

Title

**An Assessment of the Impact of Social Trails Use
on Cultural Resources in Technical Area 71,
Los Alamos National Laboratory, New Mexico**



Cultural Resources Report No. 252
Survey No. 697

Prepared for

**U.S. Department of Energy
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Introduction

This document represents an analysis of the impact of social trail usage on historically significant cultural resources in Technical Area 71 (TA-71) at Los Alamos National Laboratory (LANL), New Mexico. TA-71 is situated immediately adjacent to and south of the community of White Rock (Figure 1). The report was prepared in response to the Mitigation Action Plan associated with a LANL environmental assessment produced in 2003 titled *Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program, Los Alamos, New Mexico* (DOE/EA-1431). The detrimental effects to specific trail segments, resulting from recreational trails use and LANL mission operations are the focus of this project.

1.0 Trails Use and Cultural Resources

On September 2, 2003, the Los Alamos Site Office of the Department of Energy, National Nuclear Security Administration issued an environmental assessment pertaining to the evaluation and management of social trails at LANL. This document, *Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program, Los Alamos, New Mexico* (DOE/EA-1431), recognized that since the establishment of LANL in 1943, employees and members of the Los Alamos and White Rock communities have unofficially utilized certain portions of LANL for recreational (“social”) purposes. One the most popular manifestations of this, is the use of existing trails, some associated with the ancestors of San Ildefonso and Santa Clara Pueblos and some established by the Los Alamos Ranch School as well as the development of new trails for walking, jogging, horseback riding, mountain biking, and other forms of recreation.

W. Bruce Masse, Sherri Sherwood, and Dan Pava, all members of the Environmental Stewardship Division’s Ecology Group (now Environmental Protection Division, Ecology and Air Quality [ENV-EAQ]) conducted extensive surveys at TA-71 between August 22 and September 20, 2005. The pedestrian surveys included the use of a global positioning system (GPS) unit to gather detailed location data for all identified trail segments in the area. Surveyors, referred to throughout this document as “assessors,” recorded impacts to archaeological sites affected by recreational trails use, as well as to the trails themselves. Some impacts were a result of long-term trails use (e.g., erosion), others were more recent (e.g., the creation and use of two-track roads, modern camping, pot hunting/looting, and vandalism). Specific damage to sites and trail segments is discussed in subsequent sections. Appendix A lists all trail segments and affected sites and provides recommendations for future trails use in this area. Recommendations for future trails use are also presented in this report. In the majority of situations, when mitigation was necessary, assessors suggested rerouting trails, erosion control, and, in a few worst-case scenarios, closure of specific trail segments. Trail segments were recommended for closure when they posed safety threats to users and when substantial threats to cultural resources have or will occur.

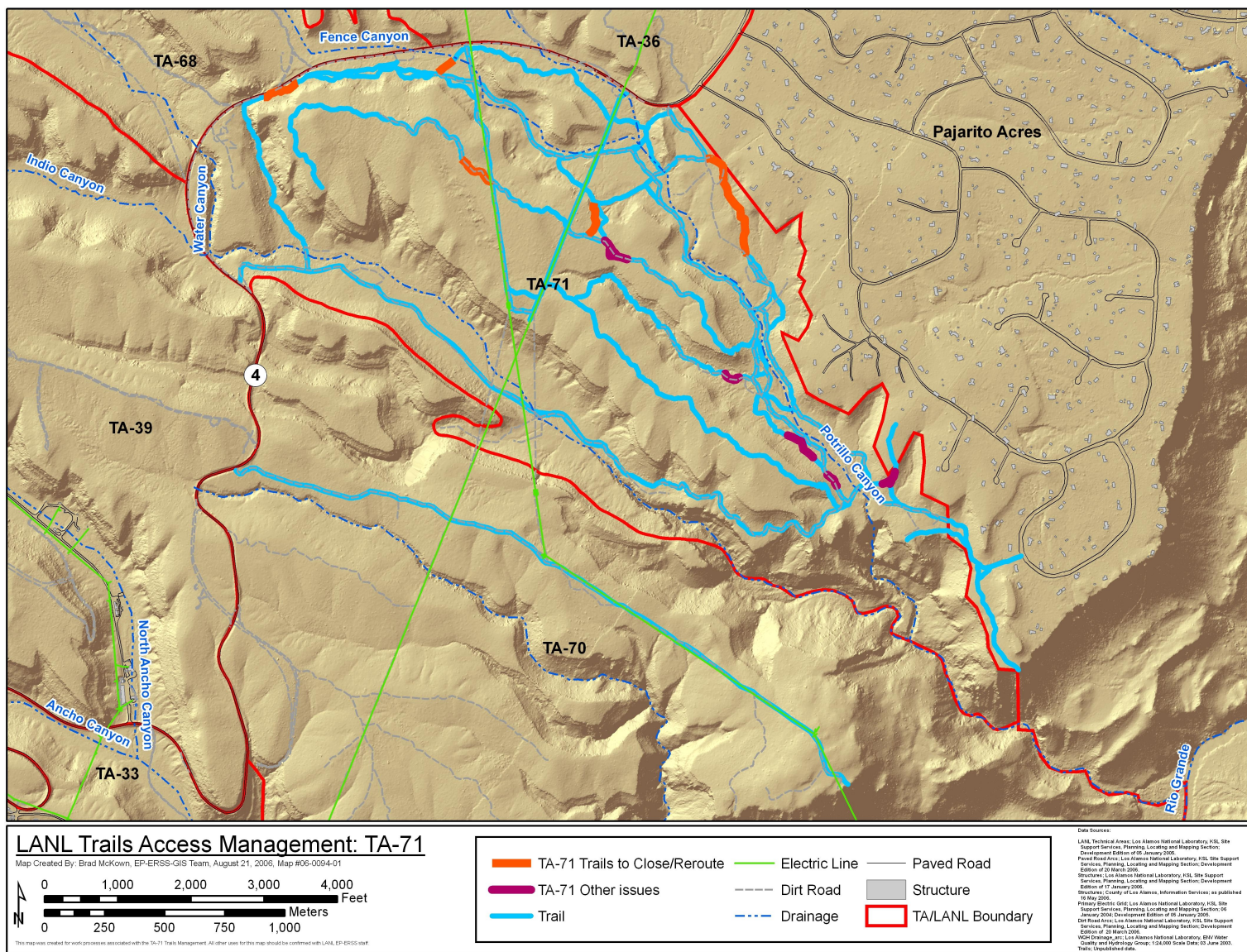


Figure 1. TA-71 trails, impacted areas, and trail segments recommended for treatment.

2.0 A Brief Culture History of the Pajarito Plateau

LANL manages more than 2000 heritage resources in accordance with Federal laws; these sites date as far back as 5500 BC, during a period referred to as the Archaic period, up to the 1940s and 1950s, which are associated with the Manhattan Project and the Cold War (Table 1). Sites at LANL include large lithic and/or ceramic scatters, rock shelters, pueblo roomblocks, cavates, and Manhattan Project buildings (Vierra and Hoagland 2000; Vierra et al. 2002). After the Archaic period, the Plateau was home to Ancestral Pueblo people whose descendants still live in the area today. The TA-71 area was occupied as early as the Archaic period and more recently by Ancestral Pueblo peoples. Ancestral Pueblo sites date to as early as AD 900 and as late as AD 1500. Cavates, ancient trail segments, one- to three-room field houses, and pueblo roomblocks dating to the Coalition and Classic periods have been identified during previous surveys of TA-71. These sites provide cultural resource managers with a better understanding of the lives of Ancestral Pueblo peoples (see Powers and Orcutt 1999; Vierra and Hoagland 2000). In particular, ancient trail segments provide archaeologists with information regarding ancient travel and trade routes as well as about inter-site relationships among people living on the Pajarito Plateau. For this reason, the archaeological record provides information about the ways in which people living on the Pajarito Plateau interacted and moved across the landscape.

Table 1. Temporal Sequence Associated with Sites on the Pajarito Plateau

Cultural Affiliation	Period	Dates
Paleoindian	Clovis	9500–9000 BC
	Folsom	9000–8000 BC
	Late Paleoindian	8000–5500 BC
Archaic	Jay	5500–4800 BC
	Bajada	4800–3200 BC
	San Jose	3200–1800 BC
	Armijo	1800–800 BC
	En Medio	800 BC–AD 400
	Trujillo	AD 400–600
Ancestral Pueblo	Early Developmental	AD 600–900
	Late Developmental	AD 900–1150
	Coalition	AD 1150–1325
	Classic	AD 1325–1600
Native American, Hispanic, and Euro-American	Spanish Colonial	AD 1600–1821
	Mexican	AD 1821–1846
	U.S. Territorial	AD 1846–1912
	Statehood to World War II	AD 1912–1945
	Recent	AD 1945–present

3.0 Assessment Methodology

The survey team included members of the Trails Assessment Working Group and ENV-EAQ. As previously stated, the assessors used GPS units, forms, and digital camera pictures to record site impacts and trail use issues. Assessors used the Trail Cultural Resource Impact Field Record Form (Figure 2) to document findings. The form includes an area for notes to record information about Ancestral Pueblo trail segments used continually for hundreds of years.

TRAIL CULTURAL RESOURCE IMPACT FIELD RECORD FORM	
TECH. AREA #: <u>71</u>	DATE: _____ TRAIL/SEGMENT: _____
RECORDERS _____	Collection: ___No; ___Yes(#)
GENERAL DESCRIPTION OF TRAIL SEGMENT: _____ _____	
NUMBER OF IMPACTED ARCHAEOLOGICAL SITES ALONG TRAIL SEGMENT: _____	
DESCRIBE TRAIL IMPACTS BY INDIVIDUAL ARCHAEOLOGICAL SITE:	
SITE #: LA _____	Temp or other No: _____ Site Type: _____
Erosion: ___; Vandalism: ___; Modern Trash: ___; Camping: ___; Pot-hunting: ___; Other: _____	
General Comments: _____ _____	
Photos: (Camera Name) _____	
GPS: (Unit) _____	
Recommendations: Reroute Trail ___; Erosion Control: ___; Close Trail Segment: ___; Other: _____	
Discussion: _____ _____	
SITE #: LA _____ Temp or other No: _____ Site Type: _____	
Erosion: ___; Vandalism: ___; Modern Trash: ___; Camping: ___; Pot-hunting: ___; Other: _____	
General Comments: _____ _____	
Photos: Camera Name: _____ Photo Numbers: _____	
GPS : (Unit) _____	
Recommendations: Reroute Trail ___; Erosion Control: ___; Close Trail Segment: ___; Other: _____	
Discussion: _____ _____	

Figure 2. 2005 Trail Cultural Resource Impact Field Record Form.

In general, archaeological site locations have been recorded previously as part of other projects (e.g., Hoagland et al. 2000; Nisengard et al. 2002; Vierra 2000). Many of the archaeological sites located at TA-71 were located with a GPS and marked with string and flagging tape during the Laboratory's tree thinning project in 2001 and 2002. The markings made the sites visible to tree thinners, protecting the sites from damage during mechanized tree falling and other thinning activities. In some places, Ancestral Pueblo trail segments have been integrated into the modern hiking, biking, and horseback riding trails used by residents of White Rock and Los Alamos, as well as by visitors to the area. In recent years, TA-71 has been closed during certain times of the year because of fire restrictions and wildfire danger.

4.0 Findings and Recommendations

4.1 General Trail and Site Impacts

The three primary impacts related to cultural resources, including Ancestral Pueblo trails, because of recreational trails use on LANL lands are erosion (Figure 3), site looting (Figure 4), and vandalism and/or modern disturbances (Figure 5). Natural erosion, primarily from wind and water, accounts for the majority of site and trail impacts. In some cases, recreational, grazing, and LANL mission activities, including the use and construction of two-track roads, fire roads, and new trail segments, exacerbate the impacts of natural erosion (Figures 3 and 5). Figure 3 illustrates damage to a trail segment and an artifact scatter resulting from construction of a power line in TA-71. The affects of erosion on trail segments and cultural resources can be mitigated to some degree with better land management methods (e.g., tree and grass planting as well as other erosion controls included in LANL projects).



Figure 3. Erosion impacts to trail segment 1-C, a power line corridor, and LA 139576, a Coalition period artifact scatter.



Figure 4. LA 139477, evidence of looting at an Ancestral Pueblo site adjacent to trail segment 16-D.



Figure 5. LA 6787A, a two-track road runs through the site, shaped tuff blocks line the side of the road.

Looting of archaeological sites (Figure 4) has also been an issue at TA-71 as recreational trail segments sometimes cross through these sites. In most cases, looting activities include manual excavation of Ancestral Pueblo sites resulting in depressions in the centers of masonry rooms and the pushing aside of masonry blocks in an attempt to retrieve artifacts. Disturbance of cultural resources ultimately results in their destruction,

as stratigraphic and contextual information is lost when the contents of these sites are ransacked. Recreational trails users and LANL personnel sometimes impact archaeological resources unintentionally; however, results of these activities are also detrimental to these resources (Figure 5).

4.2 Trail Segments Recommended for Treatment

Members of the Trails Assessment Working Group visited 37 trail segments, 22 of which were recommended for some form of treatment, including closure, future monitoring, erosion control, site excavation, and string removal (Table 2). Details concerning site and trail impacts are presented below with photographs of damage. Specific locations of the segments are not illustrated in this report in an effort to protect cultural resources.

Table 2. Trail Segments and Sites Recommended for Treatment

Trail Segment	Impacts	Cultural Resources	Recommendations
1-F	Modern trash and camping	LA 139571	Monitor.
3-C	Erosion and trail disturbance	LA 21622	Reroute trail to the east. Place check dams along deeply incised trail segment. Erosion control should be placed immediately upslope from site.
4-E	Erosion	None	Reroute trail to the northwest; erosion control check dams. Trail is along the new power line corridor.
5-A	Minor erosion	LA 139510	Remove string from sites.
5-B, 5-C, 5-D*	Looting, erosion	LA 139572	Periodic monitoring. Leave trail as is for now.
5-F	Erosion	LA 6787B	Leave trail as is. It is more difficult to create a new trail segment. Monitor.
5-F	Looting	LA 6787A	Move trail to the north or south of the site.
8-C	Erosion	SWEIS II 8, LA 134573	Reroute trail segment to trail segment 7 (another established trail). Preserve ancient portion of trail segment 8-C.
10-G, 10-H*	None	A-4	Remove string.
11-C	Erosion	LA 139481	Close trail segment.
14-A	None	LA 139515	Close trail segment.
14-D, 14-E*	Erosion	A-1	Remove string.
14-J	None	JAM-1	Excavate site.
14-J	Erosion	LA 139479, A-2	Monitor and remove string.
14-K	Erosion	A-3	Monitor and remove string.
16-B	Erosion	LA 139517	Remove string from site.
16-D	Looting	LA 139477	Remove string from site.
17-J	Collection	LA 139463	Monitor.
17-M, 10-G	Erosion	LA 21661	Erosion control.

* Note: contiguous trail segments are to be treated in the same manner.

4.3 Recommendations for Mitigation of Impacts to Trail Segments and Cultural Resources

The trail segments and associated cultural resources included in this section have been recommended for some treatment. A general treatment recommendation for each is summarized in Table 2; descriptions that are ore detailed and information regarding site conditions are provided here.

Trail segment 1-F and LA 139571. Assessors recommend monitoring for trail segment 1-F and LA 139571. The site consists of an Ancestral Pueblo period artifact scatter within two meters of the trail segment. Impacts to the site include scattered modern trash, a recent campfire, a road that cuts through a portion of the site, and low-level erosion (Figure 6). Erosion has resulted in areas of exposed bedrock. Because the site is a relatively dispersed artifact scatter, assessors recommend future site monitoring. Monitoring will help keep a record of further impacts and will allow assessors to alter their recommendations if additional treatment becomes necessary.



Figure 6. Trail segment 1-F and LA 139571 with evidence of a modern campfire within the site boundaries.

Trail segment 3-C and LA 21622. Erosion is the most significant impact to trail segment 3-C and LA 21622 (Figures 7 and 8). A portion of the trail has been washed out by erosion; the Coalition period one- to three-room structure (LA 21622) is also affected by erosion directly to the east and west of the site boundary (identified with string and pink flagging tape in Figures 7 and 8). Assessors recommend rerouting the trail further to the east and placing a check dam and/or other erosion controls along the incised trail segments to protect both the site and the trail from further erosion.



Figure 7. Trail segment 3-C and LA 21622 with impacts from erosion.



Figure 8. LA 21622 has been impacted by erosion and trails use.

Trail segment 4-E. While there are no cultural resources situated along trail segment 4-E, assessors recommend erosion controls and rerouting of this segment due to extreme impacts from erosion (Figure 9). Assessors recommend rerouting the trail to the northwest and placing check dams within the area. This segment is also along the route of the new power line corridor and may experience further impacts if not rerouted.



Figure 9. Heavily eroded trail segment 4-E.

Trail segment 5-A and LA 139510. This trail segment is not subject to heavy recreational use. LA 139510 is a relatively dispersed lithic scatter that has not been dated and has been marked with string and pink flagging tape (Figure 10). Although the trail does cut through a portion of the site's boundary, assessors believe that impacts to the site are minimal. Because the site is situated so close to the trail segment (Figure 10), assessors recommend removal of the boundary string.



Figure 10. Trail segment 5-A and LA 139510.

Trail segments 5-B, 5-C, and 5-D and LA 139572. Trail segments 5-B, 5-C, and 5-D cut through LA 139572, a large Coalition period pueblo complex (Figure 11). Erosion has impacted the southwest edge of the site, and at least one of the trail segments follows along the boundary string. There is some evidence for older looting activities at the site and very few artifacts are visible on the surface. An absence of sherds and lithics on a large site like this one is indicative of casual collection activities. Because the site is quite large, assessors do not recommend relocating the trail segments, but have suggested continued monitoring of the site.



Figure 11. Assessors record impacts to trail segments 5-B, 5-C, and 5-D and site LA 139572.

Trail segment 5-F and LA 6787A and LA 6787B. Trail segment 5-F is part of an old two-track dirt road that meets up with an ancient Ancestral Pueblo trail in some areas. Two Ancestral Pueblo sites in the area have been impacted by natural causes and recreational use of trail segment 5-F; however, trails assessors recommended treatment for only one of the two sites.

LA 6787A consists of a large Coalition period pueblo complex (Figure 12). At the site two old looters pits appear to have been filled with masonry blocks (Figure 13). Trail segment 5-F bisects LA 6787A and assessors recommend that this portion of the trail be relocated to the south or the north of where it is now, to prevent further damage to the site.



Figure 12. S. Sherwood, kneeling on trail segment 5-F, records impacts to LA 6787A. Masonry blocks at the bottom of the picture reflect intact archaeological deposits associated with the roomblock.



Figure 13. S. Sherwood assesses trail segment 5-F and site LA 6787A. In the forefront is a cluster of masonry blocks, evidence of looting.

LA 6787B is a Coalition period roomblock with no evidence of looting. Low-level erosion has impacted the southeastern portion of the roomblock (Figure 14). Because erosion at the site is low, damage to the site is minimal and, because it would be quite difficult to reroute this portion of the trail segment, assessors recommend leaving the trail

in place. However, continued monitoring of the effects of erosion and trails use to the site is recommended.



Figure 14. Assessors view trail segment 5-F and erosion associated with trails use at LA 6787B.

Trail segment 8-C and sites SWEIS II 8 and LA 139573. Trail segment 8-C coincides with a Coalition period pueblo roomblock (SWEIS II 8) and LA 139573, a Coalition period trail segment. The roomblock does not appear to have any damage related to trails use. The trail itself is quite eroded because of its age, recreational use, and natural erosion (Figures 15 and 16). Assessors recommend rerouting portions of 8-C to trail segment 7, another established trail situated close to this trail segment, to preserve the Ancestral Pueblo trail segment (Figure 16).



Figure 15. An eroded portion of trail segment 8-C.



Figure 16. Ancient segment of 8-C to be closed and the trail rerouted to trail segment 7.

Trail segments 10-G and 10-H and site A-4. Recent tree falls and casual erosion controls have impacted trail segments 10 G and H. When a tree fell in one area of the site, trails users rerouted a portion of the trail and began to use the “bypass” route as an alternative (Figure 17). Because these trail segments are relatively well used, assessors recommend removing the perimeter string from site A-4.



Figure 17. Bypassed portion of trail segment 10-G. Area where site has been blocked off with tree branches is visible on the right side of the photograph.

Trail segment 11-C and LA 139481. Trail segment 11-C is not subject to heavy recreational use. In some areas, under use of this trail segment has resulted in unmitigated tree fall and debris. Erosion has also impacted portions of the site (Figure 18). LA 139481 is an Archaic period lithic scatter and it is bisected by trail segment 11-C. Because this segment is seldom used and because it impacts LA 139481, assessors recommend closure of the segment.



Figure 18. S. Sherwood records trail segment 11-C and LA 139481.

Trail segment 14-A and LA 139515. LA 139515 is a rock shelter of undetermined age; trail segment 14-A crosses in front of the shelter. This is a relatively new trail segment and it is not heavily used (Figure 19). For this reason and due to the proximity of the trail to the site assessors recommend that this trail segment be closed and that the more established segment, 13-B, be used as the primary trail in this area.



Figure 19. Eroded portion of trail segment 14-A and LA 139515.

Trail segments 14-D and 14-E and site A-1. Site A-1, consisting of an Archaic lithic scatter, is adjacent to the junction of trail segments 14-D, 14-E, and 14-F. Both 14-D and -E are moderately to heavily used segments and run along an alluvial bench above a small stream (Figure 20). Because this trail does have a large number of users, assessors recommend removal of the string that surrounds the site.



Figure 20. S. Sherwood records impacts to trail segment 14-D and site A-1.

Trail segment 14-J, LA 139479, and JAM-1. Trail segment 14-J is moderately used and is moderately to severely eroded in some areas. In addition, there are several tree falls on the trail and it has been rerouted in many areas to avoid these hazards. 14-J is adjacent to two sites, LA 139479 and the newly identified JAM-1. Assessors recommend removal of the perimeter string from LA 139479, a dispersed Archaic period lithic scatter, which is bisected in several places by trail segments. Erosion, tree falls, and trail rerouting have all impacted the site (Figure 21). It also appears that artifacts have been collected from the site, as assessors were unable to identify any artifacts on the trail segments.



Figure 21. Masonry blocks used to reroute trail segment 14-J after a tree fall.

Assessors also identified two roasting pits (JAM-1) next to a well-used portion of trail segment 14-J (Figure 22). The roasting pits are relatively ephemeral and assessors recommend excavation of the two features to avoid further deterioration by erosion and trails use.



Figure 22. Assessors record trail segment 14-J and JAM-1.

Trail segment 14-K and site A-3. Trail segment 14-K is heavily used and has been subject to a great deal of wind and water erosion (Figure 23). The trail is adjacent to site A-3, which is a Coalition period one- to three-room structure. Assessors recommend

removing perimeter string (Figure 24) from the site and continual monitoring of both the trail segment and the site.



Figure 23. Heavily eroded portion of trail segment 14-K.



Figure 24. Tree fall on string surrounding site.

Trail segment 16-B and LA 139517. Trail segment 16-B is moderately used and has been impacted by a moderate amount of erosion. 16-B runs next to and through portions of LA 139517, an Archaic period lithic scatter. Assessors recommend removal of the perimeter string from the site (Figure 25).



Figure 25. S. Sherwood records impacts to trail segment 16-B and LA 139517.

Trail segment 16-D and LA 139477. Trail segment 16-D is moderately used and is about 25 feet from LA 139477, a one- to three-room Ancestral Pueblo structure of undetermined age. No artifacts were found at the site that could be used to help date the structures. The site has been subject to recent looting activities (Figure 26).



Figure 26. S. Sherwood records impacts to trail segment 16-D and LA 139477.

Assessors suggest that looting has occurred within the past five years. Looters excavated the center of the structure, pushing masonry blocks out to the sides and removing any

artifacts that may have been associated with the site. Assessors recommend removal of the perimeter string from the site to help prevent easy identification and further damage.

Trail segment 17-J and LA 139463. Trail segment 17-J is heavily used and some erosion has occurred as a result of trails use. LA 139463 is a Coalition period Ancestral Pueblo roomblock. Situated to the north of trail segment 17-J, the roomblock is not bisected by the trail and the site has not been impacted by the trail itself. However, the roomblock is devoid of all artifacts, including ceramics and lithics, which is unusual at a Coalition period site of this size, and is usually indicative of casual collection of artifacts. Because it is unlikely that further damage will occur at the site, assessors recommend continual monitoring of the site.



Figure 27. Trail segment 17-J and a heavily vegetated LA 139463.

Trail segments 17-M and 10-G and LA 21661. The heavily used trail segments 17-M and 10-G follow below LA 21661, a Coalition period cavate (Figure 28). The trail and the cavate have been subject to erosion, which will continue to impact the trail in particular (Figure 29). For this reason, assessors recommend erosion control devices (e.g., check dams, wattles) be placed at various parts of the trail and below the cavate to prevent further damage to the site and the trails. Assessors collected a projectile point from the front of the cavate, but this was the only artifact observed during the site visit.



Figure 28. Assessors record trail segments 17-M and 10-G (in the forefront) and LA 21661.



Figure 29. Heavily eroded portion of trail segment 10-G.

5.0 Future Recreational Trails Use at TA-71

As previously stated, a majority of impacts to trail segments and cultural resources result from natural erosion. This impact can be mitigated to some degree with erosion control methods and better land management in the area, some of which could be done as a part of LANL missions, others of which will be done at the grassroots level. Other kinds of

impacts including, modern disturbances, camping, looting, and vandalism are relatively rare and TA-71 and other areas accessible to the public are subject to self-monitoring by those who use them. Recreational trails users, in general, treat areas where they have public access to LANL lands, like TA-71, with a great deal of respect. In addition, grassroots trails maintenance in TA-71 is done by the recreational trails users (e.g., hikers, bikers, horseback riders) in hopes of preserving their access to these areas and protecting associated resources. Trail users, including LANL workers, have a documented history of notifying LANL's Environmental Stewardship Division when they witness vandalism, safety issues, and/or misuse of natural and cultural resources.

In some cases, Ancestral Pueblo trails have been incorporated into the network of TA-71 trails. While there are some examples of heavily eroded trail segments, many of these trails are in excellent condition (Figure 30). In such cases, it is not always realistic to suggest rerouting these segments, as doing so could jeopardize cultural resources and user safety. LANL's Trails Assessment Working Group has worked with members of Los Alamos County, staff members of San Ildefonso and Santa Clara Pueblos, and the public to understand the concerns of trail users and those of the descendants of Ancestral Pueblo peoples.



Figure 30. S. Sherwood stands next to a well-preserved Ancestral Pueblo trail segment that continues to be used.

In the past, specific trail segments have been closed in response to security concerns and in an effort to protect and preserve archaeological resources (e.g., Mortandad Cave Kiva trail). However, trail closures are not the only option. In fact, places like TA-71 provide examples of recreational trails use that is beneficial to all parties. Such use contributes to the maintenance and preservation of natural and cultural resources and provides opportunities for LANL and non-LANL residents to better understand and appreciate these kinds of resources. Currently, National Park Service officers from Bandelier National Monument, as part of an agreement with the Department of Energy's Los Alamos Site Office, patrols TA-71. This monitoring should continue in the future as it benefits all parties and limits the amount of damage that can occur in this area. In addition, the Trails Assessment Working Group, with a great deal of help from Craig Martin, of Los Alamos County, the State Historic Preservation Office, and other groups at LANL has developed a management plan for organized trails maintenance, which would begin in the Fall of 2006. This effort is beneficial to all participants, as it creates an atmosphere for open communication, education, and participation; investing in the community.

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Appendix A. Detailed Information Concerning Impacts to Cultural Resources and Trails Assessment Working Group Recommendations.

Trail Segment	Site Number	Impacts	Recommendations	Notes
1-C	LA 139576	Erosion	None	Erosion from power line corridor/trail, erosion is more pronounced upslope.
1-E	None	None	None	Power line two-track dirt road. A few scattered artifacts along the road.
1-F	LA 139571	Modern trash and camping	Monitor site.	Scattering of modern trash across site, modern campfire, and road goes through site. Some erosion and bedrock exposure.
2-C	LA 139541	Erosion and road disturbance	None	Erosion to bedrock and disturbance by road, no monitoring necessary.
2-D	LA 82590	Erosion and road disturbance	None	Two track road and some erosion to bedrock. Light artifact scatter, little damage.
3-C	LA 21622	Erosion and trail disturbance	Reroute trail to the east. Place check dams along deeply incised trail segment, erosion control immediately upslope from site.	Site and adjacent trail segment heavily eroded.
4-A	Unknown	Vandalism and modern trash	None	Site situated between 10-A, 11-B, 12, and 4A,
4-E	None	Erosion	Reroute trail to the northwest; erosion control check dams.	Heavily and deeply eroded along trail (old two-track road),
5-A	LA 139510	Minor erosion	Remove string from site perimeters.	Trail runs through site, but there are no substantial impacts.
5-B, 5-C, 5-D	LA 139572	Pot-hunting, erosion	Periodic monitoring. Leave trail as is for now.	Evidence of old pot hunting, no trash.
5-E	LA 21667	None	Not affected by trail use.	Prehistoric trail segments do not warrant preservation, keep trail as is.
5-F	LA 143903	Erosion	None	Minor impacts by trail.
5-G	Cavate complex	Erosion	None	
6	LA 139458	Camping	None	Slight trail past LA 139458. No damage to sites. Old campfire ring. Well used.
8-A	LA 139579	Erosion	None	Trail has a minor impact on the site. Some general erosion across the area.
8-C		Erosion	Reroute trail to Trail 7. Preserve trail segment 8-C.	Some erosion through site, no apparent damage to the roomblock.

Appendix A continued.

Trail Segment	Site Number	Impacts	Recommendations	Notes
9	LA 13957D	None	None	Trail clips the site, but no real problems.
10-G, 10-H	A-4	None	Remove string	
11-C	LA 139481	Erosion	Close trail segment	Trail is eroded; large amount of tree fall; seldom used.
14-D, 14E	A-1	Erosion	Remove string	Well-used trail; runs along alluvial bench above stream. 14-D is moderately used trail segment, some erosion.
14-J	LA 139479, A-2	Erosion	Monitor and remove string from site perimeter.	Trail is moderately used, moderately to severely eroded in some areas; some tree fall, much of the original 14-J no longer exists; trail has been rerouted.
14-J	JAM-1	None	Excavate site	Trail runs next to two roasting pits.
14-K	A-3	Erosion	Monitor and remove string from site perimeter.	Trail is heavily used, some erosion.
15-A		None	None	Contains portions of prehistoric trail segments.
16-A		None	None	Contains portions of prehistoric trail segments and there is an unknown historic feature near the trail.
16-B	LA 139517	Erosion	Remove string from site perimeter.	Trail runs by lithic scatter.
16-D	LA 139477	Pot-hunting	Remove string from site perimeter.	Trail is within 25 feet of site; damage to the site occurred within the last five years.
17-J	LA 139463	Collection	Monitor.	Heavily used, Pueblo abuts trail, but has not been disturbed. LA 139606 also undisturbed. Area is virtually devoid of artifacts.
17-M, 10-G	LA 21661	Erosion	Erosion control	Trail runs below cavate; well traveled, trail eroded at junction. The site is devoid of artifacts.
20 - Butte Trail		Camping	None	Intermittent trail leads to the top of the mesa where shrine is situated.