

THE CROOKS GAP HOUSEPIT SITE AND OTHER NEARBY MID-HOLOCENE HOUSEPITS

by
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INTRODUCTION

This article summarizes excavation results at the Crooks Gap Housepit site (Site 48FR6260) completed by Cardno ENTRIX in 2010 and then compares those results with 20 other excavated housepits at eight sites located within 20 km of the site (Figure 1). The results are provided in more detail in Peterson and Smith (2012). The Crooks Gap Housepit site is a multicomponent site situated in aeolian deposits near Crooks Creek in southeastern Fremont County, Wyoming. One of the components contains the remains of four housepits dating between 5420 and 5170 years BP. It is one of a growing number of sites in the Wyoming and Big Horn Basins containing excavated housepits dating to the mid-Holocene (Buenger and Goodrick 2011; Larson 1997; Rose 2008; Smith 2003). The site is in an area where 20 additional housepits have been excavated, thereby providing an opportunity to examine comparatively this subset of excavated housepits.

The Crooks Gap Housepit site is in Crooks Gap directly between Green Mountain to the east and Crooks Mountain to the west and at the southwest edge of the Sweetwater Arch near the northern edge of the Great Divide Basin in the center of the Wyoming Basin. The gap comprises a prominent natural pass between the Great Divide Basin to the south and the Sweetwater River valley to the north. The site is east of Crooks Creek, a small perennial creek which flows northward through Crooks Gap to the Sweetwater River. Natural grass meadows are present along the creek and its tributaries, some of which were developed as historic hay meadows. The site is approximately 12 m higher than the creek and provides a good view of the creek and adjacent valley bottom to the west and north.

The deposits encapsulating the cultural remains at the site consists of aeolian silt to silty sand which accumulated in the lee of a low ridge spur to the south. Those sediments rest on top of a deposit comprised primarily of granite cobbles and boulders and were in turn capped by a surface veneer of granite cobbles and small boulders deposited subsequent to formation of the aeolian deposit.

The Crooks Gap Housepit site is at a modern ecotone providing access to resources associated with sagebrush steppe and riparian biomes within the Crooks Creek valley bottom, escarpment-foothill transition and limber and lodgepole woodlands biomes in the adjacent mountains, and the desert shrub biome in the Great Divide Basin. The Wyoming big sagebrush community dominates the area surrounding the site with shrub-dominated riparian vegetation with wet meadows along Crooks Creek and a band of limber pine and juniper along the east edge of the Crooks Creek valley floor. Limber pine woodland is also present on the mountain slopes adjacent to the site.

Potential toolstone material sources in the site area are limited. The Tertiary formation underlying the site area is a poor source of quality toolstone material, and most local toolstone, if any, comes from secondary sources. Much of the prehistoric toolstone acquisition associated with the site involved the use of secondary gravel and cobbles from lag and fluvial deposits in the area. Some toolstone material may also have originated from the Laney and Tipton members of the Green River formation, which outcrop along the face of the Delaney Rim escarpment at the south edge of the Great Divide Basin/north edge of the Washakie Basin approximately 90 km south of the site.

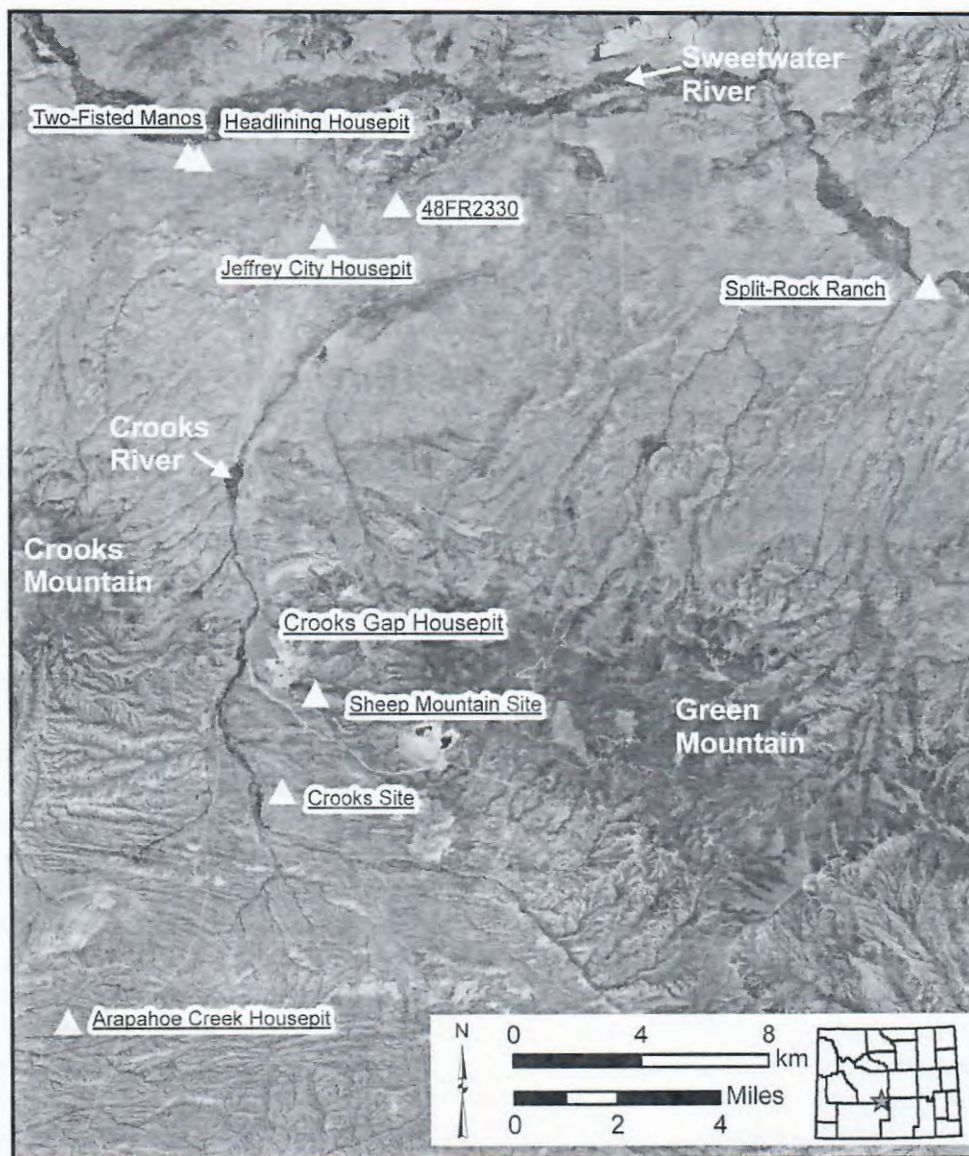


Figure 1: The Crooks Gap Housepit site and other nearby excavated housepit sites.

THE CROOKS GAP HOUSEPIT SITE

A 6 x 14 m (84 m²) block was excavated at the site (Peterson and Smith 2012). Two cultural components were distinguished within the excavation block. Component I consisted of a dense palimpsest of features and cultural material dating mostly to the early Opal phase between 5420 and 5170 years BP with one radiocarbon age estimate of 8010 years ago. The component contained 57 features, including four housepits and possible housepits, 355.698 kg of heat-altered rock, six projectile points, four bifaces, four flake tools, two modified cobbles, one groundstone fragment, 410 pieces of debitage, 765

bone specimens, and 27 charred goosefoot seeds from six features. Most of the remains assigned to Component I appears to be the result of multiple short-term, occupations over a 250 year period. The remains from these many reoccupations occur as a single archaeological layer within the aeolian deposits at the site.

Component II dated to the late Opal phase at 3690 and 3680 years BP and yielded only three features (one rock-filled stained basin and two stained basins), two projectile points, two bifaces, 177 pieces of debitage, 42 bone fragments, and 36.989 kg of heat-altered rock. Component II likely

represents a single, relatively short-term residential occupation where limited generalized domestic activities were conducted.

Fifteen radiocarbon age estimates ranging from 8010 ± 50 to 3680 ± 40 years BP were obtained during the data recovery excavations at the Crooks Gap Housepit site (Table 1). An additional age estimate of 4830 ± 40 years BP (Beta-240374) was previously obtained from Feature T28-F1A in the pipeline trench wall during the open trench inspection phase of the project (McNees and Denoyer 2008).

The radiocarbon age estimates are tightly grouped from 5420 and 5170 years ago ($n=11$), and including all but two of the age estimates associated with Component I. One outlying age estimate from Component I dates to the early Great Divide phase at 8010 years B.P. Several diagnostic projectile points consistent with that age estimate were also recovered from the block, suggesting the component includes some material from a limited early Great Divide phase occupation. Those projectile points fall within various types associated with the foothill/mountain Paleoindian complexes defined by Frison

(e.g., 1992, 1997) and sometimes designated as the Frontier complex (Kornfeld et al. 2010). They are classified as a Lovell Constricted point base, a James Allen point base, and a probable James Allen point midsection. The other outlying age estimate of 4390 years B.P. from Component I post-dates the rest of the estimates from the cultural layer. Based on the stratigraphic position of the feature from which it was obtained, the age estimate appears too recent. It was the only estimate obtained by dating organic material extracted from stained sediment. Based on these considerations, it is considered unreliable.

The two radiocarbon age estimates from Component II are virtually contemporaneous at 3690 and 3680 years B.P., respectively. They suggest a single short-term occupation of the site near the end of the Opal phase. The only undated feature assigned to the upper cultural layer was a rock-filled basin different from any of the other features excavated at the site.

The deposits at the site generally consist of aeolian silt to silty sand. Those deposits rest on a colluvial deposit primarily consisting of a dense bed of granite boulders and cobbles probably Pleistocene

Table 1: Radiocarbon age estimates, Crooks Gap Housepit site.

COMPONENT	FEATURE NUMBER	FEATURE TYPE	LAB NO. (BETA)	AGE ESTIMATE (YEARS BP) ¹	CALIBRATED AGE ESTIMATE (YEARS BP) ²
I	12	Small stained basin in Housepit 59	291489	5280 ± 40	6190 – 5930
I	16	Medium stained basin	291490	5290 ± 40	6190 – 5940
I	19	Medium stained basin in Housepit 59	294191	5260 ± 40	6180 – 5920
I	29	Medium stained basin in Housepit 59	291492	5200 ± 40	6000 – 5900
I	31	Small stained basin in Housepit 1	291493	5290 ± 40	6190 – 5940
I	36	Housepit	291494	5170 ± 40	5990 – 5900
I	39	Housepit	291498	5420 ± 40	6290 – 5180
I	48	Medium stained basin	291499	8010 ± 50	9020 – 8700
				8670 – 8650	
II	2	Medium rock filled stained basin	290143	3690 ± 40	4150 – 3910
I	15A	Large bell-shaped pit in Housepit 59	290144	5330 ± 40	6270 – 6240
				6210 – 5990	
II	18	Medium stained basin	290145	3680 ± 40	4140 – 4120
				4100 – 3900	
I	21	Small stained basin in Housepit 1	290146	5250 ± 40	6180 – 6140
				6120 – 5920	
I	57	Large stained basin	290147	5390 ± 40	6290 – 6170
				6150 – 6110	
				6070 – 6060	
				6050 – 6020	
I	54	Medium stained basin in Housepit 36	294513	5260 ± 30	6180 – 6150
				6120 – 5930	
I	58	Stained basin	294738	4390 ± 30^3	5040 – 4860

¹ Conventional radiocarbon age estimate in radiocarbon years before present (years BP), not calibrated; all age estimates obtained through AMS process.

² Calibrated age estimate range provided at two sigmas.

³ Dated obtained on charcoal-stained sediment.

in age. The aeolian deposits accumulated in the lee of a low rise to the south. The prehistoric inhabitants of the site initially constructed their housepits and features after a shallow aeolian leeward deposit had formed over the underlying granite boulders. In several instances, these features encountered subsurface boulders the prehistoric inhabitants had not anticipated and which required modification of the features. The aeolian deposits then continued to aggrade slowly during the span of occupations represented in the excavation block, until sometime after the final occupation, when the ground surface stabilized and a soil formed. The modern surface deposit is a mix of aeolian deposits and colluvium with a surface veneer of granite cobbles and boulders.

Four stratigraphic units and two stained cultural layers were defined (Figure 2). Stratum I consists of light olive brown colluvial and alluvial sediment over and around the underlying granite boulder deposit. It is a slightly consolidated poorly sorted sand, mostly medium grains with some coarse grains and approximately 25% small gravel. The stratum lacks root channels at this depth, but there is extensive charcoal staining leached and intermixed by burrowing animals from above.

Stratum II consists of aeolian yellowish to light yellowish brown silty poorly sorted sand with slightly finer-grained sand and more silt than Stratum I. It is approximately 20% small gravel and <1% root channels. The tops of the large granite boulders begin to appear in the bottom of this stratum. This stratum contains the two stained cultural layers, which range from grayish brown to very dark gray. Excavation was halted at or near the base of this stratum across the excavation block, except in the south end of the block, where portions of Stratum I were excavated.

Stratum III is well consolidated brown to pale brown silt with some fine- to medium-grained sand. It consists of a continuation of the aeolian deposits comprising Stratum II and is a possible A horizon with some possibly very lightly stained sediment. It is approximately 10-15% small gravel and \leq 1% root channels.

Stratum IV is the reclaimed topsoil on the pipeline right-of-way. It was removed across the excavation block before start of excavations.

The two stained cultural layers with which Components I and II are associated are encapsulated

within Stratum II across the entire block. The cultural deposit generally consists of an upper lightly stained layer with which Component II is associated and an underlying moderately to darkly stained layer with which Component I is associated.

The two stained layers followed the slope of the aeolian deposit from south to north across the excavation block. However, the lower layer sloped at a slightly greater angle as the depth of the deposit increased from south to north. As a result, the cultural layers were more vertically compressed relative to each other in the south part of the block, and more distinct in the central part of the block. They taper off in the northern part of the block, where the upper stained layer intersected the ground surface and the staining associated with the lower cultural layer faded away and the cultural layer thickened. The intermixing of material from the early Opal phase occupations and the Great Divide phase occupation(s) occurred primarily in the north part of the block.

COMPONENT I

The remains assigned to Component I—including four housepits with many overlapping interior stained basins—appear to be the result of repeated residential, though perhaps short-term, occupations occurring over the 250 year period dating between 5420 and 5170 years BP. This time span falls within the early Opal phase of the Early Archaic period. The remains from these reoccupations occur as a single archaeological layer within the sand deposits at the site. The component also contains a smaller amount of cultural material from an earlier occupation.

FEATURES

The 57 features assigned to Component I includes one housepit (Feature 36) with up to nine interior features, one housepit (Feature 39) with up to four interior features, one possible housepit (Feature 59) with up to 12 interior features, and one possible housepit (Feature 1) with up to eight features. Features found outside of the housepits are 13 stained basins, three heat-altered rock scatters, one heat-altered rock filled basin, one post mold, and two large bell-shaped pits (Figure 3; Table 2).

Housepit Feature 36 was a darkly stained but poorly defined housepit with up to nine interior basins (Figures 4 and 5). The boundaries and interior

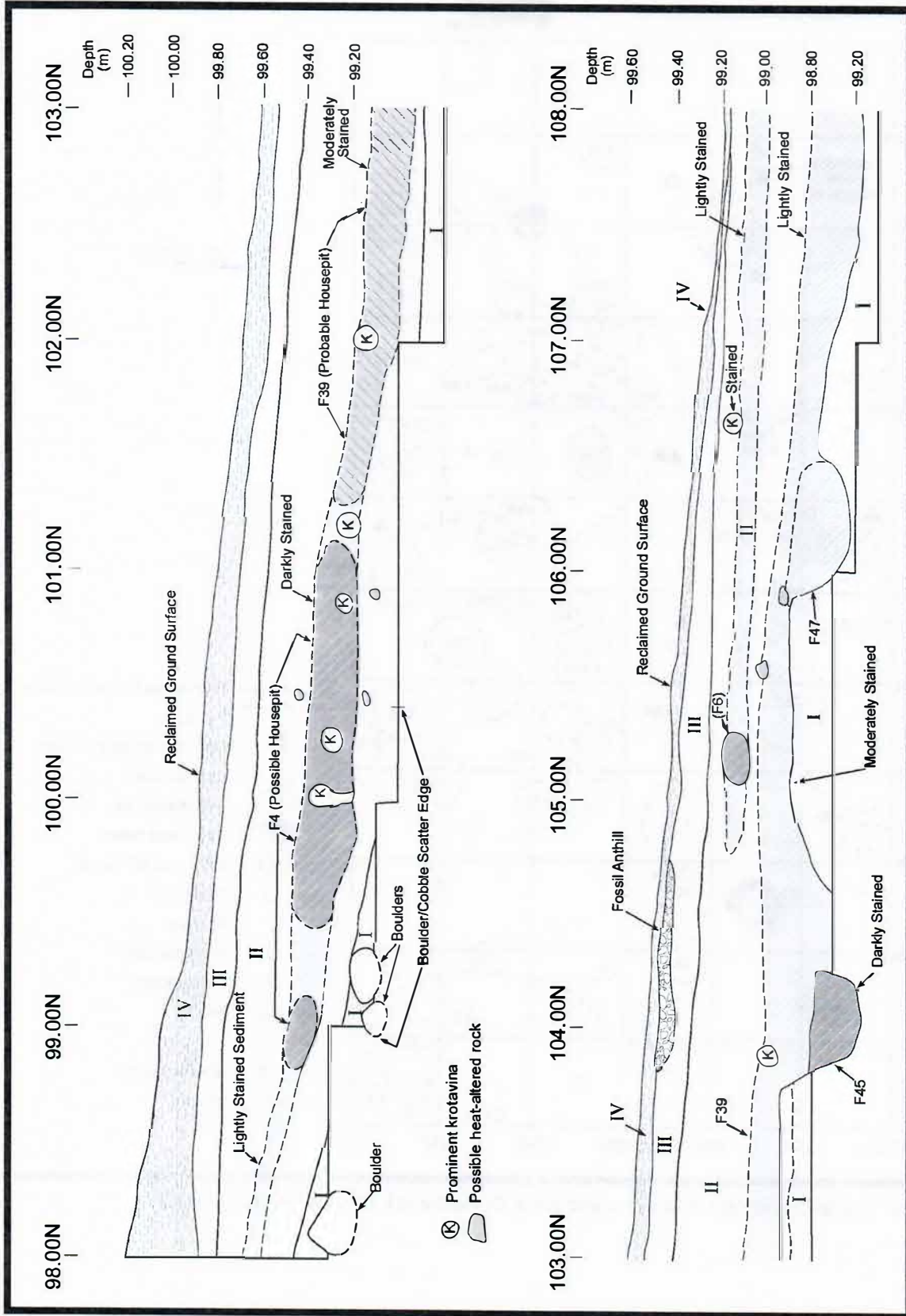


Figure 2: Stratigraphic profile of the west wall of the excavation block from 98.00N to 108.00N, Crooks Gap Housepit site.

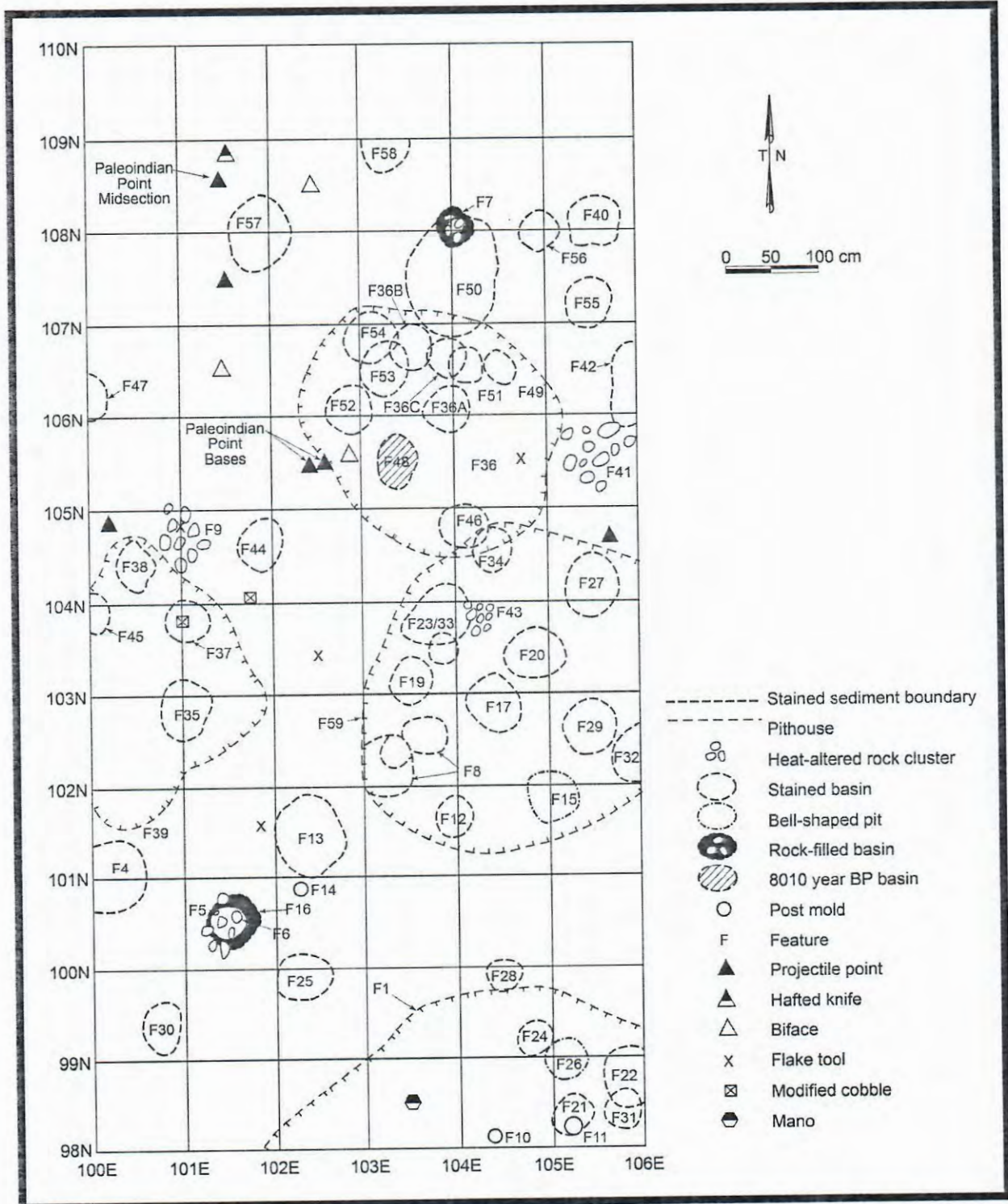


Figure 3: Spatial distribution of features and tools, Component I, Crooks Gap Housepit site.

Table 2: Summary of cultural features, Component I, Crooks Gap Housepit site.

NO.	FEATURE TYPE	DIMENSIONS (CM) ¹			TOP OF FEATURE NO.	HEAT-ALTERED ROCK			ARTIFACTS FROM FILL			AGE EST. (YEARS BP) ²
		L	W	D		WEIGHT (KG)	NO. OF FLAKES	NO. OF FAUNAL	OTHER			
HOUSEPIT FEATURE 36 AND ASSOCIATED INTERIOR FEATURES												
36	Housepit	310	240	30	99.00	183	8.989	15	80	Biface	5170 ± 40	
36A	Deep interior stained basin	52	45	30	98.92	16	0.180	5	3	--	--	
36B	Medium interior stained basin	55	46	12	98.68	8	0.150	2	4	--	--	
36C	Medium interior stained basin	50	44	13	98.70	--	--	2	8	--	--	
46	Medium stained basin	50	49	9	98.70	--	--	5	--	--	--	
49	Small, deep stained basin	44	34	24	98.60	--	--	1	4	--	--	
51	Small stained basin	39	37	18	98.60	--	--	4	5	--	--	
52	Medium stained basin	55	49	25	98.68	12	0.070	4	17	--	--	
53	Medium stratified stained basin	58	48	24	98.60	9	1.120	0	20	--	--	
54	Medium stained basin	63	61	20	98.60	19	0.475	1	3	--	5260 ± 30	
HOUSEPIT FEATURE 39 AND ASSOCIATED INTERIOR FEATURES												
39	Housepit	320*	184*	20	99.10	213	2.846	6	14	Modified cobble	5420 ± 40	
35	Large interior stained basin	81	80	40	98.90	69	0.720	1	9	--	--	
37	Medium interior stained basin	50	47	29	98.90	52	0.150	--	5	--	--	
38	Medium interior stratified stained basin	65	43	34	98.90	73	0.179	--	1	--	--	
45	Stained basin	45	17*	22	98.77	8	0.035	0	1	--	--	
HOUSEPIT FEATURE 59 AND ASSOCIATED INTERIOR FEATURES												
59	Possible housepit	368	300*	30	99.20	207	8.076	48	57	Projectile point	--	
8	Stained basins	58 49 35	56 44 34	17 24 13	99.01 99.09 99.01	21	0.372	5	111	--	--	
12	Small stained basin	51	40	12	99.30	--	--	--	19	--	5280 ± 40	
15	Large bell- shaped pit/ Medium stained basin	69 57	57 55	65 23	99.22 99.20	159	4.057	5 0	64 0	--	5330 ± 40	
17	Medium to large stained basin	72	60	36	99.10	--	--	1	13	--	--	
19	Small to medium stained basin	52	47	16	99.07	26	0.089	0	6	--	5260 ± 40	
20	Medium stratified stained basin	69	67	31	99.00	72	0.637	--0	9	--	--	
23/33	Stained basins	43 68	41 59	27 31	99.00 98.90	1	0.400	--	19	--	--	
27	Large stained basin	73	66	31	99.00	24	0.515	6	69	--	--	
29	Medium stratified stained basin	57	56	11	99.15	--	--	--	3	--	5200 ± 40	
32	Stained basin	66*	47*	26	--	--	--	5	4	--	--	
34	Medium stained basin	49	45	13	99.01	2	0.061	--	18	--	--	

Table 2: (continued).

NO.	FEATURE TYPE	DIMENSIONS (CM) ¹			TOP OF FEATURE NO.	HEAT-ALTERED ROCK			ARTIFACTS FROM FILL			AGE EST. (YEARS BP) ²
		L	W	D		WEIGHT (KG)	NO. OF FLAKES	NO. OF FAUNAL	OTHER			
POSSIBLE HOUSEPIT FEATURE 1 AND ASSOCIATED INTERIOR FEATURES												
1	Possible housepit	410*	175*	--	99.40	--	--	--	--	--	--	
10	Probable post mold	12	12	9	99.40	--	--	--	0	--	--	
11	Possible post mold	22	20	7	99.30	--	--	--	--	--	--	
21	Small stained basin	45	40	5	99.62	2	0.125	--	--	--	5250 ± 40	
22	Small to medium stained basin	65	40*	19	99.54	--	--	1	27	--	--	
24	Small stained basin	40	37	7	99.55	--	--	--	4	--	--	
26	Small bell-shaped pit	35	32	35	99.50	--	--	1	9	--	--	
28	Small stained basin	42*	26*	8*	99.49	--	--	--	1	--	--	
31	Small stained basin	43	41	13	99.40	10	0.035	--	16	--	5290 ± 40	
NON-HOUSEPIT/EXTERIOR FEATURES												
4	Medium to large stained basin	87	61*	20	99.46	3	0.600	5	21	--	--	
5	Heat-altered rock scatter	83	50	18	99.52 99.34	17	7.920	--	--	--	--	
7	Structured heat-altered rock filled basin	43	39	34	98.82 98.48		37	20.270	--	4	-- --	
9	Large heat-altered rock scatter	76	74	14	99.09 98.95	38	17.380	--	--	Modified cobble; flake tool	--	
13	Large bell-shaped pit	94	84	30	99.20	19	0.350	5	17	--	--	
14	Possible post mold	15	15	7	99.30	1	0.200	--	--	--	--	
16	Medium stained basin	65	64	23	99.25	4	1.400	2	--	--	5290 ± 40	
25	Stained basin	67*	44*	11	99.43	--	--	1	--	--	--	
30	Medium stained basin	59	43	23	99.36	--	--	1	--	--	--	
40	Medium stained basin	65	57	17	98.73	1	0.022	--	3	--	--	
41	Heat-altered Rock Scatter	100	100	19	98.84	23	11.720	--	1	--	--	
42	Large stained basin	100	26*	20	98.70	4	0.960	3	1	--	--	
44	Medium stained basin	56	50	13	98.87	2	0.100	--	1	--	--	
47	Stratified stained basin	50*	21*	28	98.90	--	--	--	1	--	--	
48	Medium stratified stained basin	64	54	25	98.69	8	0.022	8	1	--	8010 ± 50	
50	Large bell-shaped pit	142	100	42	98.60	123	5.360	3	13	--	--	
55	Medium stained basin	60	59	25	98.55	15	0.127	3	26	--	--	
56	Small stained basin	49	43	11	98.55	2	0.025	2	1	--	--	

Table 2: (continued).

NO.	FEATURE TYPE	DIMENSIONS (CM) ¹			TOP OF FEATURE	HEAT-ALTERED ROCK NO.	WEIGHT (KG)	ARTIFACTS FROM FILL			AGE EST. (YEARS BP) ²
		L	W	D				NO. OF FLAKES	NO. OF FAUNAL	OTHER	
57	Large stained basin	87	70	32	98.60	13	0.450	0	23	--	5390 ± 40
58	Stained basin	50*	34*	37	98.40	14	0.300	0	7	--	4390 ± 30 ³

¹ L = length; W = width; D = depth; * = partial dimension.
² Conventional radiocarbon years before present, not calibrated.
³ Insufficient charcoal present to date, so a bulk sediment sample was dated. The sediment sample was likely contaminated with soil humates resulting in the younger date.

constituents of this housepit were difficult to discern from the surrounding matrix given the extensive amount of stained sediment and overlapping stained basin features. Basin Features 36A, 36B, and 36C were clearly associated with the floor of the housepit. The association of the other basin features with the housepit floor was more poorly defined, because of the indistinct and diffuse nature of the floor and the top of the overlapping basin features. The housepit fill was stratified. The top stratum was very dark grayish brown silty sand with approximately 7% small gravel, and the bottom stratum was very dark gray silty sand with approximately 7% small gravel.

Housepit Feature 39 was a poorly defined, deflated housepit with up to four interior subfloor basins (Features 35, 37, 38, and 45) located along the western edge of the excavation block. The relationship of the partly excavated Feature 45 to the housepit floor is not completely clear. The housepit fill was dark grayish brown silty sand with 10-15% small gravel. No oxidized sediment or visible charcoal was present.

Feature 59 was a poorly defined, deflated housepit feature consisting of a large stained lens with as many as 12 interior features (Features 8, 12, 15, 17, 19, 20, 23/33, 27, 29, 32, 34, and 43) (Figure 6). It overlapped with the southeastern side of Housepit Feature 36. The housepit fill ranged from faintly to very darkly charcoal-stained (brown to very dark grayish brown) silty fine to medium-grained sand with 10-15% small to medium gravel. The feature fill was not identified as stratified during excavation. No oxidized sediment or visible charcoal was present.

Feature 1 was a large generalized stain which was probably a shallow, amorphous deflated and poorly preserved housepit feature. It contained

eight associated interior basins (Features 10, 11, 21, 22, 24, 26, 28, and 31). The feature consisted of moderately charcoal-stained sediment with no oxidized sediments. The boundary with the surrounding sediment was diffuse, and the stain was difficult to define. The stain became more diffuse with depth. Features were also situated outside definable housepits. These consist of 13 stained basins, three heat-altered rock scatters, one heat-altered rock filled basin, one post mold, and two bell-shaped pits. Most of these features appear to date to the early Opal phase between 5420 and 5170 years BP, the period represented by the housepits and most of the other excavated remains at the site. However, a radiocarbon age estimate from one stained basin feature (Feature 48) situated among the early Opal phase features and just below Housepit Feature 36 dated to the early Great Divide phase (8010 ± 50 years BP). Nine hundred and sixteen pieces of heat-altered rock with a combined weight of 89.386 kg were recovered scattered across the general occupation surface outside features in Component I.

FLAKED STONE ARTIFACTS

Flaked stone artifacts recovered from Component I consist of six projectile points, four bifaces, four flake tools, two modified cobbles, one ground-stone fragment, and 410 pieces of debitage.

Six projectile points were recovered from Component I (Table 3; Figure 7). Specimen FR6260-46 was located next to Housepit Feature 39 and is the proximal portion of a medium-sized opaque dark red heat-altered chert side-notched dart point. This point style is common in regional Early Archaic Opal phase occupations, which is consistent with the conventional radiocarbon date from Feature 39 (5420 ± 40 years BP).

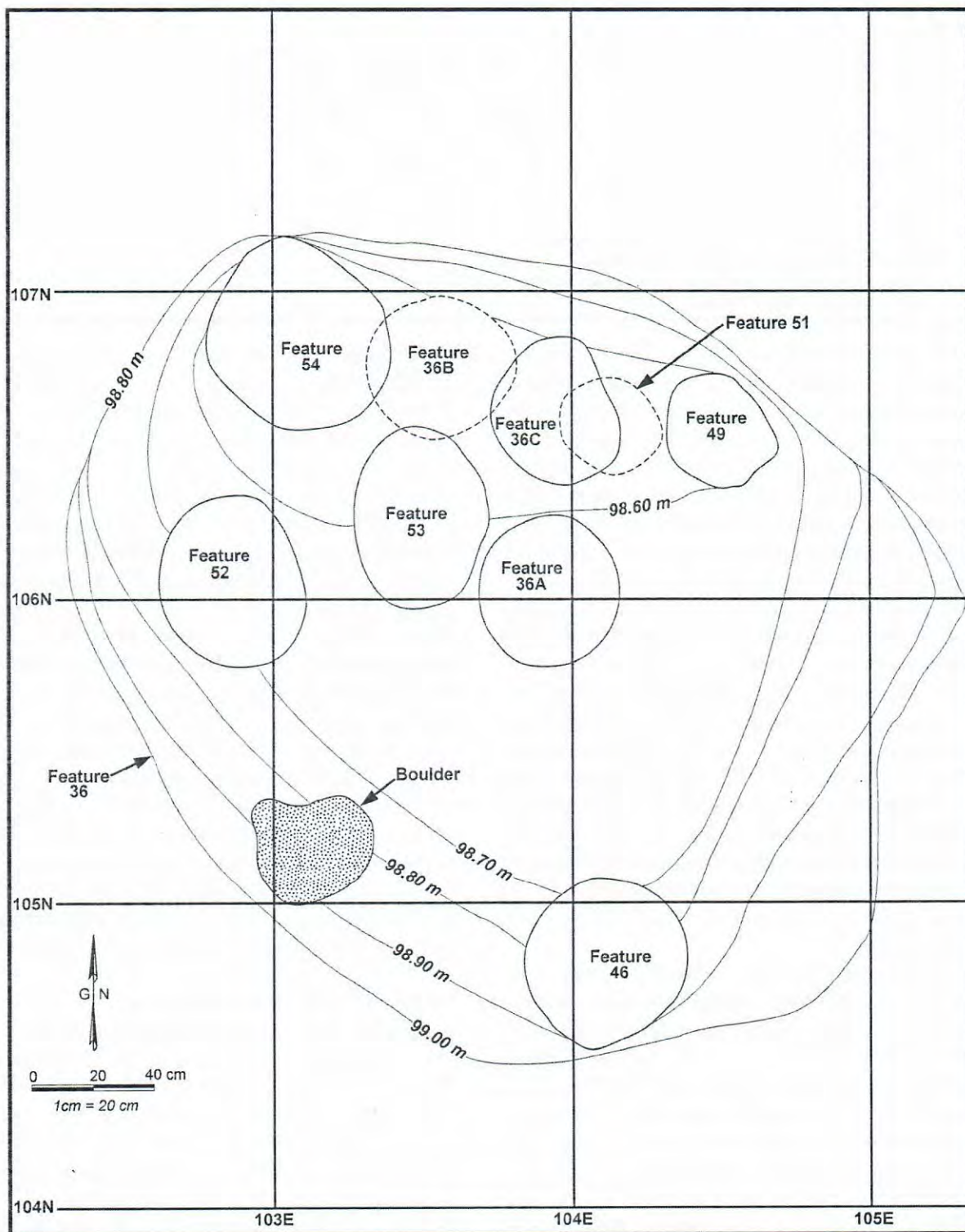


Figure 4: Plan map of Housepit Feature 36, Crooks Gap Housepit site.



Figure 5: Overview of Housepit Feature 36 after excavation facing south, Component I, Crooks Gap Housepit site.

Specimen FR6260-116 was in the excavation level just above and near to Feature 57 and is a nearly complete medium-sized opaque brown chert side-notched dart point. This point style is also

common in regional Early Archaic Opal phase occupations, which is consistent with the conventional radiocarbon date obtained from Feature 57 (5390 ± 40 years BP).

Table 3: Projectile points, Component I, Crooks Gap Housepit site.

CAT. NO. ¹	POINT STYLE	PORTION	UNIT			DIMENSIONS (MM) ²					MATERIAL
			NORTH	EAST	LEVEL	L	W	T	NECK W	BASE W	
46	Medium side-notched	Proximal	104	100	9	30*	17	6	12	15*	Opaque dark red heat-altered chert
116	Medium side-notched	Complete	107	101	14	26	19	3	12	16	Brown opaque chert
268	Unknown	Midsection	104	105	11	24*	16	4	--	--	Off-white opaque chert
122	Unknown	Midsection	108	101	16	31*	23*	4	--	--	Brown opaque/ semitranslucent chert
157	Medium stemmed	Proximal	105	102	9	19*	20*	5	--	17	Pink and tan fine-grained quartzite
158	Medium lanceolate	Proximal	105	102	11	11*	18	4	--	18	Opaque fossiliferous chert

¹ Begins with prefix "FR6260-".

² L = length; W = width; T = thickness; * = incomplete measurement.

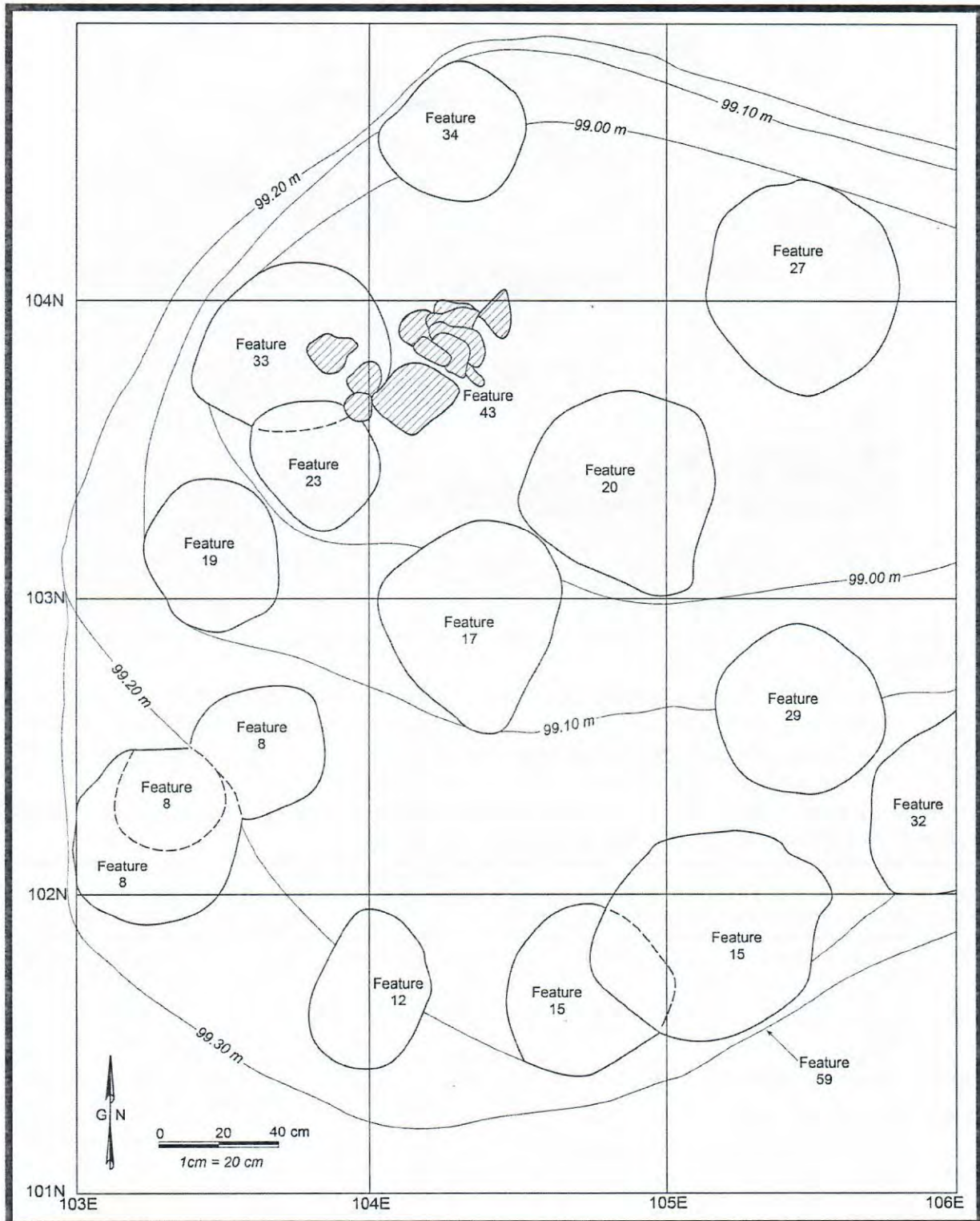


Figure 6: Plan map of Housepit Feature 59, Component I, Crooks Gap Housepit site.

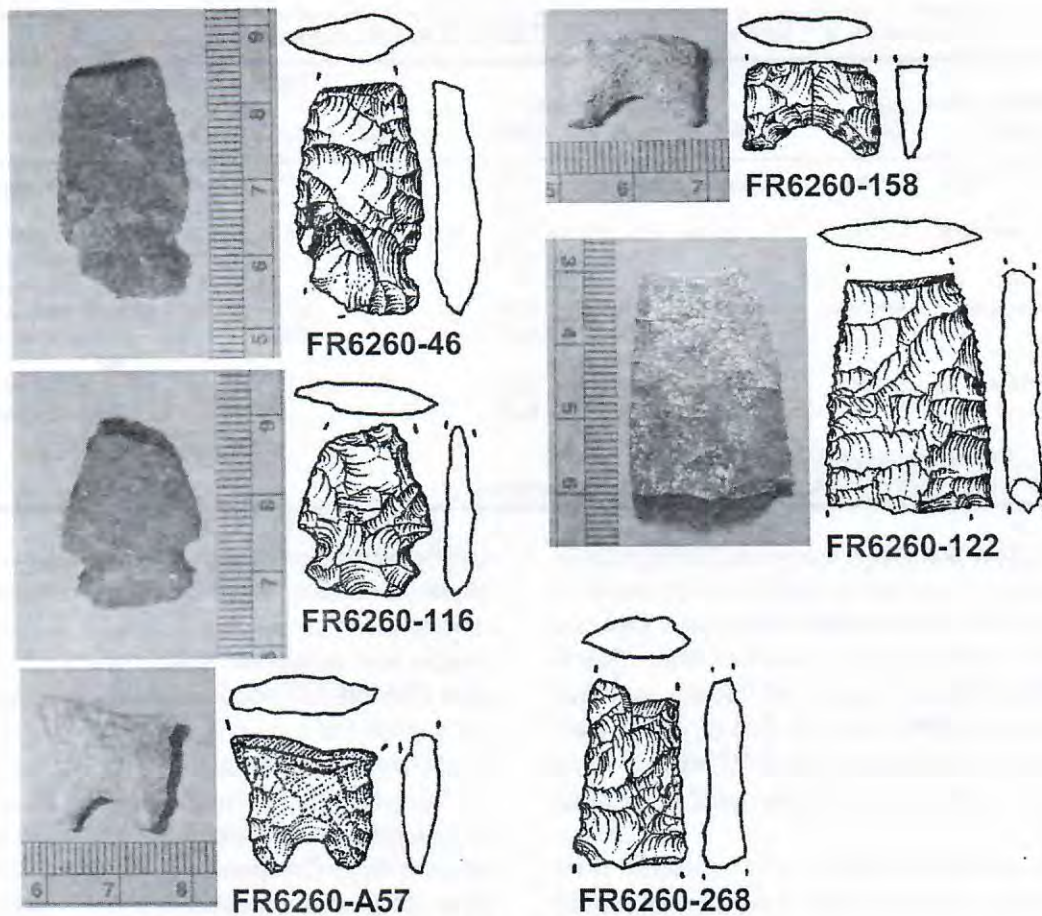


Figure 7: Projectile points, Component I, Crooks Gap Housepit Site.

Two specimens appear to be late Paleoindian in form (Specimens FR6260-157 and FR6260-158). They were both located in the unit adjacent to Feature 48, the one feature dated to the late Paleoindian period (8010 ± 50 years BP). However, both of these points were located several excavation levels above the level where Feature 48 was identified. The top of Feature 48 may have been obscured by the staining from Housepit Feature 36, so it could have been at the same levels as the projectile points. Specimen FR6260-157 is the proximal portion of a medium-sized split-stemmed projectile point resembling a Lovell Constricted point base. Lovell Constricted point types have been dated throughout Wyoming to around 8,500 to 8,000 years BP (Frison 1991; Kornfeld et al. 2010). Specimen FR6260-158 is the proximal portion of a medium-sized lanceolate projectile point with a deeply convex base. This point fragment resembles a base of an Allen-type Frontier Complex projectile point, which dates to the late Paleoindian period from as early as 10,000

to around 8000 years BP (Frison 1991; Kornfeld et al. 2010).

Specimen FR6260-122 is a midsection fragment of what would have been a finely worked, thin, medium to large projectile point. It was located in close proximity both stratigraphically and spatially with Feature 57.

Specimen FR6260-268 consists of two refitted fragments of a projectile point midsection recovered near Feature 27 and Housepit Feature 59. The form of the fragments is consistent with the other Early Opal phase projectile points.

Four bifaces were recovered from Component I (Table 4). The bifaces consist of one hafted knife, one indeterminate final biface, and two preblanks. The hafted knife FR6260-120 is a complete large side-notched hafted knife common to the Early Archaic Opal phase occupations (Figure 8). It has been heavily reworked to the extent the blade has an almost diamond cross-section and resembles a large hafted awl.

Table 4: Characteristics of bifaces, Component I, Crooks Gap Housepit site.

CAT. NO. ¹	REDUCTION STAGE	SIZE CLASS	PORTION	FUNCTIONAL CLASS	UNIT	LEVEL	DIMENSIONS (MM) ²			MATERIAL
							L	W	T	
111	Final biface	Unknown	Lateral	Unknown	106N 101E	13	20*	11*	4*	Semitranslucent chert
120	Final biface	Large	Complete	Hafted knife	108N 101E	14	78	28	7	Gray and dark gray banded and mottled fine-grained quartzite
349	Preblank	Medium	Terminal	Unknown	105N 102E	12	23* (F36)	37	14	Glossy opaque creamy grayish white and gray chert
418	Preblank	Large	Complete	Unknown	108N 102E	15	51	28	14	Red, yellow, and brown mottled opaque chert

¹ Catalog Number; Begins with prefix "FR6260-".
² L = length; W = width; T = thickness; * = incomplete measurement.

Four flake tools were recovered during excavation (Table 5). Two of the flake tools are modified flakes and two are expedient flake tools. One is a unifacially and bifacially modified flake (Specimen FR6260-86), and one is a bifacially modified flake (Specimen FR6260-201). The expedient tools (Specimens FR6260-452 and FR6260-488) have only use retouch on the lateral and/or terminal margins.

Two modified cobbles were recovered from Component I features (Table 6). One modified

cobble (Specimen FR6260-372) was recovered from Housepit Feature 39 and is a complete large tabular modified cobble roughly bifacially flaked on one margin with at least six flakes scars visible. Specimen FR6260-320 was identified approximately 50 cm southeast of Feature 9, a heat-altered rock scatter. It is a large complete modified cobble with at least 10 flakes removed. It was unifacially flaked around all margins. Four hundred and ten flakes were recovered from Component I, including 256 flakes from the general component and 154 flakes from

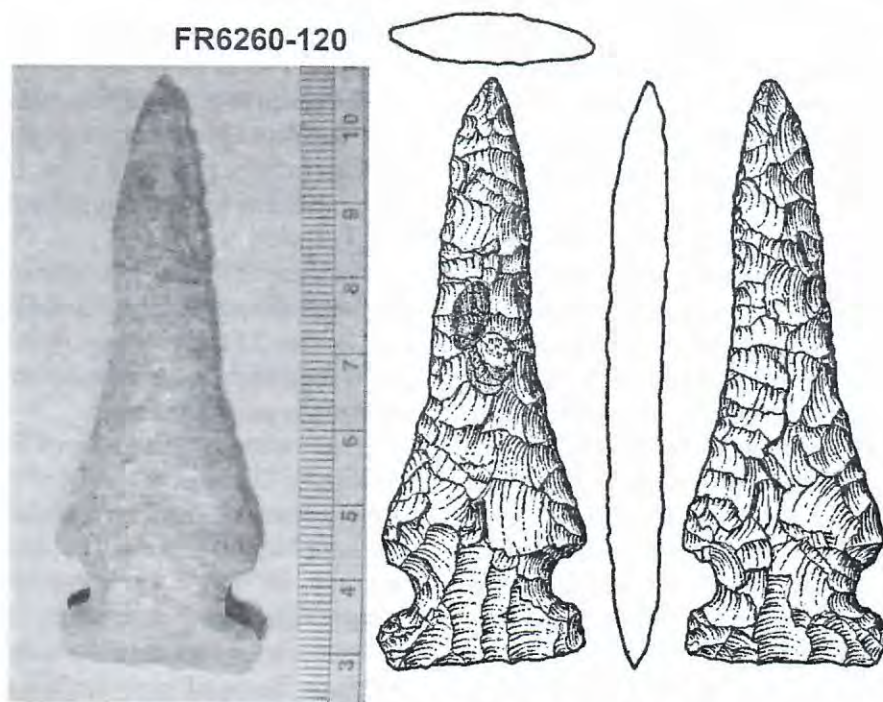


Figure 8: Side-notched biface , Component I, Crooks Gap Housepit site.

Table 5: Characteristics of flake tools, Component I, Crooks Gap Housepit site.

CAT. NO. ¹	TOOL TYPE	SIZE CLASS	PORTION	FUNCTION CLASS	UNIT	LEVEL	DIMENSIONS (MM) ²			MATERIAL
							L	W	T	
452	Expedient	Medium	Complete	Indeterminate	103N 103E	10	34	24	4	Brown dendritic semitranslucent chert
488	Expedient	Medium	Complete	Indeterminate	104N 100E	9/11	49	28	8	Light brown dendritic pebble chert
86	Modified	Medium	Complete	Indeterminate	101N 101E	8	35	26	4	Dark red fine-grained quartzite
201	Modified	Small	Lateral	Indeterminate	105N 104E	10	24*	15*	3	Tan medium-grained quartzite

¹ Catalog Number; Begins with prefix "FR6260-".

² L = length; W = width; T = thickness; * = partial measurement.

Table 6: Characteristics of modified cobbles, Component I, Crooks Gap Housepit site.

CAT. NO. ¹	SIZE TYPE	CLASS	PORTION	FLAKE SCARS	UNIT	LEVEL/ FEATURE	DIMENSIONS (MM) ²			MATERIAL
							L	W	T	
372	Possible digging rock	Large	Complete	6	103N 101E	11 (F39)	192	119	27	Tan and gray coarse-grained quartzite
320	Possible chopper	Large	Complete	10	104N 101E	11 (F9)	137	116	54	White quartz

¹ Catalog Number; Begins with prefix "FR6260-".

² L = length; W = width; T = thickness.

features. The debitage assemblages from the general component and the features are very similar. Chert flakes consisting of translucent, semitranslucent, and opaque chert flakes dominate both assemblages (73% of the general component assemblage and 77% of the feature assemblage). The other common material types present between the two assemblages are also present in similar quantities. Fifty-four (21%) fine-grained and medium-grained quartzite flakes were recovered from the general component and 28 (18%) fine-grained and medium-grained quartzite flakes were recovered from the features. There were twelve quartz flakes (5%) in the general component and five quartz flakes (3%) in the features. Flakes smaller than 3 cm dominated both the general component and the feature assemblages (96% and 97%, respectively). Ten flakes (4%) greater than 3 cm in size were recovered from the general component and four flakes (3%) from the feature.

GROUNDSTONE

One quartzite mano fragment was recovered from Component I (Table 7). It has one lightly ground face, and with no evidence of shaping, battering, or pecking on the faces or margins.

BONE SPECIMENS

One thousand and thirty-five nonintrusive bone and tooth fragments were recovered from Component I, including 294 fragments from the general component and 741 fragments from the Component I features.

The 294 fragments from the general component consist of eight tooth enamel fragments and 286 bone fragments. The general component bone assemblage is comprised of 226 (77%) medium mammal fragments, 61 (21%) small mammal fragments, four (1%) mammal fragments of an unknown-sized mammal, and three (1%) unidentifiable bone fragments. The 226 medium mammal fragments include two pronghorn (*Antilocapra americana*)

Table 7: Characteristics of Groundstone, Component I, Crooks Gap Housepit Site.

CAT. NO. ¹	TOOL TYPE	PORTION	NUMBER OF FACES	UNIT	LEVEL	DIMENSIONS (MM) ²			WEIGHT (KG)	MATERIAL
						L	W	T		
430	Mano	Complete	1	98N 103E	4	68	64	48	0.340	Quartzite

¹ Begins with prefix "FR6260-".
² L = length; W = width; T = thickness.

tooth fragments, one fragment of a pronghorn first phalange, one complete pronghorn second phalange, one proximal fragment of a pronghorn second phalange, one distal fragment of a pronghorn second phalange, and one complete pronghorn third phalange, representing an unknown number of pronghorn individuals. The remaining 219 medium mammal specimens are from medium mammals not identifiable to species and include four tooth enamel fragments, 52 fragments identifiable to element, and 163 not identifiable to element. The 52 fragments identifiable to element include one flat bone, two left distal humerus condyle, 16 long bone diaphyses, one right proximal metatarsal, two first phalange, seven pubis and obturator foramen, one left proximal radius, one radius diaphysis, eight unknown carpal, five unknown metatarsal or metacarpal condyles, two unknown distal carpals, one unknown distal metatarsal or metacarpal condyle, two unknown ribs, one unknown rib head, and two unknown vertebrae fragments.

The 61 small mammal bone fragments include one unidentifiable rabbit tooth enamel fragment and 60 fragments not identifiable to species. The 60 fragments include 22 fragments identifiable to element, one tooth enamel fragment, and 37 fragments not identifiable to element. The 22 specimens identifiable to element include 13 long bone diaphysis, five unknown long bone, one unknown rib head, one unknown rib, and two unknown flat bone fragments.

Overall, the general component bone assemblage is comprised primarily of fragments measuring less than 3.0 cm (n=277; 94%). Twelve (4%) medium mammal bone fragments measure between 3.0 and 4.0 cm, including the pronghorn first phalange fragment and complete third phalange. Three fragments, including the medium mammal left distal humerus, radius diaphysis, and one long bone diaphysis fragments, measure between 5.0

and 6.0 cm. One medium mammal unknown long bone diaphysis fragment measures 7.5 cm, and one medium mammal unknown long bone diaphysis fragment measures 8.3 cm. Seven hundred and forty-one bone specimens were recovered from the features, including 657 bone fragments and 84 tooth fragments. Bone specimens were recovered from 45 of the 57 features. The feature specimens include 355 (48%) small mammal bone and tooth fragments, 352 (47%) medium mammal bone and tooth fragments, one (0.1%) very small mammal bone fragment, and 33 (4%) unidentifiable bone fragments. One hundred and eighty specimens were identifiable as portions of specific elements and are dominated by small and medium mammal tooth fragments (n=84) and long bone diaphysis fragments (n=63). Medium mammal accounts for most of the specimens identifiable to element (n=134; 74%), and small mammal accounts for 46 (26%) of the specimens identifiable to element.

PLANT MACROFOSSILS

One hundred and eighty-three bulk feature fill samples with a combined volume of approximately 700 liters were collected and floated for plant macrofossils. Forty-five macrofossil remains were recovered from 14 of the 57 features from Component I. These remains include 28 burned goosefoot seeds from Feature 4 (13 seeds), Feature 7 (5 seeds), Feature 17 (2 seeds), Feature 36 (2 seeds), Feature 38 (2 seeds), Feature 39 (2 seeds), and Feature 57 (2 seeds), seven unburned seeds, one piece of carbonized wood, 11 *sclerotia* spores, and four pieces of insect chitin. The unburned seeds, *sclerotia* spores, and insect chitin should be considered intrusive.

COMPONENT II

Component II likely represents remains from a single, short-term residential occupation during

the late Opal phase. The two radiocarbon dated features from the component yielded radiocarbon age estimates of 3690 and 3680 years BP. The low density of artifacts and features associated with this component suggests limited generalized domestic activities were conducted during this occupation, potentially including the baking of root resources using the rock-filled basin.

FEATURES

One medium stained basin, one medium basin, and one medium heat-altered rock filled stained basin are assigned to Component II (Figure 9; Table 8).

Forty-six heat-altered rock fragments with a combined weight of 3.251 kg were recovered from Component II.

FLAKED STONE ARTIFACTS

Flaked stone artifacts recovered from Component II are two projectile points, two bifaces, and 177 pieces of debitage.

Two projectile points were recovered from Component II (Table 9; Figure 10). Specimen FR6260-69 is an almost complete tan opaque chert

side-notched dart point with shallow side notches. The point is only missing a small portion of one proximal lateral margin of the base. This type of side-notched dart point is typical of Early Archaic late Opal phase occupations. Specimen FR6260-262 is a very small gray siltstone projectile point fragment. It is a lateral portion of the base and side notch.

Two bifaces were recovered from Component II (Table 10). They consist of one final biface and one preform. The final biface (Specimen FR6260-262) appears to be a midsection. The preform (Specimen FR6260-429) is in two refitted pieces and is missing its extreme distal end. One hundred and seventy-seven flakes were recovered from Component II, including 169 flakes from the general component and eight flakes from the features. Several similarities and differences were noted between the general component and the feature debitage assemblages. Both assemblages had a majority of medium-grained quartzite flakes (47.9% of the general component assemblage and 71.4% of the feature assemblage). Additionally, flakes smaller than 3 cm dominated both the general component and the feature assemblages (94.1% and 100.0%, respectively).

Table 8: Summary of cultural features, Component II, Crooks Gap Housepit site.

NO.	FEATURE TYPE	DIMENSIONS (CM) ¹			TOP OF FEATURE	HEAT-ALTERED ROCK NO.	WEIGHT (KG)	NO. OF ARTIFACTS FROM FILL			AGE EST. ² (YEARS BP)
		L	W	D				FLAKES	BONE	OTHER	
2	Medium Heat-altered Rock Filled Stained Basin	64	55	13	99.46	44	32.863	6	33	--	3690 ± 40
3	Medium Basin	60	49	26	99.34	11	0.875	2	26	--	--
18	Medium Stained Basin	52*	40	8	99.80	--	--	--	--	--	3680 ± 40

¹ L = length; W = width; D = depth; * = partial measurement.

² Radiocarbon years before present, not calibrated.

Table 9: Characteristics of projectile points, Component II, Crooks Gap Housepit site.

CAT. NO. ¹	POINT STYLE	POINT TYPE	PORTION	UNIT			DIMENSIONS (MM) ²					MATERIAL
				NORTH	EAST	LEVEL	NECK			BASE		
							L	W	T	W	.W	
69	Medium side-notched	Dart	Almost complete	98	101	3	35*	14	4	10	11	Tan opaque chert
262	Side-notched	Indeterminate	Proximal Lateral	104	105	7	14*	8*	3*	--	--	Gray siltstone

¹ Begins with prefix "FR6260-".

² L = length; W = width; T = thickness; * = incomplete measurement.

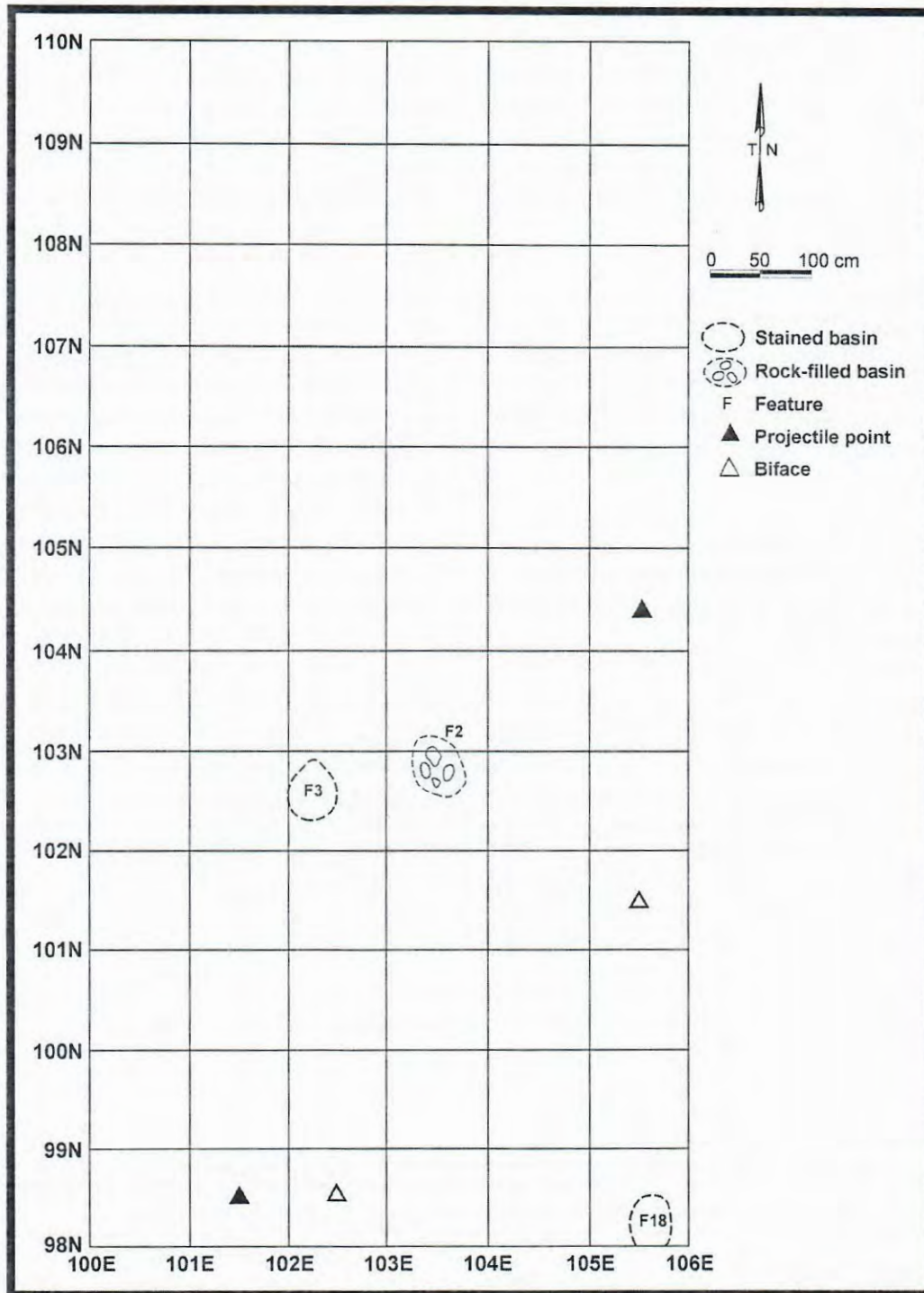


Figure 9: Spatial distribution of features and tools, Component II, Crooks Gap Housepit site.

BONE SPECIMENS

One hundred and two nonintrusive bone and tooth fragments were recovered from Component II, including 43 fragments from the general component and 59 fragments from the features.

The Component II non-feature bone assemblage is comprised of one (2%) large mammal bone fragment, 40 (93%) medium mammal fragments, one (2%) small mammal fragment, and one (2%) flat bone fragment from an unknown-sized mammal. The large mammal bone fragment is a

Table 10: Characteristics of bifaces, Component II, Crooks Gap Housepit site.

CAT. NO. ¹	REDUCTION STAGE	SIZE CLASS	PORTION	UNIT			DIMENSIONS (MM) ²			MATERIAL
				NORTH	EAST	LEVEL	L	W	T	
241	Final bifaces	Indeterminate	Medial	101	105	5	18*	16*	6	Dark red opaque chert
429	Preform	Medium	Proximal	98	103	2	44*	21	7	Tan semi-translucent chert

¹ Begins with prefix "FR6260-".

² L = length; W = width; T = thickness; * = incomplete measurement

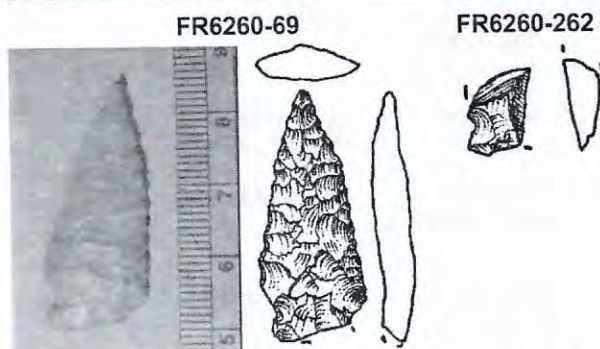


Figure 10: Projectile points, Component II, Crooks Gap Housepit site.

probable bison (*Bison bison*) complete third phalange. The 40 medium mammal specimens include three pronghorn (*Antilocapra americana*) pillared molar tooth fragments. The remaining 37 medium mammal specimens are not identifiable to species. They include four tooth enamel fragments, seven specimens identifiable to element, and 26 specimens not identifiable to element. The seven specimens identifiable to element include two long bone diaphyses, one third phalange, one humerus diaphysis, one unknown metatarsal or metacarpal condyles, and two distal metacarpal or metatarsal unfused condyle (from an unknown aged mammal) fragments. The small mammal bone fragment is a long bone diaphysis fragment.

Fifty-nine bone specimens were recovered from two of the three features identified in Component II. Feature 2 had 33 fragments, which consisted entirely of small mammal fragments. Feature 3 had 26 fragments, which included two medium mammal fragments, 17 unknown rodent fragments, two vole (rodent) tooth fragments, and five small mammal fragments.

PLANT MACROFOSSILS

Fourteen bulk feature fill samples with a combined volume of approximately 53 liters were floated from the excavated features from the three features. Five charred goosefoot seeds were recovered from Feature 3.

COMPARISONS WITH OTHER NEARBY HOUSEPITS

Twenty housepits at eight sites have been excavated within 20 km of the Crooks Gap Housepit site (Table 11). The Crooks Gap Housepit site is situated in Crooks Gap, a natural pass between the Sweetwater River to the north and the Great Divide Basin to the south. Five of the sites in the sample occur in the Sweetwater River valley north of the Crooks Gap Housepit site. The other three sites are south along the northern edge of the Great Divide Basin.

These sites are all in the general vicinity of major perennial water sources, but not immediately adjacent to them. The Crooks Gap Housepit site is near Crooks Creek, a small perennial creek flowing north through Crooks Gap to the Sweetwater River. The Headlining, Two-Fisted Manos, and Split Rock Ranch sites are situated on a broad, fairly level terrace about 0.5 km south of the Sweetwater River. The Jeffrey City site and Site 48FR2330 also are on the Sweetwater River terrace between the river and Crooks Creek, but further from these perennial water sources. Of the sites along the northern edge of the Great Divide Basin, the Crooks site is about 1.5 km from Crooks Creek. The Sheep Mountain Site is 2.4 km from Crooks Creek and the Arapahoe Creek Housepit site is about 2.6 km from Arapahoe Creek

CHRONOLOGY

The excavated mid-Holocene housepits have uncorrected radiocarbon ages ranging from approxi-

Table 11: Summary of excavated housepits located near Crooks Gap.

SITE NAME	DIMENSIONS			RADIOCARBON AGE ESTIMATE RANGE ² YEARS BP (³) ^B	REFERENCE(S)
	HOUSEPIT NO.	(CM) ¹ L	W D		
Split Rock Ranch (48FR1484)	1	550	400 70	6180 ± 170 – 4430 ± 60 (5)	Eakin (1987); Eakin et al. (1997)
	2	280	280 40	5630 ± 180 (1)	
	3		-	5730 ± 190 (1)	
	4	345	380 48	5870 ± 180 – 3400 ± 180 (7)	
	6		-	5760 ± 160 – 3080 ± 160 (2)	
Crooks (48FR1602)	A	390	370 48	4850 ± 70 (1)	McKern (1987)
	B	343	320 20	4300 ± 70 (1)	
	D	400	370 25	4360 ± 90 (1)	
48FR2330	16	460	440 125	7160 ± 150 – 5390 ± 100 (3)	Reiss (1990)
Jeffrey City Housepit (48FR4398)	2.0	323	362 60	5320 ± 40 – 5200 ± 30 (2)	McClelland and Smith (2002)
Two-Fisted Manos (48FR4516)	A	270	220 30	5240 ± 40 (1)	Fleming (2005a)
	B	277	250 31	5190 ± 40 (1)	
Headlining Housepit (48FR4464)	A	320	250 16	5520 ± 40(1)	Fleming (2005b)
	B	250	200 23	5250 ± 40(1)	
	C	330	330 43	5390 ± 40(1)	
	D	280	280 30	5330 ± 40(1)	
Arapahoe Creek (48SW13152)	1 ½	386	270 63	5530 ± 170 – 5210 ± 40 (2) ³	Lowe (2005)
	C	342	232 24	5572 ± 40 – 5560 ± 40 (2) ^c	
Crooks Gap Housepit (48FR6260)	36	310	240 30	5260 ± 30 – 5420 ± 40 (1)	Peterson and Smith (2012)
	39	320	184 20	5330 ± 40 – 5170 ± 40 (2)	
	59	368	300 30	5200 ± 40 (4)	
	1		-	5290 ± 40 – 5250 ± 40 (2)	
Sheep Mountain (48FR5125)	1	355	350 36	5040 ± 50 – 4650 ± 50(3)	Buenger and Goodrick (2011)
	15	305	309 40	6100 ± 40 – 5850 ± 40(2) ³	

¹ L = length; W = width; D= depth.

² Conventional radiocarbon age estimates, uncalibrated; (x) = number of age estimates for housepit.

³ Age estimates obtained on sediment samples are not included.

mately 8200 to 3600 years ago, although most date between 6000 and 4000 years ago (Smith 2003). The earlier housepits dating in the 8000 to 7000 years ago range are located in the Upper Green River Basin and are unique compared to most of the other excavated housepits in the Wyoming and Big Horn Basins which date to the Opal phase between approximately 6000 and 4000 years ago. Comparisons

of the average ages of the four housepits from the Crooks Gap Housepit site with those of the 41 excavated housepits dating to the Opal phase analyzed by Smith (2003) show the Crooks Gap housepits belong to the 400 year period with the most dated Opal phase housepits (Figure 11).

The average ages of the 24 excavated housepits from the nine sites in the immediate vicinity of

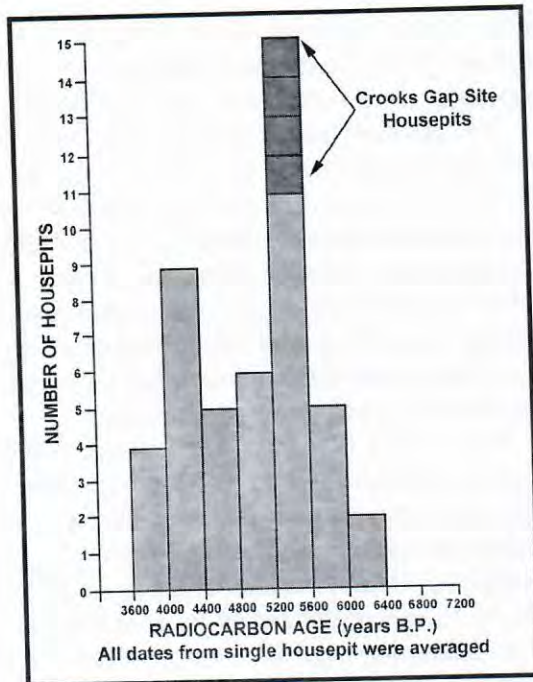


Figure 11: Distribution of radiocarbon age estimates of excavated Opal Phase housepit sites in the Wyoming and Big Horn Basins (after Smith 2003).

Crooks Gap listed (Table 11) have a similar, though tighter, distribution than the overall sample from the Wyoming and Big Horn Basins (Figure 12). Multiple dates from the same housepit were averaged for the plot. The outlier date of 7160 years BP from Housepit 16 at Site 48FR2330 was not used in averaging the other two dates (5770 and 5390 years ago) from that housepit. The distribution of the ages of the 24 housepits indicate the height of the prehistoric use of housepits in the area surrounding Crooks Gap was the 400 year period from 5600 to 5200 years ago. Fifteen of the housepits date to this period and an additional seven housepits have average radiocarbon ages belonging to the 400 year periods just before and after this 400 year period. Only two housepits, both from the Crooks site, have later ages in the 4400 to 4000 years ago period. In contrast to the overall age distribution for the Wyoming and Big Horn Basins, no peak in radiocarbon dates occurs in the 4400 to 4000 years ago period for the housepits in the Crooks Gap area, suggesting housepits were used in the Crooks Gap area for a more limited time period than the overall Wyoming Basin.

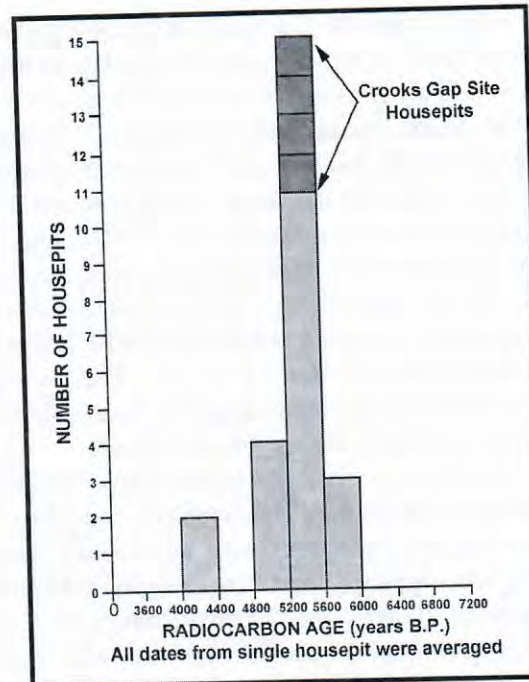


Figure 12: Distribution of radiocarbon age estimates of excavated Opal Phase housepits near Crooks Gap.

HOUSEPIT CHARACTERISTICS

The excavated housepits from the Wyoming and Big Horn Basins consist of generally circular to elliptical basins containing charcoal-stained fill. They typically have an irregular plan view suggesting informal construction. The sample of 41 excavated housepits analyzed by Smith (2003) measure from 1.70 to 6.00 m in diameter, with an average of 3.15 m. Their depths range from 14 to 125 cm with an average of 44 cm. Most of the housepits have diameters less than 4.0 m and are less than 60 cm deep. Most appear to have resulted from the mixing of charcoal, artifacts, and other trash in a confined space.

The four housepits from the Crooks Gap Housepit site conform to this overall pattern. The three measurable housepits (Features 36, 39, and 59) have average diameters ranging from 2.75 to 3.34 m with an average of 3.10 m. Their depths range from 20 to 30 cm. They are also generally elliptical and irregular in plan view. Because of the nature of the sediment, the charcoal stained sediment in these housepits was often faint and difficult to discern suggesting houses were of an ephemeral and informal nature.

The 20 excavated housepits from the eight sites surrounding Crooks Gap are also similar to those excavated at the Crooks Gap Housepit site, as well as the overall sample from throughout Wyoming. The average diameter of the 19 measurable housepits is 3.28 m with an average depth of 44 cm. The housepit with the largest diameter (5.50 x 4.00 m) from the eight sites is Housepit Feature 1 at the Split Rock Ranch site. The next largest (4.60 x 4.40 m) is Housepit Feature 16 at Site 48FR2330. It is also the deepest with a depth of 125 cm. The smallest excavated housepit of the sample (2.50 x 2.00 m) is Housepit Feature B at the Headlining site.

Evidence for the type of superstructure built over these shallow housepits is limited. Some housepits and surface structures in the Upper Green River Basin are ringed with up to 26 postholes indicating they originally possessed superstructures with posts anchored around the perimeter of the house basin (McKern and Harrell 2003; Nelson and Richard 2006). In general, however, the mid-Holocene housepits most typically contain only a few postholes or lack evidence of postholes altogether. Only 11 of the 41 excavated housepits analyzed by Smith (2003) display possible postholes and most of these contain only one. The most postholes from sites in the sample include four and five from two housepits at the Split Rock Ranch site, one of the sites near the Sweetwater River near the Crooks Gap Housepit site (Eakin 1987).

Of the four excavated housepits from the Crooks Gap Housepit site, only one (Housepit Feature 1) has possible postholes (two). Only six of the 20 housepits from the eight sites near the Crooks Gap Housepit site have postholes (Table 12). The largest number of postholes (nine), were identified from Housepit B at the Headlining site. Housepit C at this site also has four postholes, while the other two housepits from the site lack postholes. Three of the six housepits at the Split Rock Ranch site have five, four, and two postholes, respectively. The last housepit near the Crooks Gap Housepit site, the Arapahoe Creek Housepit C, has four postholes. Overall, 29% of the housepits in the Crooks Gap area have postholes which compares similarly to the overall 41 housepit sample from throughout Wyoming at 27%. Except for the housepits from the Upper Green River Basin which are often ringed with postholes, the superstructures of the housepits

in the vicinity of Crooks Gap area appear to have been constructed in a similar manner to those found throughout the Wyoming and Big Horn Basins.

An important characteristic of the housepits from the Wyoming and Big Horn Basins is the presence of at least one fairly large pit feature. Only one of the 41 excavated housepits in Smith's (2003) sample lacked at least one pit measuring over 40 cm in diameter and 15 cm deep. Some of the larger pits measure over 80 cm in diameter and over 70 cm deep. The number of pits found within the housepits or on their edge range from one to seven.

Each of the four housepits excavated at the Crooks Gap Housepit site contain large pit features with some measuring up to approximately 60 cm in diameter and 65 cm deep (see Table 12). Each housepit has at least one interior feature measuring over 50 cm in diameter and 30 cm deep and several others measuring over 40 cm in diameter and 15 cm deep. Housepit Feature 59 has the most of these larger pit features with five and Housepit Feature 39 has three of these larger features. The presence of these larger pit features in each of the four housepits at the Crooks Gap Housepit site compares well with the overall housepit sample from the Wyoming and Big Horn Basins. However, the overall number of pit features in some of the Crooks Gap Housepit site housepits was higher than typically found in most excavated housepits. Housepit Feature 59 contained 15 interior pit features and Housepit Feature 36 has nine features. These numbers are considerably higher than most of the excavated Wyoming housepits including the sample of 20 housepits from the sites surrounding the Crooks Gap Housepit site. Two of these housepits (Housepit 4 at the Split Rock Ranch site and Housepit 16 at Site 48FR2330) have seven interior features, but the remaining 18 housepits have four or fewer features. The higher number of interior features in some of the housepits at the Crooks Gap Housepit site is probably the result of reoccupation of the housepits where new pits were excavated into the loose sediment and used during subsequent visits. These reuse episodes are evidenced by the presence of many overlapping features in the housepits. In contrast, many of the other housepits in the Crooks Gap area sample appear to have been constructed into firmer and more stable sediments which preserved the interior pit features so they could be reused during repeated

Table 12: Characteristics of excavated housepits located near Crooks Gap.

Site Name	Housepit No.	Total Interior Features	Large Interior Features ¹	Oxidation ²	Possible Post Holes	Heat-Altered Rock ^{2, 3}	Flaked Stone Artifacts ³	Ground-stone ³	Bone Specimens	Charred Seeds
Split Rock Ranch	1	4	4	P	4	NR	881	2	1291	36
	2	3	3	P	0	NR	393	0	275	5
	3	1	1	P	0	NR	409	0	223	1
	4	7	7	P	2	NR	834	1	874	45
	6	2	2	P	5	NR	335	0	230	2
Crooks	A	2	2	P	0	2.982	153	2	281	0
	B	2	2	P	0	3.270	59	2	1009	2
	D	3	3	A	0	1.000	21	0	61	0
48FR2330	16	7	6	NR	0	NR	101	12	1263	655
Jeffery City	2.0	3	2	NR	0	NR	105	2	105	0
Two-Fisted Manos	A	1	1	A	0	6.155	6	0	21	1
	B	3	1	A	0	10.460	7	5	114	0
Headlining	A	3	3	P	0	0.522	20	0	77	0
	B	1	1	A	9	0.010	17	3	113	0
	C	3	3	P	4	3.255	17	2	72	1
	D	1	1	P	0	1.695	32	0	26	0
Arapahoe Creek	½	2	2	P	0	0.000	27	0	7	0
	C	4	3	P	4	0.000	148	0	202	0
Crooks Gap	36	9	5	A	0	10.984	40	0	144	2
	39	4	4	A	0	3.930	7	0	30	4
	59	15	10	P	0	14.207	104	0	392	2
	1	6	1	A	2	0.160	2	0	57	0
Sheep Mountain	1	3	2	NR	0	<1	133	3	57	0
	15	3	3	A	0	6.6	72	4	176	0

¹ Basin features larger than 40 x 40 x 15 cm² P = Oxidation present on at least one feature in Housepit; A = not present; NR = not recorded³ Total specimens for housepit and all interior features

visits without having to excavate new features.

Based partly on the number and layout of the large interior basins, McNees (2005) classified the 16 Opal phase housepits excavated for the Lost Creek Pipeline project, a nearby pipeline. Type A housepits have a single interior feature offset from the housepit center, Type B housepits have elliptical outlines with a large interior feature at each opposite edge of the housepit, Type C housepits have three large interior basins, and Type D housepits are more structurally complex with an elliptical patch of oxidized sediment at the center and a slight bench. Eleven of the 20 housepits from four of the eight sites (the Headlining, Two-Fisted Manos, Arapahoe Creek, and Jeffrey City sites) in the vicinity of the Crooks Gap Housepit site were excavated during the Lost Creek Pipeline project and classified by McNees (2005). He classified four of the housepits as Type A, four as Type B, and three as Type C. His analysis found no obvious temporal differences in the distribution of housepits types, but the possibility of geographical differences.

The Crooks Gap Housepit site housepits could not be easily classified into McNees' (2005) types, because of the number of interior features excavated over several reuse episodes which disrupted any discernible patterns. Housepit Feature 36 could possibly be classified as a Type A housepit based on the presence of one somewhat deep pit feature offset from the housepit center. Housepit Features 39 and 59 appear to be most closely similar to Type C housepits. If these classifications are correct, then comparisons with the housepit sites in the vicinity of the Crooks Gap Housepit site indicate the Crooks Gap Housepit site is similar to the sites located along the Sweetwater River. These sites along the Sweetwater River, including the Two-Fisted Manos, Headlining, and Jeffrey City sites, have Type A and C housepits.

SUBSISTENCE

Faunal Remains

Bone remains from the excavated housepits from the Wyoming and Big Horn Basins are fragmentary and are usually present in low quantities resulting in only a limited number of specimens being identified to taxa. Of the 41 housepits analyzed by Smith (2003), only 27 contained bone identifiable to at least one taxon. Identified bison bone was rare

in the sample and consisted of only three specimens from two housepits at the Split Rock Ranch site. Bone assemblages from sixteen of the 27 housepits (59%) included either deer or pronghorn in small numbers. In contrast, 25 of the 27 housepits (93%) had identified jackrabbit or rabbit bone or both. Additionally, rabbit-size or smaller animals represented over 90% of the bone fragments classifiable only to animal size class from 29 or the 34 housepits in the sample with classifiable bone. The remaining five housepits of the 34 had from 50 to 80% of the classifiable bone included in the rabbit or smaller size classes. The results of the comparison of the Wyoming housepit sample indicate the prehistoric occupants of the housepits typically relied on small mammals, especially rabbits, and to a lesser extent on deer or pronghorn. Bison are represented only rarely and only in the better-watered areas such as along the Sweetwater River near the Split Rock Ranch site.

The results of the excavation of the four housepits at the Crooks Gap Housepit site indicate both medium mammals such as pronghorn, as well as small mammals including rabbits, were exploited (Table 13). Two of the four housepits contained remains identified as pronghorn and all four had medium mammal bone. All four also yielded small mammal bone including two with remains identified as rabbit (jackrabbit or cottontail). None of the housepits contained remains identified as bison or large mammal bone. The presence of evidence for the use of medium mammals at all the housepits at the Crooks Gap Housepit site contrasts with the overall sample of 41 excavated housepits from throughout the Wyoming and Big Horn Basins where many of the housepits lacked evidence for the use of medium-sized mammals.

Comparisons with the 20 excavated housepits at the eight sites in the vicinity of the Crooks Gap Housepit site also indicate a focus on medium-sized mammals in addition to small mammals. Thirteen of the 20 housepits (65%) contained remains identified as either pronghorn or deer and all housepits had bone classified as medium mammal. Of the 20 housepits, only two housepits from the Split Rock Ranch site along the Sweetwater River had three specimens identified as bison; the only two housepits in the entire Wyoming and Big Horn Basin housepit sample to have bison bone. The Jeffrey City site,

Table 13: Summary of taxa identified in housepits near Crooks Gap.

SITE NAME (SITE NUMBER)	HOUSEPIT NO.	TAXA IDENTIFIED (NUMBER OF SPECIMENS)								
		BISON	LG-M	PRONG- HORN	DEER	MD-M	RABBIT	SM-M	VS-ML	OTHER
Split Rock Ranch (48FR1484)	1	2	--	--	2	22	104	587	739	9
	2	--	--	--	1	11	4	133	3	3
	3	--	--	1	2	13	4	118	8	9
	4	1	--	--	1	9	16	221	93	10
	6	--	--	--	--	2	5	45	9	1
Crooks (48FR1602)	A	--	--	2	--	118	2	72	--	--
	B	--	--	6	--	111	4	628	--	--
	D	--	--	2	--	13	--	43	--	--
48FR2330	16	--	--	--	2	93	14	1072	76	--
Jeffery City (48FR4398)	2.0	--	2	--	--	49	--	--	881	--
Two-Fisted Manos (48FR4516)	A	--	--	--	--	2	--	4	15	--
	B	--	--	3	--	34	3	17	56	--
Headlining (48FR4464)	A	--	--	5	--	46	--	17	--	--
	B	--	--	2	--	100	--	8	--	--
	D	--	--	--	--	20	--	43	--	--
Arapahoe Creek (48SW13152)	½	--	--	--	--	3	--	--	--	--
	C	--	--	25	--	68	--	--	63	--
Crooks Gap (48FR6260)	36	--	--	--	--	47	--	75	--	--
	39	--	--	1	--	8	--	21	--	--
	59	--	--	43	--	134	1	132	1	--
	1	--	--	--	--	3	1	53	--	--
Sheep Mountain (48FR5125)	1	--	--	--	--	56	--	--	1	--
	15	--	--	--	1	170	--	--	1	--

¹ Lg-m = large mammal – animals larger than mule deer; includes bison, elk, moose, and horse; Md-m = medium mammal – animals ranging in size from coyotes to mule deer; includes pronghorn, mountain sheep, mule deer, most canids, etc.; Sm-m = small mammal – animals from cottontail rabbit to smaller than coyote in size; includes cottontail, jackrabbit, marmot, beaver, raccoon, porcupine, etc.; Vs-m = very small mammal – animals smaller than cottontail rabbit; includes ground squirrel, kangaroo rat, pocket gopher, and other small rodents; Other = other taxa identified.

also located along the Sweetwater River, had two specimens classified as large mammal. Eighteen of the 20 housepits had bone specimens classified as small or very small mammals. Of these, nine housepits had bone identified as rabbit (jackrabbit or cottontail). The only housepit without small mammal bone was a housepit at the Arapahoe Creek site with only three medium-mammal bone specimen. The two housepits encountered at the Sheep Mountain site contained only one small mammal bone each with the rest of the bone being identified as deer or medium mammal.

Overall, the prehistoric inhabitants of the

housepit sites in the vicinity of Crooks Gap relied on both medium and small mammals as part of their subsistence including at times even bison along the Sweetwater River. This subsistence focus contrasts partly with the overall 41 housepit sample from the entire Wyoming and Big Horn Basins where small mammals and especially rabbits were most commonly identified taxa in excavated housepits with bone (Smith 2003). The better-watered area along the Sweetwater River probably supported larger populations of pronghorn, deer, and, at times, bison than the drier areas surrounding many of the other excavated housepits in the overall Wyoming and Big

Horn Basin sample. The presence of higher quantities of these mammals along the river provided the opportunity for the occupants of the housepits in the vicinity of the Crooks Gap Housepit site to encounter and hunt these animals in larger numbers than in other areas of the arid intermountain basins of Wyoming.

Seeds

The mass processing of seeds appears not to have been an important subsistence activity at most of the excavated housepits throughout the Wyoming and Big Horn Basins (Smith 2003). Only a few charred seeds and plant remains characterize most excavated housepits. Twenty of the 41 housepits analyzed by Smith (2003) lacked charred seeds and most of the others contained less than one seed per liter of examined sediment. The predominant charred seed types include goosefoot (*Chenopodium* sp.) and pricklypear (*Opuntia* sp.) cactus. Such low numbers of charred plant remains from most housepits were probably introduced into the archaeological record as a result of the natural prehistoric seed rain and do not necessarily represent extensive processing activities (Bach 1997).

Only a few excavated housepit assemblages of the 41 housepit sample analyzed by Smith (2003) have quantities of charred seeds which might suggest some processing activities. The sites include the Split Rock Ranch site (Eakin 1987), Site 48FR2330 (Reiss 1990), Site 48HO120 (Reiss 1991), Sinclair site (Smith and Reust 1992), and Medicine House (McGuire et al. 1984). Of these, two sites (Split Rock Ranch site and Site 48FR2330) occur along the Sweetwater River and are part of the 20 housepit sample near Crooks Gap (see Table 12).

The Split Rock Ranch site yielded a wide diversity of charred seed taxa, though the number of recovered seeds from each housepit was limited. The most common taxa included 27 rose (*Rosa* sp.), 26 saltbush (*Atriplex* sp.), and 17 goosefoot seeds. Charred seeds from the six housepits included 35 seeds representing 24 taxa from Housepit Feature 1, five seeds identified to three taxa from Housepit Feature 2, one saltbush seed from Housepit Feature 3, 45 seeds representing 16 taxa from Housepit Feature 4, and two goosefoot seeds from Housepit Feature 6. The prehistoric inhabitants may have processed the seeds from some of these taxa.

The housepit at the other site along the Sweet-

water River, Site 48FR2330, yielded 642 charred pricklypear cactus (*Opuntia* sp.) seeds, four charred goosefoot seeds, and nine other charred seeds. The presence of large numbers of pricklypear cactus seeds suggests this taxon was processed at the site.

The housepits at the other six sites near Crooks Gap contained only limited charred plant remains. Housepit B at the Crooks site yielded only a charred chokecherry (*Prunus virginiana*) and an unknown seed; Housepit A at the Two-Fisted Manos site had one charred Indian ricegrass seed; and Housepit C at the Headlining site contained only a possible charred prickly pear cactus tissue. The remaining housepits lacked charred seeds. The Crooks Gap Housepit site also contained only limited charred plant remains. All the recovered charred seeds were goosefoot and included two from Housepit Feature 36, four from Housepit Feature 39, and two from Housepit Feature 59. The limited remains from these sites probably do not represent extensive seed processing activities.

Except for possibly two sites located along the Sweetwater River which have some evidence for seed processing, the extensive processing of seeds appears not to have been an important subsistence activity at the sites near Crooks Gap. These results are similar to those from the overall 41 housepit sample from the entire Wyoming and Big Horn Basins (Smith 2003). The apparent limited use of seeds associated with mid-Holocene housepits agrees with previously observed patterns (Smith 1988).

The paucity of charred seeds recovered from most housepits may also be partly the result of preservation issues. The presence of charcoal flecks in many of the housepit features indicates at least some charcoal is being preserved which suggests charred plant macrofossils would also be preserved if originally present. Also, several sites, including the Split Rock Ranch site and Site 48FR2330 located in similar depositional contexts, contain larger numbers of charred seeds indicating seeds are preserved in similar contexts. The issue of preservation needs to be explored further.

Additional possible evidence for the use of seeds comes from the occurrence of groundstone at some of the housepit sites. No groundstone was recovered from the housepit or possible housepit features at the Crooks Gap Housepit site, though one mano was found in a non-feature context. Eleven of the 20 housepits (55%) from the eight sites in the

vicinity of the Crooks Gap Housepit site yielded groundstone. The groundstone may have been used for other activities instead of seed processing such as root or small animal processing.

Roots

Another resource possibly collected and processed at the Crooks Gap Housepit site and other housepit sites in the Wyoming and Big Horn Basins is roots. Direct evidence for the processing of roots is lacking at the housepit sites, but the presence of large pit features, containing charcoal, darkly stained sediment, and often oxidized walls, which may have functioned as pit ovens indicates this resource may have been important to the prehistoric occupants. These pit features are present in each of the excavated housepits at the Crooks Gap Housepit site, in all of the 20 housepits in the vicinity of Crooks Gap, and in all except one of the 41 housepits in the sample analyzed by Smith (2003). Although only one of the four housepits at the Crooks Gap Housepit site had features with oxidized walls, 12 of the 16 (75%) housepits (where the presence or absence of oxidation was recorded) from the eight sites in the vicinity of Crooks Gap had pit features with oxidation (see Table 12). Approximately 73% of the housepits (where the attribute was recorded) in the 41 housepit sample analyzed by Smith (2003) had pit features with oxidation. The presence of the oxidation and charcoal stained sediment indicates direct heat or fire was applied at some point in conjunction with the pits. Although other vegetable resources, fatty meats, and small animals were also sometimes baked in pit ovens, these features with evidence of direct heat or fire are of the ideal size and shape for baking plant resources such as roots (Wandsnider 1997).

A heating element of rock is typically included in many pit ovens to bake roots, especially those ovens used to bake roots containing the complex carbohydrates inulin and fructan, which require moderate or high processing temperatures over an extended period of time (Thoms 2008; Wandsnider 1997). The Wyoming housepits and their interior pit features are characterized by limited quantities of heat-altered rock indicating a heating element was not employed as part of the technology associated with these pit features. Rose (2008) found more than half of the interior pit features included in her study of Wyoming housepits lacked heat-altered rock.

Two of the housepits (Housepit Features 36 and 59) at the Crooks Gap Housepit site had some of the higher weights of heat-altered rock than most housepits in the Wyoming and Big Horn Basins with 10.984 and 14.207 kg, respectively (see Table 12). Only one housepit site, the Two-Fisted Manos site, of the housepit sites in the vicinity of Crooks Gap had heat-altered rock weights similar to those from the Crooks Gap Housepit site. One housepit at the Sheep Mountain site also had approximately 6.6 kg of heat-altered rock. The remaining sites where the weight of heat-altered rock was recorded had only limited rock. Even these higher weights of heat-altered rock for the two housepits at the Crooks Gap Housepit site probably does not represent the use of heating elements in the baking process. These rock weights are all from interior features within a housepit and most can be attributed to scattered rock throughout the actual housepit and not concentrated rock in a single pit feature. Documented pit ovens in the area with a heating element dating to 1300 and 1000 years ago typically have at least 40 kg and at times over 100 kg of heat-altered rock (Smith et al. 2001). Larger pit ovens in the upper Green River Basin of Wyoming have hundreds of kilograms of heat-altered rock (Francis 2000).

Because the pit features associated with the housepits most likely did not involve a rock heating element, they were probably not used for the long-term baking of inulin- or fructan-rich root species. They may have been used for more starch-rich roots which still required some baking for digestibility, but not long-term baking. Some possible starchy roots probably in the environment at the time of housepit occupation include biscuitroot (*Cymopterus* sp.) and bitterroot (*Lewisia rediviva*). Biscuitroot grows on dry open areas in open or clayey soil and bitterroot is found on gravelly to heavy, usually dry soil. Both habitats occur in the area of the Crooks Gap Housepit site and other Wyoming housepits.

MOBILITY

An often considered dimension of residential mobility is duration of site occupation. As evidenced by the design and preservation of the housepits and the density and distribution of the recovered remains, the duration of site occupation associated with the Wyoming housepit sites appears to be relatively short (Smith 2003). The irregular outlines

of the Wyoming housepits and the lack of prepared floors and walls suggest low energy construction usually associated with houses at short-term camps. Most excavated Wyoming housepits also contained only low quantities of flaked stone artifacts and bone. Nineteen of the 41 housepits analyzed by Smith (2003) had fewer than 50 flaked stone artifacts and debitage and only housepits at three sites including the Split Rock Ranch site had more than 300 artifacts per housepit. Quantities of the highly fragmentary bone exhibited similar patterns with 18 of the 41 housepits containing fewer than 100 bone fragments and 32 of the housepits having fewer than 350 fragments. The Split Rock Ranch site and Site 48FR2330 were among the few sites with the greatest quantities of bone specimens. These bone quantities are still relatively low, considering the highly fragmentary nature of the assemblages.

The results from the excavations at the Crooks Gap Housepit site indicate a short-term duration of occupation similar to the overall Wyoming housepit sample. The Crooks Gap Housepit site housepits have irregular outlines and lack prepared floors and walls and appear to represent low energy construction. The quantities of flaked stone artifacts and debitage range from two to 104 specimens per housepit, which is similar to the range for most Wyoming housepits. The bone quantities ranging from 30 to 392 fragments per housepit are also in the range for the overall Wyoming housepit sample.

Comparisons with the 20 excavated housepits from the eight sites near Crooks Gap also indicate similar patterns as evident at the Crooks Gap Housepit site and the overall Wyoming housepit sample, although some of the sites display somewhat higher quantities of recovered remains than average. The Split Rock Ranch site is the housepit site containing the greatest quantities of flaked stone artifacts and bone of the overall Wyoming housepit sample. Artifact quantities ranged from 335 to 881 specimens and bone quantities were from 223 to 1291 fragments (see Table 12). Housepit 16 at Site 48FR2330 and Housepit B at the Crooks site also had higher than average bone quantities at 1263 and 1009 bone fragments, respectively. The remaining sites and housepits had fairly low quantities of fewer than 153 artifacts and 202 bone fragments. Overall, the small quantities from most of the housepits suggest occupations of short duration with the possibility of

more extensive occupations at a few. However, the higher quantities of remains at these few housepits may be the result of more repeated occupations and use.

HOUSEPIT REUSE

An important aspect of hunter-gatherer settlement patterns is their long-term land-use strategies spanning decades, centuries, or millennia. Stable long-term land use patterns would result in the periodic and redundant reuse of some sites over an extended period of time. The Wyoming housepit dataset shows persistent land-use patterns including the reuse of housepits and sites over at least a two thousand year period (Smith and McNees 2011). This evidence includes the reuse of the actual housepit, the construction of new housepits at the same site, and the use of different sites within the larger locale. Excavations at the Crooks Gap Housepit site provide additional evidence of the reuse of the actual housepits over a period of several visits.

One means of documenting reuse of housepits is provided by stratigraphic evidence where the house depression partly fills with sediment between occupations and new interior pit features are constructed during these subsequent visits. The most dramatic example of this type of evidence for the reuse of housepits comes from the Moneta Divide Housepit site located in the southwest corner of the Wind River Basin of central Wyoming (Smith and McNees 2011). The Feature 11 housepit was a deeply stratified basin containing evidence of at least eleven occupational floors. The housepit was repeatedly occupied over a period of time during which aeolian deposits were rapidly aggrading both within and adjacent to the housepit, resulting in the concurrent rising of both the house floor and the surrounding surface. Radiocarbon dates from interior basins at the base, middle, and top of the feature suggest the series of these occupations occurred over a period of a century.

The excavation of the four housepits or possible housepits at the Crooks Gap Housepit site provides a different line of evidence for the reuse of housepits over a period of years. The land surface during the occupations of the housepits was in a non-aggrading environment so the rare opportunity to document repeated occupations through the internal stratification of the housepits as at the Moneta Divide

Housepit site was not possible. Instead, evidence for the repeated reuse of the housepits at the Crooks Gap Housepit site comes from the periodic construction of new interior pit features which overlapped previous ones. The repeated occupations at the site occurred on the same stable, non-aggrading land surface, but the previously constructed pit features within the housepit became obscured in the relatively loose sediments of the site. Upon revisits to the site, the previous pit features were not evident within the housepit so new ones were constructed and often overlapped the earlier ones.

Repeated reuse of Housepit Feature 36 is evident by the overlapping interior pit Features 36B, 53, and 54 which suggest at least three periods of use. Pit Features 36C and 51 also overlap providing additional evidence of reuse. Dramatic evidence for housepit reuse over several subsequent visits comes from Housepit Feature 59 which contains at least 15 interior pit features. For example, pit Feature 8 appears to consist of three overlapping features indicating at least three periods of use. Other overlapping features include two features recorded as Feature 15 and the features designated as Feature 23/33. Housepit Features 36 and 59 and their adjacent pit Features 46 and 34 also appear to overlap slightly suggesting they may have been constructed during different site occupations although their radiocarbon age estimates are similar. Because of the loose sediment, distinguishing the edges of the housepit basins was difficult.

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