

The Dimple Dell Site: Late Archaic-Formative Transition Period Occupations in the Salt Lake Valley

Lance M. McNees, Craig S. Smith
EcoLogic Environmental Consultants

Excavations at the Dimple Dell site (Site 42SL121) along Dry Creek in the Salt Lake valley yielded the remains of two Late Archaic-Formative transition period components dating to 1700 and 1540-1520 radiocarbon years before present (B.P.). The results of the excavation provide an opportunity to gain a better understanding of this relatively unknown period and of the relatively unknown prehistory of the Salt Lake valley. The two components represent residential campsite occupations during the mid-winter to late spring/early summer. The earlier component was represented by Feature 1, a stratified, roughly rectangular pithouse. The more recent component was associated with Feature 2, a shallow circular basin that was likely a pithouse or at least an enclosed work area. Arrow points and arrow point manufacture failures were recovered from each component, but no ceramic artifacts or evidence of maize were recovered. Subsistence activities apparently focused on the procurement of mountain sheep and mule deer. The recovery of duck bones and a sucker fish bone indicates that the adjacent riparian zone along Dry Creek was also exploited. The Feature 1 assemblage also reflects typical house-based domestic activities, including small-scale arrow point manufacture and arrow retooling, possibly clothing and/or basketry manufacture, and the use of ornaments and a bone gaming piece while the Feature 2 assemblage appears to reflect a range of specialized processing or craft activities, as shown by diverse, relatively specialized flake tools along with a drill and hafted knife fragment.

The transition from the Late Archaic period hunting and gathering lifeways to the Formative farming adaptations dating between 2100 to 1500 years ago is an important period in the prehistory of the northern Colorado Plateau and eastern Great Basin. Traits researchers often associate with the Fremont Formative period in Utah, including houses, storage structures, maize, the bow and arrow, and pottery were incrementally introduced both temporally and geographically during this period (Janetski 1993). This gradual shift from foragers to farmers was complex, with foraging remaining a viable adaptation option in many areas either as a full time or part time pursuit from the Late Archaic period into and throughout the Formative period (Simms 2008).

Houses consisting of shallow, elliptical to circular basins first appear in the regional archaeological record prior to 4000 years ago and occur sporadically throughout the remaining Late Archaic period (Janetski et al. 1991; Smith 2003;

Talbot and Richens 1993; Yentsch et al. 2009) and their presence steadily increases during the Late Archaic-Formative transition period. Clear evidence for early maize north of the Anasazi area comes from such sites as the Elsinore Burial in central Utah dating to 2150 years B.P. (Wilde and Newman 1989). Rose Spring or Rosegate arrow points, marking the introduction of the bow and arrow, occur in the region about 1700-1800 years B.P. (Holmer 1986; Janetski 1993). The sites belonging to this transition period lack pottery, which does not appear in the record until about 1500 years ago and comprises a trait defining the onset of the Formative period.

The picture emerging from the excavation of preceramic Late Archaic-Formative transition period sites in southern and eastern Utah is one of small villages or farmsteads characterized by basin-shaped habitation structures, large bell-shaped storage pits, bow and arrow technology, and maize farming supplemented by local wild resources. Among these sites is the Confluence

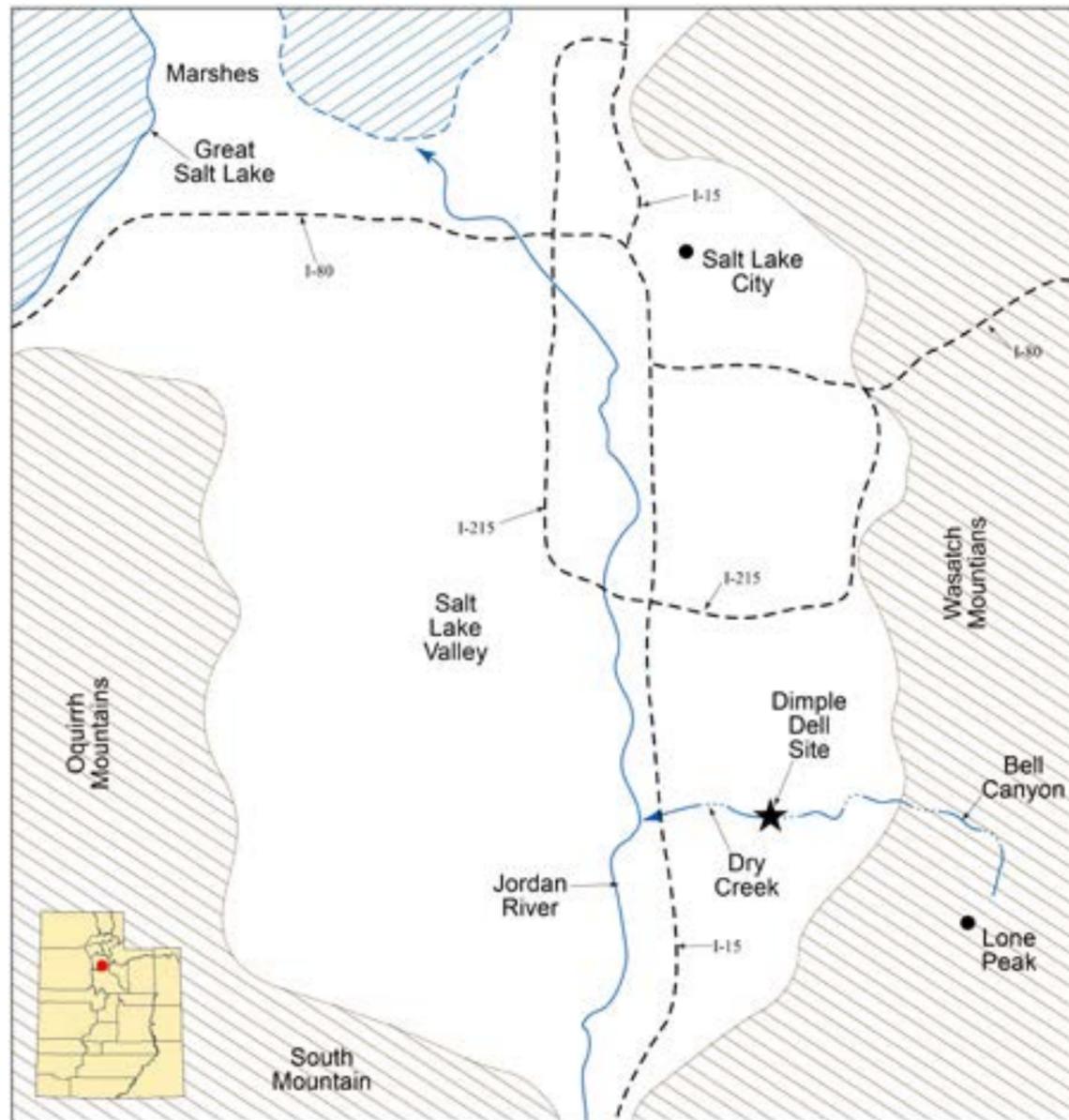


Figure 1. Location of the Dimple Dell Site Within the Salt Lake Valley.

site, located just east of the Old Woman Plateau in central Utah, which contained pithouses up to 7 m in diameter, bell-shaped pits, Rosegate arrow points, and maize, with two components with average radiocarbon ages of 1530 and 1317 years B.P. (Greubel 1998). A site in the Uinta Basin with similar attributes and evidence for maize is the Steinaker Gap site, with two occupations dating between 1790 and 1660 years B.P. (Talbot and Richens 1996). Some sites dating to this transition period such as the Icicle Bench site in Clear Creek Canyon in central Utah with an age of 1610 years B.P., lack evidence for maize and ceramics though still exhibiting a large circular basin-shaped house measuring 6.5 m in diameter (Talbot et al. 1999).

Less is known concerning this transition period in the area along the Wasatch Front. Clues concerning the use of this area adjacent to the marshes on the southeastern end of the Great Salt Lake comes from the excavation of a basin-shaped house feature at Site 42DV2 (Cannon and Creer 2010). Along with the basin-shaped house, the Formative period component at this site yielded an apparent storage feature, maize remains, and predominantly marsh resources including fish and waterfowl, along with the lack of pottery. The component yielded radiocarbon age estimates between 1360 and 1230 years B.P., much later than the excavated Late Archaic-Formative transition period sites in others parts of Utah.

The excavation of two Late Archaic-Formative transition period components dating to 1700 and 1540-1520 years B.P. at the Dimple Dell site (Site 42SL121) in an upland setting along Dry Creek within the Salt Lake valley provides additional information concerning this transitional period along the Wasatch Front (Figure 1). Two large features were excavated—a stratified pithouse (Feature 1) containing a shallow dual hearth and a deep pit, and a probable pithouse or enclosed work area (Feature 2) with a shallow dual hearth and shallow rock-filled basin. Temporally diagnostic artifacts include Rose Spring/Rosegate corner-notched arrow points and a side-notched point.

No ceramic artifacts or maize were recovered. The animal remains indicate that the pithouses were occupied during winter, possibly into late spring/early summer. This article presents the results of the excavations and then discusses the settlement and mobility patterns represented by excavated sites dating to this transition period in the Salt Lake valley and throughout Utah.

THE SITE

The Dimple Dell site is within Dry Creek valley in the Wasatch Front Valleys subdivision of the Basin and Range physiographic province on the eastern side of the Salt Lake valley (Stokes 1977). It is an extensive prehistoric site located in Dimple Dell Regional Park at which Archaic, Fremont, and Late Prehistoric period projectile points have been found (Figure 2). It was first recorded in 1988 during an archaeological inventory for a fence along the edge of the park (Richens 1988) and extended and updated during an inventory of the park in 1989 (Wilde and Southworth 1989). The site was described as a large, moderately dense scatter of heat-fractured cobble concentrations, heat-fractured cobbles, and flakes with a prominent, large charcoal-stained area near its eastern edge. The stained area was roughly 15 x 10 m in size, circular, and darkly charcoal-stained. The archaeologists who investigated the site in 1988 and 1989 observed an Elko corner-notched point, other Archaic point fragments, flakes, metate fragments, burned bone, and heat-fractured cobbles (Wilde and Southworth 1989; Uchtdorf 1988). Informants indicated that many Elko, Rosegate, and Desert side-notched points have also been collected from the site as well as “various other small projectile points” (Uchtdorf 1988), and that prior unauthorized excavations in the stained area yielded a stone ear spool, several bone awls, incised bird bones, and an incised flat pebble, among other artifacts (Uchtdorf 1988). A similar, and probably related site directly to the east has yielded Fremont ceramics, and Bear River side-notched, Humboldt concave



Figure 2. The Dimple Dell Site During Excavations Looking East Up Dry Creek Valley Toward the Wasatch Mountains.

base, Elko series and Desert side-notched points (Wilde and Southworth 1989).

Dry Creek is a tributary of the Jordan River that heads at and drains the northern slope of Lone Peak by way of Bells Canyon. The site is midway between the main mountain front and the Jordan River. It would have provided access to the resources of both the Wasatch Mountains and Salt Lake Valley as well as more immediately to the rich and diverse resources of the Dry Creek valley itself.

The site is associated with a bench north of Dry Creek at the edge of a broad upland terrace that slopes gently to the west. The bench formed when Dry Creek incised lakeshore deposits of the Provo Terrace (14,500 to 13,500 years before present) of ancient Lake Bonneville. The top of the bench is approximately 34 m (110 feet) higher than the adjacent creek bed.

The excavation block was midway down the valley side where the base of the steep slope from the bench top abuts the outer edge of a small

bench overlooking Dry Creek (Figure 3). The excavation block location has a southerly aspect that would have been beneficial during a winter occupation. The lake terrace deposits contain abundant quartzite, chert, and other cobbles that would have been readily available for use as heating stones and as sources of toolstone material.

Dry Creek is intermittent and lacks free-flowing water much of the year, but subterranean flows are present year round. Active springs flow year-round in the Seven Springs area just below the site, and a couple of springs are currently active on the opposite side of the valley. Additional springs might also have been present prehistorically in the vicinity of the site.

The native vegetation of the surrounding landscape is foothill grassland, but Dry Creek valley supports additional rich and diverse plant communities, especially in a prominent riparian zone along the creek (A/E Intra Group 1992). The riparian zone includes groves of deciduous trees

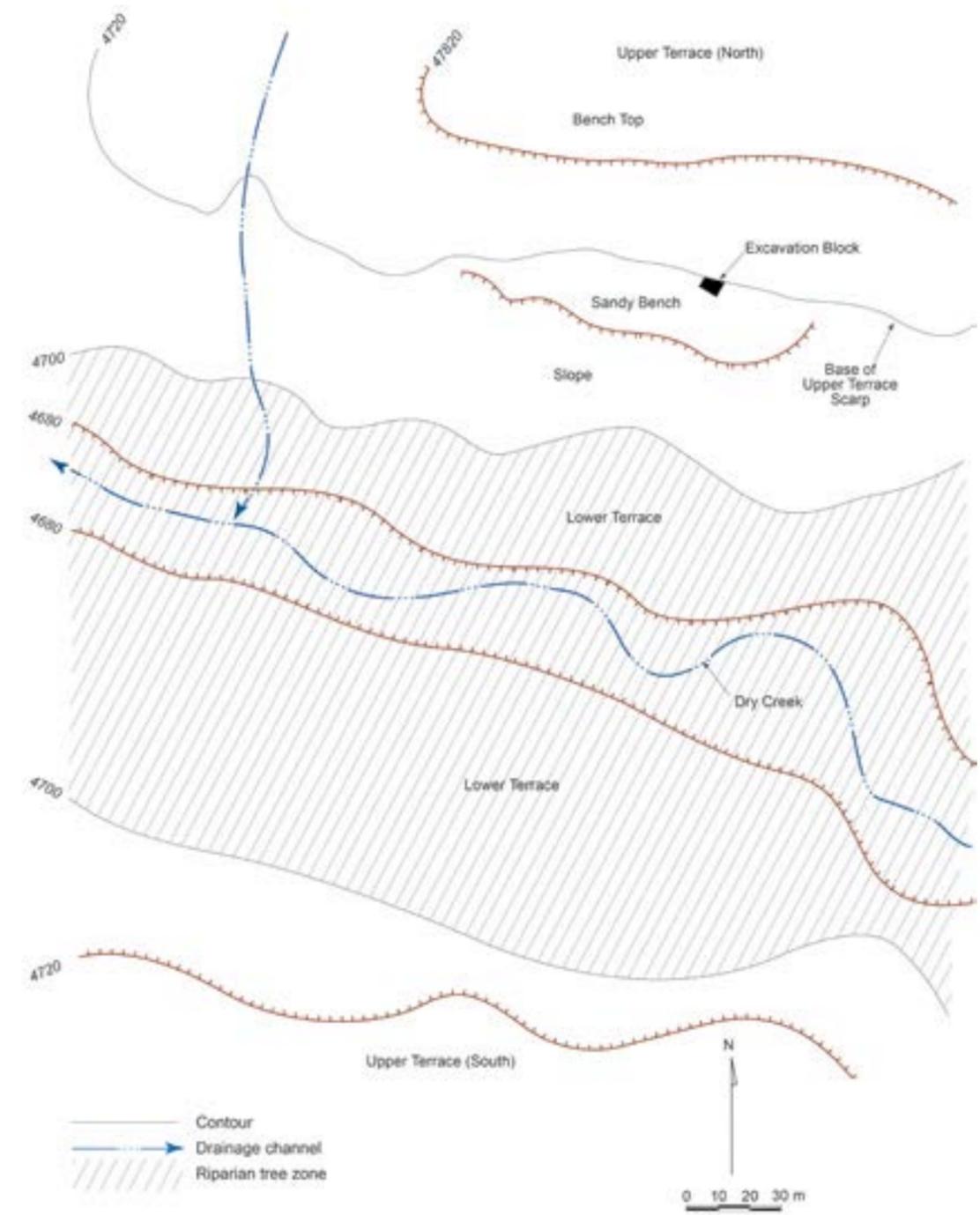


Figure 3. The Setting of the Excavation Block, Dimple Dell Site.

dominated by narrowleaf cottonwood, peachleaf willow, red osier dogwood, sandbar willow, water birch, and black hawthorn, with stands of Gambel oak, chokecherry, and black hawthorn on the slopes on the sides of the valley. Other riparian vegetation includes golden currant, Woods rose, and Baltic rush. Open areas support mixed shrubs and grasses. Common shrubs include big sagebrush, antelope bitterbrush, skunkbush sumac, rabbitbrush, fourwing saltbush, and Oregon grape. Grasses include western wheatgrass, bluebunch wheatgrass, Indian ricegrass, needle-and-thread, Sandberg bluegrass, and sand dropseed. These plant communities would have provided prehistoric inhabitants of the Dimple Dell site diverse resources, including wood for fuel, structures, and tools; fruits, seeds, and roots for food; and materials for textiles and weaving (Harrison 2015).

Dry Creek valley and the surrounding terrain also supports and historically supported diverse fauna, including large and small game animals (Harrison 2015). Large game animals native to the area include mule deer, elk, mountain sheep, and bison, bones of which have been found in the park. Small game animals in the area include black-tailed jackrabbit, desert cottontail, Uinta ground squirrel, and waterfowl.

METHODS

A 2 x 6-m excavation block was initially set up to encompass Feature 1 and the area of charcoal-stained sediment subsequently identified as Feature 2 (Figure 4). It was subdivided into three 2 x 2-m excavation units (12 m²). These were labelled as Units 1, 2, and 3 from east to west. The block was subsequently expanded to the north to encompass the remainder of Feature 1. Two additional 2 x 2-m excavation units

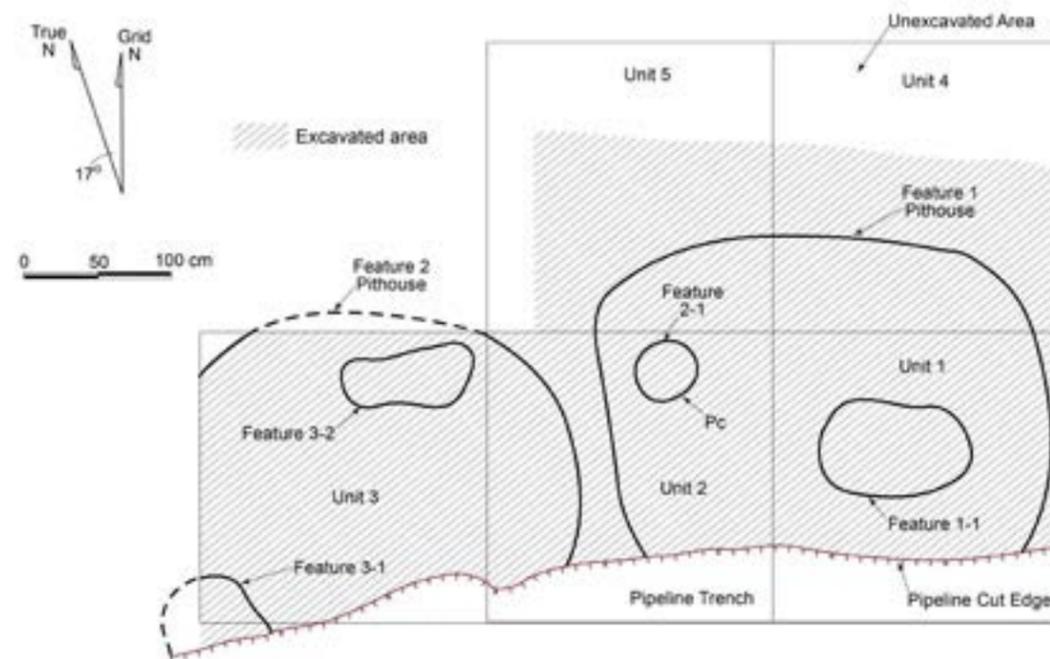


Figure 4. Plan Map of the Excavation Block, Dimple Dell Site.

Table 1. Radiocarbon Age Estimates, Dimple Dell Site (Site 42SL121).

Lab No. (Beta-)	Provenience	Age Estimate RCYBP ¹	Calibrated Years Before Present		Calibrated Calendar Years AD	
			Cal BP Intercept(s)	Cal BP 95% Probability Range	Cal AD Intercept(s)	Cal AD 95% Prob- ability Range
415824	Feature 1, Lower Fill	1700±30	1605	1695 to 1650	345	255 to 300
			1580		370	
			1575	1635 to 1545	375	315 to 405
415825	Unit 5, Stratum B	1520±30	1400	1520 to 1460	550	430 to 490
				1440 to 1435		510 to 515
				1420 to 1345		530 to 605
415826	Feature 2, Feature 3-1	1540±30	1410	1525 to 1355	540	425 to 595

¹ Conventional radiocarbon age estimate, years before present.

(Units 4 and 5) were set up, but only the portion of each necessary to fully encompass the feature was excavated. The additional excavated area encompassed approximately 4.5 m², for a total excavated area of approximately 16.5 m.

The overlying trench excavation backdirt and most of the overlying deposits were removed prior to the start of formal excavation. Formal excavation began with the removal of the remaining overlying deposits to the top of Features 1 and 2. The excavated deposits were of irregular thickness but generally ranged between 10 and 27 cm thick. The base of the deposits consisted of a mottled, lightly charcoal-stained layer overlying the two features. From the base of that layer, excavation was limited to the removal of the fill from Features 1 and 2 and their interior features. The final excavation block encompassed all of extant portion of Feature 1 and an estimated 95% of the total feature and an estimated 90% of the extant portion of Feature 2 and an estimated 75% of the total feature. Excavated sediment was screened using ¼-inch mesh hardware cloth.

DEPOSITIONAL CONTEXT AND STRATIGRAPHY

The excavation block was at the juncture of the outer edge of a small bench overlooking Dry Creek and the steep scarp of the high bench to the north. The features were excavated into a layer of colluvial brown poorly sorted silty sand with abundant rounded pebbles and cobbles (Stratum II) comprising redeposited lakeshore deposits. The colluvial deposits in turn rested on a very thick (> 3 m) deposit of unconsolidated poorly sorted white sand (Stratum I). The northern edge of Feature 1 and the base of Feature 2-1 were excavated through the bottom of the colluvial silty sand layer into Stratum I.

The lower portion of Feature 1 and all of Feature 2 contained very darkly (black) charcoal-stained silty sand (Lower Fill) containing abundant cultural remains that included stone and bone tools, stone debitage, burned and unburned bone fragments, and heat-altered rock. That sediment apparently accumulated in each feature during its period of occupation. The upper portion of Feature 1 contained moderately to darkly charcoal-stained silty sand heavily mottled with insect (cricket) burrows filled with charcoal-stained and unstained sediment (Upper Fill). It apparently filled the remainder of the

Table 2. Cultural Features, Dimple Dell Site.

Feature No.	Type	Dimensions (cm) ¹			Age Estimate (RCYBP)
		Length	Width	Depth	
1	Pithouse	310	250*	38	1700±30
1-1	Shallow dual hearth	110	74	13	-
2-1	Deep pit	50	45	34	-
2	Pithouse/work area	325*	275*	18	-
3-1	Rock-filled basin	85*	66*	10	1540±30
3-2	Shallow dual hearth	113	53	12	-

¹ * = entire feature not excavated, extrapolated dimension.

feature after abandonment, probably from the surrounding occupation surface, and is mottled with stained sediment displaced upward by burrowing insects. It contained a lesser, but still moderate density of cultural material consistent with the remains from the lower fill.

A mottled, lightly charcoal-stained layer formed across the surface encompassing and directly capping both features (Stratum III). It was generally 10 to 15 cm thick and contained moderately dense cultural material. It apparently formed during and/or shortly after the occupation of Feature 2, suggesting that it represents an occupation surface contemporaneous with Feature 2 or immediately afterward. It likely represents a palimpsest containing cultural material associated with the occupations represented by Features 1 and 2 and possibly a closely spaced subsequent occupation. Therefore, the cultural material from the layer is summarized separately throughout the following discussion and is not treated as if it is specifically associated with either of the two features.

The stained cultural layer was subsequently buried, and preserved, by colluvial silty sand migrating down the face of the slope to the north and across the bench top with which the two features were associated. Those sediments (Stratum IV) are identical to the sediments (Stratum II) directly underlying the cultural

layer. They were approximately 40 to 50 cm thick above the cultural layer at the northern (up slope) edge of the block tapering to an estimated 20 to 30 cm thick at the southern edge of the block.

RADIOCARBON AGE ESTIMATES

An age estimate of 1700±30 radiocarbon years before present (RCYBP) (Beta-415824) was obtained for a small charcoal sample obtained from very darkly charcoal-stained lower fill of Feature 1 and an age estimate of 1540±30 RCYBP (Beta-415826) was obtained for a small charcoal sample from Feature 3-1, a subfloor basin within the Feature 2 pithouse (Table 1). The difference between the age estimates is statistically significant at the 95% confidence level, indicating that they date from distinct occupations. A small charcoal sample from a mottled, lightly charcoal-stained layer (Stratum III) that capped Features 1 and 2 yielded an age estimate of 1520±30 RCYBP (Beta-415825), suggesting that it represents an occupation surface associated with the use of Feature 2.

CULTURAL FEATURES

The cultural features include the two large features, Features 1 and 2, as well as two features

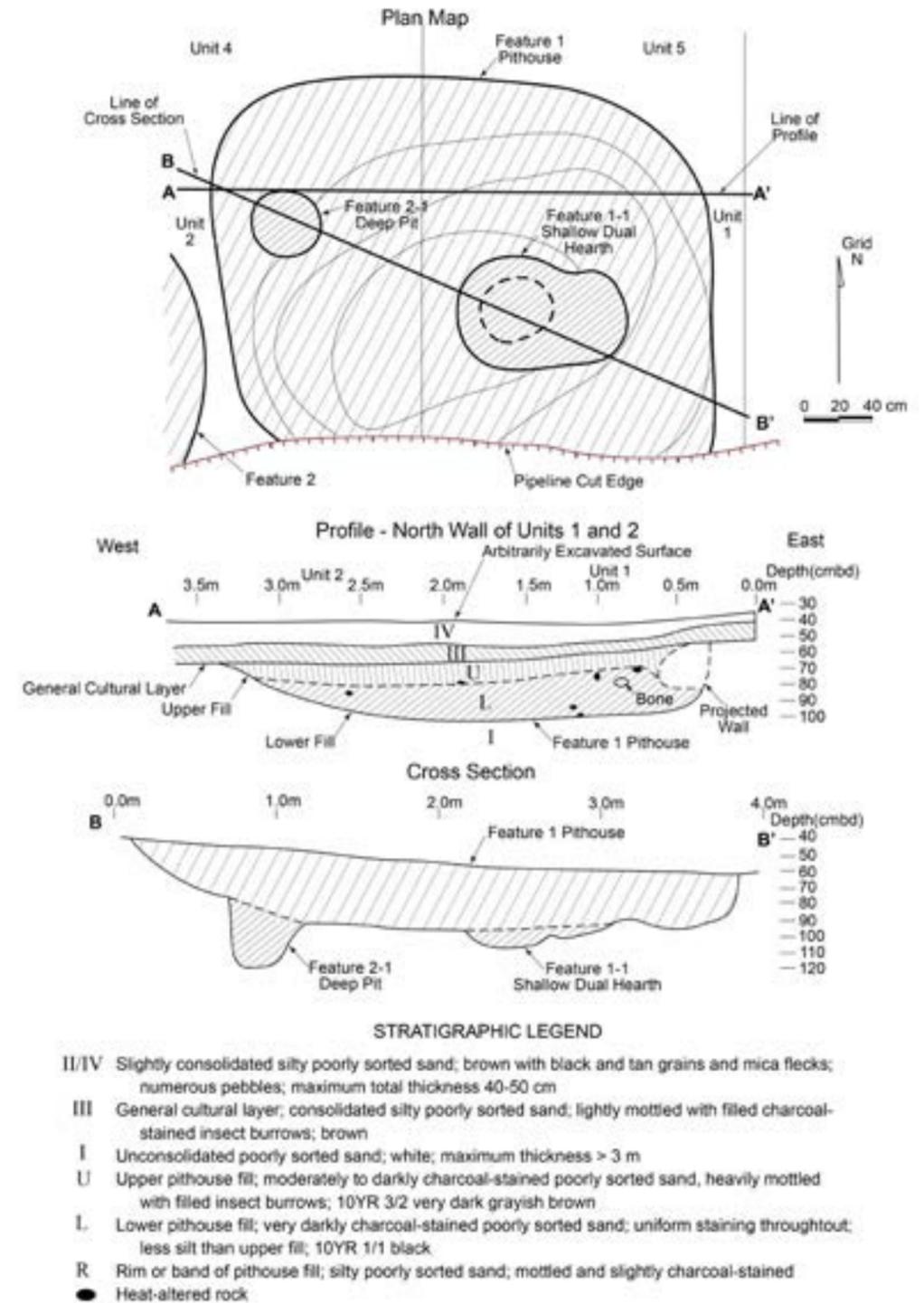


Figure 5. Plan and Profiles of Feature 1, Dimple Dell Site..

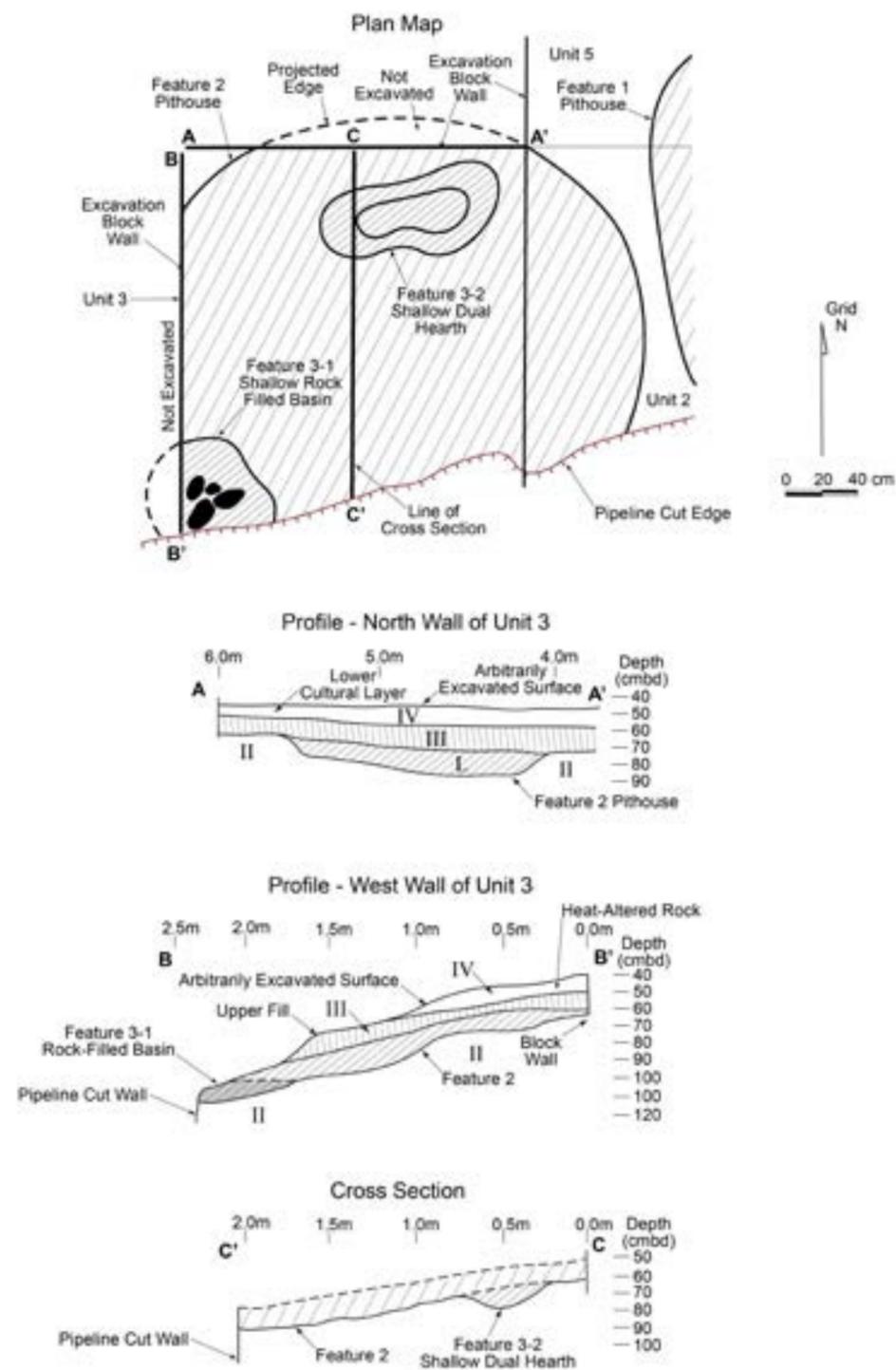


Figure 6. Plan Map and Profiles of Feature 2, Dimple Dell Site.

each excavated into the floor of each large feature (Table 2). Features 1 and 2 will be taken as the basic unit of analysis throughout most of the following discussion.

Feature 1 was a stratified pithouse that contained a distinctive shallow dual basin (Feature 1-1) and a deep pit (Feature 2-1) (Figure 5). The entire feature was excavated except its southern edge, which was slightly truncated during pipeline construction. It had an estimated area of 6.75 m², of which approximately 90% (6.1 m²) was excavated.

Feature 1 was roughly rectangular in outline with rounded corners. Its eastern and northern walls were vertical while its western wall sloped more gently. A 30-cm wide band of slightly charcoal-stained sediment capped the lower fill of the pithouse along its eastern edge and northeastern corner. It apparently represented a segment of wall that slumped into the pithouse during occupation, but was possibly a deliberately constructed ledge. No post molds or other clear-cut evidence of a superstructure were observed, but unfired angular tan clay nodules representing possible daub fragments were recovered from the upper fill, which also contained a higher silt-clay content than the lower fill.

Feature 1-1 consisted of a pair of shallow, small circular basins within and encompassed by a larger shallow elongated basin on the pithouse floor. It was interpreted as a probable hearth. The larger of the dual basins was 43 cm in diameter by 10 cm deep and the smaller was approximately 30 cm in diameter by 6 cm deep. A similar distinctive “dual hearth” was also excavated within Feature 2. Feature 2-1 was a deep pit near the northwestern edge of the pithouse. It contained very darkly charcoal-stained fill. No oxidized sediment or visible charcoal pieces were associated with either feature and each contained only a small amount of heat-altered rock.

The lower part of the Feature 1 pithouse basin contained a thick, uniform layer of very darkly (black) charcoal-stained fill 20 to 30 cm thick containing abundant cultural remains. That layer

of sediment apparently accumulated within the house during its period of occupation. The upper portion of the pithouse basin was filled with moderately to darkly charcoal-stained silty sand that apparently filled the remainder of the feature after abandonment, as noted above.

Feature 2 was a large, shallow circular basin filled with very darkly charcoal-stained sediment (Figure 6). It contained a shallow rock-filled basin (Feature 3-1) and a shallow “dual hearth” (Feature 3-2). It was also likely a pithouse, or at least a work area enclosed by a shelter or windbreak. For the purpose of the following discussion, it will be treated as a pithouse. It was shallower than Feature 1 and its base sloped to the south. Its northern and western edges extended beyond the edge of the excavation block and were not excavated and its southern edge was truncated during pipeline construction. Based on its extrapolated boundary, it had an estimated area of 8.25 m², of which approximately 70% (5.75 m²) was excavated. No post molds or other evidence of a superstructure were observed. Feature 2 was filled with a thick, uniform layer of very darkly (black) charcoal-stained fill up to 18 cm thick that capped the features on its floor. As with Feature 1, that deposit apparently accumulated within the house during its period of occupation.

Feature 3-1 was a rock-filled basin near the southwestern edge of Feature 2. It consisted of a cluster of unbroken cobbles clustered in the center of a shallow basin filled with darkly stained sediment that included a few small pieces of charcoal. The excavated portion of the feature contained four rounded quartzite cobbles ranging in size from 15 x 13 cm to 6 x 3 cm. Feature 3-2 was a pair of contiguous small, shallow circular basins that together formed a shallow elongated basin on the pithouse floor. The larger of the dual basins was approximately 52 cm in diameter by 12 cm deep and the smaller was approximately 44 cm in diameter by 6 cm deep. It contained a small amount of heat-altered rock. No oxidized sediment was associated with either feature.

Table 3. Cultural Material by Cultural Feature, Dimple Dell Site.

Provenience	Tools ²	Debitage	Bone		Heat-altered Rock ¹		Other
			Total	Burned	Count	Weight (kg)	
Feature 1							
Upper fill	2	27	578	302	67	5.340	Bone tube, stone bead
Lower fill	16	125	1706	1497	165	8.660	-
F1-1	1	1	12	11	3	0.020	-
F2-1	1	4	176	127	3	0.310	Gaming piece
Total	20	157	2472	1937	238	14.330	
Feature 2							
Fill	13	129	865	359	114	16.510	-
F 3-1	-	-	-	-	4	Not available	-
F 3-2	-	2	13	7	1	0.185	-
Total	13	131	878	366	119	>16.695	
Cultural Layer							
Total	3	26	520	233	206	15.250	-
Grand Total	36	314	3870	2536	563	46.275	

¹ The heat-altered rock totals include only specimens that were definitely fractured or fragmented; numerous entire cobbles were also present that lacked evidence of heat-alteration but might also have been used for heating purposes.

² Includes flaked stone, groundstone, and bone tools

Features 1 and 2 each contained abundant cultural material (Table 3). A significant amount of cultural material was also recovered from the charcoal-stained layer (Stratum III) that capped the pithouses. Each feature contained flaked stone and groundstone tools, flaked stone debitage, burned and unburned bone, and heat-altered rock. However, there were also significant differences between the assemblages, as will be discussed below.

TOOLS

Flaked stone, groundstone, and bone tools were recovered during the excavations. They are summarized by feature in Table 4. Photographs of selected flaked stone tools from Features 1 and

2 are provided in Figures 7 and 8, respectively. The stone tools are listed individually in Table 5.

Three arrow point styles are represented. The most common are corner-notched arrow points typically classified as Rose Spring or Rosegate (Thomas 1981). All eight Rose Spring points were recovered from the fill of Feature 1. Most were recovered from the lower pithouse fill, except one (T8) was recovered from Feature 2-1 and one (T5) was recovered from the upper fill. A proximal fragment of a typical Rose Spring point preform (T31) was also recovered from the lower fill.

Three Rose Spring points are entire, one specimen is missing its tip only, and three specimens consist of blades missing bases and tips. One point (T20) appears to have been broken during execution of the second notch at the final

stage of manufacture. Most of the points are or were small and thin, with narrow blades, sharp tips, and open corner notches. They are finely flaked, although several retain small unflaked areas on one face from the original flake blank from which they were manufactured. Several points (T2, T5, T6, and T7) have very finely serrated blades. One point (T1) diverges slightly from this pattern. It has a short, broader, more triangular blade with squared shoulders. The points exhibit neck widths ranging from 4.17 mm (T18) to 4.74 mm (T2) except one point (T5) has a neck width of 5.29 mm and the unfinished point (T20) has a neck width of 6.37 mm). The Rose Spring point preform (T31) is subacuminate in form.

Two Rose Spring points (T1 and T18) are obsidian, both sourced to Topaz Mountain (Hughes 2015). One point (T2) is a distinctive white opaque chert with black dendrites. The remainder are gray opaque chert (T5 and T20) grading into very fine-grained light gray metaquartzite (T6 and T7). The Rose Spring point preform (T31) is also gray chert.

Four bifaces are provisionally classified as leaf-shaped arrow points. Two specimens (T4 and T8) are from the lower fill of Feature 1, one (T21) is from the upper fill of Feature 1, and one

(T3) is from the general cultural layer in Unit 5 overlying Feature 1. They are all characterized by rounded bases with slight protuberances producing slight shoulders and subconvex blade margins. The protuberances range from 5.7 mm wide by 1.6 mm long (T4) to 9 mm wide by 4.0 mm long (T3). The protuberances appear to be a deliberate hafting modification, as does proximal thinning on some of the specimens and they have retouched, finished blade edges, resulting in the interpretation that they likely represent arrow points. However, the possibility that they are a distinctive Rose Spring preform style cannot be completely dismissed, although they contrast with the more typical form (e.g., represented by T31) and are heavier, wider, and generally thicker than the Rose Spring points from the site. They are also all different toolstone material than any of the Rose Spring points. One specimen (T4) is brownish gray chert, two are fine-grained metaquartzites (T3 and T8), and one is slightly coarser quartzite.

A third arrow point style is represented by a single point fragment (T11) from Feature 2. It was from a point with low, slightly expanding side notches producing a short, relatively broad stem with a flat base containing a single very small notch and sharp ears. The extant blade

Table 4. Summary of Stone and Bone Tools by Cultural Feature, Dimple Dell Site.

Provenience	Arrow points			Biface Tools	Other Bifaces	Flake Tools	Ground-stone	Bone Tools
	Corner-Notched	Side-Notched	Leaf-Shaped					
Feature 1 ¹	8	-	3	-	3 ²	-	1 ³	3
Feature 2	-	1	-	3 ⁴	2 ⁵	4	3 ⁶	2
Cultural Layer	-	-	1	-	2 ⁷	-	-	-
Total	8	1	4	4	5	4	4	5

¹ Feature 1 total includes a mano (T38) from Feature 1-1 and a leaf-shaped point (T8) from Feature 2-1.

² Acuminate preform fragment (T31) for a corner-notched point.

³ Granite mano (T38).

⁴ Hafted knife (T9), hafted knife stem (T10), drill (T13).

⁵ Point or preform tip (T12) and a possible blade of a unifacial corner-notched point (T15).

⁶ Possible mano fragments (T35, T36) and probable metate fragment (T37).

⁷ A fragment of a possible Paleoindian lanceolate point (T22) and a medium blank tip (T16).



Figure 7. Selected Flaked Stone Tools from Feature 1, Dimple Dell Site. Top Row from Left to Right: SL121-T1, SL121-T2, SL121-T5, SL121-T6, SL121-T7, SL121-T18, SL121-T19. Bottom Row from Left to Right: SL121-T4, SL121-T8, SL121-T21, SL121-T20, SL121-T31. (Scale in centimeters.)

margin slopes very steeply, indicating that the point had a very short blade. The point also had a relatively broader neck width (7.87 mm) relative to the Rose Spring points. It was made of a distinctive chert with opaque off-white inclusions in a more translucent grayish tan matrix. An arrow point or preform blade (T12) recovered Feature 2 is made of nearly identical toolstone and potentially derives from the same point or preform as the point, which might have been reworked after breakage, resulting in the latter's unusually short blade. However, the blade fragment is slightly browner in color.

A hafted knife (T9), the stem of a large hafted knife (T10), and a drill (T13) were also

recovered from Feature 2. The hafted knife is corner-notched with a thick blade. Both lateral blade margins have become concave due to resharpening. The hafted knife stem is similar in form to the complete hafted knife, except that it was from a much larger implement. The hafted knife has a neck width of 9.96 mm while the hafted knife stem had a neck width of 19.81 mm. The drill shaft has a lenticular cross section 5.78 mm by 3.26 mm at its thickest point mid-shaft. The hafted knife and drill are very similar dark red opaque chert toolstone, possibly from the same piece of raw material. The knife stem is medium-grained gray quartzite.



Figure 8. Selected Flaked Stone Tools from Feature 2, Dimple Dell Site. Top Row from Left to Right: SL121-T9, SL121-T10, SL121-T11, SL121-T12. Bottom Row from Left to Right: SL121-T13, SL121-T17, SL121-T33. (Scale in centimeters.)

A couple of indeterminate point fragments were also recovered. One (T15) appears to be the blade of an expedient corner-notched arrow point. It was recovered from Feature 2. It is a flake that has limited marginal bifacial retouch along one margin, unifacial retouch along the other margin. It broke between the tops of the two notches, possibly during manufacture, and had a neck width of approximately 11.0 mm. It is light gray fine-grained quartzite. The other point fragment (T22) is from the overlying cultural layer in Unit 5. It appears to be the proximal end of a lanceolate point with a rounded base, possibly a Paleoindian point, although no

grinding is present on the lateral margins. It broke transversely, after which a flake was removed from its proximal end on each face, suggesting that it might have been collected for expedient use by the site occupants. It is light gray opaque chert.

Three fragments of early stage bifaces that likely broke during manufacture were recovered. These include two fragments of small blanks (T14 and T39) that were likely arrow point manufacture failures, both from the lower fill of Feature 1. The other biface fragment (T16) is the pointed tip of a large, thin blank. It was recovered

Table 5. Stone Tools by Cultural Feature, Dimple Dell Site.

Tool No.	Tool Type	Type	Portion	Material Type	Dimensions (mm) ¹		
					L	W	T
Feature 1 ²							
T1	Arrow point	Rosegate/ corner-notched	Missing tip, base of stem, shoulders	Obsidian	14.5*	12.6*	3.1
T2	Arrow point	Rose Spring/ corner-notched	Missing tip	White dendritic chert	20.1*	10.4	3.2
T4	Arrow point	Leaf-shaped	Entire	Brownish gray chert	28.8*	17.4*	5.7
T5	Arrow point	Rose Spring/ corner-notched	Entire	Light gray chert	32.6	11.4	2.9
T6	Arrow point	Rose Spring/ corner-notched?	Midsection; missing end of blade, base of stem	Light gray quartzite	18.9*	11.3	2.6
T7	Arrow point	Rose Spring/ corner-notched	Entire	Light gray quartzite	24.5*	11.0	3.1
T8	Arrow point	Leaf-shaped	Entire except missing tip	Reddish purple quartzite	15.9*	16.9*	2.9
T18	Arrow point	Rose Spring/ corner-notched	Entire	Obsidian	26.7	11.4	3.2
T19	Arrow point	Rose Spring/ corner-notched	Missing stem and tip	Dark gray chert	18.7*	10.8	3.1
T20	Arrow point	Rose Spring/ corner-notched	Stem and one side of blade	Light gray chert	21.0	10.7*	3.0*
T21	Arrow point	Leaf-shaped	Entire	Dark gray quartzite	31.2*	17.0*	4.8*
T31	Biface	Arrow point pre- form	Proximal	Gray chert	12.8*	14.9	3.0
T14	Biface	Small blank	Distal	Dark red chert	26.3*	21.7*	7.9
T39	Biface	Small blank or preblank	Proximal	Reddish purple quartzite	13.1*	24.3	7.1
T38	Mano	Unifacial, small	Entire	White granite	83.3	76.9	46.9
Feature 2 ³							
T9	Hafted knife	Rose Spring/ corner-notched	Entire	Reddish-brown chert	49.7	20.4	6.3
T10	Hafted knife	Rose Spring/ corner-notched	Stem only	Light gray medium quartzite	19.3*	24.8*	6.8*
T11	Arrow point	Leaf-shaped	Part of stem and blade	Medium gray-white chert	13.4*	14.0*	3.1*
T12	Arrow point	Arrow point pre- form	Distal end of blade, missing tip	Semitranslucent white chert	14.5*	9.4	2.1
T13	Drill	Small blank	Entire	Reddish-brown chert	32.2*	15.4*	3.8
T15	Biface	Small blank or preblank	Blade	Light gray quartzite	22.2*	16.0*	4.0
T17	Flake tool	Unifacial, small	Entire	Medium gray quartzite	58.9*	23.8*	9.0*
T32	Flake tool	Flake knife	Entire	Cobble quartzite	81.5	49.4	23.5
T33	Flake tool	Toothed wedge	Entire	Cobble quartzite	67.9	51.9	28.5
T34	Flake tool	Wedge/plane	Entire	Coarse hard quartzite	63.8*	91.9	30.9
T35	Mano fragment	Unifacial?, large	Terminal	Coarse hard quartzite	94.4*	106.4	40.9

T36	Mano fragment	Unifacial?, large	Terminal	Coarse hard quartzite	40.9*	41.9*	41.6
T37	Metate fragment	Bifacial?, dished	Interior	Coarse hard quartzite	40.9*	41.9*	41.6
Cultural Layer							
T3	Arrow point	Leaf-shaped	Entire	Dark gray-brown quartzite	38.7*	14.7*	5.1
T16	Biface	Blank	Distal end of blade	Light gray with red chert	29.6*	33.9	6.8
T22	Biface	Final biface tool?	Terminal	Medium gray-white chert	23.9*	18.3*	6.5*

¹ All dimensions measured relative to the orientation of the tool; L = length, W = width; T = thickness; * = incomplete dimension measured across a break or less than maximal dimension for the complete tool.

² All tools recovered from lower fill except T38 recovered from Feature 1-1, T8 recovered from Feature 2-1, and T5 and T21 recovered from upper fill.

³ Specimen T14 originally classified as an expedient flake tool was determined to be unmodified debitage.

from the overlying cultural layer in Unit 3 above Feature 2. It is light gray fine-grained quartzite.

Four flake tools were recovered, all from Feature 2. All four tools are relatively large and tend to have specialized modifications. They include a distinctive composite tool (T17) that includes five spokeshave notches, as many as six possible graver tips, a straight bifacially retouched cutting edge, and a sharp edge showing unifacial use retouch, among other modifications. It is very fine-grained light gray metaquartzite. The remaining three flake tools are large tools made on large, thick cortical flakes removed from coarse quartzite cobbles. Specimen T32 is a primary flake that was unifacially flaked around its perimeter on its ventral face to produce a coarse cutting edge. Specimen T33 is a thick primary flake fragment that is roughly wedge-shaped in cross section from which a series of four flakes were systematically removed from the ventral surface to produce three sharp protrusions along the sharp edge of the wedge. Specimen T34 is a thick wedge-shaped primary flake with a single shallow flake removed from its dorsal surface at the center of its sharp distal end.

A complete small single-handed granite mano (T38) was recovered from Feature 1-1 on the floor of Feature 1. It is circular in outline. One face is heavily ground, including truncated quartz crystals, while the rest of its surface is

very rough. Two mano fragments and a metate fragment were recovered from Feature 2. All three were broken by exposure to heat. The mano fragments (T35 and T36) are each from rounded coarse quartzite cobbles that appear to have been expediently used as manos. Specimen T36 is heavily ground on the extant portion of one face and possibly lightly ground on the other. Specimen T35 is more problematic. The extant face of the cobble is smoothed, but it is unclear whether that reflects a grinding surface or instead remnant cortex that has otherwise exfoliated from the remainder of the cobble. The edges of the cobble might also have been used for pounding or pulverizing. The metate fragment (T37) is a blocky fragment from what appears to have been a basin metate shattered by heat. One face is heavily curved, suggesting it is from the edge of a deep basin, while the opposite face is gently curved, suggesting a shallower basin.

Numerous complete rounded quartzite cobbles were also recovered from Features 1 and 2. Some of those cobbles were potentially used as hammerstones. However, quartzite cobbles occur naturally in abundance throughout the surrounding deposits, and none of the cobbles observed during the excavation exhibited definite evidence of use as hammerstones.

The bone tools are listed in Table 6. Photographs of the bone tools are provided in

Table 6. Bone Tools from Feature 1, Dimple Dell Site.

Tool No.	Tool Type	Portion	Taxon and Element ²	Dimensions (mm) ¹			Description
				L	W	T	
T23	Bone awl	Entire	DSP metapodial	100.7*	8.6*	7.7*	Bone splinter with very sharp tip; highly polished
T24	Bone awl	Entire, but damaged	DSP probably tibia	71.6*	17.3	11.2*	Blunt tip, highly polished, blackened
T25	Bone tool	Entire	DSP distal tibia	73.1*	16.3*	8.9*	Bone with sharp polished tip
T28	Bone tool	Entire	DSP long bone diaphysis, possibly tibia	83.4	18.7	4.0	Tip rounded and polished, edges polished
T29	Bone tool fragment, possibly awl	Midsection	DSP	11.8*	9.1	3.3	Highly polished, burned

¹ All dimensions measured relative to the orientation of the tool: L = length, W = width; T = thickness; * = incomplete dimension measured across a break or less than maximal dimension for the complete tool.

² DSP = from a deer/mountain sheep/pronghorn-sized animal.

Figure 9. Four complete bone tools (T23, T24, T25, and T28) and one bone tool fragment (T29) were recovered from the lower fill of Feature 1. All of the bone tools were made on medium mammal (deer/mountain sheep) long bone fragments.

The complete bone tools consist of a split metapodial awl (T24) with a blunt tip; an awl (T23) with a very sharp tip made on a long, narrow long bone diaphysis fragment, probably from a tibia; an awl (T25) with a sharp tip made on a distal tibia fragments; and a long bone diaphysis fragment (T28), possibly from a tibia, with broad, rounded tip with very small step fractures resulting from use. Specimens T23, T24, and T28 are very highly polished in their entirety while only the tip of Specimen T25 appears to have been polished. Specimen T25 is also blackened, but apparently as a result of the polishing process rather than exposure to fire. The bone tool fragment (T29) is apparently a bone awl midsection. It is highly polished but burned.

FLAKED STONE DEBITAGE

Flaked stone debitage consists primarily of small flakes of fine-grained materials (Table 7). Materials represented include fine-grained to very fine-grained quartzite or metaquartzite, some medium-grained quartzite, various cherts, and a small amount of obsidian. The metaquartzite debitage is primarily gray, ranging from grayish white to light gray through gray to dark gray (together comprising approximately 70% of the total), with reddish to purplish gray being the next most common (approximately 25%). Other colors of metaquartzite and quartzite are also represented by one to several flakes each, including reddish brown, grayish brown, yellow, and red. The chert debitage is represented by a variety of colors, especially light gray (approximately 40% of the total), white and red to reddish brown (15% each), and tan to brown (11%), with one to several flakes each of other colors. These materials are consistent with the materials comprising the tools. Three obsidian



Figure 9. Selected Bone Artifacts from Feature 1, Dimple Dell Site. First Row: SL121-T23; Second Row: SL121-T24, SL121-T29; Third Row: SL121-T25, SL121-T28. Fourth Row: SL121-T27 (Bone Gaming Piece), SL121-T30 (Bone Tube Bead). (Scale in centimeters.)

flakes were analyzed by XRF, all of which are sourced to the Topaz Mountain source, which matches the two obsidian points.

Most of the flakes are small. Only 11 flakes (3.5%) exceed 3 cm in size, and most are smaller than 2 cm in size. They appear to reflect primarily the manufacture of small bifaces, mainly arrow point blanks, preforms, and points from small pebbles or flakes, and the manufacture or resharpening of flake tools. A significant proportion of flakes retain cortex, including an obsidian flake, apparently reflecting the use of pebbles as the main toolstone material form.

The proportions of quartzite to chert are virtually identical between Features 1 and 2 (Table 8). Obsidian debitage was recovered from Feature 1 only, but the majority of the obsidian

debitage was recovered from the general cultural layer in Units 2 and 3, suggesting that obsidian might have been associated with the Feature 2 occupation as well. However, the flakes in Feature 2 are much more heavily skewed to the smaller size classes and possess a substantially lesser proportion of cortical flakes. Both differences are statistically significant ($p < .01\%$). These contrasts might reflect a greater proportion of small biface manufacture in Feature 1 and a greater proportion of flake tool resharpening or manufacture in Feature 2, as suggested by the relative tool assemblages from each. The general cultural layer more closely resembles Feature 1 in both regards.

Table 7. Summary of Flaked Stone Debitage by Material Type and Size Class, Dimple Dell Site.

Material Type	Size						Cortical Flakes ¹
	< 1 cm	1-2 cm	2-3 cm	3-4 cm	4-5 cm	Total	
Quartzite ²							
No.	52	120	36	8	2	218	61
Percentage	23.9	55.0	16.5	3.7	0.9	100.00	28.0
Chert							
No.	20	59	9	-	1	89	13
Percentage	22.5	66.3	10.0	-	1.1	100.0	14.6
Obsidian							
No.	3	3	1	-	-	7	1
Percentage	42.9	42.9	14.3	-	-	100.0	14.3
Total							
No.	72	182	46	8	3	314	75
Percentage	22.9	58.0	14.6	2.5	1.0	100.0	23.9

¹ Flakes retaining cortex on their ventral surface.

² Predominantly fine-grained to very fine-grained quartzites or metaquartzites.

Table 8. Summary of Flaked Stone Debitage by Cultural Feature, Dimple Dell Site.

Provenience	Material Type			Size		Cortical Flakes ¹	
	Total	Fine-grained quartzite	Chert	Obsidian	≤2 cm		>2 cm
Feature 1							
No.	157	109	45	3	117	40	48
Percentage	100.00	69.4	28.7	1.9	74.5	25.5	30.6
Feature 2							
No.	131	93	38	-	121	10	20
Percentage	100.0	71.0	29.0	-	92.	7.6	15.3
Cultural Layer							
No.	26	16	6	4	19	7	7
Percentage	100.0	61.5	23.1	15.3	73.1	26.9	26.9
Total							
No.	314	218	89	7	257	57	75
Percentage	100.0	69.4	28.3	2.2	81.8	18.2	23.9

Table 9. Summary of Faunal Remains by Cultural Feature, Dimple Dell Site.

Provenience	Sample Size (NISP ¹)			Size Class (cm)			
	Total	Detailed Analysis	Burned/ Calcined	≤ 3 cm	3-5 cm	5-10 cm	
Feature 1							
No.	2472	278	1937	2031	359	75	7
Percentage	100.0	11.2	78.4	82.1	14.5	3.0	0.3
Feature 2							
No.	878	83	366	797	62	16	3
Percentage	100.0	9.5	41.7	90.8	7.1	1.8	0.3
Cultural Layer							
No.	520	78	233	466	43	10	1
Percentage	100.0	15.0	44.8	89.6	8.3	1.9	0.2
Total							
No.	3870	439	2536	3294	464	101	11
Percentage	100.0	11.3	65.5	85.1	12.0	2.6	0.3

¹ NISP = number of individual specimens; table does not include bone tools.

MISCELLANEOUS ARTIFACTS

A fragmentary stone bead (T26) and a bone tube bead (T30) were recovered from the lower fill of Feature 1, and a bone gaming piece (T27) was recovered from the fill of Feature 2-1 within Feature 1. The stone bead is approximately half of a small, thin, circular lignite disk bead with a central hole. The bead was approximately 9 mm to 10 mm in diameter by 1.6 mm thick with a slightly asymmetrical off-center hole approximately 4 mm in diameter. The bone tube bead is a section of a jackrabbit tibia diaphysis that was manufactured by incising the bone and snapping off a segment. The object classified as a bone gaming piece is a small, polished cylinder of solid bone from a medium or large mammal long bone diaphysis. It is slightly planoconvex in cross section with two broader faces and narrower sides and rounded edges and corners. Its faces have fine striations that were apparently deliberately incised. It is 48.5 mm long by 10.8 mm wide by 7.0 mm thick.

FAUNAL REMAINS

The faunal remains are summarized in Table 9. They consist predominantly of bone fragments, with a few broken bones and some teeth. Mass attributes recorded for all specimens by provenience included number of heat modified (burned or calcined) specimens and number of specimens per size class. A subset of specimens was selected from the overall sample for more detailed analysis. It consisted of specimens potentially classifiable to element and species, including specimens with complete or partial epiphyses or other distinctive attributes and larger bone fragments. Those specimens were analyzed intensively by Ron Rood (Rood 2015). Attributes recorded included species or faunal taxon, bone element, portion, breakage pattern, degree of weathering, and age of animal. Specimens were also scrutinized for cutmarks but none were observed, although a mountain sheep lumbar vertebra exhibits possible signs of chopping.

The faunal remains evidence a significant amount of bone processing. No complete bones from medium or large animals were recovered,

Table 10. Summary of Faunal Remains by Faunal Taxon and Cultural Feature, Dimple Dell Site.

Provenience	Faunal Taxon ¹									Total
	Lg-m	Md-m	Mtn Sheep	Mule Deer	Jack-rabbit	Cotton-tail	Rabbit-size	Sm-m	Other	
Feature 1	4	192	54	3	12	2	6	3	2 ²	278
Feature 2	-	60	3	15	2	1	2	-	-	83
Cultural Layer	2	39	-	8	17	1	8	-	3 ³	78
Total	6	291	57	26	31	4	16	3	5	439

¹ Lg-m = large mammal, larger than deer; Md-m = medium mammal, deer/mountain sheep/pronghorn size; mountain sheep = *Ovis canadensis*, includes specimens classified as probable mountain sheep; mule deer = *Odocoileus hemionus*, includes specimens classified as probable mule deer; jackrabbit = *Lepus* sp.; cottontail = *Sylvilagus* sp.; sm-m = small mammal, smaller than rabbit; mule deer and mountain sheep include specimens assigned both definitely and probably from these species.

² Bobcat/lynx (*Lynx* sp.) and mallard/pintail/teal duck (*Anas* sp.).

³ Dog/coyote (*Canis* sp.), lesser/greater scaup (*Aythya collaris/affinis*), and sucker fish (*Catostomus* sp.).

much of the bone was moderately fragmented, and many of the bone fragments were burned or calcined. Many of the medium mammal long bones exhibit spiral fractures that resulted from the extraction of marrow, including 77.0% of the specimens subject to detailed analysis from Feature 1 and 71.1% of the specimens from Feature 2. Bones that exhibited evidence of breakage to extract marrow include low utility mandibles and phalange as well as long bones. However, the bone assemblage does not exhibit evidence of processing typically associated with bone grease manufacture.

Feature 1 contained a greater number and density of faunal remains than Feature 2 and a strikingly greater percentage of burned specimens. Conversely, the bone from Feature 2 was generally more fragmented, as indicated by the greater proportion of specimens less than 3 cm in size. The relative proportions of burned specimens and of specimens less than 3 cm in size are statistically significant at the $p < .01$ level. The faunal remains from the general cultural layer closely approximate those from Feature 2 in contrast to Feature 1 in regard to both parameters, as well as in the dominance of

mule deer bone in comparison to mountain sheep bone.

The Feature 1 and 2 faunal assemblages both contain mountain sheep, mule deer, jackrabbit, and cottontail bone, and both assemblages are dominated overall by medium mammal (cf. mountain sheep or mule deer) bone, which comprises 89.6% of the analyzed Feature 1 sample and 94.0% of the analyzed Feature 2 sample (Table 10). A minimum (MNI) of four mountain sheep, three mule deer, four jackrabbits, and one cottontail are represented in the overall assemblage. The sample of bone classified to species or probable species for Feature 1 is heavily dominated by mountain sheep bone while the Feature 2 sample is dominated by mule deer bone: mountain sheep specimens outnumber mule deer specimens 18:1 in Feature 1 while mule deer specimens outnumber mountain sheep specimens 5:1 in Feature 2. The Feature 1 assemblage is also more diverse with a few specimens of large mammal bone, a bobcat/lynx bone, a duck bone, and small mammal bone. The bobcat/lynx specimen is a spiral fractured distal humerus from the lower pithouse fill while the duck (cf. mallard/pintail/teal bone) is a spiral

Table 11. Summary of Bone Elements by NISP, Mountain Sheep/Mule Deer, Mountain Sheep, and Mule Deer, Dimple Dell Site.

Element	Side			Total	Element	Side			Total					
	Left	Right	Unk			Left	Right	Unk						
Mountain Sheep/Mule Deer														
Cranium	-	-	5	5	Radius	-	1	-	1					
Premaxilla	-	1	-	1	Carpal	-	-	1	1					
Mandible	3	2	3	8	Femur	2	3	2	7					
Incisor	1	-	-	1	Tibia	5	4	4	13					
Tooth	-	4	-	4	Tarsal	-	-	1	1					
Tooth enamel	-	-	8	8	Metatarsal	1	-	-	1					
Thoracic vert	-	-	1	1	Metapodial	2	1	5	8					
Caudal vert	-	-	1	1	Distal sesamoid	-	-	1	1					
Vertebra	-	-	10	10	1st phalange	2	-	-	2					
Rib	-	1	34	35	2nd phalange	-	1	1	2					
Pelvis	-	-	1	1	Long bone	-	-	143	143					
Ilium	1	-	-	1	Unclassified	-	-	15	15					
Scapula	1	2	-	3	Total	24	26	241	291					
Humerus	6	6	5	17										
Mountain Sheep														
Occipital	-	-	7	7	Mule Deer									
Maxilla	1	-	-	1	Cranium	-	-	1	1					
Mandible	6	2	-	8	Mandible	1	3	-	4					
Premolar	-	-	1	1	Incisor	1	2	-	3					
Teeth	-	2	-	2	Humerus	-	1	-	1					
Lumbar vert	-	-	1	1	Radius	1	-	-	1					
Pelvis	-	7	-	7	Carpal	3	-	-	3					
Acetabulum	-	1	-	1	Acetabulum	-	1	-	1					
Humerus	-	1	-	1	Femur	-	2	-	2					
Femur	1	1	-	2	Tibia	1	1	-	2					
Tibia	1	1	-	2	Lateral malleolus	1	-	-	1					
Calcaneum	1	-	-	1	1st phalange	2	3	-	5					
Metatarsal	1	-	-	1	2nd phalange	2	-	-	2					
Sesamoids	-	-	3	3	Total	12	13	1	26					
1st phalange	5	6	-	11										
2nd phalange	4	3	-	7										
3rd Phalange	-	1	-	1										
Total	20	25	12	57										

fractured left distal ulna fragment from the upper fill. The large mammal specimens are a burned cranial fragment from the lower fill and burned and unburned long bone fragments from the upper fill. Specimens from the general cultural layer representing other taxa are a spiral fractured canid (dog/coyote) proximal rib fragment from Unit 2, a duck (cf. lesser/greater scaup) coracoid with the ends broken off from Unit 5, and a sucker vertebra fragment from Unit 4.

Mountain sheep, mule deer, and mountain sheep/mule deer-size bone elements represented in the assemblage are summarized in Table 11. All body parts are represented, including crania, the axial skeleton, and both right and left fore and hind limbs, suggesting that nearly complete carcasses were transported to the site.

Mountain sheep/deer fetal bone specimens were recovered from both Feature 1 and Feature 2. Early term fetal bone was recovered from Feature 2-1, the deep pit in Feature 1 (a right scapula blade and left femur diaphysis), the lower fill of Feature 1 (a left humerus), and the fill of Feature 2 (a right radius). These specimens suggest a mid-winter occupation of both pithouses. Feature 2-1 also yielded four molars from a late term fetus or fawn suggesting that the Feature 1 pithouse might also have been occupied into the late spring and early summer. Feature 2 yielded a horizontal ramus from a right mule deer mandible that falls into the 1.5 to 2 year age range, which would also be consistent with a winter to late spring/early summer occupation. A full term fetal rib diaphysis was recovered from the general cultural layer in Unit 5.

FLOTATION SAMPLES

Thirteen feature fill samples comprising a total of 64 liters were processed by flotation. These included nine samples (44 liters) from the lower fill of Feature 1 taken in Unit 1 (five samples), Unit 2 (two samples), and Unit 4 (two samples) 4 and 10 liters of fill from Feature 1-1. A total of two samples (10 liters) of fill from Unit 3 in Feature 2 were also processed.

All of the processed samples were moderately to darkly charcoal stained. The light fraction from each consisted mostly of very fine organic material. No charred plant macrofossil remains were recovered from any of the samples, including visible charcoal. This result is consistent with the virtual absence of macroscopic charcoal from the features in general, despite the large quantity of darkly charcoal-stained sediment that filled Features 1 and 2. It suggests that even if charred plant macrofossils such as seeds might once have been present, conditions might not have been suitable for the preservation of charred plant material.

SITE DISCUSSION

The excavations at the Dimple Dell site yielded the remains of two Late Archaic-Formative transition period components dating to 1700 and 1540-1520 years B.P. The earlier component was associated with Feature 1, a stratified, roughly rectangular pithouse measuring 3.1 x 2.5 (incomplete dimension) and 38 cm deep. Feature 2, a shallow circular basin that was likely a pithouse or possibly an enclosed work area with incomplete dimensions of 3.25 x 2.75 m x 18 cm, dated to the later component. Arrow points and arrow point manufacture failures were recovered from each, but no ceramic artifacts or evidence of maize were noted from either or from the overlying cultural layer.

The tool assemblages from the two features have some differences. Associated with the earlier Feature 1 are eight complete and fragmentary Rose Spring corner-notched arrow points and three leaf-shaped arrow points in comparison to a single side-notched point fragment from the later Feature 2. All five bone tools and bone tool fragments, both ornaments and the gaming piece, the one complete groundstone artifact (a mano), and arrow point manufacture failures and rejects are part of the Feature 1 assemblage. In contrast, Feature 2 yielded all five flake tools, most of which were relatively specialized, both hafted knives, and the drill.

The faunal remains from Features 1 and 2 also differ. Both components have mountain sheep, mule deer, jackrabbit, and cottontail bone, and both are dominated overall by medium mammal (cf. mountain sheep or mule deer) bone. However, the sample of bone classified to species or probable species for Feature 1 is principally mountain sheep bone while the smaller Feature 2 sample is characterized by mule deer bone. The Feature 1 assemblage also has a few specimens of large mammal bone, a bobcat/lynx bone, a duck bone, and small mammal bone and the Feature 2 sample has a single bone each of dog/coyote, greater/lesser scaup, and sucker fish. Feature 1 contained a strikingly greater percentage of burned specimens. Conversely, the bone from Feature 2 was generally more fragmented, as indicated by the greater proportion of specimens less than 3 cm in size.

Apparently, the inhabitants of the excavated portion of the site focused their hunting activities on upland medium-sized mammal species acquiring either mountain sheep or mule deer depending on what was available at the time near the site. Because all body parts are represented in the faunal assemblages, complete carcasses were probably transported to the site suggesting that the kills were relatively near the camp. The recovery of duck bones and a sucker fish bone indicates that the riparian area along Dry Creek was also exploited, but to a lesser degree. The unfortunate poor preservation and lack of recovery of plant macrofossils from the excavation limits the information concerning the floral portion of the occupants diet. If maize had been a component of their diet, the dense maize kernels would probably have survived suggesting that maize was probably not utilized during these occupations.

Most of the debitage is in the small range with only 11 flakes (3.5%) exceeding 3 cm in size, and most are smaller than 2 cm in size. They appear to reflect primarily the manufacture of small bifaces, mainly arrow point blanks, preforms, and points from small pebbles or flakes, and the manufacture or resharpening of flake tools.

A significant proportion of flakes retain cortex, including an obsidian flake, apparently reflecting the use of pebbles as the main toolstone material form. However, the debitage in Feature 2 is much more heavily skewed to the smaller size classes and possess a substantially lesser proportion of cortical flakes. Both differences are statistically significant ($p < .01\%$). These contrasts might reflect a greater proportion of small biface manufacture in Feature 1 and a greater proportion of flake tool resharpening or manufacture in Feature 2, as suggested by the tool assemblages from each. The general cultural layer more closely resembles Feature 1 in both regards. The proportions of quartzite to chert are virtually identical between Features 1 and 2. Obsidian debitage was recovered from Feature 1 only, but the majority of the obsidian debitage was found in the general cultural layer in Units 2 and 3, suggesting that obsidian might have been associated with the Feature 2 occupation as well.

Even given the differences between the Feature 1 and Feature 2 assemblages, the excavated area appears to have generally been used in a similar manner during the time of both components. The inhabitants during both periods constructed pithouses or at least an enclosed work area, focused on hunting and intensively processing upland medium mammals, obtained some riparian resources, and manufactured or repaired arrow points and other tools. The differences between the components also suggest that Feature 1 reflects typical house-based domestic activities including small-scale arrow point manufacture and arrow retooling, possibly clothing and/or basketry manufacture, and the loss of ornaments and a gaming piece. By contrast, the Feature 2 tool assemblage appears to reflect a range of specialized processing and/or craft activities, as shown by the diversity of relatively specialized flake tools, both large and small, along with the drill and hafted knife fragment.

Both components also appear to represent mid-winter to late spring/early summer occupations based on the recovery of mountain sheep/deer fetal bone specimens. The duration and

number of the occupations for each component are unknown. Given the presence of fetal bone specimens indicating mid-winter to late spring/early summer occupations and the fairly high density of remains and the darkly charcoal stained sediment in the lower portions of the features, the occupations associated with the components probably at least spanned the winter into the late spring to early summer. The inhabitants may have then moved to the higher elevations to exploit those resources as summer approached. The high density of recovered remains may also be the result of multiple occupations for each component where the prehistoric people returned to the same location over a period of years to conduct similar activities. The presence of complete bone tools from Feature 1 and the complete specialized tools from Feature 2 may have been deliberately cached within the features in anticipation of subsequent re-use.

The excavated area containing the two features is only one small location within an extensive site where Archaic, Fremont, and Late Prehistoric period projectile points have been noted, in addition to a large charcoal-stained area, a moderately dense scatter of heat-altered cobble concentrations, heat-altered cobbles, and debitage. The Dimple Dell site is also just one of several adjacent sites (Sites 42SL124, 42SL150, and 42SL151) that have been recorded along the northern bench and slope of Dry Creek. These sites also have buried cultural remains and evidence for occupations from the Archaic to Late Prehistoric periods. Overall, the northern side of the Dry Creek valley appears to have been an ideal location for occupations where prehistoric people returned for thousands of years and the excavated components represent just a small window into the prehistoric use of the area.

SETTLEMENT AND MOBILITY

The excavation results indicate that the prehistoric people during the Late Archaic-Formative transition period most likely occupied

the Dimple Dell site at least from the mid-winter through the late spring/early summer to hunt and process upland resources such as mountain sheep and mule deer. Other portions of the site indicate that this and other nearby sites were occupied repeatedly for thousands of years, suggesting that this pattern might have been established during the prior Archaic period and persisted into the Formative and Late Prehistoric. In that regard, it is interesting to compare the excavated Late Archaic-Formative transition period component at the Dimple Dell site to other sites in the Salt Lake valley to try to obtain insight into the broader prehistoric use of the valley, including the central portion of the valley along the Jordan River to the west and the marshes of the Great Salt Lake to the north.

Excavations at the Prison site provide additional information on settlement and mobility patterns in the Salt Lake valley (Yentsch and Rood 2007; Yentsch et al. 2009). The site is on a terrace on the eastern side of the Jordan River at the southern end of the Salt Lake valley and is another extensive site that was occupied repeatedly from at least 3000 years ago to the Late Prehistoric period. An excavated pithouse represented by an elliptical, basin-shaped depression measuring 4.5 x 3.9 x 40-50 cm deep was radiocarbon dated to 2450-2320 years B.P. Another unexcavated pithouse was radiocarbon dated at 2000 and 1720 years B.P. The analyzed bone assemblage consisting of 2622 specimens from the excavated pithouse included seven specimens identified as deer, 22 as jackrabbit, three as cottontail, one as dog, one as mountain sheep, one as vole, and one as unknown snake. Surprisingly, none of the specimens were of riparian taxa given the close proximity of the site to the river. The excavated portion of the site appears to be a residential campsite probably occupied for a season where the processing of faunal and floral resources took place.

Clues concerning the prehistoric settlement and mobility patterns associated with the marshes along the southeastern portion of the Great Salt Lake comes from the excavations

at Site 42DV2, an extensive site adjacent to Hot Springs Lake in the Jordan River Delta ideally situated for the exploitation of wetland and marsh resources (Cannon and Creer 2010). As with the Dimple Dell and Prison sites, Site 42DV2 was repetitively reused for thousands of years beginning at least by 4500 years B.P. and continuing through the Late Prehistoric period. Excavations yielded the remains of structures represented by shallow, dish-shaped depressions dating throughout the occupational history of the site starting at 4500 years B.P. The Formative component, the closest in age to the Dimple Dell site components in age, contained a roughly rectangular to oval pithouse measuring 4.25 x 3.90 m x 30 cm deep with radiocarbon dates ranging between 1360 and 1230 years B.P. A limited number of maize kernels were recovered, but the component lacked ceramic artifacts.

The Formative component, as with all the excavated components at Site 42DV2, appears to represent occupations that primarily focused on marsh and lake resources. Several fish species including suckers, minnows, and Utah chub are represented in the Formative component faunal assemblage, with unidentified fish comprising the dominant taxon. Various waterfowl including swans, geese, and ducks are also well represented in the assemblage. In contrast, only one specimen each was identified as deer and pronghorn/bighorn sheep along with 16 specimens classified as medium artiodactyl and 137 specimens classified as large or medium mammal out of a total assemblage of 44,513 specimens. The recovery of mostly saltbush and sedge plant macrofossils from component features indicates summer occupation, at a minimum.

In an effort to determine the duration of the site occupations and whether the inhabitants were sedentary with low residential mobility, the Site 42DV2 researchers considered the relative abundance of upland versus marsh resources (Cannon and Creer 2010:723). They reasoned that if the site occupants were sedentary thereby obtaining most of their upland resources through

logistical forays, a relatively high amount of upland taxa would be present in the faunal assemblage. Conversely, low numbers of upland taxa would indicate higher residential mobility with groups moving camp to procure upland resources. Their analysis suggests that the prehistoric inhabitants of the marsh and wetland area near the Great Salt Lake had some residential mobility and were not completely sedentary. This interpretation conforms to the conclusions concerning the mobility patterns represented at the Dimple Dell site where upland mountain sheep and mule deer were acquired near a residential camp.

The examination of the mobility patterns associated with these three non-ceramic components reveal that each was a residential camp occupied for a season or portion of a year where the group made residential moves to position themselves to exploit certain resources. Site 42DV2 was most likely used during the summer to procure primarily marsh and lake resources and the Dimple Dell site was the focus for hunting and processing of mountain sheep and mule deer during the late winter to late spring/early summer. No site appears to have supported a sedentary population that relied only on logistical movements of individuals to acquire food from other ecological zones. These components are probably not part of the same settlement system as they have dates several centuries apart; however, the suggested mobility patterns were likely fairly stable, perhaps lasting more than a couple thousand years as indicated by the evidence of repeated use of these sites and the similarities of the components at Site 42DV2 through time. The prehistoric inhabitants consistently returned to these sites starting at least by 3000 to 4000 years ago suggesting these locations were ideally situated for occupation and the procurement of resources. Overall, the evidence suggests that the prehistoric peoples of the Salt Lake valley were residentially mobile, moving the group to resources following fairly stable patterns that might have lasted at least a

couple millennia, including across the Archaic-Formative period transition.

This pattern contrasts with the model proposed by Janetski and Smith (2007:321) for the Late Prehistoric period in the adjacent Utah valley based on the ethnohistoric Ute use of Utah valley. They argue that the Late Prehistoric period inhabitants of Utah valley were fairly sedentary, settling in village locations situated to exploit lake and lakeside marsh resources, making only logistical forays to obtain upland resources. It does not appear that this ethnohistoric model applies to the Salt Lake valley, at least during the Late Archaic-Formative transition period. This difference in subsistence and mobility patterns may be due in part to the southern portion of the Salt Lake valley lacking the rich resources afforded by Utah Lake. However, extensive marshes do occur along the Great Salt Lake less than 40 km north of the Dimple Dell site, which would have provided important resources to the prehistoric populations possibly allowing for sedentary occupations similar to those proposed for Utah valley during the Late Prehistoric period.

Other sites excavated in southern and central Utah dating to the Late Archaic-Formative transition period may also be camps of residentially mobile inhabitants that lacked maize farming. One such site, the Icicle Bench site in Clear Creek Canyon, had a fairly large pithouse measuring 6.5 m in diameter and dating to about 1600 years ago with evidence for mountain sheep hunting and gathering of several taxa of wild plants (Talbot et al. 1999). The Sandy Ridge site in Dry Valley south of Moab is another location with a pithouse measuring 5.05 x 4.75 m where large and small game was procured and wild edible plants utilized around 1800 years ago (Richens and Talbot 1989).

In contrast to the residentially mobile populations of the Salt Lake valley and elsewhere, however, some sites in other parts of Utah do provide evidence of more sedentary peoples often growing maize during the Late Archaic-Formative transition period. Non-ceramic

transition sites evidencing probable year round occupations include the Confluence site just east of the Old Woman Plateau in central Utah (Greubel 1998), and the Steinaker Gap site in the Uinta Basin (Talbot and Richens 1996). Both of these sites exhibited large pithouses, some measuring over 7 m in diameter, bell-shaped pits outside of the pithouses, arrow points, and the remains of maize. Wild resources such as goosefoot seeds, small mammals, fish, and large game possibly obtained during logistical trips supplemented the maize. The Steinaker Gap site yielded 66 fish vertebrae, which dominated the bone assemblage of 204 specimens. Cottontail, jackrabbit, woodrat, ground squirrel, and one mountain sheep molar are among the identified specimens from the Confluence site.

CONCLUSION

Excavations of two components dating to the Late Archaic-Formative transition period at the Dimple Dell site along Dry Creek in the Salt Lake valley provide an opportunity to gain a better understanding of this relatively unknown period and of the relatively unknown prehistory of the Salt Lake valley. The components represent a residential camp occupied at least during the mid-winter to late spring/early summer season to hunt and process mountain sheep and mule deer. Comparisons with non-ceramic components at Site 42DV2 and the Prison site suggest that the Late Archaic to early Formative inhabitants of the Salt Lake valley followed a mobility pattern where the group moved seasonally or periodically to situate the residential camp near the different resources they wished to procure. They appear to have chosen locations that had been continuously used for at least a couple millennia. ■

ACKNOWLEDGEMENTS

The archaeological remains excavated during the current project were discovered near the previously recorded site boundaries during replacement of a Questar Gas Company natural gas feeder pipeline across Dimple Dell Regional

Park in early 2015. Following consultation among Questar, the Utah State Historic Preservation Office, Salt Lake County, and the Dimple Dell Park Advisory Board, archaeological excavations were conducted to recover data from the archaeological remains discovered during construction. We thank Questar for their interest and funding of the project, especially Laura Springsteen. Questar went beyond their legal requirements in providing funding for the excavation and reporting. The members of the Dimple Dell Park Advisory Board, including Terry Wood and Dr. Ty Harrison, contributed their support and interest in the project. The Utah State Historic Preservation Office (SHPO), and in particular Lori Hunsaker, facilitated the excavations. We would also like to thank crew members Rachel Collister and Michael Mori.

Lance M. McNees

EcoLogic Environmental Consultants LLC
725 Lacey Way
North Salt Lake, UT 84054
lance.mcnees@yahoo.com

Craig S. Smith

EcoLogic Environmental Consultants LLC
1495 W Honey Crisp Way
South Jordan, UT 84095
crasmith5@comcast.net

References

A/E IntraGroup

1992 Dimple Dell Regional Park: A Development and Management Guideline for All Natural and Manmade Resources in Dimple Dell Regional Park. Prepared for Salt Lake County Parks and Recreation. A/E IntraGroup, Salt Lake City.

Cannon, Mike and Sarah Creer

2010 *Data Recovery Excavations at 42DV2, Davis County, Utah*. SWCA Cultural Resource Report No. 2010-350.

Greubel, Rand A.

1998 The Confluence Site: An Early Fremont Pithouse Village in Central Utah. *Utah Archaeology* 11(1):1-32.

Harrison, Ty

2015 *An Illustrated Ethno-biology of Dimple Dell Regional Park*. Manuscript provided by Ty Harrison, Emeritus Professor of Biology, Westminster College, Salt Lake City, to EcoLogic Environmental Consultants, LLC, Salt Lake City.

Holmer, Richard

1986 Common Projectile Points of the Intermountain West. In *Anthropology of the Desert West: Essays in Honor of Jesse D. Jennings*, edited by Carol J. Condie and Don D. Fowler, pp. 89-116. University of Utah Anthropological Papers No. 110. Salt Lake City.

Janetski, Joel C.

1993 The Archaic to Formative Transition North of the Anasazi: A Basketmaker Perspective. In *Anasazi Basketmaker: Papers from the 1990 Wetherill-Grand Gulch Symposium*, edited by Victoria M. Atkins, pp. 223-242. Utah Bureau of Land Management Cultural Resource Series No. 24. Salt Lake City.

Janetski, Joel C. and Grant C. Smith

2007 *Hunter-Gatherer Archaeology in Utah Valley*. Brigham Young University Museum of Peoples and Cultures Occasional Paper No. 21.

Janetski, Joel C., Richard Crosland, and James D. Wilde

1991 Preliminary Report on Aspen Shelter: An Upland Deer Hunting Camp on the Old Woman Plateau. *Utah Archaeology* 4(1):32-43.

Richens, Lane D.

1988 *A Cultural Resource Inventory and Monitoring of Fence/Gate Installation at Dimple Dell Regional Park, Salt Lake City, Utah*. Brigham Young University Museum of

Peoples and Cultures Technical Series No. 88-37.

Richens, Lane D. and Richard K. Talbot

1989 Sandy Ridge: An Aceramic Habitation Site in Southeastern Utah. *Utah Archaeology* 2:77-88.

Rood, Ronald J.

2015 *Faunal Remains from 48SL121: Salt Lake County, Utah*. Report prepared for EcoLogic Environmental Consultants, LLC, Salt Lake City, Utah.

Simms, Steven R.

2008 *Ancient Peoples of the Great Basin and Colorado Plateau*. Left Coast Press, Inc., Walnut Creek, California.

Smith, Craig S.

2003 Hunter-Gatherer Mobility, Storage, and Houses in a Marginal Environment: An Example from the Mid-Holocene of Wyoming. *Journal of Anthropological Archaeology* 22:162-189.

Stokes, W. L.

1977 Subdivisions of the Major Physiographic Provinces in Utah. *Utah Geology* 4(1):1-17.

Talbot, Richard K. and Lane D. Richens

1993 *Archaeological Investigations at Richfield and Vicinity*. Brigham Young University Museum of Peoples and Cultures Technical Series No. 93-15, Provo.

1996 *Steinaker Gap: An Early Fremont Farmstead*. Brigham Young University Museum of Peoples and Cultures Occasional Paper No. 2.

Talbot, Richard K., Lane D. Richards, James D. Wilde, Joel C. Janetski, and Deborah E.

Newman

1999 *Excavations at Icicle Bench, Radford Roost, and Lott's Farm, Clear Creek Canyon, Central Utah*. Brigham Young University Museum of Peoples and Cultures Occasional Paper No. 4.

Thomas, David Hurst

1981 How to Classify the Projectile Points from Monitor Valley, Nevada. *Journal of California and Great Basin Anthropology* 3(1):7-43.

Uchtdorf, Irmgard

1988 Intermountain Antiquities Computer System Site Form for Site 42SL121 dated May 11, 1988, Dimple Dell Park Fence Project. Utah State Archaeological Society and Brigham Young University, Provo.

Wilde, James D. and Deborah E. Newman

1989 Late Archaic Corn in the Eastern Great Basin. *American Anthropologist* 91(3):712-720.

Wilde, James D. and Don D. Southworth

1989 *A Cultural Resource Inventory of Dimple Dell Regional Park, Salt Lake County, Utah*. Brigham Young University Museum of Peoples and Cultures Office of Public Archaeology, Provo.

Yentsch, Andrew T. and Ronald J. Rood

2007 The Prison Site: Evidence for Late Archaic Housepits in the Salt Lake Valley. *Utah Archaeology* 20(1):41-56

Yentsch, Andrew T., Ronald J. Rood, Kevin T. Jones, and Lindsay A. Fenner

2009 *The Prison Site (42SL186): An Archaic Campsite Along the Jordan River, Salt Lake County, Utah*. Antiquities Section, Utah Division of State History.