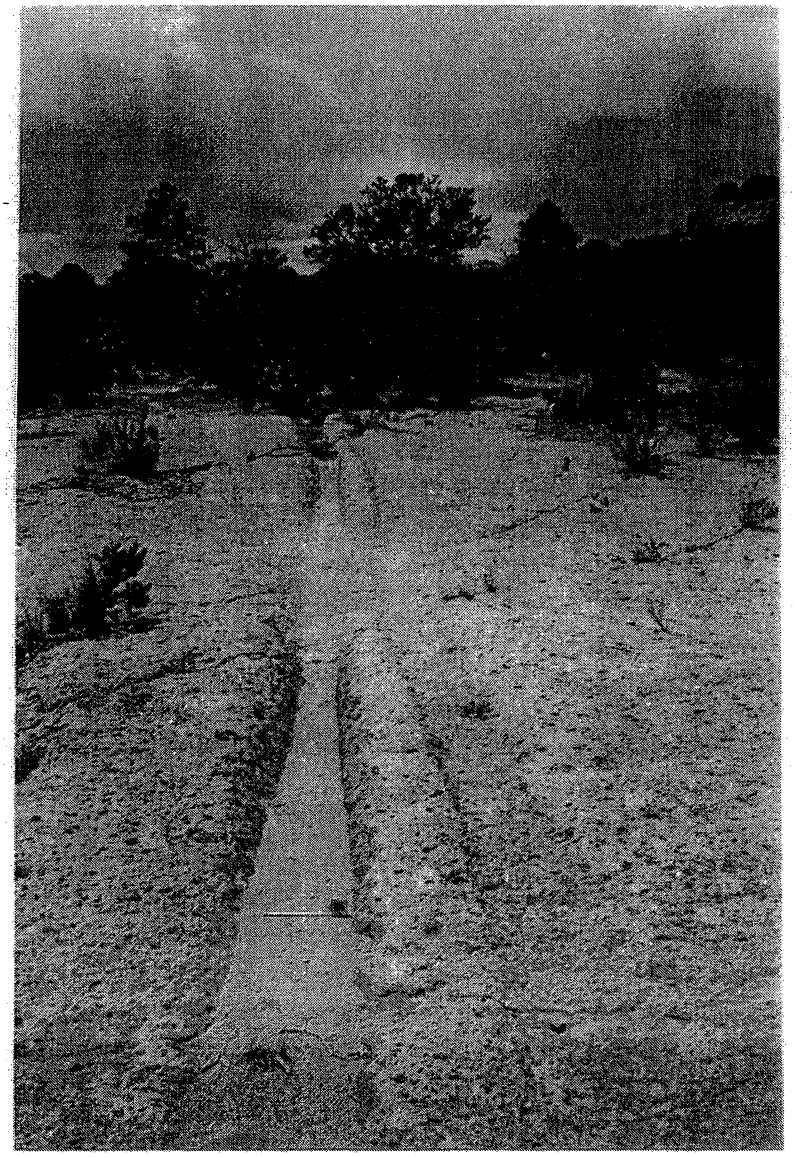
PAJARITO TRAILS PROJECT

Final Report of the 1999 Season, II:



Fieldwork in the Otowi and Sandia Canyon Areas

LA-UR-01-1525

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Cover: LA 66885 , the Sandia Canyon Trail Network, trail segment 04.

I. INTRODUCTION

This report discusses archaeological research conducted on lands managed by Los Alamos National Laboratory, New Mexico, between July 15 and August 1, 1999. The Pajarito Trails Project (PTP) was designed to achieve the following goals:

A. Examine a sample of previously-identified trails on the Pajarito Plateau which were believed to be in use during the occupation of the region by Ancestral Pueblo people.

B. Re-evaluate those sites (recording new data where appropriate).

C. Develop a protocol to record the salient features of Ancestral Pueblo trails.

The 1999 fieldwork also included research within Bandelier National Monument; an additional report (Snead 2000) has been completed concerning that portion of the project. Portions of the background and methodology sections of this report are repeated therein.

II. BACKGROUND

The Ancestral Pueblo trails of the Pajarito Plateau have been a subject of curiosity since the earliest days of scientific exploration in the region. Col. James Stevenson, leader of the Southwestern expedition of the Bureau of Ethnology, visited Puyé in 1880 and noted an unusual network of associated trails. "Along the edges of the cliffs and over the rocky surface of the mesa," he wrote, "are winding foot-paths from 3 to 10 inches deep, worn by the feet of the inhabitants" (Stevenson 1883: 432). In the same year Adolph Bandelier made the first of several forays into the Pajarito region, led by guides from the Pueblo of Cochiti, who used the ancient trails to cross the rugged terrain. Bandelier's journals contain little information about the trails themselves, but his final report described a trail on the Portrero del Rito as a route once taken by Navajo raiding parties. The term "Old Navaho Trail" or "Old Indian Trail" was applied to many of the Pajarito trails thereafter. Another early visitor to the plateau was former territorial governor L. Bradford Prince, who published a short book on a journey made to the shrine of the stone lions, in which he wondered "what multitudes of feet must have trodden those rugged paths, in order to wear into the hard and solid stone, grooves fully six inches deep" (Prince 1903: 7).[1]

Despite the early interest in Ancestral Pueblo trails, however, scientific documentation consisted exclusively of general descriptions of routes and characteristics. Maps of the region made by Edgar Lee Hewett, Kenneth Chapman, and J. P. Harrington often include trails, but provide little further information (Hewett 1906; Harrington 1916). Hewett was conscious of the importance of the trails for understanding the Ancestral Pueblo occupation of the Pajarito,

[1] According to Bandelier, Prince's journey took place in 1885 (Bandelier 1895: 152).

writing that they and other preserved features of the cultural provided "a complete picture of the ancient life of the Southwest" (1906: 52). His fieldwork, however, emphasized excavation, and besides photographs and brief comments (for example, Hewett 1909; 1953: 65), no further trail data were recorded. With the decline of formal research on the Plateau after the Hewett era and with increasing archaeological concern for issues of chronology, scientific interest in trails lapsed. Many of the trails mentioned by Hewett, in fact, were forgotten by the 1930s, as new roads built onto the Pajarito made use of the traditional routes unnecessary. Division of the land into different Indian and federal reserves also complicated use of the trails, since the features often ran across modern boundary lines. Thus when Charlie Steen reported on some of the Ancestral Pueblo trails on land administered by Los Alamos National Laboratories in the 1970s, the level of knowledge and recording had progressed little beyond that of Hewett's generation (Steen 1977: 30; 1982: 7).

Steen's interest in trails and other archaeological features of the Pajarito Plateau foreshadowed the two principal modern archaeological projects to work in the region, the UCLA Pajarito Archaeological Research Project (PARP) (Hill and Trierweiler 1986) and the Bandelier Archaeological Survey (BAS) (Powers 1986; Powers and Orcutt 1999). These large-scale survey projects were designed to inventory the full range of archaeological resources present on the Pajarito Plateau. The BAS report, for instance, describes 45 different categories of architectural features present within Bandelier National Monument, a list which includes trails (Powers et al 1999: 121).[2]

Although trails again became subjects of archaeological study, they continued to present problems for documentation and analysis. Both PARP and BAS were designed as "site" surveys, with methods designed to record discrete clusters of archaeological data. The research questions on which both projects were based focused on large-scale shifts in settlement over time. Since residential architecture provided the greatest information on these subjects, sites of this type received the most attention, with trails often being considered "minor features" for which standards of data recording were variable. Boundaries of survey areas were either based on topography or entirely artificial parameters; most of the PARP data, for instance, was collected from sample transects.

Trails, with their complex spatial parameters, fit poorly into site-based recording systems, and contained little chronological information. Thus while trails were recorded by both PARP and BAS they received little emphasis in the subsequent analyses. The statistical data for the trails recorded by the BAS provided by Van Zandt (1999: 331-335) lays important groundwork for further comparison, but does not contribute to her larger discussion of aggregation and community formation. The PARP database has been subject to more limited analysis, but the trail data recorded by the UCLA teams is broadly similar to that documented by the BAS.

It is thus evident that there are two requirements for archaeological study of the Ancestral Pueblo Trails of the Pajarito Plateau: a frame of analysis in which data from trails

[2] The terms "trail" and "linear feature" are used interchangeably in this report. While linear features is the broader term and includes ditches and similar constructions, no feature of this kind was recorded in 1999.

can be meaningfully applied to larger issues, and a data recording strategy that exploits this potential. Both are subsumed in the concept of *archaeological landscapes*, a set of conceptual models that have been increasingly used by archaeologists in the 1990 (see, for example, Crumley and Marquardt 1990). Landscape analysis treats the archaeological record as a variable distribution of features and artifacts across space. Patterns in this evidence reflect social and economic activity as well as site formation processes. By focusing on the relationship of the different features, in context, changes in human activity at different scales and over time can be examined (see Ashmore 1981; Kolb and Snead 1997).

Trails are a good fit for landscape strategies, due both to their spatial variability and to their function as features of travel and integration. In the post-BAS era of archaeology on the Pajarito Plateau, when researchers turn their attention to the organization of communities and other fine-grained studies made possible by the new wealth of data, understanding how the original inhabitants of the region configured social and economic space will be critical. Trails are one of the few physical manifestations of this process, and the information they hold will be increasingly valuable.

The research that ultimately led to the Pajarito Trails Project began in 1991, with a preliminary analysis of trail data recorded to that point by the BAS (Snead 1991). Also in the summer of 1991 a trail survey was conducted in the vicinity of the Navawi community house on tribal land northeast of the town of White Rock (Snead 1994).[3] These two efforts demonstrated both the deficiencies of existing trail data and their potential for further analysis. For instance, while a cluster of trail sites was noted for the vicinity of the Painted Cave (LA 13362) in Capulin Canyon, it was impossible to determine from associated site records whether these trails were part of the same linear feature recorded at different points, were different features in a larger network, or were entirely unrelated to each other (see Snead 1991: 6). The 21 linear features recorded in the Navawi area, in contrast, illustrated the way in which a series of apparently unrelated trails could, at a larger scale of analysis, be seen as part of a regional network of travel and communication (Snead 1994: 8).

The 1999 fieldwork emerged from this previous effort, and was designed to apply lessons learned to a new body of data. With the completion of the BAS and new trails being discovered by continuing survey efforts within the monument, the time was right for a new initiative.

III. RESEARCH DESIGN

The 1999 field season was a pilot project, intended to develop means to record prehistoric trails on the Pajarito Plateau, apply those new procedures to a sample of previously-identified trails, and to locate and record trails that had not been previously recorded.

As initially conceived, the project was to emphasize the following three areas:

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[3] The Navawi survey was conducted under permit from the office of the governor, San Ildefonso Pueblo.

1. **Frijoles Mesa/Ancho Canyon.** Area to the north of State Road 4 and the north boundary of the main section of Bandelier National Monument, including the headwaters of Chaquehui Canyon and a central section of Ancho Canyon, with mesa tops on both sides. Emphasis in this unit was to be placed on reconnaissance survey to identify possible trails connecting sites in Frijoles Canyon with sites further north.

2. **Mesa between Pajarito and Potrillo Canyons.** Area south of Pajarito Road and extending west from the outskirts of White Rock to near the mouth of Threemile Canyon. Research in this area was intended to identify and re-record trail sites discussed for this mesa by Charlie Steen.

3. **Otowi/Sandia Canyon area.** Area includes the northern portions of the former Otowi Unit, extending from the San Ildefonso boundary in the south to the boundary of the Santa Fe National Forest in the north, from the Los Alamos County line in the west to the reservation/Tsankawi unit boundaries on the east. Re-recording of previously-recorded sites was to be coupled with reconnaissance survey, particularly in the vicinity of Otowi Pueblo and associated mesas.

As it became clear that insufficient time was available to complete this agenda in the summer of 1999, it was decided to focus exclusively on the Otowi/Sandia Canyon area, land included in the zones known as Tech Area (TA) 72 and 74 (map 1). The greater number of previously recorded trail sites in the vicinity of the Otowi and Tsankawi community houses provided clear starting points. Access was also less restricted than in the other two areas.

Previous research painted a relatively complex picture of trails in the study area. PARP had recorded five sites; four in Sandia Canyon (LA 21629, 21632, 21634, 21635), and one on Kwage Mesa west of Otowi (LA 21602). None of these trails had attracted Steen's attention, but more recent fieldwork by LANL archaeologists had identified another trail site in Sandia Canyon (LA 66885) and several in the vicinity of Otowi (LA 21585, 127693). Data on these sites in most cases had been collected without significant reference to other recorded trails in the vicinity. Inconsistencies in the PARP records, in particular, made associations between the different sites difficult to establish. Clearly, a new effort to integrate these different sources of information and collect new data in a systematic fashion would clarify the nature of the trail network in the region.

For the purposes of the Pajarito Trails Project, emphasis was placed on recording trails dating to the Coalition/Classic periods (AD 1100-1600) identified by the presence of "wearing" or "grooves," abraided into exposed tuff bedrock by foot traffic. Wearing is an indirect reflection of the number of people using a trail, and trails exhibiting wearing are the most likely candidates for features in use when the population of the region was at its height. It is clear that sites of this type represent only a subset of the trails used by the Coalition/Classic population, particularly since trails across the canyon bottoms and other areas that still retain soil would not have been preserved. More ephemeral routes that carried limited traffic would also be unlikely to have left a clear signature. This bias in preservation is

unavoidable given present recording techniques. Adopting a systematic approach to the recording of trail segments, however, does provide opportunities to reconstruct poorly-preserved elements of trail systems, since the relationship between recorded segments and the logic of terrain frequently allows for "reconstruction" of routes.

The project was coordinated with the staff of the LANL Environmental, Safety, and Health Division, Ecology Group (ESH-20). Management, locational, and environmental data from the Bandelier trails were recorded using the standard LA site form produced by the New Mexico State Historic Preservation Department (HPD). Black & white photographs were taken of all sites, and sketch maps were made. GPS units borrowed from ESH-20 were used to plot site locations and the length of trail features, data that were then incorporated into the ARCVIEW data base maintained by LANL staff.

Three innovations in trail recording were implemented from the beginning, the first being the division of these features into "segments." In many cases trails were non-contiguous, either disrupted by environmental processes or consisting of discrete sets of trail features which were clearly associated with each other but not physically connected. In other cases trail structure changed significantly over the length of the feature, reflecting different levels of use, different environmental characteristics, etc. In order to record data from these trails that would reflect existing conditions as accurately as possible they were divided up into segments, either on the basis of continuity or consistent terrain. Segments were marked on the sketch maps, and site descriptions reflected this organization.

The second recording strategy concerned recording both trail structure and associated features. For comparative purposes it was important to develop a set of common characteristics that were manifested by the various trails, both in terms of the trails themselves, and in terms of features associated with them. Table 1 lists the different variables recorded in these categories.

Finally, all sites recorded were categorized as either (1) individual trails (minor/major), or (2) trail networks. This classification, both functional and conceptual, is treated in detail in the recording protocol, but essentially distinguishes between trails of either purely local function (minor) or isolated from similar sites (major), and clusters of trails that appeared to be functionally related.

Use of the individual/network dichotomy, in combination with the identification of "segments" as recording units, made it possible to impose some order on what would otherwise be a complex jumble of archaeological features of unclear association. Although the 1999 fieldwork demonstrated its utility in the Pajarito case,further testing and refinement is clearly in order prior to its application under different circumstances.

Trail Structure	*Trail Features*
Wearing	Berms
Cleared Talus	Flanking Walls
Construction	Shoring
Braiding	Cairns
Switchbacks	Trail Markers
Hand and Toe Holds	Architecture
Steps	
- One-foot	
- Two-foot	
- Basin	
Stairs	
Ramps	

Table 1. Characteristics of trail structure and types of trail features recorded in 1999. Refer to Appendix A, recording protocol, for definitions.

IV. RESULTS OF THE 1999 FIELD SEASON

Summary

Fieldwork in 1999 was conducted on July 24-27, 29, and August 1, for a total of six days spent in the field. The field crew consisted of James Snead and Howard Newman, with occasional assistance from Marit Munson of the University of New Mexico, who was conducting fieldwork in the vicinity, and her crew of volunteers. Since this effort was conducted in tandem with a more extensive work recording trails in Bandelier National Monument, the base of operations was in Juniper Campground at the monument. Regular meetings were held with ESH-20 staff to ensure effective coordination.

In the course of the work in the Otowi/Sandia Canyon area four clusters of trail segments were recorded as trail networks. Sites associated with each of these localities had been previously identified and had been assigned LA numbers. Past inconsistencies and the new recording strategy, however, created problems for associating these numbers with particular sites. Temporary (PTP) numbers were used in the field in all but one case, where association with an LA number was clear. Table 2 correlates LA, PARP, LANL, and PTP numbers, along with site names where appropriate.

LA	PARP	LANL	PTP[4]	Name
21602	500	**	**	Kwage Mesa Trail Network
127693 **		Q-29	3	Otowi East Trail Network
21585	**	**	4	Otowi Mesa Trail network (Bayo Staircase)
"	**	**	5	Otowi Mesa Trail network (Barrancas Canyon)[5]
21629, 21632-5 66885	47, 50, 52-53	**	6	Sandia Canyon Trail Network[6]

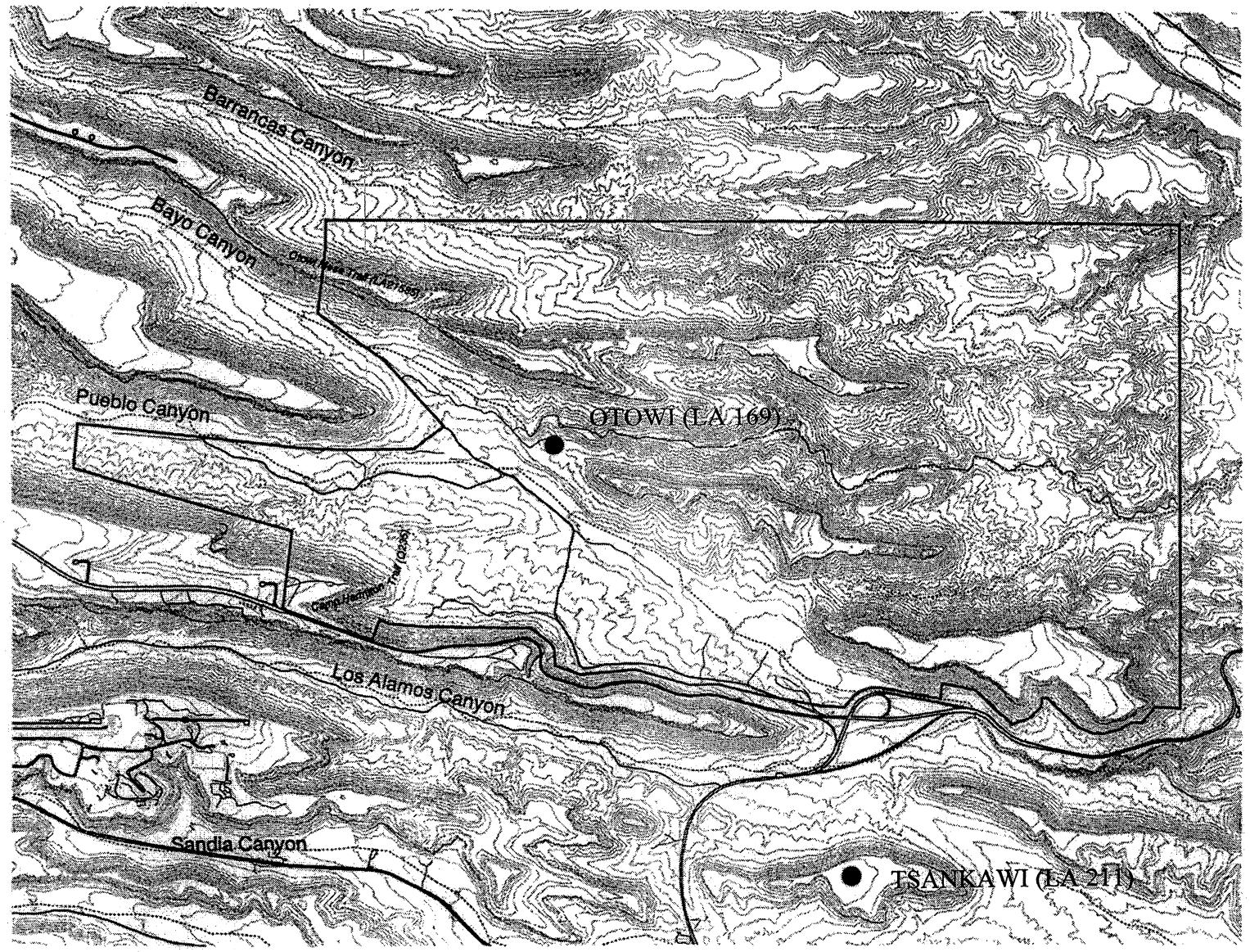
34 segments, ranging in length from 3 m to 280 m, were recorded in the study area. The total length of these segments is an estimated 1280 m. Trail structure included wearing, braiding, steps, stairs, hand and toe holds. Trail features were comparatively limited. Cairns were the most common feature, with a total of 12 recorded on 3 of the 4 sites. One petroglyph considered to be a trail marker was also recorded. In two cases petroglyph panels were accessed by recorded trails, while one trail/stair segment was interrupted by a game trap. Given the difficulties with associating artifacts and trails, no effort was made to collect ceramics or lithics in the vicinity of recorded sites. Similarly, while it is evident that the trail networks were most heavily used by the Coalition/Classic period inhabitants of the Pajarito Plateau, use of most segments during the subsequent historic and modern period is also likely. Three components are thus indicated for most segments.

The following section contains more detailed information about trails recorded in the different study areas.

[4] PTP-1, 2, and 7 were assigned to trails in Bandelier NM, and are not discussed in this report.

[5] PTP 5 & 6 were initially recorded as separate sites, but subsequently condensed into LA 21585.

[6] As initially recorded by PARP, several trail segments in close proximity on this mesa were considered to be different sites. Since the 1999 work suggests that they were all functionally related, however, they were re-recorded as a single network. See the relevant site forms for more detailed discussion.



Map 1. Study area, identifying major cultural and topographic features in the TA 72/74 area.
Courtesy Bruce Masse, ESH-20, Los Alamos National Laboratories.

Conveyance And Transfer EIS Tract

TA-74 Site

C_20_1
C100_1
Drainage
Roaddirt
Road
Land_xfr

N

Los Alamos National Laboratory
Ecology Group - ESH-20
13 May 1998

Facilities data maintained by FIMAD

Sandia Canyon (TA 72)

A number of trails are known to exist on LANL land in proximity to the Tsankawi community house (LA 211) (cf. Steen 1997, 1982; Snead 1994). Despite this, however, the only formally recorded linear features were those documented on the mesa between Sandia and Los Alamos canyons recorded by PARP (LA 21632/PARP 50; LA 21634/PARP 52; LA 21635/PARP 53; LA 21639/PARP 47) and by LANL (LA 66885) (see Larson 1987). Review of the relevant site forms indicated that the relationship between these sites should be re-examined. Four of the five were relocated in the field, and only LA 21639 could not be found[7]. In addition, two new trail segments were identified. Since the various trail segments on the mesa had clear functional relationships, they were re-classified as the Sandia Canyon Trail Network and re-recorded under LA 66885.

LA 66885

LA 66885, the Sandia Canyon Trail Network, is a series of interconnected trail segments on the low portrero between Sandia and Los Alamos canyons (Map 2). The portrero and its associated benches are largely devoid of residential sites, although cavates exist along the lower cliffs of the north side of Sandia Canyon. The nine trail segments recorded thus collectively represent a major route linking the communities of this portion of the Pajarito Plateau with other districts to the east and west. Access from the surrounding canyons is provided by four sets of stairs, which link to a trail that runs discontinuously west across the 2nd bench and then climbs to the summit of the portrero to continue westward. Visibility of the trail is relatively high, although soil and vegetation obscure it in several places away from the rim.

The various segments of the Sandia Canyon Trail Network are characterized by different degrees of wear and formality. Stairs, braiding, and handholds are evident in some segments, while others are characterized by simple wearing. Associated features include 5 cairns of piled tuff cobbles and one gametrap that appears to have been cut into one of the staircases at some point after its human use declined. No petroglyphs were noted.

Reconnaissance survey was relatively complete along the rim and associated benches toward the eastern end of the portrero. Further west, however, coverage was less systematic, particularily along the rim of the portrero summit and the cliffs behind the shooting range in Sandia Canyon. It is clear that the plethora of LA numbers associated with these trail features require consolidation; it is suggested that LA 66885, which as originally recorded includes the most formal stairs on the portrero, be retained for the entire network.

Otowi (TA-74)

Previously recorded trails in the vicinity of Otowi (LA 169) include LA 21585,

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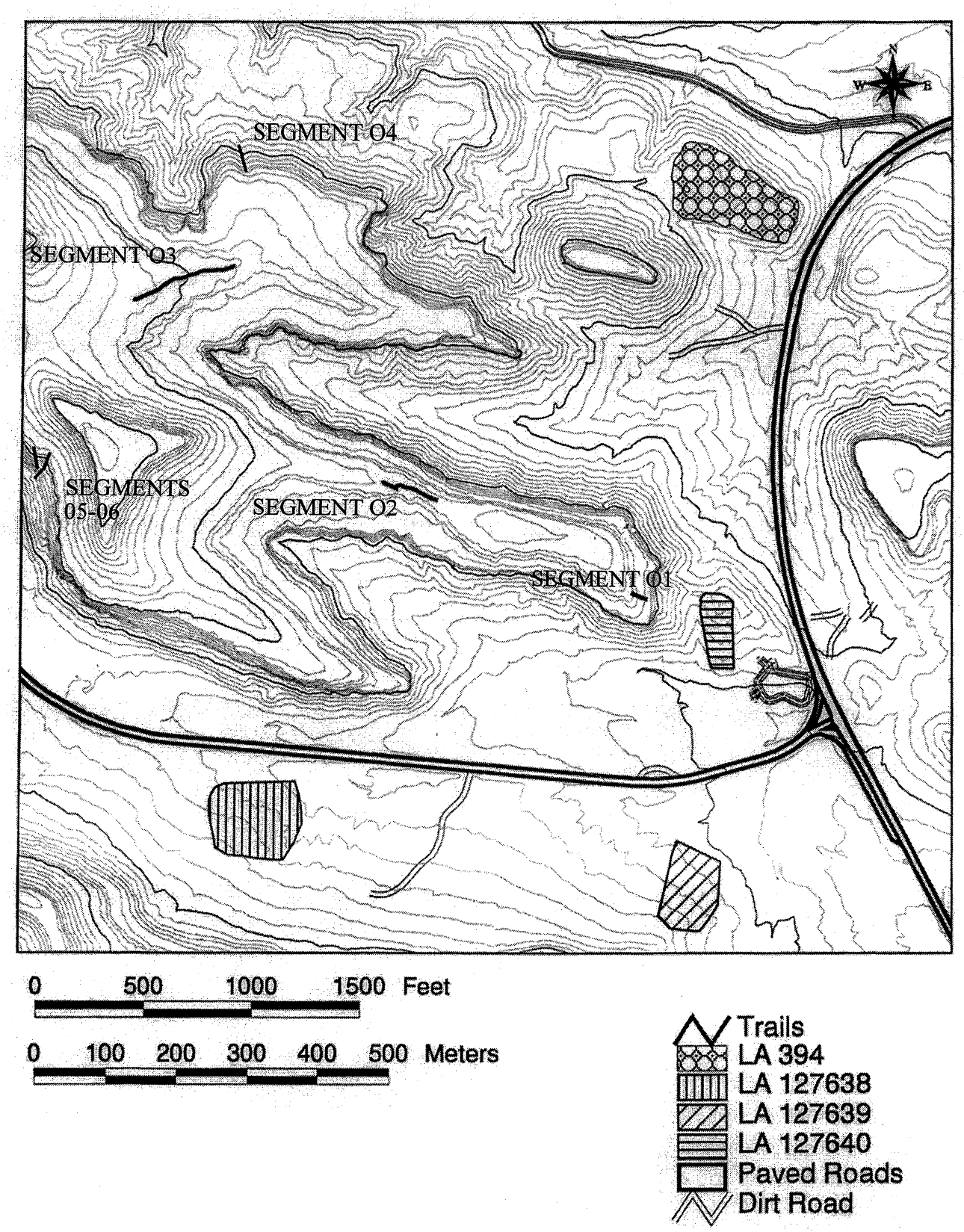
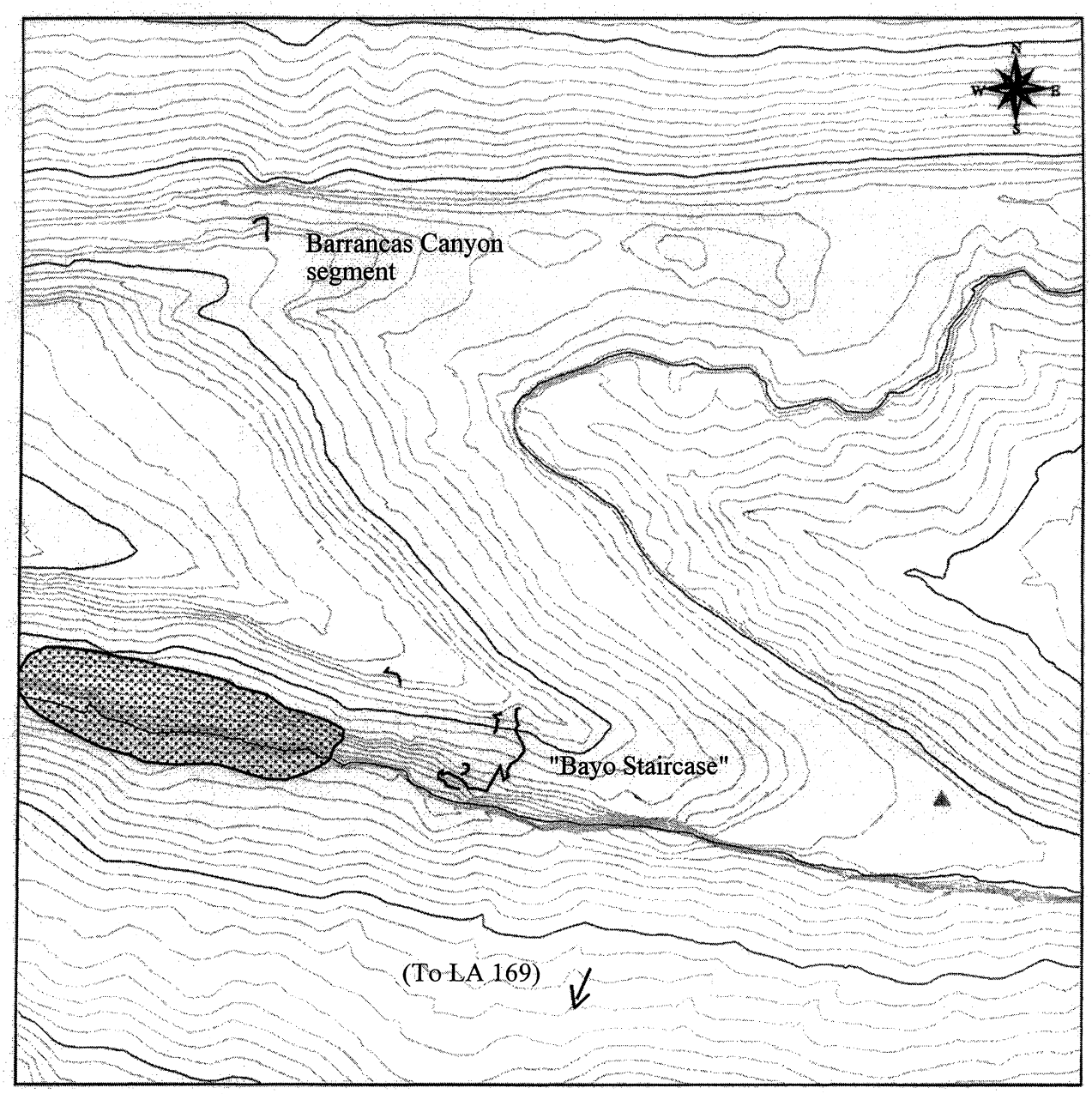
[7] Since this site appears to have been a 7 m trail segment linked to a set of hand & toe holds on the face of a small butte, it is small enough to either have been misplotted by the original PARP recording team or missed by the 1999 reconnaissance.



Map 2. LA 66885, the Sandia Canyon Trail Network, Illustrating segments 1-4, 7-8. GIS plot courtesy Bruce Masse, ESH-20, Los Alamos National Laboratories.



0 200 400 600 800 Feet

0 50 100 150 200 Meters

Trail
Other (Cairn)
LA 127673
10 ft Contour

Map 3. LA 21585, the Otowi Mesa Trail Network, Illustrating the "Bayo Staircase" and Barrancas Canyon segments. GIS plot courtesy Bruce Masse, ESH 20, Los Alamos National Laboratories.

running along the top of Otowi Mesa north of Bayo Canyon; LA 21602 descending the toe of Kwage Mesa; LA 127693, on the mesa east of Otowi; and LA 127699, the Camp Hamilton Trail. Given the general historic associations with LA 127699, effort was focused on re-recording the first three of these. In all cases, additional trail segments and associated features not previously recorded were also identified. Reconnaissance survey was also conducted down the length of Otowi Mesa to the east of LA 21585.

LA 21585

LA 21585, the Otowi Mesa Trail Network, is a series of trail segments on the mesa north of Bayo Canyon that link the vicinity of Otowi with points further west. Previous research had documented portions of the trail along the top of the portrero and descending in a series of staircases to the talus on the south side, adjacent to the cavate pueblo recorded as LA 127673. 1999 research focused on more detailed documentation of the trail segments on the mesa flank and examined the terrain further east.

A total of 10 trail segments, distinguished by breaks in the route or by differences in terrain, were recorded in association with LA 21585. Eight of these features, ascending the steep face of Otowi Mesa, are collectively termed the "Bayo Staircase," while the remaining two segments represent the descent of a northern branch of the trail into Barrancas Canyon (Map 3). In functional terms the trail segments link residential areas on the talus slopes and in the canyon bottom with cavates and other special use areas on higher benches as well as to the trail on the summit of the portrero.

The Bayo staircase itself consists of two routes that climb the portrero within 20 meters of each other but are characterized by different degrees of formality and construction techniques. While the easterly route travels up two narrow crevices in the tuff and includes formal stair segments with handholds on each side, the western route is more eclectically composed of step and hand & toe holds that climb steeper tuff faces. Both show evidence of braiding. Few associated features are present, although the trail provides access to an isolated petroglyph panel along the face of the upper cliff. One cairn of stacked tuff cobbles at the point where the Bayo Staircase reaches the summit was also noted.

The northern segments of the trail that descend into Barrancas Canyon are comparatively less formal, and no features were noted in association. No other trail features were noted along the north rim of Otowi Mesa to the east, and no evidence for the trail's continuation along the top of the portrero in that direction was recorded.

LA 21602

LA 21602, the Kwage Mesa Trail Network, is a series of trail segments that climb the eastern toe of Kwage Mesa, to the west of Otowi and directly above the modern Los Alamos County waste water facility. Three segments of the trail were recorded by PARP as their site 500. In 1999 effort was focused upon re-recording these segments and identifying new routes along the flanks of the mesa.

A total of 11 segments, distinguished by discontinuities or breaks in the terrain, were recorded in association with LA 21602 (Map 4). Two general categories emerged; segments

associated with the major trail climbing to the top of the portrero and running westward, and segments associated with the major cavate group on the south flank of the portrero in Pueblo Canyon. Portions of the major trail were relatively formal, with step and stair segments particularly present along the narrow ridge. Considerable modern use of this trail is evident, and once on the top of the portrero it links up with a modern dirt road.

Seven of the segments were identified on the south flank of the mesa and had not been previously recorded. These routes demonstrated limited formality and were typically linked sets of steps, hand & toe holds, and some stairs connecting the various benches of the slope with the talus below and the summit above. The stairway that climbs to the 1st bench is located in the middle of the LA 35003 cavate pueblo. A petroglyph panel is associated with one segment, while a single isolated petroglyph was recorded alongside another. No other features were noted.

LA 127693

LA 127693, the Otowi East Trail Network, is a series of trail segments and associated features on the mesa east of Otowi Pueblo. Two stair segments had been previously recorded; 1999 fieldwork was focused on re-examining these features and surveying other portions of the mesa top.

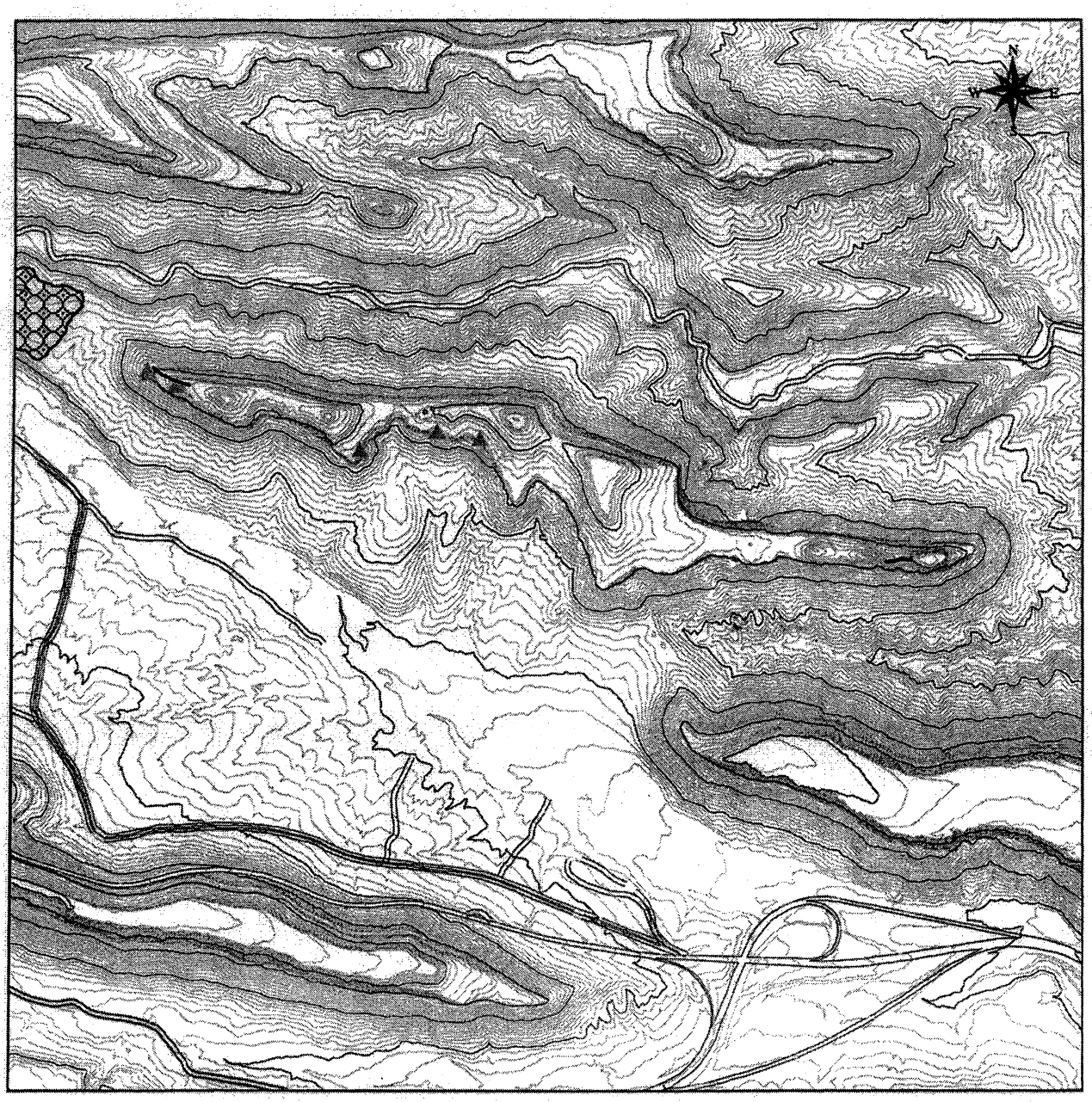
LA 127693 is the smallest of the trail networks studied in 1999, with only four clear trail segments noted (Map 5). Two of these, linked stairs on the north side of the west toe of the mesa, served to provide access to the broad 1st bench of the mesa. No ongoing trail was evident, and the two other trail segments are located at the far eastern end of the mesa, two km distant. These provide access to an isolated butte that marks the terminus of the mesa top, and the sheer drop to the talus in the vicinity precludes continued travel in that direction.

Some formality is evident at the western stairs, but the eastern segments are relatively informal routes that appear to have become visible through repeated use rather than through intentional construction. The only associated features are five cairns of stacked tuff cobbles, two of which mark the trail segments at the western end of the mesa. The other three denote the location of hand & toe hold routes down the lower cliff on the mesa's southern flank. These latter features are difficult to access at present, but should be approached from below and recorded as part of the Otowi East Trail Network.

V. PRELIMINARY CONCLUSIONS

Although other Ancestral Pueblo trails in the Otowi and Sandia Canyon areas undoubtedly exist, the trails recorded in 1999 represent a significant sample of those present and allow for several tentative conclusions. Ultimately a more systematic analysis of Pajarito trails, including those on surrounding jurisdictions, will pay a considerable dividend, contributing to important questions such as land use, community organization, and boundary formation.[8]

[8] The structure of this analysis closely parallels that made of the Bandelier trails (Snead 2000), but a more thorough comparison of the two data sets has not yet been attempted.



0 500 1000 1500 2000 2500 3000 Feet

0 200 400 600 800 Meters

Trail
Other (cairns)
LA 169 Otowi
Roads
10 ft Contour

LA 127693, the Otowi East Trail Network, illustrating trail segments and cairns.
GIS plot courtesy Bruce Masse, ESH-20, Los Alamos National Laboratories.

Trail Function

The degree of variation among the trails on the Pajarito Plateau was a surprise to the research team. Trails exhibited considerable differences in structure, in location, and in apparent purpose. Unlike trails recorded in the main section of Bandelier NM, trails in the central portion of the plateau are difficult to segregate into "major" and "minor" functional categories (see Snead 2000). Instead, their interrelationships over large areas make them easier to classify as trail networks (see recording protocol, below). This may be attributable to topography, erosion, and population density. The narrow portreros and shallow canyons of the central plateau provide good conditions for trail preservation and visibility. Soil conditions are also important, since the exposure of tuff bedrock in which foot traffic can wear trails is more common in the central plateau than further south. The high density of Ancestral Pueblo population in such a landscape may also have led to the creation of more recognizable trails than recorded elsewhere.

In general terms, the trail networks recorded in the Otowi and Sandia Canyon areas had two interrelated functions; providing access to different locations within a community, and connecting communities to other parts of the Pajarito region. In the first case, trails provide a solution to the extreme topographic variability of the study area that inhibits easy movement across the landscape. Many of the cavate pueblos, for instance, are located on multiple levels of canyon slopes, separated by exposed bedrock and cliffs of variable height. These different components of a community are frequently linked by a discontinuous series of steps, short stair segments, and hand & toe holds. Where communities are located in close proximity to a more regional trail, these segments typically link up to the broader network through a series of routes that were probably originally expedient but grew more formalized over time. At LA 21602, for instance, there are several short segments that connect the various levels of a cavate village (LA 35003) but also link the community as a whole to the main trail running up to the top of the portrero and points west. A different example is provided by LA 127693, where there is neither a regional trail link nor near a cavate village of any size. Instead, the trail network, probably used by the inhabitants of the Otowi community house, functioned solely to provide access to the mesa top, where lookouts and other special-function sites may have existed.

Local trails such as these may also help identify different components of communities. In two cases (LA 21602 and LA 21585), trails lead to isolated petroglyph panels high on the slopes above cavate villages. It can be hypothesized that such petroglyph features played a role in symbolism associated with communities in a way similar to shrines and other boundary maintenance features. The association is tentative, but suggests ways that trails may provide evidence for relationships between sites that would not otherwise be apparent.

The regional trail system on the central Pajarito is also well-defined in the study area. The relative difficulty of traveling along the canyon bottoms, whether due to vegetation, soft soils or territorial concerns, created conditions in which the relatively open and barren summits of surrounding portreros were converted into corridors of movement. Not all terrain was suitable, and many portreros were isolated by high cliffs, but in general

topography created conditions under which east-west travel could be accomplished relatively quickly. The high visibility of the portrero summits would also have been an asset to travelers, for whom changes in weather and the activities of other people in the landscape would have been critical factors. Such conditions are contrary to the logic of travel using animal or wheeled transport, in which the difficulty of terrain is the most relevant factor.

Three of the trail networks recorded in 1999 served at least in part as components of regional trail systems. LA 66885, provided a link between the Sandia and Los Alamos canyon areas and areas further west beneath modern Los Alamos. Three connecting routes led into adjacent canyons and on to communities in the vicinity. It is likely that this network was once part of a much longer route that ran from the Rio Grande up the length of Tsankawi North Mesa, dropped into Los Alamos Canyon, then reemerged as LA 66885.[9] Both the Kwage Mesa Trail Network (LA 21602) and the Otowi Mesa Trail Network (LA 21585) similarily provide access to more westerly regions. Limited evidence for routes heading east appears to be due to topographic constraints, which suggests that the route down Tsankawi North Mesa had considerable importance.

North-south travel on the Central Pajarito would have been more problematic, since it moved against the grain of portreros and canyon. While the modest elevation changes in the vicinity of Tsirege and Navawi would have made the repeated up-and-down crossing of portreros tolerable, the higher canyon walls to the north would have been considerable obstacles. North-south trails would thus be located in areas where terrain constraints were temporarily eased, such as saddles and breaks in slopes, and effort could be minimized. At first glance conditions at LA 21585 would not appear to provide such an opportunity, since the trail network climbs the side of Otowi Mesa at a relatively steep point. This is appears to have been mitigated, first, by presence of trails associated with the cavate village LA 127673, which generated a series of trails up the slope of the portrero. More importantly, however, the point at which the trail descends into Barrancas Canyon is directly opposite a break in the canyon's north wall, providing a relatively straight route at least as far as Guaje Canyon, three km away.

North-south trails may leave a much more limited archaeological signature than the east-west trails, but it seems evident that their routes can be traced. Ultimately it should be possible to perceive relationships between many of the trail networks on the Pajarito Plateau and thus reconstruct the system on a regional scale. Both the Frijoles Staircase (PTP-1) to the south and the Garcia Canyon Staircase to the north appear to be components of a north-south trail system, for instance, which with some creativity can be linked to the network hypothesized here, thus forming a "Great North Trail" that integrates the entire Pajarito Plateau.

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[9] Trails recorded in the Tsankawi unit of Bandelier NM that were apparently a part of this regional system are LA 65738 and 65743. See Snead 1991.

Trail Chronology

While trails themselves are difficult to date, the relationship of trails to each other and to other archaeological features in the nearby landscape provided interesting chronological information. The routes of several of the trail networks on the central Pajarito Plateau, such as the primary segments LA 21602, are dictated by terrain, and it is difficult to determine their origins. The close association of other segments of LA 21602 with the cavate pueblo LA 35003, however, indicate that at least portions of the trail network were established during the occupation span of the site, the Coalition or Coalition/Classic periods, and that the trail segments that they connect to were at least in existence by that time (see Map 4).

In fact, there is considerable evidence to suggest that the trail network as a regional system had its origins during the Coalition period. The clearest example of this derived from the 1999 data is provided by LA 66885, the Sandia Canyon Trail Network. The trail segments that drop into Sandia and Los Alamos canyons are closely associated with Coalition-period settlements (LA 12609 and LA 394, respectively). In both cases the stairs that climb out of the canyon bottoms are relatively formal in structure, with braiding and some related features present. In contrast, the segment that runs to the Classic-period community house of Tsankawi is relatively informal and shows only limited signs of long-term use. Although this particular trail network is regional rather than local in nature, the fact that it seems to be aligned with the Coalition-period settlement (or, perhaps, the settlement system is aligned with the trail), indicates that it was in existence in at least the mid-13th century.

There is also some evidence for trail use in periods when the Pajarito Plateau was largely empty of long-term residential population. The high degree of wear on some segments of the Sandia Canyon Trail Network implies long periods of use, probably until recent times. There is other evidence for long-term use. Segment 9 of the same trail is cut by a bedrock pit that functioned as a game trap; since this feature would have proven dangerous to travelers, its construction during historic periods, when the vicinity was probably used as a hunting ground by people from the Tewa pueblos, is likely. The famous gametrap at Navawi is similarly associated with a trail. Steen (1977) noted the presence of brush "wing walls" associated with the Navawi feature in the 1940s, supporting the idea that these features were in use (and, I argue, constructed) during historic times.

Some differences in closely juxtaposed trails may also be attributable to chronology. The parallel routes that characterize the Bayo Staircase are difficult to explain in functional terms, but may reflect different periods of use of the feature. It is clear that several segments of the stair have been re-worked over time, as well. Establishing greater specificity, of course, is difficult, but the fact that variation is present and can be measured provides important evidence for different patterns of trail use and construction over time.

Trail Structure and Associated Features

The most interesting aspect of trail structure concerns trail segments that were the product of considerable labor investment. The majority of the trails recorded in 1999 were the product of regular foot traffic over a common route, with occasional investment in steps where passage was more difficult. In many cases, however, trail structure is much more

elaborate than required by terrain constraints. The Bayo Staircase, for instance, is composed of an elaborate sequence of stairs, often with associated handholds. When compared to more expedient parallel routes, these features required planning and construction far in excess of functional necessity. Similar effort was expended on parts of the Sandia Canyon Trail Network, particularly segment 6, which ascends to the summit of the mesa. In contrast, trail networks such as Otowi East and parts of the Kwage Mesa trails display limited formality.[10]

Relative differences in the formality of segments of the Pajarito trail system require explanation. There is a certain correlation between formal stairs, regional routes, and community houses. The Bayo staircase marks the main route between Otowi pueblo and the northern plateau, while the Sandia Canyon Trail network connects the Tsankawi area with areas to the west. Both staircase features are located at points where the environs of the community houses become visible to travelers coming towards them on the trails. Similar associations have been noted on the southern Pajarito, with formal staircases associated with the community houses of Tyuonyi, Yapashi, and LA 12579 (see Snead 2000).

Since the investment of labor in construction is a means of investing "permanence" into an otherwise transitory feature, it may be that the importance of the Pajarito staircases was in their symbolism rather than their function.[11] Trails play important roles in the demarcation of territory and thus in identity, and provide passage between different socially-defined categories of space. A traveler approaching a community house would be moving progressively from relatively open land used by multiple social groups, into the peripheral resource zone of a particular community, and ultimately into the community core. The significance of this final transition would have had significance to all parties, and its commemoration may have been symbolically important.

Investment in stairs at the point where major routes neared community houses may thus have been intended to create a visible marker of this transition; such "gateway trails" would have been signs both to residents and travelers of the authority of the local group. A more detailed argument for this interpretation is beyond the scope of this report, and several inconsistencies can be pointed out, but the idea of "gateway trails" is consistent with the spatial patterning of formal staircase features. It may also be possible to explain other complex trail features via this model. Braiding is another feature of formal staircases, one that is difficult to account for in functional terms. If stairs were features of symbolic importance, the construction of multiple routes and continual re-working may have been more of a ritual activity. Perhaps the construction of new stairs in juxtaposition with the old was a means by which later generations could establish their own sovereignty by adding their labor to the

[10] Note, for instance, the discussion of the use of field houses as territorial claims, which consider the investment of labor in masonry construction to be a critical factor in their symbolic impact (see Orcutt 1993).

work.

The relative absence of features associated with the trails recorded in the Otowi and Sandia Canyon areas is an interesting point of comparison with trails recorded elsewhere on the Pajarito. The only features regularly present along trails were cairns, which can rarely be dated and may have been established at any point in the hundreds of years of trail use. The only other features noted were petroglyph panels at LA 21602 and LA 21585 and a single rock alignment at LA 127693. This relatively meager set of associations may be attributable in part to terrain, since the exposed tuff provides few opportunities for berms and shoring such as noted elsewhere in the region. Flanking walls, such as those noted at LA 125383 south of Tsankawi Mesa, may have been historic additions, and are also highly susceptible to dismantling and re-use.

These inferences about the function, chronology, and structure of Ancestral Pueblo trails in the Otowi and Sandia Canyon areas indicate their importance as cultural resources. In providing evidence about the movement of people across the landscape, they also document relationships within and between communities. Such information is critical in our attempts to better understand the social and political dynamics on the plateau in the centuries prior to the Spanish conquest.

VI. MANAGEMENT RECOMMENDATIONS

In addition to developing a recording protocol and collecting research data on the Ancestral Pueblo trails of the Pajarito Plateau, the 1999 fieldwork was also designed to evaluate the trails that were recorded in terms of LANL management goals.

Condition Assessment: Otowi

The three trail networks recorded in the vicinity of Otowi appear to be in relatively stable condition. Various natural transformations have impacted trail structure; tree growth, downslope erosion and sheetwash, and rock fall have each obscured or disrupted trail segments. Unlike conditions in Bandelier NM, no trail segments were noted on talus slopes, conditions attributable to erosion and soil shifting. Despite these impacts, trail routes can still be clearly distinguished in most cases.

Human traffic has the most obvious impact on the integrity of the Otowi trails. All of the trails in the region are currently in use by hikers, although the extent of this use is dependent on their relationship to areas of modern interest. Segments 9 and 10 of LA 21585 show no signs of current activity, since Barrancas Canyon is a more remote destination than Otowi, which attracts most traffic. In similar fashion, the more ephemeral segments of LA 21602 that run down the south flank of Kwage Mesa show less impact than the major route of the trail heading down the toe of the portrero to the canyon bottom below. LA 127693 shows the least impact from visitation, but it is clear that modern hikers make their way onto even this more remote mesa.

Since many of the trails were worn into the mesas by foot friction to begin with, it is difficult to assess the extent of damage. Many of the trail segments show fresh scuff marks. In more friable substrates, repeated trail use has had negative impacts on the integrity of stairs and hand/toe holds. Segments 1 of both LA 21585 and 21602, which climb the crumbly red tuff of the lower cliff, are so worn that they are practically unclimbable. Other trail segments, worn into harder bedrock, show limited signs of modern wear. This includes the formal features of the Bayo Staircase, which although it continues to be used by hikers shows few signs of recent damage.

Condition Assessment: Sandia Canyon

The integrity of the Sandia Canyon Trail Network is comparatively high. Natural impacts include various forms of bioturbation and erosion, although only sheetwash appears to be a significant ongoing threat. The low elevation of the mesa means that associated trails are less vulnerable to rock fall and other forms of downslope erosion that are more evident along the higher portreros near Otowi. Many of the trail segments on the benches of the portrero and along its summit are obscured by vegetation, although given the intermittent character of such features it is difficult to evaluate whether they are hidden beneath pine duff and pinon pines or whether the original trail ran across soil rather than rock in that area.

None of the recorded segments of LA 66885 show signs of substantial modern use. This is largely attributable to its position within the modern landscape of the Pajarito Plateau. Unlike the Otowi area, which is adjacent to the Los Alamos town site and thus used for recreation, the vicinity of Sandia Canyon abuts LANL facilities, such as the firing range along East Jemez Road, that discourage hikers. The relative absence of the type of pueblo residential structure that would attract visitors also contributes to the area's isolation, and public knowledge that the land is open and accessible is limited. The prominence of adjacent destinations, such as Tsankawi to the east and (for those with more avid interests) the Mortandad cave kivas to the south, also paradoxically insulate the Sandia Canyon Trail Network from visitation.

These conditions provide considerable protection for the site. Although conditions are stable at present, however, shifting patterns of land use may have a negative impact on this situation. Upon the eventual land transfer and probable closure of the Otowi area to public use, the attention of Los Alamos hikers will undoubtedly shift elsewhere, and modern travel along the Sandia Canyon Trail Network would undoubtedly increase.

Recommendations

In addition to ongoing efforts by LANL personnel to protect Ancestral Pueblo trails ~~from damage, the following three~~ suggestions ~~are offered~~ to more effectively manage linear features as cultural resources at Bandelier.

A. **Complete the recording process.** One conclusion of the 1999 fieldwork is that previous records were largely inadequate for assessing the impact on trails of modern conditions in the monument. While the four ttrail networks

discussed herein represent a sizable fraction of the total known linear features, there are undoubtedly others for which no baseline data is available. Only with the completion of consistent data recording for all of these sites can current and future impacts be evaluated.

B. **Establish a monitoring program.** During and after the collection of data that allows for the status of Ancestral Pueblo trails to be assessed, a monitoring program needs to be implemented to evaluate linear features in light of changing circumstances. This should include periodic site visitation, regular collection of data from areas subject to heavy visitation, and re-recording of sites in areas scheduled to be impacted by other resource management projects.

C. **Develop a Regional Database**. Many of the linear features associated with Bandelier National Monument either extend across its boundaries or are associated with sites on adjacent jurisdictions. This is particularly important, since the regional trail network appears to pass across the NPS Tsankawi section and property owned by San Ildefonso Pueblo, making it impossible to understand the whole without including trail segments in these adjacent areas (see Snead 2000). In order for the management of these resources to be most effective and for the most accurate research information to be compiled, data from these other management areas must be pooled. Developing a GIS database that combines spatial information on trails for all Pajarito jurisdictions, for instance, would be a major step towards understanding the regional implications of the patterns noted in 1999.

The 1999 Pajarito Trails Project has demonstrated the value of studying Ancestral Pueblo trails and the importance of their continued management. Bringing trails into view as meaningful parts of the cultural landscape, this work has developed recording procedures and also suggested future topics for study. In the coming years it is hoped that Bradford Prince's 1903 insights into the importance of trail studies can finally be realized: "[t]hey are not 'footprints on the sands of time,' but in the rocks of eternity, and they tell vividly and more lastingly of the long occupation and vast numbers of people of those ancient ruins than could the most enduring monument" (1903: 7).

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APPENDIX A. RECORDING PROTOCOL

The following is a protocol for the recording of linear features such as those documented on the Pajarito Plateau. Although derived from 1999 PTP fieldwork, the protocol is intended to be sufficiently flexible to cover situations not encountered at that time. It is expected, however, that further modification and elaboration will be required. Note that, like any archaeological recording system, this procedure results in an abstraction of reality, but one in which trail data is sufficiently standardized to allow for further analysis.

I. GENERAL PROCEDURES

For the purposes of recording, trails or linear features are considered to be "sites." The boundaries of a trail site are considered to be the physical extent of the feature itself and any associated features. Since trails are not clearly associated with types of activity that directly involve artifacts, scatters of lithics/ceramics in physical association with trails may be included when a relationship is fairly clear. **Structure** refers to the attributes of the feature itself, while **associated features** refers to other archaeological manifestations intended to support the trail's function. Further definitions of these attributes are found below.

A. Classification

Classification pertains to the broad category of linear feature under examination. While the recording protocol has been particularly designed to record trails, it is applicable to other forms of linear features, as defined below.

1. *Trail.* A trail is a route of human transit that shows some formal structure, such as modification of the ground surface, often with associated features.

2. *Road.* A road is a linear feature of high formality designed/engineered either to facilitate wheeled vehicle traffic or to move people about the landscape for some centrally-organized purpose. Roads intended to carry foot traffic must be sufficiently wide to carry traffic in both directions, while vehicle roads must be of sufficient width to accommodate cars/wagons.

3. *Path.* A path is a route of human transit with evident structure but minimal formality. A typical path would be a worn, linear feature in the topsoil indicating the passage of traffic but without steps or other structural enhancements typical of trails.

4. *Route.* A route consists of a series of surface features that indicate the passage of traffic but in the absence of any structure. A typical route

would be a series of cairns climbing a talus slope toward a break in the upper cliff denoting practicable access to the mesa top but with no other evidence of regular transit.

5. *Ditch/Channel.* A ditch/channel is an excavated linear feature that has no functional relationship to human travel. Acequias, diversion canals, and similar features fit into this category.

6. *Other.* Category to include other linear features not anticipated by this protocol; use of the "other" classification requires detailed description.

Note that this classification structure has areas of overlap; some trails, for instance, will consist of sets of formal features linked by long, path-like sections, or a mesa-top trail may descend to a canyon bottom via an entirely informal route marked by cairns. It is recommended that the linear feature being documented be classified by its maximum degree of formality (but see segment definition, below). Note also that some of these classes of feature, particularly paths and routes, may only be considered "archaeological" where there is compelling evidence for time depth.

B. Feature Types

Two types of linear feature sites can be distinguished:

1. *Individual Features*

Individual trails are associated with a particular route or cultural feature. The scale of an individual trail is variable, and the class can be further subdivided into

a. Major. These features serve to connect areas across relatively long distances and carried comparatively significant traffic.

b. Minor. These are features which served principally as local access; trails connecting mesa tops and canyon bottoms, for instance, with no direct connections to larger systems.

The distinction between major and minor sites is based upon the scale of construction, use, and association with other archaeological sites in the vicinity.

2. *Feature Networks*

Networks consist of multiple linear features that are in close proximity to each other and are functionally linked. In these circumstances trails

are usually in association with a common cultural feature, such as a community house, or provide access to the same point on a mesa top using different approaches.

Features that are relatively close to each other, but have no functional relationship, should be considered discrete individual features and recorded as such.

B. Segment definition

The archaeological manifestation of a linear feature is often highly variable. As a feature crosses different types of topography it may exhibit different characteristics; the same trail, for instance, might be highly visible as it passes through the rimrock climbing a mesa, largely invisible passing across the deeper soils of the mesa top, and visible again as it descends the far side. While the entire length is part of the same trail, its is difficult to accurately characterize the whole. By dividing up the trail into segments, however, in which the feature is described as multiple related units, each with it own characteristics, it is possible to more precisely document the attributes of different portions of the feature without losing perspective on the whole.

Two strategies can be adopted to define segments:

1. *Contiguity.* Segments can be defined on the basis of contiguous, identifiable features. While it may be evident, for instance, that a trail climbs a talus slope, its route may be visible as a series of discontinuous steps, rather than as a consistent track. In this case, defining each set of steps as a "segment" allows for accurate portrayal of the trail's characteristics.

2. *Topography/Structure.* Segments can be defined on the basis of changing topographical/geological conditions and changing trail structure. Trails will look different on talus slopes than on bedrock, and trail structure may change over the length of a trail as a result of the intent of its builders. Identifying these differences allows for better characterization of the whole.

II. RECORDING

The following steps are recommended for the recording of linear features:

A. Site Form

Since trail data is considered to be a supplement to other collected archaeological data, the use of a standard site form (NMCRIS, etc.) is necessary.

B. Mapping

Two maps are to be made of sites consisting of linear features:

1. *GPS map.* Documenting the location and general orientation of a trail site through GPS allows for it to be accurately located and placed in association with sites and topography in the region.

2. *Sketch map.* The purpose of the sketch map is to place the site in its immediate cultural and topographic context. Sufficient detail should be included to illustrate the characteristics of the particular trail and make it possible for future projects to locate the site. The sketch map should also accurately identify any defined trail segments.

C. Trail Form

Completion of the linear feature data form (see section IV, below) allows for the collation of data that is specifically appropriate for trail sites.

Following completion of site recording, the maps and linear feature data form are to be appended to the general site form.

III. DEFINITIONS

Three categories of data are recorded for linear features. The first concerns structure, and consists of the architecture of the trail itself. The second concerns minor associated features, which are other archaeological manifestations that originally pertained to trail function. The third category, associated major features, pertains to architectural features associated with the trail but not functionally related. These lists and definitions should not be considered exhaustive, and should be augmented when appropriate.

A. Aspects of structure

1. *Wearing.* Wearing, also called "incision," "erosion," etc., refers to areas where the trail has been worn into the bedrock surface by friction caused by foot traffic, leaving a tangible imprint. Trail wearing can range from a faint "shadow" on the ground to deep worn segments a meter or more in depth.

2. *Cleared talus*. Cleared talus indicates construction of a trail by moving larger stones and cobbles from its path.

3. *Construction*. Construction indicates formal excavation of trail into the ground or physical modification of the trail surface by means other than gradual erosion (i.e. wearing). Construction must be argued rather than assumed, since it is difficult in most cases to distinguish wearing from construction. Steps and similar features, while "constructed," are covered by their own category, below.

4. *Braiding*. Braiding, also called "multiple routes," is the duplication of trail routes (formal or informal) within a relatively restricted area. Operationally, braided trails are usually no more that 10 m apart; parallel trails further apart might instead be considered part of a trail network (see above).

5. *Switchbacks*. Switchbacks refer to trails that angle back and forth across a slop.

6. *Hand and Toe holds*. Hand and toe holds are modifications of the tuff surface designed to facilitate climbing up steep boulder/cliff faces. Hand and toe holds usually consist of shallow "cups" pecked into the rock surface and demonstrate a minimum of effort.

7. *Steps*. Steps are modifications of the trail surface designed to facilitate climbing moderate slopes. They are generally larger and wider than hand and toe holds. Three general morphological characteristics of steps have been noted:

   a. one-foot steps. These are steps large enough for a single foot. Unlike hand and toe holds, they have been cut straight down into the rock surface and are thus "open" at the top.
   b. two-foot steps. Steps large enough for two feet side by side.
   c. Basin steps. These are large steps which by design or subsequent erosion have a concave profile.

8. *Stairs*. Stairs are aligned sets of steps. Operationally, a set of five or more steps is here suggested to define "stairs" in relation to "steps."

9. *Ramps*. A ramp is a constructed or modified inclined plane by which a trail ascends or descends a section of slope. A ramp may be a section of bedrock that has been shaped to facilitate foot traffic down a short drop.

Linear feature characteristics are not mutually exclusive, and many Pajarito trails include all of these components.

B. Minor associated features

Minor associated features are constructed elements that pertain directly to the function of the trail.

1. *Berms.* Berms are linear mounds of stacked cobbles and boulders found along trail margins parallel to the trails themselves. Typically, berms function to bound a trail's downhill side.

2. *Flanking walls.* walls of stacked shaped/unshaped cobbles set perpendicular to the course of a trail. Flanking walls are typically found at mesa rims and appear to have been designed to limit access to the mesa tops by people traveling on the trail.

3. *Shoring.* Shoring refers to the stacking of cobbles or other construction material to level the downslope side of a trail.

4. *Cairns.* Cairns are piles of unshaped cobbles placed alongside trails to mark their routes.
5. *Trail Markers.* Trail markers consist of petroglyph panels or isolated elements that mark trail routes. While some trails may lead to or pass near larger petroglyph panels, trail markers are directly associated with trails themselves.

One complexity of linear features concerns certainty of association. Cairns, flanking walls, berms, and trail markers can be placed along trails at any point in their use life. In the recording procedure, reference should be made to evidence for association between the trail itself and any minor features.

C. Major associated features

The category of major associated features includes all archaeological features with which the trail might be physically or chronologically associated but which are not directly related to its function. These include residential or special-function structures which are reached by trails. In many cases it is difficult to directly associate major features with trails that pass nearby

IV. LINEAR FEATURE DATA FORM

The following is a prototype recording form designed to collate the data described above. Note: *status* pertains to the relationship between the current project and previous recording efforts, if any.

LINEAR FEATURE DATA FORM

LA number:
Other site number:
Name:
Classification: []road []trail []path []route []ditch/channel
[]other _____
Type:
Classification: []major []minor

Trail Segments & Characteristics:

# of segments = _____

Segment #____ Dimensions:_____
Associated Component(s):___
Status:___
Trail Structure:__
Associated features:____
Remarks:__
Photo:___

Segment #____ Dimensions:_____
Associated Component(s):___
Status:___
Trail Structure:___
Associated features:____
Remarks:__
Photo:___

Other Features:

APPENDIX B. SITE DATA

Site data, consisting of HPD site forms, sketch maps, and associated material, has been provided to ESH-20..

APPENDIX C. PHOTOGRAPHS

Contact sheets of photographs documenting linear features recorded in 1999 have been provided to ESH-20. Negatives have been retained by the Principal Investigator.