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Prehistoric Archaeology of the Sagehen Flats Locality

by

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16. Abstract

The Sagehen Flats Locality is 1 of 16 localities contained within the Escalante Sector. It is located in southwest Colorado approximately 6 km northwest of Dolores, Colorado. The Sagehen FLats Locality differs from surrounding localities in that it is an area of gentle slopes and small knolls. Its drainages feed the Sagehen Marsh, which eventually drains into the Dolores River to the east. The first prehistoric use of this area has been dated to the Archaic Tradition (5000 B.C.-A.D. 500) Occupation by the Anasazi began during late Basketmaker III times and continued into Pueblo II times (A.D. 600-975). Limited use of the locality by the Anasazi occurred for only a short time during late Pueblo II-early Pueblo III times (A.D. 1050-1200). After this time the locality was used by populations of the Shoshonean-Athabascan Tradition (A.D. 1500-1900) also in a limited manner. Historic Euro-American utilization began in the late 1800s.

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ABSTRACT

The Sagehen Flats Locality is one of 16 localities contained within the Escalante Sector. It is located in southwest Colorado approximately 6 km northwest of Dolores, Colorado. The Sagehen Flats Locality differs from surrounding localities in that it is an area of gentle slopes and small knolls. Its drainages feed the Sagehen Marsh, which eventually drains into the Dolores River to the east. The first prehistoric use of this area has been dated to the Archaic Tradition (5000 B.C.-A.D. 500). Occupation by the Anasazi began during late Basketmaker III times and continued into Pueblo II times (A.D. 600-975). Limited use of the locality by the Anasazi occurred for only a short time during late Pueblo II-early Pueblo III times (A.D. 1050-1200). After this time, the locality was used by populations of the Shoshonean-Athabascan Tradition (A.D. 1500-1900), also in a limited manner. Historic Euro-American utilization began in the late 1800s.

INTRODUCTION

Sagehen Flats Locality is one of 16 localities defined by the Dolores Archaeological Program (D.A.P.) in the Escalante Sector (Kane [1]). It is located in the southern half of the Escalante Sector, in the Yellowjacket District of the Mesa Verde Region of the Northern San Juan Culture Area. The locality is bordered on the north by Cline Crest Locality, on the east by Periman Locality, and on the south by Escalante Locality. Sagehen Flats Locality is located in Montezuma County, Colorado, as shown on the Trimble Point Quadrangle, U.S.G.S. 7.5 Minute Series 1965 Topographic Map. The locality lies in Sections 19, 30, and 31 of T38N, R15W, and in Sections 24, 25, 26, 27, 34, 35, and 36 of T38N, R16W.

This report presents an overview of D.A.P. research conducted to date in Sagehen Flats Locality. A discussion of the environment, focusing on those aspects pertinent to archaeological concerns, is followed by a brief description of past survey efforts in the locality. The various strategies employed by the D.A.P. in mitigating selected sites located in dam impact areas are also discussed. Data recovered from Sagehen Flats Locality sites during the 1978 and 1979 field seasons are then placed within the broad perspective of the D.A.P. temporal scheme, followed by a presentation of the spatial distribution of these sites based on various statistical analyses. A discussion of the material cultural elements, with an emphasis on architecture, serves as a rationale for the proposed temporal scheme. Finally, directions for future research in Sagehen Flats Locality are suggested, based on the requirements of dam impact mitigation and archaeological research.

ENVIRONMENTAL SETTING

Sagehen Flats Locality is composed of a lowland area containing marshes supported by small intermittent drainages and surrounded by small hillocks of Mancos Shale (Figures 1.1 and 1.2). The elevation varies from 2085 to 2207 m above sea level (Figure 1.3).

Three vegetation zones are present in the Sagehen Flats Locality. The marshland zone lies at an elevation of about 2090 m above sea level and consists primarily of cattail (Typha latifolia), along with American bulrush (Scirpus americanus), bulrush (Scirpus acutus), and arrowhead (Sagittaria latifolia). Second, the lowland surrounding the marsh consists of a shrubland zone comprised mainly of big sagebrush (Artemisia tridentata) and rabbitbrush (Chrysothamnus nauseosus). This shrubland zone lies mostly between the elevations of 2100 m to 2140 m above sea level. Third, the hillocks, which have shallow loess developed over Mancos Shale, support a pinyon-juniper woodland zone. It is comprised mainly of pinyon pine (Pinus edulis), juniper (Juniperus osteosperma), fendlerbush (Fendlera rupicola), and squawbush (Rhus aromatica ssp. trilobata). The pinyon-juniper woodland zone lies between 2140 m and 2207 m in the locality.

Climate[1]

Sagehen Flats Locality lies in a semiarid climatic zone (Trewartha [2:225]). This zone receives moisture during two wet seasons. The first wet season results from summer thunderstorms during July and August; the

1 Portions of this section were contributed by John Montgomery (Apricot Hamlet, Site 5MT2858, Chapter 3, Volume V, Dolores Archaeological Program Technical Reports).

Figure 1.1 Sagehen Flats Locality, general view.

Figure 1.2 Sagehen Flats Locality, facing northwest.

Figure 1.3 Topographic map of Sagehen Flats Locality.

second wet season results from winter precipitation, when moist air masses develop over the Pacific Ocean and produce moisture in the form of snow as they move inland. The annual average precipitation recorded by the United States Weather Bureau (U.S.W.B.) in Dolores, Colorado, is 460.5 mm (Kane [3:14]).

The number of annual frost-free days in the Sagehen Flats Locality has never been officially recorded; however, an annual average of 124 frost-free days has been recorded by the U.S.W.B. in Yellowjacket, Colorado, 13.7 km west of the locality. The elevations of Sagehen Flats Locality and Yellowjacket, Colorado are similar, approximately 2075 m above sea level, indicating similar weather patterns.

Meterological data recorded by the U.S.W.B. in Dolores show that July is the warmest month, averaging 19.7 degrees C, while January is the coldest month, averaging a temperature of -3.1 degrees C. The growing season near Dolores lasts between 100 and 145 days (125-120 + 20 days).

Relative humidity readings available from nearby Cortez, Colorado, indicate a generally mild continental climate. The annual average relative humidity recorded in Cortez is about 56 percent. The moisture content of the soil is affected by seasonal variability in humidity, temperature, and precipitation. While pertinent research has not been done for the Dolores area, Litzinger's [4] study at Hovenweep (in southeastern Utah) provides some relevant information. Litzinger was able to show that the evaporation potential is less than the amount of available moisture during periods of higher relative humidity. Because the periods of highest relative humidity typically occur in the winter (with heavy snowfall), available moisture readily penetrates and is stored in the soil. This moisture becomes available to plants during the high

drought stress typical of the late spring and early summer. While summer monsoons provide large amounts of precipitation, rain is not easily absorbed by the soil because the volume of rainfall is much greater than the dry soil's absorption capacity (Litzinger [4:217-220]).

Geology

Sagehen Flats Locality contains two primary geologic features: (1) the House Creek Fault, and (2) the dip slope controlled by the Dakota Sandstone. Figure 1.4 illustrates a schematic north-south geologic cross section of Sagehen Flats Locality and vicinity. The House Creek Fault extends in a northeast-southwest direction and forms the southern boundary of the locality. It is a high angle, dip-slip, normal fault (Leonhardy [5]). The northwest of the fault side is downthrown. The Mancos Shale on the downthrown side forms small hills, while it is primarily eroded away from the southeast side of the fault.

Dakota Sandstone is exposed in the locality; however, most often, this geologic unit is covered with eolian sediment deposited during the Quaternary Period. When exposed, the Dakota Sandstone is most often found in drainages and arroyos; it is a primary source of building stone.

The Mancos Shale, found primarily in the southern half of the locality, covers the downthrown side of the House Creek Fault. The Burro Canyon Formation is found exposed on the upthrown side of the House Creek Fault scarp. The Morrison Formation underlies the Burro Canyon Formation and is exposed on the upthrown side of the House Creek Fault.

Soils

The development of soils in the D.A.P. project area has been reported in detail by Leonhardy [5]. A soils map for Sagehen Flats Locality is provided here (Figure 1.5); refer to Leonhardy [5] for descriptions of each mapped type.

Hydrology

The Sagehen Marsh, which drains into the Dolores River, is the major water source within the Sagehen Flats Locality today. Core samples analyzed by K. Peterson (personal communication) indicate that the marsh has dried up on several occasions; research is underway for evidence concerning the existence of the Sagehen Marsh prehistorically. A natural dam, formed by a hillock composed of Renohill soil on the south side and by an alluvial fan extending southward from the north side, has formed; erosional processes have slowly cut a channel between these landforms (Figure 1.5). Ground water in the locality has increased since the irrigation canals were built; subsequently, water accumulates and is retained in Sagehen Marsh.

During prehistoric times the basin where the marsh presently lies was supplied with runoff from the north, west, and south. The largest watershed is the area to the north of the basin. This area extends beyond the boundaries of the locality and funnels runoff into the basin area where it joins runoff from the west and south.

A large arroyo drainage which is part of the northern watershed presently extends from the northwest to the south-southeast where it meets the Sagehen Marsh (Figure 1.3). Contained within this drainage are seeps and areas of standing water. During May and June 1979, water was noted at

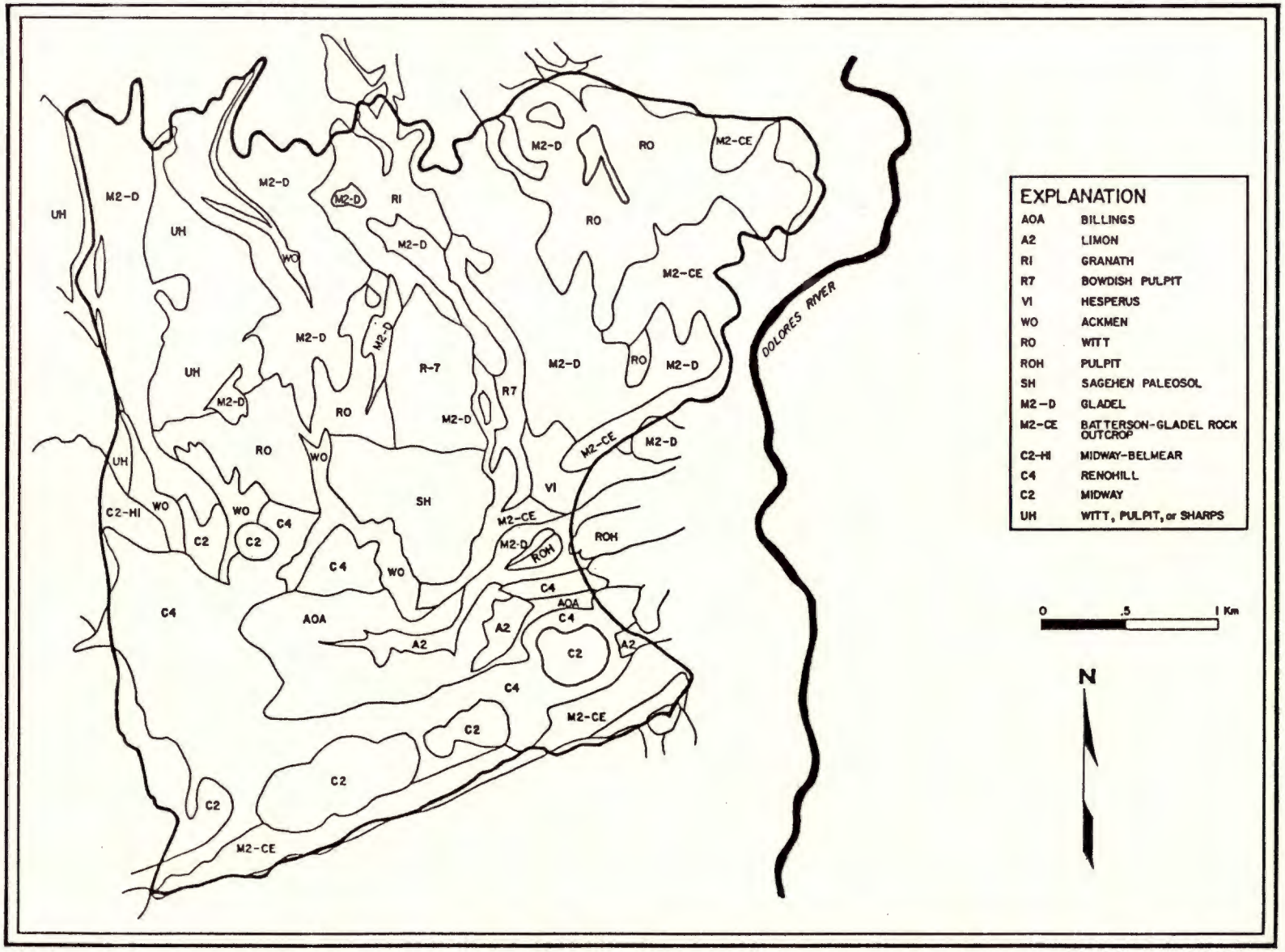

Figure 1.5 Soils map for Sagehen Flats Locality Leonhardy (5).

the seep. During September 1979, the moisture level had dropped considerably; however, water was still available at the seep and could also be found in isolated pockets above the seep.

Flora

As discussed earlier, the present day vegetation zones found in Sagehen Flats Locality are the marshland, shrubland, and pinyon-juniper woodland zones. Erdman et al. [7] have indicated that the prehistoric populations in the Mesa Verde area adapted to vegetation zones much like those present today. Vegetation in the Sagehen Flats Locality, in areas that are not presently under cultivation, may be similar to types that were available prehistorically. Descriptions of vegetation in the project area can be found in Bye [8].

The vegetal resources currently found in the Sagehen Flats Locality include the nuts of the pinyon pine (*Pinus edulis*) and Gambel oak (*Quercus gambelii*), and the bulbs of the mariposa lily (*Calochortus nuttallii*) and wild onion (*Allium* sp.). Berries are available from squawbush (*Rhus aromatica* ssp. *trilobata*), chokecherry (*Prunus virginiana*), currant (*Ribes* sp.), serviceberry (*Amelanchier utahensis*), gooseberry (*Ribes leptanthum*), and squaw apple (*Peraphyllum ramosissimum*). Fruit pods are available from prickly pear (*Opuntia* sp.), cholla (*Opuntia fragilis*), and broadleaf yucca (*Yucca baccata*). Available as herbs are wild buckwheat (*Eriogonum umbellatum*) and goosefoot (*Chenopodium* sp.). Seeds are available from Indian Ricegrass (*Oryzopsis hymenoides*), native thistles (*Cirsium* sp.), pigweed (*Amaranthus graecizans*), and amaranth (*Amaranthus retroflexus*). The tuber of common arrowhead (*Sagittaria latifolia*) can be eaten raw or

cooked, as can the young shoots and stems of the American bulrush (Scirpus americanus) and bulrush (Scirpus sp.).

Fauna

Presently, the Sagehen Flats Locality supports a varied and large population of fauna. Modern and historic disturbances in the locality might have increased the faunal population since prehistoric times. Main Canal #2 of the irrigation system seeps into the marsh and has apparently increased its size and made it more stable in recent times. Avifauna may benefit most from the increased size and stability of the marsh. The area also functions as a sanctuary for deer during daylight hours.

Agriculture in the northern half of the locality, and the introduction of grasses (e.g., crested wheatgrass [Agropyron cristatum] and western wheatgrass [Agropyron smithii]) in the southern half of the locality, have provided grazing areas for some game animals. The undisturbed areas offer nesting places and natural food supplies, which cannot be replaced through agriculture.

The following list includes fauna and avifauna observed during the 1979 field season or known to exist in the locality (Emslie [9], J. Brisbin, personal communication): long-tail weasel (Mustela frenata), striped skunk (Mephitis mephitis), black bear (Ursus americanus), cottontail rabbit (Sylvilagus sp.), black-tailed jackrabbit (Lepus californicus), white-tailed jackrabbit (Lepus townsendii), rock squirrel (Spermophilus variegatus), Colorado chipmunk (Eutamias quadrivittatus), least chipmunk (Eutamias minimus), cliff chipmunk (Eutamias dorsalis), mouse (Peromyscus spp.), pinyon mouse (Peromyscus truei), deer mouse (Peromyscus maniculatus), canyon mouse (Peromyscus crinitus), muskrat

(Ondatra zibethicus), spotted ground squirrel (Spermophilus spilosoma), bushy-tailed woodrat (Neotoma cinerea), black-tailed prairie dog (Cynomys ludovicianus), white-tailed prairie dog (Cynomys gunnisoni), gopher (Thomomys sp.), vole (Microtus sp.), badger (Taxidea taxus), porcupine (Erethizon dorsatum), raccoon (Procyon lotor), crayfish (Cambarus sp.), rattlesnake (Crotalus sp.), and western rattlesnake (Crotalus viridis). Avifauna recorded in the locality currently include bald eagle (Haliaeetus leucocephalus), golden eagle (Aquila chrysaetos), red-tailed hawk (Buteo jamaicensis), Cooper's hawk (Accipiter cooperii), nighthawk (Choreiles sp.), northern harrier (Circus cyaneus), American kestrel (Falco sparverius), scrub jay (Aphelcoma coerulescens), pinyon jay (Grymnorhinus cyanocephalus), Steller's jay (Cyanocitta stelleri), common raven (Corvus corax), common crow (Corvus brachyrhynchos), turkey vulture (Cathartes aura), great horned owl (Bubo virginianus), mourning dove (Zenaidura macroura), common flicker (Colaptes auratus), black-billed magpie (Pica pica), mountain bluebird (Sialia currucoides), western meadowlark (Sturnella neglecta), great blue heron (Ardea herodias), ring-necked pheasant (Phasianus colchicus torguatos), mallard (Anas platyrhynchos plalyrhynchos), red-headed woodpecker (Centurus uropygialis uropygialis), lesser Canada goose (Branta canadensis levcopareia), green-winged teal (Nettion carolinense), blue-winged teal (Querquedula discors), cinnamon teal (Querquedula cyanaptera), scaled quail (Callipepla squamata), sandhill crane (Grus canadensis), long-billed curlew (Numinius americanus), band-tailed pigeon (Columba fasciata fasciata), Calliope hummingbird (Stellula calliope), sage sparrow (Amphispiza nevadensis), and sharp-tailed grouse (Pedioecetes plasianellus).

Although these species have been observed in the locality during present times, this does not necessarily reflect the prehistoric faunal population in Sagehen Flats Locality. Certainly, an increase in numbers of each species is possible, as well as an increase in the variety of species, with the modification of vegetation brought about through modern agricultural practices. The predictability of this situation can only be tested through comparisons of the present-day populations and the indicators of prehistoric populations found in the archaeological record. S. Emslie [9] conducted population inventories during the 1979 field season as well as an analysis of faunal remains recovered during the 1979 field season. Analysis of faunal remains recovered from D.A.P. excavations are included in the individual site reports.

Historic Land Use

Historic land use in the Sagehen Flats Locality is first documented after 1880 (D. Duranceau [10]), when the area was used to graze sheep, cattle, and horses. Farming started in the locality sometime after 1910, when Sections 19, 25, 26, and 30 were partially cleared by chaining and used as fields to cultivate beans and wheat. These same fields are still used today for cultivating the same crops. From 1910 until 1950, Sec 36 and the Northeast Quarter of Sec 35 remained grazing pasture. After 1950, these areas were cleared with a ripper, or a disc plow, and seeded with grasses for sheep and cattle pasture. During excavation of the plow zone at many of the prehistoric sites in the locality, remnants of burned vegetable material were identified as sagebrush. The burning of these materials might be attributable to historic activities, although no informants have specifically mentioned it.

The East Half of the Northwest Quarter and the West Half of the Northeast Quarter of Sec 35 were also cleared and planted with beans and wheat; however, it was discovered that the elevation of the area is too low for cultivating these crops. The area receives early frosts from cold-air drainage and the soil retains too much moisture for the crops to ripen or dry adequately. For these reasons, this area was later planted with grass for pasture.

Extending across the southern extent of Sagehen Flats Locality and following near the 2103 m contour line is Main Canal #2, a part of the Montezuma Valley Canal System. Main Canal #2 is an irrigation canal that first brought water to the Montezuma Valley in 1889. Water is diverted from the Dolores River and channeled through Main Canal #1, where it flows into Main Canal #2. Main Canal #2 extends across Sagehen Flats and bifurcates on the western edge of the locality where two lateral canals begin: the U-Lateral Canal, which carries water to the community of Arriola; and the Lone Pine Lateral Canal, which carries water to Narraguinnep Reservoir where it is stored for irrigation.

In all, a total of 16 historic sites, including 7 homesteads, have been identified and recorded in Sagehen Flats Locality (Duranceau [10]). Table 1.1 shows the types of historic sites in Sagehen Flats Locality.

Table 1.1 Historic Sites in Sagehen Flats Locality

Site	Function
5MT4560	homestead-ranch
5MT4561	homestead-farm
5MT4562	homestead
5MT4563	temporary habitation
5MT4564	temporary habitation
5MT5057	homestead
5MT5058	stone house
5MT5059	homestead-ranch
5MT5060	homestead
5MT5066	CCC camp and homestead
5MT5169	trash dump
5MT5170	trash dump
5MT5172	homestead-farm
5MT5176	trash dump
5MT5177	temporary habitation and trash dump
5MT5181	Montezuma Valley tunnel and canal system

SURVEYS

Seven different archaeological surveys of the Sagehen Flats Locality have been undertaken since 1972. The first survey was conducted in 1972 by the University of Colorado (Breternitz and Martin [11]). In 1974, Toll [12] surveyed the area downstream of the proposed McPhee Dam site for the Bureau of Land Management. During 1975, Breternitz [13] surveyed the proposed Towaoc Canal and laterals, and Kane [14] surveyed the Monument Creek Reservoir, the Dawson Draw Reservoir, and the Great Cut Dyke-Dove Creek Main Canal Line and canal laterals that were classified as primary impact areas. Also in 1975, Kane [15] surveyed four construction impact areas: (1) the Northern Recreation Area; (2) the Southern Recreation Area; (3) the McPhee Dam Access Road; and (4) the northern portion of the Towaoc Canal. In 1976, Kane [16] surveyed proposed borrow areas--areas to be used for construction materials for the McPhee Dam--for the Bureau of Reclamation. During 1978, Dykeman et al. [17] surveyed selected areas which had not been previously surveyed within the D.A.P. area. This survey was continued during the 1979 field season and included a reassessment of previous surveys (Dykeman et al. [17]).

Approximately 80 percent of Sagehen Flats Locality has been surveyed by the D.A.P. to date. Figure 1.6 indicates those areas which have not been surveyed. Area 1 will likely never be surveyed by the D.A.P. because this portion of the locality lies beyond the take line of the reservoir. Area 2 is scheduled for investigations in the coming field seasons, and Area 3 is scheduled for survey during the 1980 field season (D. Dykeman, personal communication). It should be noted that a portion

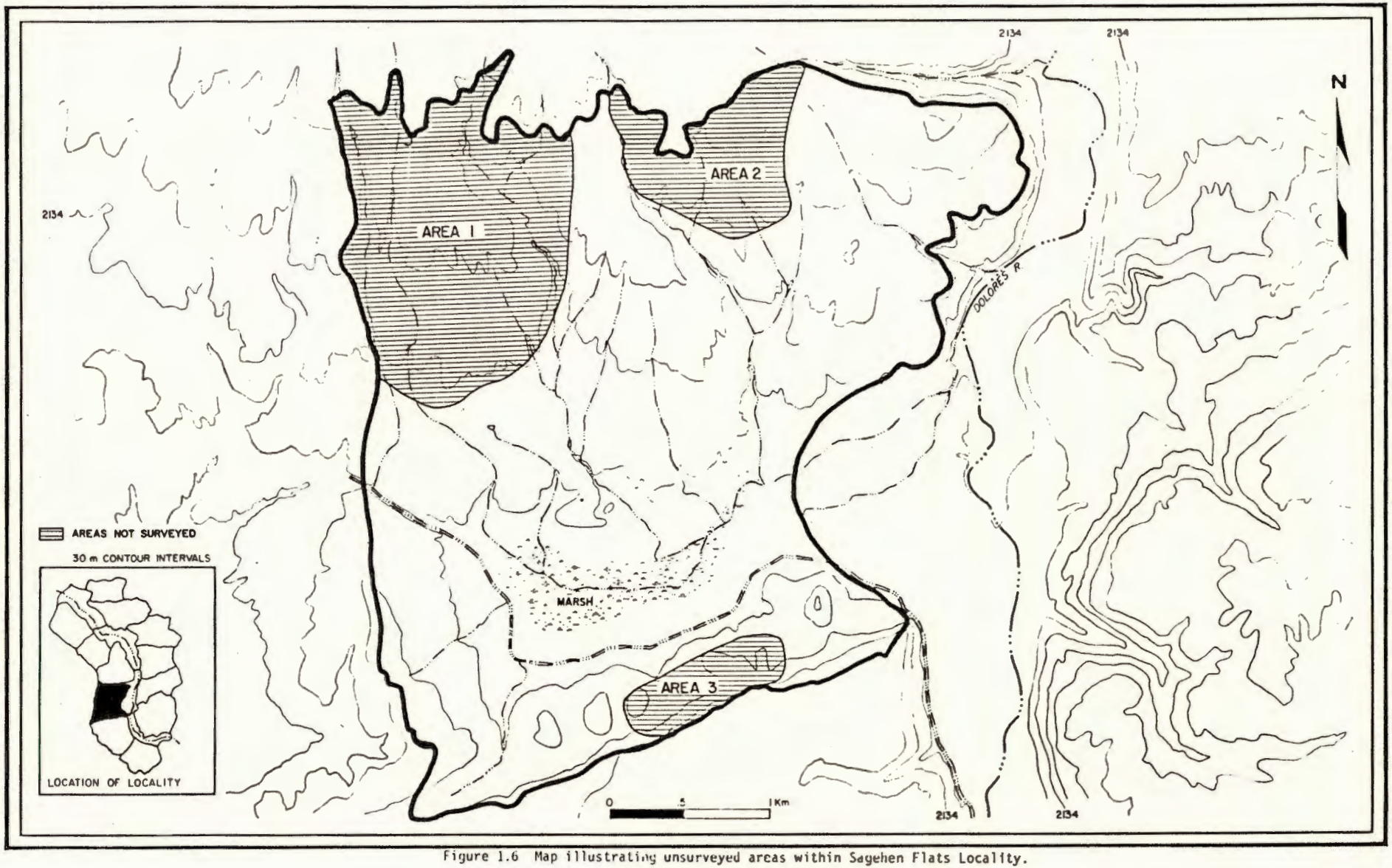

Figure 1.6 Map illustrating unsurveyed areas within Sagehen Flats Locality.

of Area 1 was included in the 1979 Washington State University probability survey; the limits of this survey, however, are not shown in Figure 1.6.

Surveys in the Sagehen Flats Locality have recorded 147 sites to date; of these, 28 have been tested or intensively excavated. Of the remaining 119 sites, 88 have been tentatively placed into the D.A.P. phase/tradition sequence based on survey information (Kane [1]). Surface artifacts and architecture were used to infer temporal placement of each site. Inferences about site function and economic strategy were made on the basis of the site's relationship to soils, available water, vegetation, geology, and cultural remains.

MITIGATION STRATEGY

During the 1979 field season, three levels of mitigation were implemented on sites located in construction-impact areas. These were: (1) intensive excavations, (2) sampling investigations, and (3) intensive, systematic surface collections.

Intensive excavation, as defined in the D.A.P. field manual (Kane et al. [18]), was the first level of mitigation strategy. This involved detailed excavation of households at selected sites within the West Sagehen Neighborhood and Milhoan Community (Kane [1]). A sample of sites of the Archaic Tradition and of the McPhee Phase of the Anasazi Tradition (see D.A.P. temporal sequence section) were also intensively investigated (Table 1.2).

The second level of investigation involved testing sites belonging to the Sagehen Phase in the West Sagehen Neighborhood and Milhoan Community. This sampling program was designed to contribute material to the data base through consistent sampling procedures. The sampling procedure involved: (1) establishing a 4 by 4 m grid system over the site area for control in systematically collecting 50 percent of the site area (this grid was maintained thoughout excavation to compare surface data with subsurface features, to provenience all cultural materials and features, and to coordinate the magnetometer survey results with the testing program); (2) drawing topographic and site profile maps illustrating the relationship of topography to cultural features; (3) removing the plow zone with either a grader or self-loading scraper to expose undisturbed deposits; (4) locating features or stains in undisturbed areas and recommending areas for detailed excavation; (5) excavating all pit features and testing large

Table 1.2 Site Mitigation Strategy

Site Number	Temporal Placement (Phase)	Function	Intensively Excavated	Sampled	Surface Collected
5MT2162	Sagehen	hamlet		X	
5MT2192	Sagehen	hamlet	X		
5MT2193	Sagehen	hamlet	X		
5MT2194	Sagehen	hamlet	X		
5MT2199	McPhee/Great Cut	limited activity indeterminate	X		
5MT2202	Great Cut	limited activity	X		
5MT2203	McPhee	field house	X		
5MT2205	McPhee	field house	X		
5MT2235	Sundial/Great Cut	hamlet	X		
5MT2236	Great Cut/	seasonal camp		X	
	Sagehen	hamlet		X	
5MT2242	Great Cut	limited act./process/procurement	X		
	Sagehen	limited activity/processing		X	
5MT2844	Sagehen	limited activity/storage		X	
5MT2848	Sagehen	hamlet		X	
5MT2853	Sagehen	hamlet and limited activity/storage		X	
5MT2854	Sagehen	hamlet	X		
5MT2857	Anasazi n.a.p.*	limited activity		X	
5MT2858	Sagehen	hamlet	X		
5MT4512	McPhee	field house	X		
5MT4513	Great Cut/	seasonal camp		X	
	McPhee	limited activity/procurement		X	
5MT4545	Sagehen	hamlet	X		
5MT4614	Sagehen	hamlet	X		
5MT4640	Sagehen	hamlet		X	
5MT4642	McPhee	limited activity process		X	
5MT4644	Sagehen	hamlet	X		
5MT4649	Indeterminate Tradition	limited activity		X	
5MT4681	Indeterminate Tradition	seasonal camp	X		
5MT4682	Great Cut	seasonal camp			X
5MT4763	Anasazi n.a.p.*	limited activity/storage	X		

* n.a.p. - not assigned to phase

stains with a hand auger to determine the extent and stratigraphy of potential pitstructures; and (6) trenching pitstructures with a backhoe at sites where more data on post-abandonment processes, structural dimensions, construction techniques, and ancillary features could be obtained. Excavation of such trenches would often provide dendrochronological and archaeomagnetic samples. These samples, along with artifactual assemblages and data on architectural styles, were used to place these sites into the D.A.P. temporal scheme and assess site function (Table 1.2).

The third level of investigation focused on data retrieval from only an intensive systematic surface collection. Only one site, Site 5MT4682, was surface-collected and not further investigated in the Sagehen Flats Locality (Table 1.2). This site contained a flaked lithic concentration and it is hoped that analysis of these items will aid in dating the site.

D.A.P. TEMPORAL SEQUENCE

The D.A.P. temporal sequence is represented by five traditions (Paleoindian, Archaic, Anasazi, Shoshonean, and Protohistoric) (Kane [1]); only the first three will be considered in the following discussion. Within the Archaic and Anasazi traditions, several phases have been defined on the basis of evidence recovered from D.A.P. investigations. Two additional categories have been created to accomodate those sites which cannot be assigned to tradition or phase: (1) sites of indeterminate tradition, and (2) Anasazi sites not assigned to phase.

Sites of Indeterminate Tradition

Within the Sagehen Flats Locality, 31 sites that could not be assigned to a tradition have been recorded. Sites of this type are often limited activity or seasonal loci (see Kane [1]), lacking sufficient temporally diagnostic material. Table 1.3 presents each of these sites with its supposed function and Figure 1.7 illustrates the distribution of these sites in the locality.

Paleoindian Tradition

No sites in the Sagehen Flats Locality have been dated to the Paleoindian Tradition; however, one basal fragment of a Plano-type projectile point was located during 1978 survey (Dykeman et al. [17]). This projectile point fragment indicates human occupation in the locality as early as approximately 7000 B.C. (Kane [1]).

Table 1.3 Sites of Indeterminate Tradition in Sagehen Flats Locality

Site	Function
5MT2195	seasonal camp
5MT2220	economic indeterminate
5MT2239	limited activity/processing
5MT2243	seasonal camp
5MT2671	indeterminate
5MT2843	limited activity/processing
5MT2846	limited activity/processing
5MT2850	limited activity/processing
5MT4633	limited activity/processing
5MT4634	limited activity/processing
5MT4637	limited activity/processing
5MT4638	limited activity/burial
5MT4639	seasonal camp
5MT4646	limited activity/quarry
5MT4647	limited activity/processing
5MT4649	limited activity/processing
5MT4662	limited activity/processing
5MT4668	limited activity/processing
5MT4669	limited activity/processing
5MT4672	limited activity/processing
5MT4675	limited activity/processing
5MT4681	seasonal camp
5MT4743	limited activity/storage
5MT4773	limited activity/water control
5MT5113	seasonal camp
5MT5115	seasonal camp
5MT5116	limited activity/processing
5MT5117	limited activity/processing
5MT5131	limited activity/processing
5MT5132	limited activity/processing
5MT5136	limited activity/processing

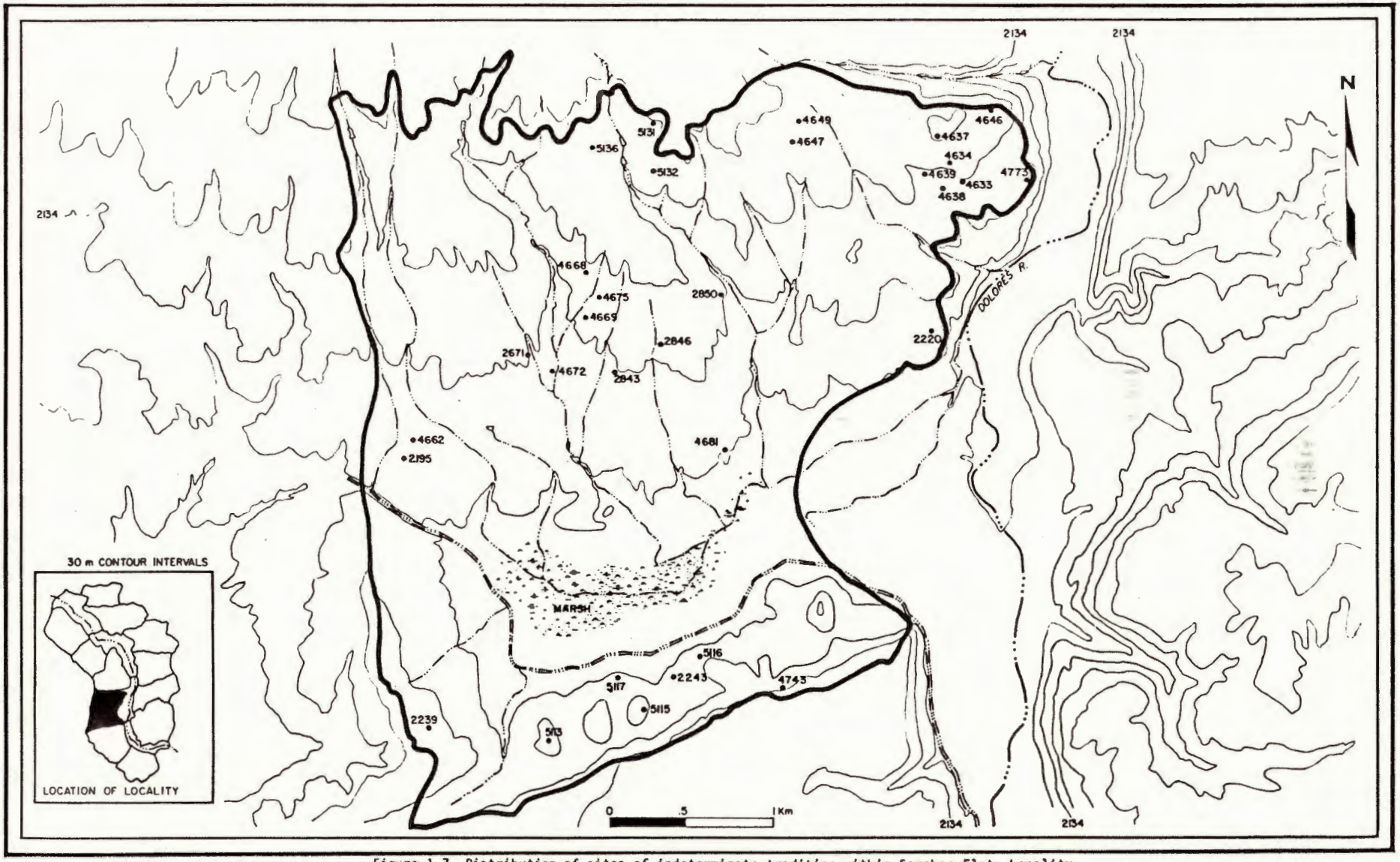

Figure 1.7 Distribution of sites of indeterminate tradition within Sagehen Flats Locality.

Archaic Tradition

Great Cut Phase (5000 B.C.-A.D. 500)

Within the Archaic Tradition, only the Great Cut Phase, dating from about 5000 B.C.-A.D. 500, has been identified based on projectile points recovered from 1978 study areas (Kane [1]). The Archaic Tradition for the D.A.P. has been defined as an eastern manifestation of the Desert Tradition proposed by Jennings [19]. Lifestyle was based on an extended family unit (bands of 25-30 persons) wandering as hunters and gatherers, but not as true nomads (Jennings [19:149-174]).

The Archaic community which occupied the Sagehen Flats Locality is called the North Marsh Band (Kane [1]). Within the locality, 19 sites have been assigned to the Great Cut Phase; Table 1.4 shows the functions, vegetation zones, soils, and associated landforms of each site, and Figure 1.8 illustrates the distribution of these sites in Sagehen Flats Locality.

Through a specialized, systematic collection and analysis procedure, Phagan [20] has identified a lithic-attribute profile which is different from that typical for Anasazi Tradition sites. This profile may represent the Archaic Tradition, although Phagan has labeled sites with such profiles merely as "non-Anasazi." "Non-Anasazi" lithic profiles, identified by correlating indices for attributes of the flaked lithic assemblages, have been noted for Sheep Skull Camp, Site 5MT2202 (Schlanger [21]); Ridgeline Camp, Site 5MT2242 (Southward [22]); Horse Bone Camp, Site 5MT2199 (Brown [23]); Horsefly Hamlet, Site 5MT2236 (Chenault [24]); Marshview Hamlet, Site 5MT2235 (Wilshusen [25]; and Climbing Cactus Camp, Site 5MT4682 (Wilshusen [26]). Three of these sites, Sites 5MT2199, 5MT2236, and 5MT2235, appear, on the basis of their lithic profiles, to be

Table 1.4 Great Cut Phase Sites in Sagehen Flats Locality with Associated Functions, Vegetation zones, Soils, and Landforms

Site Number	Function	Vegetation Zone[1]	Soils[2]	Landform
5MT2199	limited activity/processing	PJW	C2	hillock
5MT2201	seasonal camp	PJW/SS	A2	hill
5MT2202	limited activity	PJW/SS	C4	hillock
5MT2235	economic indeterminate	SS	SH	dip slope
5MT2236	seasonal camp	SS	SH	dip slope
5MT2242	limited activity/processing, procurement	PJW/SS	M2-D	ridge
5MT2246	seasonal camp	PJW/SS	C2	hillock
5MT4513	seasonal camp	SS	SH	ridge
5MT4660	limited activity/processing	PJW/SOW SS	M2-D	ridge
5MT4678	seasonal camp	SS	C2/H-1 C4	ridge
5MT4682	seasonal camp	SS	M2-CE	ridge
5MT4687	seasonal camp	SS	C4	ridge
5MT4688	seasonal camp	SS	C4	ridge
5MT4689	seasonal camp	ML/SS	ROH/ M2-D	ridge
5MT4690	seasonal camp	SS/PJW	C4	ridge
5MT4713	seasonal camp	PJW/SOW SS	M2-D	terrace
5MT5110	seasonal camp	SS	C4	hillock
5MT5111	limited activity indeterminate	PJW/SOW/ SS	C4	hill
5MT5112	seasonal camp	PJW/SOW SS	C4	hill

[1]PJW - pinyon-juniper woodland
SS - sage shrubland
SOW - scrub oak woodland
ML - marshland

[2]The abbreviations for soil types are coded and shown in Figure 1.5 and described in Leonhardy [5].

Figure 1.8 Distribution of Great Cut Phase sites within Sagehen Flats Locality.

to be multicomponent sites representing both the Archaic and Anasazi traditions. Sites 5MT2202, 5MT2242, 5MT2199, and 5MT2235 were intensively excavated. Site 5MT2236 was test-excavated, and Site 5MT4682 was only surface-collected. The testing program also identified a possible Great Cut Phase component at Lee Side Camp, Site 5MT4513 (Greenwald [27]), where five slab-lined hearths, believed to be the remains of a seasonal camp, were located on the protected side of a north-south ridge.

The remaining 12 sites shown on Table 1.4 and Figure 1.8 were tentatively dated to the Archaic Tradition on the basis of cursory examinations of materials recovered during survey.

Anasazi Tradition

Anasazi Sites not Assigned to Phase

Four sites (Figure 1.9) dated to the Anasazi Tradition could not be identified to phase: Site 5MT2672 (either a field house or a hamlet), Site 5MT5129 (a hamlet), Site 5MT2857 (a limited activity site) (Hewitt [28]); and Site 5MT4763 (a storage facility). The first two sites were recorded during survey and Site 5MT2857 was tested. Site 5MT4763 was intensively excavated but the small cultural assemblage did not allow for a narrower temporal designation (Kleidon [29].

Sagehen Phase (A.D. 600-850)

In the Sagehen Flats Locality, 88 sites have been dated to the Sagehen Phase of the Anasazi Tradition (for a detailed discussion of the Sagehen Phase see Kane [1]). Table 1.5 presents Sagehen Phase hamlets and Table 1.6 presents Sagehen Phase limited activity loci; the distribution of these sites is illustrated in Figure 1.10.

Hamlets of a single household, or infrequently of two or three

Figure 1.9 Distribution of Anasazi sites not assigned to phase.

Table 1.5 Sagehen Phase Hamlets in Sagehen Flats Locality with Associated Vegetation Zones, Soils, and Landforms (Page 1 of 2)

Site Number	Vegetation Zone[1]	Soils[2]	Landform
5MT2162	PJW/SOW/SS	UH	ridge
5MT2192	SS	SH	ridge
5MT2193	SS	RO	dip slope
5MT2194	SS	RO	hillock
5MT2198	SS	WO	hillock
5MT2200	SS	M2-D	hillock
5MT2222	SOW/PJW	M2-CE	ridge
5MT2224	PJW/SS	M2-D	dip slope
5MT2225	PJW/SOW/SS	M2-D	ridge
5MT2228	PJW/SOW/SS	M2-CE	ridge
5MT2236	SS	SH	dip slope
5MT2668	SOW	R1	hillock
5MT2848	SOW/SS	R7	dip slope
5MT2853	SS	R7	dip slope
5MT2854	PJW/SOW	RO	ridge
5MT2855	PJW	RO	ridge
5MT2856	PJW	RO	ridge
5MT2858	PJW/SOW	RO	hillock
5MT2861	PJW	M2-CE	ridge
5Mt2862	PJW	RO	dip slope
5MT2866	SOW/PJW	RO	dip slope
5MT2867	Disturbed SS	R7	ridge
5MT4514	SS	SH/WO M2-CE	hillock
5MT4524	SS	SH	dip slope
5MT4525	SS	SH	dip slope
5MT4542	SOW	M2-D	ridge
5MT4543	SS	M2-D/ C2/WO	ridge
5MT4545	SS	RO	hillock
5MT4546	SS	SH	hillock
5MT4547	SS	SH	dip slope
5MT4614	SS	RO	dip slope
5MT4626	PJW/SS	RO/ M2-CE	ridge
5MT4627	PJW/SOW	M2-CE	ridge
5MT4629	SS	RO	ridge
5MT4630	Formerly? PJW	RO	dip slope
5MT4631	Formerly SS/PJW	RO	dip slope
5MT4632	Formerly? PJW	RO	dip slope
5MT4640	PJW	RO	dip slope
5MT4641	SS	RO/ M2-D	ridge
5MT4644	SOW/SS	RO	hillock

Table 1.5 Sagehen Phase Hamlets in Sagehen Flats Locality with Associated Vegetation Zones, Soils, and Landforms (Page 2 of 2)

Site Number	Vegetation Zone[1]	Soils[2]	Landform
5MT4645	SS	RO	dip slope
5MT4652	SS	RO	dip slope
5MT4657	SOW	R1	ridge
5MT4659	SOW	R1	ridge
5MT4664	SS	RO	hillock
5MT4676	Formerly? PJW	M2-D/RO	ridge
5MT5126	SS/SOW/PJW	M2-D/RO	dip slope
5MT5133	SOW/SS	M2-D/R1	dip slope
5MT5137	SOW/SS	UH	dip slope
5MT5138	SOW/SS	M2-D/UH	dip slope

[1]PJW - pinyon-juniper woodland
SS - sage shrubland
SOW - scrub oak woodland

[2]The abbreviations for soil types are coded and shown in Figure 1.5 and described in Leonhardy [5].

Table 1.6 Sagehen Phase Limited Activity Loci in Sagehen Flats Locality with Associated Functions, Vegetation Zones, Soils, and Landforms (Page 1 of 2)

Site Number	Function	Vegetation Zone[1]	Soils[2]	Landform
5MT2199	limited activity/ economic indeterminate	PJW	C2	hillock
5MT2202	limited activity/ procurement, processing	PJW/SS	C4	hillock
5MT2227	limited activity/ economic indeterminate	SOW/PJW	M2-CE	hill
5MT2231	limited activity/ economic indeterminate	PJW/SS	M2-CE	hillock
5MT2238	limited activity/ economic indeterminate	PJW/SS	C2	hill
5MT2242	limited activity/ processing	PJW/SS	R7/ M2-CE	ridge
5MT2244	limited activity/ economic indeterminate	PJW/SS	C4,C2	hill
5MT2682	seasonal camp	PJW/SOW	C2	ridge
5MT2684	limited activity/ processing	SOW	M2-CE	ridge
5MT2841	limited activity/ processing	SS	M2-D	dip slope
5MT2842	limited activity/ processing	SOW/SS	M2-D/R1	dip slope
5MT2844	limited activity/ storage	SS	R7	dip slope
5MT2845	limited activity/ processing	SS	R7	dip slope
5MT2847	limited activity/ processing	SS	R7	dip slope
5MT2849	limited activity/ processing	SOW	M2-D	dip slope
5MT2852	limited activity/ processing	SOW/SS	R7	dip slope
5MT2853	limited activity/ storage	SS	R7	dip slope
5MT2859	limited activity/ processing	PJW/SS	M2-CE/ RO	ridge
5MT2863	limited activity/ manufacturing	PJW	M2-CE	dip slope
5MT2864	limited activity/ processing	PJW/SOW/SS	M2-CE	dip slope
5MT2865	limited activity/ manufacturing	SS	M2-D	ridge
5MT2868	limited activity/ processing, storage	PJW	M2-D	ridge
5MT4544	limited activity/ quarry, processing	SS	WO	ridge

Table 1.6 Sagehen Phase Limited Activity Loci in Sagehen Flats Locality with Associated Functions, Vegetation Zones, Soils, and Landforms (Page 2 of 2)

Site Number	Function	Vegetation Zone[1]	Soils[2]	Landform
5MT4635	limited activity/ processing	SOW/SS	M2-CE	hill
5MT4636	limited activity/ processing	SOW/SS	M2-CE	hill
5MT4642	economic indeterminate	Formerly ? PJW/SS	RO	dip slope
5MT4643	limited sctivity/ processing	Formerly ? PJW	RO	dip slope
5MT4648	seasonal camp	SS/SOW/PJW	M2-CE	ridge
5MT4649	seasonal camp?	PJW/SS	RO	ridge
5MT4674	seasonal camp	SOW/SS	RO/M2-D	dip slope
5MT4678	seasonal camp	SS	C2/H1/ C4	ridge
5MT4711	limited activity/ manufacturing	PJW/SOW/SS	M2-D	ridge
5MT4712	seasonal camp/ storage	PJW	M2-D	ridge
5MT5109	seasonal camp	SS/SOW/PJW	C4	ridge
5MT5114	seasonal camp	SOW/SS	C2	hill
5MT5118	seasonal camp/ manufacturing	PJW/SS	C4/C2	hill
5MT5127	limited activity/ processing	PJW/SOW/SS	RO	ridge
5MT5128	limited activity/ manufacturing	PJW/SS	RO	ridge
5MT5130	limited activity/ processing	PJW/SOW/SS	M2-CE	hillock

[1]PJW - pinyon-juniper woodland
SS - sage shrubland
SOW - scrub oak woodland

[2]The abbreviations for soil types are coded and shown in Figure 1.5 and described in Leonhardy [5].

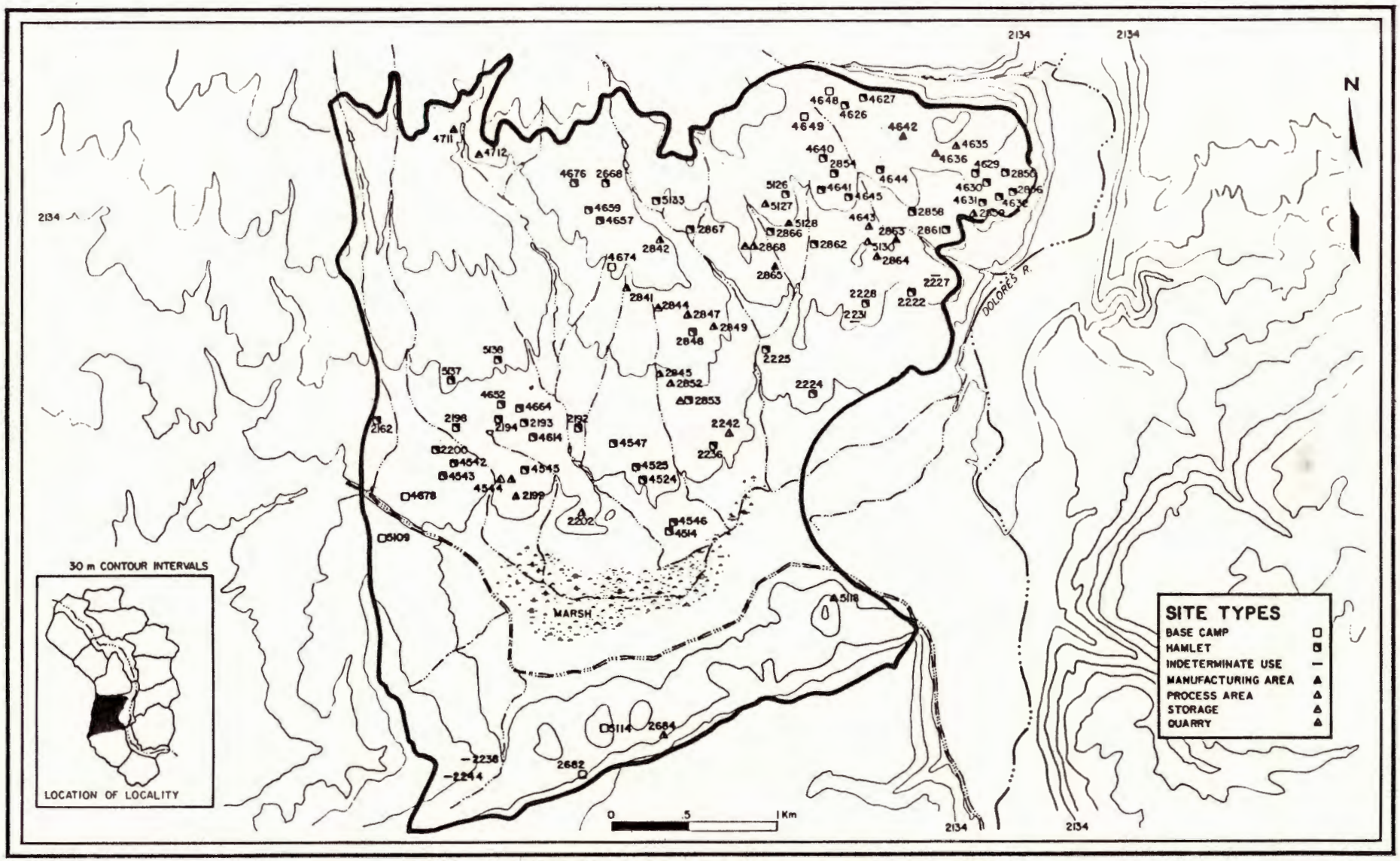

Figure 1.10 Distribution of Sagehen Phase sites in Sagehen Flats Locality.

households, were distributed throughout the Sagehen Flats Locality in areas where farming was feasible (Kane [1]). These populations practiced a mixed subsistence strategy of horticulture, and hunting and gathering. It is thought that farming was simple, due to the lack of specialized sites such as field houses (Kane [1]); irrigation projects may never have developed beyond simple diversion dikes. The lack of specialized farm sites indicates that hunting and gathering supplemented the economy of the people occupying these Sagehen Phase sites. Natural resource exploitation is represented by the many, varied limited activity loci in the Sagehen Flats Locality as well as in other neighboring localities. Sagehen Marsh, if present prehistorically, might have supported avifauna for these populations to hunt, as well as edible and economic plants. The pinyon-juniper forests and scrub oak woodlands today support a variety of vegetation and faunal types for exploitation.

During the 1978 and 1979 field seasons a total of nine sites of the Sagehen Phase were intensively investigated: Sagehill Hamlet, Site 5MT2198 (Hewitt [31]); Dos Casas Hamlet, Site 5MT2193 (Brisbin et al. [32]); Casa Bodega, Site 5MT2194 (Brown [33]); Aldea Sierrita, Site 5MT2854 (Kuckelman [34]); Apricot Hamlet, Site 5MT2858 (Montgomery [35]); Tres Bobos Hamlet, Site 5MT4545 (Brisbin [30]); Prairie Dog Hamlet, Site 5MT4614 (Yarnell [36]); and Windy Wheat Hamlet, Site 5MT4644 (Brisbin [37]). On the basis of these excavations, the time span believed to be represented by the Sagehen Phase was broadened from the original estimate of A.D. 650-850 (Kane [2]) to A.D. 600-850. Intensive investigation of these Sagehen Phase sites has also yielded data with sufficient variation to prompt the division of the Sagehen Phase into three subphases: early Sagehill, late

Sagehill and Dos Cases. These subphases are believed to reflect changes in settlement distribution (Kane [38]).

Tres Bobos Hamlet (Brisbin [30]), representing the early Sagehill Subphase (A.D. 600-700), was characterized by a pitstructure with an antechamber, and associated surface rooms distributed to the north and west of the pitstructure. Although Sagehill Hamlet (Hewitt [31]) was designated the type site for the late Sagehill Subphase (A.D. 700-760), subsequent investigations revealed that Site 5MT4614 (Yarnell [36]) was more representative of this subphase. At Site 5MT4614, the ventilating system was built into the pitstructure, and surface rooms were larger and contained distinct activity areas represented by tool assemblages. The Dos Casas Subphase (A.D. 760-850) was characterized by larger pitstructures with associated contiguous surface rooms. The front rooms of these surface structures appear to have been occupied on a seasonal basis. The front rooms also appear to have been used for more than just storage based on the hearths, ash pits, and artifact assemblages associated with food processing found in them. The type site for this subphase is the second element at Dos Casas Hamlet (Brisbin et al. [32]).

Nine other sites dated to the Sagehen Phase were investigated as part of a testing program that involved the use of heavy equipment including a grader, self-loading scraper, and backhoe. These were Pine View Hamlet, Site 5MT2162 (Greenwald [39]); Horsefly Hamlet, Site 5MT2236 (Chenault [24]); Charred House, Site 5MT2844 (Greenwald [40]); Rusty Ridge Hamlet, Site 5MT2848 (Greenwald [41]); Deer Hunter Hamlet, Site 5MT2853 (Greenwald [42]); Sunflower Hamlet, Site 5MT4640 (Hewitt [43]); Desecho Camp, Site 5MT4642 (Hewitt [44]); and Roadside Camp, Site 5MT4649 (Hewitt [45]).

Since mobility throughout the locality is virtually unrestricted due to its physiography, use of the area during the Sagehen Phase was probably not limited to those year-around residents of the farmsteads. The area might have been attractive to members of several surrounding localitites for its arable soils, for its diversity of plant zones and wildlife, and as a migration route to and from the Dolores River canyon. Many of the limited activity loci might have resulted from this type of nonresident use; however, these associations remain conjectural at this point.

McPhee Phase (A.D. 850-970)

A total of 31 sites in the Sagehen Flats Locality have been dated to the McPhee Phase (A.D. 850-970) of the Anasazi Tradition. The distinction generally associated with the McPhee Phase is a change in settlement patterns which involved the assembly of dispersed hamlets into larger hamlets or nucleated communities (Kane [1]), and the appearance of seasonally occupied sites associated with agriculture, known as field houses. Woodbury [46] defines field houses as temporary habitations associated with agricultural production; they may have been used as granaries during and after the harvest. Adams [47] points out that habitation sites close to field systems do not need limited activity (field house) sites. Such was the case with the Sagehen Phase dispersed communitites. However, during the McPhee Phase, the clustered households allowed for few individual farmsteads, and the need for field houses developed. These sites, occupied seasonally, might have served as temporary habitation quarters for those individuals tending the fields; they might have been used for crop, tool, and wild-food storage as well.

The 31 sites in the Sagehen Flats Locality dated to the McPhee Phase (Figure 1.11) were categorized into three functional types: hamlets

Figure 1.11 Distribution of McPhee Phase sites in Sagehen Flats Locality.

(Table 1.7) field houses (Table 1.8) and limited activity loci (Table 1.9). During the 1978 and 1979 field seasons, four of these sites were intensively excavated: Little House, Site 5MT2191 (Hewitt [48]); Moonlight House, Site 5MT2205 (Kleidon [49]); Casa Roca, Site 5MT2203 (Brisbin [50]); and Cascade House, Site 5MT4512 (Wilshusen [51]). All of these sites have been identified as field houses and are discussed in this section.

Hamlets (Figure 1.11, Table 1.7) characteristic of the McPhee Phase settlement pattern actually developed during the Dos Casas Subphase of the Sagehen Phase. During the Dos Casas Subphase, surface rooms were occupied during part of the year while pitstructures continued to serve as the primary domicilary unit. During the McPhee Phase, households began to occupy surface structures on a year-round basis. No McPhee Phase habitations have been excavated in Sagehen Flats Locality to date.

A total of nine field houses has been identified in Sagehen Flats Locality (Figure 1.11 and Table 1.8); four of these sites (Sites 5MT2191, 5MT4512, 5MT2203, and 5MT2205) have been intensively investigated. The concept of seasonal occupation associated with field houses is supported by the presence of hearths and processing tools. Jar sherds found at these sites indicate storage use; however, actual artifact inventories have been low. Little support was found for storage of farming tools and the identification of wild foods awaits the results of bulk soil analysis.

Domestic and storage facilities are best represented at Little House, Site 5MT2191 (Hewitt [48]), where four masonry rooms were found. One room, located to the north of three contiguous rooms, contained a hearth and interior features. This single room was larger than the other three

Table 1.7 McPhee Phase Hamlets in Sagehen Flats Locality with Associated Vegetation Zones, Soils, and Landforms

Site Number	Vegetation Zone[1]	Soils[2]	Landform
2197	SS	SH	dip slope
2204	SS	C4	hillock
2206	SOW	C4/C2	hill
2223	PJW/SOW/SS	RO/M2-D	ridge
2229	PJW/SS	M2-CE	dip slope
2230	PJW/SS	M2-D	ridge
2233	PJW/SS	M2-D	ridge
2651	PJW/SOW/SS	M2-D/R1	ridge
4541	SS	M2-D/RO	ridge
4628	PJW/SS	RO	hill (hill slope)
4653	SS	RO	hillock
4676	Formerly? PJW	M2-D/RO	ridge

Table 1.8 McPhee Phase Field Houses in Sagehen Flats Locality with Associated Vegetation Zones, Soils, and Landforms

Site Number	Vegetation Zone[1]	Soils[2]	Landform
2191	SS	SH	dip slope
2203	SS	SH	ridge
2205	PJW/SS	WO	hillock
2234	PJW/SS	M2-D	hillock
2650	SS	RO/M2-D	ridge
2666	SOW/SS	R1	ridge
4512	SS	SH	ridge
4679	SS	WO/RO	ridge
4680	SS	SH	ridge

Key for Tables 1.7 and 1.8

[1] PJW - pinyon-juniper woodland
SS - sage shrubland
SOW - scrub oak woodland

[2] The abbreviations for soil types are coded and shown in Figure 1.5 and described in Leonhardy [5].

Table 1.9 McPhee Phase Limited Activity Loci in Sagehen Flats Locality with Associated Functions, Vegetation Zones, Soils, and Landforms

Site Number	Function	Vegetation Zone[1]	Soils[2]	Landform
2199	limited activity indet.	PJW	C2	hillock
2237	limited activity/procurement processing	PJW/SOW/ SS	M2-CE	ridge
2238	limited activity indet.	PJW/SS	C2	ridge
2247	limited activity indet.	PJW/SOW/ SS	C2	ridge
2851	seasonal camp	PJW/SOW/ SS	M2-D	dip slope/ canyon wall
4513	limited activity/procurement	SS	SH	ridge
4642	limited activity/processing		M2-CE/ RO	dip slope
4660	limited activity/processing	PJW/SOW/ SS	M2-D	ridge
5114	seasonal camp	PJW/SOW/ SS	C2	hill
2236	limited activity indet.	SS	SH	dip slope

indet. - indeterminate

[1]PJW - pinyon-juniper woodland
SS - sage shrubland
SOW - scrub oak woodland

[2]The abbreviations for soil types are coded and shown in Figure 1.5 and described in Leonhardy [5].

rooms, and activity areas were situated around it. The remaining three rooms lacked features and resembled storage rooms at permanent habitation sites.

Both Site 5MT2203 and Site 5MT2205 contained only surface structures lacking features generally associated with habitation sites. The ceramic assemblages from these sites date them to the McPhee Phase. The association of this type of assemblge with the nonhabitational surface structures is similar to other field house sites.

Site 5MT4512 (Wilshusen [51]), is considered a field house on the basis of function, although in terms of its physical characteristics, it varied considerably from Woodbury's [46] definition. Cascade House had two small subterranean structures in association with two contiguous surface rooms. One of the pitstructures had an area of only 6.3 m^2, including the antechamber. The structure lacked a central hearth, but did contain a hearth against the northeast wall. The small size of the structure might have required the hearth to be positioned against the wall to provide adequate room for food-processing activities. Several metates found on metate rests and centrally located in this pitstructure indicate food-processing activities.

Similarily, a second small pitstructure contained a mealing area but lacked other features. This pitstructure was also small, 3.1 m^2. Both pitstructures might have been similarly used, serving as processing areas and possibly as storage facilities. To a lesser extent, these units might have served as sleeping quarters. However, there is little indication for this use as a primary concern.

The very high percentage of grinding implements found at Site 5MT4512 supports the field house classification. The ceramic assemblage is

comprised of a very high ratio of jar sherds to bowl sherds indicative of storage.

Wilshusen [51] suggests that the large size of the site and unusual structures have resulted from its specialized use. The number of mealing stations indicates that several individuals participated in the processsing activities. The site might have been used as a special use area for several families, with the pitstructures serving as sheltered processing areas.

Surveys have recorded 10 McPhee Phase limited activity sites (Figure 1.11, Table 1.9) in the Sagehen Flats Locality; however, only 3 of these have been investigated: Horsebone Camp, Site 5TM2199 (Brown [23]); Horsefly Hamlet, Site 5MT2236 (Chenault [24]), and Lee Side Camp, Site 5MT4513 (Greenwald [27]). Based on ceramic assemblages and the lack of architectural remains, these sites have been identified as McPhee Phase limited activity loci. These sites might represent supplemental procurement areas to horticultural activities; however, evidence of such activity is scanty and often overshadowed or obscured by other activities of earlier or later visitors to these same loci.

Sundial Phase (A.D. 1050-1200)

The Sundial Phase is characterized by a small population and little cultural activity in the locality (Kane [1]). McPhee Phase habitations were abandoned, rendering the area unoccupied for almost 100 years. Evidence of occupation in the Sagehen Flats Locality during that time has not yet been recovered in the archaeological record. In all, eight have been recorded (Figure 1.12, Table 1.10), though only two have received intensive investigation in the Sagehen Flats Locality. Marshview Hamlet (Site 5MT2235) is a small habitation (Wilshusen [25]) that has a round

Figure 1.12 Distribution of Sundial Phase sites in Sagehen Flats Locality.

Table 1.10 Sundial Phase Hamlets and Limited Activity Loci in the Sagehen Flats Locality, with Associated Functions, Vegetation Zones, Soils, and Landforms

Site	Function	Vegetation Zone[1]	Soils[2]	Landform
5MT2233	limited activity indet.	SS/PJW	M2-D	ridge
5MT2235	habitation	SS	SH	dip slope
5MT2241	tower	PJW	M2-D	ridge
5MT4653	tower	SS	M2-D	dip slope
5MT4678	limited activity/ processing, procurement	SS	C2/H-1 C4	ridge
5MT4628	limited activity indet.	PJW/SS	RO	hill (hill slope)
5MT4660	limited activity/ processing	SS/SOW/ PJW	M2-D	ridge
5MT4676	limited activity indet.	formerly? PJW	M2-D/RO	dip slope

[1]PJW - pinyon-juniper woodland
SS - sage shrubland
SOW - scrub oak woodland

[2]The abbreviations for soil types are coded and shown in Figure 1.5 and described in Leonhady [5].

pitstructure and associated surface rooms. Round pitstructures are associated with other Sundial Phase sites, such as Sundance Pueblo, Site 5MT2215 (Harriman [52]), in the project area. The ceramic assemblage from Site 5MT2235 also dates to the Sundial Phase.

Towers, which had not been associated with any of the earlier phases in the project area, were also recorded at sites with late Pueblo II and early Pueblo III (Sundial Phase) pottery types. Site 5MT2241 (Morris [53]), with a small tower and a ceramic assemblage characteristic of the Sundial Phase (see material culture section), was excavated to recover data on possible uses and functions of tower sites of the Sundial Phase. Results are pending.

There are few Sundial Phase sites in the project area. At the close of the McPhee Phase and throughout the Sundial Phase, there was only a small population who occupied the locality; these peoples apparently left the area by A.D. 1200 (Kane [1]).

Beaver Point Phase (A.D. 1400-1900)

Four Jeddito sherds (A.D. 1300 to present) were collected from the surface at Site 5MT4541 (Greenwald [54]). Only a small portion of the entire site, a McPhee Phase hamlet, was located in a dam impact area; subsequently, only that small portion was investigated. That portion, south of the main site area, was cleared of vegetation and examined for subsurface features, but none were recorded. The McPhee Phase sherds recovered were attributed to downslope wash from the main site area. The four Jeddito sherds were collected from the surface and did not appear to be associated with the main site area. Jeddito sherds have been recovered from throughout the Northern San Juan Culture Area; however, their occurrence in the project area is rare. W. Lucius (personal communica-

tion) suggests that populations from the Hopi Mesas and the central San Juan area, generally associated with this pottery type, were in the area.

Little evidence has been found in the Sagehen Flats Locality indicating use by the Shoshonean and Athabascan peoples. Local informants (D. Duranceau, personal communication) mention visits to this sector by members of the Ute Mountain tribe as early as A.D. 1850; however, these were reported to be infrequent hunting trips, and the sector was passed through only to get to higher lands.

SPATIAL DISTRIBUTIONS

Nearest-Neighbor Analysis

Nearest-neighbor analysis was used to test for clustering or patterning of sites in the Sagehen Flats Locality. The statistic was not constructed to deal with finite areas; subsequently, a value of underestimation occurs when a site's "natural" nearest neighbor lies beyond the finite area. The corrected formula, established by Ebdon (in Pinder et al. [56]), accounts for the underestimation value caused by the finite area. Through the analysis of random point patterns, Ebdon generated a table of variable reduction coefficients to statistically validate either clustering or regular patterning. With a mean random distribution falling at 1.00, a calculated value less than 1.00 indicates that the distance between sites is clustered. A value greater than 1.00 suggests more than just a random distribution of sites and indicates pattern regularity.

As is common with any statistic, if the number of cases is small, a problem is encountered when using the nearest-neighbor statistic. The statistic was calculated only for those groups which are represented by 10 or more sites, i.e., Sagehen Phase hamlets, McPhee Phase hamlets, and McPhee Phase field houses (Table 1.11).

Table 1.11 Nearest-Neighbor Values Generated for Each Group of Sites

	Values
Sagehen Phase hamlets	.58
McPhee Phase hamlets	.86
McPhee Phase field houses	.81

A nearest-neighbor value of 0.58 was generated for the Sagehen Phase hamlets located in Sagehen Flats Locality. The value indicates that the sites are clustered; this clustering might result from a preference to locate arable soils. Other geomorphological features were certain to play a part in the selection process of site location. These factors will be addressed later in this report.

A nearest-neighbor value of 0.86 was generated for the McPhee Phase hamlets, suggesting a minimal amount of clustering.

A nearest-neighbor value of 0.81 was generated for McPhee Phase field houses, also indicating a minimal amount of site clustering. As can be seen from Figure 1.11, these sites are located on arable soils at a common elevation to the north of Sagehen Marsh. The relationship presumed to exist among these sites and geomorphological features is tested with the Chi-square statistical analysis presented below.

Chi-Square Test

The Chi-square test was selected to test for associations among site locations and proximity to arable soils and particular landforms. To assess these associations, all sites grouped according to phase were tested for significant relationships.

The relationship of Sagehen Phase sites to soil types (Table 1.12) proved to be significant at the 0.05 level. The contingency coefficient value was high, reflecting a strong relationship. Table 1.12 shows that arable soils were preferred for hamlet locations, while nonarable soils were preferred for limited activity sites. Therefore, the relationship between these site types and their location to landforms was not significant during the Sagehen Phase (Table 1.13).

Table 1.12 Chi-square Contingency Values; Test of Sagehen Phase Site Asociations with Soils

	Arable	Nonarable	Total
Limited Activity Sites	11	26	37
Hamlets	37	12	49
Column totals	48	38	86

$x^2 = 16.10$

Chi-square value is significant at the 0.05 level.

Contingency coefficient value = 0.397

Table 1.13 Chi-square Contingency Values; Test of Sagehen Phase Site Associations with Landforms

	Ridge	Dip Slope	Hill	Total
Limited Activity Sites	14	12	11	37
Hamlets	18	21	10	49
Column totals	32	33	21	86

$x^2 = 1.356$

Chi-square value is not significant at the 0.05 level.

A significant Chi-square value for the relationship between sites and proximity to arable soils was calculated for all McPhee Phase sites in the Sagehen Flats Locality. Again, the contingency coefficient value is high, reflecting a strong relationship. Although the Chi-square was not used to test the association of the individual site types, Table 1.14 indicates a strong preference for the location of field houses to arable soils and the location of limited activity sites near nonarable soils. There were no significant values for any association of the location of McPhee Phase sites to landforms (Table 1.15).

Table 1.14 Chi-square Contingency Values; Test of McPhee Phase Site Associations with Soils

	Arable	Nonarable	Total
Limited activity sites	2	8	10
Hamlets	6	7	13
Field houses	9	1	10
Column totals	17	16	33

$x^2 = 10.05$
Chi-square value is significant at the 0.05 level.
Contingency coefficient value = 0.483

Table 1.15 Chi-square Contingency Values; Test of McPhee Phase Site Associations with Landforms

	Ridge	Others	Total
Limited activity sites	5	5	10
Hamlets	7	6	11
Field houses	6	4	10
Column totals	18	15	33

$x^2 = 1.024$

Chi-square value is not significant at the 0.05 level.

MATERIAL CULTURE

Ceramics

The ceramic assemblage in the Sagehen Flats Locality indicates that the area was most intensively occupied from the late Basketmaker III to early Pueblo II periods. The lack of recorded sites dating from about A.D. 975-1050 in the project area indicates near or total abandonment during this time. Ceramics dating from A.D. 1050-1200, however, have been recovered in small quantities from various limited activity loci, seasonal camps, and small hamlets in Sagehen Flats Locality.

The occupation dating from late Basketmaker III to early Pueblo II times is associated with the Sagehen Phase (A.D. 600-850) and the McPhee Phase (A.D. 850-970) of the D.A.P. temporal chronology. Three wares associated with these time periods were represented in Sagehen Flats Locality: Early Pueblo Gray Ware, Early Pueblo White Ware, and Mesa Verde Red Ware.

Early Pueblo Gray Ware is represented by three types in the locality: Chapin Gray (A.D. 575-900), Moccasin Gray (A.D. 775-900), and Mancos Gray (A.D. 875-950) (Breternitz et al. [56:1-11]). These three types are generally jar forms and were probably used for storage and cooking.

Early Pueblo White Ware is represented by two types in the locality: Chapin Black-on-white (A.D. 575-900) and Piedra Black-on-white (A.D. 750-900) (Breternitz et al. [56:25-31]). Both types are generally represented by hemispherical bowl forms; however, jar forms, pitchers, and ladles are also common. Painted designs were introduced in the Early Pueblo White Wares and continued with the Late Pueblo White Wares (A.D. 900-1275) (Breternitz et al. [56]).

Mesa Verde Red Ware is represented by three types in the locality: Abajo Red-on-orange (A.D. 700-850), Bluff Black-on-red (A.D. 750-900), and Deadmans Black-on-red (A.D. 800-1000) (Breternitz et al. [56:53-63]). Bowls were more common than jars, though a variety of jar forms as well as other forms were plentiful.

Paint, form, temper, and clay types indicate that the Mesa Verde Red Ware was manufactured in southeastern Utah and traded to the Escalante Sector (Lucius and Wilson [57]). Early Pueblo Gray Ware was manufactured locally from clay derived from Mancos Shale. Until about A.D. 800-850, Early Pueblo White Ware was made locally; however, after that time, much of the white ware was brought into the Escalante Sector through intraregional trade (W. Lucius, personal communication).

Two Late Pueblo Gray Wares collected in the locality are associated with occupation during the Sundial Phase (A.D. 1050-1200). Mancos Corrugated, dating from A.D. 900-1200, and Mesa Verde Corrugated, dating from A.D. 1100-1300 (Breternitz et al. [56:17-32]), were present at Site 5MT2235, a small Sundial Phase hamlet. Late Pueblo White Wares, represented by Mancos Black-on-white from A.D. 900-1150, and McElmo Black-on-white, from A.D. 1075-1275 (Breternitz et al. [56:37-44]), were also collected in the locality. Ceramics from the Cibola and Kayenta regions were also present; however, specific types were not identified from the sparse samples. This assemblage of types indicates a brief use of the locality for about 150 years. Absolute dates from dendrochronological or archaeomagnetic samples which would aid in interpretation have not been recovered from the Sundial Phase sites in the Sagehen Flats Locality thus far.

Several Jeddito sherds (A.D. 1300-present) have also been recovered from one site in the locality (Site 5MT4541).

Lithics

Lithic materials collected from the Sagehen Flats Locality are divided into two categories, flaked and nonflaked, which reflect two different manufacturing technqiues. Flaked lithic tools are manufactured by thinning core items with pressure or percussion flaking in order to shape the tool. Flakes from core reduction are often used (i.e., scrapers) and are called utilized flakes, whereas unmodified waste is referred to as flaked lithic debitage. Nonflaked lithic tools are produced through reductive processes other than flaking, usually grinding. However, rough shaping of an item might have been performed by flaking initially, then followed by grinding to smooth or shape the item for use. Nonflaked lithic tools may also be shaped by use.

To date, only inventories and preliminary analyses have been completed on materials recovered during the 1979 field season. Few temporally diagnostic flaked or nonflaked lithic artifacts have been found in the project area. A detailed projectile point typology is presently being constructed, but it seems that few items can be dated to phase. Diagnostic lithic items might only reflect tradition and not a smaller temporal assignment.

Worked Bone

Bone tools recovered throughout the locality indicate that a variety of tool types (e.g., bone awls, needles) were made from several species.

Deer and turkey bones, identified through field observation as the most commonly occurring bones, were made into tools which have been recovered from prehistoric contexts, but detailed descriptions await future program analysis.

Architecture

Most of the data used to define specific phases come from changes in architecture. These changes are noted not only in individual architectural units but also in overall site patterning. Of the 27 sites in the Sagehen Flats Locality which were investigated during the 1979 field season, 21 contained architectural components. Fourteen of the 21 sites were hamlets, 3 were field houses, 3 were limited activity loci identified as storage units, and 1 was indeterminate. Investigation focused on hamlets more than on any other group of sites; subsequently the following discussion considers primarily the architecture of hamlets.

The earliest permanent habitation identified in the project area is represented by Site 5MT4545 (Brisbin [30]), which might represent the relocation of a single family from another area during the early Sagehill Subphase (A.D. 600-700) of the Sagehen Phase. As a unit hamlet, the site consists of a pitstructure with associated surface rooms. The pithouse is shallow, containing a main chamber (12.5 m^2, including bench surface) divided by a wingwall, and an antechamber (Brisbin [30]). A partial bench is located in both chambers. The pithouse is stylistically similar to others dated to the Basketmaker III period (Hayes and Lancaster [58]; Birkedal [59:67-85, 126-144]).

Two elements at the site are indicated by the number of surface structures (Brisbin [30]). The earliest element is represented by

seven surface structures oriented in an east-west alignment north of the pithouse; they vary in size, depth, shape, and construction. The structures are arranged in a regular pattern, indicating little forethought in their placement. On the other hand, the second element is represented by seven structures arranged in an orderly fashion with less variation in size, depth, and shape (Brisbin [30]). These rooms are located to the west of the pithouse and are oriented north-south.

During the late Sagehill Subphase (A.D. 700-760) pitstructures became smaller and deeper, and antechambers were gradually replaced with ventilating systems. Benches are rarely found in pitstructures dating to the Sagehill Subphase. Also during this time, surface structures became larger, with more activities associated with them. However, there is only one site in the Sagehen Flats Locality, Site 5MT4614 (Yarnell [36]) which has surface structures as part of this development.

The Dos Casas Subphase (A.D. 760-850) is marked by a functional change and a different arrangement of the surface structures than previously identified. Construction of pitstructures also differed from that in the late Sagehill Subphase. They became larger and the bench reappeared as an architectural features in many cases. Two sites, Site 5MT2193 (Brisbin et al. [32]) and Site 5MT4644 (Brisbin [37]), of the Dos Casas Subphase show strong similarities in construction style. Over time, many major architectural features, such as the wingwall and sipapu, were retained.

Surface structures during the Dos Casas Subphase were arranged into contiguous units. They were more uniform in size, shape, and construction than previously recognized. At that time the apparent functional specialization for rooms occurred. The addition of larger front

rooms which occasionally contained hearths, warming pits, and/or ash pits, suggests temporary or seasonal use as domestic quarters. The rear set of rooms were generally devoid of features, other than postholes, suggesting storage.

Two major architectural changes occurred during the McPhee Phase (A.D. 850-970): pitstructures became totally subterranean, and the front surface structures were used as permanent habitation units. This information is based on results of excavation of sites located in the project area, though not in Sagehen Flats Locality specifically.

The single example of a Sundial Phase (A.D. 1050-1200) hamlet in Sagehen Flats Locality is represented by the later occupation at Site 5MT2235 (Wilshusen [26]). There is little material available for comparison of the hamlets in the Escalante Sector. This site is similar to earlier hamlets in that a single pitstructure and contiguous surface structures are present; however, no evidence indicating the use of front surface rooms for habitation was found. Morphologically, the pitstructure changed in form from rectangular to oval. Through intensive excavations it was determined that the primary function of the pitstructure remained domestic.

Through investigations as part of the D.A.P. mitigation, as well as investigations throughout the Mesa Verde Region, it is possible to hypothesize temporal designations for those sites recorded from surveys. Architecture and ceramics are securely dated in the D.A.P. area and permit the relative dating of sites with temporally diagnostic types.

Additional sites containing architecture have been grouped together based on observations made during various investigations. These sites contained limited material culture and minor architectural remains though

they usually contained surface structures. These sites usually contain from one to four surface structures, and in one case, Site 5MT4512 (Wilshusen [51]) two pitstructures were present. The various levels of investigation could temporally and functionally place five of these sites: three were identified as McPhee Phase field houses and two were identified as Sagehen Phase limited activity storage loci (Table 1.2).

Site 5MT4681 and Site 5MT4763 contain single-room surface structures. There were too few temporally diagnostic materials recovered to date these sites.

FUTURE RESEARCH

The possibility of conducting future research in the Sagehen Flats Locality is dictated by the necessity to adequately mitigate the impact of future construction. With the conclusion of the 1979 field season, investigations in Borrow Area A and Borrow Area E have been completed (King [60:5, Map 2]), except for Site 5MT2854 and Site 5MT4644, which are scheduled to be completed during the 1980 field season.

In order to address Problem Domains 2 (demography) and 4 (foreign relationships) for the Archaic Tradition and for the Sundial Phase of the Anasazi Tradition, Site 5MT4690 and Site 5MT2241 are scheduled for intensive investigations during the 1980 field season.

REFERENCES CITED

[1] Kane, Allen E. 1981. Introduction to field investigations and analysis. In Field investigations: 1978. Dolores Archaeological Program Technical Reports I(1). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[2] Trewartha, Glenn T. 1954. An introduction to climate. McGraw-Hill:New York.

[3] Kane Allen E. 1981. Sagehen Flats Archaeological Locality. In Field investigations: 1978. Dolores Archaeological Program Technical Reports I(3). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[4] Litzinger, William J. 1976. The experimental garden project, 1975. In Hovenweep 1975, edited by Joseph C. Winter. San Jose State University Archeological Report 2:177-190

[5] Leonhardy, Frank C. 1981. Geology of the Dolores Project Area. In Laboratory analysis: 1979. Dolores Archaeological Program Technical Reports VI(9). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[6] Leonhardy, Frank C. 1979. Reconnaissance soils map of the Dolores Archaeological Project Area. Ms. on file, Bureau of Reclamation, upper Colo. Region, Salt Lake City.

[7] Erdman, James A., Charles L. Douglas, and John W. Marr 1969. Environment of Mesa Verde, Colorado. National Park Service Publications in Archeology 7B.

[8] Bye, Robert A., Jr. 1981. Environmental studies report. In Laboratory Analysis: 1979. Dolores Archaeological Program Technical Reports VI(6). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[9] Emslie, Steven D. 1979. Summary of activities by the faunal task specialist. In Laboratory analysis: 1979. Dolores Archaeological Program Technical Reports VI(7). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[10] Duranceau, Deborah 1980. Historic Research Design. In Historic studies: 1979. Dolores Archaeological Program Technical Reports VII(2). Ms. on file, Dolores Archaeological Program, Dolores, Colorado.

[11] Breternitz, David A. and Daniel W. Martin 1973. Report of the Dolores River Project archaeological reconnaissance, 1972-1973. Ms. on file, Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.

[12] Toll, Henry W., III 1974. Archaeological Resources in the Dolores River Canyon below the proposed McPhee Reservoir, Montezuma, Dolores, and San Miguel counties, Colorado. Ms. on file, Bureau of Land Management, Montrose District Office.

[13] Breternitz, David A. 1975. Archaeological resources of the Towaoc Canal and laterals, Dolores River Project, Colorado. Ms. on file, National Park Service Interagency Archaeological Services, Denver.

[14] Kane, Allen E. 1975. Archaeological resources in Great Cut Dike-Dove Creek Area. Dolores River Project; reaport of the 1974 season. Report to Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.

[15] Kane, Allen E. 1975. Archaeological resources of the Dolores River Project; report of the 1975 field season. Ms. on file, Interagency Archaeological Services, National Park Service, Denver.

[16] Kane, Allen E. 1977. Archaeological resources of the Dolores River Project; report on field operations, fall 1976. Ms. on file, Bureau of Reclamation, western Colorado Projects Office, Durango.

[17] Dykeman, Douglas, Jerome Fetterman, and Gay Ives 1981. Report of the YACC cultural resources survey, 1978. In Survey: 1978. Dolores Archaeological Program Technical Reports IV(1). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[18] Kane, Allen E., Nancy J. Hewitt, Joel M. Brisbin, Patrick Hogan, Gary Brown, Steven D. Emslie, J. Holly Hathaway, Frank C. Leonhardy, William A. Lucius, and Roger A. Moore 1981. Field manual. In Field investigations: 1978. Dolores Archaeological Program Technical Reports I(11). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[19] Jennings, Jesse D. 1964. The desert west. In Prehistoric man in the New World, edited by J.D. Jennings and E. Norbeck, pp. 149-174. University of Chicago Press, Chicago.

[20] Phagan, Carl J. 1980. "The Archaic" in the D.A.P., or, where were all the H & G? Ms. on file, Dolores Archaeological Program, Dolores, Colorado.

[21] Schlanger, Sarah H. 1981. Excavations at Sheep Skull Camp (Site 5MT2202), a multiple occupation site. In Field investigations: 1978. Dolores Archaeological Program Technical Reports I(4). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[22] Southward, Jude 1981. Excavations at Ridgeline Camp (Site 5MT2242), a multiple occupation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(16). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[23] Brown, Gary A. 1981. Excavations at Horse Bone Camp (Site 5MT2199), an Archaic/Anasazi limited activity site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(14). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[24] Chenault, Mark 1980. Excavations at Horsefly Hamlet (Site 5MT2236), an Archaic Camp/Anasazi Site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Report V(15). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[25] Wilshusen, Richard 1981. Excavation at Marshview Hamlet (Site 5MT2235), a Pueblo III habitation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(12). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[26] Wilshusen, Richard 1981. Climbing Cactus Camp (Site 5MT4682), a Baskemaker III/Pueblo I seasonal use site. In Field Investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(18). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[27] Greenwald, David H. 1981. Excavations at Lee Side Camp (Site 5MT4513). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.5). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[28] Hewitt, Nancy J. 1982. Site 5MT2857. In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality: 1979. Dolores Archaeological Program Technical Reports V(3.9). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[29] Kleidon, James 1982. Excavations at Faraway House (Site 5MT4763), a Pueblo I/Pueblo II limited activity site. In Field investigations, Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(10). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[30] Brisbin, Joel M. 1981. Excavation at Tres Bobos Hamlet (Site 5MT4545), a Basketmaker III habitation. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(2). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[31] Hewitt, Nancy J. 1981. Excavations at Sagehill Hamlet (Site 5MT2198, a Basketmaker III/Pueblo I habitation site. In Field investigations: 1978. Dolores Archaeological Program Technical Reports I(5). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[32] Brisbin, Joel M., Alice Emerson, and Sarah Schlanger 1981. Excavations at Dos Casas Hamlet (Site 5MT2193), a Basketmaker III/Pueblo I habitation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(5). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[33] Brown, Gary A. 1979. Excavations at Casa Bodega Hamlet (Site 5MT2194), a Pueblo I habitation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(7). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[34] Kuckelman, Kristin A. n.d. Excavations at Aldea Sierrita (Site 5MT3854), a Basketmaker III/Pueblo I habitation site. In Other field investigations in selected localities: 1979-1980. Dolores Archaeological Program Technical Reports XVI(3). In preparation.

[35] Montgomery, John 1981. Excavations at Apricot Hamlet (Site 5MT2858), a Basketmaker III/Pueblo I habitation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(6). Preliminary draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[36] Yarnell, Richard W. 1981. Excavations at Prairie Dog Hamlet (Site 5MT4614), a Basketmaker III/Pueblo I habitation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(6). Preliminary draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[37] Brisbin, Joel M. n.d. Excavations at Windy Wheat Hamlet (Site 5MT4644), a Pueblo I habitation site. In Other field investigations in selected localities: 1979-1980. Dolores Archaeological Program Technical Reports XVI(4). In preparation.

[38] Kane, Allen E. 1979. Preliminary approximation of pool area temporal/functional matrix. Ms. on file, Dolores Archaeological Program, Dolores, Colorado.

[39] Greenwald, David H. 1981. Pine View Hamlet (Site 5MT2162). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.1). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[40] Greenwald, David H. 1981. Charred House (Site 5MT2844). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.2). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[41] Greenwald, David H. 1981 Rusty Ridge Hamlet (Site 5MT2848). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.3). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[42] Greenwald, David H. 1981. Deer Hunter Hamlet (Site 5MT2853). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.4). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[43] Hewitt, Nancy J. 1981. Sunflower Hamlet (Site 5MT4640). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.6). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[44] Hewitt, Nancy J. 1981. Desecho Camp (Site 5MT4642). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.7). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[45] Hewitt, Nancy J. 1981. Roadside Camp (Site 5MT4649). In the 1979 site testing program: operations in the Sagehen Flats Locality. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(13.8). First draft submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[46] Woodbury, Richard B. 1961. Prehistoric agriculture at Point of Pines, Arizona. Society for American Archaeology, Memoir 17.

[47] Adams, Charles E. 1978. The function of limited activity sites in the settlement system of the Lower Piedra District, Colorado. Limited activity and occupation sites: a collection of conference papers, edited by Albert E. Ward. Contributions to Anthropological Studies 1:99-107.

[48] Hewitt, Nancy J. 1981. Excavations at Little House (Site 5MT2191) a McPhee Phase field house. In Field investigations: 1978. Dolores Archaeological Program Technical Reports I(7). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[49] Kleidon, James 1982. Excavations at Moonlight House (Site 5MT2205), a Pueblo I seasonal use site. In Field investigations: 1978. Dolores Archaeological Program Technical Reports V(8). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[50] Brisbin, Joel M. 1981. Excavations at Casa Roca (Site 5MT2203), a Pueblo II field house. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(9). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[51] Wilshusen, Richard 1981. Excavations at Cascade House (Site 5MT4512) a Pueblo I field house. In Field investigations, Sagehen Flats Locality: 1979. Dolores Archaeological Program Technical Reports V(11). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[52] Harriman, Ray 1981. Excavations at Marshview Hamlet (Site 5MT2215) a small Sundial Phase Anasazi habitation site. In Field investigations: Sagehen Flats Locality, 1979. Dolores Archaeological Program Technical Reports V(12). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[53] Morris, Maxine M. n.d. Site 5MT2241. In Other field investigations in selected localities: 1979-1980. Dolores Archaeological Program Technical Reports XVI(6). In preparation.

[54] Greenwald, David H. n.d. Excavations at Jeddito Camp (Site 5MT4541), a McPhee Phase hamlet. In Other field investigations in selected localities: 1979-1980. Dolores Archaeological Program Technical Reports XVI(8). Final report submitted to the U.S. Bureau of Reclamation, Upper Colo. Region, Salt Lake City, in compliance with Contract No. 8-07-40-S0562.

[55] Pinder, David, Izumi Shimada, and David Gregory 1979. The nearest-neighbor statistic: archaeological application and new developments. American Antiquity 44(3):430-445.

[56] Breternitz, David A., Arthur Rohn, and Elizabeth Morris 1974. Prehistoric ceramics of the Mesa Verde region. Museum of Northern Arizona Ceramic Series 5.

[57] Lucius, William A. and Dean Wilson 1980. San Juan redwares: a resource model. Paper presented at the 53rd Annual Pecos Conferences, Mesa Verde National Park, Colorado.

[58] Hayes, Alden C. and James A. Lancaster 1975. Badger House community, Mesa Verde National Park, Colorado. National Park Service Publications in Archaeology 7E.

[59] Birkedal, Terje G. 1976. Basketmaker III residence units: a study of prehistoric social organization in the Mesa Verde Archaeological District. Unpublished Ph.D. dissertation, University of Colorado, Boulder (University Microfilms, Ann Arbor).