Department of Defense
Legacy Resource Management Program

Legacy Project # 09-442

Development of DoD Guidance for Archaeological Site Monitoring and Condition Assessments

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February 2011

For the **Development of DoD Guidance**

for Archaeological Site Monitoring and Condition Assessments

Prepared for:

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1.0 INTRODUCTION

The purpose of this study is to provide guidance related to archaeological site monitoring, preservation practices, and condition assessment strategies for archaeological sites on Department of Defense (DoD) installations. The study was funded by the DoD Legacy Resources Management Program as Legacy Project #09-442 and sponsored by the U.S. Marine Corps.

Section 110 of the National Historic Preservation Act, Article 14 of the Archaeological Resource Protection Act, and Executive Order 13287 (Preserve America) call for federal agencies to not only inventory and evaluate archaeological resources, but also to monitor their condition. DoD installations tend to make inventory and evaluation tasks priorities at the expense of monitoring site condition, due to budget and staffing limitations. Those installations that do monitor site condition rarely do so in a consistent fashion: baseline mapping or photographs are typically not provided to monitors; monitors may change from one visit to another; and data on site condition are usually not reported in a standardized fashion. Since additional manpower dedicated to monitoring is not a practical answer, this study was initiated with the goal of compiling best management practices to ensure consistent data collection and to aid in prioritizing future site treatment actions. The end products of the investigation include procedures for identifying current and potential threats to sites and tools to assist current Cultural Resource Managers (CRMs) with monitoring tasks.

The first sections of this report concern the development of protocols and methods for site monitoring on DoD installations. Existing monitoring programs from a variety of areas and agencies are canvassed and their applicability to the needs of DoD installations is assessed in Section 2.0. Baseline data collection and long-term monitoring methods are developed in Section 3.0 for use in the DoD environment.

The protocols and methods developed in this study were evaluated in a pilot program at Marine Corps Base (MCB) Quantico, located in Fauquier, Prince William, and Stafford counties, Virginia. Baseline data were collected from a selected sample of archaeological sites, and follow-on site monitoring visits were conducted after a suitable period of time that simulated an appropriate monitoring interval. The purpose of the field work was to assess the protocols developed, evaluate the data collection procedures from a practical standpoint, and make any alterations in the procedures as might be suggested by the results of the field evaluation. The results of the evaluation are presented in Section 4.0.

The final sections of this report include conclusions based on the findings of the study, and recommendations for implementation of monitoring programs at DoD installations. A list of references cited in the report and a series of appendices including a list preparers (Appendix A) close out the document.

2.0 OVERVIEW OF ARCHAEOLOGICAL SITE MONITORING PROGRAMS

2.1 Introduction

Many public lands—including military facilities managed by the DoD—are geographically extensive and contain large numbers of diverse and potentially significant archaeological sites. Compliance with federal cultural resources legislation on public lands has typically focused on the critical task of inventorying archaeological resources (Hargrave 2009; Kelly 2007). Archaeological site inventories enable public land managers to develop avoidance strategies that minimize negative impacts to known archaeological sites (Kelly 2007). Due to limited budgets and staff available to public land managers (Kelly 2007), archaeological sites might not then receive much further attention—unless planned impacts necessitate that potential effects to the sites be evaluated under Section 106 of the National Historic Protection Act (NHPA) (ACHP 2008; Little et al. 2000).

However, while sometimes overlooked by public land managers, Section 110 of the NHPA calls for the long-term preservation and protection of archaeological resources even if destruction is not imminent (Kunde 1999:ii). Archaeological sites are not static entities. Avoidance strategies developed at the time an archaeological site is recorded may become ineffective over time as a consequence of the dynamic forces acting on the site. Environmental forces, such as erosion, and animal activities, including rodent burrowing, can affect the physical integrity of a site if left unchecked, leading to a loss of critical cultural information and possibly imperiling the site's eligibility to the National Register of Historic Places (NRHP). Whether inadvertent or intentional, human-related impacts can be more capricious. For instance, the intensity of human-related impacts may grow dramatically with enhanced accessibility to a site, perhaps through encroachment of residential or military training areas, or increased off-road vehicle use (Affleck 2005; Ouren et al. 2007; Sampson 2007; Sowl and Poetter 2004; Stokowski and LaPointe 2000; Kathy Strain, personal communication 2009).

There is a growing recognition that proper stewardship of archaeological resources on public lands cannot rely on avoidance strategies but rather must become more proactive (Kelly 2007). Archaeological resources must be observed on a regular basis to examine the dynamic forces acting on a site if public land managers hope to develop long-term strategies that will minimize or redirect these ever-changing impacts (Kelly 2007). There are legal considerations as well—some law enforcement agencies will not become involved with Archaeological Resources Protection Act (ARPA) or other violations of the integrity of archaeological resources unless it can be demonstrated that collecting, looting, or vandalism are actively occurring (Kelly 2007; McAllister 2007). In some situations, conflicts may arise between the provisions of Sections 106 and 110. The Archaeology River Monitoring Program at Grand Canyon National Park (Grand Canyon Monitoring Program), for example, has noted a conflict between their efforts to comply with Section 106 to mitigate the effects of water releases from the Glen Canyon Dam and National Park Service directives regarding "preservation-in-place" developed under Section 110 (Grand Canyon National Park 2009).

Kelly (2007) asserts that land managers who fail to recognize the need for protecting archaeological resources will not be good stewards. Stewardship of archaeological resources may be hampered by a lack of communication between land managers, archaeologists, and state and federal agencies (Kelly 2007). There may also be a persistent notion that natural and cultural resource management issues are separate and must be managed separately (Kelly 2007). This is certainly not the case. Maintaining a balanced ecosystem can protect archaeological sites even through something as prosaic as keeping ground cover intact, which reduces erosion and can minimize the impact of vehicles travelling across sites (Affleck 2005:55; Fuchs et al. 2003:346). However, because impacts to archaeological resources may not be as obvious as those to natural resources, the latter tend to receive more attention than the former. Unfortunately, unlike natural resources that can be potentially restored, archaeological resources are non-renewable (Kunde 1999:7; Nickens 1991).

Failure to protect archaeological (and natural) resources can have serious consequences. The U.S. military is one of the largest federal landholders in the U.S. and must strive to maintain readiness and meet national security requirements while at the same time ensuring proper stewardship of its extensive environmental resources (Anderson and Ostler 2002:197; Bullard and McDonald 2008). Improper stewardship of environmental resources over an extended period can result in degradation of lands used for training exercises and a loss of realism in the training experience, thus impeding military readiness (Anderson et al. 2005:208).

2.2 Overview of Archaeological Site Monitoring

To effectively manage archaeological resources and address site integrity issues, land managers must develop long-term resource management programs (Kunde 1999:ii). A formal archaeological site monitoring program is an important component of managing archaeological resources—albeit, as noted above, one that is oft neglected in favor of inventorying archaeological resources (Hargrave 2009:A-1). Archaeological site monitoring programs typically begin with recognition that sites are being damaged, and the realization that, if impacts are detected early, the forces that threaten a site can be more effectively controlled and even minimized (Kelly 2007). Regular visits to sites through a formal site monitoring program—for example—have proven an effective technique for helping preserve the integrity of archaeological sites, such as deterring the activities of vandals, looters, and collectors (Kelly 2007).

Archaeological site monitoring involves periodic visits to an archaeological site to detect any changes in a site's condition from a previous visit to the site (Dierker and Leap 2006; Hargrave 2009:A-1). To implement a site monitoring program, one must examine current site conditions and evaluate the nature and extent of past, current, and potential threats to an individual site. As reviewed in the next section, monitoring programs may rely on the original archaeological site form as the source of the baseline data against which subsequent visits to the site are compared. Alternatively, an archaeological visit may be conducted at an archaeological site with the sole intent of gathering baseline data to aid in subsequent monitoring of the site (Kelly 2007).

In all of the programs reviewed, baseline site data is gathered by professional archaeologists (Table 2.1). However, in these programs, subsequent monitoring visits to an archaeological site may be conducted by professional archaeologists, non-archaeological professionals employed by public land agencies, or volunteer site stewards (Kelly 2007). Typically, photographic documentation is an integral component at each stage of the monitoring process (Coder et al. 1994, 1995). All reviewed site monitoring programs depend on forms to record baseline and site monitoring data, although, as shown below, the content of forms can differ considerably. Baseline data provides the foundation for any monitoring program, and consistency of those data is essential for the monitoring to be meaningful. In order for that to happen, dedicated training is necessary to ensure standardized collection of baseline and site monitoring data (Jennifer Dierker, personal communication 2009).

2.3 Review of Existing Archaeological Site Monitoring Programs

The development of protocols related to archaeological site monitoring and condition assessments for DoD use relied on a review of existing programs distributed across the nation. A dialogue was also established with the directors of several programs (Table 2.1) (see also Arizona State Historic Preservation Office 2009; Bureau of Land Management 2009; California Archaeological Site Stewardship Program 2009; California State Parks 2008; Dierker and Leap 2006; Florida Division of Historical Resources 2009; Friends of Sierra Rock Art 2009; Nevada Historic Preservation Office 2009; New Mexico Historic Preservation Division 2009; Project Archaeology 2009; San Juan Mountains Association 2009; Santa Fe National Forest 2008; Tennessee Valley Authority 2009; Texas Historical Commission 2009; U.S. Forest Service 2009). Two recent evaluations of site monitoring programs were consulted and proved extremely useful in providing guidance that facilitated this dialogue (Hargrave 2009; Kelly 2007). The authors of both works were contacted for additional insights into developing archaeological site monitoring protocols best suited to the Marine Corps Base Quantico (Quantico) but still applicable to DoD installations nationwide.

Programs formulated to address threats to archaeological sites on public lands ranged from the passive to the proactive. Due to extremely restricted staff and funding, the Tennessee Valley Authority's *A Thousand Eyes* program is limited to posting signs notifying the public that archaeological sites are afforded legal protection (Erin Pritchard, personal communication 2009). Florida's *Sitewatch* program is implemented primarily as a reaction to reports from state land managers of damage to sites, suspicious activities at or near sites, or apprehension of individuals actively looting a site (Kevin Porter, personal communication 2009). The majority of archaeological site monitoring programs canvassed for this study are more structured, with regular visits scheduled to record any active or potential threats to known sites. Sites may be selected for monitoring based on past impacts or perceived threats—such as recreational or training activities—and the nature of these threats may influence the time between monitoring visits (Kathy Strain, personal communication 2009). The Friends of Sierra Rock Art presumes that all sites require monitoring until they are evaluated for NRHP eligibility; this ensures that all unevaluated sites are treated equably (Nolan Smith, personal communication 2009).

Table 2-1. List of Contacts at Existing Site Monitoring Programs

State/Area	*Program*	*Contact Information*	
		Name and Title	**Address**
Arizona	Archeology River Monitoring Program	Jen Dierker, Archeologist	Grand Canyon National Park 823 San Francisco Suite B Flagstaff, AZ 86001
	Arizona Site Stewards Program	Kristen McLean, Site Stewards Coordinator	Arizona State Parks 1300 W. Washington St. Phoenix, AZ 85007
California	Stanislaus National Forest Site Monitoring Program	Kathy Strain, Forest Program Manager for Heritage Resource and Tribal Relations	Stanislaus National Forest 19777 Greenley Road Sonora, CA 95370
	Colorado Desert District Archaeological Site Stewardship Program	Christopher Corey, Associate State Archaeologist	Archaeology, History and Museum Division 1416 9th Street Room 902 Sacramento, CA 95814
	Friends of Sierra Rock Art -Tahoe National Forest Archaeological Site Monitoring Program	Nolan Smith, District Archaeologist, American River Ranger District	Tahoe National Forest 631 Coyote Street Nevada City, CA 95959
	California Archaeological Site Stewardship Program	Beth Padon, Program Coordinator	Discovery Works P.O. Box 51476 Irvine, CA 92619
Colorado	Southwest Colorado Cultural Site Stewardship Program	Dr. Ruth Lambert, Cultural Program Director	San Juan Mountains Association P.O. Box 2261 Durango, CO 81302
Florida	Sitewatch program	Kevin Porter, Archaeologist III	Bureau of Archaeological Research, B. Calvin Jones Center for Archaeology Governor Martin House 1001 de Soto Park Drive Tallahassee, Florida 32301
Montana	Montana Site Stewardship Program	Crystal Alegria, Coordinator	Project Archaeology P.O. Box 170570 Bozeman, MT 59717
Nevada	Nevada Archaeological Site Stewardship Program	Sali Underwood, Site Stewardship Coordinator	700 Twin Lakes Dr. Las Vegas, NV 89102
New	SiteWatch, New	Phil Young,	Department of Cultural Affairs

State/Area	*Program*	*Contact Information*	
		Name and Title	**Address**
Mexico	Mexico Historic Preservation Division	Volunteer Coordinator	Historic Preservation Division Bataan Memorial Building 407 Galisteo Street Suite 236 Santa Fe, NM 87501
	Northwest New Mexico Site Stewards Program	Clay Johnston, Program Director	Salmon Ruins P.O. Box 125 Bloomfield, NM 87413
	Santa Fe National Forest Site Stewards	SFNF Site Stewards	P. O. Box 31943 Santa Fe, NM 87594-1943
Tennessee Valley Authority	A Thousand Eyes	Erin Pritchard, Archaeologist, TVA Cultural Resources	Tennessee Valley Authority 400 W. Summit Hill Dr. Knoxville, TN 37902-1499
Texas	Texas Archaeological Stewardship Network	Mark H. Denton, MA, RPA, Coordinator, State & Federal Review Section	Archeology Division Texas Historical Commission P.O. Box 12276 Austin, TX 78711-2276.
Utah	Utah Site Stewardship Program	Laura Kochanski, Archeologist	Bureau of Land Management Monticello Field Office 435 North Main P. O. Box 7 Monticello, Utah 84535

Formal monitoring programs differ in terms of staffing. Some programs, such as the Grand Canyon Monitoring Program, involve professional archaeologists at all stages from the initial baseline survey to annual site monitoring visits (Coder and Andrews 1993; Coder et al. 1994, 1995; Leap et al. 1996; Dierker and Leap 2006). Most site monitoring programs rely heavily on volunteer site stewards, especially for the follow-up site monitoring visits after baseline data are recorded by a professional archaeologist. These programs are often situated within broader volunteer efforts (Kelly 2007). In most cases, the use of volunteer site stewards represents a matter of economics as federal land managers are chronically underfunded (Horne 2005:36). Arizona's Site Steward Program has had some success using off-duty military personnel to monitor sites on and off military facilities (Kristen McLean, personal communication 2009). Volunteer site stewards are more frequently avocational archaeologists who already share concerns about threats to archaeological resources (Nolan Smith, personal communication 2009).

The use of volunteer site stewards can create challenges, from having to rely on overly generalized forms (Beth Padon, personal communication 2009) to inconsistency in recording site conditions between monitoring visits (Chris Corey, personal communication 2009; Nolan Smith, personal communication 2009). Site monitoring programs may also need to tailor themselves to the desires of site monitors, who may only favor monitoring sites located in specific areas—although these monitors do become more heavily vested in the sites they visit

(Kathy Strain, personal communication 2009). Safety is also a concern and programs emphasize that volunteers should not contact anyone actively damaging a site; rather, the appropriate law enforcement personnel should be notified (Padon and Padon 2005). Site monitoring programs without full-time coordinators, no matter how well structured, simply will not be very effective—as was learned by the Utah Site Stewardship Program (Kochanski, personal communication 2009).

Training programs and detailed training manuals are seen as critical to ensuring that volunteer site stewards record information on site conditions accurately, consistently, and at the appropriate level of detail (Jennifer Dierker, personal communication 2009). The Arizona Site Stewards Program is one of the oldest volunteer-based site stewardship programs in the United States, and has been emulated by a number of other site monitoring programs. In this program, volunteer site stewards are sponsored by various public land managers—such as cultural resource personnel at military installations (Luke Air Force Base and Yuma Proving Ground)—and are selected, trained, and certified by the State Historic Preservation Officer (SHPO) and the Arizona Governor's Archaeology Advisory Program. A site steward's handbook and the program's website clearly outline procedures for monitoring archaeological sites and articulate the goals of this program (Arizona State Historic Preservation Office 2009).

Another well developed program is New Mexico's SiteWatch, which also is coordinated through the SHPO's office (New Mexico Historic Preservation Division 2009; Paul 2001). In addition to an extensive handbook, this program has produced a brochure that describes the basic requirements and duties of a volunteer site steward. Following training, regional chapters of the SiteWatch program partner with the Bureau of Land Management (BLM), National Park Service (NPS), US Forest Service (USFS), and state agencies. A Site Steward Foundation was created in 2008 to provide a stable source of funding for this program. As is too infrequently the case, the importance of site monitoring is widely acknowledged, but funding tends to remain at inadequate levels for a monitoring program that does not rely heavily on volunteer site stewards.

Most programs that rely on volunteer site stewards require both classroom time and field visits as part of the training process—although the time devoted to this varies quite a bit. The Arizona Site Steward Program requires 10 hours of classroom instruction and fieldwork (Kristen McLean, personal communication 2009), while the California Archaeological Site Stewardship (CASS) program provides their site stewards with two full days of training. The first day is devoted to an overview of archaeology for the local region and introductions to agency archaeologists and law enforcement personnel. On the second day, volunteer stewards take field trips to the sites that will be monitored (Padon and Padon 2005:34). At 40 hours of hands-on training, the USFS's Stanislaus National Forest (California) Site Monitoring Program has one of the longer training regimes for volunteer site stewards (Kathy Strain, personal communication 2009). During their day and a half of training, volunteer site stewards for Santa Fe National Forest visit simulated sites and view a demonstration of how to collect monitoring data without causing further impacts to a site (Santa Fe National Forest 2008).

Volunteer site stewards generally must sign a code of ethics/conduct and/or a confidentiality agreement before they are formally admitted to a site monitoring program—and may also need to complete a detailed application form (Clay Johnston, personal communication 2009; Kathy Strain, personal communication 2009; Padon and Padon 2005:34). The goal of these documents is to ensure that volunteers are aware of applicable state and federal laws, and of the sensitivity of site locational information. In addition to helping protect archaeological sites, volunteer site stewards may also be encouraged to promote the public's knowledge of the past (Padon and Padon 2005:33)—and its fragile nature. The use of volunteer site stewards may also increase awareness about the importance of cultural resources among the local community surrounding a site and result in a decrease in site impacts from looting or vandalism (Clay Johnston, personal communication 2009; Kathy Strain, personal communication 2009).

2.4 Establishing a Baseline for Site Monitoring

Gathering baseline data is *the* critical first step for initiating an archaeological site's monitoring program. Subsequent monitoring visits use these baseline data to evaluate and determine the nature and extent of past, active, or potential impacts/threats to an archaeological site. There is considerable variation in how existing site monitoring programs gather these crucial baseline data, ranging from reliance on original site recording forms to dedicated visits by teams of professional archaeologists. Volunteer site stewards may assist with gathering these baseline data, but only in tandem with a professional archaeologist. This is the case for the California State Parks Colorado Desert District Archaeological Site Stewardship Program (Chris Corey, personal communication 2009).

2.4.1 Issues with Using Site Forms as a Source of Baseline Data

Due largely to budgetary constraints, some programs do not use a dedicated visit to a site to obtain baseline data, but rather rely on existing site recording forms. The California Archaeological Site Stewardship Program (Beth Padon, personal communication 2009), Northwest New Mexico Site Stewards Program, and Texas Archaeological Stewardship Network, for example, typically initiate site monitoring programs using existing site forms (Mark Denton, personal communication 2009; Clay Johnston, personal communication 2009). Program directors differ on whether site forms contain adequate information for the purpose of initiating a site monitoring program. Baseline data for sites monitored in the Arizona State Stewards program are usually derived from site forms, but older forms may contain insufficient information on site attributes, such as site condition (Kristen McLean, personal communication 2009). A similar situation has been noted for the Friends of Sierra Rock Art-Tahoe National Forest Archaeological Site Monitoring Program. This program relies on completed California site forms for baseline data (Nolan Smith, personal communication 2009).

Kelly (2007) noted some general issues with using existing site forms as a source for baseline data, including:

- Incomplete site data;
- Absence of detailed site descriptions;

- Lack of information regarding current site conditions, especially disturbances and threats to a site;
- Insufficient information to relocate a site; and,
- Inadequate mapping of a site's boundaries and internal distribution of cultural remains.

The best site forms may collect some data on past, existing and future threats to sites, but are not typically designed to detail the exact nature and distribution of these threats—the latter representing critical information for follow-up monitoring visits. Even for comprehensive site forms, a baseline visit would still be important if considerable time has elapsed since the site was recorded—the nature and level of threats to individual sites are constantly changing (Kelly 2007).

However, in many cases, site forms are not well designed for recording the types of information needed by a monitoring program, but rather emphasize the information potential of individual sites and their NRHP eligibility (Michael Hargrave, personal communication 2009). The emphasis is on the cultural content of sites such as artifacts and features, but don't prompt the recorder to consider or describe potential threats to site integrity such as vulnerability to erosion. Even sites evaluated by professional archaeologists may not have information presented on a site form or accompanying compliance report concerning potential threats to cultural resources, because these factors do not affect a site's *current* eligibility. Michael Hargrave (personal communication 2009) noted that site forms do not typically consider offsite impacts that might soon encroach on a site—and this is particularly an issue for archaeological sites in military training areas. A site monitoring program must have specific objectives and management goals in mind, and these may lead to collection of additional data from sites other than what is typically presented on site forms (Jennifer Dierker, personal communication 2009).

Additionally, documentation standards may have changed since a site form was initially completed or a site was evaluated. In the Grand Canyon Monitoring Program, baseline data are collected by professional archaeologists using extensive site recording forms that have been designed partly to enable site monitoring. If considerable time has passed since a site was first recorded, additional data may be collected from a dedicated site visit and a new site form completed. Detailed measurements and re-mapping of the site may prove necessary (Jennifer Dierker, personal communication 2009). Professional archaeologists associated with the Southwest Colorado Site Stewardship program found that site forms provided minimal useful baseline data. This situation is particularly true for those forms more than 15 years old when site recording was less comprehensive (Ruth Lambert, personal communication 2009).

Existing site forms are also known for the inconsistency with which data were recorded. In the Nevada Archaeological Site Stewardship program, baseline data are usually derived directly from site forms that are ideally updated during dedicated baseline visits by professional archaeologists. However, archaeologists associated with the various participating federal land management agencies rarely have the time to conduct baseline

visits and site monitoring of necessity relies on site forms of varying quality (Sali Underwood, personal communication 2009).

Another issue is that many early site forms, or site forms for sites on non-federal lands may not have been completed by professional archaeologists; rather, site recordation often represents the efforts of untrained individuals who fail to collect or properly document data on site conditions. This problem has been encountered in Florida's Sitewatch program. Site forms are the source for baseline data information, but this information may be very limited for sites recorded by nonprofessionals. The minimal standards for recording a site in Florida consist of a indicating a site's location on a USGS quadrangle map. In this latter case, an updated site form would have to be completed and then used to obtain baseline information; additional recording of baseline data beyond the site form does not take place in Florida's program (Kevin Porter, personal communication 2009).

Dedicated baseline visits are seen as critical to recording information often absent on site forms for the Stanislaus National Forest (California) Site Monitoring Program. Baseline visits are especially important for recording what cultural remains are currently visible on the surface—and more likely to be adversely affected by impacts or threats. Surface remains, especially portable items, are attractive to vandals or looters, or more susceptible to pedestrian or vehicle impacts (Kathy Strain, personal communication 2009). Surface collection of artifacts as part of baseline data gathering, where practical, would be one way to minimize a potential issue for subsequent site monitoring (Coder et al. 1995).

New Mexico's SiteWatch program makes baseline condition assessments on a form designed specifically for that purpose. Site forms are explicitly viewed as containing inadequate information for initiating a site monitoring program (New Mexico Historic Preservation Division 2009). Their baseline form is subdivided into three types of impacts: natural; human-made impacts not witnessed; and human-made impacts witnessed. A mix of free-format and checklist fields are incorporated into this form, with the majority of the form oriented toward unguided user comments.

2.4.2 Review of Best Practices for Baseline Data Gathering

As Kunde (1999:53) noted "*Baseline* data refers to the condition which prevails when monitoring begins or the basis from which all future change is assessed." It is important that subsequent monitoring visits make observations in the same place and on the same basis as baseline data were collected (Kunde 1999:53). Therefore, well-defined methods of data collection must be in place through all stages of site monitoring, beginning with assembling baseline data. However these data are collected, Grand Canyon Monitoring Program personnel stress that forms should be simple and straightforward. Their initial monitoring form was too complicated and contained too many subjective options (Coder and Andrews 1993; Coder et al. 1994).

Nolan Smith (personal communication, 2009) has found as part of his work with California's Friends of Sierra Rock Art that certain minimal information needs to be available as baseline data of site conditions—some of which might be available from adequately completed site forms. This information includes:

- What are the site's dimensions? Site dimensions provide an indication of how long baseline data recording and subsequent monitoring visits may take;
- How was the site located? Knowing this may indicate past or active threats to a site, such as animal burrows or erosion;
- What are the depths of site deposits? Are there cultural remains (features, artifacts) on the surface? This information can help determine whether active or potential threats will impact all cultural deposits at a site, and not simply those on the surface;
- What is the site's topographic and environmental setting? Understanding the geomorphic context of a site is important as well, because this can reveal the degree to which existing and potential threats will affect a site's integrity (Coder et al. 1994); and,
- What is a site's current condition and relative level of disturbance? A site that is in good condition may need less frequent monitoring than a site in poor condition.

The baseline data recording process must budget adequate time to gather this information, if it is not present on site forms. If a site has not been evaluated, some of these data may not be available, such as depth of cultural deposits, which will make it difficult to fully determine whether subsurface deposits are endangered by active or potential impacts.

Successful baseline data gathering depends on the presence of an accurate site map. Detailed maps will need to be created if these do not exist, especially maps that include the locations of surface remains as these are highly susceptible to most site impacts or threats. These maps are critical to indicating the location of active and potential threats to cultural resources (Coder et al. 1995). Subsequent monitoring efforts can also objectively track the movement of objects across a site if a detailed map exists (Coder et al. 1994). For the Grand Canyon Monitoring Project, large and complex sites were particularly an issue for obtaining baseline data because of inadequate maps that showed boundaries but few internal features (Coder and Andrews 1993).

Field implementation of a baseline data gathering effort should involve relocating a site's datum, or establishing a new datum if the original was not found or never created. A site's boundaries also need to be determined to ensure that all active or potential threats to its integrity are adequately considered. A walkover of the entire site must be undertaken to locate and identify all human and natural impacts, which will be recorded on the map of the site. Data on vegetation and general surface conditions should also be collected, as this information can help determine how much damage active or potential impacts may cause to a site. Recording impact locations using GPS can potentially ease subsequent relocation of past or active impacts. Another crucial aspect of baseline data gathering is photographic documentation. Examining photographs taking during baseline or subsequent monitoring visits is often the primary strategy employed for detecting recent changes at a site (Hargrave 2009).

During baseline data gathering, photographs should be taken only of impacted cultural remains and those that are at risk—rather than of every feature at a site. More extensive photographic documentation would seem a laudable goal, but has been found to be

impractical, very time consuming, and often results in redundant information (Coder et al. 1994). Photographs should be taken from designated fixed points in and around a site—designated here as photographic stations—to ensure that images capture all past, active or anticipated threats. This practice enables comparison of field conditions during follow-up site monitoring visits with previous photographs taken at a site. These photographic stations must, of course, be clearly marked on site maps. Photographs must be well documented, including not only the photographer's location but also the direction of a particular view, the relative height of the photographer, and the date and time the photograph was taken (Hargrave 2009).

Again, it should be emphasized that threats to sites are dynamic and this is the reason why site monitoring programs are integral to the preservation process. Kelly (2007) recommends resurveying sites every one to five years because site conditions can change so rapidly. The Southwest Colorado Site Stewardship Program conducts baseline recording of sites on an annual basis, with site monitoring visits occurring during the interim. Annual re-establishment of a site's baseline sometimes involves creation of additional photographic stations to document new threats/impacts or previous threats/impacts that have grown beyond the views of existing photographic stations (Ruth Lambert, personal communication 2009).

2.5 Follow-up Site Monitoring Visits

The basic purpose of site monitoring visits is to determine whether there have been changes in the condition of all or part of an archaeological site since baseline data were collected, or from a previous monitoring visit (Dierker and Leap 2006). Baseline data need to be presented in a readily accessible manner—especially when site monitoring visits are conducted by non-archaeologists who may not have been present when the baseline was established. Photographs, previous site descriptions, and maps need to be assembled to compare current site conditions with those visible during previous monitoring episodes (Dierker and Leap 2006). Archaeologists working with the Grand Canyon Monitoring Program only take subsequent photographs from a photographic station if there has been a change in site conditions to avoid essentially duplicating photographs and generating more documentation that then has to be managed (Coder and Andrews 1993; Coder et al. 1994, 1995). Because site monitoring is time consuming, Hargrave (2009) suggests that site monitoring should focus on those characteristics that make a site eligible for listing on the NRHP. Implementation of site monitoring visits among the various programs analyzed is quite variable, especially in terms of monitoring frequency and forms used to record site monitoring observations.

2.5.1 Monitoring Frequency

The frequency at which individual sites are monitored depends on the various risk factors affecting a site. If a site is actively threatened or site conditions are changing rapidly, the site will be monitored more frequently (Kathy Strain, personal communication 2009; Kelly 2007). Sites that are remote, stable, and with no active or potential threats may be monitored infrequently (Leap et al. 1996). Some sites, particularly those that are remote and in good condition, may be assigned to an "inactive" monitoring schedule.

For the Friends of Sierra Rock Art, sites are more frequently monitored if they are close to roads or public areas, or if there are known past disturbances—although no specific schedule is set for monitoring. Weather conditions are the major restriction influencing when sites can be monitored (Friends of Sierra Rock Art 2009).

The Grand Canyon Monitoring Program visits remote, "pristine" sites on an as-needed basis, such as after unusual weather disturbances, unexpectedly heavy visitor use in the site vicinity, or upon tribal requests (Leap et al. 1996). Typically, however, the Grand Canyon Monitoring Program monitors sites on an annual basis, evaluating and refining the methods used to document site conditions (Coder et al. 1994, 1995; Dierker and Leap 2006). The Arizona Site Stewards Program schedules monitoring visits at least once a week for sites located in areas popular with tourists and once every 10 to 12 weeks for remote, less threatened sites (Arizona State Historic Preservation Office 2009). On the Stanislaus (California) National Forest, some sites are visited daily during the peak recreational season, other sites are visited monthly, and some sites are only visited once every five years (Kathy Strain, personal communication 2009). In Florida, sites are only examined if it is necessary to complete a damage assessment, or if a looter or other suspicious activity has been noted around a site (Kevin Porter, personal communication 2009). Financial constraints can be an issue. The Northwest New Mexico Site Stewards Program's preferred monitoring interval is every four weeks, but funding limitations result in site visits that take place once every six to eight weeks (Clay Johnston, personal communication 2009).

2.5.2 Recording Site Monitoring Data

Accurate record keeping for each visit to a site is imperative, as the ultimate goal of a monitoring program is to assess whether site conditions are stable or have changed since the last visit to a site. The site monitoring programs reviewed in this report were quite variable in how they recorded site monitoring data. Only a few representative site monitoring forms are detailed in this section and examples are provided in Appendix B.

The Grand Canyon River Monitoring Program refined their site monitoring form over a number of years. The initial monitoring form developed for this program was too long, too cumbersome and too convoluted, with many subjective options that were translated into an abstract number for data entry (Coder and Andrews 1993). In response to these issues, this program explicitly developed a single sheet, double-sided monitoring form that includes structured fields (check lists, an impact matrix) with free-format fields for comments and explanations. The impact matrix allows the user to quickly check whether various types of physical impacts are absent, active, or inactive for various types of cultural remains. The current form also includes a section for recommendations for future actions (e.g., monitoring schedule, preservation options, or recovery options) and a six-page narrative that details the variables on the form and why the information is being recorded (Coder et al. 1994; Jennifer Dierker, personal communication; Dierker and Leap 2006).

The archaeological site monitoring form used by the US Forest Service for the Stanislaus National Forest (California) Site Monitoring Program is largely a series of check lists with minimal space for user comments. The form is site-specific and asks the recorder to check yes/no for the presence of three different types of impacts (natural, human, and livestock), as

well as to assess whether certain types of impacts are possible, definite, or active threats. This form is three pages in length but the current program manager stresses that a two-page, double-sided, largely check list form is actually ideal. Site monitors, in her experience, will not complete a form longer than two pages that is not largely check list in structure (Kathy Strain, personal communication 2009).

The California Department of Parks and Recreation currently uses a four-page form dedicated to recording site monitoring data from individual sites: the Archaeological Site Condition Assessment Record (ASCAR). The first page of ASCAR asks for fairly broad data in a mix of check lists and free-format fields, including: the site's eligibility status for the California and National Registers; the site type; whether the site is prehistoric or historic; whether the site was relocated; and an overall site condition damage assessment check list, ranging from no damage to heavy damage. A short comments field follows the damage assessment check list. An explicit note on the first page states that a new site form must be completed if the original site record is 5 years old or older. ASCAR's second and third pages are primarily devoted to a matrix ranking various types of impact in terms of intensity of impact (expressed as a percentage) for the entire site, ranging from none to heavy (>75%) intensity. Impacts are subdivided into several major categories (some with sub-categories), including animal damage, erosion and other geological processes, fire, park construction, park maintenance, park visitor use, trails and related disturbances, and vandalism. The final page of this form provides some space for comments on disturbances and proposed future actions, the latter of which follows a check list of "Proposed Future Actions Required for Site Management and/or Protection." Chris Corey (personal communication, 2009), who is Associate State Archaeologist, California Department of Parks and Recreation, noted that his agency was revising this form because the department's lawyers found the form to be much too subjective.

A much more stream-lined, single page form is used by the San Juan Mountains Association Cultural Site Stewardship Program. This form divides site impacts into human activities, animal activities, and natural processes, and asks the site monitor to check whether the activities occur generally within the site or within structures. Each activity block is further separated into sub categories and contains a free-format block for the site monitor to add comments. This form is designed as a spreadsheet to ease computer entry. Ruth Lambert (personal communication, 2009), who is director of the San Juan Mountains Association Cultural Site Stewardship Program, stresses that computerized entry of monitoring data is critical to allowing program managers the ability to track changing threats to archaeological resources and deciding how best to allocate scare resources for dealing with documented threats, such as determining monitoring frequency at individual sites. Data entry of monitoring data is also strongly suggested by Hargrave (2009) in his recent overview of site monitoring programs for similar reasons.

The Northwest New Mexico Site Stewards program has a site monitoring form that is very basic and completely web-based. The top of the form has spaces for the monitor's name, email address, date of visit, site name, total mileage, total volunteers, and total number of hours on the site. Below this is a free-format field for "observations pertaining to vandalism

or site deterioration" and a second free-format field for additional comments. A check box enables the site monitor to note if the "site remains unchanged."

A much less structured form is employed by the California Archaeological Site Stewardship Program (CASSP). Their form contains no check lists, and largely consists of free-format fields where the monitor can describe the condition of the archaeological site, condition of trails to the site, evidence of human intervention at the site, observation of current human activity at the site, and whether law enforcement personnel were notified of human activities at the site. This form does not consider explicitly consider non-human impacts to an archaeological site. Beth Padon (personal communication, 2009), co-coordinator of CASSP, notes that this monitoring form is intentionally kept generic because they deal with a number of agencies (National Park Service, Bureau of Land Management, US Forest Service) that each have their own protocols regarding the monitoring of archaeological sites. Because the form contains little guidance on how to complete it, their two-day training program is critical to minimize subjectivity of site monitor observations (Padon and Padon 2005).

The Arizona Site Stewards Program uses a generic, multi-use, single-page form to record site monitoring data: the Arizona Site Steward Quarterly Activity Log. This form is designed to record multiple sites and multiple site steward activities, including site visits, mapping/ survey, public education, and other. Observed impacts to archaeological sites are recorded in a vandalism report column, with a coded list provided on the form for this purpose. Vandalism is simply recorded as present, although there is a small free-format box that an individual could use to provide further details. If vandalism is noted, a separate form is available that is designed to create a record for law enforcement personnel: the Arizona Site Steward Cultural Vandalism Report. Clearly, the emphasis in this program is to record human and not animal or other natural impacts to an archaeological site.

2.6 Threats and Impacts

Examination of site monitoring programs, however extensive their recording forms are, did provide an indication of the types of threats to which sites are subject. Specific threats to sites are frequently divided into three broad categories: those related to natural activities (e.g. erosion, natural fires, tree falls, etc.); those related to animal activities (burrowing, trampling, trail formation, insect or rodent damage, etc.); and those related to human activities (vandalism, looting, collecting, vehicle tracks, camping, development, military training, etc.). These threats vary regionally and also depend on the nature of the public lands containing archaeological resources. Thus, while general site monitoring protocols can be developed that are applicable to a variety of settings, the specific threats to be recorded will need to be tailored to individual public lands where sites are being monitored. The range of potential threats to an archaeological site as reflected on site monitoring forms is presented in Appendix C. The list of threats also varies depending on what aspects of site monitoring are considered important by a specific site monitoring program.

2.7 Conclusions

The ultimate goal of this review of existing site monitoring programs was to facilitate the development of baseline data gathering protocols and to develop a site monitoring form that

can be readily used for follow-up site monitoring visits by personnel who are not professional archaeologists. Among the recommendations emerging from this review are the following:

- The site monitoring form should include sufficient information from the baseline monitoring visits to each individual site to enable a quick and ready assessment of whether site conditions are stable or have changed since the last visit.
- Monitoring forms should collect information about on and off-site threats to site integrity.
- Emphasis should be placed on using checklists where possible to ease and speed recording of sites during follow-up monitoring visits, but there must be sufficient space for additional comments.
- Forms and checklists should be as objective as possible for consistency of information collected.
- The site monitoring form should be no longer than two pages, although a separate form will be necessary for the photographic log.
- A short user guide also must be prepared to illustrate the proper way to prepare the site monitoring form, the best way to take photographs, and to define any terms that might be unfamiliar to monitors who are not professional archaeologists.

Particular attention also must be paid during the creation of the site monitoring form and the photographic log to ease computerization of the data recorded on the forms. Computerization of the data will enable a ready assessment of the types, number, and occurrences of threats to sites at MCB Quantico, and help determine how frequently sites should be monitored following the baseline monitoring survey of the site. It may prove possible to assign levels of risk—low, medium, and high—to sites, which would enable the monitoring frequency to be determined. Early detection of active or potential impacts is critical to protecting a site's physical integrity and its NRHP eligibility from potential or active threats—or at least helping minimize the effect of these threats.

3.0 MONITORING PROGRAM FOR DOD INSTALLATIONS

The following section describes the devlopment of the monitoring program beginning with baseline data collection and survey followed by ongoing monitoring procedures.

3.1 Baseline Data Needs

A comprehensive site monitoring program begins with archaeological professionals collecting baseline data for each site. This information represents a snapshot of site conditions against which to compare the findings of subsequent site visits. Baseline data should incorporate previous site documentation (site forms, maps, relevant report sections, etc.), as well as descriptions and a field assessment of current site conditions. Previous documentation, particularly an accurate and detailed site map, can aid in 1) relocating the site and defining its boundaries as originally defined; 2) locating or re-establishing a permanent site datum; 3) relocating features; and 4) determining the extent of previous excavations or collections, including authorized archaeological excavations or unauthorized digging. If no site map showing site boundaries, internal features, or the extent of previous excavations at the site exists, a new map may need to be created prior to or during the baseline visit.

Site records and reports also should be examined closely, with attention paid to environmental and topographic characteristics, such as slope and drainage, because these can help assess how and to what extent observed impacts or potential threats might affect a site's integrity. The collection of baseline data must anticipate future risks as well as document existing threats, and thus the location of each site should be assessed with regard to site access and the proximity of known or potential threats (e.g. roads, trails, recreational/public areas, military training areas). This information may also be useful in determining how frequently individual sites may need to be monitored.

3.2 Development of Baseline Methods and Forms

The ultimate goal of a baseline survey is to collect information that can be used to assess changes in site condition over time. Data collection forms were developed for this purpose that could be readily used for follow-up site monitoring visits by personnel who are not necessarily trained or professional archaeologists. The baseline data gathering form was designed to include sufficient information from the baseline monitoring visits to each individual site to enable a quick and ready assessment of whether site conditions are stable or have changed since the last visit. The form includes prompts for current environmental conditions (e.g., vegetation, surface visibility, and topography), a table of specific impacts or threats to site integrity, and space for additional comments on general threats and notes related to the monitoring process. A photographic log was also developed to record the location of photographic stations used to document current site conditions. The log includes the station number, direction the camera is facing, distance and angle to datum, and a space for comments or descriptions pertaining to station placement or the subject of the photograph. Guidelines for conducting a baseline survey and examples of blank forms are presented in Appendix D.

Step 1: Relocate Site and Datum

The first step in initiating baseline data collection is to relocate the site and its datum. This can be achieved through review of previous documentation or with the aid of GIS data and a quality GPS receiver. If a datum does not exist or one cannot be relocated, a new datum, utilizing 1-inch-diameter PVC pipe or some similar durable material, should be established and its location recorded on the site map. If GPS equipment is available, the coordinates of the datum should also be recorded and added to the installation GIS. Relocation of the original datum or placement of a new datum is a critical step in the monitoring process. The locations of all photographic stations should be recorded relative to each site's datum. The datum can often serve as one of the photographic stations.

Step 2: Record Current Conditions

After establishing the site datum, the next stage is to record the current conditions of the site photographically. A sufficient number of photographs should be taken to document the range of general site conditions, as well as the condition of any visible features such as foundations, mounds, pits, or trenches. Future site monitors will need to relocate the positions from which the photographs were taken, and thus the location of each photo station should be recorded on a photographic log form. The form records the angle and distance to the site datum, as well as GPS coordinates, if those are available. The orientation or compass direction of each photograph should also be recorded on the log. Photographic stations should be established in locations that provide a clear view of site conditions but also in such a way that they can be easily relocated and their views replicated. The number of photographic stations at each site will vary based on site size and complexity: a minimum of four stations, representing views of the site in the cardinal directions, is recommended at each site.

Step 3: Record Impacts and Threats

Impacts and threats that are observed should be recorded on the baseline data gathering forms, noting the type of impact or threat and any pertinent descriptive comments or measurements. Alphanumeric codes have been developed for common or typical impact types to standardize terminology and to facilitate the mapping of impacts on the site maps. A list of the codes and definitions is included in the baseline survey guidelines (Appendix D). Each specific impact or threat should be photo-documented. Recommendations can be made by the monitoring personnel on how to mitigate those threats, which may include frequent site monitoring, signage, fencing, or even site burial. An absence of observed impacts or threats also should be documented on the baseline data gathering forms.

Throughout the baseline survey of each site, the time necessary to complete each task should be recorded. This may prove useful in assessing how long it will take to conduct baseline surveys and follow-up monitoring for other sites on a given installation. The time to complete these tasks on the initial follow-up survey should also be recorded, and this

information can be compared to the baseline survey times to help test the efficacy of the site monitoring forms and protocols developed following the baseline surveys.

Particular attention was paid during the creation of the site monitoring forms and the photographic log to ease computerization of the data recorded on the forms. Computerization of the data will enable monitoring data to be added to the installation GIS as well as provide a ready assessment of the types, number, and occurrences of threats to sites within the monitoring program. It may prove possible to assign levels of risk—low, medium, and high—to sites, which would aid in determining the frequency of follow-up monitoring visits. For this purpose, a Site Monitoring and Condition Assessment Database was developed in Microsoft Access. This relational database utilizes simple graphical user interface forms to facilitate queries and data entry. Data gathered during the MCB Quantico pilot study, discussed in Section 4.0, were used to populate a prototype of the database. A user guide for the database is provided in Appendix E.

Summary Recommendations

- Locate or establish site datum;
- Take a sufficient number of photographs to document the range of general site conditions;
- Establish photographic stations in locations that pro;vide a clear view of site conditions in a way that they can be easily relocated
- Log photo locations and angles;
- Record Impacts and Threats;
- Record time required for each task; and
- Enter data into computer database.

3.3 Development of Follow-Up Monitoring Methods and Forms

Continued monitoring of site conditions is important for evaluating changes that have occurred since a site was last visited. Regular monitoring by the installation CRM or professional archaeologists is generally not practical due to budgetary or staffing constraints. The follow-up monitoring procedures presented below have been developed so that regular monitoring can be conducted by volunteers (avocational archaeologists) or other professional staff that frequent the site locations (e.g., range maintenance or other environmental personnel).

A two-page archaeological site monitoring form was also created. This form maintains consistency in terminology with the baseline data gathering form but utilizes a checklist format with prompts to ensure consistent data gathering. An impact/threat table uses the same alphanumeric codes developed for the baseline survey. Only the most common impacts were specifically included on the forms, and are organized by category (environmental, animal, human). Blank spaces were left under each category allowing the monitor to enter additional or site-specific impacts. Since the methods for photo-documentation are the same for both levels of monitoring, the photographic log developed for baseline survey is used for follow-up monitoring.

Follow-up monitoring guidelines, also directed toward a non-professional archaeologist audience, were developed to summarize the goals of site monitoring and outline the methodology. A copy of the guidelines and samples of blank monitoring forms are provided in Appendix F. The guidelines also include the following quick-reference guides:

- Archaeological Site Monitoring Form User Guide – provides descriptions and guidance for the fields used on the monitoring form.
- Photographic Log Form User Guide – provides descriptions and guidance for the fields used on the photographic log form.
- Site Monitoring Impact Codes and Definitions Table – provides the alphanumeric codes and definitions for the common impacts referenced on the monitoring form. This table should not be considered all-inclusive, other impact types can be added depending on geographical and ecological contexts of a given installation.

Prior to initiating the follow-up monitoring fieldwork, a packet of baseline data should be assembled that includes: the baseline survey site map, baseline data gathering form, photographic log form, and an aerial image and/or a portion of the USGS topographic map of the site area. The first step in follow-up monitoring field work is to relocate the subject site and its datum, which was placed during the baseline survey. Next, a walkover of the site area should be conducted to assess the current site conditions. Documentation of current site conditions is important for evaluating changes that have occurred since the sites were last documented. Once the more general site conditions are documented, specific impacts and threats to the site can be considered. During this phase of the monitoring survey, impacts documented during the baseline survey should be compared to any observed impacts noted during the walkover. This is largely achieved by recreating the photographic stations and comparing the views to those documented during previous visits.

If monitoring personnel find the site to be in the same condition as documented in the baseline data, only a minimum amount of data needs to be recorded on the follow-up monitoring forms. Any changes to previously recorded disturbances or newly identified impacts can be recorded in the appropriate fields in the follow-up monitoring form. New photographs should be taken and keyed to existing photographic stations when possible, or new photographic stations may be established and added to the site map. If the site is significantly disturbed, beyond what can be reasonably documented by the follow-up monitoring form, additional survey by the installation CRM or professional archaeologists may be required to fully assess site integrity.

3.4 Code of Ethics and Conduct

It is essential that all non-professional archaeologists working and/or volunteering for any site monitoring program follow a code of ethics and conduct. Generally, this means accepting a special responsibility towards unique and often fragile archaeological resources. It also requires the acceptance of cultural resource management law, a strict code of ethics, and, particularly in the case of volunteers, adherence to a code of conduct that ensures the requisite level of professional and respectful behavior.

The chief objective of any monitoring program is to prevent destruction of archaeological sites and to uphold all state and federal preservation (antiquity) laws. Therefore, all non-archaeologist employees and volunteers must be guided by a preservation ethic. It should be stressed that monitoring and non-collective surface investigation will be the only investigative methods used by the monitoring program. Participants must hold archaeological site location information in strict confidence due to legislated restrictions of site location information and make that information available only to the appropriate authority responsible for administering the lands involved.

A document presenting the requirements and expectations for a Code of Ethics and Conduct is provided in Appendix I. It is recommended that this document be reviewed and signed by all non-professional archaeologist site monitoring personnel.

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4.0 PILOT STUDY: MCB QUANTICO

In order to facilitate the development of archaeological site monitoring and condition assessment protocols and methods, a pilot monitoring study was implemented for select sites at MCB Quantico, Virginia (Figure 4-1). The pilot study consisted of baseline data collection and one follow-up monitoring visit for each of the selected sites. The process by which the sites were selected and the results of each monitoring visit is presented below.

The baseline site monitoring protocols developed for this project were designed to ensure that sufficient information is collected from initial site monitoring visits at MCB Quantico by trained archaeologists to: 1) evaluate the nature and extent of past, current, and potential threats to individual sites; and 2) guide subsequent site monitoring visits by non-archaeological personnel. Information gathered from the baseline site monitoring visits was used to develop streamlined forms and a clear set of procedures that will assist non-archaeological personnel with subsequent site monitoring visits.

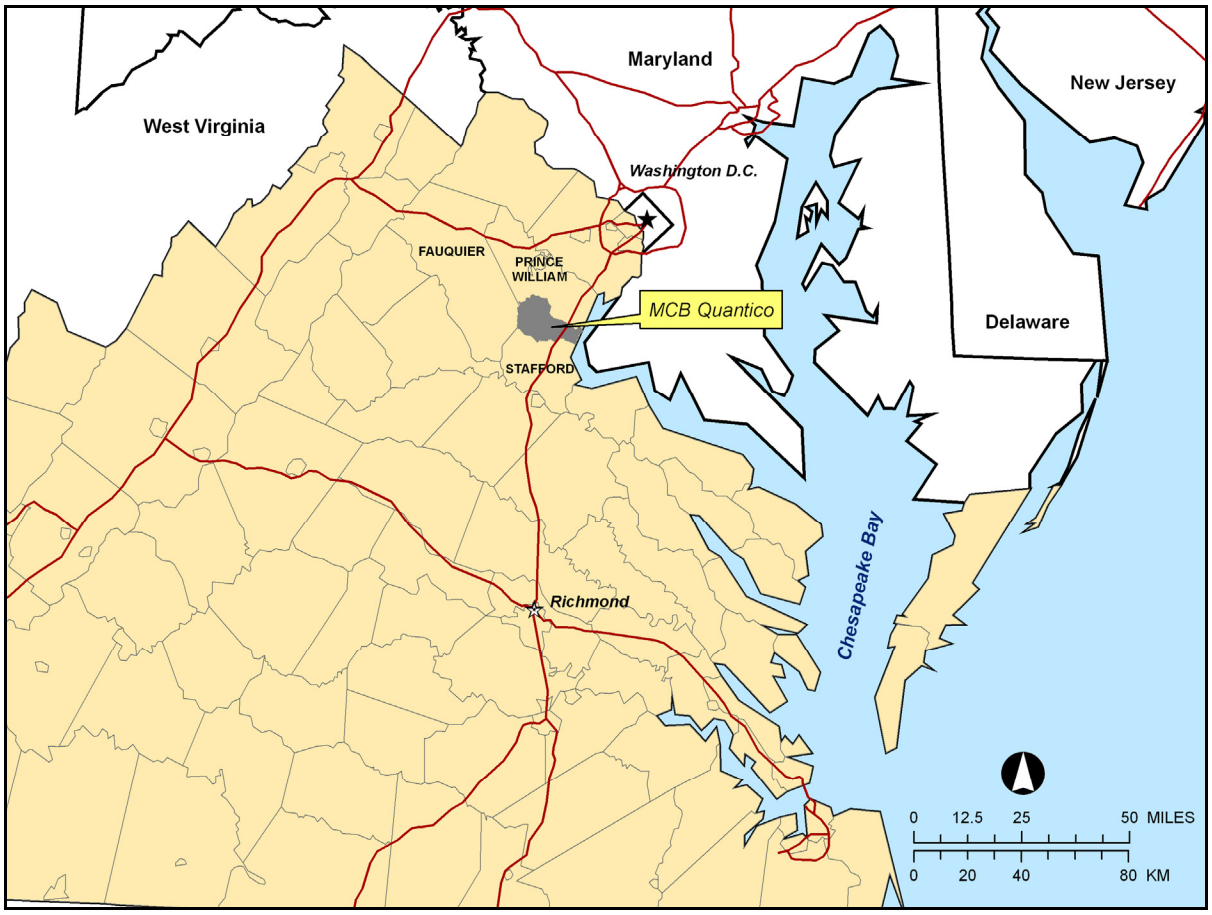

Figure 4-1. Location of MCB Quantico within Fauquier, Prince William, and Stafford Counties, Virginia.

4.1 Previous Archaeological Investigations at MCB Quantico

To date, 385 prehistoric, historical, and multi-component archaeological sites have been recorded within MCB Quantico. These sites were recorded during various compliance studies conducted since the late 1980s. In total, 96 technical reports documenting cultural resources studies at the base have been completed. The most extensive work was conducted by the William and Mary Center for Archaeological Research, who recorded over 140 sites between 1994 and 1996 during a series Section 110 surveys designed to develop and test a predictive model for the base (Huston and Downing 1994, Huston et al. 1996). Section 110 inventory of the base is ongoing.

The Natural Resources and Environmental Affairs Branch at MCB Quantico maintains a geographic information system (GIS) containing the results of all surveys and evaluations. The GIS data layers for archaeological resources provides a means of maintaining an inventory of resources and studies as well as serving as a tool to alert planners of compliance needs in a timely fashion. The GIS was used as a starting point for selecting sites to be included in the pilot monitoring program conducted at MCB Quantico as part of this study and as a primary tool for site relocation in conjunction with global positioning systems (GPS) equipment.

4.2 Site Selection and Baseline Data Collection

From a database of 109 NRHP-eligible and potentially eligible sites provided by the MCB Quantico CRM, 12 sites were selected for the pilot site monitoring program. An effort was made to include a representative sample of time periods, site types, and site locations (isolated vs. well-traveled areas) so that the initial monitoring methodology could be assessed under a variety of field conditions. The site locations were selected based on a series of questions:

- Is the site within, near, or adjacent to roads or trails (especially public roads)?
- Is the site within, near, or adjacent to public facilities (e.g. recreational areas, base housing)?
- Is the site within, near, or adjacent to active military training facilities?
- Does the site have components visible on the surface that might attract visitors, collectors, or looters, especially from targeted sites such as Civil War camps?
- Does the site have known or suspected subsurface cultural deposits?

Selected in consultation with the CRM, the sites included three Civil War camps, two World War I era sites (training trenches and a refuse dump), a historical grave site and domestic structure foundation, five prehistoric sites, and one potential prehistoric mound complex. Seven of the selected sites were located in the developed portion of MCB Quantico, referred to as “Main Side”, close to recreation and housing areas. The remaining five sites were located along roads and foot-trails within the military training area designated as “Guadalcanal”.

Table 4-1 lists the 12 sites that were selected for the pilot monitoring study. They are listed by site number along with information about time period; access; and general location on the base.

Table 4-1. Sites Selected for MCB Quantico Pilot Monitoring Study.

Site Number	*Area*	*Description*
44PW0917	3 acres (monitored) 149 acres (entire site)	historical; large Civil War camp; due to large size, focus was on a single regimental camp; Main Side.
44PW1106	1 acre	prehistoric; bisected by road and power line r-o-w; Main Side
44PW1412	1.6 acres	historical; Civil War camp; urbanized area, easy access; Main Side
44PW1558	2.3 acres (monitored) 39 acres (entire site)	historical; WWI training trenches; housing and road nearby; Main Side
44PW1559	1.6 acres	historical; USMC Dump, ca. 1918; contained within 44PW0917 and bisected by road; Main Side
44PW1717	7.2 acres	unknown, potentially prehistoric mound complex; relatively remote; Guadalcanal
44ST0302	1.5 acres (monitored) 18.5 acres (entire site)	historical; Civil War camp; Main Side
44ST0898	0.4 acres	prehistoric; quarry workshop, surface feature reported, remote; Guadalcanal
44ST0983	1.4 acres	prehistoric; unplowed, remote; Main Side
44ST0985	0.8 acres	historical; grave site and foundation; Guadalcanal
44ST1028	4.5 acres	prehistoric; lithic scatter, in remote training area; Guadalcanal
44ST1038	16.5 acres	prehistoric; lithic scatter; remote but relatively easy access along road; Guadalcanal

Three of the selected sites (44PW0917, 44PW1558, and 44ST0302) ranged in site area from 18 to 149 acres. Due to logistical considerations and time constraints of the current pilot study, only portions of these sites were selected for monitoring. The monitoring focused on sections of the sites that were particularly vulnerable, such as areas adjacent to housing or recreational areas or where erosion or military training is ongoing. While an entire site certainly needs to be considered in terms of current site conditions and past, active, and potential impacts, examining large, complex sites will be more efficient after site monitoring procedures are tested and refined. These sites may require special additional procedures for future monitoring efforts, such as aerial photographs taken explicitly to assess threats to the entire site.

4.2.1 Baseline Survey Field Results

Prior to beginning fieldwork at MCB Quantico, a packet was assembled that included a site map, a baseline data gathering form, a photographic log form, an aerial image of the site area, and a brief synopsis of each site with emphasis on known impacts or perceived threats. The

baseline monitoring survey of the 12 sites within the MCB Quantico pilot study was completed by two people in four 8-hour days. Actual time spent at each site ranged between 1 and 3 hours depending on ease of access and relocation, site size, internal complexity, and the number of impacts or threats that required documenting. Most of the sites were easily relocated with the aid of map coordinates and a Trimble GeoXM GPS receiver. The fieldwork was conducted in early spring, and the lack of foliage and underbrush aided in site relocation as surface features and other landmarks were more easily distinguished at a distance. Only two existing datum markers were relocated during the pilot study indicating that a datum had not been previously placed, a lack of visibility, the use of non-durable markers, or vandalism. If a datum did not exist or couldn't be relocated, a new datum, utilizing 1-inch-diameter PVC pipe, was established and its location was recorded using the GPS receiver. As discussed previously, only a portion of the larger sites were chosen to be monitored and a separate datum needed to be placed.

Past and active impacts or disturbances resulting from human activities, natural processes, and animal behavior were documented within the pilot study sample. Human activity impacts included looter's pits, development, logging, recreational use, and military training. Several recently excavated looter's pits were documented at two of the three Civil War sites within the study. The looter's pits were excavated into the sides and bases of winter hut pit features. Development impacts included housing area encroachment, a road, and a utility line right-of-way construction. Logging impacts within managed pine stands consisted of vehicle ruts. Evidence of recreational use was present in the form of recent beer can scatters at two sites and an all-terrain vehicle trail at one site. Military training impacts were minimal with only one excavated foxhole documented. Impacts related to natural processes resulted from erosion and tree falls. Erosional gullies were present at several sites, particularly at the Civil War camp sites where gullies are forming in the rows of winter hut pits excavated into hillsides. Tree falls were documented at most of the sites as all of the sample sites were located within wooded areas. Uprooted trees, especially large trees which are susceptible to high winds, can disturb subsurface deposits, damage surface features, and promote erosion on slopes. Animal related impacts were limited to ground hog borrows which were present at three sites.

Threats to site integrity identified within the MCB Quantico pilot study sample were primarily related to the types of documented impacts. The most serious of impact is the evidence of recent looting or relic hunting at two Civil War camp sites suggesting that these sites are currently at risk of additional damage. The threat of looting and vandalism is directly related to site accessibility. Five of the sites within the pilot sample are located within developed areas of the Main Side portion of the base allowing relatively easy access. Not coincidentally, all of the evidence of looting documented during this baseline survey occurred within this area. A less nefarious but equally damaging threat includes ongoing erosion related to precipitation and storm water runoff which that was documented at several sites within the sample. Persistent yet manageable threats include development, military training, and timber harvesting. As previously mentioned, five sites within the pilot sample are located within developed areas of the base and the remaining seven are located within training areas of the Officer's Candidate School and Guadalcanal portions of the base with two of those sites located within managed pine stands.

Appendix G presents examples of the baseline data gathered during this survey. The examples include filled-out baseline data gathering and photographic log forms, representative photographic station images, and the resulting site map showing the data points collected during the survey. Specific location information which that is included in the original baseline data has been withheld here for reasons of site confidentiality.

4.2.2 Baseline Survey Methods and Form Revision

Upon completion of the pilot baseline survey at MCB Quantico, the forms were revised to reflect how the data were collected in the field. These revisions included clarification of terminology, the modification of column headings, and revision or addition of prompts. For example, a prompt for "monitoring notes" was added to the baseline data gathering form to allow site monitors to set apart information regarding the monitoring process such as the rationale for datum or photographic station placement. A short user guide was prepared to illustrate the proper way to prepare the form and define terms that might be unfamiliar to monitoring personnel who are not professional archaeologists (Appendix D).

4.3 Follow-Up Monitoring

The follow-up monitoring survey of the 12 sites comprising the MCB Quantico pilot study sample was completed by a two-person crew in three 8-hour days during October and November of 2009. All 12 sites were successfully relocated and a site monitoring form was completed for each site. A minimal number of sites were easily relocated with the aid of GIS data and a GPS receiver. However, though the relocations were completed during the fall, there was sufficient foliage present to interfere with GPS satellite reception. This situation required a heavier reliance on aerial photography, topographic maps, and compass than necessary during the baseline survey. These types of issues should be anticipated depending on time of year. All 12 datum markers placed during the baseline survey were relocated. Actual time spent at each site generally ranged between 1 and 3 hours depending on ease of access and relocation, site size, internal complexity, number of documented impacts or threats, and number of pre-established photographic stations.

All fieldwork was carried out by volunteer labor under the direction of Versar personnel. An effort was made to incorporate both the inexperienced volunteer and natural resources personnel skill set levels. These two sets are most commonly employed in site monitoring efforts as cultural resources programs are often understaffed. Ken Curry, a new volunteer with the MCB Quantico cultural resources program, conducted site monitoring on October 28th and 29th and John Rohm, wildlife biologist with the Virginia Department of Game and Inland Fisheries, conducted site monitoring on November 12th.

4.3.1 Follow-Up Monitoring Field Results

Past, active, and potential impacts or disturbances resulting from human activities, natural processes, and animal behavior were noted. For the follow-up study, these impacts were only documented in those instances where impacts had not been present and noted during the baseline survey. As with the baseline survey, threats to site integrity identified within the

MCB Quantico pilot study sample were primarily related to the types of previously recognized impacts. The only new human impacts noted as a result of the follow-up study included the placement of erosion prevention measures (specifically at site 44ST0302). No new incidents of looting were documented as a result of the monitoring survey. New impacts resulting from animal activity noted as a result of the follow-up study were restricted to some burrowing and a deer rub. For natural processes, due to heavy rains during part of the fieldwork, flooding was noted at some of the sites (primarily 44PW1412 and 44PW1717). Continued issues with erosion and tree fall were also noted.

Appendix H presents examples of the data gathered during the follow-up monitoring visits. The examples include filled-out site monitoring and photographic log forms and representative photographic station images of newly observed impacts. Again, specific location information which that is included in the original monitoring data has been withheld here for reasons of site confidentiality.

4.3.2 Follow-Up Monitoring Methods and Form Revision

Upon completion of the pilot follow-up monitoring survey at MCB Quantico, the forms were revised to reflect user reactions and how the data was were collected in the field. These revisions included clarification of terminology, the modification of column headings, and revision or addition of prompts for both the baseline and monitoring forms and photographic logs. Feedback from both volunteers was fairly consistent and generally addressed the following two issues:

- The need for more information regarding site relocation, and
- the standardization of photographic station locations for more efficient relocation and assessment

The first issue addressed the inadequacy of provided maps. Specifically, the information packets provided to the volunteers during the monitoring fieldwork (consisting of the baseline form, site map, photographic log, and color reproductions of the photographs) were often not sufficient to assist in the actual relocation of the sites. It was noted that to streamline the monitoring process, more practical/logistical information needed to be provided to the monitor including explicit directions to each site, preferred parking areas, access concerns or requirements, and a variety of maps that identify the site location at different scales (e.g., a 7.5- minute USGS topographic map or installation map). The site map generated as part of the baseline data used the MCB Quantico installation GIS as a base map. This map was drawn at a scale necessary to identify the site datum, photographic stations, and the immediate site vicinity but was not particularly useful in site relocation.

Although GPS technology can be a great aid in this type of work, it cannot be depended upon exclusively. During the monitoring visits completed for this project, neither the Trimble XM nor the Garmin GPS 60 units were functional (due to poor satellite reception) for an estimated 85 percent of the time spent in the field. The units rarely functioned when under tree cover or overcast skies. As such, monitors must be provided with enough information to relocate archaeological sites and document impacts without the aid of GPS technology.

The second issue addressed the efficiency of the photographic stations. In order to determine if conditions on the ground have changed since the baseline/prior visit, each photographic station view must be recreated. During the monitoring visits, the great majority of the photographic stations could be recreated from either the baseline site map or the directions on the baseline photographic log; however, this practice was often time consuming and inefficient. To facilitate photographic station recreation, it is recommended that: 1) the photographic stations be established following a more standardized system; and 2) that these stations be marked or designated in some way. For example, prehistoric sites in a wooded setting often have no discernable surface features or landmarks. In such instances, establishing photographic stations at cardinal directions from the datum and at some standardized distance (e.g., 15 meters) can adequately record current site conditions as well as being quickly and easily recreated. Only in instances where impacts need to be photographic recorded should non-standardized photographic stations be established.

Further, it was recommended that some system be used to physically mark if not all of the stations, some of the more significant photographic stations (e.g., illustrating looter activity). While establishing points using material like wooden stakes or PVC pipe may not be realistic or desirable depending on the installation, other less obtrusive markings could be established (e.g., use of a tree scribe). When using witness trees, the common practice is to score the tree at eye level and again at the base. In this manner, one can find the location even in a clear cut, assuming the stumps have not been removed (and they usually are not). This technique is used by a number of different disciplines, and has been employed for over 50 years by the Forest Service. Monitors should check with the installation Natural Resources Office or Forestry Program to identify appropriate trees and methods for this purpose.

In addition to marking important photographic stations, it might be prudent, particularly in woodland settings, to document the location of each datum with reference to bearing and distance from certain scribed witness tress (working with the assumption that a site's datum may be removed over time and that GPS technology cannot be counted on at all times to reestablish any removed datum). Other practical concerns include the determination that photographic stations established at greater than 100 m from the datum could not be recreated.

5.0 RECOMMENDATIONS

5.1 Recommendations for improving the monitoring methods and forms

Some additions to the baseline survey packet may aid in site relocation for personnel involved in site visits. Potential improvements could include addition of USGS topographic maps, additional installation maps, and aerial imagery. These would be at a scale that would allow site relocation without use of GPS. GPS units may not be available for use in monitoring, and it is not always effective in poor weather or wooded conditions.

In addition to enhanced maps, it would be useful to explicitly identify access points, such as where to park, and other practical logistical information. This will avoid volunteers or other personnel having to revisit these details every time a new person visits the site. Such information could include landmarks or other landscape features not included in the installation GIS. For example, at Site 44ST0302 – Civil War huts at the OCS, the monitoring point is located at the intersection of two trails not shown on the map. This site would have been much more difficult to locate if OCS personnel had not provided this information. Site-specific practical information might also include specific health and safety concerns if applicable (e.g. the need to coordinate with a nearby firing range, or the presence of potential soil contaminants).

It may be beneficial to conduct a second pilot study at an installation that is not in an east coast woodland setting (e.g., MCB Camp Pendleton or Marine Corps Air-Ground Combat Center Twenty-nine Palms) in order to refine methods or adapt forms. Sites of differing characteristics may also present unique considerations for monitoring, such as for deeply buried sites, especially large sites, historic mines, or sites entirely on the surface, such as in desert environments.

5.2 Recommendations for Implementing Monitoring Program

Staffing - Dedicated site monitors and monitor training are recommended. A specifically dedicated monitor can assure continuity between visits, over the lifetime of the program. Site monitors can be volunteers, but volunteers will require training and oversight.

Timing - The timing and frequency of site visits should be based on the monitoring needs of each site. For example – sites where active looting has been observed or suspected should be visited more frequently than other sites. In areas of the country with thick deciduous vegetation, Fall can be a good time to relocate and visit certain sites though leaf litter may obscure those sites that have erosion issues (like the WWI trenches).

Photostations- It is recommended that particularly important stations be marked (such as active looting pits) where recreating the perspective is necessary. The use of systematic stations (established from cardinal directions at specific intervals) is recommended for the general site conditions photographs. Note that

stations established beyond 75 to 100m from the site may be difficult to relocate; stations should either be established closer to the site, or clearly marked in some way if they are genuinely necessary.

Data - Site monitoring data should be maintained in a database, so that monitoring programs can be adjusted according to what is found during monitoring visits. This will also facilitate incorporation of monitoring results into planning documents, such as Integrated Cultural Resources Management Plans, funding requests, and reports to headquarters and DoD.

Program - Site forms and monitoring protocols should be periodically revisited so that adjustments can be made as warranted by reported site conditions.

5.3 Impact/Threat Mitigation

Using the results of standardized monitoring, a project should be developed to prioritize future site treatment actions, such as stabilization, excavation, or interpretation, in consultation with various stakeholder groups. The most frequent and imminent threats/impacts observed in the present study were related to erosion and looting. Tree falls and rodent burrows were common impacts, but may prove difficult to mitigate. Potential examples of treatment regimens could include:

Looting – Recommend more frequent monitoring of Civil War sites (every 3-6 months) along with posted signs stating the law and penalties for disturbing resources. Alternatives designed not to draw too much attention to the resource may be desirable.
Increase awareness of law enforcement or personnel who work near vulnerable sites.
Install surveillance cameras (similar to game cameras, several frames per hour etc.), or fake cameras (low cost option) as a deterrence.

Erosion - Soil stabilization netting/seeding.
Storm water management or re-routing to avoid flow through sites (e.g. Site 1412).

Recreation - If any of the areas where vulnerable sites are located are used for recreational purposes (e.g. hunting), it may be advisable to educate users about the importance of leaving archaeological finds in place. The sorts of playing cards used for troops in combat might do well for this.

Training - If any of the areas where vulnerable sites are located are used for training, it may be advisable to educate users about the importance of leaving archaeological finds in place. The sorts of playing cards used for troops in combat might do well for this.

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APPENDIX A: Project Personnel

Brian Crane, PhD, Principal Investigator
Dr. Crane is a Senior Project Manager in the Cultural Resources Division of Versar. He served as the Project Manager for this project. Dr. Crane has 16 years of experience in all phases of historic and prehistoric archaeological projects in the United States, Caribbean and Central America, with academic projects, and projects in compliance with Section 106 of the National Historic Preservation Act of 1966 and other federal, state and local legislation. Responsibilities have included field supervision, historic research, report writing, and laboratory work. Areas of expertise include historical archaeology, urban archaeology, and African American archaeology. Dr. Crane has prepared numerous cultural resources compliance and planning documents for the Air Force and Army.

Mackenzie Caldwell Rohm, MA, Archaeologist
Ms. Rohm is a Staff Archaeologist with Versar with 8 years of experience as an archaeologist in the Mid-West, Mid-Atlantic, and Southwest regions of the United States. She has conducted numerous prehistoric and historical survey, testing, and data recovery projects in compliance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, for the USDI Bureau of Land Management, USDA Forest Service, Air Force, Navy, U.S. Army Corps of Engineers, and other Federal and state agencies. Responsibilities have included project design and implementation, field and laboratory supervision, artifact analysis, archival research, and report writing.

Dennis Knepper, Archaeologist
Mr. Knepper is a Senior Archaeologist with Versar and has 24 years of experience as an archaeologist in Texas, the Southwest and Mid-Atlantic regions of the United States as well as Latin America, the Caribbean, and East Asia. He has directed numerous prehistoric and historical survey, testing, and data recovery projects in compliance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, for regulatory compliance with FHWA, FERC, GSA, USACOE, and other federal and state agencies. Responsibilities have included project design and implementation, field and laboratory supervision, artifact analysis, archival research, database management, predictive modeling, and report writing.

Christopher L. Bowen, Archaeologist
Mr. Bowen is a Staff Archaeologist with Versar and has 17 years of experience as an archaeologist in the Mid-Atlantic regions of the United States as well as the Mid-West and Colorado. He has directed numerous prehistoric and historical survey, testing, and data recovery projects in compliance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, for the Air Force, Federal Highway Administration, U.S. Army Corps of Engineers, and other Federal and state agencies. Responsibilities have

included project design and implementation, field and laboratory supervision, artifact analysis, archival research, database management, predictive modeling, and report writing.

Bernard Means, Ph.D. Archaeologist

Bernard Means is an Archaeologist at Versar and a professor of anthropology at Virginia Commonwealth University. Dr. Means has 25 years of experience as an archaeologist on projects throughout the southwest and Mid-Atlantic regions of the United States, and southern India. He received his bachelor's degree from Occidental College, Los Angeles, in 1986, and his Ph.D. from Arizona State University, Tempe, in 2006. He has researched and analyzed data from a wide variety of projects throughout the Mid-Atlantic region, and has authored or co-authored more than 80 technical reports or report sections. This work has included numerous prehistoric and historical survey (Phase I), testing (Phase II), and data recovery (Phase III) projects in compliance with Section 106 of the National Historic Preservation Act, as amended, for regulatory compliance with FHWA, FERC, GSA, USACOE and other federal and state agencies. His responsibilities have included project design and implementation, field and laboratory supervision, artifact and data analysis, archival research, and report writing. Special areas of expertise include: intrasite spatial analyses; directional (circular) statistics; modeling the social, behavioral, and ideological factors underlying the human use of space; village spatial and social organizations; the research potential of museum collections; applications of radiocarbon dating, especially accelerator mass spectrometry of ceramic residue and cultigens; analyses of the built environment using archaeological data; and, New Deal archaeology. His recent book, *Circular Villages of the Monongahela Tradition* (The University of Alabama Press, 2007), has been well received, and he is also the author or co-author of six book chapters, 21 articles or reviews, and has presented over 50 papers at national and regional archaeological conferences.

APPENDIX B: Representative Site Monitoring Forms

This appendix presents only a small selection of the site monitoring forms reviewed as part of this project. These forms are considered in greater detail in Chapter 2.

3/00 **Grand Canyon National Park and Glen Canyon National Recreation Area**

RIVER CORRIDOR ARCHAEOLOGICAL SITE MONITORING FORM

MANAGEMENT

1. Site Number AZ _____ 2. Monitor Session _____
3. River Mile _____ Bank (L/R/B) _____ 4. Date _____
5. Property Type: _____
6. Monitor(s) _____
7. PA Signatories _____

PHYSICAL IMPACTS

Coding: 0 = Absent, 1 = Active, 2 = Inactive, 3 = NA (for items 8 - 14)

		Structures / Storage	Artifacts	Roasters / Hearths	Perishables / Midden	Rock Images	Other
8.	Surface Erosion (0 - 10 cm)						
9.	Gullying (10 - 100 cm)						
10.	Arroyo Cuttin (> 1 m)						
11.	Bank Slump						
12.	Eolian/Alluvial Erosion/Deposition						
13.	Side Canyon Erosion						
14.	Other Physical Impacts (animals spalling, roots)						

15. Drainage Type (river, terrace, or side canyon-based or no drainages): _____

16. Do any of the above impacts appear to have occurred since the last monitoring episode 0 = No, 1 = Yes. If yes, explain in Question # 17. _____

17. Comments:

3/00 **Grand Canyon National Park and Glen Canyon National Recreation Area**

RIVER CORRIDOR ARCHAEOLOGICAL SITE MONITORING FORM

VISITOR-RELATED IMPACTS

Site Number:
Monitor Session:

Coding: 0 = Absent, 1 = Present, 3 = NA (for items 18 - 2

		Structures / Storage	Artifacts	Roasters / Hearths	Perishables / Midden	Rock Images	Other
18.	Visitor Impacts						

19. Collection Piles: If present, explain in Question # 2 _____
20. Trails On-Site: If present, explain in Question # 26. Explain any off-site trails als _____
21. Camping On-Site: If present, explain in Question # 26 _____
22. Criminal vandalism/ARPA violations: If present, explain in Question # 2 _____
23. Other visitor impacts: If present, explain in Question # 2 _____
24. Visitor-related impacts since last monitoring: _____
25. Are any visitor-related impacts directly related to river fluctuations and/or dam operations, i.e. development of new trails to avoid high water, availability of new beaches in proximity of site 0 = No, 1 = Yes. If yes, explain in Question # 26 _____
26. Comments:

RECOMMENDATIONS

27. Monitor Schedule: 1) Discontinue 2) Semiannual 3) Annual 4) Biennial 5) Every three to five years 6) Inactive 7) Control Group _____
28. Preservation Options: 0 = No, 1 = Yes

    Trail Work _____ Plant vegetation _____ Other Preservation Options _____
    Install checkdams _____
29. Recovery Options: 0 = No, 1 = Yes

    Research _____ Data Recovery _____ Other Recovery Options _____
30. Comments:

Stanislaus National Forest

ARCHAEOLOGICAL SITE MONITORING FORM

MANAGMENT INFORMATION

1. SITE # _____ 2. NAME OF MONITOR _____

3. DATE ____ ____ 4. QUAD _____ 5. DISTRICT _____

6. SITE DESCRIPTION:

ENVIRONMENTAL SITUATION

7. Primary Physiographic Settings: Alluvial terrace ( ); Dune ( ); Slope ( ); Ridge ( ); Cliff face ( ); Stream terrace ( ); Rock shelter/cave ( ); Outcrop ( ); Arroyo/wash ( ); Saddle ( ); Floodplain ( ); Other ( ).

8. Degree of Shelter: Open ( ); Overhang/cave ( ); Combination ( ).

9. Dominant Soil Type: Alluvium ( ); Aeolin ( ); Colluvium ( ); Bedrock ( ); Residual ( ).
10. Soil Texture: Silty ( ); Gravelly ( ); Sandy ( ); Combination ( ).
Describe: _____

NATURAL IMPACTS

11. Evidence of natural impacts:

(a)	Surficial sheet washing	Yes ( )	No ( )
(b)	Gullying (cuts 10-100 cm. deep)	Yes ( )	No ( )
(c)	Arroyo Cutting (cuts more than 100 cm. deep)	Yes ( )	No ( )
(d)	Wind deflation	Yes ( )	No ( )
(e)	Bank slumpage	Yes ( )	No ( )
(f)	Dune migration	Yes ( )	No ( )
(g)	Other	Yes ( )	No ( )

Describe: _____

12. Evidence of wild animal-caused impacts:

(a)	General trampling	Yes ( )	No ( )
(b)	Trailing through site	Yes ( )	No ( )
(c)	Burrowing	Yes ( )	No ( )
(d)	Bedding	Yes ( )	No ( )
(e)	Dusting	Yes ( )	No ( )
(f)	Shelter	Yes ( )	No ( )
(g)	Compacted area	Yes ( )	No ( )
(h)	Other	Yes ( )	No ( )

Describe: _____

List type of animal (s) causing impacts if known:

13. Characterize the stability of the site: Stable (no active erosion) ( ); Incipient erosion ( ); Active erosion ( ).

HUMAN IMPACTS

14. Collection piles. Yes ( ) No ( )
List total number of piles

15. Roads/Trails. Yes ( ) No ( )
List number of roads/trails across site ( )
(on sketch map identify location of roads/trails)

16. Evidence of on-site camping.
Indicate with an (X) what kinds of evidence are present:

(a)	Fire scars, fire pits, recent charcoal	( )
(b)	Rearrangement/clearing of rocks	( )
(c)	Recent camper trash	( )
(d)	Obvious soil compaction	( )
(e)	Other	( )

Describe: _____

Does this evidence appear to be recent (less than 5 years) Yes ( ) No ( )

17. Evidence of deliberate vandalism.

(a)	Surface disturbance (e.g. grafitti)	Yes ( )	No ( )
(b)	Slight subsurface disturbance	Yes ( )	No ( )
(c)	Substantial subsurface disturbance	Yes ( )	No ( )
(d)	Undercutting of walls	Yes ( )	No ( )
(e)	Walls demolished or rebuilt	Yes ( )	No ( )
(f)	Building material removed	Yes ( )	No ( )
(g)	Other	Yes ( )	No ( )

Describe: _____

Does this evidence appear to be recent (less than 5 years) Yes ( ) No ( )

LIVESTOCK IMPACTS

18. Trails: Yes ( ) No ( )
List number of trails across site ( )
(on sketch map identify location of trails)

19. Livestock use facilities adjacent to or located on site:

(a)	Stock pond	Yes ( )	No ( )
(b)	Fence	Yes ( )	No ( )
(c)	Corrals	Yes ( )	No ( )
(d)	Salt licks	Yes ( )	No ( )
(e)	Troughs	Yes ( )	No ( )
(f)	Other	Yes ( )	No ( )

20. Evidence of livestock caused impacts:

(a)	Dusting ground	Yes ( )	No ( )
(b)	Compacted areas	Yes ( )	No ( )
(c)	General trampling	Yes ( )	No ( )
(d)	Trailing through site	Yes ( )	No ( )
(e)	Bedding area	Yes ( )	No ( )
(f)	Shelter area	Yes ( )	No ( )
(g)	Manure piles	Yes ( )	No ( )
(h)	Wall rubbing	Yes ( )	No ( )
(i)	Other	Yes ( )	No ( )

Describe: _____

Does this evidence appear to be recent (less than 5 years) Yes ( ) No ( )

MANAGEMENT ASSESSMENT AND RECOMMENDATIONS

21. What types of impacts threaten this site: (i.e. what to look for)
Rank each threat according to the criteria listed below.

0 = Not a threat now or in the foreseeable future.
1 = Possible threat.
2 = Definite threat.
3 = Actively occuring at present time.

(a)	Livestock trailing	___
(b)	Livestock bedding	___
(c)	Salt licks	___
(d)	Development of new gulies or arroyos	___
(e)	Human roads/trails	___
(f)	Human campsites	___
(g)	Human visitation	___
(h)	Animal burrowing	___
(i)	Dune migration	___
(j)	Development projects	___
(k)	Logging activities	___
(l)	Wind deflation	___
(m)	Bank slumpage	___
(n)	Vandalism (pothunting, collecting or grafitti)	___

RECOMMENDATIONS FOR SITE:

**PHOTOS OF THE SITE MUST BE TAKEN AT EACH MONITORING SESSION AND ATTACHED TO FORM. A SET PHOTO POINT SHOULD BE ESTABLISHED AT THE INITIAL MONITORING SESSION AND LOCATED ON SKETCH MAP.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE CONDITION ASSESSMENT RECORD (ASCAR)

Temp Site No.: _____
Trinomial Site No.: CA-_____
Primary Site No. _____
HRI No. _____

County:_____ District:_____ Park Unit:_____

Site Name and Other Site Nos. (if any): _____

_____

Calif. Register Status (check one): __Ineligible __ Potentially Eligible __Eligible __Listed __Undetermined

Nat. Register Status (check one): __Ineligible __ Potentially Eligible __Eligible __Listed __Undetermined

(Note: If Listed, check others that apply: __Part of NRD __NHL __HABS __HAER __SHL __CPHI __CP)

Site Type: _____ Time Period (check one): __ Prehist. __ Hist. __ Both

Name of Monitor: _____ Date of Monitoring: _____

Date of Last Evaluation: _____ Date of Last Site Record: _____*

Site Relocation Status (check one): __ Relocated __ Not Relocated __ Site Destroyed

* Note: If site record is 5 years or older, complete a Primary Record Form (DPR 523) to update site information along with the assessment form (cf. PRC 5024.1(g)(4)). Also, place a datum on the site and take photos from this location as a reference point for future monitoring.

Overall Site Condition Damage Assessment:

__None (no damage) __Slight __Light __Moderate __Moderately Heavy __Heavy __Not Rated

Comments on Condition: _____

_____

_____

_____

_____

Photos (list roll and number):_____

State Archaeologist comments/recommendations: _____

_____

_____

State Archaeologist Reviewer: _____ Date: _____

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE CONDITION ASSESSMENT RECORD (ASCAR)

Temp Site No.: _____
Trinomial Site No.: CA-_____
Primary Site No. _____
HRI No. _____

County:_____ District: _____ Park Unit:_____

Disturbances and Intensity of Impact

(If present, use a check mark for all that apply; then check the amount of impact intensity for these disturbances)

Type of Impact	Check If Present	Intensity of Impact for the Entire Site					
		None	Slight (1-10%)	Light (10–25%)	Mod. (26-50%)	Mod. Heavy (51-75%)	Heavy (>75%)
Animal Damage							
Burrowing animals							
Other (indicate in comments)							
Overall Animal Impact							
Erosion and Other Geological Processes							
Arroyo Downcutting							
Coastal Erosion							
Earthquake Damage							
Eolian Deposition							
Flooding							
Gullies, Rills, and Sheetwash							
Riverine Erosion							
Slumping							
Other (indicate in comments)							
Overall Erosion Impact							
Fire							
Wildfires							
Prescribed burns							
Other (indicate in comments)							
Overall Fire Impact							
Park Construction							
Buildings and Other Structures							
Culverts							
Roads							
Sewer Lines							
Trails (New Construction)							
Utility Lines							
Other (indicate in comments)							
Overall Construction Impact							

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
ARCHAEOLOGICAL SITE CONDITION ASSESSMENT RECORD (ASCAR)

Temp Site No.: _____
Trinomial Site No.: CA-_____
Primary Site No. _____
HRI No. _____

County:_____ District:_____ Park Unit:_____

Disturbances and Intensity of Impact (Continued)

(If present, use a check mark for all that apply; then check the amount of impact intensity for these disturbances)

Type of Impact	Check If Present	Intensity of Impact for the Entire Site					
		None	Slight (1-10%)	Light (10–25%)	Mod. (26-50%)	Mod. Heavy (51-75%)	Heavy (>75%)
Park Maintenance							
Trash Removal/Raking							
Trenching							
Vegetation Cutting/Raking							
Other (indicate in comments)							
Overall Maintenance Impact							
Park Visitor Use (on the site)							
Campfires							
Campgrounds (designated)							
Camping (non-developed)							
Fishing							
Hiking							
Picnicing							
Trash Disposal (Littering, etc.)							
Other (indicate in comments)							
Overall Visitor Use Impact							
Trails and Related Disturbances							
Designated Existing Trails							
Horse Trails							
Mountain Bike & Similar Trails							
Off-Road Vehicle Tracks							
Volunteer Trails							
Other (indicate in comments)							
Overall Trail Impact							
Vandalism							
Surface Collecting							
Pothunter Holes							
Rock Art Defacement							
Rock Art Boulders Removed							
Bedrock Mortar Destruction							
Other (indicate in comments)							
Overall Vandalism Impact							

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE CONDITION ASSESSMENT RECORD (ASCAR)

Temp Site No.: _____
Trinomial Site No.: CA-_____
Primary Site No. _____
HRI No. _____

County:_____ District: _____ Park Unit:_____

Comments on Disturbances (if needed): _____

_____

_____

_____

Proposed Future Actions Required for Site Management and/or Protection

___ Placement of Protection Signs and/or Interpretative Signs

___ Notify Park Rangers and Other Park Staff to Patrol Site

___ Close Area and/or Restrict Access

___ Fence Construction Around Site

___ Monitor Park Construction and Maintenance

___ Test Excavation

___ Full-scale Excavation (Data Recovery)

___ Include in Resource Management Program

___ Include in Site Stewardship Program

___ Other (indicate below)

Comments on proposed future actions (if needed):_____

_____

_____

Estimated No. of Person Hours to Complete ASCAR Form (include Travel Time): _____

San Juan Mountains Association
Cultural Site Stewardship Program

Site Monitoring Form

Site Number: _____
Date: _____

Steward Name: _____ District: _____
Steward Number: _____ Activity: _____
Contact Phone: _____ Contact email: _____
Hours: _____ Miles: _____

Human Activities:	General Site	Within Structures	Map Reference	Comments:
Recent Footprints				
Trails Present				
Collector's Piles				
Campfires				
Litter				
Graffiti				
Vehicle tracks				
Excavation				
Other Disturbance				

Animal Activities	General Site	Within Site	Map Reference	Comments:
Trails				
Displaced Rubble/Artifacts				
Trampling of Artifacts				
Bedding Areas				
Manure				
Rodent Burrows				

Natural Processes	General Site	Within Site	Map Reference	Comments:
Erosion				
Rock Fall				
Roof / Floor / Wall Fall				
Deteriorating Features				
Displaced Boards / Roofing				
Fire				

Northwest New Mexico Site Stewards Form

NAME	EMAIL ADDRESS	DATE OF VISIT

SITE NAME	TOTAL MILEAGE (to and from site)	TOTAL VOLUNTEERS

TOTAL NUMBER OF HOURS (ie. 2 volunteers each worked 4 hours=8 total hours, include travel time, round fractions up)

☐ Site remains unchanged

OBSERVATIONS PERTAINING TO VANDALISM OR SITE DETERIORATION:

ADDITIONAL COMMENTS:

Submit Query

California Archaeological Site Stewardship Program
Site Monitoring Report

Site.
Date and time of monitoring.
Name. _____
Address. _____
_____
Phone.
Accompanied by (name and address).
Condition of archaeology site. (State if clear, damaged, overgrown, or vandalized. Describe any damaged areas. Attach sketches, maps, or photographs.)
Condition of trails (State if clear, obstructed, overgrown, or damaged).
Evidence of human intervention at site, such as footprints, trash, fire. (Do not touch or disturb—just note it. Write "none" if no evidence—do not leave blank.)

California Archaeological Site Stewardship Program, Site Monitoring Form, continued

Observation of human activity at site. (Do not make contact or attempt to chase off individuals. Provide description of individuals, their activities, and where they were doing it. Note license plates of vehicles at trailhead or campsites.)
Describe location from which you observed the activity.
What steps did you take to notify law enforcement, BLM Field Officer, or others?
Other significant activity or problems that you encountered while monitoring.
Comments and suggestions.
Signed. Date.

ARIZONA SITE STEWARD QUARTERLY ACTIVITY LOG

Name: _____ Region: _____ Report Due Date: 1/1 ☐ 4/1 ☐ 7/1 ☐ 9/1 ☐

Site ID #	Site Name	Activity Date (mm/dd/yy)	Vandalism Report (Put in Code)	Hours For: (Round to nearest 1/2 hr increment)				In this column, indicate Agency if activity is a surveying or mapping project; comment about "Other" activity, or put Site name if Site ID# is not known.
				Site Visit	Mapping/ Survey	Public Education	Other	
	TOTALS							

Tips On Completing Report:

Site ID # Use the 1-4 digit ID number assigned to the site by the Site Steward Program. Do NOT use the Land Manager's Primary number.
Note: If you don't know the Site ID #, please identify the Site Name or Land Manager's Primary number.

Vandalism Report: If you completed a vandalism report for this site visit, indicate the type of vandalism using the codes:
Note: More than one code may be used to cover the extent of the vandalism reported.

Please round your activity time up to the nearest ½ hour increme
Indicate the time in the appropriate column.
Site Visits: Time spent visiting sites in the Site Steward inventory. Sites you have a volunteer agreement to monitor.
Mapping/Survey: Please identify the Land Manager for which you are performing this work.
Public Education: This category is for activities you perform where you provide educational information to the public.
Other: Other activities related to the Site Steward program. Do not include regular meetings of other organizations.

PLEASE USE THE VANDALISM CODES BELOW:

01. New Roads/ATV travel	12. Spray paint/paintball
02. Potholes/looting	13. Petroglyphs used for target shooting
03 Backhoe/Bulldozer trench	14. Shrins or cairns built
04. Signs removed or damaged	15. Erosion/flooding damage to site
05. Rearranging of rock features	16. Human tracks found
06. Collector's pile	17. Damage/removed vegetaion
07. Fires made at site or fire rings	18. Boulders moved or removed
08. Unauthorized visitors on site	19. Probeholes
09. Artifacts removed	20. Trash/debris
10. Human remains exposed	22. Fences Down
11. Petroglyph thieff or attempted	23. Other (please specify)_____

- Please return this form to Site Steward Coordinator, Arizona State Parks, 1300 W. Washington, Phoenix,
- AZ 85007. In Tucson, please log on to your Region's website.

Arizona Site Steward Cultural Vandalism Report

Protecting Arizona's Heritage

Date Incident Noted:_____ Time Incident Noted:_____

Site Name/Primary Number/ASM Number:_____

Noted and Reported by:_____

Phone Number:_____ E-Mail:_____

UTMs, Lat/Long or Description of location of Incident:_____

Date of Previous Visit to Site:_____

Indicate the Nature of the Damage (Check all that may apply):

01. New Roads/ATV travel
02. Potholes/evidence of looting
03. Backhoe/Bulldozer trench
04. Signs removed or damaged
05. Rearranging of rock features
06. Collector's pile
07. Fires or fire rings made at site
08. Unauthorized visitors on site (squatters)
09. Artifacts removed from surface of site
10. Human remains exposed
11. Petroglyphs removed, or attempt to remove
12. Spray paint/paintball games
13. Petroglyphs used for targets or graffitied
14. Shrines or cairns built at or near site
15. Erosion/flooding damage to site
16. Human tracks found at damaged site
17. Damaged/removed vegetation
18. Boulders moved or removed
19. Probe holes noted at site
20. Trash dumped or debris at site
21. Fences down or damaged
22. Other (please specify)_____

Were photos taken? Yes_____ No_____ If yes, by whom?_____

Prints (B&W_____ Color_____ Digital_____ Film_____ Slides_____

Was a Photo Log Kept? Yes____ No_____ Were sketches made? Yes____ No_____

Was this vandalism witnessed in the process of happening while you were there? Yes____ No___

If this vandalism was witnessed, please include the following information:

Length of time spent in observing the suspect(s) at the site:_____

List all witnesses to the vandalism, include e-mail addresses or phone numbers:

_____ _____

_____ _____

Equipment noted being used in the crime:_____ _____

Describe vehicle: Year_____ Make_____ Model_____ Color_____ License Plate State & Number_____

Describe suspect(s) at site: _____

Describe any contact with suspects:_____

Attach any additional comments or narrative, and any sketches or photographs.

APPENDIX C: List of Threats to Sites Derived from Site Monitoring Forms

The following list of threats was derived from existing site monitoring programs. It is organized by state and site stewardship program within each state. The threats are further subdivided into animal, human, natural, and general threats.

State	Threat type	Threat
Arizona	**Arizona Site Stewards Program**	
	General	Damaged/removed vegetation
		Other (specify)
	Human	Artifacts removed
		Backhoe/bulldozer trench
		Boulders moved or removed
		Collector's pile
		Fences down
		Fires made at site or fire rings
		Human remains exposed
		Human tracks found
		New Roads/ATV travel
		Petroglyph removed or attempt to remove
		Potholes/looting
		Probe holes
		Rearranging of rock features
		Shrines or cairns built
		Signs removed or damaged
		Spray paint/paintball
		Target shooting at site
		Trash/debris
		Unauthorized visitors on site
	Natural	Erosion/flooding damage to site
California	**Stanislaus National Forest Site Monitoring Program**	
	Animal	Bedding
		Burrowing
		Compacted area
		Dusting
		General trampling
		Manure piles
		Shelter
		Trailing through site

State	Threat type	Threat
		Wall rubbing
	General	Other (note if natural, animal, or human)
	Human	Building material removed
		Collector's pile
		Fire scars, pits, charcoal
		Rearranging of rock features
		Roads/trails
		Slight subsurface disturbance
		Soil compaction
		Substantial subsurface disturbance
		Surface disturbance
		Trash/debris
		Undercutting of walls
		Walls demolished or rebuilt
	Natural	Arroyo Cutting (cuts more than 100 cm. Deep)
		Bank slumpage
		Dune migration
		Erosion
		Gullying (cuts 10-100 cm. Deep)
		Surficial sheet washing
		Wind deflation
	California Archaeological Site Stewardship Program	
	General	Damage (non specific)
	Natural	Overgrown
	Human	Fire
		Footprints
		General
		Trash/debris
		Vandalized
	California State Parks	
	Animal	Burrowing
	General	Fire (wildfires, prescribed burns)
		Disturbances (new and ongoing)
	Human	Bedrock mortar destruction
		Fires (camp)
		Park construction (multiple categories)
		Potholes/looting
		Rock art defacement/removal

State	Threat type	Threat
		Surface collecting
		Tracks, off-road vehicles
		Trailing through site (horse, mountain bike)
		Trash/debris
	Natural	Arroyo cutting
		Earthquake damage
		Eolian deposition
		Erosion, coastal
		Erosion, riverine
		Flooding
		Gullying
		Sheetwash
		Slumping
Colorado	**Southwest Colorado Cultural Site Stewardship Program**	
	Animal	Bedding areas
		Displaced rubble/artifacts
		Manure piles
		Rodent burrows
		Trails
		Trampling of artifacts
	Human	Camp fires
		Collector's pile
		Excavation
		Graffiti
		Litter
		Other
		Recent footprints
		Tracks, vehicles
		Trails present
	Natural	Deteriorating features
		Displaced boards / roofing
		Erosion
		Fire
		Rock fall
		Roof/ floor/ wall fall
Montana	**Montana Site Stewardship Program**	
	Animal	Burrowing
		Livestock

State	Threat type	Threat
	Human	Alteration/defacement of_____
		Broken glass/bottles
		Camp fires, recent
		Cans
		Collector's pile
		Construction
		Digging
		Fireworks
		Graffiti
		Recent footprints
		Recent trash
		Rock art damage
		Structural collapse
		Tracks, off-road vehicles
	Natural	Riverbank erosion
		Runoff erosion
New Mexico	**SiteWatch**	
	Human	Backhoe
		Bulldozing
		Collecting
		Excavation
		Fence removal
		Graffiti/tagging
		Looting
		Other
		Other
		Probing
		Rock art removal
		Sign removal
		Target shooting
		Vandalism
		Visitor impacts
	Natural	Erosion
		Other
		Structural collapse
	Northwest New Mexico Site Stewards	
	Human	Artifacts removed
		Backhoe trench

State	Threat type	Threat
		Bulldozing
		Bullet holes
		Fencing down
		Graffiti, miscellaneous
		Human remains exposed
		Other (describe)
		Potholes
		Rock art removal
		Signs removed
		Spray paint
	Santa Fe National Forest Site Stewards	
	Animal	Animal activity
	General	Other
	Human	Pot hunting
		Project intrusion
		Recreational use
		Road construction
		Surface collecting
		Vandalism
		Vehicular
	Natural	Gully formation
		Other
		Sheetwash
		Structural decay
Texas	**Texas Archaeological Stewardship Network**	
	General	Known or Perceived Future Impacts
	Human	Artificial impacts
	Natural	Natural impacts
Utah	**Utah Site Stewardship Program**	
	Animal	Bedding areas
		Comments
		Displace rubble
		Displaced boards / roofing
		Manure
		Trails
		Trampling of artifacts
	Human	Backhoe trench(es)
		Bulldozing

State	Threat type	Threat
		Bullet holes
		Campfires
		Collector's pile
		Comments
		Fencing down
		Graffiti
		Graffiti, miscellaneous
		Litter
		Major disturbance
		Minor disturbance
		Other (describe)
		Postholes
		Potholes
		Recent footprints
		Removed artifacts
		Rock art removal
		Signs removed
		Spray paint
		Trails present
		Uncovered human remains
		Vehicle tracks
	Natural	Deteriorating walls
		Erosion
		Floor fall
		Rock fall
		Rodent/insect disturbance
		Roof fall

APPENDIX D: Archaeological Site Monitoring and Condition Assessments
Baseline Data Gathering – Field Documentation
Guidelines and Instructions

A comprehensive site monitoring program begins with collecting baseline data for each site against which to compare the findings of subsequent site visits. Baseline data should include all previous site documentation (site forms, maps, relevant report sections, etc.) as well as an assessment of current site conditions. Previous documentation, particularly an accurate and detailed site map, can aid in site relocation and boundary definition; in locating or re-establishing a permanent datum; in feature relocation; and in determining the extent of previous excavations. If a site map does not exist that shows site boundaries, internal features, or the extent of previous archaeological work at the site, a new map may need to be created prior to or during the baseline visit.

Documentation of current site conditions is important for evaluating changes that have occurred since the sites were last documented as well as providing evidence of past and active impacts or threats to each site. Specific impacts and threats to sites are frequently divided into three broad categories:

- natural processes or environmental dynamics (e.g. erosion, natural fires, tree falls, etc.);
- animal behavior (e.g. burrowing, trampling, trail formation, insect or rodent damage, etc.); and,
- human activities (e.g. vandalism, looting, collecting, vehicle tracks, camping, development, military training, etc.).

The types of impacts or threats present at a site may vary depending on site accessibility; the nature of activities taking place on or in the vicinity of a site; the kinds of cultural remains present at a site, particularly any with a visible component that might attract collectors, looters, or vandals; the depth of deposits at a site; and, the site's environmental and topographic setting. Sites with surface or shallow subsurface cultural components are more likely to be adversely impacted by natural processes, animal, or human activities, and therefore more likely to lose their integrity, information potential, and eligibility for the NRHP.

The follow pages provide blank baseline data gathering and photographic log forms, explanations of the fields used on the forms, and examples of typical impact and threat types.

Archaeological Site Monitoring
Baseline Data Gathering Form

Page# __of __

Site Name or # _____

Recorder(s): _____ Date: _____

Current site conditions:

Vegetation:

Surface visibility:

Topography/drainage:

Other (include observations of cultural materials or features):

Specific observed impacts/threats to site

Impact/Threat type & nature (past, active, or potential threat)	Impact Code	Photo Station (PS#)	Distribution (Isolated, random, patterned)	Description/Comments

General threats (note if there is no evidence of threats):

Monitoring notes:

Archaeological Site Monitoring
Photographic Log for Baseline Data Gathering

Page#__ of __

Site Name or # _____ Datum _____

Recorder(s): _____ Date _____

Photo Station (PS#) Loc. /Other Loc.	Direction (azimuth)*	Distance from datum*	Angle from datum*	Description/Comments

* note distance units and method of measurement (direct, GPS, GIS, etc.)

Archaeological Site Monitoring
Baseline Data Gathering Form – User Guide

Field	Description
Site Name or #	Common site name, state trinomial, or other unique identifier.
Recorder(s)	Names and affiliation of individuals conducting the site visit.
Date	Date on which site visit occurred (MM/DD/YYYY).
Vegetation	Description of vegetation across the site area. (e.g., wooded in mature hardwoods with an open understory of scattered hollies and laurel; or dense scrubland dominated by mesquite trees and prickly pear).
Surface Visibility	Description of groundcover and an estimate of surface visibility across the site area.
Topography/drainage	Description of landforms, relief, aspect, and drainage patterns across site area.
Other	Include observations of the current condition of cultural materials or features exposed at the site. Also include additional environmental description here if needed.
Specific observed impacts/threats to site	This table is intended for documentation of specific impacts or threats observed during the initial baseline data gathering site visit.
Impact/Threat type & nature (past, active, or potential threat)	Enter impact or threat type (e.g., erosion, vandalism, animal burrowing) and whether or not the impact occurred in the past, is actively damaging site, or if current conditions suggest future damage may occur.
Photo Station (PS#)	Corresponds to Photo Station Number (PS#) on Photographic Log for Baseline Data Gathering form. Provides provenience information for documented threat.
Distribution (Isolated, random, patterned)	Describe the distribution of the impact(s) or threat(s); single occurrence (isolated) or multiple occurrences [random (tree fall or erosion) or patterned (a series of looter pits)]
Description/Comments	Detailed description of threat and addition comments. Also include the frequency of a particular impact or threat type and its extent or dimensions in applicable. Note units of measurement.
General threats	Use this field to describe general or potential threats to the site (e.g., trees at risk of uprooting, nearby logging, easy public access, deteriorating erosion or flood control measures, etc.). Also note if there is no evidence of threats.
Monitoring Notes	Use this field for information specific to the monitoring visit that may be useful to future site monitors (e.g., rationale for number or locations of photo stations, GPS locations, datum relocation information or type used, etc.).

Photographic Log for Baseline Data Gathering – User Guide

Field	Description
Site Name or #	Common site name, state trinomial, or other unique identifier.
Recorder(s)	Names and affiliation of individuals conducting site visit.
Datum	Enter datum coordinates (UTM, State Plane, LatLong)
Date	Date on which site visit occurred (MM/DD/YYYY).
Photo Station (PS#) Loc. /Other Loc.	Photo Station Location. Number Photo Stations sequentially.
Direction (azimuth)	Indicate direction to subject in degrees from magnetic north.
Distance from datum	Indicate distance of Photo Station from permanent site datum. Note units of measurement and method of measurement (direct, GPS, GIS).
Angle from datum	Indicate angle of Photo Station from permanent site datum
Description/Comments	Description or comments on subject of Photo Station.

Archaeological Site Monitoring and Condition Assessments
Baseline Data Gathering – Impact Codes, Definitions, and Additional Examples

(note: this list is not all-inclusive, other threats to site integrity may be present based on local conditions)

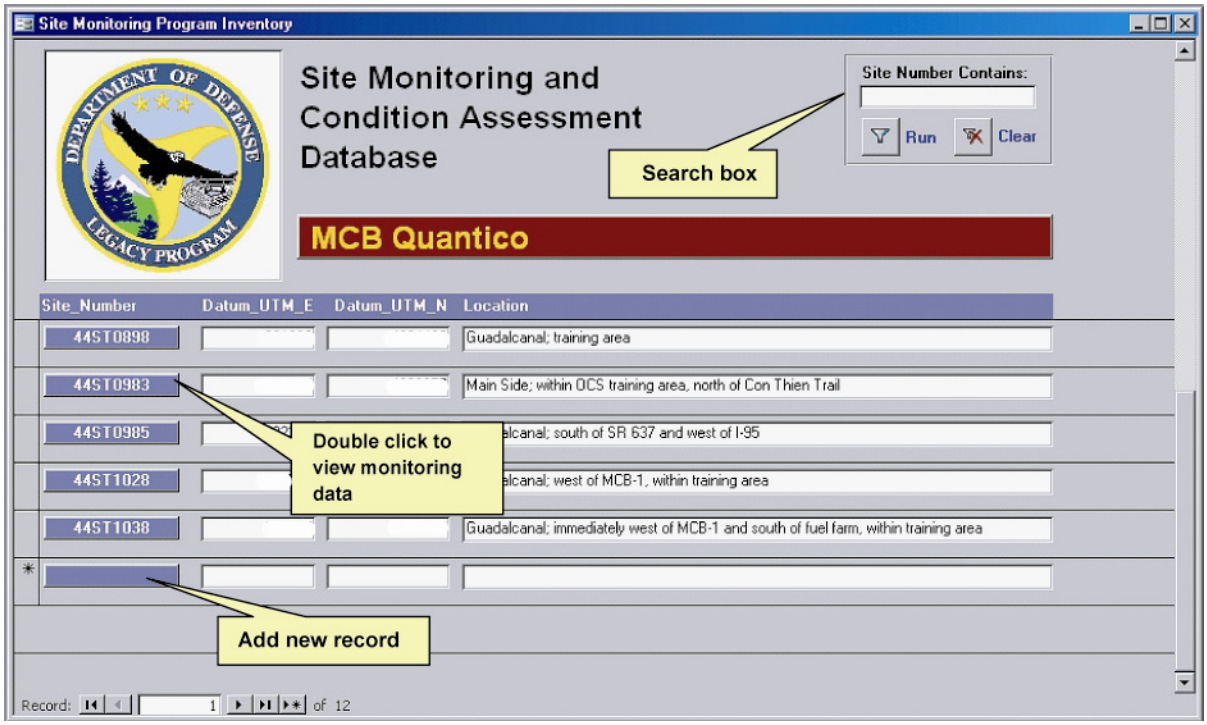
Code	Impact/Threat Type	Definition
Environmental Impacts		
E1	Surface erosion	Movement of soils from a landform by wind, water, or ice action
E2	Displaced vegetation	Vegetation uprooted through wind, water, or other action
E3	Tree fall	Uprooted tree causing damage and producing craters tree
E4	Fire (natural)	Forest fire altering surface artifact scatters or architectural ruins
E5	Water damage	Moisture accumulation causing molding or decay of cultural objects
E6	Bank erosion	Erosion along the margins of a creek, stream, or river
E7	Flooding	Catastrophic water damage that removes vegetation, features, and artifact-bearing deposits or covers a site with additional soil deposits
E8	Gullying	Channels cut in the earth by running water
E9	Root damage	Breaking, cutting, or drying out of roots
E10	Damaged vegetation	Damage to plant leaves, stems, or other plant parts
E11	Freeze/thaw cycle	Physical weathering (flaking, cracking) of rocks or soil deposits following freezing and thaw episodes, which may repeat
E12	Rock/roof fall	Boulders, cobbles, or roof material (rockshelters) dislocated onto a site, crushing or compacting surface and near surface deposits
E13	Sheetwash	A fairly uniform layer of particles removed from an area's entire surface or deposited across an area's entire surface
E14	Slumping	Downward slipping of a mass of rock or loose debris, moving as one or more units; commonly along cliffs and banks
E15	Dune migration	Movement of a dune by wind
E16	Earthquake damage	Ground cracking, up and down movement of soils, vibration damage, etc.
E99	Other (specify)	An environmental impact or threat not specified in the variable list
Animal Impacts		
A1	Burrowing	Holes or tunnels created by subsurface animal movement
A2	Trampling	Damage caused by animals, such as cattle, treading across a surface
A3	Trails (deer, etc.)	Tracks formed by regular movement of animals through an area
A4	Rodent damage	Excludes burrows. Chewing, gnawing, or nesting from site materials
A5	Scat piles	Discrete depositions of animal waste
A6	Shelter/den	Digging into matrix to create a semi-subterranean living/sleeping areas
A7	Insect damage	Chewing or burrowing damage from insects, such as termites
A8	Bird damage	Predominately damage from nesting activities or excessive excrement
A9	Bedding areas	Large circular areas of compacted vegetation
A10	Dusting	Dust create from surface deposits to clean feathers, skin, or fur
A11	Wall rubbing	Damage from repeated rubbing/abrading of structural remains
A12	Compacted area	An area were animal behavior has compressed soil deposits
A13	Livestock	Evidence of livestock grazing in the site area
A14	Displaced artifacts	Artifacts moved from their original placement by animal activity
A99	Other (specify)	An animal impact or threat not specified in the variable list

Human Impacts		
H1	Vandalism	Malicious damage or destruction of archaeological deposits
H2	Excavation (looting)	Excavation for the express goal of removing artifacts for personal gain
H3	Metal detecting related	Artifacts found through metal detecting but then discarded
H4	Trash/dumping	Deposition of trash or garbage, frequently as repeated occurrences
H5	Logging	Damage following timber harvesting activities
H6	Fire scars/pits/charcoal	Evidence of fires, often from camping or other recreational activities
H7	Graffiti/tagging	Scratching, painting, or marking of images or lettering
H8	Vehicle tracks, military (tracked vehicle)	Linear ruts formed by a tracked vehicle, with soil displaced on either side of the track
H9	Vehicle tracks, military (wheeled vehicle)	Linear ruts formed by a wheeled vehicle, with soil displaced on either side of the track
H10	Trails/paths	Unofficial track created by repeated foot traffic
H11	Roads	Unofficial track created by repeated vehicle traffic
H12	Artifacts removed	Artifacts removed from the surface of an archaeological site
H13	Artifacts displaced	Artifacts moved (but not removed) from their original placement on the surface of an archaeological site
H14	Backhoe/bulldozer trench	Mechanical excavation of a trench; may be looting related
H15	Surface features displaced	Structural remains (walls, etc.) moved from their original placement
H16	Surface features damaged	Structural remains (walls, etc.) or features altered by human interactions
H17	Excavation (other)	Excavation of soil deposits within a site other than for the purpose of looting, such as pits created as part of recreational activities
H18	Probe holes	Holes excavated by looters to find the extent of subsurface features
H19	Vehicle tracks, off-road vehicles	Unofficial Tracks caused by off-road vehicles, usually by recreational activities associated with all-terrain vehicles
H20	Development	Construction-related activities within or adjacent to site boundaries
H21	Bullet holes	Firearms damage, often from target practice at cultural remains
H22	Building material removed	Structural remains removed from an archaeological site
H23	Artifact/Collector's pile	Artifacts displaced from their original locations to a centralized point
H24	Fencing down/ removed	Destruction/removal of fencing used to protect/control site access
H25	Footprints	Human footprints present in restricted site areas
H26	Signs damaged/ removed	Destruction/removal of signs used to protect/control site access
H27	Rock art damaged/ removed	Destruction or removal of American Indian or other rock art
H99	Other (specify)	A human impact or threat not specified in the variable list

APPENDIX E: Site Monitoring and Condition Assessment Database User Guide

Maintaining monitoring data in an easily accessed digital format is important to program success. A relational database populated with archaeological site monitoring protocol development sample data from MCB Quantico was developed using Microsoft Access 2003 as discussed above in Section 3.2 of the Report. Simple graphical user interface forms were created within the database to facilitate queries and data entry. These forms include a Site Monitoring Program Inventory Form and a Site Monitoring Form for each site in the monitoring program. Each is described below. Site coordinates have been redacted.

Site Monitoring Program Inventory Form

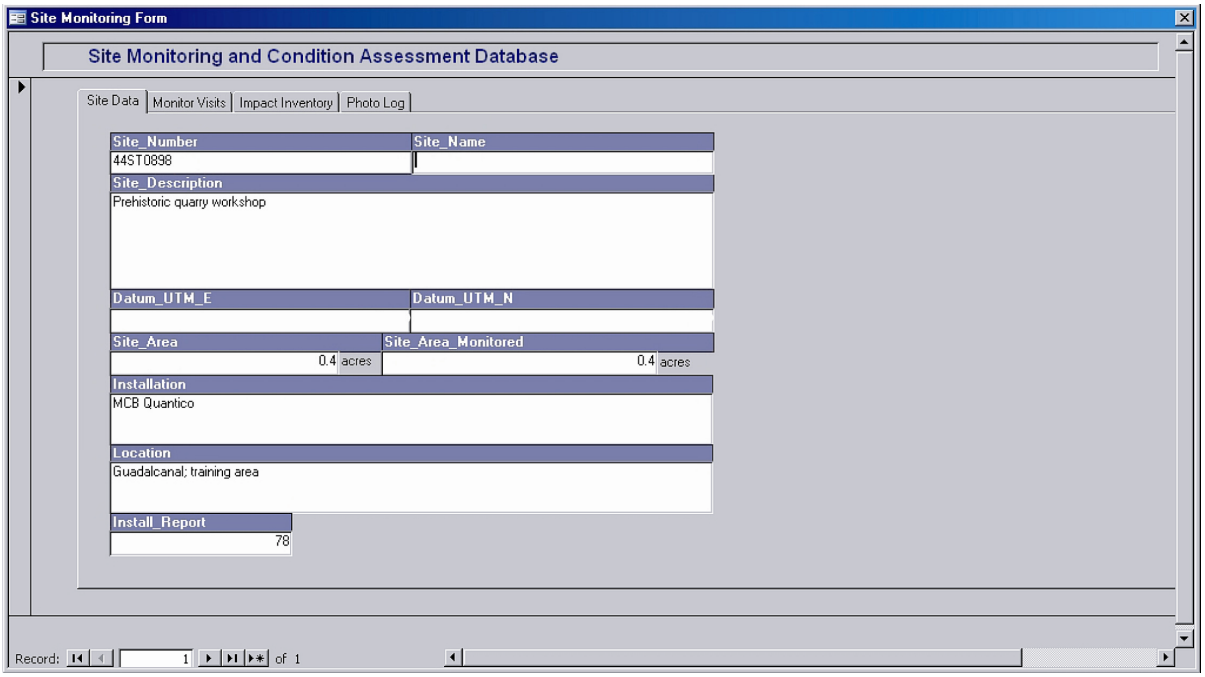


The Site Monitoring Inventory Form displays location information for each site within the database. The total number of resources within the database is shown in the bottom left corner. This form provides a search box in the upper right hand corner by which to query the list of sites by site number or part thereof. Individual Site Data Forms can be viewed by double-clicking the blue button under the Site Number column heading in the inventory table. When a site is added to the site monitoring program, a new record can be added within this form.

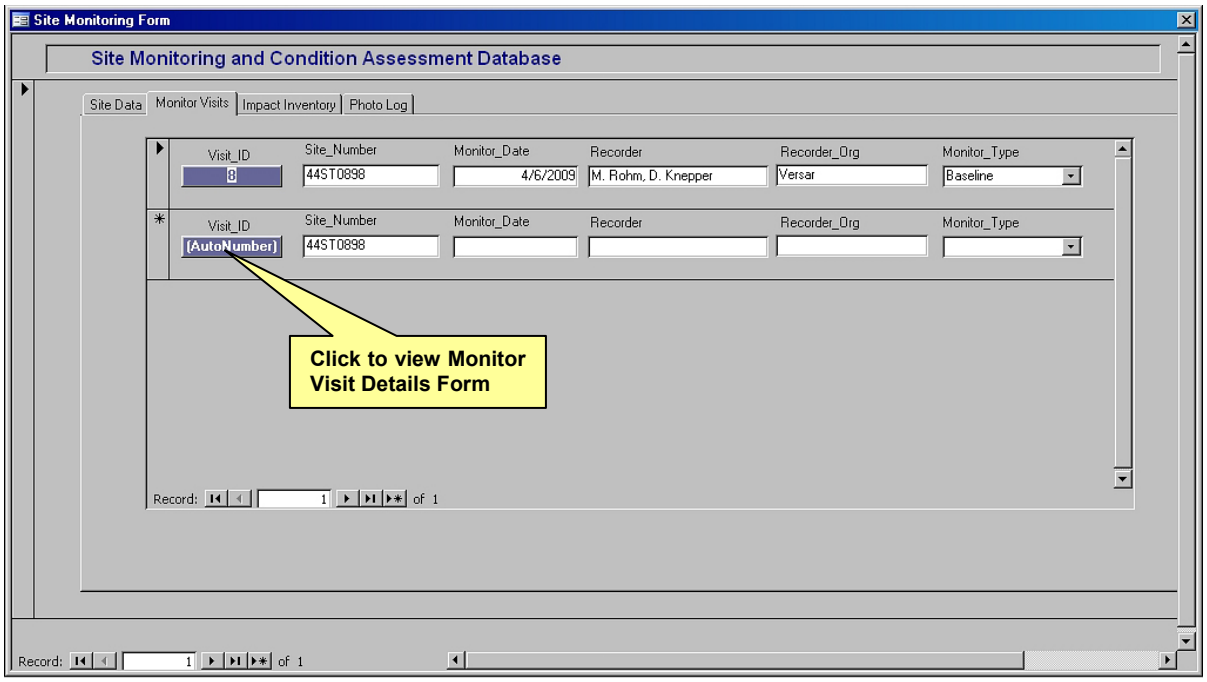
Site Monitoring Form

The Site Monitoring Form displays detailed information on each monitoring visit made to a particular site. The form contains a series of tabs with sub-forms including:

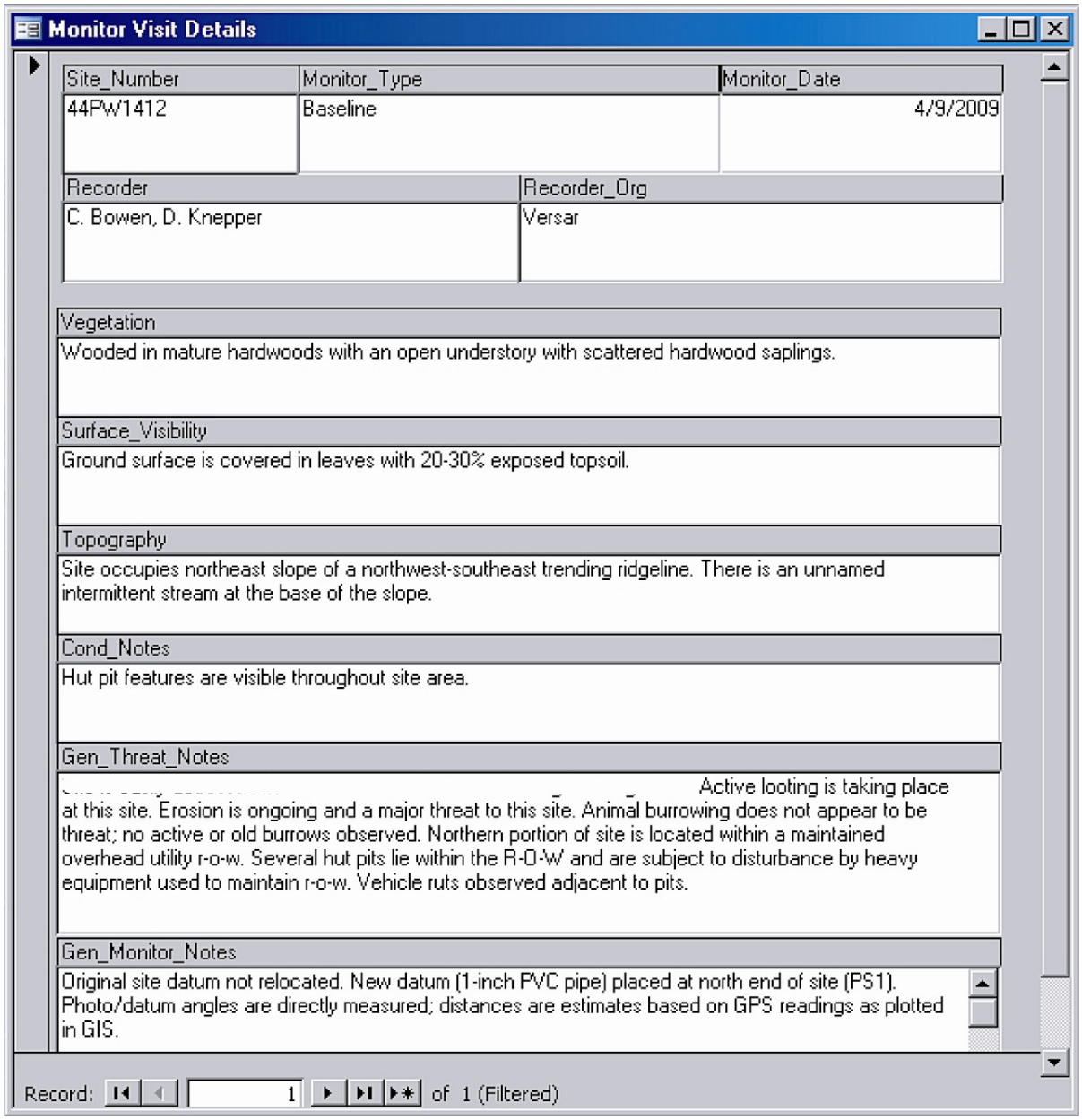
Site Data – Displays general site information including a brief site description, size, and location.



Monitor Visits – Lists monitoring visits by date, recorder, and type (e.g. baseline or follow-up). Double clicking the Visit ID button opens a Monitor Visit Details form.



Monitor Visit Details – Displays information pertaining to the current environmental conditions of a site during the monitoring visit as well as general notes on impacts, threats, and any information pertaining to the monitoring process (i.e., conditions effecting the visit or particulars of datum placement).



Impact Inventory – Lists individual impacts and/or threats to site by date recorded and type. Alphanumeric codes are provided as a means of keying specific impacts to the site map. Impact Codes can be selected from a drop-down list within the field. Impact Agent and Impact Type are automatically entered based on the selected Impact Code. A list of codes and their definitions can be viewed by clicking the command button at the bottom of the form.

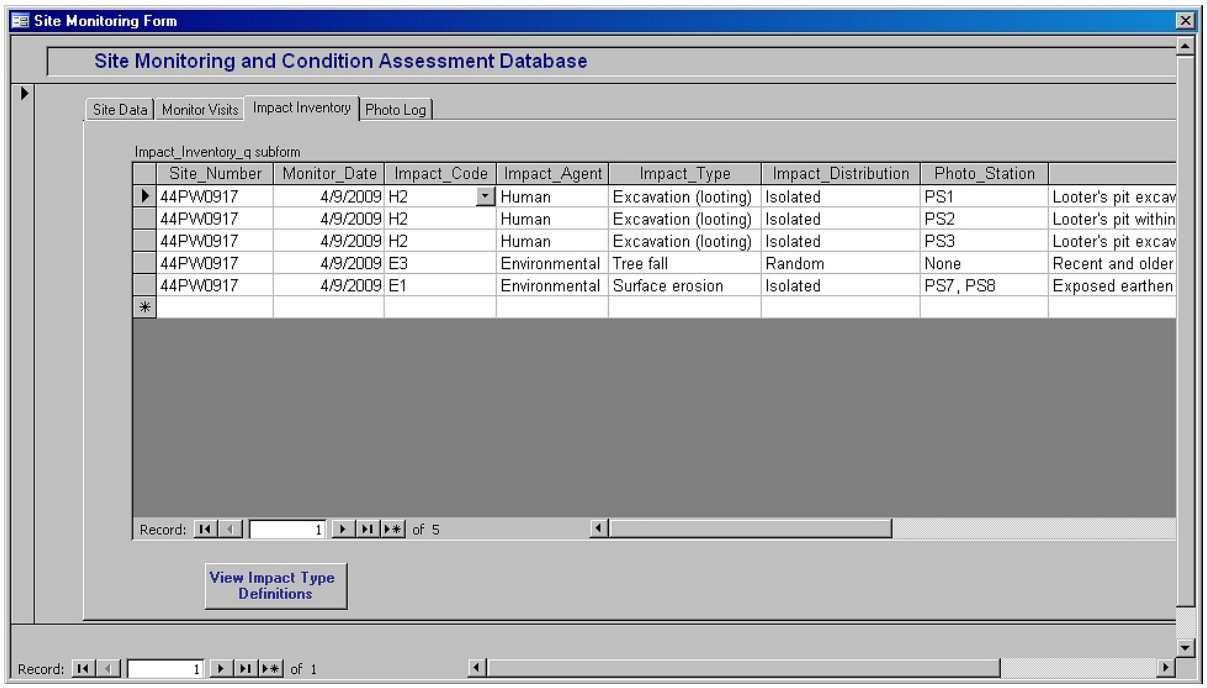
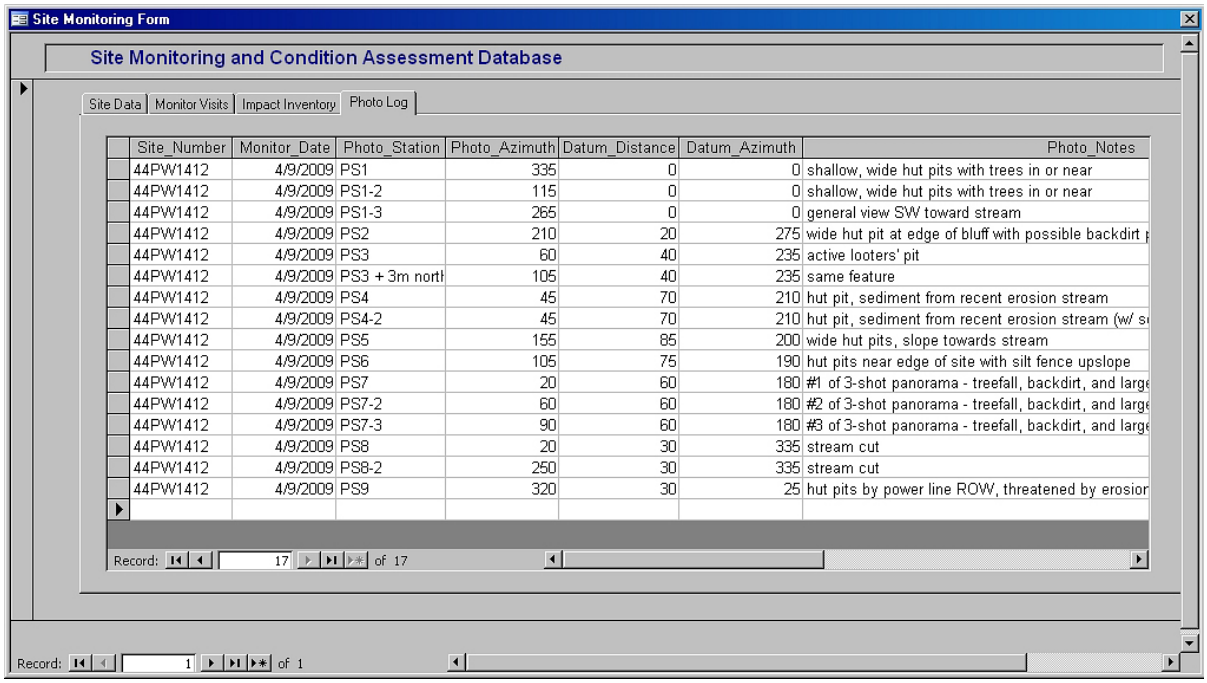


Photo Log – Lists photographs or digital images taken of the site listed by Photo Station number, date, and location relative to site datum.



Instructions for adding hyperlinks to photographs (digital image files):
Navigate to the Site Monitoring Form for a particular resource and click on the Photo Log tab. Place the cursor within the "Photo_Image" field and select from the MS Access menu bar: Insert/Hyperlink (or Ctrl+K) and navigate to the location of the image file to be inserted. The image file and database must reside on the same machine or server.

Appendix F:
Archaeological Site Monitoring and Condition Assessments
Follow-Up Monitoring - Field Documentation
Guidelines and Instructions

A comprehensive site monitoring program begins with professional archaeologists collecting baseline data for each site against which to compare the findings of subsequent monitoring visits. These data have already been collected and are included in the packet of information provided.

The following is a list of tasks that must be completed as part of this monitoring visit:

- Site relocation (including relocation of datum established during baseline survey)
- Documentation of current site conditions (vegetation, surface visibility, observations of cultural materials or features)
- Assessment of past, active, and potential impacts or threats to the site (disturbances caused by environmental processes, animal behavior, and human activities)
- Photographic documentation using established photographic stations (note: new photographs should only be taken if necessary, i.e., if there have been significant changes to the site such as new disturbances, substantial changes to existing disturbances, &c.)

If the site appears to be in the same condition as documented in the baseline data, there is no need to fully complete the monitoring form or take additional photographs; the monitoring visit is complete. Fill out the top portion of the form (everything above the table) and make sure to check the box that indicates: "Site appears largely unchanged since last visit."

If changes are observed to previously recorded disturbances, or if new impacts are visible, this form must be completed in its entirety and new photographs taken. The new photographs should be keyed to existing photographic stations when possible, or new photographic stations may be needed. Clearly indicate any new photographic stations on the site map.

If the site is significantly disturbed, beyond what can be reasonably documented by this monitoring form, fill out the top portion of the form (everything above the tables) and make sure to check the box that indicates: "Significant impacts since last visit and a new baseline should be established for the site." Complete the monitoring form and take sufficient photographs documenting this damage to aid professional archaeologists with determining what course of action is needed with respect to the documented impacts. Take photographs and link them to existing photographic stations or establish new photographic stations if necessary.

These guidelines and instructions contain the following information for your reference:

- **Archaeological Site Monitoring Form – User Guide** provides explanations of the fields used on the monitoring form. Typical impacts are anticipated as a part of this

form, however, a list of additional impacts that may prove relevant, and their definitions, are also provided as part of the user guide to aid in your observations.

- **Photographic Log Form– User Guide** provides explanations of the fields used on the photographic log form.
- **Site Monitoring – Impact Codes, Definitions, and Additional Examples** provides definitions for the common impacts referenced on the monitoring form as well as additional examples to be used as needed. Some impacts may cause damage to a site or its environs on multiple levels, and each impact should be noted. For example, a flooding episode could uproot trees. In this case, both the flooding code (E7) and the tree fall code (E3) would be used and keyed to the appropriate photographic stations.

Archaeological Site Monitoring Form – User Guide

Field	Description
Site Number	Trinomial number (e.g., 44ST0302, 44PW1115), or other unique identifier.
Today's Date	Date on which site visit occurred (MM/DD/YYYY).
Recorder(s)	Names and affiliation of individuals conducting the site visit.
Total time on site	Time spent on monitoring the site (in minutes).
Date of last visit	Date on which last site visit occurred (MM/DD/YYYY).
Current Site Conditions:	
Vegetation and surface visibility	Description of vegetation (e.g., wooded in mature hardwoods with an open midstory of scattered hollies and laurel); and description of groundcover and an estimate of surface visibility (e.g., surface visibility 25% due to thick pine needles and fallen leaves).
Other	Include any relevant observations of the current condition of cultural materials or features exposed at the site. Also include additional environmental description here as appropriate.
Summary Observations:	
Site appears largely unchanged since last visit	Check this box if there are NO CHANGES in current site condition from previous visit
Impacts noted in last visit continue to be active, but no new impacts	Check this box if previously documented impacts continue to disturb the site (some change from pre-existing impacts , but no new impacts)
Significant impacts since last visit and new baseline should be established	Check this box if the condition of the site is significantly impacted from previous visit to the extent that new baseline data needs to be recorded.
Specific observed impacts/threats to site	
Impact Code	Code tied to specific impacts sorted by general type (environmental, animal, human). A list of additional impacts is included as part of this guide and should be referenced as appropriate.
Impact/Threat type	Descriptive name of impacts sorted by general type (environmental, animal, human).
Impact/Threat type & nature (past, active, or potential)	Is the impact past (e.g. flood damage or tree fall) actively damaging the site (e.g. animal burrowing or erosion), or do current conditions suggest future damage may occur (e.g. metal detecting on a Civil War site, development)?
Distribution	Describe the spatial distribution of the impact(s); isolated (single occurrence), random (e.g., tree fall, animal burrowing), or patterned (e.g., a series of looter pits)
Photo Station (PS#)	Corresponds to Photo Station Number (PS#) on Photographic Log.
Notes	Detailed description of impacts and/or addition comments (identify by Impact Code). Also can include the extent or dimensions and units of measurement as applicable.

Photographic Log for Site Monitoring Visit – User Guide

Note: Photographs only need to be taken ***if*** new disturbances or substantial changes to existing disturbances are observed (creating new photo stations as necessary).

Field	Description
Site Number	State trinomial, or other unique identifier.
Recorder(s)	Names and affiliation of individuals conducting site visit.
Datum	Enter datum coordinates (UTM, State Plane, Lat/Long)
Date	Date on which site visit occurred (MM/DD/YYYY).
Photo Station (PS#) Loc. /Other Loc.	Photo Station Location. Number Photo Stations sequentially.
Direction (azimuth)	Indicate direction to subject in degrees from magnetic north.
Distance from datum	Indicate distance of Photo Station from permanent site datum. Note units of measurement and method of measurement (direct, GPS, GIS).
Angle from datum	Indicate angle of Photo Station from permanent site datum
Description/Comments	Description or comments on subject of Photo Station.

Site Monitoring – Impact Codes and Definitions

(note: this list is not all-inclusive, other threats to site integrity may be present based on local conditions)

Code	Impact/Threat Type	Definition
Environmental Impacts		
E1	Surface erosion	Transport of soils from a landform by wind, water, or ice action
E2	Displaced vegetation	Vegetation uprooted through wind, water, or other action
E3	Tree fall	Uprooted tree causing damage and producing craters tree
E4	Fire (natural)	Forest fire altering surface artifact scatters or architectural ruins
E5	Water damage	Moisture accumulation causing molding or decay of cultural objects
E6	Bank erosion	Erosion along the margins of a creek, stream, or river
E7	Flooding	Catastrophic water damage that removes vegetation, features, and artifact-bearing deposits or covers a site with additional soil deposits
E8	Gullying	Channels cut in the earth by running water
E9	Root damage	Breaking, cutting, or desiccation of roots
E10	Damaged vegetation	Damage to plant leaves, stems, or other plant parts
E11	Freeze/thaw cycle	Physical weathering (exfoliation, cracking) of rocks or soil deposits following freezing and thaw episodes, which may repeat
E12	Rock/roof fall	Boulders, cobbles, or roof material (rockshelters) dislocated onto a site, crushing or compacting surface and near surface deposits
E13	Sheetwash	A fairly uniform layer of particles removed from an area's entire surface or deposited across an area's entire surface
E14	Slumping	Downward slipping of a mass of rock or unconsolidated debris, moving as one or more units; commonly along cliffs and banks
E15	Dune migration	Movement of a dune through interaction of sand deposits and the wind
E16	Earthquake damage	Ground cracking, horizontal and vertical displacement of soils, vibration damage, etc.

Code	Impact/Threat Type	Definition
E99	Other (specify)	An environmental impact or threat not specified in the variable list
Animal Impacts		
A1	Burrowing	Holes or tunnels created by subsurface animal movement
A2	Trampling	Damage caused by animals, such as cattle, treading across a surface
A3	Trails (deer, etc.)	Tracks formed by regular movement of animals through an area
A4	Rodent damage	Excludes burrows. Chewing, gnawing, or nesting from site materials
A5	Scat piles	Discrete depositions of animal waste
A6	Shelter/den	Digging into matrix to create a semi-subterranean living/sleeping areas
A7	Insect damage	Chewing or burrowing damage from insects, such as termites
A8	Bird damage	Predominately damage from nesting activities or excessive excrement
A9	Bedding areas	Large circular areas of compacted vegetation
A10	Dusting	Dust created from surface deposits to clean feathers, skin, or fur
A11	Wall rubbing	Damage from repeated rubbing/abrading of structural remains
A12	Compacted area	An area were animal behavior has compressed soil deposits
A13	Livestock	Evidence of livestock grazing in the site area
A14	Displaced artifacts	Artifacts moved from their original placement by animal activity
A99	Other (specify)	An animal impact or threat not specified in the variable list

Human Impacts		
H1	Vandalism	Malicious damage or destruction of archaeological deposits
H2	Excavation (looting)	Excavation for the express goal of removing artifacts for personal gain
H3	Metal detecting related	Artifacts found through metal detecting but then discarded
H4	Trash/dumping	Deposition of trash or garbage, frequently as repeated occurrences
H5	Logging	Damage following timber harvesting activities
H6	Fire scars/pits/charcoal	Evidence of fires, often from camping or other recreational activities
H7	Graffiti/tagging	Scratching, painting, or marking of images or lettering
H8	Vehicle tracks, military (tracked vehicle)	Linear ruts formed by a tracked vehicle, with soil displaced on either side of the track
H9	Vehicle tracks, military (wheeled vehicle)	Linear ruts formed by a wheeled vehicle, with soil displaced on either side of the track
H10	Trails/paths	Unofficial track created by repeated foot traffic
H11	Roads	Unofficial track created by repeated vehicle traffic
H12	Artifacts removed	Artifacts removed from the surface of an archaeological site
H13	Artifacts displaced	Artifacts moved (but not removed) from their original placement on the surface of an archaeological site
H14	Backhoe/bulldozer trench	Mechanical excavation of a trench; may be looting related
H15	Surface features displaced	Structural remains (walls, etc.) moved from their original placement
H16	Surface features damaged	Structural remains (walls, etc.) or features altered by human interactions
H17	Excavation (other)	Excavation of soil deposits within a site other than for the purpose of looting, such as pits

		created as part of recreational activities
H18	Probe holes	Holes excavated by looters to find the extent of subsurface features
H19	Vehicle tracks, off-road vehicles	Unofficial Tracks caused by off-road vehicles, usually by recreational activities associated with all-terrain vehicles
H20	Development	Construction-related activities within or adjacent to site boundaries
H21	Bullet holes	Firearms damage, often from target practice at cultural remains
H22	Building material removed	Structural remains removed from an archaeological site
H23	Artifact/Collector's pile	Artifacts displaced from their original locations to a centralized point
H24	Fencing down/ removed	Destruction/removal of fencing used to protect/control site access
H25	Footprints	Human footprints present in restricted site areas
H26	Signs damaged/ removed	Destruction/removal of signs used to protect/control site access
H27	Rock art damaged/ removed	Destruction or removal of American Indian or other rock art
H99	Other (specify)	A human impact or threat not specified in the variable list

Note: All information provided to and generated by monitors (including, but not limited to, site location information, site descriptions, reports, maps, and photographs) are the property of the agency administering the site. It is imperative that monitors hold program data in strict confidence.

Collecting artifacts is outside the regular scope of this monitoring program. Therefore, monitors should not collect any artifacts from lands they will be monitoring unless explicitly directed to do so by a cultural resources specialist working with the program.

Archaeological Site Follow-Up Monitoring Form

Confidential Information

Site Number _____ Date: _____

Recorder: _____ Total time on site: _____ Date of last visit: _____

Current site conditions:
Vegetation & surface visibility:

Summary observations (check only one):

Site appears largely unchanged since last visit ☐

Some new impacts, recorded on this form and with new photographs/photo log ☐

Impacts noted in last visit continue to be active but no new impact(s) ☐

Significant impacts since last visit and a new baseline should be established for the site ☐

Other monitoring notes (include observations of cultural materials or features):

**See user guide for additional impact codes. If there is more than one instance of an impact that need photo documentation, use separate lines & indicate as (Code)-observation#, e.g. E1-1, E1-2, etc.

Impact Code	Impact/Threat Type	Impact/Threat Nature			Distribution			Photo Station	Notes (Identify by Impact Code)
		Past	*Active*	*Potential*	*Isolated*	*Random*	*Patterned*		
Environmental Impacts									
E1	surface erosion								
E2	displaced vegetation								
E3	tree fall								
E4	fire (natural)								
E5	root damage								
E_____									
E_____									
E_____									
E_____									

Impact Code	Impact/Threat Type	Impact/Threat Nature			Distribution			Photo Station	Notes (Identify by Impact Code)
		Past	*Active*	*Potential*	*Isolated*	*Random*	*Patterned*		
Animal Impacts									
A1	burrowing								
A2	trampling (livestock)								
A3	trails (deer, etc.)								
A4	rodent damage								
A5	manure piles								
A____									
A____									
A___									
A___									
Human Impacts									
H1	vandalism								
H2	excavation (looting)								
H3	metal detecting evidence								
H4	trash/dumping								
H5	logging								
H6	fire scars/pits/charcoal								
H7	graffiti/tagging								
H8	vehicle tracks, military (tracked vehicle)								
H9	vehicle tracks, military (wheeled vehicle)								
H10	trails/paths								
H____									
H____									
H____									
H____									

Archaeological Site Monitoring
Baseline Data Gathering Form

Site Name or # 44PW917

Recorder(s): C. Bowen D. Knepper Date: 4/9/2009

Current site conditions:

Vegetation: Wooded in mature hardwoods with an open understory with scattered hollies.

Surface visibility: Ground surface is covered in leaves with 30-40% exposed topsoil; heavy pebble content.

Topography/drainage: Site occupies western slope of a south-trending ridge. Site area drains to the west toward the Creek.

Other (include observations of cultural materials or features): Hut pit features are clearly visible throughout site area.

Specific observed impacts/threats to site

Impact/Threat type & nature (past, active, or potential threat)	*Photo Station (PS#)*	*Distribution (Isolated, random, patterned)*	*Description/Comments*
Looter's pit (recent)	PS1	isolated	Looter's pit excavated within hut pit. Appears shovel-excavated; backdirt pile is visible, exposed. Discarded bottle fragments on ground surface adjacent to pit – placed back into hut pit by recorders. Lack of weathering and infill suggests this is recent activity (w/in a year). Pit measures 6-x-5-x-3 feet.
Looter's pit (recent)	PS2	isolated	Looter's pit within hut pit. Also appears recent. Pit measures 3-x-3-x-3 feet.
Looter's pit (recent)	PS3	isolated	Looter's pit excavated on top of ridge adjacent to shallow pit – either hut feature or older looter pit. Pit measures 2.5-x-2.5-x-1 feet.
Tree falls	n/a	random	Recent and older falls contribute to infilling of hut features. Also uprooted trees can displace soil from a feature and create pits that promote erosion.
Erosion	PS7 PS8	isolated	Exposed earthen berm adjacent to a row of hut pits is promoting erosion of the hut pits into a gully. Berm may be backfill from hut pits. Affected area measures 50-x-15-x-2-3 feet.

Archaeological Site Monitoring
Baseline Data Gathering Form

Site Name or # 44PW917

Recorder(s): C. Bowen D. Knepper Date: 4/9/2009

General threats (also note if there is no evidence of threats):
Site is easily accessed with plenty of foliage cover in the summer months. Weathered backdirt piles near some pits appear more recent than Civil War, may be older looter's pits perhaps 30-50+ years old. Some of these hut pits appear deeper than may have been originally excavated or necessary for such a feature – suggests looting. Late 1980's-early 1990's aluminum Budweiser cans are scattered at the top of the ridge (to south of datum). Surface artifact scatter is present at north end of site (vicinity of P.S. #5). Artifact types include a mold-blown, embossed panel bottle fragment, green and clear bottle fragments, strap metal, an iron bar or counter weight, and domestic ceramic fragments. Observed animal (groundhog) burrowing is minimal within the site area.

Monitoring notes: A datum for this portion of the site was placed at the top of the ridge in the southeast corner of the camp boundary.

APPENDIX G: Example of Baseline Data and Forms
Archaeological Site Monitoring
Photographic Log for Baseline Data Gathering Page# 1 of 1 of 1

Site Name or # 44PW917 Datum UTM:

Recorder(s): C. Bowen D. Knepper Date 4/9/2009

Photo Station (PS#) Loc. /Other Loc.	Direction (azimuth)*	Distance from datum*	Angle from datum*	Description/Comments
PS1	75º	50m	350º	looters' pit/artifact pile
PS1-2	n/a	50m	350º	2 additional photos – detail of artifacts and second image across backdirt pile
PS2	140º	35m	265º	looter's pit, no artifacts
PS3	345º	65m	165º	looter's pit, small, no artifacts
PS3-2	250º	65m	165º	same looter's pit
PS4	310º	55m	275º	general context
PS4-2	10º	55m	275º	general context
PS4-3	50º	55m	275º	general context
PS4-4	110º	55m	275º	general context
PS5	175º	85m	355º	general context
PS5-2	220º	85m	355º	general context
PS5-3	220º	85m	355º	general context, same as previous but portrait orientation
PS6	90º	60m	350º	tree disturbance in shallow hut pit
PS7	210º	50m	340º	linear erosion threat
PS8	60º	40m	320º	series of hut pits on slope, erosion threat
PS8-2	40º	40m	320º	series of hut pits on slope, erosion threat
PS9	85º	60m	300º	series of hut pits
PS9-2	130º	60m	300º	series of hut pits
PS9-3	220º	60m	300º	series of hut pits

** angles are directly measured; distances are estimates based on GPS readings as plotted in GIS*

Sample Baseline Data Gathering Photo Station Images

Figure B-1. 44PW917, Photo Station 1 (PS1), Recent Looter's Pit

Figure B-2. 44PW917, Photo Station 9 (PS9), Series of Hut Pit Features

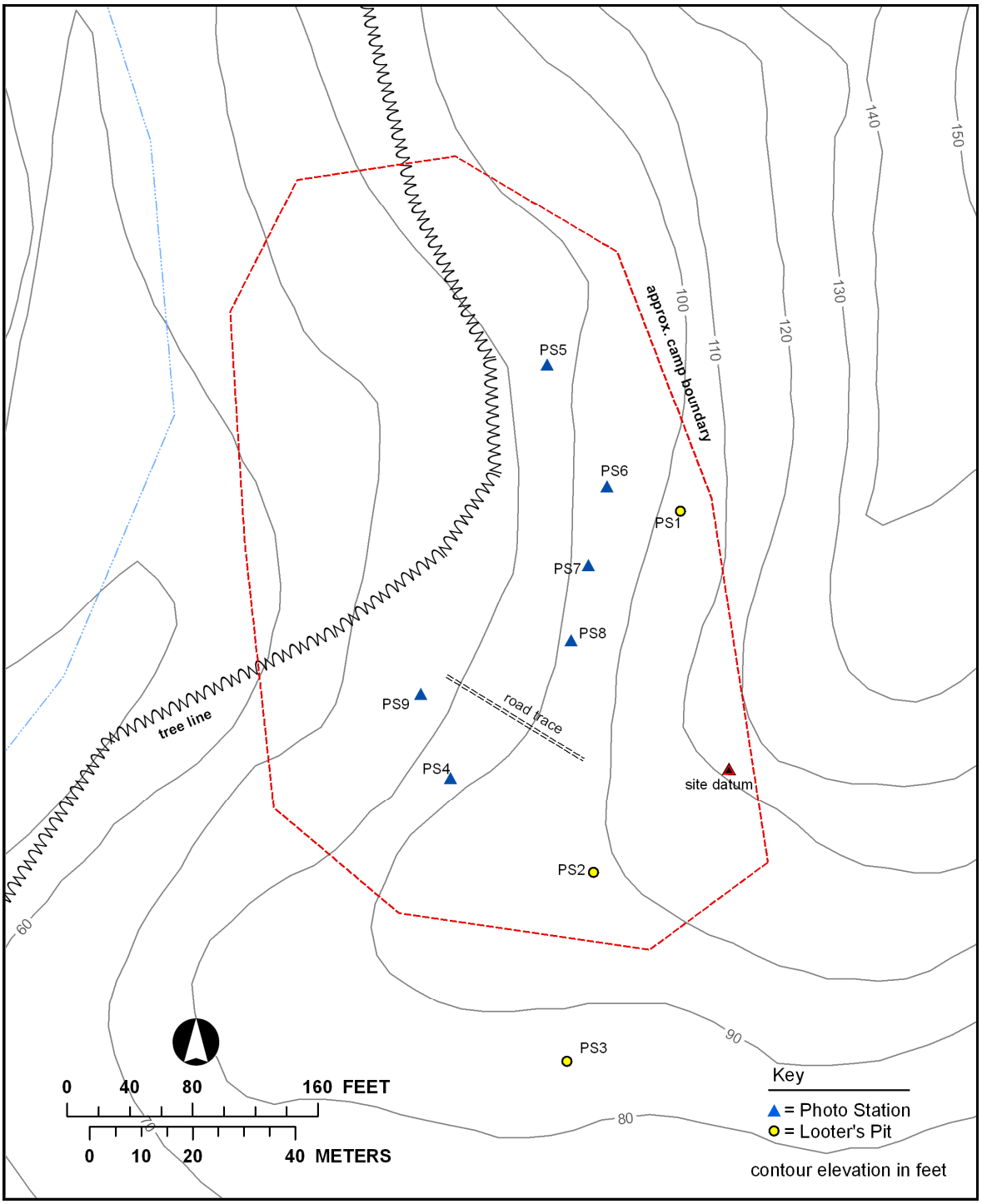


Figure B-3. 44PW917, Site Map Showing Data Points Collected During Baseline Monitoring.

APPENDIX H: Example of Follow-Up Monitoring Data and Forms

Archaeological Site Monitoring Form
Confidential Information

Site Number: 44PW0917 Date: 10/29/2009

Recorder: K Curry (MCBQ volunteer), MC Rohm (Versar) Total time on site: 140 minutes Date of last visit: 04/09/2009

Current site conditions:
Vegetation & surface visibility: Overstory of mixed mature hardwoods with some second growth; midstory of regenerating hardwoods and holly; no real understory; surface visibility 0% due to ground vegetation and leaf litter.

Summary observations (check only one):
Site appears largely unchanged since last visit ☐ Some new impacts, recorded on this form and with new photographs/photo log ☒

Impacts noted in last visit continue to be active but no new impact(s) ☐ Significant impacts since last visit and a new baseline should be established for the site ☐

Other monitoring notes (include observations of cultural materials or features):

Datum successfully relocated after searching. Description of datum location for baseline survey not accurate. The datum is not located at the top of the ridge as identified on the baseline form. The datum is located on a terrace below the ridge top. Difficult to find given description, scale of baseline map, and lack of GPS (poor satellite reception).

No evidence of new and/or active looting was noted. Were able to recreate most photo stations using the baseline site map and compass/pacing. Artifacts noted in PS 2 not visible. Surface artifacts either obscured due to heavy leaf litter or have been moved (by natural processes like erosion or by visitors to the site – not known). PS 5 only able to recreate generally.

This site needs to be accessed from a residential area during times when it is not feasible to use the golf course. Should confirm with MCBQ CR staff at some capacity to clear access issues in advance.

GPS not working (poor satellite reception).

**See user guide for additional impact codes. If there is more than one instance of an impact that need photo documentation, use separate lines & indicate as (Code)-observation#, e.g. E1-1, E1-2, etc.

Impact Code	Impact/Threat Type	Impact/Threat Nature			Distribution			Photo Station	Notes (Identify by Impact Code)
		Past	*Active*	*Potential*	*Isolated*	*Random*	*Patterned*		
Environmental Impacts									
E1	surface erosion								
E2	displaced vegetation								

Archaeological Site Monitoring Form
Confidential Information

Impact Code	Impact/Threat Type	Impact/Threat Nature			Distribution			Photo Station	Notes (Identify by Impact Code)
		Past	*Active*	*Potential*	*Isolated*	*Random*	*Patterned*		
E3	tree fall								
E4	fire (natural)								
E5	root damage								
E_____									
E_____									
E_____									
E_____									
Animal Impacts									
A1	burrowing		X		X			PS 4-5, 6	buck rub on tree (not visible in PS4-4) indicated deer activity in the area even though trails were not clearly visible
A2	trampling (livestock)								
A3	trails (deer, etc.)								
A4	rodent damage								
A5	manure piles								
A 99	buck rub		X		X			PS 4-7	
A____									
A___									
A___									
Human Impacts									
H1	vandalism								
H2	excavation (looting)								
H3	metal detecting evidence								
H4	trash/dumping								
H5	logging								
H6	fire scars/pits/charcoal								
H7	graffiti/tagging								
H8	vehicle tracks, military (tracked vehicle)								
H9	vehicle tracks, military (wheeled vehicle)								

Archaeological Site Monitoring Form
Confidential Information

Impact Code	**Impact/Threat Type**	**Impact/Threat Nature**			**Distribution**			**Photo Station**	**Notes (Identify by Impact Code)**
		Past	*Active*	*Potential*	*Isolated*	*Random*	*Patterned*		
H10	trails/paths								
H____									
H____									
H____									
H____									

Archaeological Site Monitoring
Photographic Log

Page#_2_ of _2

Site Name or # 44PW0917 Datum UTM:

Recorder(s): K Curry, MC Rohm Date 10/29/2009

Photo Station (PS#) Loc. /Other Loc.	Direction (azimuth)*	Distance from datum*	Angle from datum*	Description/Comments
PS 4-5	75	55m	275	active rodent burrowing at PS 4
PS 4-6	220	55m	275	active rodent burrowing at PS 4
PS 4-7	110	55m	275	buck rub – not visible in baseline PS 4-4

* note distance units and method of measurement (direct, GPS, GIS, etc.)

Sample Baseline Data Gathering Photo Station Images

Figure C-1. 44PW917, Photo Station 4 (PS4-6), Active Rodent Burrowing Visible in vicinity of PS 4

Figure C-2. 44PW917, Photo Station 4 (PS4-7) Buck Rub not Visible in Baseline (PS 4-4)

APPENDIX I: Site Monitoring Program Code of Ethics and Conduct

The following ethics code of conduct is based on volunteer training manuals developed by SHPOs in Arizona and New Mexico (AZSHPO 2009, NMHPD 2009). It is essential that all non-professional archaeologists working and/or volunteering for any site monitoring program follow a code of ethics and conduct. Generally, this means accepting a special responsibility towards unique and often fragile archaeological resources. It also requires the acceptance of cultural resource management law, a strict code of ethics, and, particularly in the case of volunteers, adherence to code of conduct. This insures the appropriate treatment and protection of not only the archaeological resources but all personnel involved in the reprocess.

The chief objective of any monitoring program is to prevent destruction of archaeological sites and to uphold all state and federal preservation (antiquity) laws. Therefore, all non-archaeologist employees and volunteers must be guided by a preservation ethic. It should be stressed that monitoring and non-collective surface investigation will be the only investigative methods used by the monitoring program. Participants must hold archaeological site location information in strict confidence due to legislated restrictions of site location information and that it will be made available only to the appropriate authority responsible for administering the lands involved.

It is recommended that this agreement be signed by every non-archeologist site monitoring participants. Minimally, however, this document needs to be reviewed and signed by all volunteers.

Adoption of this Code of Ethics and Conduct indicates agreement that the following rules will be observed:

Site Monitors Shall:

- **Comply with Preservation Laws**
  Monitors shall comply with all Federal, State and local antiquity laws and regulations.

- **Respect the Public**
  Monitors shall be courteous on public lands and respect private property.

- **Respect All Involved Personnel**
  Monitors shall work with and be respectful of all federal personnel as well as any designated outside parties that may provide oversight for the monitoring program.

- **Hold Site Information Confidential**
  Monitors shall not share site information with anyone outside the program; nor shall they put site location information on the Internet.

• **Adhere to Protocol for Bringing Others to a Site**

Monitors shall take only other monitors or professional archaeologists to archaeological sites; all others require permission from the appropriate source.

• **Report Violations**

Monitors shall give information about suspected violators of local, State, and Federal laws only to the appropriate law enforcement officer and to the land manager with the authority responsible for administering the lands involved.

• **Report Human Remains**

If human skeletal remains are found at a site, Monitors shall not photograph the remains nor disturb the remains, and shall immediately notify the appropriate, pre-determined contact.

• **Transfer of Documentation**

Upon termination of the site monitoring, each Monitor shall transfer to the all records, photographs, and other documents pertaining to the survey to the appropriate, pre-determined contact.

Site Monitors Shall Not:

• **Collect Artifacts**

Monitors shall not collect any artifacts unless explicitly directed to do so by the person in charge, and done under the supervision of a professional archaeologist who meets the federal and state permitting standards.

• **Maintain Site Documentation for Personal Use**

Monitors shall not collect, gather nor maintain documentation on archaeological sites for person use. This includes maps, site location information, photographs, and copies of any official site forms or sensitive information.

• **Conduct Media Interviews at a Site**

Monitors shall not conduct media interviews or participate in any other publicity concerning the location/condition of sites without the consent of the governing federal agency/installation and/or involved landowners/land managers.

SIGNOFF SHEET

The following personnel have read and understand the Code of Ethics:

NAME	SIGNATURE	DATE