilized for the work in 2014.

The measurements to Trench C were 46.5-52.5 meters heading north from the datum, and 4.5-5.0 meters heading east from the baseline. The original termination depth of approximately 3.3 meters was replicated, due to the rapidly rising water. Trench T was also 46.5-52.5 meters heading north from the datum. This trench extended to 8.5 meters east of the baseline, when measuring to the N.E. corner. The east-west width of Trench T was approximately 3.9 meters.

Three GPS locations were taken for Trench C, as Trench T was difficult to access after excavation, and because it abutted the east wall of Trench C. The GPS readings were: N 45 degrees 8 minutes 53.53 seconds and east -122 degrees 50 minutes 41.34 seconds; N 45 degrees 8 minutes 53.62 seconds and east -122 degrees 50 minutes 41.49 seconds; and Lat 45.1481901 Long -122.844395.

FINDINGS

The undisturbed strata of Woodburn's lower elevation properties provide a near-perfect time capsule of the last 15,000 years of this area's history. Each layer of soil reveals a clear depositional history for that period. Flora, fauna, and even episodic flood events and ponding are defined. Further, each stratum has been dated and described (Table 1). Thus, items can quickly be dated by the layers with which they are associated.

When the small amount of excavated sediment from Trench C was inspected in 1999, it contained more than a dozen bones from an extinct species of predator bird, the teratorn.² It was hoped that more of this large bird might be contained within the soils

² This animal, with an estimated wingspan of 12'-14', proved to be a new species (Campbell and Stenger, 2000). The Woodburn bird is now classified as *Teratornis woodburnensis*.

bordering the east side of Trench C, or within the matrix that collapsed back into Trench C during excavation in 1999. However, no additional skeletal elements from the teratorn were recovered, either from the excavation of Trench T or the re-excavation of Trench C.

The partial remains of other animals were documented and collected. A total of thirteen bones or bone fragments were recovered in this 2014 project.³ These specimens reflected species from several different environmental niches. In all, avian, terrestrial, and semi-aquatic animals were potentially represented. These included extinct giant bison, beaver, and bird. The specimens have been preliminarily catalogued as:

- Distal end of a bison fused radius/ulna included seven fragments
- One bison phalange
- One carpal/tarsal bone, probably bison, but not confirmed
- One beaver sized metacarpal/tarsal
- One goose sized ulna
- One unidentified bird bone fragment

Field photos of some of the specimens that will be examined are provided in this report (figure 2).

One possible artifact was documented and collected. It is potentially a biface, of basalt-like material. This type of mineral would have been more difficult to work than materials such as cryptocrystalline silicate. On this potential tool, the scars where the cortex was removed are all vertical (figure 3). There are no pressure flaking scars evidenced.

Dr. David Rice was consulted, in an effort to determine whether or not this specimen was cultural. Further, if this lithic was determined to be cultural, was the technology that was represented early prehistoric, or more recent?

³ Faunal count and identification provided by David Ellingson (July, 2014).

Dr. Rice felt that the specimen was probably a lithic biface, of an early period. Thus, the stratum date of 11,700-11,200 yBP is not necessarily a problem for this style of tool. Additionally, the consistently vertical removal of the cortex severely lowers the probability that this specimen was produced in a rock crusher (for the manufacture of gravels) or that it was a naturally occurring alteration in the stone. However, there was agreement that the provenience of this item is very problematic.

Three factors overshadow the possibility of the deposition being an *in situ* situation.

1. Immediately adjacent to the trench area is a dense layer of gravel that was laid down to create a road bed for construction. These imported gravels have migrated laterally, encroaching upon the trench area (figure 4). The shape and development of this specimen, might, therefore, be a fortuitous result of gravel production.
2. This specimen may have been brought in from the area in which the gravels were collected or processed. Thus, this may be an artifact, but introduced from another area in very recent times.
3. The item may have been relocated to the area of the trench due to over bank deposition, as there is an upward slope along the west wall of Trench T. Movement from higher to lower elevations is common, both from erosional forces and from human action, such as the throwing of items. While this would have occurred in prehistory, the artifact is still an isolated specimen, with the actual site being up on the above bank surface.

One additional factor should be considered in assessing the provenience of this specimen. The old city dump was located on top of Trench T. While this would not typically be a factor in the assessment of stratum 3C, which was undisturbed for millennia, the collapse of the trench walls allowed material from other strata to become mixed with the contents of stratum 3C during the mechanical excavation of this area.

Inspection of the biface argues for the specimen being early prehistoric. The visible technology and shape support this finding. However, based upon consideration of the above factors, it was determined by Drs. Rice and Stenger that primary deposition of this lithic biface is not indicated. The intrusive gravels and trench collapse, plus the probability of over bank deposition, suggest that this lithic is merely an isolate. It is not indicative of a site in the immediate, low lying vicinity.

SUMMARY

Since starting in 1999, the testing program employed at Legion Park has proven enormously successful. The paleoarchaeological investigations have resulted in the recovery of scientifically significant specimens, and in the showcasing of the natural world to the general public.

Multiple scientific disciplines have benefited from the information that has been generated during the paleontological investigations at Woodburn. We now have important data concerning an early human presence in the Willamette Valley, a far better understanding of the effects of the terminal Bretz floods events in this area, and a new knowledge of climate change near the end of the Pleistocene. The list of Ice Age animals associated with the area have been expanded and verified. The work in 2014 continued to validate the changes in plant and animal communities over time, as well as to add strength to the discussion of the Woodburn area's importance for many thousands of years.

In late August, an emeritus vertebrate paleontologist from the Page Museum/La Brea Tar Pits will inspect the material listed above, and the High School specimens, to expand upon the identifications where possible. This is at no cost to the City, as his time and expertise is being donated, and transportation is being provided by IAS.

ACKNOWLEDGMENTS

This project would not have occurred without the efforts and support of the City of Woodburn. Jim Row, Community Services Director, and multiple people in the Public Works Department, made this project successful. Also deserving of thanks is Woodburn High School teacher, David Ellingson.

It needs to be stated that without Bill Orr, of the University of Oregon, our research team would not have enjoyed the opportunity of discovery that we have experienced since the 1990's. The expertise developed from this association over so many years has allowed our work at Legion Park to be scientifically accurate and current. And, perhaps most importantly, it has opened more widely the door of science to Woodburn students and the general public.

Another factor in the continued success of the testing program at Legion Park is the involvement of the scientific community. Specialists from many branches of study, and from many different institutions in the U.S. and abroad, have voluntarily assisted in the identification and research of the Woodburn Pleistocene flora and fauna. This has provided Woodburn with a world identity and the most accurate species classifications possible.

Volunteers from the Oregon Archaeological Society added greatly to this project, as well. As they learned and honed new skills, they provided man power and forward thinking that is a benefit to any project.

LIMITED CITATIONS & REFERENCES

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APPENDIX

TABLES AND FIGURES

PROJECT BACKGROUND

STRATIGRAPHIC PROFILE FOR MAMMOTH PARK

DEPTH (M) & APPX. AGE	HORIZON	STRATUM	DESCRIPTION
0-0.5 (0-6,850 BP)	Fill or Topsoil (site dependent)	1	Topsoil is brown silty clay loam
0.5-1.5 (6,850 BP)	Mill Creek Clay	2	Dense clay, gray brown to dark gray (10YR5/2m), firm angular structure
1.2-2.8 (10,480- 10,330 BP)	Woodburn Bog-Late Stage, Woodland Developing	3A	Loose, woody, dark brown (5YR3/2m). Contains wood, peat, seeds, cones and insects.
(10,920- 10,480 BP)	Woodburn Bog-Classic Stage	3B	Peat, platy sphagnum moss with leaves and seeds, red-brown to dark brown (5YR4/6); silt rythmites and insects.
(11,840- 11,300 BP)	Woodburn Bog-Early Stage	3C	Dessicated bog and loam with slight clay and silt. Firm, organic, with peat residuum (5YR3/3m). Micro- and avifauna present. Modified mammal bone, hair.
2.8-3.4 (12,200 – 12,050 BP)	Post-Flood Horizon	4	Firm, micaceous silt with slight clay, medium dark brown (5YR5/4m-5YR3/3m) with sparse organics. Avifauna, megafauna, artifacts, animal & naturally shed human hair.
3.4-5.5+ (12,760 - 12,310 BP)	Willamette Silts-Late Event	5 Upper	Firm, micaceous clayey silt, medium olive- gray (2.5YR6/4m) to gray. Particles cemented to sand size with strong subangular blocky structure. Sparse organics. Sub-angular pebble erratics. Egg shell, and lithic artifacts. Contrasting white band, a horizon of calcium carbonate, appears.
(14,790- 12,630 BP)	Drying Event		Firm, micaceous clayey silt, light to dark gray (5Y 4/1 to 2.5Y 7/2). Lithic artifacts.
(12,890- 12,760 BP)	Flood deposit	5 Lower	

Table 1. Dated stratigraphic deposits at Woodburn for areas of 145'-155' elevation. The sequence and context of these deposits confirm a Paleoamerican presence. Table adapted from Hibbs (2000).

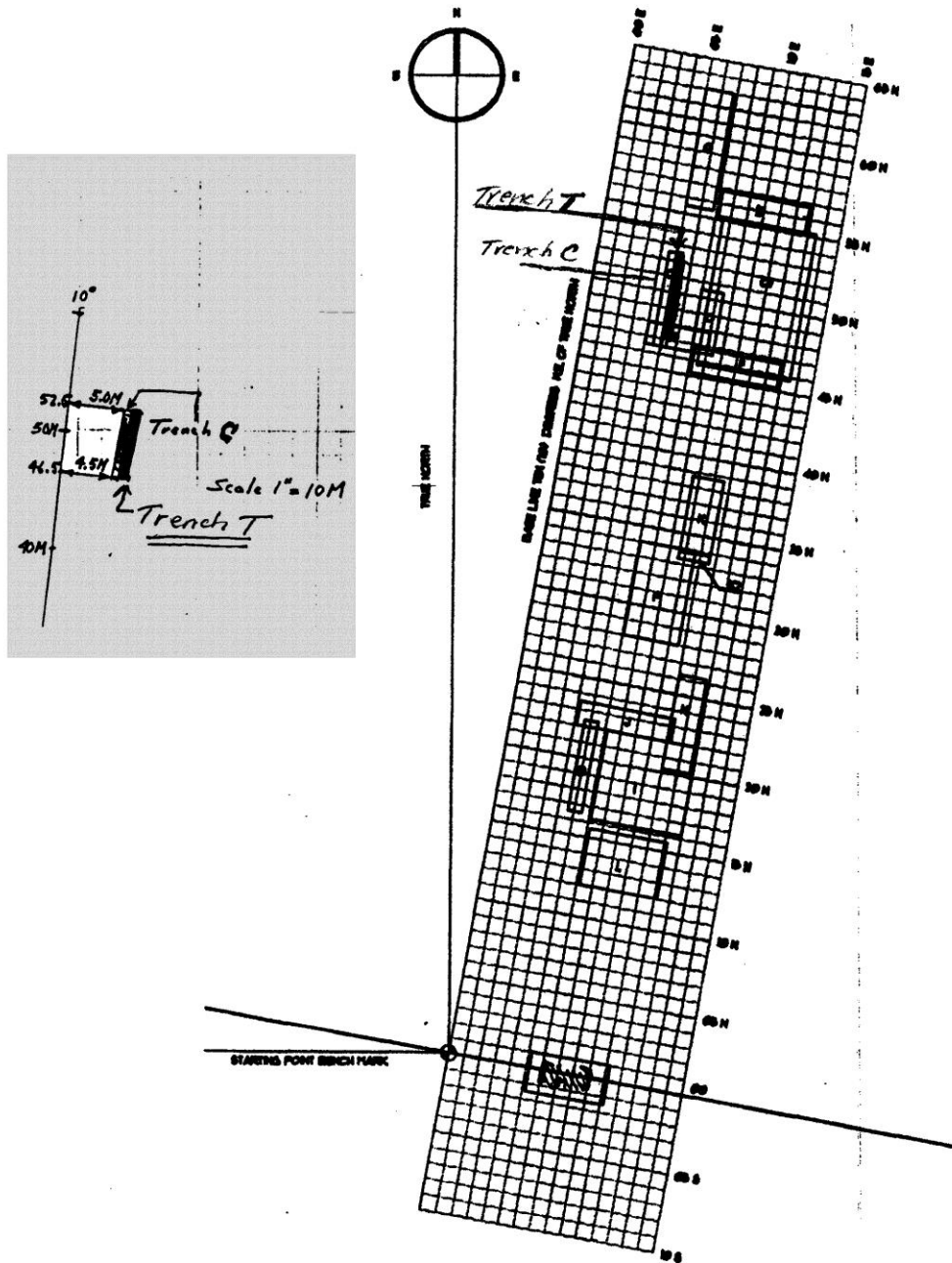


Figure 1. Map of the trenches in this segment of the park. Trench C collapsed during excavation in 1999. Trench T, excavated in 2014, included the east wall of trench C.

Trenches A and B are to the north and south of this area. The inset area, in gray, shows the detailed locations of trenches C and T.



Figure 2. Examples of faunal specimens. (These field photos can be replaced with better photographs, once the specimens are through the stabilization process.)



Figure 3. Two views of the probable biface, of early style.



Figure 4. Intrusive gravels from a utility road bed have traveled laterally into the site area, mixing with the material from stratum 3C.

APPENDIX: PROJECT BACKGROUND

PREVIOUS WORK

In the years prior to the subsurface investigations at Legion Park, work was done within the lower elevation areas of Woodburn High School. That area is now identified as Mammoth Park, and was first recognized as a paleontological site by E. J. Packard in the 1950's (Orr and Orr, 1999). At that time, no cultural material was identified. The site remained primarily undisturbed from then until 1987, when a utility trench was excavated, exposing numerous species of extinct Pleistocene fauna. Based upon a preliminary identification of the specimens, this excavation yielded evidence of ground sloth (*P. harlani*), mammoth (*M. columbai*), horse (*E. occidentalis*), bear (*Ursus sp?*), giant bison (*B. antiquus*), and possibly dire wolf (*C. dirus*).⁴ After the utility work was complete, the exposed segment of the site was backfilled.

In 1995, a representative for the City of Woodburn contacted the Center for the Study of the First Americans (CSFA) to initiate further excavation of the site area (Bonnichsen, 1995).⁵ In an effort to meet the needs of the City, CSFA arranged for the Institute for Archaeological Studies (IAS) to manage the testing program. Dr. Alison Stenger was identified as the project director and Charles Hibbs, Jr. became the project coordinator.⁶ As this was entirely a paleontological site, IAS insisted that a paleontologist be brought onto the project. Dr. William Orr, who arranged for the 1987 specimens to be saved for

⁴William Orr and a student identified the fauna from the 1987 excavation. Selected specimens from this excavation are available for viewing at Woodburn City Hall.

⁵The Center for the Study of the First Americans is a private non-profit corporation, at that time under the direction of Robson Bonnichsen.

⁶Funding for IAS was provided through Oregon State University, and not CSFA, with Stenger and Hibbs using the site for an OSU course in field methods.

use by the City, agreed to become the project paleontologist. Because of his position with the Thomas Condon State Museum of Fossils and the Department of Geosciences with the University of Oregon, he was quite familiar with Willamette Valley fossil material.

The suggested plan for testing the site involved manual and mechanical auguring, followed by mechanical trenching of selected areas. It was anticipated that a rapid assessment of the overall stratigraphy could be ascertained by examining the contents of the cores. It was further expected that organics for radiocarbon dating could be obtained from the core samples. Trenching would then verify the soil profiles indicated by the cores, while allowing for the safe and effective recovery of any Pleistocene fauna.

As reported the following winter (Stenger and Hibbs, 1996a), the combination of coring and then trenching proved to be an effective method of data recovery for deep, saturated sites. Radiocarbon dates reflected the late Pleistocene / early Holocene age of the site, and verified that the stratigraphy remained in tact throughout most of the site.⁷ Intense visual inspection allowed for further description of the stratigraphy (see Table 1). Each stratum below the clay cap was described by color, texture, structure, and inclusions (Hibbs, 1996; Beatty, 1997).

This first phase of testing resulted in significant data recovery. Material rarely documented in late Pleistocene sites, but observed within this site, included: microfauna, beetles, tree limbs with bark in tact, leaves, cones, in tact bird bones and egg shell. Initial identification of the microfaunal population verified the presence of numerous animals, including squirrel, muskrat, gopher (McDonald, 1999), and shrew or vole. The avifaunal presence was predominately water fowl, although raptors were indicated by the frequency of rodent remains (Orr, 1996).

A small amount of cultural material was also observed. This included lithic and bone

⁷Samples taken from stratigraphically separated trench deposits reflected an ordered series of dates, extending from 12,310 +/- 80 yrBP to 10,330 +/- 80 yrBP.

debitage, a single polished and cut bone cylinder, and a small limb with cut marks.⁸ Two unidentified mammal bones exhibiting cut marks were also identified. The density of artifactual material, however, was substantially less than 1 item per meter². Even when the more obscure faunal flakes were included, fewer than 20 culturally related specimens could be associated with the inspection of more than 126 cubic meters of soil.

The excellent preservation observed at this site was the result of a pH level of 6.0-6.5. This, combined with the broad range of material recovered, necessitated assembling a multidisciplinary team of researchers. Areas of expertise were thus expanded to include entomology, plant silicates, and ancient DNA extraction and interpretation.⁹

In 1997, management of the investigation was transferred back to CSFA. However, in the Fall of 2002, IAS briefly returned to the site, to test an area north of the region previously inspected. The results of this excavation included the documentation of: a carved wooden stake; multiple fragments of bison bone, some of which appear to be modified; a glacial cobble of probable Montana or Idaho origin; and fresh water shell. All of these specimens were contained within Pleistocene strata.

During the intervening years between 2002 and the summer of 2010, several different excavations occurred. These were managed by David Ellingson, a Woodburn High School teacher and mentor of science students. The results of his findings have been shared with amateur and professional audiences, and one of his excavations yielded the remains of an extremely large specimen that is still being studied by the scientific community. The animal proved to be *Bison antiquus*, the now extinct giant bison. The cranium and horn cores, however, were still missing from this find. Thus, in August of

⁸Lithic material included a (red) jasper flake and two probable basalt flakes. Additional basalt flakes plus several bone flakes were identified by Bonnicksen (1996).

⁹The initial group of specialist would be further expanded in future years, through the collaborated research of the Thomas Condon State Museum of Fossils and the Institute for Archaeological Studies.

2010, the Institute for Archaeological Studies collaborated with Mr. Ellingson, in an effort to locate that material. Through the assistance of the City of Woodburn, the project was able to move forward, with deep excavations conducted. Trained volunteers from the Oregon Archaeological Society provided much of the labor and expertise, and participants from Portland Community College were involved in field and laboratory work during the project's last week-end.

Summer testing has continued at Mammoth Park each year since 2010. Field work is again anticipated in August of 2014. This will be followed by the work of high school students in September.