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Testing House Pits at the ZX Ranch Site, Lake County, Oregon: A Report on the 1939 Investigations

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SCIENTIFIC archaeological research in Oregon was pioneered by Luther S. Cressman in the 1930s. Much of this early research was conducted in the high desert of eastern Oregon, beginning in 1932 with a wide-ranging survey of petroglyphs (Cressman 1936, 1937, 1988). Subsequent expeditions were made to this northwest corner of the Great Basin to collect surface artifacts, observe the pluvial geology, and conduct small test excavations in dry caves. Cressman believed the region had been occupied by humans since the early Holocene, possibly serving as a migration corridor from the Far North to the American Southwest (Cressman et al. 1940; Cressman 1942, 1988). He spent the summers from 1935 to 1939 excavating in caves for archaeological evidence to test this hypothesis.

Excavations were conducted at the Paisley Five-mile Point Caves in 1938 and 1939 (Cressman 1942). These three caves are located on the west side of the Summer Lake Basin in south-central Oregon, north of Upper Chewaucan Marsh and the town of Paisley, which are in the Lake Abert-Chewaucan Marsh Basin (Fig. 1). All three caves contained deposits of ash from the 6,845 B.P. eruption of Mt. Mazama, and cultural material was found in two of them. Artifacts were recovered from above and below the ash in Cave No. 1 and below the ash in Cave No. 3; the deposits in Cave No. 2 had been disturbed. Pleistocene horse and camel bones were found in the lower deposit in Cave No. 3 (Cressman 1942:93, 1966; Aikens 1982:142),

suggesting that the cultural remains in this stratum were associated with extinct fauna. These tests, along with excavations at Fort Rock, Catlow, and Roaring Springs caves, provided the necessary evidence for the antiquity of humans in the Great Basin (Cressman 1942), but this antiquity was not generally accepted until the advent of radio-carbon dating in the early 1950s and the corroborating early radiometric ages obtained on sagebrush sandals ($9,053 \pm 350$ B.P. [Cressman 1951:308]).

In 1939, Cressman and a field party from the University of Oregon camped along the Chewaucan River three miles west of Paisley while completing the Paisley Five-mile Point Caves excavations (Cressman 1988:382). During their stay, several excursions were taken in the local area to explore the geology and archaeology. One of these small projects was the testing of three house depressions at the ZX Ranch site on the northern edge of Upper Chewaucan Marsh, east of Paisley. Apparently because these archaeological tests did not contribute directly to the primary research objectives at the time, they received little attention after the field season and never were analyzed or published. These excavations are of great value now, however, since recent research concerns in the region have focused on later Holocene cultural adaptations, especially the development of semisedentary pit-house villages (Pettigrew 1985; Oetting 1988, 1989).

The existence of large house depressions

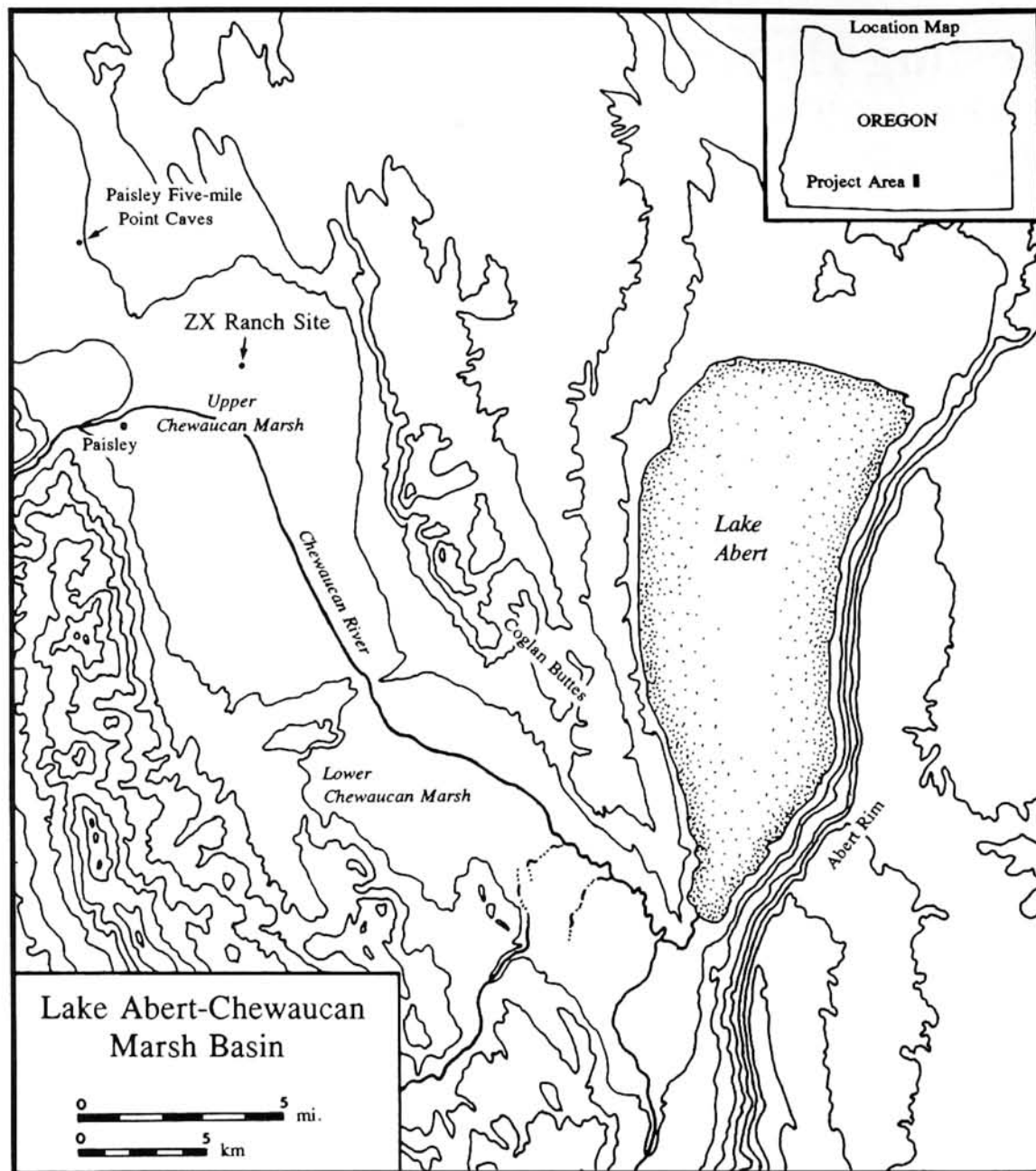


Fig. 1. The Lake Abert-Chewaucan Marsh Basin.

and circular rock rings at archaeological sites in the Lake Abert-Chewaucan Marsh Basin was not recognized in the professional literature until the 1970s, when numerous village sites were recorded along the shores of Lake Abert (Pettigrew 1980). Proposed

highway construction prompted excavations at a number of sites on the east shore of the lake, and test units were placed in 13 depressions and two rock rings at 13 sites (Pettigrew 1985; Oetting 1989:130-143). However, the test units employed were not

designed to explore or define the structure and function of the features. Single 1x1-m. test pits were placed in 12 depressions and one rock ring; a 2x2-m. unit was placed in a second rock ring; and one depression was sampled with a 1x1-m. unit and a 2x2-m. unit. No large-area excavation, trenching, or cross-sectioning of any depression was attempted. Identifiable house floors, rims, or hearths were found in only five of the tested features (Oetting 1989:142).

Cressman and his field party recognized the house depressions at the ZX Ranch site as cultural features, and their excavation strategy reflected this. Trenches were placed across each of the house pits to expose and profile such features as floors, rims, or hearths. Thus, these early archaeological tests are still the most extensive excavations of house features in the Lake Abert-Chewaucan Marsh Basin. Fortunately, the field notes, artifacts, and some photographs from these 1939 tests have been curated for the last fifty years at the Oregon State Museum of Anthropology, University of Oregon, Eugene (stored under Accession No. 61). This material was located and analyzed to provide more data on house pits in the Lake Abert-Chewaucan Marsh Basin as part of a larger research project (Oetting 1989). This article is meant to recognize and document the ZX Ranch site excavations.

The examination and analysis of this collection included a review of the field notes (Cressman 1939:8, 14-16) and photographs; classification of the projectile points and other artifacts; and construction of feature maps from the transit notes. All of the chipped-stone tools and the nonlithic implements were located and examined during the analysis, but only 13 of the ground-stone and cobble tools were available for examination.¹ The field notes were invaluable in preparing the narrative of the testing and description of the

features that are presented below. However, the notes are overly brief in discussing artifact proveniences and the characteristics used to distinguish features such as house floors. Likewise, some of the descriptions in the transit log do not fully explain the significance of the mapped location, and photograph descriptions are similarly cryptic. These descriptions probably contained sufficient information, as mnemonic devices, for the excavators and mappers who had been in the field, but to an investigator 50 years later they are often enigmatic. These shortcomings, however, are minor, and the various existing records and artifacts, in combination, provide a good picture of the work accomplished during the exploration and testing of the ZX Ranch site.

NATURAL SETTING

Pluvial Lake Chewaucan filled the Lake Abert-Chewaucan Marsh and the Summer Lake basins during the Pleistocene (Allison 1982:12). The Summer Lake Basin became isolated during this period, but the sub-basins of Upper Chewaucan Marsh, Lower Chewaucan Marsh, and Lake Abert still are connected hydrographically by the Chewaucan River (Fig. 1). The river flows onto the basin floor at Paisley, passes through the two marshes, and drains into Lake Abert, the largest closed-basin saline body of water in the Pacific Northwest (Phillips and Van Denburgh 1971:B2).

The sharp fault-block relief and arid climate of the region are typical of the Oregon high desert and the northern Great Basin. The Lake Abert-Chewaucan Marsh Basin is on the northern edge of the Basin and Range Geomorphic Province. The very flat basin floor consists of two grabens bounded by tilted fault-blocks with steep fault-scarp rims. Summers are warm and dry, with significant diurnal temperature variation, and

winters are cold. Precipitation is sparse and generally comes in winter and spring.

The Upper and Lower Chewaucan marshes were freshwater bulrush-cattail wetlands maintained by the river in the bottomlands of the marsh sub-basins. Prior to marsh draining and irrigation, the flow of the river sank into the upper and lower marshes, rising only at the Narrows, and exited at the southeastern end of Lower Chewaucan Marsh (Waring 1908:31). Use of Chewaucan River water for irrigation and the draining of marsh land for cultivation began in 1884, and development continued until 1915. The river is now channeled through the former marshes and supplies irrigation water to about 41,000 acres of reclaimed marsh land (Phillips and Van Denburgh 1971:B13). All of the upper marsh and much of the lower marsh now are cultivated.

THE 1939 FIELD INVESTIGATIONS

On June 17, 1939 several members of the University field party inspected a site which was reputed to contain a number of burials east of the town of Paisley. The site was dubbed the "ZX Ranch Site" since it was (and still is) owned by the ZX Ranch, one of the largest ranch operations in Oregon. Directions recorded in the 1939 field notes place the site approximately one mile east of the ZX Ranch "Red House" building (Cressman 1939:8), on the northern edge of Upper Chewaucan Marsh.

The site was on high ground bordering the marsh, and a local informant stated that swampy marshlands had extended to the base of this high ground prior to the channeling of the Chewaucan River. Some of these high points had formed islands along the edge of the wetlands. Most of the burials seemed to be eroding out of a small mound on the high ground of one of the former islands. Several burials already had been taken from the site,

but the archaeologists observed several more in place and noted the presence of several circular depressions, thought to be house pits, along with cultural debris on the surface.

Preliminary Exploration

Permission to excavate was obtained, and the field crew returned on June 22 to begin work, only to find that "somebody [had] pot-hunted the likely burials" (Cressman 1939:14). Undaunted, the party decided to do some "exploratory digging" across the site. Four 2x2-m. pits were excavated, three of them approximately 12 m. apart on a southwest-to-northeast line and a fourth 7 m. northwest of the southwestern unit. No artifacts were collected from these excavations, but this work indicated that the burials and surface artifacts probably had been exposed by wind erosion and now were lying on a deflated surface. The excavators uncovered several "large chunks" of charcoal, but, this being prior to the development of radiocarbon dating, the specimens were not retained. The field crew then began sieving the loose surface sediments (using 1/2-in. mesh) and found a number of projectile points and other implements, which were collected. These artifacts included 44 classifiable projectile points, 82 other flaked-stone tools, 40 hammer/choppers, and 32 ground- or pecked-stone implements (see Table 1).

After skimming and sieving the loose surface material, the field crew spent the remainder of the day informally surveying the higher points along the former marsh shoreline. They reported several localities with circular depressions and observed a number of flaked- and ground-stone tools. Unfortunately, none of these finds were recorded or mapped.

Excavations in House Depressions

The following day the field crew returned

THE HOUSE FEATURES

Table 1
ARTIFACTS FROM THE SURFACE
OF THE ZX RANCH SITE
ACCESSION NO. 61

Catalog Number Range	Type of Artifacts	Number of Specimens
1-10040, 1-10041	Unformed bifaces	12
1-10093 to 1-10204	Formed bifaces	32
1-10211 to 1-10228	Drills ^a	3
1-10264 to 1-10302	Projectile points	44
1-10304 to 1-10337	Other classified specimens:	
	Formed scrapers	7
	Graver/gouge	1
	Retouched flakes ^b	24
	Unworked obsidian "needles"	3
	Hammer/choppers	40
	Chopper	1
	Manos	9
	Metates	3
	Pestles	10
	Mortars	10
	Hollow bone	1
	Incised stone	1
Total		201

^a Two made of obsidian, one of chert.

^b 21 made of obsidian, two of chert, and one of basalt.

to the site and excavated in three of the circular depressions. These excavations completed the archaeological investigations conducted at the ZX Ranch site. The depressions were designated "Housepit No. 1 [sic]," a single large pit, and "Housepit No. 2 [sic]," two smaller depressions positioned adjacent to one another. Two trenches, forming an "L" shape joined in the center of the depression, were excavated in House Pit No. 1 (Fig. 2a). A single east-west trench was dug in House Pit No. 2, from the center of the western pit across the eastern pit to its eastern edge (Fig. 2b). The two features were about 32 m. apart, and this area was 180 m. from the pits excavated the previous day.

House Pit No. 1

This large circular depression was surrounded by a low berm, or ridge, of clayey earth (Fig. 2a). The diameter of the pit within this ridge was 6.7 m., and the outside diameter was 9.5 m. The house pit had been dug into the original ground surface to a depth of about 30 cm. The outer edge of the pit had a low ridge built up about 15 cm. above the original surface. No timbers or postholes were located in the excavated portion of the house. A piece of thatching, consisting of grass, twigs, stems, and bark, was found in the Museum's collections (OSMA catalog No. 1-34469 [Connolly 1986]). A note with this specimen stated it was from the "north end of house pit, ZX Ranch," but no mention of this thatching has been found in the field notes.

The fill of the house pit contained approximately 30 cm. of decomposed organic matter mixed with charcoal, which was overlain by the surface sod. It is unclear from the excavation notes whether a discernible house floor was observed, but the impression gained is that at least one floor was identified. A fire pit containing ash and charcoal was located just southeast of the center of the depression, 15.2 cm. below surface. The pit was not lined with stone, but did contain a lining of sand.

Twenty-six tools were recovered from House Pit No. 1 (Table 2). A large metate was found on the surface at the eastern edge of the depression. A bone awl and antler flaking implement were discovered *in situ* in the shorter trench, as was a perforated stone disc. A second stone disc ornament came from the west wall of the trench. The other collected tools came from the pit fill and were recovered in the screens. These artifacts included 10 projectile points, three formed bifaces, a scraper, two used flakes, a hammer/

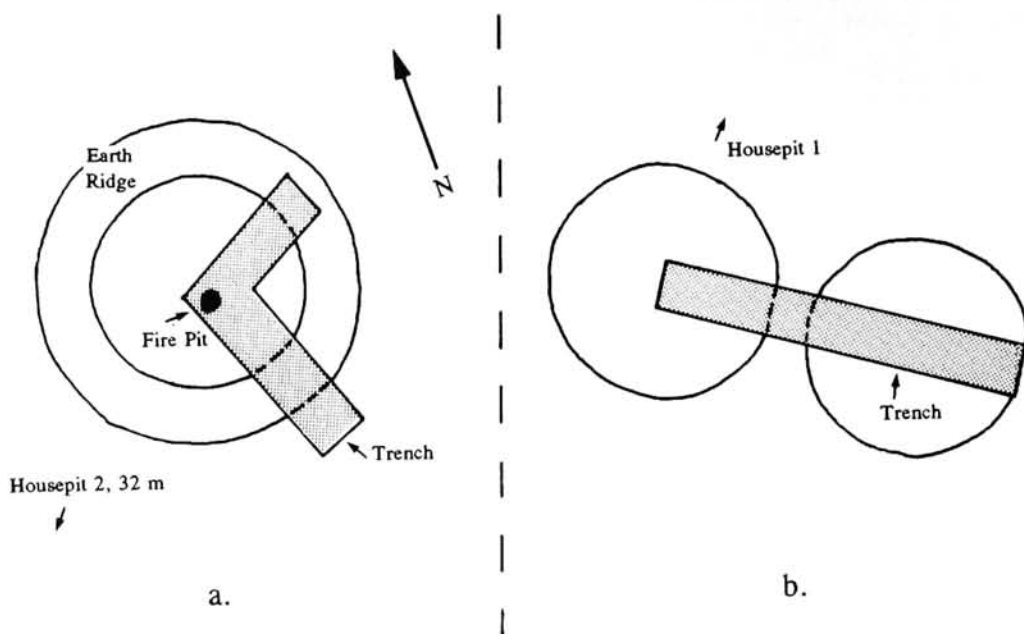


Fig. 2. Plan views of the tested house pits: a, House Pit No. 1; b, House Pit No. 2.

Table 2
ARTIFACTS FROM THE HOUSEPITS
AT THE ZX RANCH SITE
ACCESSION NO. 61

Catalog Number Range	Type of Artifacts	Number of Specimens
House Pit No. 1		
1-10205 to 1-10210	Formed bifaces	3
1-10234 to 1-10252	Projectile points (classified)	10
1-10338, 1-10339	Formed scraper	1
	Retouched flakes	2
	Hammer/choppers	1
	Manos	4
	Metates	1
	Antler flaker	1
	Bone awl	1
	Stone discs	2
Total		26
House Pit No. 2		
1-10340	Unformed biface (chert)	1

chopper, and four manos. Lithic debitage was present in the fill, but these flakes were not counted or kept.

House Pit No. 2

This feature consisted of two depressions. The western pit was 6.1 m. in diameter. No measurements were recorded for the other depression, but sketches in the field notes indicate it was about the same size, 6 m. (Fig. 2b). These two depressions were smaller and less "impressive and clear-cut," according to the excavators. Neither pit had a raised outer ridge similar to that of House Pit No. 1. A clearly defined house floor was outlined in the sidewall of the trench. A lens of sand was found in the fill near the center of the pit. Cressman (1939:16) noted that this probably was the fire pit but it had not been recognized as such during the excavation. Only one tool, a thick unformed biface of chert, was recovered in House Pit No. 2 (Table 2).

In sum, the distinguishing house components observed in the 1939 excavations include the following features. House Pit No. 2 had a house floor visible in the sidewall, and a floor may have been exposed in House Pit No. 1. Unfortunately, the criteria used in distinguishing the floors were not explained. All of the depressions had been excavated to a depth of at least 30 cm. into the original ground surface. The pit of House No. 1 was slightly larger in diameter than the pits comprising House Pit No. 2 (6.7 m. compared with 6.1 m.) but the sizes are relatively uniform. A low protective ridge of sediment surrounded House Pit No. 1, increasing the overall diameter of the structure to 9.5 m. Both had internal fire pits near the center of the depression which were marked by sand. The fire pits were not stone-lined.

COLLECTED ARTIFACTS

In all, 228 tools were collected, 201 from the surface, 26 from House Pit No. 1, and one from House Pit No. 2 (Tables 1 and 2). Projectile points comprised the largest category of tools collected at the ZX Ranch site and are used below in determining the age of this occupation, since no radiocarbon determinations could be made. All 54 points were made of obsidian. Forty-four points were collected during the surface sieving and include 38 narrow-necked Rosegate series specimens, four broad-necked Elko series specimens, one Gatecliff Split Stem, and one small Northern Side-notched point (Table 3). Ten more projectile points were found in the fill of House Pit No. 1, and the composition of this assemblage reflects the surface assemblage: seven Rosegate specimens, one small Gatecliff Split Stem-like specimen with a long narrow blade, a small Humboldt Concave Base, and a leaf-shaped specimen (Table 3).

Three drills and 48 other bifaces were recovered, most from the surface. Three

bifaces came from the fill of House Pit No. 1, in addition to the chert specimen from House Pit No. 2. This specimen and one chert drill were the only bifaces not made of obsidian. The majority of formed bifaces were oval or triangular, with rather thick cross sections. In general, they were not finely flaked. Several of these specimens have short stems, suggesting they were hafted. One specimen (catalog No. 1-10182) from the surface is a fragment of a lanceolate biface with very fine oblique parallel flaking. This implement is heavily worn from wind or water action and probably predates the primary site occupation.

There were eight obsidian formed scrapers, seven from the surface. They are made on flakes and were shaped by unifacial flaking although some edges exhibit bifacial flaking. Several of these implements may have been hafted. Recent large-scale testing on the east shore of Lake Abert did not produce any specimens comparable to these well-finished flake scrapers (Pettigrew 1985; Oetting 1988). However, some similar tools were collected during the 1984 survey in the lower Chewaucan River area (Oetting and Pettigrew 1985).

Twenty-six used flakes were collected, 24 from the surface. These specimens are primarily long, narrow blade-flakes, with extensive edge wear on the distal end and, often, on one lateral edge. They are uniformly complete, and most are obsidian, except for one basalt and two chert specimens. This tool type also is not well represented in the Lake Abert testing collections, where most used flakes show only minimal reworking of edges (Oetting 1988).

Over 10 percent of the flaked-stone tools collected at the ZX Ranch site have some cortex present on the specimen. Unfortunately, but not surprisingly for a 1939 excavation, no mention was made of the amount, type, or density of lithic debitage.

Table 3
PROJECTILE POINTS COLLECTED AT THE ZX RANCH SITE

Point Type	Surface Sieving	House Pit No. 1 Fill	Total
Rosegate series	38	7	45
Elko series	4	—	4
Gatecliff Split Stem	1	1	2
Humboldt Concave Base	—	1	1
Willow Leaf	—	1	1
Northern Side-notched	1	—	1
Total	44	10	54

Thirty-seven ground- or pecked-stone tools were collected, 32 from the surface and five from House Pit No. 1. The implements collected on the surface included 10 pestles and an equal number of mortars, nine manos, and three metates. A metate also was found on the surface of House Pit No. 1, and four manos were recovered from the fill of this house. Of the 37 ground-stone tools and 42 hammer/choppers collected, only 13 items could be located in the Museum collections.¹ They seem quite similar to specimens collected in more recent systematic investigations in the region (e.g., Pettigrew 1985; Oetting and Pettigrew 1985, 1987; Oetting 1988). Three mortar fragments were relocated: two rims, smoothed but undecorated, and a thick bucket-mortar base. A single mano, from the House Pit No. 1 fill, was identified. It is not handled, and both sides were used. The medial fragment of a large pestle, a small metate fragment, and seven hammer/choppers also were relocated and examined.

CHRONOLOGY

A regional cultural chronology has been defined for the Lake Abert-Chewaucan Marsh Basin, based primarily on statistical analyses of cross-dated projectile point styles (Oetting 1989:77-115). Six temporal periods were designated, each characterized by a primary point type or combination of types, and site-occupation periods were assessed by the

proportions of specific point types present in each component (Tables 4 and 5). The temporal spans of the Middle and Late Archaic periods in this basin are supported by 12 radiocarbon age determinations ranging from $3,480 \pm 130$ B.P. to 110 ± 70 B.P. from the excavations on the east shore of Lake Abert (Oetting 1989:81).

The ZX Ranch site projectile point assemblage is dominated by narrow-necked Rosegate series points, which comprise 86% of the surface-collected specimens and 70% of the points found in House Pit No. 1. This proportion of Rosegate series points suggests that the site and, in particular, House Pit No. 1, was occupied within the last 2,000 years, in the Late Archaic II period (Tables 3 and 5).

THE ZX RANCH SITE HOUSES IN REGIONAL CONTEXT

Archaeological and ethnographic data on house structures from the northern and western Great Basin reveal that the ZX Ranch site house remains, along with those elsewhere in the Lake Abert-Chewaucan Marsh Basin, most closely resemble the semisubterranean earth lodges and mat houses constructed by the late prehistoric and ethnographic Klamath or Modoc (Oetting 1989:161-163). The Northern Paiute, who ranged over the region at the time of contact, generally did not construct buildings over excavated pits, although in western Nevada shallow pits occasionally were dug if families

Table 4
LAKE ABERT-CHEWAUCAN MARSH BASIN CULTURAL CHRONOLOGY^a

Period	Associated Projectile Point Types	Age
Late Archaic (I and II)	II: Rosegate series I: Rosegate and Elko series	2,000 B.P. – Historic
Middle Archaic (I and II)	II: Elko series I: Elko series/Gatecliff Split Stem	4,000 B.P. – 2,000 B.P.
Early Archaic	Northern Side-notched	7,000 B.P. – 4,000 B.P.
Initial Archaic	Great Basin Stemmed	11,000 B.P. – 7,000 B.P.

^a After Oetting (1989:108).

Table 5
CRITERIA FOR CLASSIFICATION IN THE REGIONAL CHRONOLOGY^a

Period	DSN/CT	RGS	ES	GSS	GCS	NSN	GBS ^b
Late Archaic II	>0%	>50% ^c	<20%	<10%	>0%	–	–
Late Archaic I	–	25-50%	25-50%	10%	>0%	–	–
Middle Archaic II	–	<15%	>50%	>10%	–	–	–
Middle Archaic I	–	–	25-50%	25-50%	–	–	–
Early Archaic	–	–	>0%	>0%	–	>20%	>0%
Initial Archaic	–	–	–	–	–	>0%	>20%

^a After Oetting (1989:110).

^b DSN = Desert Side-notched; CT = Cottonwood Triangular; RGS = Rosegate series; ES = Elko series; GSS = Gatecliff Split Stem; GCS = Gatecliff Contracting Stem; NSN = Northern Side-notched; GBS = Great Basin Stemmed.

^c Required conditions for classification are italicized.

wintered in the mountains near pinyon groves (Fowler and Liljeblad 1986:443). Paiute dwellings, both the infrequent pit houses and the common surface brush and pole houses, measured between 2.4 m. and 4.5 m. in diameter.

Klamath and Modoc earth lodges were substantial structures. These dwellings varied from 3.6 m. to 12 m. in diameter, and their pits were excavated from 30 cm. to 1.5 m. in depth (Spier 1930:197ff; Ray 1963:146ff). Ethnographic structures generally had central posts, but the presence of postholes is variable in prehistoric Klamath examples (Cressman 1956:437). Central fire hearths were common in both ethnographic and prehistoric structures and generally were not lined with stone (Spier 1930:203; Cressman 1956:436-443). Mat-covered houses, erected over pits 3 to 4 m. in diameter, sometimes were used for

winter dwellings by the less affluent Klamath (Spier 1930:202) and may have been common winter houses for the late prehistoric Modoc (Ray 1963:146). The ethnographic Klamath and Modoc often banked earth around the bases of winter structures, forming a low berm around the excavated house pit (Spier 1930:202; Ray 1963:155). Thus, the size (over 6 m. in diameter), depth (30 cm.), and configuration (the low ridge around House Pit No. 1) of the ZX Ranch site features suggest closer affinities to Klamath and Modoc structures than to those of the Northern Paiute. The fire pits and the low earthen ridge suggest that these were winter structures.

The age and setting of the ZX Ranch site fit well with recent research on settlement patterning in the Lake Abert-Chewaucan Marsh Basin (Oetting 1989). Over 70 sites

with house pit depressions or surface rock rings presently are known from the basin. Analyses of chronological and locational data from two large surface surveys (Oetting and Pettigrew 1985, 1987; Oetting 1989) and the excavations along the east shore of Lake Abert (Pettigrew 1985; Oetting 1988) suggest that these village sites first appeared in the archaeological record during the Middle Archaic period of the regional chronology, dated to between 4,000 and 2,000 years ago. However, villages were most common during the Late Archaic, especially during the most recent portion (Late Archaic II), less than 2,000 years ago and possibly within the last 1,000 years. The Late Archaic II period and the ZX Ranch site are characterized by projectile point assemblages dominated by Rosegate series points.

Twenty of the 32 dated village sites in the basin are Late Archaic II in age, including the ZX Ranch site. The majority of undated village sites occur in locations typical of the Late Archaic II and differ from the settlement patterns discerned for earlier periods. Village sites in general, and Late Archaic II sites in particular (village and nonvillage), were preferentially located near stable, modern (prereclamation) water sources, as is the case with the ZX Ranch site and its location along Upper Chewaucan Marsh. These settlement-subsistence patterns indicate the development of an increasingly sedentary lifestyle that took advantage of the nearby wetlands resources. Further, these settlement patterns and the house forms exemplified by the ZX Ranch site parallel those of the late prehistoric Klamath to the west (Cressman 1956:463-465; Oetting 1989: 231-236), suggesting that the Late Archaic II inhabitants were culturally affiliated with the Klamath, who spoke a Penutian language (Oetting 1989).

CONCLUSIONS

The 1939 excavations at the ZX Ranch site were brief and the available records are incomplete, but the work is important nonetheless. These were the first examinations of house pits in the region and are still the most extensive exposures of individual depressions. They were purposefully excavated by professional archaeologists to investigate these depressions as *cultural features*. The testing strategy recognized these features as house pits, and excavations were directed at obtaining information on the structure of the features. Despite the lapse of 50 years between the fieldwork and its reporting, these excavations still provide valuable primary data for discussing the structure and age of house pits in the Lake Abert-Chewaucan Marsh Basin. Finally, this study demonstrates the value of museums in the long-term curation of archaeological collections and supporting documentation, as well as the research potential of curated collections, regardless of their age.

NOTE

1. The ground-stone and heavy cobble artifacts are listed by tool type in the Museum accessions catalog. Unfortunately, the original storage of the Museum's larger specimens was poorly organized and only now is being upgraded. Thus, few of these tools could be relocated during the course of this study.

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REFERENCES

- Aikens, C. M.
1982 Northern Great Basin Archaeology. In: *Man and Environment in the Great Basin*, D. B. Madsen and J. F. O'Connell, eds., pp. 139-155. Society of American Archaeology Papers No. 2.
- Allison, I. S.
1982 *Geology of Pluvial Lake Chewaucan, Lake County, Oregon*. Oregon State University Studies in Geology No. 11.
- Connolly, T. J.
1986 *Catalog of Prehistoric Basketry and Other Perishables from Eastern Oregon*, Volumes 1 and 2. MS on file at the Oregon State Museum of Anthropology, University of Oregon, Eugene.
- Cressman, L. S.
1936 *Archaeological Survey of the Guano Valley Region in Southeastern Oregon*. University of Oregon Monographs, Studies in Anthropology 1.
1937 *Petroglyphs of Oregon*. University of Oregon Monographs, Studies in Anthropology 2.
1939 1939 Field Notes. Photocopy on file at the Oregon State Museum of Anthropology, University of Oregon, Eugene.
1942 *Archaeological Researches in the Northern Great Basin*. Carnegie Institution of Washington, Publication 538.
1951 *Western Prehistory in the Light of Carbon 14 Dating*. *Southwestern Journal of Anthropology* 7:289-313.
1956 *Klamath Prehistory*. *Transactions of the American Philosophical Society* 46(4).
1966 *Man in Association with Extinct Fauna in the Great Basin*. *American Antiquity* 31:866-867.
1988 *A Golden Journey: Memoirs of an Archaeologist*. Salt Lake City: University of Utah Press.
- Cressman, L. S., H. Williams, and A. D. Krieger
1940 *Early Man in Oregon: Archaeological Studies in the Northern Great Basin*. University of Oregon Monographs, Studies in Anthropology 3.
- Fowler, C. S., and S. Liljebld
1986 Northern Paiute. In: *Handbook of North American Indians*, Vol. 11, Great Basin, W. L. d'Azevedo, ed., pp. 435-465. Washington: Smithsonian Institution.
- Oetting, A. C.
1988 *Archaeological Investigations on the East Shore of Lake Abert, Lake County, Oregon, Volume 2*. Eugene: Oregon State Museum of Anthropology, OSMA Report 88-6.
1989 *Villages and Wetlands Adaptations in the Northern Great Basin: Chronology and Land Use in the Lake Abert-Chewaucan Marsh Basin, Lake County, Oregon*. University of Oregon Anthropological Papers 41.
- Oetting, A. C., and R. M. Pettigrew
1985 *An Archaeological Survey in the Lake Abert-Chewaucan Basin Lowlands, Lake County, Oregon*. Eugene: Oregon State Museum of Anthropology, OSMA Survey Report 85-5.
1987 *Archaeological Investigations in the Lake Abert-Chewaucan Basin, Lake County, Oregon: The 1986 Survey*. Portland: The Cultural Heritage Foundation Report No. 1.
- Pettigrew, R. M.
1980 *The Ancient Chewaucanians: More on the Prehistoric Lake Dwellers of Lake Abert, Southeastern Oregon*. Association of Oregon Archaeologists Occasional Papers 1:49-67.
1985 *Archaeological Investigations on the East Shore of Lake Abert, Lake County, Oregon, Volume 1*. University of Oregon Anthropological Papers 32.
- Phillips, K. N., and A. S. Van Denburgh
1971 *Hydrology and Geochemistry of Abert, Summer, and Goose Lakes, and Other Closed-Basin Lakes in South-Central Oregon*. United States Geological Survey Professional Paper 502-B.
- Ray, V. F.
1963 *Primitive Pragmatists, The Modoc Indians of Northern California*. Seattle: University of Washington Press.
- Spier, L.
1930 *Klamath Ethnography*. University of California Publications in American Archaeology and Ethnology 30.
- Waring, G. A.
1908 *Geology and Water Resources of a Portion of South-Central Oregon*. United States Geological Survey Water-Supply Paper No. 220.