CRM

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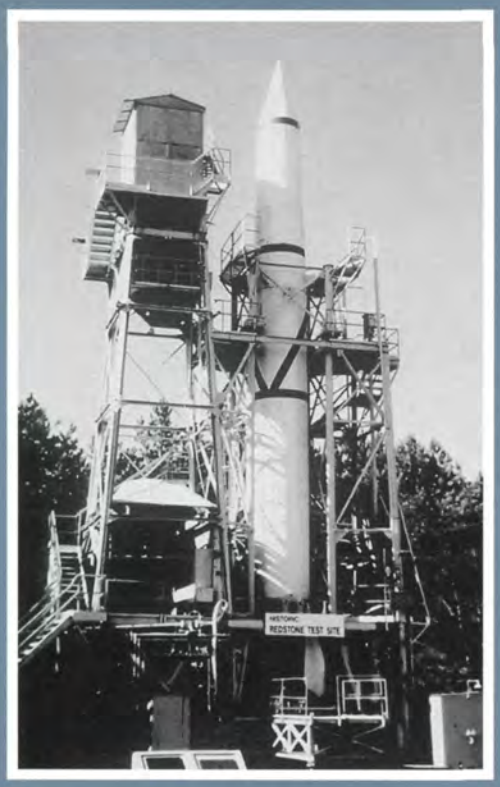
# Keeping the Peace and Protecting our Heritage



## *Cultural Resource Management in the Department of Defense*

U.S. DEPARTMENT OF THE INTERIOR
National Park Service
Cultural Resources

**PUBLISHED BY THE NATIONAL PARK SERVICE**

Information for parks, federal agencies, Indian tribes, states, local governments, and the private sector that promotes and maintains high standards for preserving and managing cultural resources

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*Cover: top left, Redstone Test Stand, a National Historic Landmark, at Redstone Arsenal, Huntsville, Alabama, photo courtesy U.S. Army Aviation and Missile Command; top right, spectacular pictorial records of prehistoric life and activity, Coso Rock Art National Historic Landmark, Naval Air Weapons Station, China Lake, California, photo courtesy Naval Air Weapons Station, China Lake; bottom left, pioneer cabin site on the grounds of the Air Force Academy, c. 1871, on the National Register of Historic Places, photo by Doug Ripley; bottom right, Spanish Colonial Revival style building, San Diego Marine Recruit Depot Historic District, photo courtesy San Diego Marine Corps Depot.*

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L. Peter Boice

# Seeking Innovative Solutions to Managing Cultural Resources in the Department of Defense

The Department of Defense (DoD) manages a wide range of unique cultural resources on its 25 million acres of public lands. Included are buildings, structures, sites, and objects associated with the historical growth and development of the U.S. military, as well as many other elements of American history and prehistory.

Cultural resources under DoD management include the impressive architecture of our military service academies and other historic military installations; Native American rock carvings and archeological sites; pioneer cemeteries, structures, and sites; sites and buildings associated with such major recent efforts as nuclear weapons development and the space program; historic aircraft and ships; and documents, photographs, and other objects associated with our nation's military history. These cultural resources are tangible reminders and symbols of people, events, and ideas that shaped our nation's character. They also are important because of their support of military mission goals, their contributions to military history and tradition, and their enhancement of quality of life for the residents, employees, and visitors to DoD installations.

*Brochure cover, courtesy Office of the Secretary of Defense.*

These facts notwithstanding, cultural resource management (CRM) is not a core element of DoD's primary mission of national defense. It is difficult to fund CRM requirements that are not strictly driven by legal compliance issues. And CRM usually lies "below the radar screen" with respect to its visibility to senior DoD officials. Consequently, DoD has been working to develop new solutions for CRM in the Department.

### *Identifying New Technologies for CRM*

A major recent initiative, jointly sponsored by the DoD Legacy Resource Management Program (Legacy) and the Strategic Environmental Research and Development Program (SERDP), was a CRM workshop held at Naval Air Station Patuxent River, Maryland, in June 2000. The workshop's goals were to define the state-of-the-art in CRM science and technology, define DoD's future CRM needs, and identify potential technologies to reduce costs and improve efficiencies. (The proceedings from this workshop are available at <http://www.denix.osd.mil>.) The Legacy and SERDP programs currently are evaluating the workshop's many recommendations to determine which offer the best short- and long-term opportunities.

One way that new technologies may help is by reducing the amount of field sampling through a better integration of techniques, such as predictive modeling, remote sensing, and geophysical prospecting. Equally important is to assess how well previous predictive techniques have worked.

### *New Tools for CRM*

DoD's new Integrated Cultural Resources Management Plan (ICRMP) Toolbox is discussed elsewhere in this issue (see Loechl and Whalley, p. 7). Another recently completed project is the Center of Expertise for the Preservation of Historic Structures and Buildings, U.S. Army Corps of Engineers, Seattle District's study, The Cost of Maintaining Historic Military Family Housing. This report looks at the current conditions of historic military family housing, and the factors affecting their maintenance costs. The report identifies improved management and operations procedures for both historic and non-historic housing.

New communications tools are also needed. For example, Legacy-SERDP workshop participants suggested a need for new tools to facilitate stakeholder involvement in Native American consultations. Documents such as Cultural Resources in the Department of Defense and DoD-specific training courses may help facilitate communications throughout the Department.

### *New Policies and Procedures for CRM*

A potentially contentious issue surrounds the questions "what should we preserve?" and "how should we preserve it?" While an idealist might be unwilling to sacrifice any artifacts, documents, buildings, or other cultural resources, others would argue that certain of these resources are of marginal value and are diverting scarce resources from more compelling needs. DoD has undertaken several major inventories to begin to address such issues.

A four-volume inventory, California Historic Military Buildings and Structures, analyzes the way in which these buildings and structures have been evaluated by the various DoD components in California, and provides a methodological and contextual framework to guide future work. It is hoped that the results of this study will identify those buildings and structures that DoD must protect, while permitting the Department greater management flexibility with others.

The nationwide curation needs assessment conducted by the Mandatory Center of Expertise for the Curation and Management of Archaeological Collections, U.S. Corps of Engineers, St. Louis District, may result in similar management flexibility (see Marino and Trimble, p. 11). For example, this seven-year study of almost 250 DoD collections identified many collections with substantial percentages of soil samples, and others with large amounts of fire-cracked rock. Because it is unlikely that these items have any significant scientific research value, it may be possible to delete these items from our long-term curation inventory.

### *Summary*

DoD continues to be a leader in federal CRM. The cultural resources under DoD control are significant national assets. Wise stewardship of these resources is DoD's moral and legal obligation. New technologies, tools, policies and procedures will help maintain DoD's ability to manage these resources for future generations.

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Paula A. Massouh

# The Department of Defense Legacy Resource Management Program

In 1990, Congress passed legislation that established the Legacy Resource Management Program. The program provides financial assistance to DoD efforts to enhance natural and cultural resource stewardship on military lands while supporting the military mission. Three principles guide the program—stewardship, leadership, and partnership. Since its creation, the program has funded several thousand projects ranging from threatened and endangered species protection to underwater archeology.

Due to legislative changes enacted in 1997, Legacy's emphasis has shifted from smaller installation-specific projects to broader, regional, national, and ecosystem-based projects. During FY1998-FY2000, Legacy funded approximately 60 cultural resource projects at military installations, totaling almost $35 million. This article will briefly discuss the application process as well as mention some of the projects funded during the designated period.

The Legacy Program Tracker at <http://www.dodlegacy.org> provides guidance on the Legacy application process. Interested applicants can submit their proposals electronically. Those accessing the system can then track the progress of specific proposals through the system.

The web site also provides information on the program, such as points of contact and review chains of command for each service, the submission dates, and areas of emphasis that relate to specific interests of the Department of Defense. Several of these areas of emphasis that pertain to cultural resources will be discussed later in this article. Users can also access information on the various projects that have been funded by Legacy.

Legacy funding is not restricted to military installations or their affiliates. Non-military personnel, such as at universities and non-profit organizations, can also apply for consideration, but must coordinate proposed projects with a particular service or command to ensure that their proposal has military support and supports the military mission. However, inclusion of a proposal in the tracking system does not denote DoD approval to fund a project. A review committee, consisting of DoD and service representatives, ultimately decides on whether to approve or reject a proposal.

Cultural resource projects funded during FY1998 -FY2000 covered a wide range of interests. One of the areas of emphasis, cultural resource management, encompasses projects involving a broad spectrum of cultural resources issues. In June 2000, Legacy funded a three-day workshop, co-sponsored with DoD's Strategic Environmental Research and Development Program (SERDP), in which the participants identified potential technologies that could be adapted to reduce costs and efforts in meeting cultural resources stewardship management at DoD installations. Other projects funded under this area of emphasis include an inventory of California historic military buildings and structures, a historic housing context study of historic family military housing in Hawaii, the conservation and recovery of submerged vessels, such as the *H.L. Hunley* (see Conlin, p. 35), and the creation of an Integrated Cultural Resources Management Plan Electronic Toolbox (see Loechl and Whalley, p. 7).

A second area of emphasis, curation of DoD-owned and controlled archeological properties and documents, pertains to the conservation

*A propellant static test in progress on a major propellant test stand at Edwards AFB, 1958. Many of these Cold War-era structures remaining at Edwards AFB have been determined eligible for the National Register and were included in an inventory of California historic military buildings and structures funded by the Legacy program. Photo courtesy National Archives.*

of DoD-owned and controlled archeological properties and documents. Since DoD owns more archeological resources than any other agency, Legacy has been committed to ensuring that DoD collections are protected and cared for in a professional manner. Legacy-funded projects have provided for the rehabilitation of DoD collections and the development of partnerships with institutions throughout the country that will curate collections. Other curation-related projects have funded studies that have identified the numerous DoD collections that are threatened due to poor storage conditions and relocation due to base closures and realignments (see Marino and Trimble, p. 11).

A third area of emphasis, recently added for FY2002, Native American issues, is applicable to both cultural and natural resource projects. Military installations contain sites and landscapes where American Indian, Alaska Native, and Native Hawaiian people lived. Therefore, we are seeking to support efforts that facilitate DoD-wide or regional efforts that protect, manage, and/or restore resources in these areas in a manner that is supportive of military activities and operations, meeting our obligations to federally-recognized tribes. Although this area of emphasis was recently added, Legacy has been funding projects relating to Native American issues. These projects include a knowledge-based system on the cultural affiliation of the Five Civilized Tribes that will be disseminated on the World Wide Web, as well as a Native American treaty research study that will define treaty obligations for DoD military installations.

Legacy has also funded projects dealing with GIS applications and geophysical studies of archeological sites, a historic buildings conference, cold war studies, conservation of historic books and documents, and the publication of a new cultural resources booklet. The program will continue to encourage new approaches and creative partnerships to promote cultural resources management on DoD lands.

The Legacy program also has reached out to those outside of the DoD sphere by publicizing its accomplishments through attendance at national conferences and meetings. Legacy provided a display on the Integrated Cultural Resources Management Plan (see Loechl and Whalley, p. 7) at the Cultural Resources 2000 conference held by the National Park Service in Santa Fe, New Mexico, December 4-8, 2000. At the annual meeting of the Society for Historical Archaeology, held in Long Beach, California, January 10-13, 2001, Legacy provided a display relating to the underwater archeology projects that it has funded over the past few years.

As we begin the 21st century, it is important that we conserve and defend our cultural resources that represent our national heritage. Projects such as those funded by the Legacy Resource Management Program can help the Department of Defense support its mission while also preserving the past to the benefit of future generations.

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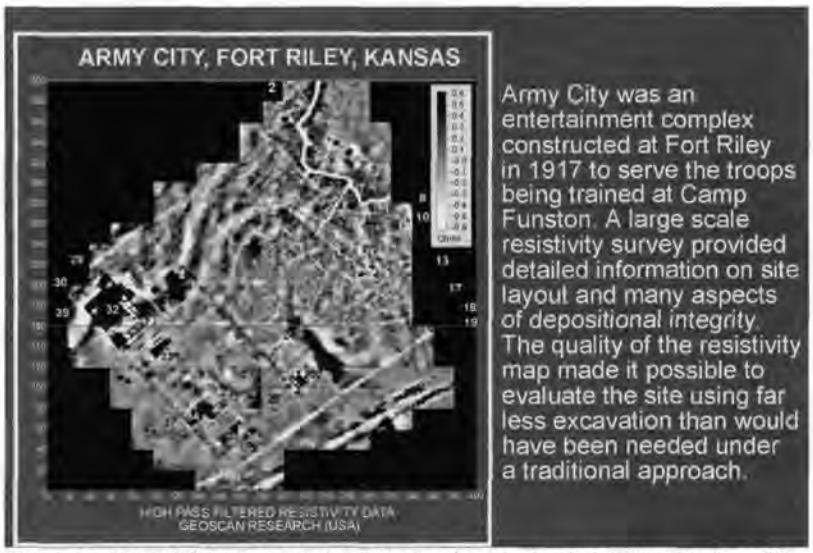



*Example of a resistivity map produced from a Legacy funded project dealing with geophysical applications. Courtesy Construction Engineering Research Laboratory (CERL).*

Suzanne Keith Loechl and Lucy Whalley

# Integrated Cultural Resources Management Plan Electronic Toolbox

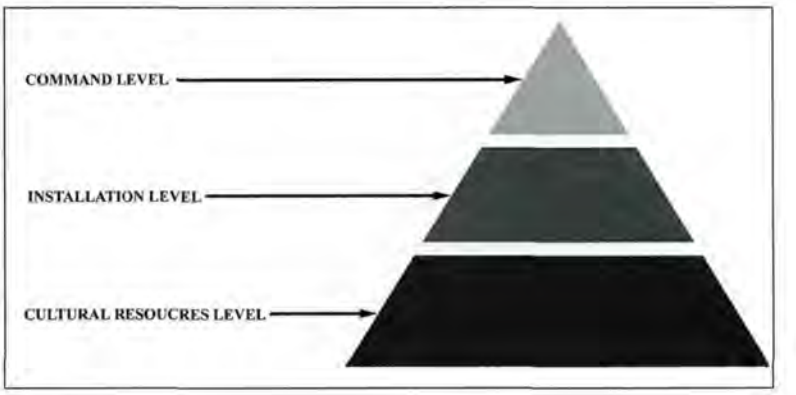
A new web-based toolbox can help Department of Defense (DoD) cultural resource managers tailor required plans according to the unique needs at each military installation. Available on the Defense Environmental Network and Information Exchange (DENIX), (http://www.denix.osd.mil/ICRMP), the toolbox contains supporting documents and sample plans to assist in developing Integrated Cultural Resources Management Plans (ICRMP).

DoD is committed to comprehensive land management and is faced with complex land management issues. The need to train the nation's military forces while protecting our natural and cultural heritage is a major challenge that necessitates an integrated and comprehensive approach. To this end, DoD Instruction 4715.3 requires installations to develop plans for integrated cultural resource management. ICRMPs are part of a larger land management program that balances land and heritage conservation with the needs of the military mission.

The new *integrated* plans respond to the need for cultural resources management to encompass the entire range of cultural resources issues and manage them to meet legislative as well as military mission requirements. The concept of integrated cultural resources management is mirrored in DoD's Integrated *Natural* Resources Management Plans that integrate a variety of related natural resource elements with other base functions, including military training. Prior to the new DoD Instruction in 1996, cultural resources were managed either by Historic Preservation Plans or Cultural Resources Management Plans. These were developed independently from plans supporting the primary installation mission. *Integrated* Cultural Resources Management Plans take a proactive approach by integrating the entire installation cultural resources program with ongoing mission activities, and allowing for identification of potential conflicts between the installation's mission and cultural resources management.

The ICRMP also aids in determining what funding is needed to meet compliance requirements over a five-year period by addressing cultural resources issues that are most at risk due to impacts from the military mission and other factors. The requirements would depend on the historic nature of the installation and the state of its cultural resource program. Examples include archeological, historic building and landscape assessments, and traditional cultural properties. The ICRMP provides a forum to examine long-term management goals, to establish short- and long-term priorities, and to develop strategies to meet these goals. Each year the plan can be updated to incorporate new information and activities. After a five-year period, the plan receives a major review. Thus, the plan follows a pattern similar to and integrated with the rolling five-year fiscal program and budget cycle used by DoD.

The organization of the ICRMP is similar to a pyramid that represents three hierarchical levels of information. At the top level of the pyramid, the installation command focuses on the military mission as well as the current status and future requirements of the cultural resources program. By approving the plan, the command signals confidence in program management and del-




*ICRMP pyramid structure.*

*Officers' Quarters at Parris Island, South Carolina, 1920. Photo courtesy Parris Island Marine Corps Recruit Depot Museum.*

egates authority and responsibility to the cultural resources manager. At the middle level of the pyramid, information is disseminated to and integrated with other installation offices that have the potential to impact cultural resources. At the bottom level of the pyramid, the cultural resource manager develops procedures to maintain continuity in the program, identify gaps, and determine future requirements.

Since 1998, the Legacy Resource Management Program has provided funding to the Construction Engineering Research Laboratory (CERL) in Champaign, Illinois, to conduct a needs assessment and create a prototype for a DoD-wide tool to develop ICRMPs. CERL hosted a workshop attended by cultural resource professionals from all levels of the services. The purpose of the workshop was threefold: to learn how each service interprets the DoD Instruction; to understand how cultural resources and other installation offices currently integrate cultural resources management into the larger program, and to brainstorm ideas for how to best approach the ICRMP requirement to serve all of the Department of Defense.

The workshop attendees unanimously agreed that guidance provided to cultural resource managers to develop ICRMPs should not be a "cookie cutter" approach, but consist of a set of tools to help them develop an individual ICRMP specific to their installation's needs. Therefore, per the suggestion of one of the attendees, a "toolbox" which could provide information and guidance for developing a plan was developed.

Since the workshop, a multi-disciplinary team of cultural resource professionals at CERL developed a web-based Integrated Cultural Resources Management Plan Electronic Toolbox that was implemented at three different installations: Fort Lewis, Washington (Army); Washington Navy Yard, Washington, DC (Navy); and Marine Corps Recruit Depot Parris Island, South Carolina (Marine Corps). The implementation of the toolbox at these three installations helped to augment the toolbox during its development. A prototype plan for the Air Force is currently underway for Edwards Air Force Base, California.

The toolbox is organized into four major components of the plan: management, integration, monitoring, and reporting. The management section contains information about cultural resource management and provides tools to assist with the assessment process. The integration section outlines the general installation structure for each of the services and describes the philosophy behind successful integration. The monitoring section stresses the importance of monitoring the success of the cultural resource program once the plan is in place. The reporting section lists the major reporting requirements for each of the services.

The main window in the toolbox provides general information about cultural resources legislation, planning level surveys, and installation context. A standardized menu on every page provides links to the DoD Instruction, individual service regulations and guidance, and a list of acronyms. A links page also provides access to many cultural resources web sites, such as the National Register of Historic Places, the Advisory Council on Historic Preservation, and sites relating to Native American consultation.

Finally, the toolbox contains a prototype window that provides access to the prototypes previously discussed which can be downloaded from the web site. While each plan was developed to address the specific needs of each installation and service, all the plans are similar in nature.

The toolbox is currently on DENIX and is under formal review by cultural resource offices throughout DoD. Once the review comments are reviewed and incorporated, the toolbox will reside on DENIX permanently. Ongoing management of the toolbox will ensure web links, legislation, and other components are updated accordingly.

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Newell Wright, Vista Stewart, Tegan Swain, and Lynn Shreve

# Using GIS and the Web on Eglin AFB

The Department of Defense, as stewards of military lands, considers cultural resource protection a part of its central mission, "the defense of the United States – its people, its land, and its heritage."* At Eglin Air Force Base, protecting cultural resources includes using the newest Geographic Information Systems (GIS) and web technologies.

For the past several years, Eglin has incorporated both of these technologies into daily operations for the identification, documentation, protection, and maintenance of the archeological and historic properties on the base. The GIS is a mapping, photography, remote sensing, Global Positioning System (GPS), and database management tool united into a single system and distributed on inter-office and base-wide levels. The Eglin web page is the base's primary public information distribution medium while it has improved the efficiency of various missions.

Eglin is the largest single land holding air force base in the free world. Consisting of 464,000 acres—720 square miles—it is located in the western region of the Florida panhandle bordering the Gulf of Mexico. Close proximity to coastal waters and abundant terrestrial resources have made this location attractive to human inhabitants for thousands of years. Prehistoric site types on Eglin AFB include small early Archaic temporary campsites to sizeable late Mississippian villages (7000 B.C.–A.D. 1500).

In addition to prehistoric settlement, Eglin has a rich history of colonial settlement, pioneering homesteads, naval stores, and military activity and testing. The first military use of Eglin as an auxiliary field and bombing and gunnery range occurred in 1935. Soon after, approximately 300,000 acres were acquired from the Choctawhatchee National Forest which provided a larger installation for military research and development. Evidence of forestry and military activity is suggested by the remains of homestead sites, turpentine camps, historic military structures, laboratories, firing ranges, abandoned missile testing sites, and simulated villages.

Due to the existence of historic buildings listed on the National Register of Historic Places, Eglin has established two historic districts. Camp Pinchot Historic District is a group of historic Forest Service buildings that have been preserved and are currently being used as an integral part of the mission. The Eglin Field Historic District is a group of buildings constructed during WWII that have been preserved and restored to provide offices for base personnel serving in administrative, legal, research, and hospital related positions. The Cultural Resources Management Office is currently in one of these rehabilitated structures. Eglin is therefore provided with evidence of a cultural past ranging from prehistoric camps to abandoned missile test sites. With resources this diverse and geographically separate, electronic technologies provide the most efficient method of location and documentation.

The primary focus of the GIS program is the inventory, evaluation, preservation, and documentation of archeological sites and historic structures. GIS greatly facilitates the mapping, recording, and in some instances relocation of resources across the property that makes up the Eglin military installation. Environmental Management Historic (EMH), the division responsible for historic preservation, worked with the Florida State Historic Preservation Office (SHPO) to implement a preservation program applicable to Eglin AFB. In the 1980s, EMH conducted quarter section surveys of the base and developed a probability model for archeological occurrence. The high probability zones were determined to be primarily within 656 feet and 50 feet in elevation of previous or existing water resources. Areas of documented activity such as mills, structures, homesteads, or historic military properties were also given high testing precedence. Enhanced GIS planning increases the ability to observe inventoried areas where missions are planned, and also to evaluate zones of interest to the installation prior to a mission occurring.

As a tool of the preservation management process, high probability zone maps are available base-wide. Point and click menus, similar to

Microsoft Word or Microsoft Excel menus, assist the user in creating maps for their projects through a customized Microstation Viewer. Mission planners can create composite maps for locations within the Eglin AFB boundary by overlaying maps of various streams, test areas, historic buildings, and high probability zones for recovery. There is also a zoom feature which highlights only the area slated for activities. In this way planners can produce customized maps from their own computer and print or send these maps over the web to fellow planners and other offices.

EMH works closely with the Natural Resources office during controlled burns and timber sales to preserve combustible, nonrenewable, and other at-risk resources across Eglin by exchanging maps through the Microstation Viewer. The availability of the viewer to the entire Eglin command facilitates information sharing and increases awareness of resources and promotes compliance with protection requirements.

Mission planners can easily view the area slated for activities and incorporate resource concerns in their strategy. A customized cultural resources viewer created for EMH expedites accessibility to GIS maps and database information needed to assist other base divisions.

Eglin uses the Trimble Global Positioning System to facilitate navigation to known sites, record new site locations, and document shovel tests locations and results. Data obtained from these investigations is then entered into an electronic database and appended to precise real time location maps. The Trimble units give a differential GPS location reading to within +/- 50 cm. Data downloaded from the field is incorporated into an Access Database. The information is exported through an Open Database Connectivity (ODBC) link to generate Area, Site, and Artifact maps. This process of electronic transfer has improved the accuracy and reliability of the survey and testing outcomes. Existing State of Florida site forms have also been incorporated electronically allowing EMH to access information from previously investigated sites, enter updated information, and record new sites, through easy entry menu screens. The GIS system also has the capability to link artifact provenience with site location and curation records.

Eglin's Historic Structures Program is conducting an inventory of structures that are at least 50 years old, as well as Cold War structures. GIS provides extensive assistance in the inventory of these structures by visually representing the properties to be evaluated. Digitized locations of historic structures, photos of historic buildings, and database information about buildings are all part of the GIS. Smart maps contain both digitized graphical information, such as roads and structures, and also imbedded photos and database links to the Historic Structures Site Form.

EMH in consultation with the SHPO is in the process of determining National Register eligibility and significance of these structures. The historical structures database was developed similar to the archeological site form to include easy entry menu screens. As information about these buildings is entered into the database, it is linked to the GIS. To assist the base in planning efforts, a Historical Structures web page has been posted on the base Intranet. The Eglin Historic Structures web page provides the status of each historical building on base and connects to both the photo library and the GIS mapping.

The Eglin Intranet's access is limited to the Air Force and contains the Historic Structures Web Site for managing Eglin's historic structures as well as the cultural resources management plan (CRMP) with hyper links for project planners. The Eglin Historic Structures web page provides identification and current status information on all of Eglin's historic structures. Access to this web page allows mission planners to obtain the most recent information pertaining to historic structures, including management decisions regarding long-range mission uses. Each structure's evaluation and status are featured on its own page with links to photos, GIS mapping locations, and their National Register significance. Additional links to a consultation page summarize the SHPO's concurrence or determinations.

Preserving Eglin Air Force Base's rich and diverse history requires education at all levels of the Base community. The Cultural Resource Management Program has implemented GIS and web technology to promote coordination and cooperation within the Air Force command. GIS allows the easy transfer of maps and information, between Environmental Management, Civil Engineering, Test Wing, and other tenants on Eglin AFB. This facilitates the simultaneous goals of preventing mission delays and proactive preservation. Web technology is promoting

information sharing and training by making pertinent information easily accessible. This is especially true with the management and preservation of historic structures.

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Note

* *Cultural Resources in the Department of Defense*, R. Christopher Goodwin & Associates, Inc. for Legacy Resource Management Program, (1991), 2.

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Eugene A. Marino and Michael K. Trimble

# Stewards of the Past

## Archeological Collections and the DoD

For over 60 years, federally-sponsored archeology has occupied itself with one major function—excavation. Excavation has taken many forms, from massive earthmoving ventures to meticulous layer-by-layer scrutiny of the past, and has resulted in the generation of countless artifacts that span prehistoric and historic times. Congress, likewise, has long recognized the importance of archeological sites on federal lands and has passed numerous laws, such as the Archaeological Resources Protection Act of 1979, that are aimed at protecting these resources.

Although collections from public lands have existed since before the beginning of the 20th century, those made prior to the 1920s and '30s were relatively limited in volume. It was not until the Great Depression years (1930s) and again during the River Basin Survey era (late 1940s through the mid-1980s) that federally-funded, compliance-driven archeological projects succeeded in creating both a substantial database for American archeology and a long-term problem that continues to plague the field today; namely, that the amount of professionally-appropriate museum space available for collections storage could not keep pace with the level of excavation that was being maintained throughout the country.

By the early 1970s, the archeological community recognized that outdated storage practices and overcrowded repositories were no longer adequate. However, most federal funding for archeology continued to go toward compliance-driven excavation and not long-term management of collections, even though federal laws call for both. Between 1970 and 1990, many collections became seriously compromised due to inappropriate storage methods, general neglect, and lack of funds.

In September 1991, the National Park Service released 36 CFR Part 79, a regulation that established guidelines to be followed by federal agencies to properly curate prehistoric and historic cultural materials and their associated documents. Shortly after publication of this regulation, the Department of Defense (DoD) Legacy Resource Management Program entered into an agreement with the newly established U.S.Army Corps of Engineers Mandatory Center of Expertise for the Curation and Management of Archeological Collections, located at the Corps' St. Louis District, to identify and locate all DoD archeological collections, assess their condition, and estimate the requirements needed for their long-term management.

Identification began with a blanket literature review of all pertinent written information pertaining to archeological work on DoD land; the hypothesis being that the documents would, in turn, lead to locating the collections. Though

tedious, the strategy proved effective in locating the 200-plus repositories holding over 18,000 cubic feet of archeological material and 2,500 linear feet of associated documents from 196 military installations across the country.

Once a collection, defined here as artifacts **and** associated records, was identified, the next steps were to physically visit and inspect the materials and then form recommendations as to their future curation needs. Information gathered from these phases included collection size and composition—two pieces of information critical to understanding specific conservation and long-term care requirements of the collection.

Also gathered was information on the level of labeling and extent of processing in order to determine how locatable and accessible a collection is and what work has been done and what work remains to be completed before materials are ready for long-term storage.

Equal emphasis was placed on the examination of both artifacts and records during the inventory process. Documentation is an extremely important part of any archeological collection. If this documentation is not stored properly, the artifacts become the only tangible evidence that the site ever existed. Further, if the records are not maintained and the artifacts are poorly curated, future research using the artifacts may be extremely limited if not impossible.

Because curation has been neglected, long-term management of federal collections has been uneven and collections are often housed in repositories that are inadequate for long-term storage. These facilities may possess staff with training in curatorial practices, but may not possess the necessary infrastructure to accommodate the range of curation needs that some collections require. Similarly, collections located in institutions that purport to be long-term curation facilities may still reside in substandard containers. In some cases these collections have been neglected for decades, remaining untouched since they were excavated.

Not all long-term repositories are in such dire straits. In fact, several were visited that serve as excellent examples of proper curation and collections management. However, until a national strategy for collections management is adopted and the necessary funding is made available, proper curation facilities will continue to be the exception rather than the rule.

To date, the DoD response to curation has been comprehensive and far reaching. For instance, the agency has developed a national plan to inventory all collections from their lands; used the findings of the inventory to illustrate the need for better collections management and begun to identify professional repositories to meet these needs; and begun to address rehabilitation of its materials so that they can be preserved by professionals, cataloged for easy access, and used by interested researchers.

Implementation of these steps will help to ensure that DoD archeological collections receive proper, standardized care by qualified individuals and will help validate the considerable financial investment made by the American taxpayer for archeology by allowing for greater use of the collections for research and general educational pursuits.

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Cheryl L. Huckerby

# Fort Hood, Texas

## CRM in the Home of the Army's Largest Fighting Machines

Fort Hood's Cultural Resource Management program is an integral part of the fort's mission to provide an efficient and effective training facility through an active program of identification, assessment, protection, monitoring, and education of cultural resources. The program sustains training by providing options that avoid impacts to resources and assists in creating a safe training environment by identifying potential hazards associated with some resources that need to be avoided, such as historic well and cistern locations. In addition, Fort Hood's CRM program research provides information to military and other landscape users, e.g., geomorphologic units, erosion patterns, and relationships between locations of past usage areas and the landscape topography. Most importantly the program supports the installation's mission by increasing awareness of the presence and importance of cultural resources and by providing a link to identify these resources as part of our American heritage that the Department of Army protects.

### *Background*

Fort Hood is located in central Texas, approximately one hour south of Waco and one-hour north of Austin. Its boundaries encompass approximately 220,000 acres (349 square miles) of diverse landscape. The terrain is varied with gently rolling, open hills on the west side and 200 to 300 meter (600 to 900 foot) escarpments on the east side. The installation consists of a live fire area, training maneuver areas, and a cantonment. The cantonment borders dense residential and commercial development. The majority of the installation borders low-density residential development and agricultural lands used primarily for livestock grazing.

Camp Hood formally opened for troop training in September 1942 and provided training grounds for over 130,000 troops. In the 1950s, the Department of the Army designated Camp Hood a permanent post, renamed the installation "Fort Hood," and acquired approximately 50,000 acres concurrently with the acquisition of land for Belton Lake Reservoir. Over the years, Fort Hood has expanded through a series of smaller land acquisitions to accommodate new equipment and training needs. Today, Fort Hood owns all but approximately 6,000 acres adjacent to Lake Belton which are leased from the U.S. Army Corps of Engineers (ACOE). Fort Hood's CRM program has oversight responsibility for the entire 220,000 acres.

Fort Hood is the largest armored post in the United States and is home to two armored divisions. It is also home to Headquarters III Corps Phantom Command and is the primary training resource for the 49th Armored Division of the Texas Army National Guard. Fort Hood supports two major airfields, the Robert Gray Army Airfield and Hood Army Airfield.

*Example of Fort Hood landscape. Photo by the author.*

*Projectile point recovered during excavations on Fort Hood. Photo by Ian McGuire.*

Training is conducted on Fort Hood year-round. Training lands are used for battle readiness in tank and mobile infantry maneuvers, artillery firing, helicopter tactical training, and large-scale mock offensives. Fort Hood's 61,374.9 -acre live fire area, impact area, firing ranges, and associated facilities accommodate firing of all Army weapons.

### The Program

Since 1978, the Fort Hood Cultural Resource Management Program (FTHCRM) office has kept pace with training due to a long-range program of identification and testing for National Register of Historic Places (NRHP) eligibility. Successful coordination of cultural resource conservation and protection with the Army's training mission has occurred. Surveys identified a total of 2,222 archeological resources resulting in 99% of training areas and cantonment plus 71% of the live fire area systematically inventoried for archeological cultural resources. This number consists of 1,102 prehistoric archeological sites inclusive of one Native American sacred resource and 1,120 historic archeological sites. The archeological cultural resource inventory was completed in 1991. Since then, Fort Hood has implemented National Register eligibility testing for prehistoric archeological resources that is currently near completion. Chronology of the prehistoric material recovered span from 10,000 BP to 700 BP and represent the remains of hunter/gatherer camps, kill sites, quarries, and resource processing centers. Other features include rock art, burned rock middens and mounds, rockshelters, and an identified Medicine Wheel.

Fort Hood contains the entire or partial territories of 23 dispersed rural communities represented by the historic archeological resources, three historic buildings, and 21 pioneer cemeteries. Historic resources include cattle ranches, farms, community structures, and trash dumps ranging from the 1850s through the military acquisition periods of 1942 and 1953. Pioneer cemeteries and adjacent community sites remain the focus for ethnic identity among former members of these dispersed communities and are currently the focus of an oral history project.

### Operations and Initiatives

FTHCRM is integrating cultural resource awareness and hence coordination into the various operational divisions within the installation. First and foremost is obtaining a better understanding of training needs, and the operation of the equipment and its impact on the landscape in which the resources are located. Hence FTHCRM has implemented a detailed Geographic Information Systems (GIS) program to coordinate all the information FTHCRM has acquired.

Being part of the Environmental Division of Fort Hood's Department of Public Works (DPW) has benefited FTHCRM by providing a large amount of baseline environmental information. The other departments have provided vegetation maps, habitat definitions, and hydrological maps, which complement the geomorphologic work FTHCRM has undertaken concurrent with surveys and inventories. By combining the current versions of this information in the GIS, FTHCRM is able to track landscape impacts resulting from proposed training exercises, assess if specific resources will be affected and provide alternatives to enable implementation of the training exercises on schedule, thereby not requiring postponement for mitigation purposes. For example, FTHCRM is entering the locations of dig sites requested for different training exercises into a GIS layer. By overlaying this layer with training area boundaries and underlying the layer with digital aerial photographs, FTHCRM is identifying high use areas. With this information, high use areas can be targeted for research and identify the best alternative to conserve an archeological resource *in situ*. This analysis will also

identify those high use areas where data recovery may be the best option in trade off for resource preservation *in situ*.

From an operational perspective, FTHCRM has worked closely with the Natural Resources program and the Integrated Training Area Management (ITAM) program to provide a comprehensive map compatible with the existing training maps to assist training planners in identifying potential environmental coordination requirements. This map is a restricted document signed out to military personnel and complements the Coordination for Excavation Form that is required for all excavation activities on Fort Hood. To obtain the permit, soldiers are required to visit various offices to provide location and information on the training exercise enabling assessment of the proposed exercise impacts. By consulting the Coordination for Excavation map, trainers are able to identify those areas where environmental requirements will be minimal or non-existent, thus expediting the coordination process. This reduces the need to go back and forth revising training plans and re-checking with the various environmental and other DPW offices. The Corps of Engineer's Construction Engineer's Research Laboratory in Champaign, Illinois, is currently developing an electronic coordination procedure.

To assist construction in support of training, FTHCRM attends project-planning meetings with G3/Range Control engineers, ITAM project coordinators, and DPW's Engineering and Planning Services to identify potential cultural resource impacts early. This provides time to identify alternatives for project locations. If avoidance is not possible, coordination and any needed mitigation measures must be implemented.

Supplementing integration and coordination efforts is FTHCRM's expanding education program. An example of this is the awareness training provided for troops. A half day segment is included in the Environmental Awareness Training Class provided to all unit environmental coordinators, during which coordinators and potential coordinators are briefed on how to comply with regulations that require them to avoid impacts to cultural resources, how to recognize resources in the field so they are able to insure avoidance, and how to obtain the Coordination for Excavation permit. The soldiers are then taken on a field trip to gain first hand experience in identifying resources in the field. Succinct briefings on regulation compliance and resource avoidance are prepared for senior military personnel as well as civilians. Upon request, civilian training is provided and FTHCRM participates in a variety of environmental and installation activities to promote cultural resource awareness, such as Earth Day and Texas Archaeological Awareness month. In 2000, FTHCRM sponsored brown bag lunch seminars featuring talks on Fort Hood archeology. FTHCRM also has established associations with Mercyhurst College and the University of Birmingham, United Kingdom, for personnel and research purposes.

Active resource protection is a fundamental crucial program that includes implementing direct protection options such as stabilizing, fencing, burying, and avoiding resources. The type of protection a resource needs is based on the potential degradation activities that could affect it. An open campsite, for example, is more likely to be run over by tanks than a rockshelter and thus requires different protection measures. However, military degradation is not the only

*Cultural resource field activities occur concurrently with military training activities. Photo by Karl Kleinbach.*

degrading activity affecting sites. They are also affected by natural actions and man-made degradation, such as erosion and looting, respectively.

The second component of protection addresses all these types of degradation by monitoring resources to track degradation impacts. This enables FTHCRM staff to identify recent military impacts that occurred from a lack of following coordination for excavation procedures, major erosion events, such as heavy rains, and man-made degradation, such as looting. This information is then used to implement appropriate rehabilitation or mitigation measures. In the case of looting, FTHCRM works with the Provost Marshall's Office (PMO) and Criminal Investigation Unit (CID) to identify potential looters leading to arrest and prosecution.

This collaboration with PMO and CID has resulted in the third component of protection, the implementation of Archaeological Resource Protection Act procedures. FTHCRM staff developed a standard operating procedure for a response team to investigate active looting at archeological resources. In cases where potential perpetrators have not been identifiable, a surveillance program has been established to regularly visit archeological resources where previous looting activity has been identified. This is enabling FTHCRM to establish activity patterns and through documenting the damage and collecting other evidence in accordance with criminal investigation practices, FTHCRM is establishing the basis for prosecution when a perpetrator is apprehended. FTHCRM is also testing different remote surveillance equipment set-ups to improve identification of potential perpetrators.

Another protection program under development involves integration with military operations. FTHCRM is working with military personnel to develop a digital avoidance map that is downloadable into heavy equipment navigation systems. The aim is to provide personnel operating the heavy equipment with a way to efficiently avoid sensitive areas via an alert system tied into the navigation equipment, which sounds when entering a buffer area abutting a sensitive area.

### Fort Hood within the Department of the Army

Though FTHCRM supports Fort Hood's mission, we do not work in isolation. Fort Hood's mission reflects our Department of the Army Forces Command's (FORSCOM) mission: to train, mobilize and deploy combat ready ground forces of America's Total Army to meet operational requirements of our nation. FORSCOM is a steward of Army resources, caring for soldiers, civilians, retirees and families, and of the high quality installations from which we project and support the force. To support this mission, FORSCOM's cultural resources program initially began in the 1970s at Fort Hood and at Fort Polk, Louisiana.

FORSCOM, headquartered at Fort McPherson, Georgia, consists of 11 installations scattered about the continental U.S. encompassing 2,491,912 acres. Military personnel are routinely transferred between them to maintain their readiness training. Hence FORSCOM installations work close together to insure a level of homogeneity in program approaches. This helps produce training continuity in meeting environmental requirements that help to sustain the training landscapes. Nevertheless, the CRM programs at each installation are distinct because of the specific resources for which they are stewards. Some installations have a preponderance of archeological resources such as Fort Hood while others, such as Fort McPherson, consists primarily of historic buildings.

### Conclusion

Cultural resources and particularly archeological sites are a common component of the Army's training landscape. Installation programs that integrate their preservation efforts with training needs, not only insure that America's Army meets its readiness training requirements, but also support stewardship of these resources. Identifying and assessing the resources and exploring options to best meet preservation needs accomplish this aim. The military have been responsive to the programs by providing feedback on the feasibility of avoidance options and what information is most helpful for them to avoid resources while training. This cooperative spirit will enable Fort Hood's Cultural Resource Management program to move in new management directions in the 21st century.

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Stan Berryman

# NAGPRA Issues at Camp Pendleton

Camp Pendleton is located in San Diego County, California, along the Pacific Coast and extends inland for a distance of approximately 20 miles. It extends 17 miles from San Clemente, California, southward to Oceanside, California, comprising 125,000 acres. It is situated between the City of San Diego to the south and Los Angeles to the north and is the only relatively open coastal area within the southern California megalopolis.

Camp Pendleton exists to train marines. The base's natural resources are unique and irreplaceable to the Marine Corps because they combine a long coastline and extensive, diverse inland ranges and maneuver areas. Camp Pendleton's mission is "to operate an amphibious training base to promote the combat readiness of operating forces by providing necessary facilities and services; to support the deployment of the Fleet Marine Force and other organizations; and to provide support and services responsive to the needs of Marines, Sailors and their families." Camp Pendleton's resident population consists of 50,000 Marines, 15,000 dependent families, and 3,000 civilian employees

### *Archeology*

To date, over 80% or 90,000 acres of the non-live fire impact areas have been archeologically surveyed. The live fire areas consist of 12,000 acres. Dating from the early Holocene to European contact, 650 sites have been recorded on the Base. There are seven ethnohistoric villages recorded for Camp Pendleton. The location of four villages has been verified through field study. The other three villages have been located by ethnohistoric study. The types of prehistoric sites on the base include shell middens, milling sites, residential bases, quarries, and rock art.

### *Tribal Territories*

Camp Pendleton is located in the traditional territory of the Juaneno and Luiseno Tribes. Most likely these Shoshonean speakers were one tribe prior to the intrusion of the Spanish. It has been estimated that they arrived in the area about 2,000 years before the present. Prior to that time, the area may have been occupied by the ancestors of the Yuman speaking Kumeyaay, who also claim the Camp Pendleton area as traditional territory.

There are 19 tribal governments with which Camp Pendleton consults. These include six Luiseno (Pechanga, Pauma, Pala, Rincon, La Jolla, and Soboba) and 13 Kumeyaay (San Pasqual, Mesa Grande, Santa Ysabel, Barona, Sequan, Viejas, Campo, Manzanita, Cosmit/Inaja, Cuyapaipe, La Posta, Jamul, and Capitan Grande), one Kumeyaay repatriation coalition, one Luiseno repatriation coalition that is forming, one Luiseno non-federally recognized tribe, and three Juaneno non-federally recognized tribal governments.

### *NAGPRA*

The Native American Graves Protection and Repatriation Act (NAGPRA) mandates the repatriation of Native American human remains and objects possessed or controlled by federal agencies and museums. It covers items in agency possession prior to 1990, and items discovered inadvertentently subsequent to 1990. It is the inadvertent discoveries that will be addressed in the balance of this article.

The implementing regulations of NAGPRA mandate a series of steps that can result in project delays up to and at times longer than 30 days. NAGPRA also permits development of a comprehensive plan of action (comprehensive agreement) which is a legally binding equivalent to memorandum of agreement.

NAGPRA is property rights and human rights law. It covers human remains—full burials or elements of burials, with the exception of naturally shed items, associated and unassociated funerary objects, sacred objects, and objects of cultural patrimony. Inadvertent discoveries are those remains and objects found during an activity or project action including archeological excavations.

To date, there have been 17 inadvertent discoveries involving three major military construction projects on Camp Pendleton. They have included complete burials, human bone fragments, and ceremonial and funerary objects.

There have been seven NAGPRA consultations on Camp Pendleton involving representatives of up to 19 federally recognized tribal governments, four non-federally recognized tribal governments, and tribal legal representatives. The meetings have varied in size from six to 30 tribal representatives; up to 150 days in project delays; preparation of five individual plans of actions; over 800 hours of Marine Corps and Naval Facilities Engineering Command (NAVFAC) staff time; and hundreds of hours of uncompensated Native American time. Camp Pendleton staff time consists of initial determination of the discovery, contacts with the tribes and notifications, development of background information, determination of affiliation, conduct of consultation, development of a plan of action and newspaper notices, repatriation preparation of reburial site, and assistance in reburial if requested.

Camp Pendleton's approach to inadvertent discoveries has been to follow the NAGPRA regulations, conduct the consultations in a non-confrontational atmosphere, take field visits to the locations of the discoveries, and develop a mutually agreeable plan of action.

### *Developing a Comprehensive Plan*

Camp Pendleton and NAVFAC entered into a cooperative agreement/contract with two tribal governments (one Luiseno and one Kumeyaay) to provide program management, meeting facilitation, and elder consultation. There were monthly working group meetings to address concerns of the tribes and Camp Pendleton over a nearly two-year period. The result of these meetings has been a draft comprehensive agreement that covers future inadvertent discoveries.

The goal has been to develop a comprehensive agreement that will allow the Base and the tribes to achieve the aims of NAGPRA within a timely manner and in an atmosphere of mutual respect. The final draft comprehensive agreement is currently under review. The elements of the final draft agreement include:

- Definitions
- Affiliation determination
- Points of contact
- Treatment of inadvertent discoveries discovered during construction or routine activities
- Treatment of inadvertent discoveries identified during archeological field work
- Treatment of items not positively identified as human remains or cultural objects
- Treatment of items identified in the laboratory and during analysis
- Treatment of items if further archeological excavation is required
- Notification and disposition of inadvertent discoveries
- Dispute resolution, amendments, and confidentiality

Identification of points of contact is the key element of the agreement. The appointed tribal representatives and the government archeologists will form a rapid response team to shorten the consultation time and to provide for an expedited decision tree. The time between a discovery until the consultation occurs will be seven days.

The tribal signatories to the agreement will appoint a total of two points of contact (POCs) and two alternatives. The POCs for Camp Pendleton will be the Base archeologist and the NAVFAC archeologist. Currently when there is an inadvertent discovery, the Base calls each tribal government, the Kumeyaay coalition, and the non-recognized tribes. Within three days, this is followed up with a letter to each tribal government with a date, time, and place for a consultation meeting. The time lag between discovery and action in the field can take over 30 days. Under this agreement, the Base will contact the tribal POCs who will contact the individual tribal governments. The consultation meeting between the government and tribal representatives will occur within seven days. The consultation will determine further action and treatment based on the procedures within the agreement. The POCs will serve to better facilitate the treatment and ultimate repatriation of the human remains.

### *Expectations*

The implementation schedule is as follows:

- Complete legal review of the agreement document by the end of 2000 (accomplished).
- All involved parties will agree to the plan by May 2001.
- Appoint POCs by mid-year 2001

It is expected that the Comprehensive Agreement will result in smoother consultations and a better response to inadvertent discoveries on Camp Pendleton.

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Andrew R. Sewell, Stephen C. Wagner, Ryan J. Howell, Wendell P. Greek, and Karyn L. Caldwell

# CRM at Fort McCoy, Wisconsin

Fort McCoy is a U.S. Army Reserve Command installation situated on 60,000 acres in west central Wisconsin. Indigenous peoples have occupied the Fort McCoy bioregion beginning nearly 10,000 years before the present, including Paleoindian, Archaic, Woodland, and Oneota cultures. The Ho-Chunk Nation is the only federally recognized Native American tribe culturally affiliated with the installation today. European-American settlers arrived in the mid-19th century, transforming the landscape for agriculture. Fort McCoy was established in 1908 as an Army field artillery range, and has served a major role in every American military conflict since World War I, training over 175,000 Army Reserve, National Guard, and Marine Reserve troops annually. Thus the landscape constituting present-day Fort McCoy is an area of unique cultural continuity that spans more than 10,000 years and has been home to indigenous peoples, early settlers, and military personnel.

Archeological surveys have been conducted over the Fort McCoy landscape since the 1970s, with focused National Historic Preservation Act compliance work dominating since the mid-1980s. Early archeological surveys were conducted as needed until a full-time professional archeologist was hired in 1993, and a formal cultural resources program was established. Since 1994, an integrated cultural resources management approach has been used to coordinate the actions and decisions of archeologists, land managers, and environmental specialists with military trainers and master planners. The integration of management decisions reflecting the needs and actions of installation managers on the landscape has been greatly facilitated by the development of a Geographical Information Systems (GIS) environment and successfully merging the GIS platform into installation long-term planning. This achievement has transformed archeology on Fort McCoy, creating an efficient, planned response to the Army's changing needs for land use while ensuring cultural resource law compliance.

*Field technician Claudia Schugel recording data from one of the prehistoric sites at Fort McCoy. Photo by Ryan Howell.*

### *Program Overview*

The U. S. Army's goals include the practical concerns of training for combat readiness while maintaining a well-developed program of natural and cultural resources management. The Fort McCoy cultural resources management (CRM) program has served as the primary means for achieving the installation goals of promoting sound environmental stewardship while supporting Army mission requirements. The presence of an "in-house" CRM program has allowed installation land management programs to establish and maintain long-term, cost-effective management methods, such as predictive models and management plans, based on cultural landscape management.

At Fort McCoy, the CRM program is paired with the Natural Resource Management Program under the Directorate of Training and Mobilization (DTM) as the Biological and Cultural Resources Management Team (BCRMT). This integration has allowed the development of internal operating procedures that permit rapid consultation between program managers and installation training staff, resulting in the efficient sharing of important data and rapid response to requests for environmental clearances in support of the installation training mission.

What sets the Fort McCoy CRM program apart from other DoD installation CRM programs across the nation is the availability of a

trained specialist for each of the broad classes of cultural resources found at Fort McCoy.

Within the last three years, prehistoric archeologists have formally surveyed 1,090 acres in advance of training, construction, and timber harvests, which represents 7% of the total installation area designated as "high probability" for archeological sites, and brings the total percentage of installation land surveyed to 26%. An additional 760 acres were surface surveyed following a windstorm that severely damaged several areas of the installation in 1998. Over 61 miles of roads, vehicle paths, and trails also have been recently surveyed in conjunction with the Training Area Restoration Program. Fourteen new prehistoric sites and 108 isolated finds were identified as a result of these recent surveys. In addition to new site identification and evaluation surveys, archeologists have evaluated 30 sites previously identified by short-term contract projects, but which had remained unevaluated. Because all unevaluated sites are considered eligible for the National Register, thus requiring protection, a "backlog" of such sites represents a considerable investment in protection strategies and land-use restrictions. The 30 recently evaluated sites represent a reduction of 70% of the backlog, accumulated from years of identification surveys.

Fort McCoy's historic resources have recently received similar attention. During the 1999 field season, over 100 installation historic homestead sites were documented and evaluated for National Register eligibility. This project resulted in one of the largest and most thorough evaluations of historic homesteads within the state of Wisconsin. During the 2000 field season, the Fort McCoy CRM program also investigated a 19th-century saw and grist mill and associated village. The excavation was accomplished with an all-volunteer crew under the supervision of the staff historic archeologist.

During the same time period, Fort McCoy architectural historians documented and evaluated all of the approximately 1,200 buildings and structures located within the boundaries of the installation. The documentation was converted to a digital PDF format, enabling installation managers to "click" on a building footprint located on an installation street map and bring up the historic documentation for that building. Documentation includes photographs, historic use data, and architectural descriptions.

The Fort McCoy staff archeologists' dedication to their discipline is evident in their acknowledgement of their professional responsibility to disseminate the results of their work. Fort McCoy archeologists have presented six professional papers at regional and national conferences within the last year, and are currently preparing articles for publication in professional journals. Staff archeologists have also given presentations to local historical societies and a copy of the four-volume report for the historic homestead project was donated to the Monroe County History Room, which will also feature a display of artifacts found by local volunteers during recent installation mill project excavations.

### Conclusion

The Fort McCoy Archaeology Laboratory supports the Fort McCoy mission by rapidly responding to requests for training area NHPA compliance surveys for new construction and training projects, while ensuring that data from their surveys are incorporated into the archeological and historical records of west central Wisconsin. The current program strives to maintain the Army's standards and goals of land stewardship, accomplish high quality, useful research, and meet the practical daily needs of a large military installation. The Fort McCoy Archaeology Laboratory's integrated management approach ensures a cost-effective balance between the installation's mission requirements and the careful stewardship of Fort McCoy's cultural heritage.

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# Rock Art Sites at Marine Air Ground Task Force Training Command

The Marine Corps Air Ground Combat Center, home to the Marine Air Ground Task Force Training Command, is located in the southern Mojave Desert, one of the hottest and driest deserts in North America. It is the Marine Corps' largest training facility, occupying 935 square miles (approximately 600,000 acres).

Currently, over 1,200 recorded archeological sites have been identified. The most visible of its prehistoric resources are the rock art sites. To date, there are three recorded rock art sites located within the installation boundaries. A fourth has been located, but has not yet been completely recorded. With approximately 15% of the installation inventoried for cultural resources, the potential exists for many more rock art sites to be found as surveys continue.

The first rock art site recorded on the base is the Foxtrot Petroglyph Site. The site, CA-SBR-161, documented in 1979,[1] was listed in the National Register of Historic Places in February 1995. The Foxtrot Petroglyph Site encompasses approximately three linear kilometers of rock art applied to the southern face of a large lava flow located in the central/eastern portion of the installation. The rock art at this site is unusual because it has both petroglyphs (images scratched, pecked, or chiseled into rock surfaces) and pictographs (images painted on rock surfaces). The site consists of five areas where rock art concentrations occur along the lava flow. The site has over 450 rock art panels and over 1,300 design elements present in the five defined areas. Foxtrot contains rock art styles common to both the Great Basin and southern California deserts. Great Basin abstract is the predominant style represented. The common abstract motifs are cross-hatching, wavy lines, circles, concentric circles, and meandering lines. Additionally, anthropomorphic and zoomorphic figures are common. The unique blend of different styles and motifs at Foxtrot indicates use by Native Americans for ceremonial or ritual purposes over many centuries, making the site a truly unique resource.

*Photos courtesy Marine Air Ground Task Force Training Command.*

*Common abstract motifs at the Foxtrot Petroglyph Site.*

The second recorded rock art site is the Lavic Lake petroglyph site, CA-SBR-7898, located in the northern sector of the base. Unlike Foxtrot, this site is located in a basalt boulder field and includes pecked and incised images. Bisected circles, meandering lines, rakes, rectangular grids, and a pattern of interlocking triangles are found on the panels at this site. Documentation[2] for this site identified 55 boulders with 63 glyphs. Although not large, it is an important resource that provides information on the variability of rock art styles, elements, and motifs found in the desert west.

The third recorded rock art site, the Cleghorn Pass Site, was found in April 1998, by biologists conducting surveys of sensitive plant species in remote areas of the base. Dropped off by helicopter at the crest of the Bullion Mountains, biologists were making their way down a major drainage when they discovered a single boulder covered with petroglyphs. The find was reported, and cultural resources staff flew by helicopter to the location to record the site.

*The Lavic Lake Petroglyph site is located in a basalt boulder field.*

Designated CA-SBR-9768, the Cleghorn Pass site is located at the western end of a small secondary drainage near the southern terminus of the central Bullion Mountains. This minor drainage converges with a larger, northeast-trending seasonal drainage that enters a major wash some 2.5 km northeast of the site. It should be noted that this wash co-joins with other washes to form the major wash that borders the Foxtrot site on the south. Situated among granitic hills and outcrops, the two igneous boulders that comprise the site appear to be out of place. Nearby are a number of ephemeral waterfalls and natural water tanks (*tinajas*) that attract a number of animals when water is present. Elevations in this part of the Bullion Mountains range from 2,400 to 4,000 feet and the site is located at the 3,060-foot elevation.

The main archeological feature at the Cleghorn Pass site consists of a large boulder displaying petroglyphs, images pecked into the rock surface on three sides of the boulder. Additionally the top of the boulder has been ground flat and a cross glyph pecked onto its surface. Five cupules—small, bowl like depressions—have also been pecked and ground along the edge of the top of the boulder. The boulder measures approximately 1.0m in height and 1.25m at the base. The east face of the boulder exhibits about 20 petroglyph elements, including two animal figures that appear to be "lizards." The other glyphs are all abstract and consist primarily of circles and curved connected lines and are considered typical of Great Basin Abstract and Curvilinear design elements.[3] Differential repatination among the glyphs indicates that there were at least three separate episodes of inscription. The north face of the boulder has three amorphous glyphs and the letters "WB" carved into it. The south face has a single amorphous, pecked glyph.

The second feature at this site is of the same igneous material as the rock art boulder and is located about two meters east of the latter. It is an unshaped, tabular, and unifacially ground millingstone. Additionally, a plain pottery sherd and a single chert core were found in close proximity. The site area showed no signs of military activity; however, an early historic mining camp dating to the late 1800s/early 1900s is located adjacent to the rock art boulder.

Rock art is one of the most difficult media to document. Elements and portions of elements are visible or not depending on light and weather conditions as well as perceptions on the part of the recorder. Therefore, with each episode of inventory or recordation, a different perception in the number and kinds of elements present is generated and it is often difficult to reconcile the findings. It is, therefore, also difficult to compare various rock art sites effectively.

In looking at the three rock art sites at the Combat Center, the most obvious difference is in their setting or landscape; from a cliffed lava flow, to a boulder field, to an isolated boulder in a remote location high in the mountains. While Foxtrot and Lavic Lake are easily accessible, Cleghorn Pass is remote and entails a difficult climb. Rock art expressions are highly visible at Foxtrot and may be considered as part of the "public" realm. Rock art at Lavic Lake and Cleghorn Pass, however, is not as evident. The

*Pattern of interlocking triangles found at the Lavic Lake Site.*

*The main feature at the Cleghorn Pass sites consists of a single boulder with petroglyphs on its surface.*

Lavic Lake petroglyphs are located on a limited number of boulders within a larger boulder field. There, if you did not know where to look, you would not know that they are there. Cleghorn Pass rock art is very visible, but is remote and difficult to access. The latter two sites can thus be characterized as part of the private or secret realm.

Foxtrot is the largest site with the greatest number of elements and as expected appears to span the greatest length of time. Looking at repatination as a relative measure of age, Foxtrot has some glyphs that are so heavily repatinated as to be virtually indistinguishable from the parent material and are, thus, probably many thousands of years old. As there are habitation sites in the vicinity of Foxtrot that are 7,500 to 7,000 years old, it is possible that some of the rock art is equally as old. The remaining glyphs vary in their degree of repatination from moderate to light indicating fairly continuous applications over time. The Lavic Lake petroglyph site, if related to habitation sites found in the surrounding vicinity, could date to between 3,500 and 1,500 years ago. The degree of repatination of glyphs at this site appears relatively equal connotating inscription within a relatively discrete time frame. The Cleghorn Pass site has relatively little repatination visible; however, there is sufficient visual evidence that glyphs were applied to the rock surface on at least three separate occasions, possibly over a number of decades.

Inasmuch as historic Native American peoples of interior western North America generally do not admit knowledge of the purpose or meaning of rock art designs, numerous interpretations have been offered regarding their function. Some researchers propose that rock art sites in the region were related to hunting of large game, for example acquiring hunting magic. Others have associated rock art with vision quests, expressions of interrelated beliefs, and rites of passage. The Foxtrot site with its numerous and graphically different styles and motifs offers the opportunity to develop a comparative database against which other sites can be compared. The Lavic Lake and Cleghorn Pass sites, although much smaller, provide additional information on the variability of rock art styles, elements, and motifs found on the base and in the region. All three sites demonstrate the range of environments used by Native Americans and offer an unparalleled view into the range and depth of Native American traditional practices unavailable through other records or artifacts.

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### Notes

1. Daniel F. McCarthy, *The Foxtrot Rock Art Site, CA-SBr-161,* Twentynine Palms Marine Corps Base, San Bermardino County, California. Unpublished report for U.S. Marine Corps, Twentynine Palms, California (1979).
2. Meg McDonald, J. Jeffery Flennikan and Daniel F. McCarthy, *Evaluation of Prehistoric Resources at Pisgah Crater Lava Flows and Lavic Lake, Marine Corps Air Ground Combat Center, San Bernardino County, California.* Unpublished report for U.S. Marine Corps, Twentynine Palms, California (1996).
3. Robert F. Heizer and Martin A. Baumhoff, *Prehistoric Rock Art of Nevada and Eastern California* (Berkeley, University of California Press, 1962).

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Laurie J. Lucking

# Preservation and Partnerships

## Sacred Places on Army Lands in Hawaii

The 25th Infantry Division Light and U. S. Army, Hawaii (USARHAW) is comprised of 28 sub-installations covering 161,000 acres on the islands of Hawaii and Oahu. These lands, hereinafter referred to as the Installation, include six active training ranges and three large cantonment areas. The training ranges contain over 400 archeological sites, two of which (Ukanipo Heiau and Hanakaoe Heiau) are on the National Register of Historic Places. The sub-installations of Fort Shafter and Wheeler Army Airfield each contain a National Historic Landmark district. Schofield Barracks and Kilauea Military Camp each contain a large National Register of Historic Places district. In all, there are 750 buildings listed on or determined eligible for the National Register and two archeological sites.

Many of the sites on installation lands can be classified as either traditional cultural places or sacred sites, areas important to the native Hawaiian population as traditional religious, hunting, gathering, and fishing areas. These sites include shrines, temples or *heiau*, taro fields or *loi*, and natural areas having religious significance. These sites also include "new" traditional cultural places, such as this *heiau* near the Makua Military Reservation.

*"Opening" ceremony for Ukanipo Heiau, March 23, 1998.*

In 1998, the Installation began a process to open the Ukanipo Heiau site to native Hawaiian religious practitioners under the American Indian Religious Freedom Act of 1978. A National Register site complex covering 105 acres, it is located outside the active training area at the Makua Military Reservation (Reservation) on land leased from the State of Hawaii. The Reservation, composed of two valleys, Makua and Kahanahaiki, consists of fee-simple lands, ceded lands, and lands leased from the State of Hawaii. Because of the complex land issues that affect site access and management, a cooperative effort was envisioned between the native Hawaiian community in the Waianae/Makua area, the State of Hawaii as landowner, and the Army as land-user. The goal was to give the native Hawaiian community curatorial oversight of the Heiau with financial and personnel support from the Army under the State Custodial Management Program.

In March 1998, the Army asked the native Hawaiian community to provide volunteers to sit on a Ukanipo Heiau Advisory Board that would be responsible for drawing up:

- a site stabilization plan,
- a site access and use plan, and
- a long-term management and maintenance plan.

Per the request of the native Hawaiian community, the Army agreed to allow them to choose a Native Hawaiian, who would be a paid consultant, to be the leader or facilitator of the group. On March 23, 1998, the Heiau was officially "opened" in a ceremony, allowing members of the community to visit the site for the first time in 50 years. In 1998, the Ukanipo Heiau Advisory Council O Wahipana O Makua, was formed, consisting of 14 members of the Waianae/Leeward Coast community and advisors from the Army and the State of Hawaii Historic Preservation Division. The members from the community represented families with ancestral

*After action review of detonation of 500-pound bomb by Native Hawaiians and EOD, Makua.*

ties to Makua, as well as interested organizations such as Malama Makua, Koa Mana, and the kupu`o ka`aina O Wai`anae.

Beginning in August 1998, five World War II-era bombs, ranging in size from 100 to 1,000 pounds, were discovered within the site complex over a four-month period while surveying and mapping the site. After six months of intense consultation between the Army, the native Hawaiian community and the State of Hawaii, these bombs were successfully detonated while minimizing impact to the site. The detonations took place on three separate occasions. The Ukanipo Council worked closely with the explosive experts to determine how to avoid site elements during detonation. Several members volunteered to accompany the unexploded ordnance detail (EOD) to inspect the bomb locations prior to detonation and to designate important sites that needed to be avoided. The Army provided helicopter support and personnel who took measures to cover portions of the sites to protect them against bomb fragments. Almost all of the members of the Ukanipo Council were present during each pre-detonation site preparation, each detonation, and post-detonation site inspection to ascertain damage. The EOD subsequently located and detonated 81 other smaller pieces of unexploded ordnance.

Beginning in January 1999, the Ukanipo Council met every two weeks to work on the formation of a programmatic agreement for the management of the Heiau. They examined the maps prepared by the archeologists that had surveyed the site, discussed details of cultural protocol and access, and discussed initial planting and landscaping plans. The Ukanipo Council wrote the programmatic agreement with input from the Hawaii State Historic Preservation Office, the U.S. Army Garrison, Hawaii, and the U.S. Army Corps of Engineers, Pacific Ocean Division. On October 12, 2000, all of the parties signed the programmatic agreement for the management of Ukanipo Heiau. Under the terms of the programmatic agreement, the Installation

- recognizes the Ukanipo Heiau Advisory Council O Wahipana O Makua as the stewards of the site,
- guarantees access to the Ukanipo Heiau site complex,
- agrees to provide all maps, survey reports, photographs, and other survey materials for the Heiau to the Ukanipo Council,
- agrees to aid in site maintenance activities including stabilization of stone structures, building a fence, and providing water for landscaping, and
- agrees to complete a survey of archeological features associated with the Heiau.

The Ukanipo Heiau Advisory Council O Wahipana O Makua agrees to

- maintain the landscaping and erosion control features,
- monitor effects of site use, develop interpretive and educational programs, and
- implement access and cultural protocols.

The State of Hawaii agrees to

- serve in a technical assistance capacity on all aspects of preservation, and
- act as a conduit for other State of Hawaii agencies.

The Ukanipo Council is now overseeing the implementation of the management plan.

Because of the successful establishment of the Ukanipo Council, the Installation has since 1999 hired two native Hawaiians to participate in the Traditional Cultural Places Surveys at Makua Military Reservation, Schofield Barracks, and Pohakuloa Training Area. Informal partnerships have also been established with Hawaiian civic clubs, other native Hawaiian organizations, and families and individuals from various communities to help the Installation identify and manage sites. A public outreach program also is being developed to permit native Hawaiians, especially the *kupuna,* or elders, to tour archeological sites as safety permits.

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Photos by the author.

Vicki S. Best, Gregory A. Fasano, and Richard W. Arnold

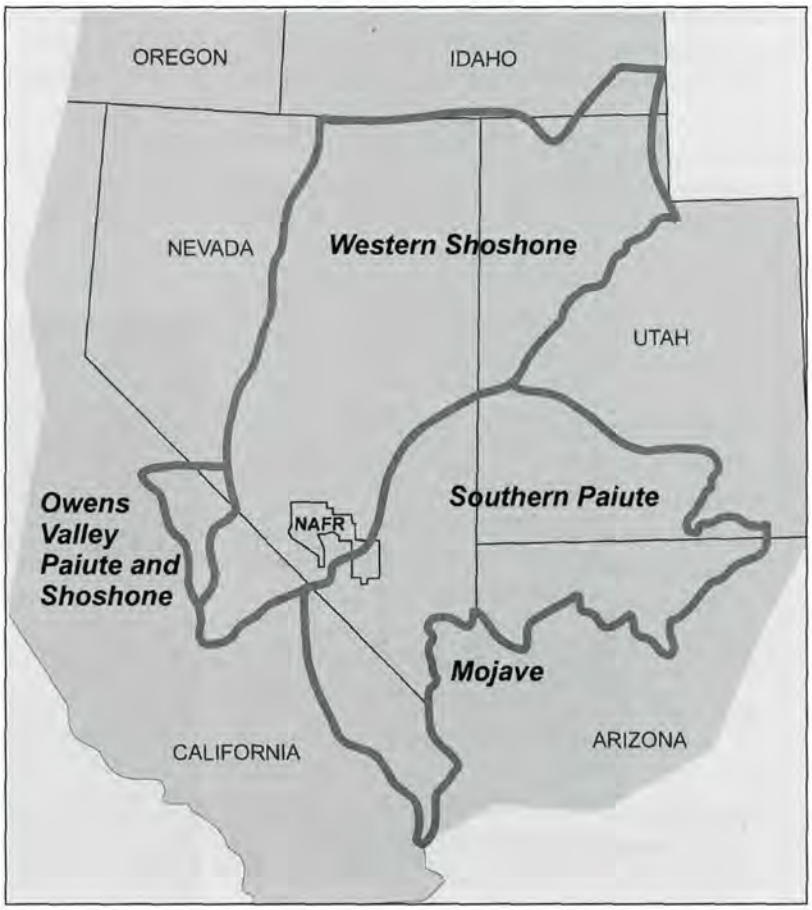
# From Sacred Sites to Stealth Bombers

## Bridging Cross-Cultural Boundaries

The Native American Interaction Program (NAIP) at the Nellis Air Force Base (NAFB) has completed its fifth year of interactive cultural consultations with 17 American Indian tribes and one Indian organization that represents Indian people throughout the southern Nevada area. Since 1995, Science Applications International Corporation (SAIC) has managed and coordinated the NAIP for NAFB and its associated three-million-acre training range. This program combines science and culture in an effort to understand those who have gone before us. By embarking on this task, NAFB faces challenges that are in stark contrast to the day-to-day training mission of this distinct military installation. How does one convey to an Air Force Wing Commander that the Indian people believe that the air above NAFB is alive, and military jet crashes are caused when planes fly through pockets of spiritually dead air damaged from radiation originating from "angry rocks"? Such is an example of the diverging perspectives that emerge when the two worlds of the Air Force and the Indian people intersect.

Seventeen tribes and one Indian organization with demonstrated cultural and historic ties to the southern Nevada area were invited to participate in the NAIP. The program is comprised of Indian people of Southern Paiute (seven tribes), Western Shoshone (four tribes), Owens Valley Paiute (five tribes), and Mojave (one tribe) ethnic origin, as well as the Las Vegas Indian Center. Working with this many groups could have been as challenging as breaking the military code of silence. However, this unique collection of tribal representatives has learned to work together to achieve their goals. For the past 10 years, these tribes located in Nevada, Arizona, California, and Utah have converged to work with several federal agencies. They now call themselves the Consolidated Group of Tribes and Organizations (CGTO).

By holding a large general meeting at NAFB in the spring of each year, tribal representatives from each of the 18 entities and NAFB personnel are able to come together and discuss the direction for the NAIP. At the conclusion of each meeting, the tribal representatives meet in a private executive session to formulate recommendations to the NAFB. This front-line program has led to the involvement of Indian people in




*Location of the Nellis Air Force Range and associated Native American ethnic groups. Photo courtesy Science Applications International Corporation (SAIC).*

the preparation of the NAFB Legislative Environmental Impact Statement for training range land renewal, Native American Graves Protection and Repatriation Act consultations, and the review of numerous environmental reports. By working together, tribal representatives have made specific recommendations that have resulted in plans and actions that promote cultural and environmental stewardship of the lands comprising the Nellis Air Force Range (NAFR).

One of the first initiatives under the NAIP was to conduct a Native American ethnography project. The project was designed to include interviews of knowledgeable Indian elders and was driven by Executive Order 13007, which affirms identification, protection, and access to American Indian sacred sites located on federal lands. The Indian people maintain a holistic perspective of the world that must be considered when speaking of sacred sites. One Western Shoshone member offered up this summary:

> It's important to understand the indigenous perspective of the world around us and our holistic way of thinking. As Indian people we are tied to the land, air, and water. All elements of the world, animate and inanimate, are functionally integrated. The water, air, rocks, plants, animals and people are connected. The change in one element changes the other elements. The significance of a sacred site can not be reduced to just the rock cliff with the petroglyphs. Its significance is interrelated with the creek within the canyon, the trout in the creek, the pinyon pine trees, the juniper, the bighorn sheep, the birds, and so on.

The information recorded served as the building blocks for a successful program that continues today. For example, one of the elders interviewed remembered when the airplanes originally started flying in the area. Another person remembered visiting the Stonewall Mountains on horseback after the land was withdrawn for military purposes in the 1940s. These individuals also shared information on the foods that were collected, the medicines that were used, and the ceremonies that were conducted in conjunction with the lands that currently encompass the NAFR. Efforts such as these are examples of the paramount initiative shown by NAFB in recognizing that Indian people need a forum to be able to come forward and communicate with federal agencies.

*Southern Paiute representative discussing possible interpretations of rock art in Wellington Canyon. Photo courtesy SAIC.*

To expand on this project, each year NAFB funds small subgroups of tribal members, appointed by the CGTO, to visit various cultural resource areas on the NAFR. These site visits allow tribal representatives to access areas that have not been utilized by Indian people for more than 50 years. The tribal representatives are familiar with much of the land through stories and songs having been passed down from earlier generations. Tribal representatives are able to view the conditions of the cultural resource areas and offer suggestions on ways to protect and preserve the land. Indian people have a complex understanding of ecosystem management with deep religious overtones. By having the opportunity to visit these areas, tribal members have been able to offer prayers that in their view help to restore the natural balance of the area. At the conclusion of each trip, the participants prepare a report and recommendations to document their findings. The information gained may then be used as a basis for additional ethnographic studies and active Air Force land management and preservation efforts.

An example of this process occurred when an extensive ethnographic study was conducted on the Pintwater Cave and Wellington Canyon areas on the NAFR. A subgroup of Indian elders visited the Pintwater Cave area in January 1997, and a second group visited the Wellington Canyon area in February 1998. The sites were

documented as sacred sites and recommendations were made to the NAFB that the areas be protected from disturbance. These areas and their extensive rock art panels are viewed as being extremely important to the Indian people and a recommendation was made for additional ethnographic studies. NAFB responded to these recommendations by instituting measures to protect and preserve the locations and by issuing a contract for additional ethnographic work.

In October 1999, SAIC teamed with the University of Arizona, Tucson–Bureau of Applied Research in Anthropology to conduct the ethnographic research. Indian elders and knowledgeable tribal representatives were brought to the field for interviews. Pintwater Cave is believed to have uses that may be associated with hunting, medicine, or prayer. The interviewees offered differing interpretations of the area with one member stating,

> This is a power spot for vision seeking. This is definitely a medicine spot. I also believe this is a man's [medicine man] spot.

Another elder stated,

> [They] came for different reasons; vision-questing, wishing, [using] artifacts as payment for the wish. This cave has more power than the others.

Tribal representatives also offered varying interpretations of the rock art in Wellington Canyon, which consists of both petroglyphs and pictographs. One male elder stated that Wellington Canyon is a place of many religious drawings and thinks "most of them are thank-you kinds of drawings" made by those who offered thanks to the Spirit for success or good fortune. Another representative felt the place was used annually by Indian people for "doctoring purposes or where they gathered to test their powers against each other." The results of these efforts provide NAFB with valuable information to assist in its land management and trust responsibility to the involved tribes and organizations in accordance with cultural and Native American regulations.

NAFB has also instituted a program whereby Native American monitors are employed to work with archeological field crews as surveys are conducted on the NAFR. The monitors have been trained to assist in the study efforts and are intimately involved in the fieldwork. Monitors often walk transects, flag sites, and record interpretations. What may have been viewed as an adversarial relationship by some has actually led to a truly collaborative approach to archeology and the development of mutual friendships. These efforts have allowed NAFB and the archeological community to gain significant insight into Native American culture and beliefs.

During an archeological field sampling project conducted in 1999 in the Kawich Mountains on the northern reaches of the Nellis Range, Native American monitors identified an area that they described as an "adverse ceremonial area." The monitors reported feeling something was "not quite right" as they viewed the area in question. Further investigation later revealed that an Indian family from a nearby area had indeed practiced bad medicine at this site, intending to cause great harm to others. The monitors offered a traditional prayer and appropriate offerings and have requested that a spiritual leader be brought to the location to restore balance to the area.

The CGTO may not be supportive of the complete mission of the NAFB due to environmental concerns, but they commend NAFB on its commitment to preserve and protect the numerous cultural resources the training range entails. Of the many cultures that exist in the United States, the culture of Native peoples is commonly overlooked and all too often forgotten. At the NAFB, government and Native American representatives have intertwined, leading to a revised realm of thinking that strives to unlock the mysteries of the past and preserve the cultural and spiritual landscape for tomorrow's generations.

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To commemorate Nevada Archaeology Week, May 13-19, 2001, a full-color poster titled "Native Americans and Archaeology" was prepared in honor of the Nellis AFB Native American Interaction Program. The poster depicts Native Americans participating in cultural resource management efforts on the Nellis Range.

Julie L. Webster and Gordon L. Cohen

# Military Aircraft Hangars

## Footprints through a Century of Flight

When international conflict threatens national security, the U.S. military response is unmistakable. On the leading edge of U.S. military power is aviation technology—an ever-diversifying arsenal of tactical and strategic aircraft that play a key role in the operations of every military service. Since the first military application of air power almost a century ago, aviation technology has rapidly advanced to meet formidable new mission demands. The aviation technology revolution has not only left its permanent imprint on global politics, it has also left its footprints across the American landscape. The history of U.S. aviation can be read to a great extent in the function, form, and style of its airfield architecture.

A military airfield's "alpha" structure is the aircraft hangar. Typically, the earliest ones were humble structures, little more than sheds intended to keep these new flying contraptions sheltered from the elements. However, aeronautical engineers and pilots relentlessly pushed the envelope in military air power, creating faster and more powerful flying machines—and lots of them. Hangar designers responded in kind by creating large, increasingly sophisticated (and unintentionally glorious) structures tailored to the complexities of outfitting and maintaining a modern airborne arsenal. The variety and quality of military aircraft hangars erected during the 20th century is surprisingly impressive.

*Oldest identifiable example of the U.S. All-Steel Hangar at Fort Sam Houston, Texas, c.1917. Photo courtesy Archives at Fort Sam Houston, Texas.*

### *The Threat to Hangars*

On military installations today these spacious, magnificent buildings are rapidly being subdivided or consumed wholesale to serve diverse functions, such as research facilities, offices, and gymnasiums. Their structural clear spans provide facility designers a "clean slate" of open, highly adaptable space for consolidating multiple functions previously housed in smaller separate buildings. While adaptability is highly valued as the Department of Defense (DoD) works to reduce its building inventory, historically significant architecture can accidentally be marred or lost in the tumult of short-term budget pressures. If a targeted hangar is at least 50 years old or is thought to have exceptional historic importance, its significance must be reviewed in accordance with the National Historic Preservation Act (NHPA). To efficiently conduct these reviews, facility and cultural resource managers need accessible, reliable historic and architectural information to help determine the significance of hangars.

The Construction Engineering Research Laboratory (CERL) was tasked to study the DoD's aircraft hangar inventory and develop criteria relevant to NHPA requirements. The research was conceived by Dr. Paul Green, U.S. Air Force Air Combat Command (ACC), and funded by ACC and the DoD Legacy Resource Management Program. The product of this study was a comprehensive report intended to facilitate the assessment of a military hangar's historical and architectural significance. The report is now available online for viewing or download at <http://www.cecer.army.mil/techreports/webster98/webster98_idx.htm>.

### *Study Methodology*

In order to serve DoD cultural resource managers, the report had to work well as a quick, random-access reference while providing a coherent, linear historical account of military aviation construction programs. The basic tasks were to

- identify and describe the principal hangar types,

- document their origins, locations, and approximate numbers, and
- provide a context for understanding their aviation and construction history.

The study looked at all DoD aircraft hangars, except those on Reserve, National Guard, Base Realignment and Closure, and overseas installations. The CERL research team made several site visits to better understand military airfield infrastructure and how it is used. The team also visited centralized repositories with military airfield construction record holdings and conducted literature searches. To gather detailed site-specific physical data, a mail-in survey was designed and sent to all installations known to maintain a significant airfield infrastructure. Countless DoD historians, architects, engineers, record drawing stewards, real property staff, and cultural resource personnel responded, and their submittals were collated into a draft database. Although extensive, the draft database included significant gaps that had to be filled with existing data from Army and Air Force headquarters-level real property offices. Although the selected real property records did not include information on specific architectural characteristics, the statistical data they contained greatly enhanced the research team's knowledge base. All of the material collected by the research team, especially the architectural drawings, were used to develop a hangar typology—a tool that provides a classification system based on structural cross-section, principal material, and other physical characteristics.

### *Versatile CRM Guide*

The hangar report can be used in several different ways depending on the needs of the reader. First, the historical narrative will help cultural resource managers understand the place of their local hangars in the national aviation construction context. This text is divided into five chapters that correspond to a major U.S. military conflict or peacetime era. Each chapter is subdivided to address the aviation construction histories of the various military services. Major sections are labeled to identify the principal national aviation construction themes of the era. The report focuses on national contexts that are intended to illuminate local and regional contexts—not to replace them.

Second, the report includes a chapter dedicated to hangar typology, illustrated and cross-referenced with numerous charts, photos, and drawings. The typology chapter can be of great value in helping a cultural resource manager identify hangars in those cases where local documentation is inadequate or missing. When the cultural resource manager identifies the basic type of hangar, he or she can then study the hangar database (included in an appendix) to determine which other installations have similar structures. The database can provide an initial indication of a hangar's relative abundance or scarcity in the national context.

Finally, for quick reference purposes, each history chapter concludes with a simplified timeline comprising a chart of major historical, technological, and programmatic milestones. These timelines help the reader visualize key interrelationships between military activities, defense objectives, technological developments, and military construction programs. All elements of the report—the historical narrative, quick reference timelines, hangar typology, and appendices—are readily cross-referenced to help cultural resource managers make informed inferences in order to fill gaps in local construction records.

### *Summary of Findings*

The CERL study illustrates how military hangar construction was affected by two overarching trends: changes in air mission requirements and standardization of facility design.

The report documents how air mission requirements evolved in response to technical advances in aircraft. Although larger and more specialized airplanes were constantly rolling off U.S. assembly lines, the most important driver of military hangar demand appears to have been sharp increases in the number and size of air combat groups—especially during the defense buildup before World War II. The relationship between aircraft size and hangar size is actually indirect and complex, and only in a few cases is there direct evidence of a connection. Once the all-metal airplane body went into full production, there was no longer any reason to shelter these aircraft, except during maintenance, repair, and outfitting operations. The major construction challenge then was to provide enough hangar space to handle the enormous servicing capacity required to keep an airborne fighting force in the sky.

As new training, outfitting, and maintenance activities drastically increased the need for new hangars, both the Army Air Corps and the Navy construction programs came to rely extensively on standard designs and plans. The CERL study shows that there was even an appreciable amount of standardization within particular specialties and construction programs. For example, in terms of architecture, air depot facilities can

Table 6-5. Concrete arch cross section typology.

| Concrete Arches | | | | |
|---|---|---|---|---|
| **Cross Section** | **First Known Use** | **Plan Description** | **Plan No.** | |
| ***Open Arch*** | early 1940s | Shore Facility – Denver Type Reserve Station | 486581<br>520026 | ⚓ |
| | early 1940s | Monolithic Concrete Seaplane | varies | ⚓ |
| | unknown | Shore Facility-Miramar Type | varies | ⚓ |
| | mid-1940s | Squadron Operations | varies | ✪ |
| | late 1940s | Monolithic Concrete | 35-04-01 | ✪ |
| | mid-1950s | Organizational Pull-Thru | 39-01-65 | ✪ |
| | mid-1950s | Organizational Pull-Thru | 39-01-66 | ✪ |
| | mid-1950s | Organizational Pull-Thru | 39-01-67 | ✪ |
| ***Transverse Arch*** | late 1930s | Monolithic Concrete Seaplane | varies | ⚓ |

Note: The *star* symbol in the right-hand column indicates an Army or Air Force plan; the *anchor* symbol indicates a Navy plan.

*Concrete Arch Cross Section Typology for military hangars. Created by the Construction Engineering Research Laboratory (CERL).*

readily be distinguished from flying training field facilities, and these in turn can be distinguished from technical training facilities.

Not surprisingly, the rarity of pre-1919 hangars is noteworthy, and the rarity of wood frame construction also stands out. One discovery made during the research was that most surviving hangars originally designated as temporary construction are made of steel. This was unexpected because, as a rule, temporary military facilities were usually made of wood. Virtually all wooden hangars—and half of all non-permanent hangars—were constructed during the World War II era. However, only about 25% of the temporary hangars recorded in the CERL database are timber structures. The preponderance of steel temporary hangars in the DoD inventory is accounted for by a World War II-era Air Corps policy that encouraged the use of steel in technical temporary construction. Based on the available data, most of the surviving wood frame hangars appear to be located in Alaska and the Pacific Northwest, where heavy timber was available locally in plentiful amounts.

One particular hangar—the U.S. All-Steel Hangar—warrants special comment. Although it was a classic workhorse design of the World War I era, many installation cultural resource managers do not recognize it and therefore consider it a rarity. This hangar was in fact mass-produced during World War I, but many building components did not reach their intended locations until after the Armistice. Consequently, most U.S. All-Steel Hangars were assembled after World War I and put to alternative uses, such as warehouses or maintenance shops, usually located away from the airfields for which they were originally intended. Many installations today still have one or more of them in use. The structure can be identified by its distinctive 66-foot steel gambrel truss. Due to the modular design of this hangar, however, it was not uncommon to erect them in multiple-bay configurations and in varying lengths. Alternative layouts, such as these, as well as their utilization away from historic flight lines, likely contribute to difficulty recognizing the U.S. All-Steel Hangar on military installations today.

### Conclusion

The CERL hangar study has drawn many inquiries from DoD personnel as well as the civilian sector, and some queries have revealed unique and scarce resources. For example, the report has been used to help understand the provenance of historic military hangars located on former military air bases that are no longer owned by DoD. However, the principal goal of the study was to assist DoD cultural resource managers with NHPA compliance reviews. DoD cultural resource personnel report that the study also has proven valuable in the successful conversion of historic hangars to new uses. Furthermore, cultural resource managers at installations with no original design documents have made inquiries when they need additional technical expertise to interpret layouts, structural elements, or nonstandard construction details.

The hangar study should provide cultural resource managers, historians, architects, and engineers a sound basis on which to begin an evaluation of historic aircraft hangars. The big-picture perspective presented in the report will certainly contribute to national-level significance assessments and provide a basis for more meaningful determinations of regional and local significance.

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June Noelani Cleghorn

# Repatriation of Human Remains at Marine Corps Base Hawaii

The following is a brief summary of the repatriation effort conducted by Marine Corps Base Hawaii, Kaneohe Bay (MCBH) followed by a synopsis of efforts to execute Native Hawaiian claimant requests for reburial. The ultimate objective is to present a snapshot of the intricacies of conducting statutory consultation with multiple groups who submitted claims for repatriation of the collection of Native Hawaiian human remains found on the Mokapu peninsula.

### *The Mokapu Burial Area*

The Mokapu peninsula is located on the northeast side of the island of O'ahu between Kailua and Kane'ohe Bays. MCBH currently occupies this entire peninsula. The archeological evidence from Mokapu provides a picture of the indigenous inhabitants of windward O'ahu, during the 500 years prior to Captain James Cook's "discovery" of the Hawaiian Islands in 1778. These early Hawaiian inhabitants established temporary campsites on the peninsula shorelines as they sought out abundant marine resources for their subsistence. They were probably members of extended family units totaling not more than 150 people at any given time. These Hawaiian family groups used the peninsula's northernmost sand dunes for burial.

*The Mokapu Burial Area consists of the high vegetated sand dunes, seen in the left foreground and extending the length of this coastline to Ku'au, the name of the pinnacle rock seen at the right above. Photo courtesy Jon Chun, Marine Corps Base Hawaii (MCBH).*

The picture of pre-Contact occupation described above resulted from archeological data gathered during systematic excavations of Mokapu's northern sand dunes that were conducted as early as 1938. In these few years prior to the Pearl Harbor bombing in 1941, the federal government was acquiring the various privately owned and territorial parcels of the Mokapu peninsula for military use. Beginning as early as 1917, and continuing intermittently over the next two decades, the Bishop Museum accepted isolated human remains which were reported by local residents as having eroded out of Mokapu's sand dunes. With the threat of war and the increased focus on establishing the Mokapu peninsula as a strategic military installation, two archeologists, one from the Bishop Museum and one from the University of Hawaii, applied for permission to excavate the sand dunes. The excavations, conducted on weekends between 1938-1940, resulted in the recovery of human skeletal remains representing more than 1,300 individuals.

By 1943, the federal government had acquired the entire Mokapu peninsula. The government operated the peninsula first as a Naval Air Station (NAS) throughout the World War II, followed by commissioning of the Kaneohe Marine Corps Air Station (MCAS) in 1952. During the Kaneohe NAS years, a commercial sand mining operation was established on the peninsula's northern sand dunes that supported a buildup of military infrastructure both on the peninsula and at other installations island wide. The dune sand was used as padding for installation of underground utilities and concrete building foundations. As a result, isolated human remains, whose original burial had been located in Mokapu's sand dunes, were disturbed and inadvertently deposited elsewhere on the peninsula and to other locales throughout the island.

In the early 1970s, as federal and state governments were beginning to identify and inventory the nation's significant cultural resources, Kaneohe MCAS nominated the Mokapu sand dunes for listing on the National Register of

Historic Places (NRHP). In 1972, these sand dunes became known as the Mokapu Burial Area and were listed on the NRHP as Site 50-80-11-1017. Marine Corps assets on O'ahu Island were consolidated in 1994, resulting in the establishment of Marine Corps Base Hawaii with the Mokapu peninsula, known as MCBH Kaneohe Bay, being its largest land holding. Current efforts to maintain, repair, and replace World War II era buildings and infrastructure on MCBH often result in the inadvertent discovery of isolated human remains whose original burial locales had been within what is now the Mokapu Burial Area.

### *NAGPRA Compliance and Consultation*

MCBH completed its inventory of Native Hawaiian human remains in 1994, when it published the requisite Notice of Inventory Completion in the February 28 *Federal Register.* This inventory identified the Mokapu Collection of Native Hawaiian human remains (referred to below as the Mokapu Collection) as representing at least 1,582 distinct individuals. The solicitation of claims for the Mokapu Collection that accompanied the 1994 Notice of Inventory Completion resulted in the submittal of numerous competing claims from Native Hawaiian individuals and organizations.

The initial efforts at consulting with these first claimants took the form of written correspondence culminating in one large group meeting, near the end of 1994, which resembled an adversarial town meeting with the government representatives on one side facing Native Hawaiian representatives on the other. The representatives for MCBH urged the many claimants to work out differences among themselves and to submit a second "unified" claim as being the fastest route to a resolution of this apparent claimant competition. This suggestion was received with anger and frustration among some of the claimants since their own attempts to unite failed. Thus, the responsibility for executing repatriation became the onus of the Marine Corps, as the government agency mandated to take such action.

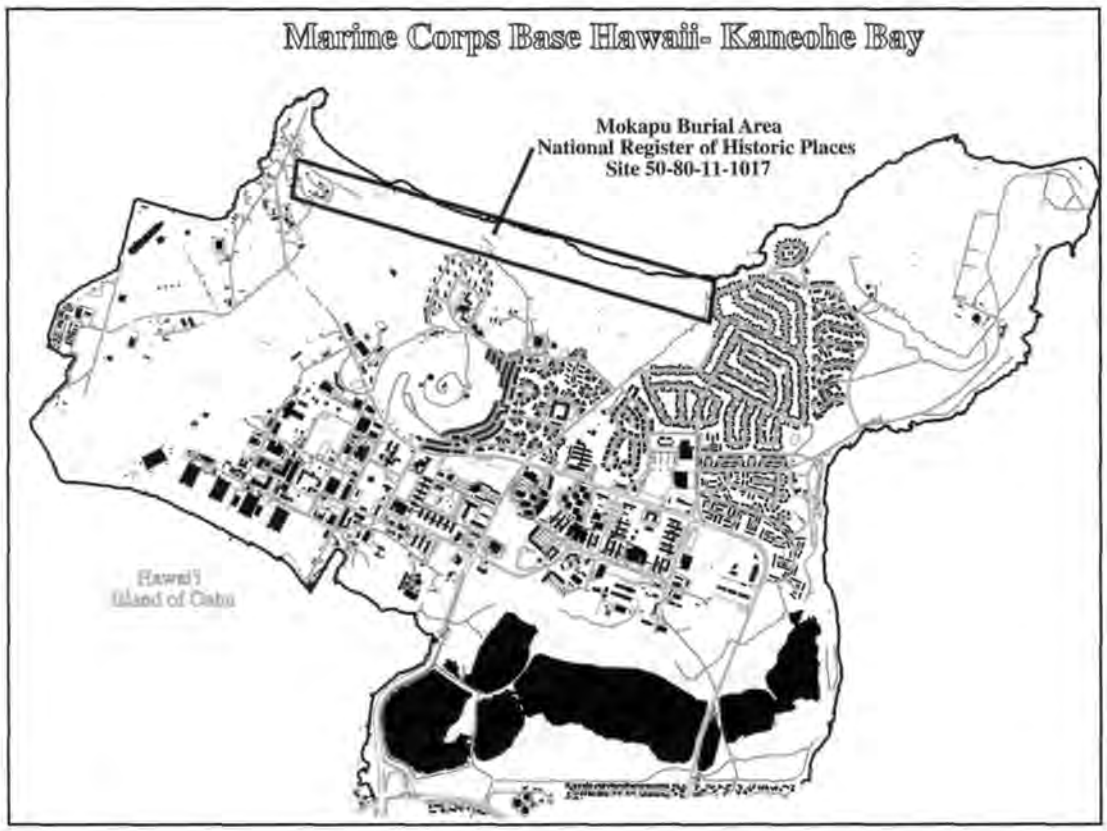
### *Multiple Competing Claimants*

Acting in good faith, MCBH turned to the NAGPRA regulations for guidance in evaluating these multiple claims. Unfortunately, the procedures listed in the NAGPRA regulations for evaluating multiple competing claims lack the practical means to reach a resolution. Additionally, as the MCBH legal staff realized that the NAGPRA regulations were not going to be of much help in resolving competing claims, it also became increasingly clear that the claimants themselves were often baffled with the confusing "maze" of regulations.

Thus, early in the repatriation process, MCBH accepted responsibility for aiding the claimants in their understanding of the extensive procedures required for repatriation of what they believed were their rightful ancestral remains. Specifically, MCBH opted to become partners with these claimants and together learn as much as possible regarding the implementation of a successful repatriation process. MCBH sponsored NAGPRA training workshops for both the claimants and base staff, attempted to learn about centuries-old Native Hawaiian burial traditions, and tried to interpret the NAGPRA regulations in ways that would support the integrity of such traditions.

For example, the NAGPRA criterion for claims of lineal descent (43 CFR 10.2(b)(1)) can only be met if the individual sets of remains can be specifically named or identified. However, pre-Contact Hawaiians purposefully buried their loved ones in nondescript ways to inhibit desecration of their ancestors' remains by rival families or chiefs. Thus, the vast majority of traditional Hawaiian burials found during modern times is lacking identification. Indeed, none of the 1,582 individual sets of remains in the Mokapu Collection could be named as specific individuals. Thus MCBH realized that all of the lineal descent claims from families and individuals would have to be denied. Rather than accept denial and exclusion of the lineal descendant claims based on a definition that did not take into account the specific traditions of Native Hawaiian burial, MCBH allowed for these Native Hawaiian families to resubmit their claims as Native Hawaiian organizations claiming cultural affiliation. Ultimately, all the claims for lineal descent were resubmitted as cultural affiliation claims from Native Hawaiian organizations, and these organizational claims were subsequently afforded equal standing as claimants under the NAGPRA regulations due to the broad nature of the qualifying criteria listed for Native Hawaiian organizations.

At this point in the repatriation process an important success had been achieved: MCBH had used the NAGPRA regulations to allow for equality among all claimants who wanted to be




*Marine Corps Base Hawaii, Kaneohe Bay, is located on the Mokapu peninsula on the northeast coast of O'ahu Island. The Mokapu Burial Area, National Register of Historic Places Site 50-80-11-1017, is located along the northern coastline of the peninsula as illustrated in the aerial photo above. Courtesy Jon Chun, MCBH.*

part of the Mokapu Collection repatriation. Soon after this success, however, difficulty arose in dealing with these multiple culturally-affiliated Native Hawaiian organizations. This difficulty arose from the claimants' disparate views on Native Hawaiian traditions regarding the treatment and care of their ancestral remains. In the end, the Native Hawaiian organizations wanted MCBH to judge the various claims and thereby limit which ones could or could not keep their standing. Since there were no procedures in the NAGPRA regulations for agencies to "judge" or limit such claims, MCBH saw that it had to get the claimants to realize that the only way to keep this repatriation process moving was to recognize all the Native Hawaiian organizations as the rightful claimants for the repatriation of the Mokapu Collection. Thus, the Notice of Inventory Completion published in the August 31, 1998, issue of the *Federal Register* states that the Marine Corps repatriated the Mokapu Collection to 21 Native Hawaiian organizations who had filed claims. Then in April 1999, five years after publication of the first Marine Corps *Federal Register* Notice of Inventory Completion, final repatriation was completed.

### *Successful Consultation*

The process of consultation executed by MCBH, albeit lengthy, was nonetheless successful because it culminated in the repatriation of the Mokapu Collection to all 21 Native Hawaiian claimants who had filed claims of affiliation with this collection of remains. During the course of these several years, many differences emerged among the numerous representatives of the Native Hawaiian organizations who were engaged in this process with MCBH. However, these consultations were ultimately successful due to the following key accomplishments:

- During the latter three years of the repatriation consultation process, MCBH established consistent agency points-of-contact (POC) which included one civilian cultural resources specialist and one or two specific Marine Corps officers.
- Face-to-face meetings were scheduled on a regular basis which afforded the claimants the opportunity for continual contact between themselves and the MCBH representatives.
- The process was modified in ways that helped to support the integrity of the cultural traditions that formed the basis of these Native Hawaiian claims.
- Though some claimants were adamantly opposed to MCBH acting as facilitator and/or mediator in this consultation process, MCBH did support and conduct mediation or facilitation when it seemed the only way to keep the process moving.
- Over time, MCBH learned to be better listeners and realized that many of the claimants took great satisfaction in knowing that, though ultimate decisions would be made by the base commanding general and not by his POCs, it was the familiar base POCs who were committed to hear them out.
- Ultimately, the single most effective action accomplished in this consultation process was enforcing equity among the claimants by

ensuring that all those who wished a voice in this process were guaranteed that voice.

### *Repatriation and Beyond*

Through more than five years of active consultation, MCBH found that trust from the claimants was earned through our perseverance and commitment to bringing repatriation to a successful end. Once repatriation was finalized, a majority of the 21 recognized Native Hawaiian claimants, who ultimately became "owners" of the Mokapu *iwi kupuna* (Hawaiian phrase for "bones of the ancestors"), submitted to MCBH written requests for support and permission to rebury their ancestral remains on the Mokapu peninsula and thereby allow for their ancestors to "return home."

The United States Marine Corps is a combat organization whose mission is one of military readiness and global projection of operating forces. Though reburial of Native Hawaiian ancestral remains is not required under NAGRPA and is not essential for global military readiness, the Marine Corps has nevertheless supported this reburial request because it is the right thing to do. The Marine Corps takes its resource stewardship responsibilities seriously, and MCBH is committed to providing such stewardship for the remains of those who first resided on the Mokapu peninsula.

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David L. Conlin

# Recovery of the Confederate Submarine *H.L. Hunley*

Historians point to the March 9, 1862, engagement between the Union ironclad USS *Monitor* and the Confederate ironclad ram CSS *Virginia* in Hampton Roads, as a pivotal moment in the development of modern naval warfare. Though most would argue that the obsolescence of wooden ships of sail was vividly demonstrated in Virginia that day, fewer are able to appreciate that an equally significant development in naval warfare—the first successful attack on a surface ship by a submarine—occurred just two years later off the coast of Charleston, South Carolina. While the tactical and strategic impact of armored battleships crested and then declined in the first half of the 20th century, the implications of that first submarine attack continue to affect global geopolitics and strategic thinking today.

Submarine warfare during the Civil War emerged largely as a Confederate response to the Union blockade of southern ports. Within the tightly constrained context of the blockade emerged a remarkable drama of actions and reactions, causes and effects, and technological innovations and responses that culminated dramatically in naval combat off Charleston in early winter 1864.

In 1864, the northern blockade was in full force, and its crippling economic effects had begun to bite deeply into the South's ability to fight the war. Unable to compete at an industrial level with the Union, the Confederacy turned to technological and tactical innovation to break the Federal stranglehold on southern ports, sometimes with spectacular results.

On February 17, 1864, the tiny Confederate submarine *H.L. Hunley*, under the

As this issue of *CRM* goes to press, archeologists have almost completed the excavation of *Hunley*'s interior, which filled with sediment following the sinking in 1864. Remains of eight of the crew have been found, and it is likely that the ninth crewmember will be recovered as well. To date, the reasons for *Hunley*'s loss remain a mystery. For the latest infomation, go to <http://www.hunley.org>.

H.L. Hunley *in its excavation trench prior to recovery. Computer simulation by Mike Skrab, Oceaneering Advanced Technologies, courtesy Friends of the Hunley.*

command of Lieutenant George Dixon, slipped from the shores of Charleston Harbor on the outgoing tide, aimed itself at the Union blockade ship USS *Housatonic* and prepared for what was to become a singular milestone in naval history—the first ever successful submarine attack on an enemy ship. With a crew of eight turning the hand crank that powered the submarine, Dixon steered four miles out to sea toward the Union blockade fleet.

As *Hunley* drew near *Housatonic,* lookouts in the rigging spotted what seemed to be a log, then a porpoise, and finally the attacking submarine. While the alarm was sounded, the Union ship slipped its anchor, backed its engine, and frantically tried to avoid the attack. As the crew and captain of the blockader fired pistols, rifles, and shotguns at the tiny sub, *Hunley* rammed a 135-pound black powder charge into the stern quarter of *Housatonic* directly adjacent to the powder magazine, backed off, and blew the entire starboard stern quarter off the Union ship. After a massive explosion, *Housatonic* settled to the shallow bottom as sailors in their underwear scrambled into the rigging to await rescue. *Hunley* signaled the success of the attack and then disappeared into the night. *Hunley*'s commander, George Dixon, and his crew of eight men, the third and final crew to meet disaster in the submarine, also disappeared. *Hunley* was to remain lost for 131 years.

In May 1995, after an exhaustive search, archeologists sponsored by author Clive Cussler's research organization, the National Underwater and Marine Agency (NUMA), successfully located the submarine buried beneath three feet of mud and sand outside Charleston harbor. In 1996, with funding from the Department of Defense Legacy Resource Management Program and other private and government sources, a joint team of archeologists drawn from the National Park Service Submerged Cultural Resources Unit (NPS), the Underwater Archaeology Branch of the Naval Historical Center (NHC), and the South Carolina Institute of Archaeology and Anthropology (SCIAA) returned to coordinates provided to the Navy by NUMA to confirm that the object found was the remains of *H.L. Hunley,* assess the condition of the submarine, and recommend a course of action for the wreck.* Based on the 1996 assessment and the threat posed to the site by looters, the decision was made to recover the submarine for conservation and perpetual curation in South Carolina. Archeologists from the NHC, NPS, and a number of federal and state institutions and organizations working with engineers and consultants from Oceaneering Advanced Technologies, systematically examined and modified technical options for *Hunley*'s recovery, based on information obtained from the assessment and subsequent findings. This cooperation cre-

*NPS Archeologist Matt Russell mapping the stern of* H.L. Hunley. *Diving conditions on site were difficult, with low to zero visibility the norm. Photo by Brett Seymour, NPS, courtesy Friends of the Hunley and* National Geographic.

*August 8, 2000 8:45 a.m.,* Hunley *and frame are safely lifted from the bottom and placed on the transport barge. Photo courtesy Tim Smith, NPS.*

ated a feasible plan that was implemented during the summer of 2000. At the same time, archeologists from the NHC, NPS, and SCIAA briefly examined the wreck of USS *Housatonic* and worked out myriad bureaucratic and management details within the framework of the programmatic agreement signed between state and federal management authorities in 1996.

Fieldwork for *H.L. Hunley*'s recovery commenced on May 5, 2000, nearly five years to the day from when the submarine was discovered by Cussler's NUMA team. While *Hunley* was being prepared for recovery, archeologists working with geologists, sedimentologists, micro- and marine biologists, corrosion specialists, and water chemists collected scientific information pertaining to site formation processes, *Hunley*'s interior and exterior environments, and overall state of preservation. During the next several months, the submarine was carefully excavated from the sediments that surrounded it and gently suspended from a series of slings attached to a truss that stretched over the submarine.

On August 8, 2000, at 8:40 a.m., the first submarine to sink another warship was successfully raised from the floor of Charleston harbor and placed on a barge for transport to shore. By 6:00 p.m., this extraordinary piece of American and world history was safely placed in a tank of fresh water at a state-of-the-art conservation facility in North Charleston. The entire project was documented by teams from the National Geographic Society and South Carolina Educational Television.

Ultimately, *Hunley*'s recovery represents a model of federal, state, and private sector united in service to an archeological resource of extraordinary importance. The *Hunley* project drew on the talents of hundreds of agencies and businesses at the formal and informal level and the success of the recovery is directly attributable to the thousands of contributions, both large and small, that were made by these individuals and groups. Cooperation, focused on preservation, has produced tangible results and placed this treasure of American and world history in the hands of generations to come.

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**Note**

* Larry E. Murphy, Daniel J. Lenihan and Christopher F. Amer, "Conclusions and Recommentations," *H.L. Hunley Site Assessment,* Cultural Resources Management Professional Papers, Number 62 (Santa Fe: National Park Service, 1998).

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*David L. Conlin is an underwater archeologist for the Submerged Resources Center of the National Park Service and supervised field operations on the* Hunley *recovery. He has a Ph.D. and a M.A. in anthropology from Brown University, a M.A. in maritime and Aegean archeology from Oxford University in England, and a B.A. in anthropology from Reed College. He has worked on projects in the Mediterranean, Caribbean, and Africa, as well as in the U.S.*

## Acknowledgements

Dr. Robert Neyland of the Naval Historical Center, on loan to the state of South Carolina's *Hunley* Commission, directed the *Hunley* recovery project. This project involved archeologists and professionals from the National Park Service Submerged Resources Center and Fort Sumter National Monument, South Carolina Institute of Archeology and Anthropology, South Carolina Division of Archives and History, the College of Charleston, and NUMA. Oceaneering Advanced Technologies provided the engineering and technical expertise for the recovery. The Department of Defense Legacy Resource Management Program, the State of South Carolina and the private non-profit group, Friends of *Hunley*, chaired by Warren Lasch, provided funding for the project. The South Carolina *Hunley* Commission, chaired by Senator Glen McConnell, provided policy and management oversight for the recovery.

Sannie Kenton Osborn and Robert Wallace

# New Frontiers, New Soldiers of Preservation

## The Presidio of San Francisco under Civilian Control

Since the Ohlone Indians occupied the area now known as the Presidio of San Francisco (Presidio) thousands of years ago, various groups have made distinct contributions that have helped shape its identity. Until the United States Army's departure in 1994, the Presidio of San Francisco was the longest continuously occupied military installation in the nation, having been occupied by a succession of soldiers, settlers, and families sent by the governments of Spain (1776-1822), Mexico (1822-1846), and the United States (1846-1994). Bounded on the north by San Francisco Bay and on the west by the Pacific Ocean, the Presidio seemed to be on the edge of civilization. In the 18th and 19th centuries, the Presidio simultaneously marked the northern frontier of Spanish and Mexican colonial expansion; the southeastern frontier for Russian fur traders travelling from Alaska and Fort Ross, its northern California outpost; and the western frontier of an American nation seeking its manifest destiny.

*Map of El Presidio National Historic Landmark district and El Presidio Archaeological Site prepared by Christopher Lee, Presidio Trust.*

In 1962, the Presidio was designated a National Historic Landmark district. Ten years later, Congress passed legislation designating it as part of the Golden Gate National Recreation Area (GGNRA). Designated for closure under the 1989 Base Realignment and Closure Act, the 1,480-acre Presidio was added to the larger 76,500-acre GGNRA. The National Park Service (NPS) assumed total jurisdiction over the ex-military post in 1994. In 1996, Congress created the Presidio Trust (Trust), an executive agency of the U.S. government, to oversee 80% of the former Army post, that includes most of its historic buildings. Both the Trust and NPS are responsible for the stewardship and interpretation of the Presidio's cultural landscapes, historic buildings, and archeological sites. They also are entrusted with the research and preservation of the Presidio's rich oral and archival histories. Congress also mandated in the Trust's charter that it be financially self-sufficient by fiscal year 2013. Otherwise, the Presidio will be transferred to the General Services Administration and sold.

The most basic principle of the Trust's historic preservation program is adaptive re-use and rehabilitation of the park's 474 historic buildings. Many that stood empty and unused before the Army's departure now need extensive care. These buildings represent 11 significant styles of architectural classification and eight major historical periods represented in the National Historic Landmark district designation. In the year 2000, several historic buildings underwent rehabilitation, including seismic strengthening, electrical and plumbing modernization, and accessibility improvements. Over the coming decade, an estimated $200 million is required to save the imperiled buildings, which will be funded from a combination of public and private investment, long-

term leasing revenues, and federal tax credit incentives.

The Main Post is one of the most significant areas in the Presidio historic district both archeologically and in terms of preserving the built environment. At least 50 archeological features contribute to the post's history and cultural landscape development, including three recorded prehistoric sites. The Main Post has been the center of activity on the Presidio since its first temporary structures were built in 1776. Selected by the Spaniards for its wind-sheltered location and commanding views of San Francisco Bay, the Main Post now comprises 149 buildings showcasing a wide range of architectural styles. Collectively, these buildings represent the most substantial Civil War-era military complex in the far West. Housing was an integral part of the Main Post, including several enlisted men's barracks buildings and a distinctive row of officers' houses. This article describes the rehabilitation of three of these Main Post structures—Buildings 36, 39, and 50—as well as archeological investigations associated with the building rehabilitations and at the *El Presidio* archeological site. All three structures and the *El Presidio* archeological site serve to remind us of the many layers of the Presidio's history.

### Building 36

Located on Lincoln Boulevard, Building 36 was designed by Captain Charles F. Humphrey, a U.S. Army quartermaster officer, and constructed as one of a pair of barracks in 1885. It is the last extant Indian War-era (1865-1890) wooden barracks at the Presidio and represents a period during the 1870s and 1880s when the Presidio expanded in both size and importance. The wood-frame military architecture of Building 36 was almost entirely superseded by brick construction after 1890. The building is now part of the Trust's Main Post leasing program and has been converted into offices for a collection of smaller non-profit tenants.

*Main Post in the 1890s with Building 36 on the far left. Courtesy NPS Park Archives, Presidio of San Francisco.*

The former barracks building underwent a complete rehabilitation consistent with the *Secretary of the Interior's Standards for Rehabilitation* and with the Presidio's *Rehabilitation Guidelines.* The entire structure was seismically strengthened and then brought into compliance with all applicable building codes including complete fire detection and suppression systems. The non-historic fabric in the interior of the building was selectively demolished. All remaining historic fabric was incorporated into the design for the building rehabilitation of common and tenant spaces while some historic fabric was lost. Other historic fabric was replaced in kind or carefully removed and reinstalled, some of which will lend to the seismic stability of the structure. Deteriorated historic plaster and wood lath were replaced with new drywall and veneer plaster. Missing historic fabric of certain elements on the first floor front porch were converted back to an original state by restoring missing windows and doors at historic openings and replacing missing column brackets. A second stair was also repositioned where the missing historic stair had previously existed. All restored elements matched remaining historic elements, or replicated elements found in historic photodocumentation. The contractor provided supervision to ensure that the rehabilitation of the structure and remaining historic fabric complied with drawings and specifications. During the installation of utility trenches for Building 36, ground disturbance precipitated the recovery of a buried Civil War-era 88-pound, 9-inch solid-cast Dahlgren cannonball. The cannonball is now displayed in the Presidio's Archeology Lab, a "temporary" World War I wooden structure originally built as a Quartermaster depot warehouse.

### Building 39

Located on the Presidio's historic Main Post, Building 39 was built in 1938 to house enlisted troops. Constructed in modified Mediterranean Revival style, the three-story I-shaped barracks was later transformed into the headquarters of the U.S. Sixth Army. The building stood vacant since 1995, when the Sixth Army was de-activated. In 1998, the San Francisco Film Centre (Centre) became the first

*Building 36 after rehabilitation. Photo by Robert Wallace.*

long-term tenant of the Presidio Trust by signing a lease for Building 39 and the 800-seat Presidio Theatre. The Centre conducted a $6.6 million rehabilitation of the 67,000-square-foot former barracks that included a complete seismic upgrade of the facility, accessibility improvements, and complete replacement of the electrical, plumbing, and fire safety systems. The tenant's design team carried out the project in accordance with the Secretary of the Interior's Standards for Rehabilitation, under the supervision of Trust historical architects. The Centre is now home to a variety of non-profit and for-profit arts-related organizations, including the San Francisco Film Society and the George Gund Foundation. The site also includes state-of-the-art film production and editing facilities, and public space showcasing film-related exhibits.

During the rehabilitation, artifacts dating from 1815, including *tejas* (roofing tiles used by the Spanish colonists), multicolored ceramic pottery (*majolica* and lead glazed earthernwares), a fired-clay tobacco pipe, oxidized metal hooks, and cattle bones, were discovered on the west side of the building. Since Building 39 is bisected by the c. 1815 expansion of the Spanish garrison quadrangle, avoiding adverse effects to this archeological site was a top priority in the rehabilitation. This site appears to have been a kitchen or hearth. The objects were removed and the soil and strata recorded so that the rehabilitation work continued with minimal delay. The artifacts are now on display at the Presidio's Archeology Lab.

### Building 50

Building 50 is a complex series of interconnected concrete, wood-frame, and steel-frame structures representing several periods of construction over approximately 200 years. In the late-19th and 20th centuries, the building served as the U.S. Army Officers' Open Mess and later as the Presidio Officers' Club. Although no complete buildings remain from the Spanish or Mexican occupations, the front portion of Building 50 contains the adobe walls of a much earlier Spanish building from c. 1812-1815, making it one of the oldest structures in the city and county of San Francisco. Therefore, it is most likely the most historically significant building on the Presidio. It is the largest of only two remaining Spanish Colonial military buildings in California; the other being El Cuartel, a soldier's residence, located on the quadrangle of the Presidio of Santa Barbara.

Building 50, although only a partial structure, contains the fabric of the last *comandancia*, or commanding officer's quarters left from Spanish Colonial California. Building foundations from an even earlier adobe structure have also been found beneath it. From 1846-1856, U.S. troops rebuilt the crumbling wall of *El Presidio's* buildings, joining the two wings of the original adobe with plaster and wood infill to reuse the structure as a court-martial room. A projecting central assembly hall with gable was added in the 1880s, later used as a ballroom. During the period from 1931 to 1934, Quartermaster Captain Barney Meeden directed an attempted "restoration" of Building 50, transforming the building into a contemporary Spanish Colonial Revival edifice, with the Spanish tile roofs, decorative iron work, and heavy timber lintels and beams. This building saw minimal use after the Army's departure until early 2001, when it was upgraded to accommodate a museum-quality public exhibition space. In January 2001, a portion of the still-extant adobe wall was found during rehabilitation activities for the building's exhibit gift shop. Archeologists and historic preservation personnel from both the Trust and NPS recorded and measured the exposed portions of the adobe wall in order to see the interfaces between different building episodes. The Trust has contracted with Architectural Resources Group of San Francisco to prepare a complete historic structures report.

### Archeological Investigations

Located in the heart of the modern Presidio's Main Post area, the *El Presidio* site has driven development in the post from 1776 to the

present. Several archeological investigations have been conducted at this site, including

- the discovery of the Spanish Colonial *El Presidio de San Francisco (El Presidio)* in 1993, during the Army's removal of an underground fuel oil storage tank along Funston Avenue;
- additional research on the 1780 *El Presidio* chapel site between 1996 and 1999, done by NPS in cooperation with Cabrillo College, and;
- field studies along the Funston Avenue "Officers Row" at the *El Presidio* site by the University of California at Berkeley's Archaeological Research Facility during the summers of 1999 and 2000.

The project conducted by U.C. Berkeley yielded a wide range of significant, intact archeological deposits and features that span from early colonial occupations of the Presidio through the early 1900s, including dense concentrations of Spanish-colonial (1776-1821) and Mexican (1822-1846) period archeological deposits. Limited testing showed that an American period component of the site contains well-preserved archeological remains, including privy pits, brick foundations, a box drain or sewer, wooden architectural remains, and household waste deposits. The site also has preserved structural remains associated with previous historical landscapes, such as remnants of wooden fences from the early 1900s.

The importance of these findings is only heightened by the Presidio's prominent role in the history of Spanish colonies in the New World, indigenous Californians, the city of San Francisco, and 18th- and 19th-century international relations. The Trust recognizes *El Presidio's* international importance and is preparing a specialized Archeological Management Plan for the site as part of its overall Main Post planning. These intact remains relate to each historic phase of the Presidio's occupation and provide rich fodder for in-depth studies into any of these time periods. Archeological resources are essential to the Presidio's long-term use as a national park, and a conservation-based interpretive approach to managing and protecting these resources will greatly enhance both the educational and recreational values of the Presidio.

Today a network of supporters—public, private, local, regional, and national—is uniting around an effort to preserve one of our nation's most beautiful and significant destinations. Their contributions of time, expertise, and financial resources reflect the broad support the Presidio enjoys. These people provide indispensable support for the Trust and NPS, helping the organizations achieve the preservation and economic mandates set forth by Congress. The former crown jewel of the United States Army retains much of the rich foundation left behind by our American soldiers—historic structures, customs, and culture upon which to build a vibrant community where people live, work, and visit.

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*Robert Wallace is an architect and Senior Project Manager at the Presidio of San Francisco.*



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David G. Anderson

# Resource Management in the Department of Defense

## Defending America's Heritage

The articles in this issue of *CRM* illustrate how the Department of Defense is defending America's heritage, not just on the battlefield and overseas, but on the home front, through an impressive, proactive program of preservation and management. Given the military's own proud history, and concern for its past, this is perhaps not surprising. Its position and approach certainly serve as an example other federal and state agencies should follow. The diversity of topics covered in this issue demonstrates that heritage resource management is strongly integrated into and forms a well-considered part of the military mission. The content of these papers shows that the agency is leading the way in a host of areas. The many dedicated people in DoD working in heritage resource management deserve all of our thanks.

In my work with the National Park Service, I have been helping provide technical assistance and contract oversight at a number of military installations. I know that DoD puts its money where its responsibilities are with regard to identifying, evaluating, and protecting cultural resources. DoD is far ahead of all other federal agencies in this regard. The support provided by DoD for heritage resource management should serve as a model for federal agencies. Many installations are completely surveyed, allowing for effective resource management. The technical, communications, and management tools in support of these efforts, as Peter Boice noted, are varied and growing. Through the innovative Legacy program, discussed by Paula Massouh, furthermore, the results of installation-specific work are put into a broader perspective while important or unusual projects and initiatives receive support.

The military is also leading the way in ensuring that heritage management is solidly integrated into other management concerns, in support of the ongoing mission of the agency, and in full compliance with existing laws and regulations. Integrated Cultural Resource Management Plans (ICRMPs) are effective means of ensuring this occurs, as Loechl and Whalley discuss. The ready availability of resources that support ICRMP development on the web is something of value to everyone concerned with heritage management, and not just people in DoD.

The curation program within DoD, as led by staff of the St. Louis District COE, and maintained by dedicated individuals on many installations, as Eugene Marino and Michael Trimble document, is indeed one of the best of any federal agency. The equal emphasis placed on artifacts and associated records is laudable, since without proper documentation, the artifacts themselves are greatly reduced in scientific and interpretive value. Anyone who has had to work with older collections, as I often have, realizes that curators and records managers are often the unsung heroes of the cultural resource management world.

Cheryl L. Huckerby's presentation of Fort Hood's outstanding CRM program highlights the diversity of activities that occur on individual DoD installations, including GIS-based predictive modeling, public outreach, archeological, architectural, and historical research and synthesis, archeological and architectural survey and evaluation, and the protection of sites from looting. Her paper offers a look at the specific procedures by which CRM is implemented on an active military installation. These programs show how it is possible to facilitate the ongoing Army mission while simultaneously doing an excellent job of preserving heritage resources. Most of my own work with the military has been on U.S. Army Forces Command (FORSCOM) installations, so I appreciated her overview of the larger FORSCOM program, which I think is exemplary even by DoD's high standards.

Many of the papers, including that by Newell Wright and his colleagues about Eglin Air Force Base, document the very fine networked GIS and web-based computer systems in use on DoD installations. The Eglin case shows how these systems are invaluable aides to research and management, facilitating communication and cooperation between personnel in many specialties and offices on an installation. As an aside, the Eglin, Fort Hood, Camp Pendleton, and Fort McCoy case studies discussed here illustrate how fieldwork conducted on DoD installations has produced some of the very best archeological survey data in the country. This information is typically in a GIS, and hence readily available for management purposes, as well as state of the art scientific studies of past settlement, land use patterning, and predictive modeling.

Stan Berryman's discussion of the NAGPRA consultation process, specifically as it relates to inadvertent discoveries of human remains at Camp Pendleton, is another fine demonstration of how the military takes a proactive role in managing heritage resources. The inadvertent discovery process is something all resource managers must know about. The best way is to learn from installations like this, where many such discoveries have occurred, specific procedures for dealing with them have been developed, and these procedures have been then formalized through cooperative agreements with tribal governments. Having specific details on how to proceed worked out as much as possible in advance, and incorporated in ICRMP documents, is crucial.

The case study from Fort McCoy, Wisconsin, presented by Andrew Sewell and his colleagues, again illustrates the importance of a well-supported GIS in both installation land use management and for the better understanding of the past. Over 1,200 buildings on the installation have been documented and evaluated by architectural historians, emphasizing the importance routinely given to standing structures by the military, and another exemplary aspect of DoD's national preservation program. The Fort McCoy case also highlights the importance of strong interaction between cultural and natural resources personnel, as well as other installation specialists, in managing and interpreting cultural resources. The Fort McCoy predictive modeling effort is typical of the high quality, replicable analyses of this kind occurring on military installations around the country. Critical in all such studies, of course, is the development of probability zones that can be quickly and easily delimited on the ground by field teams, as was done here. Our predictive models change over time, of course, as more and better data are collected, and our understanding of land use in the past changes. We must be prepared to revisit our earlier efforts and refine them, and DoD is taking the lead in seeing that that happens.

The paper recounting rock art discoveries at the Marine Corps Air Ground Combat Center in the Mojave Desert, by Marie Cottrell and her colleagues, effectively demonstrates how agencies can work to preserve and protect these sites, as well as learn from their contents. Protection from vandalism is a serious issue before land managers, and sites on military bases sometimes are afforded a rare measure of protection just by virtue of the way access is controlled. The paper also gave us an idea of what can be learned from such sites, and why their preservation is important.

Laurie Lucking's paper about the use of sacred places on Army lands in Hawaii, and the paper by Vicki Best and her colleagues on the use of similar kinds of sites on Nellis Air Force Base in Nevada, reminds us that military lands have value to many people, and that the perception of the landscape itself is culturally determined. Public outreach and partnerships programs directed to the protection and appropriate use of traditional cultural properties and sacred sites are an important aspect of DoD land management. The exemplary case studies from these installations serve as real world examples that other agencies can learn from. The use of Native American monitors during archeological fieldwork at Nellis, and the resulting development of truly collaborative interaction, is also a strong positive example of how to develop and maintain good relations, with benefits to all parties.

Webster and Cohen's paper deals with historic architecture, in this case military aircraft hangars, and demonstrates work that DoD excels in—the evaluation and maintenance of large

The papers discussed by David Anderson in this article, with the exception of those by Massouh, Osborn, Loechl and Whalley, and Webster, were derived from presentations made during a DoD symposium, "Keeping the Peace and Protecting our Heritage: Cultural Resource Management in the Department of Defense," that was held at the Society for American Archaeology meeting in Philadelphia, Pennsylvania, April 5-9, 2000. David Anderson acted as the discussant at the symposium that was co-chaired by L. Peter Boice and Paula Massouh.

numbers of historic buildings. World War II-era temporary wooden buildings are perhaps the best known military structures to be evaluated collectively, rather than individually. This approach to standing architecture, looking at as many or all the existing examples of a class of buildings, and evaluating and managing them accordingly, is an approach that might work well in state and local historic preservation programs. It certainly would seem to make more sense than examining structures on a case-by-case basis. The study also illustrates the serendipitous and in some cases counter-intuitive results that can come from broad studies, in this case, that many early "temporary" hangars were made using steel rather than wood frame construction.

June Cleghorn's presentation about repatriation efforts at the Kaneohe Bay, Hawaii Marine Corps Base, is another excellent real-world case study about how NAGPRA consultation should proceed. I routinely tell people in state and federal agencies, including my own, that military installations are the first place they should look to find excellent standard operating procedure (SOP) documents and procedures for implementing NAGPRA. As this case study shows, relationships built on mutual respect and willingness to talk and listen, and with sensitivity to the needs and concerns of all parties, are the way to proceed.

As an archeologist whose home is in South Carolina, I particularly appreciate the presentation by Conlin on the recovery of *Hunley*. Like many in my state and around the country, I have been following the conservation, analysis, and interpretation work on this historic submarine. The way many people are reacting to this discovery, particularly the possibility that human remains are almost certainly present within the ship, and their insistence that they be treated with respect, has given me (and no doubt many other people) a much better appreciation of the concerns of native peoples in such matters. This is a remarkable project, a landmark of underwater archeology. The effort associated with the recovery and ongoing analysis of *Hunley* shows us that having proper funding, personnel, and facilities in place, is crucial to the success of large, complex projects.

Osborn and Wallace's paper on recent work at the Presidio illustrates how the rehabilitation and adaptive re-use of buildings can proceed given wide public and private support. The linkage between archeology and architecture is also impressive, particularly in a complex known primarily for the latter kind of resources. Large numbers of battlefields have become national parks, and as an NPS employee who has seen many excellent historic architectural districts on military bases, I fully expect more military cantonment areas to one day achieve this status.

DoD is a leading federal agency in both the funding and the doing of CRM on the ground, and the many fine examples of this work are becoming more and more widely available, as exemplified by the case studies in this issue. The dedicated heritage management professionals in DoD, who do so much to foster an appreciation for our nation's cultural resources, deserve our admiration and respect.

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