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A Challenge for the Military Mission

Preservation in the Armed Forces

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To promote and maintain high standards for preserving and managing cultural resources

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Newell O. Wright

Defending the Nation's Heritage

The Department of Defense (DoD), as the manager of over 25 million acres, is a major player in National Historic Preservation Act (NHPA) compliance actions. Lands controlled by DoD contain myriad historic properties, including those which bear witness to the country's earliest Native American inhabitants, the subsequent periods of exploration and colonialism, manifest destiny, plantation economies, internal strife, and more recent events which reflect alternating periods of global aggression and goodwill. DoD's preservation efforts provide a connection to the significant events of the nation's past through material cultural remains as well as sites and structures. These historic properties offer insight into events that shaped the prehistoric landscape, molded European presence on these lands, and forged a new nation following the declaration of war on the English throne by the firebrands of the American Revolution.

DoD's activities in defense research, technology, and flight have, in themselves, left behind historic properties of national significance. The stewardship of these resources serves as a lasting reminder of the importance of military actions in world events and as a legacy of military achievement.

DoD's obligation to protect the nation's heritage has its own historical roots. In 1872 Congress delegated the responsibility of protecting the first national park to the War Department. In the late-19th century, as Civil War battlefields came under federal protection as memorials to persons and ideals, their management was assigned to the Secretary of War.

Today, in response to legal requirements and increasing public concern for stewardship of cultural resources, DoD has become a leader in the development of formal compliance programs. These programs can be appreciated from two perspectives.

From a heritage perspective, the NHPA offers an unprecedented degree of protection to the nation's cultural resources; without that law much of our cultural heritage would have already been lost in the name of progress. From a military planner's perspective, compliance allows agencies to conduct missions with the assurance that their actions will be unimpeded by the threat or reality of legal challenge. Thus, the cultural resources management program serves to increase mission flexibility.

DoD's cultural resources stewardship benefits the nation in a variety of ways including scientific and educational contributions, commemoration of historic milestones, and efficient use of tax dollars. An example of the economic benefits can be seen in adaptive re-use of historic structures. Preservation of historic buildings offers useable space financed by an earlier generation of taxpayers and often preserves design features not readily reproduced with modern techniques.

The material cultural remains preserved through DoD efforts offer an educational resource and a physical connection with the nation's past. Publications, presentations, and outreach programs offer an outlet for the dissemination of information on DoD's demanding management responsibilities, far-ranging cultural resources programs, and plans for future preservation efforts.

CRM is an example of one vehicle for sharing information with a larger audience. The compendium of articles comprising this issue of *CRM* addresses an array of topics covering examinations of land use and military mission, compliance with specific regulations, fresh approaches to management and protection of cultural resources, specific examples of the preservation process at work, and challenges facing historic preservation as we enter the 21st century. Through the circulation of information on cultural resources work, this issue of *CRM* heightens public consciousness and also conveys to cultural resources professionals the scope of DoD's contributions to preservation of our nation's heritage.

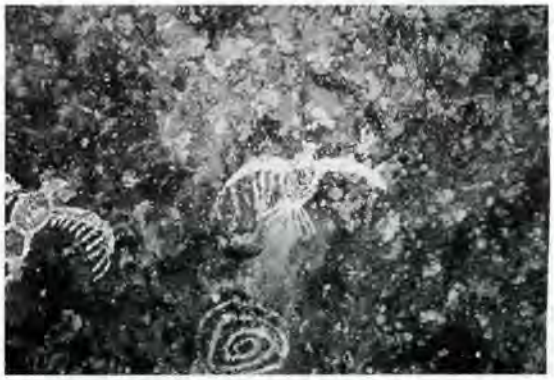
Twenty years ago few people involved in historic preservation understood the magnitude of the cultural record standing in threat of ruin or buried under the surface on DoD lands. Few people recognized the kind of effort required to properly manage these resources. Fewer still realized the rewards that would be reaped from DoD's expansive preservation efforts.

This issue of *CRM* demonstrates how far DoD efforts have come and how much they have accomplished. The job is not complete, however, and much remains to be done. Future issues of *CRM* will highlight the tasks that lie ahead and the steps to be taken to fulfill preservation goals as we move toward and into the next millennium.

Newell O. Wright is the Base Historic Preservation Officer at Eglin AFB, FL. Dr. Wright served as co-guest editor of this issue of CRM.

L. Peter Boice

The Importance of Cultural Resources Management for DoD



Native Americans left pictographs and petroglyphs that depicted both humans and animals on many DoD installations in the arid southwestern United States. A major group of these spectacular pictorial records of prehistoric life and activity is preserved at the naval Air Weapons Station China Lake, CA.

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, including remnants of the Oregon Trail; sites and buildings associated with such major efforts as nuclear weapons development and the space program; historic aircraft and ships, including USS *Constitution*; and documents, photographs, uniforms, flags, 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.

It is sometimes suggested that the preservation of cultural resources is inconsistent with DoD's military mission. Specific issues include the cost of maintaining historic facilities, the potential impact of archeological sites on the use of training lands, and the proper disposition of artifacts. Although sound cultural resources management must occasionally cope with all of these challenges and more, such views are shortsighted. What often is not considered are the full range of benefits which properly managed cultural resources can convey. In fact, DoD's cultural resources 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.

Military Mission Goals

Implicit within DoD's primary mission of "keeping the peace" has been the military's role of protecting America's heritage, including its democratic form of government and way of life, and the natural, social, and cultural evidence of that way of life. Preservation of visible signs of democracy help promote territorial and cultural integrity, both here and overseas, thus serving as a means of nation-building. By recognizing and respecting the symbols of cultural diversity, cultural resources preservation can also promote the integration of different groups of people.

Changing military training and testing needs are less likely to meet local resistance if a military installation has established good relationships with the surrounding civilian community. One area of common interest can be an installation's cultural resources. These resources are often an integral part of the community's cultural heritage, and local citizens value their preservation. If DoD installations are good stewards of their natural and cultural resources and work cooperatively with local communities for their preservation, the installations are more likely to be viewed favorably when controversial issues need to be discussed.

In many cases, sound preservation and reuse of historic facilities can actually contribute to

Fort Sam Houston, San Antonio, TX, has nearly 900 historic buildings. In 1991, the fort signed a programmatic agreement to manage its historic resources, including the Band Building. Fort Sam Houston has joined with the Army Corps of Engineers and the National Park Service to provide hands-on training courses for artisans to learn the fine craftwork needed to restore buildings such as this.

an installation's cost-savings goal. Although it is frequently assumed that rehabilitating an "old" building is more expensive than new construction, this may not be the case if all costs and benefits are considered. Other economic benefits of re-use include the preservation of higher quality building materials and workmanship, and less total energy consumption, if all energy expenditures are considered.

In addition, cultural resources are protected by a variety of federal laws, including the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archeological Resources Protection Act. Early planning for cultural resource protection and management can help installations avoid the costly delays that can result from incomplete compliance with cultural resources preservation laws and regulations.

Military History and Tradition

Cultural resources commemorate and honor our nation's and our military's history. The handsome brick officers' quarters at F.E. Warren Air Force Base (Fort Russell), Wyoming, testify to our military's role in westward expansion. The spires of West Point are symbols of military honor and achievement. The industrial might of the Norfolk Naval Shipyard in Virginia demonstrates the will of the nation to build an arsenal of democracy. And, the runways at Edwards Air Force Base, California, symbolize our striving to go ever higher, and faster, and further. Such places are vivid reminders of the military's role in the history of our country, symbols of strength and sacrifice that have made our nation great.

The preservation of outward manifestations of our cultural heritage provides direct experiences about remote and otherwise inaccessible places, events, and people. Protecting and preserving cultural resources found on these and other military installations is important to:

- know and understand our past;
- recognize and commemorate past events and persons;
- provide a sense of belonging and identity;
- offer an inspiration for future generations;
- foster *esprit de corps* among our military men and women about the history and traditions of military units.

Quality of Life

Maintaining orderly, attractive, stimulating places to live and work contributes to the security of all military personnel, their families, and surrounding communities. Preservation of historic buildings and districts on a military installation, as well as the presence of other cultural resources, creates a strong sense of place and improves the living and working environment.

One important element in supporting a strong quality of life is commitment to good installation design and planning. The historic buildings on many of our military installations are well planned and designed. Recurring landscapes and building types also contribute to an installation's quality of life. For example, the Olmsted Brothers designed the landscape plan for Fort Lewis, Washington, so that the parade ground focused on the distant snowcapped peak of Mount Rainier. The result is one of startling beauty and grandeur.

Many of our military installations are homes to military museums which are visited by thousands of residents and visitors alike. For example, Wright-Patterson Air Force Base, Ohio, has been at the forefront of aviation science for nearly 100 years. Wright-Patterson maintains programs to educate both military personnel and the public on the history of its activities. Their museum holds one of the largest collections of aircraft, spacecraft, missiles, and related artifacts in the world. Other DoD museums house world-class collections of archeological artifacts, military memorabilia, and other items.

Other installations use cultural resources to develop on-base programs of public education and scientific inquiry, such as those related to archeological investigations. Base personnel frequently volunteer to assist in such projects.

Summary

Cultural resources under DoD control are significant national assets. Wise stewardship of these resources is DoD's moral and legal obligation. Sound management can benefit mission and other military needs, and also enhance the quality of life for DoD's military and civilian employees.

L. Peter Boice is Director, Conservation Office of the Deputy Under Secretary of Defense (Environmental Security) in Washington, DC.

Located on Marine Corps Recruit Depot Parris Island, South Carolina, are the remains of the 16th-century Spanish village known as Santa Elena. Considered the finest Spanish colonial archeological site in the eastern United States, Santa Elena has been nominated as a national landmark. MCRD Parris Island has been working with the South Carolina Institute of Archeology and Anthropology since 1979 on excavation projects at Santa Elena.

Constance Werner Ramirez

A Summary History of the Army's Preservation Program

Although the National Historic Preservation Act (NHPA) was passed in 1966, the historic preservation program for Army installations was developed primarily in response to specific federal agency tasks and deadlines in Executive Order (EO) 11593, signed by President Richard Nixon on May 13, 1971. Almost 100 years earlier, the Army, then the War Department, had been given responsibility for the management of Yellowstone National Park and later for many Civil War battlefields and sites designated as historic monuments. But after these properties were transferred to the National Park Service in the 1920s, the military conducted few formal preservation activities, and history was the domain of the Center for Military History and the Army museum program. With the NHPA and EO 11593, the Army was forced to consider its inventory of historic buildings and sites in whole new terms: integration of a preservation process into the maintenance, repair, alteration, use, demolition, disposal, and acquisition of all of its real property. Twenty-five years later and with lessons learned from hundreds of preservation activities, the Army has a comprehensive, nationwide preservation program.

Even before passage of the NHPA, the Army Corps of Engineers' civil works program had developed a preservation program in its district and division offices across the country. From its founding in 1802, the Corps had been given responsibility for many surveys that ultimately involved historic and cultural properties and management of national parks, landmarks, and battlefields. Then in 1879, the Corps' Geographical Surveys were abolished, and the practice of carrying out ethnological, archeological, and cultural resource surveys came to an end. The Bureau of the Budget (now OMB) decided in 1947 that only the National Park Service had the authority to budget for and conduct archeological investigations on federal civil works projects. In 1951, the Chief of Engineers requested the Park Service to administer the antiquities permit program on all Army lands. It was not until after the enactment of the National Environmental Policy Act (NEPA) in 1970, that one district, Tulsa, added archeological expertise to its environmental resources staff. This resulted in Larry Banks, working as a geologist, to be given the position of Archeological Coordinator in September 1970.

In early 1971, while the Corps' military program was beginning to inventory historic properties on Army installations, the civil works program was discussing the role of the National Park Service and its authority to fund archeological investigations as part of Corps project costs. After EO 11593 was issued, the Corps decided that it could fund archeological work. In December of that year, the Tulsa District of the Corps of Engineers awarded the first archeological contracts to Wichita State University for surveys of Construction of Copan Dam and to Texas Archeological Research Laboratory for the Lake Texoma Restudy.

There continued to be disagreement among the Corps' Districts as to the role of the National Park Service in funding and carrying out surveys, but now there was also the growing awareness of the compliance requirements of Section 106 of the NHPA and its new regulations (36 CFR 800). Corps projects (undertakings, now), such as at Tahquitz Canyon and Warm Springs Dam in California, were delayed as staff learned new procedures. By the spring of 1974, the Corps' headquarters had begun meetings with archeologists and the National Park Service regarding funding responsibilities for compliance with NEPA. After the passage of Public Law 93-291, the Moss-Bennett Act, a task force was assembled to draft regulations for all civil works archeological and historic preservation activities. This meeting resulted in Engineering Regulation (ER) 1105-2-460, which in its revisions, guides the Corps of Engineers Civil Works Program in its cultural resource management responsibilities today.

Within a few years, the Corps of Engineers had hired over 20 archeologists and today has a cultural resources staff numbering over 70 archeologists and several historians, architects, and landscape architects.

Executive Order 11593, the Moss-Bennett Act, and NEPA also spurred the Corps' military

Glen DeGarmo, former preservation officer at Fort Bliss, and Fred Brieur, formerly at Fort Hood, in front of the Governor's Palace, Santa Fe, NM, 1977.

(Above right) John W. Morris and Dee Ann Story at the Environmental Advisory Board meeting in April, 1980. LTG Morris was Chief, U.S. Army Corps of Engineers from 1976 to 1980.

program into action. In the first Army regulation on the environment, issued in 1974, a chapter was devoted to historic preservation. The emphasis was on identifying properties to be nominated to the National Register. When the field asked for assistance, the Military Programs Directorate in the office of the Assistant Chief of Engineers advertised for a contractor to write a technical manual on historic preservation. The contract was awarded to Parrish, Pine and Plavnick, a New York planning consulting firm with an office in Washington, run by Robert Plavnick, a well-known local government planner and an Army reservist. Having just worked with him on the preservation plans for Fort Myer, Virginia, and Fort McNair, DC, I then wrote *Technical Manual 5-801-1: Historic Preservation Administrative Procedures* and, a few months later, *Technical Manual 5-801-2: Historic Preservation Maintenance Procedures.* The final volume on archeological procedures never got written. At that time, no one seemed to have a clear picture of how the Army should manage its mostly unknown archeological sites. The two manuals set forth the structure, direction, guidance, and the level of technical information for the Army's program to the present.

In the meantime, many Army installations, such as Fort Leavenworth, were discovering that just forwarding information about their landmark buildings or districts to the National Register office did not satisfy the new compliance requirements. In 1976, the issue of the treatment of 19th-century buildings located on property acquired by the Army in the 20th century came to the attention of the Advisory Council on Historic Preservation. To bring the issue to the attention of the Army leadership, Robert Garvey, then Executive Director of the Council, recommended that the Council members meet on site to discuss compliance with the Army. With an agreement to protect the buildings from further deterioration, the Army's compliance program was born. Upon returning to Washington, the staff of the Buildings and Grounds Division of the Corps' military program moved rapidly to establish a consulting position for a historic preservation expert at headquarters. In January 1977, I accepted that position.

Issues, particularly concerning the Army's archeological resources, were emerging at a number of military bases and in the same year installations began hiring and contracting for assistance. At Fort Bliss, Texas, where an earlier survey of its missile range and one of its maneuver areas had located a large number of sites, Dr. Glen DeGarmo was hired. A few months later, Fort Hood, in central Texas, had hired Dr. Fred Brieur. Problems with sites on the Yakima training center at Fort Lewis, Washington, assigned extra duty to Major Robert Kavanagh, an anthropologist, to develop a historic preservation compliance program. The three largest of the Army's major commands responded to the problems at their installations by assigning responsibility for compliance to members of their real estate and engineering staffs. During this time, the Corps' civil works program had begun to hire archeologists at several of its district and division offices. By the spring of 1978, the beginnings of a core historic preservation staff had begun to develop in each of the Corps' programs and slowly a dialogue began between installations and districts regarding identification of historic properties.

The first meeting of this emerging group of historic preservation professionals occurred in the spring of 1978, when its members gathered at Woodlawn Plantation, outside Fort Belvoir, Virginia, to draft guidance for management of Army archeological resources. Over a three-day period, Larry Banks, Fred Brieur, Glen DeGarmo, Robert Kavanagh, Shirley Smith (FORSCOM), Odette Cranno (DARCOM), Larry Aten of the National Park Service, and I put together a strategy that tied level of risk to archeological sites to priority for inventory and treatment. In other words, the Army would identify those archeological sites most likely to be damaged by Army land uses (particularly tactical vehicle maneuvers) first and complete its other EO 11593 responsibilities second. Given funding, personnel, and priorities, triage would be the recommended policy. This approach was written up in an Army technical note (an Army policy interpretation document) and was followed by many installation cultural resources management programs for the next 15 years.

Despite the enthusiasm of the core group, most Army installations and commands believed that compliance with EO 11593 could be assigned to existing staff in the areas of real estate, facilities engineering, military housing, and, in a few places, to public affairs. As a consequence, there was a great need for training and the dissemination of information to all installations and major commands. Beginning with a small conference in the fall of 1977 in Washington, DC, the Army developed a series of annual or biennial workshops that brought together all Army personnel with responsibility for historic preservation compliance. In 1979, the Army sponsored a week-long historic preservation conference at Fort Sam Houston in San Antonio, TX. Over 100 people attended from installations and major commands and that number increased slightly through a series of similar workshops held roughly every two years, and in collaboration with the DoD, Navy, Air Force, and the Marine Corps through 1994. Since then, single-subject meetings, such as on curation, have been organized by one or more of the military departments.

Another early initiative that has continued is the organization of programmatic compliance activities. The first of these was the command-wide program initiated by Stan Fried, chief of real estate at the Army's Materiel Command (DARCOM), to survey and evaluate the buildings and archeological literature for 75 Army installations. DARCOM transferred funds to the National Park Service which contracted for a 2-volume report to be prepared, using a consistent format, for each of the installations in that command, the Army's arsenal, depot, and testing facilities. The cooperation with the National Park Service had been initiated previously for documentation of buildings at several Army installations and was to continue and expand in the 1980s.

With the enactment of the 1980 amendments to the NHPA, the Army realized that it needed to expand its policy guidance and to have a regulation devoted solely to historic preservation. The Army regulation was written and approved by the summer of 1983, and was finally printed and distributed a year later. Army Regulation 420-40, Historic Preservation, directed Army installations to fund and prepare historic preservation plans that would accomplish the requirements of the NHPA, as amended. It made a requirement of the guidance first issued in the technical manual on administrative procedures.

The programs in the other military departments of DoD began to take shape in the late 1970s. In May of 1979, the Navy hired Dr. John Bernard Murphy as a socio-economic planner to develop the historic preservation program for the Navy. Meanwhile, the Air Force natural resources staff at Tyndal Air Force Base, Florida, had begun providing Air Force bases with technical assistance in archeology and historic preservation. By 1982, Air Force headquarters had assigned historic preservation to one of its officers. A year later, Dr. A. Ludlow Clark, fresh from MX missile-Native American negotiations, took the natural and cultural resources staff position at Air Force headquarters at Bolling AFB in Washington, DC. Finally, in 1984, DoD hired Christina Ramsey to work in the office of the DoD Director of Environmental Policy. Under her leadership, the natural and cultural resources staff of the four military services were coordinated, primarily through the Natural Resources Committee and its subcommittee on cultural resources, later to become the Defense Cultural Resources Committee (DCRC). In 1985, DoD distributed a new directive that laid out the requirements for the military departments in cultural resources, very similar to the Army regulation. A year later, DoD sponsored the first tri-service workshop on historic preservation in Williamsburg, VA, and thereafter, the workshops begun by the Army were organized through the DCRC. With the close of 1985, the Army's program had the major elements that were to be developed for the next 10 years.

The years between 1985 and 1991 cover a period of rapid program development. Major commands and installations began to obtain historic preservation and archeology staffs. The construction at Fort Irwin in the California Mojave Desert, Pinon Canyon in southeastern Colorado, and Fort Drum in upstate New York focused attention on the installations' needs for technically-competent cultural resources staff. Also the Corps of Engineers' district offices continued to increase their cultural resources (primarily archeology) staffs and took on a larger role in supporting installations and major command cultural resources projects. Paul McGuff at Fort Worth District and Horace Foxall at Seattle District began programs to support the total Army program, in cultural resources planning and historic building maintenance, respectively.

The 1980s also saw Congress and DoD begin to look at opportunities to reduce the maintenance and repair budgets for military installations. Directions came down that concerned World War II temporary buildings and historic family housing units. With the request from Congress in 1983 to DoD to demolish most of its World War II temporary real property, a nationwide programmatic compliance project was initiated. The Army was assigned the lead for DoD on a Programmatic Agreement for the documentation of a representative sample of approximately 40,000 World War II

temporary buildings (all of which might be eligible for listing on the National Register as a multiple property nomination) with the Advisory Council and the National Conference of State Historic Preservation Officers. Ten years later, this effort had resulted in several volumes of documentation and history of military temporary buildings and an exhibit at the National Building Museum in Washington, DC, on the impact of World War II designs and construction on the American homefront.

Another mid-1980s program undertaken at the request of Congress was a study and plan for reducing the costs of maintaining the historic houses, or family quarters, on DoD installations. Each military department undertook its own project, and the Army selected 2,006 housing units in quarters listed on the National Register (approximately 40% of the family housing quarters that met the criteria of the National Register and roughly 2% of the total number of Army family housing units). Detailed histories and building condition analyses were used as the basis for estimating one-time repair costs and 25-year maintenance requirements. In the Army's report to Congress and the subsequent historic preservation plan for the historic quarters at Fort McNair in Washington, DC, and Forts Myer and Belvoir in Virginia, the Army approached the issue of treatment of similar historic properties united by a national military historic context and subject to current budget guidance that did not differentiate for National Register properties.

In addition to the support by the Corps of Engineers' district offices, the Corps also supported the growing cultural resources program through its research laboratories. The Waterways Experiment Station, Vicksburg, Mississippi, primarily through the work of Roger Saucier, had taken particular interest in the problems of management of archeological sites in water resources projects. In 1969, the Corps established the Construction Engineering Research Laboratory (CERL) in Champaign-Urbana, Illinois, to address issues of installation management, and by the 1980s it, too, was recognizing the need to work on cultural resources management problems. Through the interest of Dr. Diane Mann, anthropologist, and Dr. Louis R. Shaffer, technical director of CERL, the laboratory began a cultural resources research and development program. Beginning with the problem of developing a computer-based information management system for archeological sites, and then expanding into one-for-all cultural resources, CERL developed CRIS, the Cultural Resources Information System. This led the Army to look at the issue of computerized preservation planning systems. When the United States Military Academy at West Point, New York, was interested in developing such a plan, it entered into an agreement with the Advisory Council to develop a prototype. Thanks to the work of John Cullinane, AIA, the Council's senior architect, the Army learned a lot about developing installation preservation plans. This experience, with the work on CRIS, was used by CERL to develop XCRIS, a graphic user interface integrating GISs, DBMSs, text-editing, and report generation with on-line compliance guidelines that could provide a cultural resource manager with a dynamic planning and decision-making tool. CERL also undertook the nationwide survey of World War II temporary military buildings, development of prototypes and standards for both archeological and historic landscape and building surveys, and the application of many materials analysis processes to cultural resources. It also entered into partnerships with other research programs, such as the universities of Arkansas and California, to bring their expertise to the service of the Army. Through CERL's Cultural Resources Research Center, under the direction of Keith Landreth, the Army could address the technical issues critical to a cost-effective preservation compliance and stewardship program.

By the end of the 1980s, the Army's cultural resources program contained the components of a mature government program. There was a policy document, technical guidance, a research and development capability, contracting experience, a range of precedent compliance documents with the Advisory Council and with the SHPOs, a schedule of regular training conference-workshops, and a growing list of completed field projects in documentation, survey, planning, maintenance, and management issues. In November 1988, the program was recognized when the Deputy Assistant Secretary of the Army for Installations and Housing was presented with a National Historic Preservation Honor Award from the Advisory Council and the Department of the Interior. The only piece missing was consistent budget guidance and funding.

The Army's cultural resources program was in place but its low priority and constant fight for funds resulted in sporadic progress. Then late in 1990, Congress appropriated $10 million to the DoD to set up a Legacy Resource Management Program to augment the work in natural and cultural resources. This unexpected shot in the arm has resulted in DoD funding more work in cultural resources in the last six years, about $85 million, than in its whole program before 1990. Across the United States on installations of all sizes, the cultural resources program has achieved many of its objectives. Requirements of NAGPRA, of 36 CFR

79, and of NHPA Section 110 have been funded through the Legacy program. Training materials, workshops, and various meetings have brought up-to-date information to installation personnel. Brochures, reports, and videotapes are telling the story of the Army's history and its stewardship of historic properties. Policy studies have identified and provided background for guidance documents on the treatment of Cold War historic properties, cultural resources management plans, and DoD's role in the protection of historic properties outside the United States. The use of central funding techniques versus decentralized funding has more clearly shown where each is most effective. Partnerships have been formed with national and local historic preservation organizations that have multiplied the public benefit of Army investments in cultural resources compliance. By the mid-1990s, the second generation of the Army's cultural resources management program was underway.

Nevertheless, cultural resources must ultimately enhance the readiness and military mission of the Department of the Army. Without a public recreation or historic property interpretation mission, the Army must manage its historic properties in terms of the contribution that they can make to national security. A study by the Department of the Navy, on behalf of DoD, identified seven specific benefits to the military of cultural resources. Besides the savings by re-use of existing historic facilities and enhancement of the quality of life on military installations, the study pointed out that the qualities of readiness now most needed in the theater were exemplified in the installations' historic places: understanding of different and changing cultural values, adaptation of existing facilities, exploitation of technology for information, respect for tradition and places hallowed by human activity, and a reminder that each soldier is part of a long and proud history of service to the United States. By fully integrating cultural resources management into the military mission, they become assets that strengthen the defense of this democracy.

Constance Werner Ramirez is Director, Cultural, Environmental, and Accessibility Programs, Public Buildings Service, General Services Administration. From 1977 to 1995, she directed the historic preservation program of the Department of the Army.

Information about the U.S. Army Corps of Engineers Civil Works program was provided by Larry Banks, formerly Chief Archeologist, Corps of Engineers Southwestern Division.

Taj Mahal, from cover

Casting a long shadow over Washington Circle is the majestic Taj Mahal (current Building 100) which rises 170 feet into the air at Randolph Field near San Antonio, TX. The origins of the name are unknown, but the distinctive appearance of the building clearly reminded someone of the original Taj Mahal, and the name stuck. First Lieutenant Harold L. Clark, the architect of the air city that was Randolph, came up with the idea of a decorative domed structure to encase the water tower that was usually so obtrusive at most airfields. In doing so, he also devised a scheme to centralize a considerable number of functions in a single large post administration building at the base of the tower. Completed in 1931 at a cost of $252,000, the Taj came to house not only a 500,000-gallon water tank but the signal office, a photographic unit, the post office, the telephone exchange, a print plant, a weather office, the judge advocate's office and courtroom, and administrative offices of the Quartermaster, as well as the personnel, finance, recruiting, and public relations offices. In addition, the rear wing contained a movie theater and auditorium that had a seating capacity of 1,150 people. On the second floor were the offices of the Randolph Field and the Air Corps Training Center commanders. Over six decades later, many of those functions still remain in the Taj.

Launch Complex 33, U.S. Army White Sands Missile Range, New Mexico, was designated a National Historic Landmark in October 1985. Photo courtesy U.S. Army Public Affairs Office.

Susan I. Enscore and Sheila A. Ellsworth

An Integrated Method For Cultural Resource Management

The National Historic Preservation Act of 1966, as amended (NHPA), is the most prominent federal regulation which military cultural resource managers must address. Historic documentation of military installations encompasses historic buildings, structures, objects, landscapes, and archeological resources. To meet legislative requirements, techniques for identification, evaluation and management of these resources have emerged without a coordinated approach over the years. Additionally, legislative compliance at the installation level is often handled in a reactive manner, precipitated by either scheduled undertakings or unexpected maintenance problems and issues. In this "compliance by immediate necessity" approach, each compliance case is seen as an individual event, consisting of limited historical research and fieldwork.

With the downsizing of the Department of Defense (DoD), this approach to the identification and management of cultural resources is no longer adequate. It has proven inefficient in terms of duplicated efforts, time and cost. The following factors contribute to the difficulty in cost-effective identification, management, maintenance, and preservation of cultural resources on military installations: lack of resources (manpower and funds); inability to hire needed expertise; non-uniform methodologies and guidance in significance determination; and lack of efficient methods for cultural resource identification and evaluation. A clear, concise and comprehensive approach to an installation's cultural resources documentation requirements is necessary to be both cost-effective and beneficial to all levels of installation management. This comprehensive approach translates into an organized, coherent, and coordinated effort which includes all aspects of cultural resources (i.e., inventory, evaluation, maintenance, management, adaptive use, etc.).

A comprehensive plan identifies and evaluates all areas of the installation's cultural resources at once. The plan also allows the cultural resource manager, facility planners, and Operations and Maintenance (O&M) personnel to successfully allocate time and resources for the proactive management of historic properties. Systematic procedures will assist in cost-effective, non-intrusive compliance with the NHPA through development of identification, evaluation, and maintenance processes.

Once properties have been identified as historically significant, cultural resource managers face the task of proper maintenance. Construction and maintenance techniques for more recent structures and buildings do not necessarily apply to historic structures and buildings. For example, historic bricks are softer than today's kiln-fired bricks. Historic mortar was high in lime while today's mortar consists of Portland cement, a much stronger binding material. The use of Portland cement mortar has a tendency to quickly

Space Launch Complex 10, Vandenberg Air Force Base, CA built in 1958. Complex 10 was listed as a National Historic Landmark in 1986 on the basis of its being "the best surviving example of a launch complex built in the 1950s at the beginning of the American effort to explore space." Photo by Sgt. Louis Briscese, January 1994.

destroy the much softer historic brick, therefore causing rapid deterioration of the building. Installation personnel need guidance and treatment manuals on the proper maintenance and repair of historic materials.

An integrated cultural resources management plan addresses the installation users' diverse needs in a simple, yet comprehensive, manner. Quality preservation procedures result from a combination of historical, architectural, landscape architectural, and engineering research that provides practical guidance to historic resource managers at the installation level. This approach must incorporate all levels of installation personnel, including residents and users, into the preservation initiative to be effective. Effective plans assist installation personnel in complying with federal preservation legislation in addition to encouraging residents and users to become stewards of the installation, thereby preserving the historic character.

The U.S. Army Corps of Engineers Construction Engineering Research Laboratories (USACERL) is one of four U.S. Army Corps of Engineers Research and Development Laboratories. Its mission is to create and develop technologies for sustainable military installations. At USACERL, members of the Cultural Resources Research Center (CRRC), are developing a comprehensive approach and tools for cultural resource management. All tools can be used in various combinations according to specific installation needs:

Programmatic Agreements

A Programmatic Agreement (PA) is an effective tool by which an installation may fulfill its Section 106 requirements for similar and repetitive properties, complex projects, or its entire cultural resources program. A PA, in consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP), allows the Section 106 process to be tailored to the specific needs of active installations servicewide and ultimately DoD-wide.

For example, CRRC assisted Vandenberg Air Force Base (VAFB), California, with the development of an Interim PA for VAFB's numerous operational Cold War facilities. Once the ongoing review process is successfully completed, the PA will streamline VAFB's Section 106 process, allowing the base to continue its mission of research, development, and testing of missiles and satellites with minimal delay.

Plans and Guides

Preservation and Management Plans provide installation personnel with guidance on the proper management, maintenance and future use of historic buildings, structures and landscapes. Management plans evolve from baseline inventories and can ultimately result in programmatic agreements.

For example, CRRC completed a Historic Landscape Inventory and Master Plan for Fort Sam Houston, TX. The landscape inventory defined the post's historic context and identified the significant landscapes. At the completion of the inventory, CRRC developed a landscape master plan (LMP) using the following criteria: maintain or enhance the historic character, public image, and quality of life, and proper maintenance and treatment procedures. The LMP has become a significant tool for the cultural resource manager, O&M personnel, and the residents and users of Fort Sam Houston by providing a management solution that is sensitive to both the post's historic character and environmental needs.

Nationwide Theme and Context Data

The development of nationwide theme and context studies reduces the effort required to effectively identify, evaluate, manage and mitigate effects on cultural resources. Thematic studies pertain to groups of cultural resources sharing a unifying or dominant trend. Context studies provide information on historical patterns, trends, specific events, or broad areas of significance that produced the cultural resource. Theme and context studies by installation, by military service, or DoD can ultimately eliminate the need for continued property-by-property studies; provide guidance for a broad user community; and develop into PAs.

Old trooper Monument and Plaza, Fort Riley, KS, c. early 1960s. The monument and plaza, while relatively new, is a landscape feature within the post's Cavalry Parade. The parade was determined to be a significant landscape by USACERL in 1995. Photo by G.C. Burt, June 1994.

Officer Housing, Fort Bliss, TX, from 1893. USACERL has conducted research to determine the National Register of Historic Places eligibility of approximately 450 buildings and structures in and around the main cantonment area at Fort Bliss. Photo by S.A. Ellsworth, September 1995.

For example, two areas of study for CRRC are a preliminary thematic overview of DoD aircraft hangars and Cold War facilities. These studies serve as guidelines for the identification and evaluation of both aircraft hangars and Cold War cultural resources. Research in the Cold War area includes a comprehensive overview, a defense radar program theme and context study, and an anti-ballistic missile theme and context study (all sponsored by the Air Force Air Combat Command and the Legacy Program).

Historic Preservation Technical Guides

Historic preservation technical guides serve to educate and assist installation personnel (CR managers, O&M personnel, and installation users, visitors, residents) on the proper techniques to improve the efficiency and effectiveness of identifying, evaluating, repairing, maintaining and managing installation cultural resources.

For example, CRRC's technical guides pertaining to condition inspection, materials specification and repair techniques assist installation personnel with proactive maintenance of historic building materials. In contrast, current maintenance practices requires the allocation of resources for building repairs after the building elements fail. The net result would be the inefficient use of resources and potential loss of historically significant building elements.

Cultural Resources Multi-Media Systems

Cultural resources multi-media systems are interactive computer programs designed to enhance the management of cultural resources or educate installation users about cultural resources. The systems are designed for the installation end user and include several modules of data as needed, i.e., historical background, current conditions, maintenance requirements, techniques and specifications, photographs, drawings, and maps.

The CRRC designed a multi-media system for Fort Riley, Kansas, to identify, evaluate, and maintain their historic landscapes. The system was designed to allow the cultural resource manager to manage and the O&M personnel to maintain the historic landscapes. It is also a powerful tool for educating the residents on proper planting materials in keeping with the historic character of the post.

A second multi-media system was designed for Cape Canaveral Air Station (CCAS), FL. This system, entitled "Stepping Stones to the Moon," is designed as an education and public awareness tool and is located at the CCAS museum. Visitors have the option to learn about astronauts and specific space programs, play a history game, and listen to and view footage of missile launches.

These various preservation tools work together to create a comprehensive approach to cultural resource management. Theme and context studies can supply the basis for cultural resource decision-making that results in Preservation Plans and Programmatic Agreements. Guidance documents and multi-media systems can assist in the implementation of Management Plans. Using completed tools to build others avoids duplication of effort, providing a more cost-effective process. Data collected quickly, economically, and accurately provides the foundation by which the comprehensive management of cultural resources is possible.

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Mark C. Huck

U.S. Army Military District of Washington
Implementation of a Historic Preservation Plan

The U.S. Army Military District of Washington (MDW) is comprised of six installations with approximately 5,500 units of family housing. Although this represents only about 5% of the Army total (120,000 units within the United States), MDW has 77 General/Flag Officer's quarters, nearly 25% of the Army total of 324 units. All of these quarters are historic. In all, more than 400 housing units within MDW are listed or eligible for listing in the National Register of Historic Places. The average age of these quarters is 71 years.

The installations of the MDW have always maintained stewardship of these quarters, but the active preservation of individual and neighborhood groups of quarters began in 1984 when the MDW initiated the process to comply with Army Regulation 420-40, the Army's implementation of the Section 106 review process. Through this process, historic districts were identified at Forts Lesley J. McNair, Myer, and Belvoir.

Installation Historical Context

Forts McNair, Myer, and Belvoir, like all Army installations, have long histories that make them unique. Fort McNair is one of the nation's oldest continually occupied Army bases, established in 1791. The War College campus was built here in 1905, designed by McKim Mead and White. Stanford White had designed long, symmetrical barracks across the street from each other facing the parade grounds. The barracks to the west impinged on the hospital where Major Walter Reed did his original work to cure yellow fever and later died of complications due to surgery in 1902. White fully expected to build on the site, but resistance to the demolition of the hospital prevailed. As a result, six bays are missing from the west barracks. White reveals himself as an optimist for this project, however; the face brick on the facade was left toothed to eventually complete the rest of the building.

Fort Myer was constructed on land originally belonging to Robert E. Lee, but which was confiscated during the Civil War by the federal government when the Lees were unable to pay their property taxes in person, as a provision in the tax law required. The fortification created there was named Fort Whipple and became home to the Signal Corps because of its prominent location on top of a hill. It was renamed Fort Myer in honor of Brig. Gen. Albert J. Myer, the Army's first chief signal officer. The Signal Corps left in 1887 when General Sheridan changed Fort Myer's mission to become the nation's calvary showplace. The stables originally built for the calvary are still home to the Army's last official horses. Fort Myer is now the home of the Old Guard, which performs military ceremonies, including burials at Arlington Cemetery. It is also famous as the site where in 1907 Orville Wright demonstrated the first powered airplane flight to last longer than one minute.

Fort Belvoir has been an Army post since 1917, originally named Fort Humphreys. It was part of the colonial estate of Lord Fairfax, which he named "Belvoir," for "beautiful to see." It is the largest of MDW's installations, covering 8,656 acres. Fort Belvoir is surrounded by significant historic sites including Gunston Hall, Mount Vernon, and Woodlawn Plantation. The relocated Pope-Leighey House, a Usonian house designed by Frank Lloyd Wright, is presently located at Woodlawn.

The Cultural Resource Survey Process

In 1984, the House Appropriations Committee's Subcommittee on Military Appropriations requested the Army to develop a long-range plan for the care of its historic housing due to the high costs of operating, maintaining, and upgrading these units. This request prompted two Army studies, both of which evaluated the historic and architectural significance of historic units, listed prioritized maintenance and repair requirements, and estimated costs for a 25-year program. The first was *Historic Family Housing Management Plan Study* by Geier Brown Renfrow Architects/MMM Design Group (1985). This study surveyed 100 quarters at Forts Myer and McNair. The second was *Study/Survey of Historically Significant Army Family Housing Quarters* by Mariani & Associates (1986-89). This study surveyed 2,000 historic quarters countrywide. This action by the Army acknowledged the role historic preservation played in efficient management of family housing, and formed the basis for the current prototype design projects at MDW.

MDW and the Army have participated in the process of researching their historic assets as pre-

scribed in Army Regulation 420-40, *Historic Preservation*. Once cultural resources on the installation have been evaluated, a Historic Preservation Plan detailing the conservation and stewardship of the cultural resources is developed. Through this process, historic districts were identified at Forts McNair, Myer, and Belvoir.

This process at MDW grew out of the mutual interest of the Commanding General and a council composed of civilian employees and residents. The Office of the Deputy Chief of Staff for Engineering and Housing and the MDW Housing Officer took the initiative to assemble a task force which brought together Army housing and engineering personnel, representatives of public preservation agencies, and the Norfolk Architectural/ Engineering firm of Hanbury Evans Newill Vlattas & Company. The task force defined three goals: to protect and preserve MDW's historic architectural resources, to provide a standard of excellence in family housing, and to prevent unnecessary expenditures of financial and human resources.

The task force developed a set of Stewardship Standards, or principles applied to work to be performed on MDW's historic quarters. The Stewardship Standards specify treatment of interior and exterior elements of the quarters and are meant to be referenced in conjunction with prevailing Installation Design Guides and the *Secretary of the Interior's Standards for Rehabilitation*. The Stewardship Standards were formally adopted by the MDW in December of 1992. In January of 1993, the Army historic family quarters preservation program was introduced in a promotional brochure, *Historic Preservation Plan, Military Family Quarters*.

Quarters 20A at Fort Myer, Virginia. Repair of deteriorated wood at the front entrance, and complete paint removal and repainting. Photo by the author.

One objective of the program was to address the need for guidance on the everyday maintenance and repair requirements of the historic quarters. Toward that end, three-ring binders were compiled containing descriptions of all elements from each type of historic quarters found on the three installations. These were distributed to each installation. The *Historic Quarters Component Guidebook* analyzes each quarters, or group of similar quarters, and provides direction on the repair or replacement of specific components. Where historic components are either missing or in need of replacement, the guidebooks specify new ones, chosen with respect to both historic character and modern needs. Modern amenities are recognized as requirements for the comfort of current occupants, and their integration is designed to be as sympathetic as possible to the character of the building.

Another aspect of the *Guidebook* is to represent logical management practices. All components and designs are standardized, which saves time on individual design and contracting efforts and results in cohesive units with equitable components. The production of the guidebooks involved the input of residents and installation personnel. Upon completion in December 1993, the guidebooks were officially sanctioned by the Commanding General and adopted as Installation policy.

Implementation

The main objective of the Historic Preservation Plan at MDW was the selection of a number of prototype whole-house revitalizations to serve as models for subsequent work. In the fall of 1993, 12 quarters in 8 buildings at Forts Belvoir, Myer, and McNair were chosen as prototypes, based on the recommendations of the A/E and the installations, taking into account scheduled vacancies and a range of occupant ranks and types of quarters. Currently, construction documents have been completed for all 12 quarters, ready for execution upon funding authorization. Two prototypical quarters at Fort Belvoir have already received funding and are being scheduled for rehabilitation in fall 1997. The National Park Service Historic Preservation Training Center is acting as the contracting agency. The construction phase will be used to document the renovation in progress to further the practice of cultural resource preservation at MDW and elsewhere in the Army. Following the completion of these prototype revitalizations, the results will be evaluated and the next phase of the program can be modified if needed before further implementation.

Integral to the whole house revitalization of historic quarters is the opportunity to anticipate future needs that may potentially disrupt the historic fabric of the building and design the solution into the house. A good example of this would be the mechanical and electrical systems of these homes. In all of these elements can be found wrapped and stapled tightly to the baseboards, running in busses next to ceilings forming unlit coves, and plunging through door and window jambs at every floor to reach the exterior, where

Quarters 7 at Fort McNair in Washington DC. This quarters, designed by McKim, Meade and White, is representational of 15 similar General's Quarters in a row. Photo by Nat McCormick.

they snake along walls like vines. The prototype design anticipates the need for growing capability and integration of future new technology by designing a cable space inside the existing baseboard. All electrical lines, telephone wiring, and TV cable to every room in the house run in this space, eliminating the need to extend these services later. If more cable is added, the baseboard is removed and the cable installed. In this way several maintenance headaches are avoided by eliminating the need to drill and anchor into the historic fabric of the building. This reduces water penetration problems and the disruption of the quarters' period appearance.

Conclusion

Most of the historic housing at MDW is assigned to higher ranking officers, primarily colonels and generals. Many of these quarters need consolidated and/or updated utilities, and repairs to many building elements suffer because Congress is reluctant to renovate housing which does not directly impact enlisted personnel. Work on these quarters is progressing piecemeal within the limits predefined by Army regulations until Congressional authority can be granted to begin renovation. The present installations at the Military District of Washington must continue to craft compelling professional and economic presentations to Congress so that funding will continue to be available for the appropriate revitalization of Historic Army Family Housing. In this way we can continue to serve our goals of providing a standard of excellence in family housing, preventing unnecessary expenditures of financial and human resources, and protecting and preserving our historic architectural resources for future generations.

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1984

1) *Historic Family Housing Management Plan* Study by Geier Brown Renfrow Architects/MMM Design Group (1985) surveyed 100 units at Forts Myer and McNair.

2) *Study/Survey of Historically Significant Army Family Housing Quarters* by Mariani & Associates (1986–89) surveyed 2000 historic units countrywide.

1992-present Hanbury Evans Newill Vlattas & Company developed MDW's Historic Family Quarters Preservation Program.

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Kira Khadem

Puget Sound Naval Shipyard Building 50 Restoration

Located in the northwest corner of Washington State, bordered by the Olympic mountain range to the west and the Cascade mountain range to the east, is the Puget Sound Naval Shipyard. The Shipyard is situated on Sinclair Inlet, a natural deep water port. The 354 acres of the Shipyard are bordered on three sides by the City of Bremerton in Kitsap County. The City of Seattle is only one hour away by either driving or ferry service. The Shipyard now employees 8,925 civilians and 7,262 military personnel. It is built around six major piers and six large dry docks, and consists of approximately 400 structures.

Originally called Puget Sound Naval Station, the name was changed in 1945 to Puget Sound Naval Shipyard. The Shipyard's principal historic significance was its role as the primary repair facility for damaged battleships and aircraft carriers as well as smaller warships of the Pacific Fleet during World War II. Today, Puget Sound Naval Shipyard contains four historic districts and one National Historic Landmark District.

Officially funded by Congress in 1891 as a dry dock site for naval and commercial purposes, the Shipyard has provided over a century of service in defense of the nation. The decision to establish a shipyard in the Northwest was due in part to the fact that the United States had no dry dock north of San Francisco large enough to accommodate the country's larger commercial sailing vessels and steamships. Often ships in need of repairs had to be sent to the British Columbia Dock Yard at Esquimalt. In 1888, President Grover Cleveland appointed a commission to select a suitable site for a navy yard and dry dock in the Northwest. The commission decided Puget Sound was the most suitable location in the entire region for a navy yard and dry dock. Congress recognized the resulting flight of American money to a foreign port and passed the proposal to establish a dry dock in the Northwest.

By 1896, the first dry dock was completed, along with an administrative building and officers' quarters. A Marine Reservation was established shortly after to provide security. In 1906 a wireless station was established and in 1911 a hospital was built.

Through the years, Puget Sound Naval Shipyard grew. By 1913 a second dry dock was completed, along with numerous buildings and structures. By World War I its mission was expanded and included the development of the capability to construct new ships. Additional dry docks were built, with the fifth finished in 1941. By World War II, the Shipyard was to play a major role in winning the War in the Pacific. It performed major battle repair, modernization, overhaul, and shipbuilding as the only west coast shipyard capable of repairing large ships.

By 1945, the Shipyard's mission changed to the deactivation of the war fleet. Its workload since that time has included conversion of carriers to accommodate jet aircraft and maintenance of the Navy's nuclear powered ships.

Throughout its history, the Shipyard has designed and built structures based on changing technologies and needs. The designs and construction of shipyard buildings were determined mainly by the public works officers. The basic configuration of the Shipyard was firmly established by post-World War I.

Located within the National Historic Landmark District and in the heart of the industrial area of the Shipyard is one of the oldest original buildings of the Shipyard, Building 50, built in 1896. With partial funding provided by the Legacy Resource Management Program* and additional Shipyard resources, Building 50 is being restored and re-utilized.

Building 50 was designed by the Seattle architectural firm of Chamberlain and Siebrand in 1896. It was originally constructed on a hill overlooking the Shipyard for a cost of $7,000. It was the headquarters for the Naval Station during most of the initial period of development (1891–1906) and housed the offices of the Commandant. Five other similar structures were built adjacent to Building 50 for officers quarters, and are still used as quarters today.

In 1911, the building was moved off the hill closer to the main work area of the Shipyard near Dry Dock 2 to be used as a receiving ships office. Over the years, the building had many uses; in 1918 it was the Shipyard's dental office, in 1920 the building was used by the Shipyard chemists,

Building 50 in 1907.

Building 50 in 1995 before restoration.

in 1922 by the Fire Chief and, shortly after that, the Apprentice School was established in the building.

By 1939 the building was moved a short distance to the newly built Dry Dock 5, which is where it remains today.

Working from an old 1907 photograph, the Shipyard's goal was to restore this building to its original appearance as much as possible.

Initially, restoration plans included replacement of all the original siding, as it was thought it would have a better appearance. However, after careful review it was decided only 30% of the original siding really needed replacement since the goal of historic restoration is to maintain as much original material as possible, thus keeping the "historic character" of the building.

Repairs were also made to the columns, which were held in place by a forklift while the bases and plinths were removed and repaired and later reinstalled by the Shipyard carpenters.

At the same time, the original wood windows were removed and rehabilitated. Initial estimates to repair each window ran about $600. However, additional research resulted in retention of an experienced window rehabilitation contractor for approximately $300 for each window.

Next came the demolition of an old concrete security vault built alongside the west wall and used to store encryption machines during the 1940s. Not original to the building, the vault was torn down. While the vault was being removed, a portion of the attached Building 50 wall unexpectedly came down, too. Temporary supports were used to shore up the remainder of the wall until it was rebuilt and the siding was installed. Because the vault covered some of the window openings on the west wall, new windows designed to match the original windows were installed along the lower portion of the new west wall to match the original windows on the top portion.

Today, the renovation is almost complete. The exterior has been repainted the original color of colonial ivory, the stone facing around the foundation has been replaced, and almost all the awnings have been installed.

With Legacy money the Shipyard held a class in historic preservation, including preservation technology for all craftspeople, contracting officials, and other employees involved in the project. While craftspeople worked on Building 50, a video was made of their accomplishments, which will be used to produce a historic preservation training video.

The high cost of building maintenance and Building 50's location within the Shipyard's controlled industrial area sparked discussions in the 1970s to demolish it. The plan never materialized, and the building continued to be used as an office space.

During rehabilitation, the interior was remodeled to provide more administrative space and to include a berthing area for Navy personnel living on old barges during deactivation of their submarines. Part of the interior of the building will provide sleeping quarters, showers, a small kitchen, and additional classrooms upstairs. It is estimated that the money saved will amount to over $1 million a year and, more importantly, that the project will improve the quality of life for these military members.

This project has been unique for the Navy. It is the first and only project that Legacy has funded to actually restore a historic building; all other funding has been for studies. Since this is a "first time" project of this type, the work has been challenging and has provided several tangible benefits.

It has provided historic preservation and craft-skills training to a number of our own craftspeople and established a list of technical resources for the location of materials and expertise within the community.

This rehabilitation project has also brought together the Navy, the Army Corps of Engineers, and the National Park Service to work in partnership. More important, it has brought heightened awareness of historic preservation to our own employees and through civic displays shown the public a piece of their American heritage.

Note

* In 1991 Congress elevated the stewardship of DoD's natural and cultural resources by enacting a bill to establish and fund the Legacy Resource Management program. Legacy's purpose is to "promote, manage, research, conserve, and restore the priceless biological, geophysical, and historical resources which exist on public lands, facilities, or property held by the Department of Defense."

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Susan H. Alvarez

Land-Use History—Past and Present

A Challenge For the Military Mission

Fort Hunter Liggett (FHL) in southern Monterey County, California preserves a cultural landscape that emerged over thousands of years in a remote and bountiful environment. Hypothesized to extend back in time at least 8,000 to 10,000 years, FHL's rich cultural heritage spans a documented 6,000 years of prehistory. Between the 1769 Spanish exploration of this locale and the War Department's 1940 purchase of area ranch lands, remains of four distinctive historic eras cover the installation. In addition to a long prehistory, typically Californian 18th- and 19th-century Spanish, Mexican, and American settlement imprinted the land.

Presently, all branches of the armed forces take advantage of this isolated terrain for training and both testing and experimentation toward enhanced defense technology. Indeed, meeting training and testing needs is the primary objective at FHL. Action planning, installation development and maintenance, and coordination with regulatory agencies facilitate these goals. United States World War II involvement began a history of "free rein" training over 200,000-plus acres. Legislation and public concern eventually challenged to integrate natural and cultural resources protection into training goals and facility maintenance.

Environment and Cultural Background

The installation's natural and cultural environment is bounded on the west by a high ridge paralleling the Pacific coast. Rising sharply from rocky coastal shores, this ridge is one of a wooded and chaparral-blanketed system enveloping oak and grass-covered hills that roll onto margins of elongated river valleys. Eastward, and 1,000 to 1,500 feet in elevation below FHL, lies the fertile Salinas River valley.

This protected, well-watered setting, bountiful in food and material resources, and with access to both inland and coastal resources, supported a large prehistoric population. Speakers of a Hokan language were among the first to migrate south and west over the Sierran barrier toward Pacific shores. These ancestors to the Salinan Indians finally occupied the upland valley hinterland, the current FHL. The present 165,000-acre military holding is understood to have been heartland of territory controlled through a long prehistory by ethnographically identified Salinan Indians.

Many thousands of years after ancestral Salinan people arrived, Spanish padres established a mission on oak dotted plains bordering San Antonio River. Mission San Antonio de Padua (1771) initiated local agrarian development, heavily impacting area natural resources and, subsequently, reducing the indigenous population to near extinction. Mission records indicate that of the estimated 3,600 pre-Spanish population (Cook 1976), less than 20% survived missionization (Bancroft 1884). Secularization (1833) resulted in division of mission lands; five Mexican grants were wholly or partially within present FHL. The Mexican regime continued the mission's economic practices—heavy livestock grazing, irrigated and dry farming, and adobe building construction—on grants encompassing vast tracts of land. After several generations under Franciscan tutelage, the Salinan people moved back onto the land. Mid-1800s gold discovery and California statehood stimulated Euro-American crowding westward in pursuit of mineral wealth or soil rich farms. Mexican land grants were fragmented; locally, small homesteads dotted valleys within and bordering present FHL. Mining ventures explored gold, mercury, and chromate possibilities, expanding area operations into a thriving mining district. Serving local farmers and miners, the stage stop town of Jolon flourished and a Chinese community settled near the town's outskirts in order to mine nearby canyon streams. Between 1880 and 1920, small farms again were gathered into large ranches and, in 1920, publishing magnate William R. Hearst, Jr. consolidated as much local land as possible into a cattle operation encompassing over 200,000 acres.

South-facing elevation of original Jose Maria Gil Adobe (c. 1865) constructed on El Camino Real, overlooking San Antonio River. Ranch residence until 1940; served through 1950s as Bachelor Officers' Quarters. Pending restoration, structure is "mothballed." Courtesy U.S. Army, FHL Archives, 1979.

(Below) East elevation of north wing addition. Courtesy U.S. Army, FHL Archives, 1993.

More recently, topographic isolation attracted military use of the heavily wooded hillslopes, rugged mountains, and coastal access. Hearst's holdings and neighboring parcels were incorporated into the War Department's 1940s Hunter Liggett Military Reservation (HLMR). This new era altered the local economy, providing civilian jobs and periodically expanding the area's consumer population. Military presence also limited public access and all private development, thereby, affording protection to a significant block of central coast range cultural and natural resources. Soldier training historically involved hand and mechanical excavation, semi-permanent bivouac construction, use of high explosives and anti-aircraft artillery, and tank gunnery over all of HLMR. Favored for its European-like setting, HLMR prepared thousands of soldiers in a realistic environment for combat on World War II fronts in France, Germany, and Italy. This

Remains to the late-19th-century mud-mortared stone house built by Leon Gil, son of J.M. Gil. In the early 1920s, William and Rebecca Bane transformed the farmstead into the coastal mail and supply route terminus, creating a local social scene that prevailed until 1940 establishment of HLMR. Courtesy U.S. Army, FHL Archives.

aspect of the installation's heritage invigorates today's training and equipment testing activities. Fort Hunter Liggett is equally proud of its distant cultural past and current innovative land-use management toward the 21st century.

Historic Mission San Antonio, preserved within an 85-acre inholding, and FHL standing structures, those of undetermined historic property status as well as two National Register of Historic Places (NRHP) properties, are obvious remnants of post-1770 land use. Less evident, but no less significant, are more than 500 prehistoric and historic archeological sites ranging from sparse lithic scatters to complex occupation sites. Prehistoric sites commonly contain housepit depressions, bedrock food processing mortars, well-developed middens with dietary debris, and potential or confirmed human burials. Historic adobe "melts," refuse scatters, and linear features characterize later settlement remains. Nearly six decades of defense training and equipment testing for World War II and operations in Korea, Vietnam, Panama, and the Persian Gulf resulted in an additional cultural layer: defense vantage points, bivouacs, and landscape features nearly as ephemeral as those attesting to former land uses.

A comprehensive study of a single site's remains, from a scatter of prehistoric tool crafting to a strategic depression surrounded by concentrations of brass projectile debris, could unravel cultural layering for an appreciation of land use, determined perhaps by topography as well as human common sense. Time's cultural layering also provides evidence of impacts to FHL's natural and cultural environment. Such information helps refine understanding of human attraction to the area, land use and re-use, and, more importantly for current resource management, facilitates assessment of potential risk to cultural deposits during future actions.

Cultural Resources Management Program

Evaluating significance for the range of FHL cultural resources proved problematic during development of FHL's Historic Preservation Plan (HPP). Highly visible historic properties, such as the c.1865 Jose Maria Gil Adobe and Hearst's Milpitas ranch house (known as the "Hacienda"), a 1920s Spanish colonial style building designed by architect Julia Morgan, are recognized as significant by the entire FHL community. Fort Hunter Liggett also protects two sites important in ancient sacred rituals. Both ceremonial sites, one of which is NRHP listed, contain superimposed polychrome painted elements, bedrock mortars, and well-developed middens. A third sacred site showing intensive, but as yet not fully understood, prehistoric activity is associated with monolithic formations bordering a major stream course.

Additionally, FHL is cognizant of its responsibility to protect a large number, about one half, of the 500-plus sites recorded as sparse lithic scatters and/or isolate bedrock mortars. Failing datability or other scientific analyses, these site types appear to contain limited information potential and occur so frequently throughout the installation that only planning ensures their protection and minimizes impacts to both facility maintenance and military land use. Recent excavation of a sample of these sites demonstrated that intact, below-ground deposits were significantly deeper than previously understood and contained data altering their characterization for potential significance.

Assessing risk potential for FHL's cultural assets and implementing resource protection measures that do not constrain the full range of training or facility operations, animates the management challenge. Currently, FHL's programmatic approach streamlines Section 106 processes for categories of undertakings and integrates applicable mandates into military objectives to the satisfaction of regulatory agencies, concerned citizens, and the professional community. These programs involve coordination including pre-action site marking, monitoring ground disturbing activities, and post-action evaluation of land use in sensitive areas. To date, no training or operations action has been stopped and, although previously unknown archeological deposits have been

In 1941, Hearst's Milpitas Ranch Hacienda served as post headquarters and currently is officer housing, dining room, and lounge Courtesy U.S. Army, FHL Archives, 1941.

Below: Detail, west wing, Courtesy U.S. Army, FHL Archives, 1993.

encountered, measures are successfully protecting recorded sites.

Preservation program development generated public enthusiasm that remains critically watchful as FHL continues the military mission. Program implementation also stimulated Salinan Indian involvement in FHL actions, including formal and informal consultation pertinent to heritage concerns. Less specific to FHL land use, but paramount for sustaining associations beneficial to both the Salinan people and FHL, includes installation support of Salinan activities. In 1995, FHL sponsored the Salinan people's successful application for a National Trust for Historic Preservation (NTHP) grant to compile a Salinan Veterans' photographic display for exhibit in the Hacienda during Historic Preservation Week. Similarly, two local historic preservation groups received a 1997 NTHP grant to support Preservation Week events hosted by the installation. In addition to annual compliance reports, FHL provides presentations for special interest groups, updating them on challenges and successes of integrative preservation programs.

As demonstrated at FHL, the military met preservation challenges and successfully achieved sustainable goals through innovative and realistic procedures. On site cultural resources management allows for activities documentation toward program refinements. The FHL historic preservation program illustrates that, while enhancing quality of living and working environments, resource protection and community involvement are stimulating as well as integral parts of the military mission through creative management.

Susan H. Alvarez is FHL Cultural Resources Manager.

Marie Cottrell and Antoinette Padgett

Graffiti at the Foxtrot Petroglyph Site

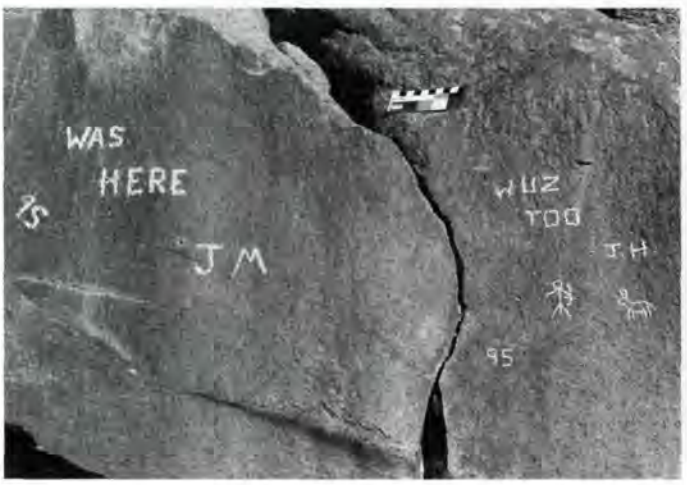
Inhabited by coyotes, jackrabbits, and rattlesnakes and separated from major transportation corridors by the San Bernardino and Little San Bernardino Mountains, the 600,000-acre Marine Corps Air Ground Combat Center is located in one of North America's hottest deserts. At first glance it appears to be one of the most desolate places in the world to live, but the evidence is irrefutable. The military installation abounds with prehistoric archeological sites, giving testimony to the centuries it served as home to Native Americans. Among the numerous archeological sites located within the installation boundaries, one of the most well-known is the Foxtrot Petroglyph Site, Marine Corps Air Ground Combat Center at Twentynine Palms, California. It was listed in the National Register of Historic Places on February 23, 1995. The site consists of a 3-kilometer stretch of lava flow, with four primary concentrations of rock art. Four hundred and ninety rock art panels and over 2,000 design elements have been recorded. Unique features include the presence of both petroglyphs (images pecked or scratched into rock surface) and pictographs (images painted onto rock surface) in the same geographical location as well as style elements characteristic of both the northern Great Basin region and the southern Colorado Desert region. The implication is that the design elements were created by the various Native American cultural groups that occupied or traversed the area during the prehistoric past.

Area residents have known about the Petroglyph site since the 1940s. However, it was not until the late 1970s that the Marine Corps became aware of its significance. Since that time, the site has been placed off limits to all military activities. It is, however, accessible and over the years various individuals have left their mark on the site by either carving, scratching, or painting their names, initials, and/or dates onto the rock surface. The majority of the graffiti are carved or incised, but there are a few that have been painted. As graffiti tend to encourage more graffiti, the Marine Corps Air Ground Combat Center initiated a program to restore the site. The project was funded by the Department of Defense Legacy Resources Management Program, Rock Art Inventory and Protection Project.

The purpose of the restoration and re-integration project was to mask the presence of graffiti at the petroglyph site, thereby removing incentives for additional vandalism. A technique developed by conservators was used to disguise the carved, scratched, and incised graffiti using synthetic acrylic polymer pigments. These have a uniform grain size, which will allow future researchers to distinguish the re-integrated areas from the surrounding rock when examined under magnification. This is important in light of the current techniques being developed for dating rock art. To determine the colors necessary for re-integration, rocks containing graffiti were compared to a Munsell soil color chart. Black, brown, gray, violet, red, yellow, buff, and white pigments were selected and a pointillist-style painting technique was used to fill in the graffiti with enough color to break up the visual impact. The object of re-integration is not to completely cover the graffiti with an exact color match, but to blend it in with the rock surface so that it is less visible. Carved and incised graffiti directly over petroglyphs was not treated. Surrounding areas, however, were re-integrated. Graffiti consisting of very fine scratching was disguised using a highly dilute wash.

Below, left. Re-integration in progress of both incised and pecked graffiti.

Right. Same panel after re-integration treatment.



The pecked or carved abstract elements of the Foxtrot Petroglyph Site are believed to be of great time depth, generally western Archaic. Several are found with scratched geometric lines superimposed, which appear to be more recent.

All graffiti were photographed before and after treatment. The colors used and the success of the technique were documented for each panel. Success was generally dependent upon the depth of the carved and incised graffiti. Deeper graffiti were more difficult to disguise due to the associated shadows. With this technique, re-integrated graffiti may be more or less visible depending on the time of day, angle of the sun and/or presence of clouds. The photographic documentation will be used by Marine Corps personnel for monitoring the condition of the panels which were re-integrated to determine both the longevity and the success of the treatment.

Three painted graffiti were found in the same general vicinity at the center of the site, adjacent to a major supply route. Removal of painted graffiti at rock art sites must always be approached with extreme caution, as frequently the solvents available for removal can be detrimental to the rock surface. At the Foxtrot Site, selected solvents were tested on small areas of each painted graffiti to determine the most appropriate solvent to use. The most offensive graffiti, a large green "GLENN '95," had been painted directly over a petroglyph panel. A test poultice was applied using acid free tissue as a buffer between the poultice and the rock surface. The paint was softened to a point at which it could be peeled off with tweezers. Additional poultices were then applied in the same manner to small areas of the graffiti. Plastic wrap was placed over the poultices to retard evaporation, and the poultices were removed at timed intervals. In the areas outside the letters, minute spatters from the spray paint were more difficult to remove, causing a ghosting effect around the letters. Upon completion, a water poultice was applied to treated areas to draw out any solvent remaining on the rock surface. Although it was not possible to remove all the paint using this treatment, after one year the graffiti are considerably less visible.

A wide variety of curvilinear and rectilinear abstract elements, as well as zoomorphic and anthropomorphic figures, are represented at the Foxtrot Petroglyph Site.

An important component for any rock art conservation project is to examine why the site was vandalized initially. Some of the graffiti at the Foxtrot Site date back to 1907, long before it was acquired by the Marine Corps. The bulk of the graffiti, however, is relatively recent. Earlier studies of the site by McCarthy (1979) and Hedges and Hamann (1992) made it possible to determine that 17 panels were vandalized between 1979 and 1992. As a result of the re-integration project, nine graffiti dated between 1993–1996 were found, in addition to several undated graffiti not noted by the previous researchers. The majority of the graffiti were found in close proximity to four "off limits" signs which were placed directly in front of the most visible petroglyphs. As these may have been the impetus for some of the graffiti, all four signs were repositioned along the lava flow where there are no petroglyphs to designate the entire area as "off limits." If continued monitoring indicates that sign repositioning has limited or no effectiveness in eliminating vandalism, the next option may be to move the main supply route to the south, away from the rock face on which the petroglyphs occur.

The restoration and re-integration project is an important contribution to preserving the rock art at the Marine Corps Air Ground Combat Center. During a time when rock art on private and public lands continues to be vandalized, the efforts of the Marine Corps to preserve this cultural resource are laudable. Fortunately, limited public access to an active training base helps conserve significant cultural resources such as the Foxtrot Petroglyph Site; unfortunately, there are still individuals who cannot resist the opportunity to leave their mark where others in the past have left theirs.

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Jan Ferguson

Remote Sensing Aids Archeological Investigations

Orville Wright piloting the Wright Model E over Huffman Prairie Flying Field. The Model E carried the automatic stabilizer that earned Orville the Aero Club of America trophy for 1913. It also was one of the only two Wright models with a single propeller. Photo courtesy Wright State University Archives, Wright Brothers Collection.

In 1994, a team of archeologists from the U.S. Army Construction Engineering Research Laboratories Tri-Services Cultural Resources Center (USACERL) conducted archeological investigations at the 1910 hangar location within the Huffman Prairie Flying Field site located on Wright-Patterson Air Force Base, near Dayton, Ohio. This work expanded on archeological testing conducted by USACERL in 1990, and confirmed the results of 1993 airborne remote sensing studies by the Earth Observation Research Office of the Science and Technology Laboratory of the National Aeronautical and Space Administration's (NASA) John C. Stennis Space Center and 1993 ground-level geophysical studies of the hangar area by the Waterways Experiment Station of the U.S. Army Corps of Engineers (CEWES). All except the 1990 USACERL studies were funded by the Department of Defense's Legacy Resource Management Program. The 1990 USACERL archeological investigations suggested the presence of the 1910 hangar as an archeological component of the Huffman Prairie Flying Field site. The remote sensing investigations revealed magnetic anomalies and images believed to be associated with the hangar structure and significantly narrowed the focus of the area to be subsurface tested. The 1994 archeological investigations at these target areas located an *in situ* post, posthole features, and artifacts associated with or actually from the hangar. These results verify the location of the 1910 hangar, provide a basis for management of this significant site, and add another to the growing list of success stories resulting from utilizing remote sensing techniques to maximize the results of archeological field work while minimizing ground disturbance.

Huffman Prairie Flying Field is a National Historic Landmark and is part of the Dayton Aviation Heritage National Historical Park. Wilbur and Orville Wright moved to this 84-acre site after their first flight in Kitty Hawk, North Carolina in 1903. From 1904 through 1905 the Wright brothers mastered the principles of manned powered flight at this site and developed the world's first practical airplane. At this site the Wrights also operated the world's first permanent flight school from 1910 to 1916, where they trained 119 of the world's first pilots, and operated a support base for exhibition flying in 1910 and 1911. Never containing more than a single hangar and one or two outbuildings at any given time, today the site lies in the floodplain just at the end of the active runways at Wright-Patterson Air Force Base and remains much as it did when the Wright brothers worked there. None of the original buildings are still standing. In 1990, the Air Force constructed a replica of the 1905 hangar in its approximate original location. No other buildings are on site.

The Wright brothers believed strongly in the scientific method and kept detailed records of their experiments with early aircraft, both at Kitty Hawk and at Huffman Prairie Flying Field. While these records tell us what the Wrights were doing at the site, they don't tell much about how the site was actually used, on a day-to-day basis, particularly during the 1910 to 1916 phase of occupation at the site. During this time a variety of activities were taking place at the site—pilot training, exhibition flying, and field testing of new models of aircraft being developed by the Wright Aeronautical Company in Dayton—all operating out of the 1910 hangar. Although the hangar is shown on a few maps and aerial photographs of the time, several of the key landmarks in these documents are now missing. With the creation of the Dayton Aviation Heritage National Historical Park and the National Historic Landmark designation, there is greater need for the base to increase its knowledge of the site overall and to better understand the 1910 to 1916 phase.

The first attempt to locate the 1910 hangar was carried out in 1990 by USACERL. Extensive subsurface testing designed to locate foundations or driplines associated with the hangar produced a large quantity of artifacts but did not uncover any *in situ* archeological features. A change in strategy was needed to get to the information we strongly suspected was down there, while limiting the subsurface disturbance we did to the site. When the

base received DoD Legacy funding for USACERL to do additional work at the 1910 hangar site, USACERL contracted with NASA and CEWES to perform remote sensing, including geophysical studies.

The NASA study took place between May and August of 1993. Because of the wealth of information that can be obtained from airborne remote sensing instruments, NASA offered to overfly the entire installation and to select the optimum available instruments to address a wide range of research interests at the base, beyond just the 1910 hangar project. Ultimately NASA used airborne imaging techniques (the Calibrated Airborne Multispectral Scanner, or CAMS, which contains a single, broad-range thermal band, and the Inframetrics Model 740 scanner, a lightweight thermal unit used primarily in support of the space shuttle program and one of the most powerful thermal instruments commercially available) and color infrared aerial photography. Preliminary data analysis suggests that CAMS data could be useful for a wide range of activities, such as wetlands delineation and facilities management. While scheduling difficulties meant that the CAMS data was collected at not the most optimum time of the year for detecting features associated with the 1910 hangar, several anomalies indicating potential features could be seen in both the CAMS and the Inframetrics data. The anomalies detected were then spatially pinpointed using extant landmarks, historical documents, and archeological data. The anomalies appeared to indicate the rectangular "footprint" of the hangar (either architectural elements of the hangar itself or thermal soil anomalies resulting from activities associated with the building) and the remains of Symmes Road, which used to pass just behind the hangar.

Chevon Kathari, left, and Rafe Kinoshita of the U.S. Army Construction Engineering Research Laboratory gather data at the 1910 hangar excavation site.

The CEWES study took place in October 1993, and consisted of three geophysical methods—magnetic surveying, electro-magnetic surveying, and ground-penetrating radar. Anomalies detected were assessed as possible indications of the hangar, with particular attention paid to anomalies detected by multiple methods. These were then interpreted in comparison with a 1915 map and 1924 aerial photo of the area, both of which show the 1910 hangar.

The 1994 USACERL investigations were undertaken to ground-truth the results of the CEWES survey; the NASA survey results were not available at the time of the 1994 excavation, but were used later as part of the data analysis. USACERL's 1994 strategy was designed to minimally impact the 1910 hangar locus, through the use of limited machine testing and large hand-excavated units to identify architectural remains of the post-in-ground structure. USACERL limited the work to a portion of the hangar locus deemed likely to reveal discernible archeological features. Execution of this strategy was complicated by difficulties in coordinating the CEWES survey grid and the 1990 and 1994 survey grids. The 1994 excavations succeeded in locating several subsurface features, including an *in situ* wooden post, a posthole, and a possible posthole. The features were compared to the remote sensing anomalies and the 1915 map. The detection of these features suggests that the Huffman Prairie Flying Field includes *in situ* architectural remains located in the general vicinity of the 1990 and 1994 excavations and the anomalies detected by the airborne and geophysical remote sensing studies.

The remote sensing studies and archeological fieldwork have contributed to several significant findings. Despite having been bulldozed c. 1940, extensive subsurface remains, including artifacts and architectural remains, of the 1910 hangar locus are present on the Huffman Prairie Flying Field site. Artifact concentrations occur, but in some cases are displaced as a result of the bulldozing and plowing performed during hangar demolition. Artifacts are relatively abundant and are dominated by construction materials. Airplane parts, though few in number, give important information about the repair and operation of early aircraft. Domestic artifacts, principally fragments of glass beverage bottles, provide a glimpse into the daily lives of the pilots, mechanics, and others who worked at the 1910 hangar. The hangar itself may also provide detailed information on the design and construction of one of the world's earliest airplane hangars. The investigations are part of a continuing effort by Wright-Patterson Air Force Base to manage Huffman Prairie Flying Field and to develop it as a resource for public information and education. Finally, the investigations demonstrate the utility of applying remote sensing techniques to archeological sites. Although the target of the remote sensing surveys was an ephemeral, post-in-ground structure, and the studies were done in non-optimal seasons, both sets of techniques were able to locate indications of the hangar structure.

Jan Ferguson is the Base Historic Preservation Officer/cultural resources manager for Wright-Patterson Air Force Base.

Lee Foster, Jerry Fuentes, and Sannie Kenton Osborn

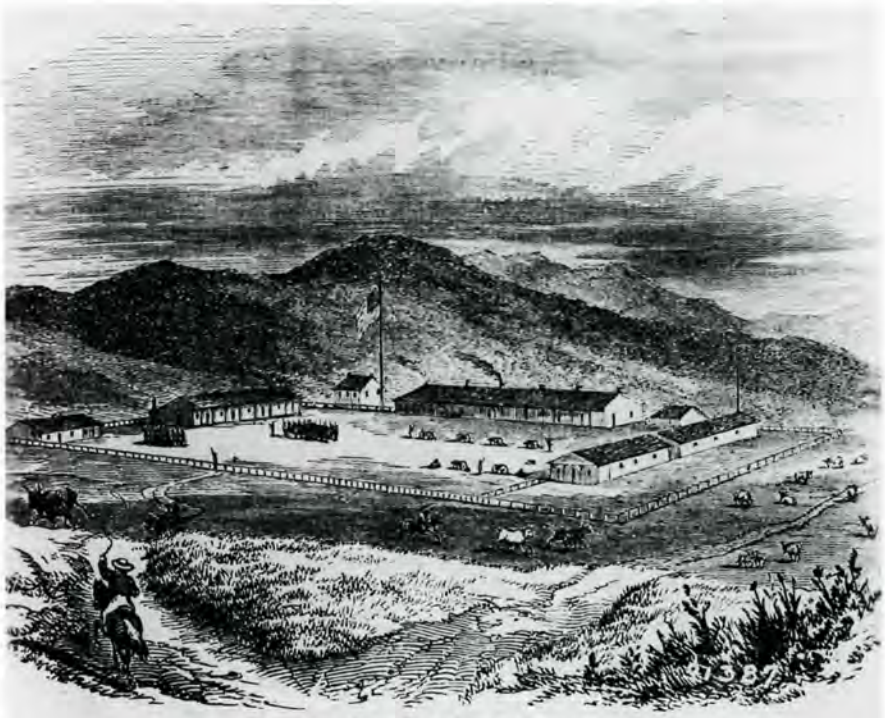
The Presidio of San Francisco
A Study in Inter-Agency Cooperation

The adobe is bad in itself because of the dampness it crumbles. The store houses are built of mud without any support [plaster] and therefore exposed to rain...[the guard-house's] walls are crumbling. The sergeant's house is of stone without support and is falling down. All the walls of the church are crumbling...The wind blows in such a way...that they are like hurricanes which make notable harm in the roofs and every year one must attend to them with unendless work. —*Comandante Hermegildo Sal, 1792*

It is difficult to imagine that this lament, written by the Spanish Commander of the Presidio de San Francisco some 16 years after its founding, describes the idyllic refuge which today crowns one of America's most beautiful cities. Yet what is now a tranquil green space guarding the Golden Gate was once a harsh and forbidding place. This barren, windswept spot was beset by torrential rains and earthquakes, presenting a forbidding environment to those who endeavored to live there.

Today, the Presidio of San Francisco's rich tapestry of cultural and natural resources reflects a nearly continuous military presence of more than 200 years. The Spanish explorer Lt. Col. Juan Bautista de Anza established the outpost in 1776, the third such garrison in California. Mexico occupied the Presidio after declaring independence from Spain in 1822, and the U.S. Army took possession of the Presidio in 1848 as part of the Treaty of Guadalupe Hidalgo. This beautiful post was designated by the Secretary of the Interior in 1962 as a National Historic Landmark, and in 1972 the Presidio was included within the boundaries of the newly created Golden Gate National Recreation Area although it continued its mission as an Army garrison.

The Presidio offered an unsurpassed opportunity as well as a tremendous challenge to interpret and safeguard an important part of our nation's heritage. Recognizing the potential for encountering material culture representing 200 years of military occupation and several millennia of Native American habitation, the Sixth U.S. Army, Forces Command, worked closely with the U.S. Army Corps of Engineers, Sacramento District, and the U.S. Army Environmental Center. Since 1989, when Congress identified the Presidio for closure under the Base Realignment and Closure Act of 1988, the Army, Corps, and National Park Service have coordinated their



The Presidio of San Francisco.

The U.S. Army incorporated the remaining adobes of the Presidio of San Francisco into their early Army post in this 1855 illustration from "The Annals of San Francisco." Photo courtesy the Golden Gate National Recreation Area—Presidio of San Francisco Museum.

Tents were pitched to house troops supporting the Spanish-American War and the Filipino Insurrection. The brick barracks on the left were constructed in the 1890s. Photo courtesy the Golden Gate National Recreation Area—Presidio of San Francisco Museum.

efforts to ensure the continued protection of this landmark property.

Cultural resources studies had already taken place at the Presidio to document its significance for nomination as a National Historic Landmark. This nomination has since been revised and expanded by the National Park Service. In 1985 a Historic American Buildings Survey report of the Presidio was completed, followed by an adaptive re-use study and the production of historic building maintenance manuals. Subsequently, as part of the closure process, the Army undertook archeological and other cultural resources investigations at the Presidio as it began to repair installation infrastructure and remove hazardous materials prior to transfer of the property to the National Park Service.

In 1993 the Army executed a Programmatic Agreement which detailed its responsibilities for considering the effects of its actions on cultural resources at the Presidio. In June 1993, removal of a small underground storage tank behind Officers' Quarters 12 revealed a concentration of large serpentine stones, clay roof tile fragments, and Majolica ceramic sherds. Excavation of the exposed archeological feature showed the findings to be typical of a Spanish colonial wall-foundation.

The determination that the wall was located outside the predicted footprint prompted a reexamination of the historical development of the Presidio. The discovered wall-foundation was significantly north and east of the northeast corner as established by Comandante Sal's 1792 plan. It was speculated that the foundation represented a casemate or other outbuilding. Further excavations at Officers' Quarters 12 were intended to provide the dimensions of the casemate, but actually revealed two parallel walls running north-south (the interior and exterior of the eastern portion of the quadrangle) and two interior walls running east-west.

Additional investigations to the north and south confirmed that the Spanish Presidio structure is larger than previously thought, emphasizing the importance of archeological studies in improving our understanding of the documented past. Instead of a small outbuilding as depicted in Comandante Sal's 1792 plan, archeologists had discovered the foundations of the eastern side of the Presidio quadrangle and a portion of the northern side. The wall-foundations were nearly twice as long as the dimensions shown in Comandante Sal's plan and were located farther to the east than expected.

The discovery of remnants of the original Spanish Presidio sparked the imaginations of cultural resources professionals, military and National Park Service personnel, and the residents of San Francisco and stimulated increased public involvement and agency cooperation. "It's an amazing discovery," said Glades Hansen, a retired archivist for the City of San Francisco. Public tours of this exciting find were included in the city's annual birthday celebration which coincides with the founding of the Presidio. A cooperative effort ensued among Los Californianos (descendants of the original Anza expedition), Spanish consulate, Boy Scout Troop 77, California Office of Historic Preservation, Advisory Council on Historic Preservation, National Trust for Historic Preservation, National Park Service, and the Army to make information widely available to the public and other agencies.

"This is part of the ultimate irony that in the 217 years that the Presidio has been here, we would find proof of the first occupants now that we are preparing to turn the post over to the Golden Gate National Recreation Area," said Col. Gregory Renn, Garrison Commander. Among those activities intended to publicize the find and to increase public awareness of the Presidio's rich history were development of a traveling exhibit which has been featured at professional conferences and public meetings throughout the United States, production of a one-hour documentary video on the Presidio's history which is shown daily at the National Park Service Presidio visitor center, distribution of fact sheets and interpretive materials to the public, historic preservation training for Army and National Park Service staff, and a variety of events held on the Presidio during National Preservation Week and California Archeology Week.

The Army is proceeding with a comprehensive program of infrastructure improvements and environmental remediation at the Presidio. Concurrently, the National Park Service is undertaking a wide variety of projects in accordance with its general management plan. These undertakings are now being reviewed under a new Programmatic Agreement executed by the National Park Service. Cultural resources specialists from both agencies continue to work together to safeguard the Presidio's irreplaceable cultural record. Army projects are examined jointly and are subject to review and permitting by National Park Service oversight groups. The number, complexity, and time-sensitive nature of both Army and National Park Service projects require meticulous yet responsive assessment.

An archeological sensitivity model developed by the National Park Service has facilitated the review process, permitting effective use of resources earmarked for the cleanup and remediation effort. This is clearly demonstrated in the development of archeological monitoring protocols which have evolved during the past three years. Additional procedures are currently being developed to deal with such issues as sensitivity assessment, curation, inadvertent discovery, and recordation. Particularly important is the problem of hazardous and toxic waste at the Presidio and the thorny issue of how to deal with areas of contamination as they affect archeological features and artifacts. The questions of how to deal with these health and safety issues and to effectively satisfy cultural resources requirements are still being resolved.

Since the discovery of the Spanish Presidio wall-foundation in 1993, National Park Service archeologists have located collapsed adobe walls near the 1792 chapel and sacristy of the Presidio, and, early in 1996, tile and packed earth flooring were uncovered on the eastern side of the Presidio during placement of a fiber optic cable. Significant discoveries will continue to be made as cleanup and remediation progress. Through the continued cooperation between the National Park Service and the Army, these irreplaceable fragments of American history will continue to be safeguarded for the benefit of future generations.

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Newell O. Wright and Corinne D. Hollon Graves

The Recent Past on Eglin Air Force Base

On Eglin AFB, Santa Rosa Island, Florida, two parallel rows of concrete pillars emerge from the stark white dunes and extend 150 meters toward the Gulf of Mexico. Not far away, in a remote heavily wooded section of the reservation, north of the Choctawhatchee Bay, nine immense concrete structures stand like ruins of a forgotten city.

These sites are not remnants of an ancient civilization but rather physical reminders of important missions conducted within the United States during World War II. They were conceived and fabricated in secret, tested with a sound and fury equivalent to any battlefield, but abandoned soon after the war. These sites reflect an important moment in both the nation's and the Air Force's history. However, commemorating or preserving them for the future is not without problems.

In 1944 the Germans were bombing England with "V" missiles. As part of the Allied response, Eglin constructed a replica of a German V-1 missile site. Codenamed "Operation Crossbow," the bombing tests began immediately following construction.

Cultural resources managers are often in the difficult situation of proposing the preservation of sites associated with events which are transitional between recorded history and remembered events. Such sites often have not had the benefit of time to demonstrate their significance. The sites mentioned above and others at Eglin are representative of a widespread class of properties within DoD that are associated with World War II.

For young Americans, World War II is historic in the same way as the Civil War and Revolutionary War: it is an event of which they have no personal recollections. Preservation of the material record of this era offers these citizens a connection to the recent past. World War II sites such as those recorded at Eglin AFB provide insight into the events that shaped the daily lives of a vanishing generation and serve as material reminders of the truly global nature of the Second World War—a conflict which left indelible marks on our nation's landscape. As described below, many of these cultural landmarks bear testimony to American ingenuity and determination as well as the military role in development of advanced technologies.

Operation Crossbow

In 1944, when the outcome of World War II was far from settled, enigmatic weapon complexes were identified on the Axis-held coast of France. Each consisted of a series of concrete structures, up to 300' in length. Although the function of the oddly shaped structures was not immediately known, intelligence concluded the obvious, that the sites were part of a new, although yet unidentified, weapon to be used against Great Britain. Further investigations suggested that the Germans were building these structures to store, assemble, and fire V-1 and V-2 missiles, unmanned rockets utilized for long-range attacks. In order to avoid potential interference with the invasion of the continent, termed Project Overlord, and to circumvent additional attacks on England, the Joint Chiefs sought to destroy the sites. However, in the interest of saving men and material, a practice run was proposed to determine the most efficient means of attack.

On January 25, 1944, Brig. Gen. Grandison Gardner, commanding general of the Army Air Force Proving Ground Command at Eglin, received a telephone call from General H. H. "Hap" Arnold, Army Air Corps Chief of Staff. "Gran, I can't tell you over the telephone what I am talking about, but I hope you will know," Gardner later recalled Arnold as saying. "I want you to build one, study it and decide what is the best way to destroy it. I want it done in days and not weeks. Did you hear? Days and not weeks, and it will take a hell of a lot of concrete" (Kessler 1982 Part Two:31-32).

Winston Churchill designated the project Operation Crossbow—a term later used for all operations against the German long-range rocket program. Specifications for construction were based on information smuggled out of France, photographs taken by reconnaissance aircraft, and sketches done by British intelligence. A courier brought the specifications in a sealed pouch to Eglin where, amid as much secrecy as the command could maintain in disguising a project so large, work commenced.

With time of the essence and building materials scarce, Proving Ground Command purchasing agents scoured the Southeastern states looking for concrete, steel, and bricks. Under tight security,

planes, trains, and trucks rushed materials to Eglin, where thousands of military and civilian workers labored around the clock to complete the work. As General Arnold had requested, the work was done in days rather than weeks, and 12 days after work began the project was complete.

Test approaches to the target began as soon as the concrete dried. Teams of officials scrupulously checked the effectiveness of various approaches, the efficiency of tactical operations, and the vulnerability of aircraft to ground defenses.

The Eglin tests confirmed beyond question what American field commanders in Europe, the Operation Crossbow Committee designated by the Joint Chiefs, and General Arnold suspected: minimum altitude attacks by fighter planes, properly delivered, provided the most effective and economical aerial countermeasure against the sites. The medium and high altitude bombing attacks which the British had employed and advocated were ineffective and wasteful of lives and planes.

The results of Eglin's tests caused acrimonious debate within the Allied command. The British refused to accept the results and continued to favor high altitude bombers. Despite rising bitterness among American air chiefs in Washington, Eisenhower acceded to the demands of the War Cabinet, which continued to insist on the British approach. As a result, the air support for Project Overlord continued to suffer from the diversion of bombing resources to Operation Crossbow. Ultimately, it was not air attacks, but the occupation of the launch sites by Allied ground forces that overcame the threat. As for the techniques and weapons developed at Eglin, they were employed with conclusive results throughout the remainder of the war against bridges, railways, and other targets that shared characteristics with the V-missile sites.

Constructed of concrete, masonry block, and brick, nine structures of various sizes and shapes comprise Eglin's Operation Crossbow district. Some were heavily damaged as a result of the intense bombing to which they were subjected in February 1944, and the buildings are currently in various states of preservation. Distributed over a 14-acre area, the structures include replicas of a missile launching ramp, missile-storage building, an "aiming house" where the V-1 was equipped with guidance mechanisms and targeted prior to launch, V-1 assembling facilities, and support buildings. These structures, now overgrown, remain as they were left in 1944, some intact and others wearing the marks of well-aimed bombs. Together they offer mute testimony to Eglin's role in this strategic World War II endeavor.

JB-2 Testing

In June 1944, Germany began bombarding England, especially London, with the V-1 or Buzz bomb. In July 1944, parts of a V-1 salvaged by the Polish underground and recovered from crashed but unexploded bombs, were flown to Wright-Patterson Field and within three weeks America had completed its first copy of a V-1, the JB-2 (Jet Bomb), the United States' first operational guided missile and the predecessor of the modern cruise missile.

A problem quickly arose, however: the US had no experience launching their new bombs. To solve this dilemma, Eglin was chosen to test launching techniques. Three sites were created on Eglin's Gulf-side property, all designed to test different launching techniques.

One launching site, now located on Sierra Club property east of Destin, Florida, featured a concrete inclined launch ramp. Steam-powered and portable ramps were also tested at this site. The other two sites are located within a half mile of each other on Santa Rosa Island, on Air Force property.

Recorded as Florida archeological sites 8OK246 and 8OK248, the remnants of these two JB-2 test sites, along with bunkers and debris fields from unsuccessful test flights, were identified as part of Eglin's initial historic property inventory. After identification, these were evaluated for historic significance and subsequently listed on the National Register of Historic Places.

8OK246 contains the remains of a 400' concrete launch ramp as well as an intact observation bunker and a JB-2 wreck south of the ramp. Although the ramp itself is missing, its concrete pillars stand against the passage of time.

8OK248 is the remains of a JB-2 mobile launch site, containing two concrete pads and an observation bunker, all virtually unscathed. Abandoned to the elements, 18 individual JB-2 wrecks lie scattered across the dunes, a reflection

The JB-2 rocket was the American copy of the German V-1. This c. 1945 photo was taken during JB-2 testing at Eglin.

Remains of launch ramp at 8OK246 today. This site and neighboring 8OK248 are listed on the National Register.

of the difficulties encountered in achieving field readiness.

All of the Eglin launchings were directed south to the Gulf of Mexico. The targets were buoys placed at measured distances, up to 150 miles, to which the headings and range of the guidance system were adjusted. There is no evidence that live warheads were used, as many of the wrecks examined by Eglin archeologists have concrete ballast filling the warhead compartment.

An initial order of 1,000 of these JB-2s was made in July 1944. The primary contractors were Republic Aviation for the airframe, Ford Motor Company for the pulse-jet engine, and Jack and Heinz for the guidance system. In January 1945, 75,000 JB-2s were ordered, and a launching squadron was formed to launch the missiles in Europe and the Pacific. The war concluded prior to their deployment and the orders were canceled. Ultimately 1300 were produced, but only seven survive today.

The JB-2 testing at Eglin continued until March of 1946, when the project was canceled. After cancellation, the reusable portions of the sites were disassembled. However, the debris from crashes was left where it fell, and one or more surplus JB-2s are reported to have been buried in the surrounding dunes.

Army weapons analysts watched JB-2 launches from inside observation bunkers. The photo below shows the bunker at 8OK246 as it appears today.

Summary

Until recently, the physical record of Operation Crossbow, JB-2 testing, and other significant events on Eglin have been largely ignored. World War II events, however, have reached the age defined by the National Register as worthy of consideration and, perhaps, preservation. With the end of the Cold War, sites associated with this era are also being considered for significance. Increasing age combined with a growing recognition of the importance of preserving evidence of transitional events have fostered a movement, in a manner similar to that which saved Civil War battlefields in the 1890s, to contemplate what we will do with the physical heritage of our recent past.

Sites such as Eglin's Operation Crossbow complex and JB-2 launch sites not only remind us of our past, of World War II, and of the beginnings of the Army Air Corps, but also of the evolution of technology that has resulted in modern aeronautical and defense programs. Further, these areas are standing monuments to the resourcefulness of the American people and military during the greatest war in human history. The documentation of such significant events and protection of associated historic properties are among the many challenges facing cultural resources managers at Eglin and throughout the DoD.

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Corinne D. Hollon Graves worked as an archeologist at Eglin AFB under contract with Colorado State University. Mrs. Graves left Eglin this year to return to school.

Photos courtesy Eglin AFB.

Newell O. Wright, Tegan Swain, and Mathilda Cox

Uncovering the British Colonial Past in Northwest Florida

One of DoD's obligations, as a steward of the land it controls, is to protect cultural resources that are eligible for the National Register of Historic Places. Management of these resources first requires that they be identified and assessed for significance. Eglin Air Force Base has taken seriously its obligation to the American public and has a proactive program to consider, as part of its decision-making process, the ramifications of its actions on historic properties. When a site is determined eligible for nomination to the National Register, Eglin personnel carefully consider management options in an effort to protect and preserve these significant historic properties.

For both philosophical and fiscal reasons, Eglin's cultural resources managers do not consider excavation as the primary mitigation method when archeological sites are threatened. Philosophically, protection is the preferred avenue for management, allowing preservation of the sites, structures, and material remains of the past for future generations. On military lands, preservation is feasible since DoD's cultural resources, unlike those that are on private property, are often not threatened by development pressure. Consequently, sites and structures can frequently be saved for the future when techniques for discovering information about the past will have improved. In addition to the philosophical rationale for protection, finances also offer incentive for preservation. Financial resources are becoming scarce, and it is often more cost effective to preserve sites than to excavate. However, unchangeable mission requirements or natural threats such as erosion may sometimes make it necessary to recover data or risk the imminent loss of the site, as was the case at site 8SR1251. Located on the western edge of the Eglin reservation, this site dates to Florida's British Colonial Period between 1763 and 1781. The site is of particular importance to the history of the region. It is located in an area which would have been a frontier during the time of its occupation, meaning it was not part of the main settlement of Pensacola. As such, it represents an outlying British settlement, a type which heretofore had not been studied in northwest Florida.

Because of the importance of this site, Eglin's cultural resource manager decided to "bank" it, that is, to protect the site from natural and cultural impacts as an asset for future generations. Unfortunately, natural events of 1995 swiftly challenged that plan.

In August and October of 1995, two fierce hurricanes visited the northwest coast of Florida, creating substantial damage to personal property and the shoreline. Historical properties were not spared. Not only was much of 8SR1251 lost imme-

Fig. 1 (below). Brick scatter indicating the location of a former chimney with structure 2.

Fig. 2 (right). Architectural items.

Fig. 3. Fragments of bottles and a glass stem (above).

Fig. 4. Ceramics including scratch blue, porcelain, tin, and saltglaze earthenware (right).

diately as a result of the impacts, but the remainder was threatened as a result of storm damage to protective barriers.

Eglin's cultural resources manager determined that excavation was necessary to salvage the remaining data. In consultation with Florida's State Historic Preservation Officer, a data recovery plan was devised, and the necessary permits obtained. Data recovery began in the summer of 1996 and has continued intermittently since.

Excavation at the site has proven that the decision to initiate salvage data recovery was judicious. The large number of artifacts recovered provide previously unknown details of the 18th-century life of isolated British settlers in the Florida panhandle. The investigations uncovered evidence of two former structures: one is represented by brick footings or wall supports, and the other by a chimney fall and wall trenches (Fig. 1). The function of the structures has not been determined, but the artifacts recovered provide evidence of a variety of activities. Artifact classes represented in the collection include those associated with the colonial kitchen, architecture (Fig. 2), arms, and personal items. In addition, the assemblage contains evidence of specialized activities such as fishing.

Fig. 5. Items of personal decoration.

Fig. 6. Cufflinks with coat of arms of King Carlos III of Spain.

While the occupants of the site may be considered marginal to the larger area settlements of Pensacola and Mobile, they possessed some of the finer material goods that the world had to offer. We have found evidence of the presence of wine and other spirits, decorated blown glasses for their consumption (Fig. 3), porcelain from China, and tin glazed earthenware from continental Europe and England (Fig. 4). Numerous items of personal adornment have also been recovered. These include beads, a medallion, buttons from a coat issued to the British 16th Regiment of Foot (Fig. 5), and cufflinks with the coat of arms of King Carlos III of Spain (Fig. 6). Together, the items are not the material culture one might expect from the pioneer sort competing for the basics of life on the edge of the frontier.

Cataloguing of the artifacts is well underway and formal analysis will soon follow. Even at this point in the research, however, it is clear that the excavations have salvaged a rich chronicle of early European settlement in the Florida panhandle. The artifacts have afforded a window on a rather narrow span of time not previously represented in the region's archeological record. The data recovered through controlled excavation represent a significant advancement in knowledge—an advancement which would likely have been lost to time and tides without Eglin's proactive cultural resources management program.

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John J. Cullinane

CRM Planning at Two Service Academies

In an effort to establish strong self-governing cultural resource management programs, each military service has developed internal directives, regulations, and instructions guiding the treatment of cultural resources through development of Cultural Resource Management Plans. These directives are not written as counterpart regulations to 36 CFR Part 800, "Protection of Historic Properties." Instead, they establish an internal process designed to satisfy the requirements of the National Historic Preservation Act (NHPA) while meeting fundamental mission goals of the military.

The first military service to issue such regulations was the Department of the Army. In May of 1984 the Army published AR 420-40, "Historic Preservation." This internal regulation established the goal of creating a "Historic Preservation Plan" (HPP) for each Army installation. The initial HPPs resulting from this regulation were less than satisfactory. This was due, in part, to a lack of experience on the part of installation staff and contractors, as well as differences in understanding.

United States Military Academy

By 1987 no HPP had been approved through the Army review system, or accepted by a State Historic Preservation Officer or the Advisory Council as a suitable alternative to review under Section 106. This situation resulted in the Army approaching the Advisory Council for assistance. After much debate surrounding the potential for a conflict of interest, the Advisory Council took on the challenge of developing a prototype HPP that could be applied to all Army installations. The United States Military Academy (USMA) at West Point, New York, would be the focus of the initial work.

The Advisory Council assigned two staff members to the task, Eleni Silverman, the staff architectural historian, and myself, at that time Senior Architect to the Council. Work started on the project in early June 1988.

Nomenclature

As we have all found through years of experience, what you mean to say and what others hear can be quite different. In the case of the Army regulations, the term "Historic Preservation Plan" appeared to place emphasis on the act of "preservation." The fact is that the act of "preservation" is not part of the responsibilities of any installation commander, and that was not the intent of the Army regulation. The purpose of the regulation, and the HPPs, was to improve management of historic resources at the installation. Preservation may be one of the management options, but it should not be the focus of the plan. Every commander, however, is responsible to "manage" those resources and

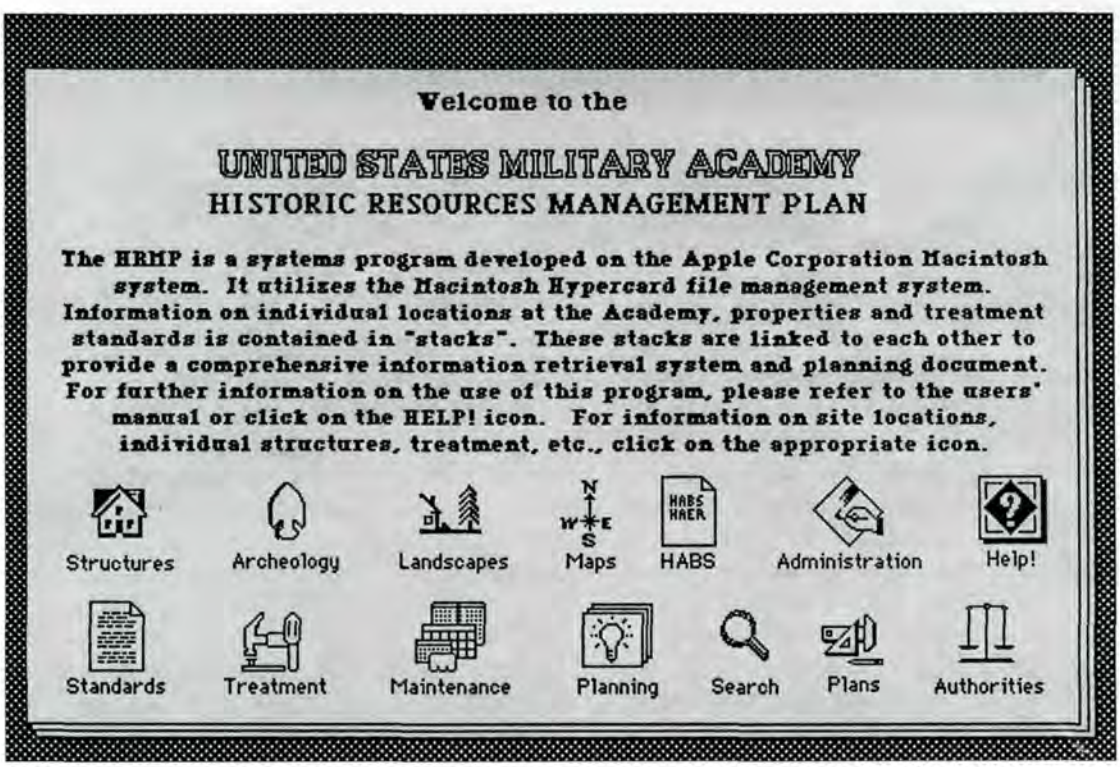

Illustration of the main program menu for the HRMP for the USMA showing the graphic interface format.

facilities under his/her command. Thus, the HPP was turned into a Historic Resources Management Plan (HRMP), later a Cultural Resources Management Plan. It was a small issue, but one that changed the focus and acceptability of the plan dramatically.

Use of the appropriate nomenclature in the development of the USMA plan was a constant consideration. Unless the terms used in the plan are consistent with those familiar to the client, the plan has little hope of being useful.

Delivery Systems

Another consideration was how the plan should be presented to the users. Again, we encountered a difference in what was needed and what was expected. The expectation was that the plan would look like a report: a printed document, double spaced, with a history of the site starting from the Ice Age, with an inventory of resources, along with recommendations for treatment.

Photograph of the Cadet Area of the United States Air Force Academy showing the Cadet Chapel and dormitories. This photo is included as a resource in the Academy's CRMP.

Understanding that any management plan is a working, dynamic document required us to consider alternative delivery systems, to look at what would best serve the project requirements and the client.

Like any other problem, the more questions you answer, the more arise. Who was the client, the user? Although the Army HQ asked for the prototype, the user would be individual installations. And, within the installation there would be a host of users, from the Commander and Chief Engineer, to the installation planner, shops personnel, and maintenance crew. This made a lot of different users, all potentially seeking different types of information for different reasons. Accordingly, the delivery system had to address the needs of all of the potential users.

Content

As we were considering how to provide the information, we were trying to determine what information should be included in the plan. The Army indicated that they felt the plan should contain all the information needed for the user to make the "smart" decision on the disposition and treatment of a resource; we agreed. The management of cultural resources not only involves adherence to standard code requirements and user needs, but also all of the preservation laws and standards, accessibility standards, energy conservation goals, respect for historic traditions, quality of life, and cultural beliefs and practices.

We quickly determined that you don't provide this quantity of information in a printed format and expect it to be useful. The alternative appeared to be development of a computerized plan. Use of a computer would allow inclusion of all of the necessary decision-making information, and also solve the problem of providing different types of information to different levels of users.

The Apple Macintosh program Hypercard was, at the time, the only graphic interface program that would allow development of a graphical, interactive data retrieval system. This would be the core of our operating system. Fortunately, since the introduction of WINDOWS, and software applications by main line companies such as Oracle and Microsoft, the point and click operating ease of the original program is now available on virtually all personal computers (PCs).

The HRMP/USMA includes 1,442 buildings, structures, and monuments, as well as approximately 65 identified archeological sites and another 85 potential sites. The plan covers a little over 18,000 acres of land and incorporates the National Historic Landmark (NHL) historic cantonment and Frederick Law Olmsted designed landscaping. The program is divided into 23 stacks of information, such as Structures, Archeology, Landscapes, Treatment, Standards, and Administrative Process. To obtain information or guidance, the user simply points the arrow at the subject and clicks. The user is then directed to the

information through a series of menus. The goal in developing the program was to provide the Academy, and any other installation using the computer "shell" program, with an easy to use management tool that allowed for meeting both mission needs and preservation interests in an effective and efficient manner.

With the assistance of the U.S. Army Construction Engineering Research Laboratories in Champaign, Illinois, which developed archeological modeling and undertook field testing, and some additional staff help, development of the program took two people 13 months. The system was installed at the Academy on July 5, 1989. It includes a stand-alone computer station, map layers integrated into the Academy's existing GIS system, and a printed Executive Summary for use by the Command for long-term economic and resource planning.

United States Air Force Academy

The Air Force followed the Army in development of internal regulations addressing cultural resources and, in June of 1994, issued Air Force Instruction 32-7065, "Cultural Resources Management." This Instruction calls for every Air Force installation to develop a Cultural Resources Management Plan (CRMP).

At the same time that the Instruction was being issued, the U.S. Air Force Academy (USAFA) and Air Staff in Washington, DC, asked my firm, John Cullinane Associates, to assist them in developing a prototype computerized CRMP. As with the Army plan, this project would use their premiere installation, the USAFA, as the test installation for our initial work.

The same principles applied to this project as to the Army's. They included the need to identify the user, define the goals of the CRMP, gather all of the relevant information and data, and develop an easy-to-use program that could be used by a variety of individuals to obtain the information they need to do their job in an efficient and effective manner.

In this case the work was undertaken principally by myself and one staff member, Susan Lassell, a preservation planner, with assistance from USAFA staff, Stacy Wetstein, an Academy summer intern, the University of Colorado Colorado Springs Department of Anthropology, and the prime contractor, Skidmore, Owens, and Merrill, the Academy's original architects, who provided design standards for new construction. The program uses Microsoft's Access software as the underlying structure, allowing development of a true relational and graphical database system.

The shell program, recently made available for testing by Air Staff, contains the necessary planning, treatment, and administrative guidance for any installation's use. Once an individual installation answers questions on eight screens, their unique information is integrated into the program, and it is ready to use. The program is designed to allow this work to be done by in-house personnel. The customization by the installation and the emulation of Air Force Standard Operating Procedures help create a sense of ownership often lacking in contracted CRMPs.

The program delivered to the USAFA runs on the Engineering office's local area network, and is linked to the Academy's AutoCad files and maps, allowing individuals to call up complete installation data from their PC. The program includes pre-Academy cultural resources on the site relating to settlement, ranching, and railroad themes, as well as all of the construction associated with the Academy. As with any program, security systems are available to restrict the release of classified or restricted information, such as the exact locations of archeological sites. Accompanied by a printed Executive Summary, this CRMP program satisfies the Academy's need to meet mission goals, while complying with DoD Integrated CRMP directives, Air Force Instructions, and federal laws, regulations, and standards. Now completed, it will serve as the basis of a programmatic agreement among the installation, SHPO, and Advisory Council.

Through the use of modern technology and techniques both the Army and Air Force are reducing their administrative burden in meeting compliance requirements while successfully managing their facilities in a manner that meets mission requirements, economic restraints, and conserves some of our most historic and valuable resources.

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Darby C. Stapp

Documenting a Cold War Nuclear Reactor

Attempting Innovation

In 1939, Nobel Prize-winning physicist Niels Bohr had argued that building an atomic bomb "can never be done unless you turn the United States into one huge factory." Years later, he told his colleague Edward Teller, "I told you it couldn't be done without turning the whole country into a factory. You have done just that."[1]

Today, that factory, known as the U.S. Department of Energy (DoE) Nuclear Weapons Complex, spans the country at sites such as Hanford, Los Alamos, Oak Ridge, Savannah River, Rocky Flats, Pantex, and the Nevada Test Site. Hundreds of buildings and structures at these sites have been determined eligible for listing on the National Register of Historic Places, a testimony to their important role in national and local history.

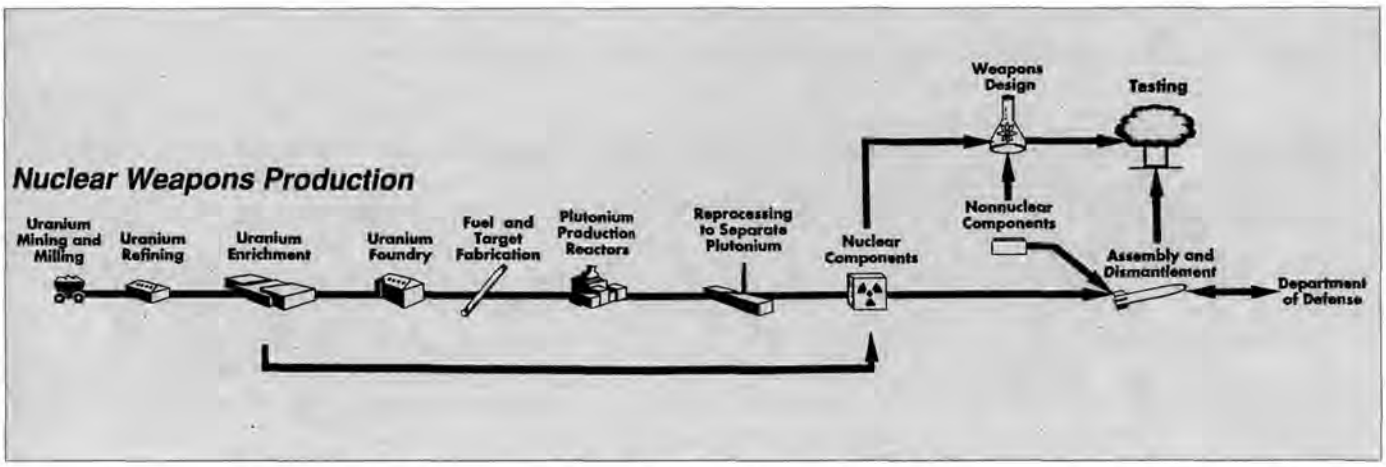
The Hanford N-Reactor complex, located on the last free-flowing stretch of the Columbia River in southeastern Washington, is comprised of over 100 buildings and structures. Courtesy U.S. Department of Energy.

With the Cold War over, DoE is now busy disarming nuclear warheads, cleaning up environmental contamination, and dismantling the complex. Before decommissioning and demolishing the eligible buildings, however, DoE will need to mitigate the effects of these actions by preserving the buildings or otherwise documenting their significance. But how does one document a nuclear weapons facility? It's not a simple question. One must go beyond the words provided in the National Historic Preservation Act (NHPA) and the Secretary of the Interior's Standards and Guidelines to understand the intent of the legislation and then develop a documentation approach that is both appropriate and reasonable.

This article describes how DoE is addressing this documentation issue at one of its Cold War-era nuclear reactors, located at the Hanford Site in southeastern Washington State.[2]

The N-Reactor Pilot Project

The N-Reactor, which operated between 1964 and 1989, was the last of nine plutonium production reactors constructed at Hanford. Since 1989, when the reactor was placed on cold standby, efforts have focused on decontamination and decommissioning. In 1994, cultural resource staff at Hanford proposed a pilot project to evaluate, and if necessary, mitigate the N-Reactor. The advantage to the N-Reactor program would be to accelerate their compliance with historic preservation requirements so they could get on with demolition. The advantage to the cultural resource program was that innovative approaches to evaluating and documenting a subset of significant buildings could be done in advance of the rest of the site historical documentation. The pilot project could then be assessed



The nuclear weapons production process as developed by the U.S. Atomic Energy Commission. The N-Reactor was the nation's most modern plutonium production reactor from 1964 to 1989. From Closing the Circle on the Splitting of the Atom. *Photo courtesy U.S. Department of Energy.*

and lessons learned incorporated into the sitewide historic preservation program, which was still in its infancy. The N-Reactor Deactivation Program agreed to fund the cultural resource pilot project and work commenced.

The Evaluation

A team knowledgeable about Hanford history and technology was formed to evaluate the historical significance of the facility. They found that N-Reactor was significant to the history of Hanford, the region, and the nation for reasons explained below.[3]

Hanford is an important historic site. Hanford's mission in the early 1940s was to construct the world's first full-scale reactors and separations facilities, irradiate uranium, and separate the resulting plutonium.[4] The plutonium was then shipped to Los Alamos where it was used in producing nuclear weapons. The first nuclear bomb ever exploded was a test, code named Trinity, conducted near Alamogordo, New Mexico, on July 16, 1945; Hanford provided the plutonium for this test. On August 6, 1945, the United States dropped an atomic bomb, known as "Little Boy" on Hiroshima, Japan. Three days later, another atomic bomb, "Fat Man," was dropped on Nagasaki, Japan. Five days later, the Japanese surrendered and World War II was over. Little Boy contained uranium produced at the Oak Ridge facility in Tennessee, and Fat Man contained plutonium produced at Hanford.

The nation's Nuclear Weapons Complex underwent a series of expansions during the 1950s as Cold War concerns heightened. The N-Reactor at Hanford, which incorporated new technology in several areas, represented the last of these expansions. Whereas the previous eight reactors at Hanford incorporated the same basic graphite block, water-cooled technology, the N-Reactor incorporated several design modifications. For example, water used to cool the reactor core was recirculated in the reactor rather than disposed of in the Columbia River as was the case with the other eight reactors at Hanford. This modification addressed an escalating concern in the region, namely that the Hanford reactors were dumping radionuclides into the river.

The N-Reactor was also designed in conjunction with a steam generating plant, added in 1963, that produced electricity for the region. N-Reactor became the first dual-purpose reactor in the United States. For many years, it was the largest electricity-producing nuclear plant anywhere. Selling the electricity enabled the government to drive down the cost of producing plutonium.

As the most advanced production reactor to be built at Hanford, and the only operating production reactor at Hanford from 1971 to 1989, the N-Reactor was considered one of the major contributing facilities to the overall site history. The DoE, therefore, determined that the N-Reactor facility was eligible for listing on the National Register of Historic Places. The Washington State Historic Preservation Office (SHPO) concurred with this determination.

Documenting N-Reactor

In 1995, the DoE and the Washington SHPO began negotiations concerning the makeup of the proposed Hanford Site Manhattan Project and Cold War Era Historic District and the ways such a district could be mitigated. While negotiations were underway, the N-Reactor historical project continued on its separate path, advancing the pilot project philosophy.

A research design was developed that drew heavily on recommendations from the Advisory Council on Historic Preservation's report, *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities.*[5] The first step was to identify individuals who would use the documentation and determine what their information needs might be. This analysis concluded the following:

- The Public: Efforts should be made to collect and preserve materials that would be useful from a public perspective.

- Historians, Social Scientists, and Historic Preservationists: A basic documentation about the history and life at the reactor should be prepared to satisfy their interest in various aspects of N-Reactor's genesis, performance, and worker-related issues.
- Nuclear Scientists and Engineers: Because information on the technological aspects of N-Reactor was already on record in countless professional documents and publications, these individuals were viewed as having little interest in the abbreviated technical information which might be included in this report.

Based upon these assumptions, the following activities were completed:

- Reports, photographs, and objects with documentation and public interpretive value were collected and catalogued.
- An interpretive event was held at the local science center that focused on the history, technology, and contributions of the N-Reactor; the feature presentation was a movie of President John F. Kennedy's October 1963 speech at the groundbreaking for the N-Reactor steam generating plant.
- An oral history program was started with former N-Reactor workers to document the history from their perspective.
- A three-volume documentation package was prepared.[6] Volume 1 is a public-oriented, well-illustrated overview of N-Reactor that documents the history of the facility and its significance to Hanford, its workers, the region, and the nation. Volume 2 includes descriptions for all buildings and structures. Volume 3 is a "Guide to N-Reactor Resources," prepared to assist future researchers interested in finding additional information about the N-Reactor. Historic Property Inventory Forms for all permanent buildings are on file at the Hanford Cultural Resources Laboratory.

All documentation derived from the N-Reactor Pilot Project will now be utilized in meeting the documentation requirements of the Historic Buildings Programmatic Agreement, which was agreed to by the DoE, the Washington SHPO, and the Advisory Council on Historic Preservation in August 1996. Sitewide mitigation efforts began in Fall 1996.

Summary

Fifty years ago, Hanford was chosen as the place where nuclear theory was transformed into practical applications in reactors and chemical separations plants. Today, Hanford is again transforming theory to practice, this time in the area of historic preservation at the site's nuclear facilities. For the N-Reactor, innovative approaches were attempted to adapt the Advisory Council's 1991 recommendations for sites such as Hanford.

DoE and the historic preservation community now have a completed nuclear facility documentation package to evaluate. Where the documentation succeeds, the methods can be applied elsewhere; where the efforts failed, we can go back to the blackboard. Such is the nature of innovation.

Notes

1 U.S. Department of Energy. 1995. *Closing the Circle on the Splitting of the Atom: The Environmental Legacy of Nuclear Weapons Production in the United States and What the Department of Energy is Doing About It.* Office of Environmental Management. Washington, D.C.

2 Stapp, Darby C., Joy K. Woodruff, and Thomas E. Marceau. 1995. "Reclaiming Hanford," *Federal Archeology* 8(2)14-22.

3 Stapp, Darby C. and Thomas E. Marceau. 1995. *The Hanford Site N-Reactor Buildings Task: Identification and Evaluation of Historic Properties. BHI-00627.* Bechtel Hanford Company. Richland, Washington.

4 Gerber, Michele S. *On the Home Front: The Cold War Legacy of the Hanford Nuclear Site.* University of Nebraska Press. Lincoln.

5 Advisory Council on Historic Preservation. 1991. *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities.* Advisory Council on Historic Preservation. Washington D.C.

6 U.S. Department of Energy. *N Reactor Comprehensive Treatment Report, Hanford Washington.* 1997. DoE/RL-96-91. Richland, Washington.

Darby C. Stapp is the Cultural Resources Coordinator for CH2M HILL Hanford, Inc., a subcontractor to Bechtel Hanford Inc., at the U.S. Department of Energy's Hanford Site. Dr. Stapp's work involves documenting Hanford and its role in the Cold War, and working with Native Americans to protect archeological and traditional cultural areas. Additional information on the Hanford cultural resources can be found at <http://www.hanford.gov/doe/culres/index.htm>.

Lee Foster

Building an Enduring Dialogue:
The Army Environmental Center's Native American Cultural Resources Program

As the United States emerges from the Cold War and approaches the 21st century, the Department of the Army is assessing its activities to better meet the challenges presented by increasingly complex domestic environmental conditions. An integral part of this assessment is an emphasis on effectively addressing issues of concern to the Native Peoples of this nation while maintaining the world's foremost, combat-ready fighting force.

Responding to concerns expressed by Native Americans, Alaska Natives, and Native Hawaiians relating to environmental justice, free exercise of religion, self determination, and recognition of tribal sovereignty, Congress and the Executive Branch have, over the past three decades, created legislative and other mandates requiring federal agencies to address these issues. Of particular relevance to agencies with land management responsibilities are the American Indian Religious Freedom Act of 1978, the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), Presidential Memorandum dated April 29, 1994, "Government to Government Relations with Native American Tribal Governments," Executive Order 13007, "Indian Sacred Sites," dated May 24, 1996, and the National Historic Preservation Act of 1966, as amended.

In redefining its relations with Native Peoples, the Army is a leader among federal agencies in addressing many of these concerns. The U.S. Army Environmental Center created its Native American Cultural Resources Program in 1994 in an effort to address Native issues while, at the same time, allowing the Army to effectively use and manage its training lands.

Medicine Bluff Sacred Site, Fort Sill, Oklahoma.

The U.S. Army Environmental Center (USAEC) is a Headquarters, Department of the Army (HQDA) activity which supports the Assistant Chief of Staff for Installation Management. The USAEC's Native American program was begun as a centrally managed Army-wide effort to satisfy the summary and inventory requirements of Sections 5 and 6 of NAGPRA. USAEC developed a program to review Army collections and prepare draft compliance documents to help Army installations with the consultation and repatriation process. The St. Louis District Corps of Engineers, Mandatory Center of Expertise for the Management and Curation of Archeological Collections assisted the USAEC with the development and execution of the program.

The approach was two-phased. The first phase, completed in March 1996, identified the locations of archeological collections from all Army installations, prepared general summaries of collection contents, identified potential culturally affiliated Native American tribes or Native Hawaiian organizations, and drafted template compliance documents required by Section 6 of NAGPRA. This major undertaking resulted in the investigation of collections belonging to 169 installations. Of these, 97 were found to hold collections and received reports containing summary data. In total, some 37,737 archeological site records and 2,062 reports were reviewed.

In the second phase of the program, 20 installations were found to require Section 5 investigations. These included such facilities as Fort Sill, Oklahoma; Fort Benning, Georgia; Yakima Training Center, Washington; and Pohakuloa Training Area, Hawaii. Physical investigations confirmed the presence of human remains or funerary objects for 18 of the 20 locations. By August 1997, inventory reports containing the results of physical examination of the collections, more detailed information on potential affiliated groups and template compliance document drafts were completed. The majority of the affected installations have now begun consultation with federally recognized tribes and

Mr. Jefferson Keel, Administrator for the Chickasaw Nation of Oklahoma, addresses the Army/Native Peoples Cultural Resources Workshop in Park City, Utah.

Hawaiian organizations in preparation for completing determinations of cultural affiliation and, ultimately, repatriating NAGPRA cultural items. This centrally managed and centrally funded approach to the Army's agencywide NAGPRA compliance documentation needs created a considerable cost savings through an economy of scale and also resulted in consistent, high quality report documentation in a standardized format.

An integral part of USAEC's efforts to address Native Peoples' issues is the complete revision of Army regulations and guidelines dealing with cultural resources management. Department of the Army Regulation (AR) 200-4 "Cultural Resources Management," provides Army installations with policy for implementing the government-to-government relationship with tribes required by the Presidential Memorandum of April 29, 1994. In addition, the new regulations give installations the direction to comply with Executive Order 13007, affording access to sacred sites and maintaining the integrity of those sites while concurrently using installation lands to develop a trained and battle-ready force.

Supplementing the new regulations are comprehensive Native American consultation guidelines. Army leaders recognized the importance of obtaining tribal input early in the regulation and guidance development process and of establishing an enduring dialogue with Native Peoples. Thus, in 1996 the Army invited interested tribes and Native Hawaiian organizations to attend a workshop at Fort Sill, Oklahoma. Representatives of 14 tribes and three Native Hawaiian organizations attended along with Army personnel representing headquarters, installations, and Corps of Engineers districts. Native Peoples provided valuable information and recommendations on how the Army should go about consulting with them on the full range of cultural resources issues.

Mr. Kunani Nihipali, Po'o (Head), Hui Malama I Na Kapuna 'O Hawai'i Nei, discusses Native Hawaiian issues at the Army/Native Peoples Cultural Resources Workshop.

The Consultation Guidelines will be adopted as official Army guidelines in the upcoming Department of the Army Pamphlet (DA PAM) 200-4 *Cultural Resources Management*. The DA PAM 200-4 provides Army installations with guidelines for implementation of the policies in AR 200-4.

The success of the Fort Sill meeting led to a second, larger workshop held at Park City, Utah, in 1997. This forum brought together 150 representatives of Native Peoples groups and Army Headquarters and installation personnel. The focus of the meeting was on further refining the consultation guidelines, and included discussion on how the Army manages training areas and tribal reaction to the management process. It also cemented relationships established at Fort Sill and strengthened the Army's dialogue with Native Peoples. Of particular interest was the presentation of Army and Native Peoples' views on the identification of sacred sites and other traditional cultural properties and management of these special places within the requirements of the National Historic Preservation Act and Executive Order 13007.

The USAEC is currently in the initial stages of drafting a counterpart to the Advisory Council on Historic Preservation (ACHP) regulations, "Protection of Historic Properties" (36 CFR Part 800) that will stand in place of 36 CFR Part 800. The early and sustained involvement of tribes and Native Hawaiian groups is viewed as crucial to developing the Army's counterpart regulations. Regional meetings and other initiatives are being planned by the USAEC and the ACHP at this time to insure that the views of Native Peoples and other stakeholders are taken into account and fully integrated into this Army counterpart regulation.

Protection of cultural resources, particularly those which are important to Native Peoples, forms an important part of the Army's stewardship responsibility. Indeed, the preservation of Native Peoples' culture and respect for their sacred places are national priorities. The Army's Native American Program seeks to acknowledge the contributions of Native Peoples not only to the nation's past, but also to its future. Many challenges remain, especially in the area of ensuring access to sacred places while maintaining the Army's ability to train forces to fulfill its national defense responsibility. The mechanism is now in place and actions are underway to foster honest and enduring dialogue with Native Peoples.

Lee Foster is Native American Cultural Resources Program Manager at the U.S. Army Environmental Center, Aberdeen Proving Ground, MD. Many of the documents mentioned above are available on USAEC's Conservation Web site at <http://aec-www.apgea.army.mil:8080/>.

Shelley J. Smith

Tularosa Basin Ecosystems: Past and Present

As land managers increasingly apply the principles of ecosystem management, the need for solid data about natural long-term cycles, landscape changes, and the roles humans have played in shaping ecosystems becomes apparent. Archeological and historic data can often provide just the kinds of information scientists need as they undertake a variety of ecosystem management projects, including data about vegetative cycles, fire histories, animal population distributions over time, climatic regimes, and riparian system histories. Further, humans have been manipulating ecosystems for many millennia; identifying human-caused changes is essential to understanding how the landscapes of today are configured.

Historic photographs in the database provide land managers with evidence of vegetation change and the influence of grazing animals. At the Frank Andregg Ranch, catclaw and other desert shrubs now grow around the barn and up the mountain slope. This expansion occurred in less than 50 years. (See next page.)

The Tularosa Basin of south central New Mexico is the focus of a pilot study to provide natural resource specialists with data from archeological, historic, and paleo-environmental sources that are relevant to current management issues. The project is a cooperative effort between the U.S. Army White Sands Missile Range and the Bureau of Land Management. Human Systems Research, Inc. is the contractor conducting the work. The U.S. Army Environmental Center initiated the project to support the Army's mission of troop readiness by maintaining training lands in realistic, natural conditions.

The project is an easy-to-use database, the heart of which is the Abstracts section. Here the user will find an annotation about each data source, a brief description of the content of each record, type of data available in the report/record (e.g. pollen, faunal), geographic origin of data, the location where the data or report is available, and a list of species by Latin and common names. A query search directs users to data sources that could assist them in designing, implementing, or choosing a management option. The database software is askSam's Electronic Publisher, read-only version.

Six other components of the database provide additional useful tools: archeological concepts, user data files, reports, photos, maps, and resources. Since the purpose of the project is to enable managers to make more informed decisions, the archeological concepts component is a crucial bridge to the database for the natural resources specialist. Here users will find overviews of various kinds of archeological, historic, and paleo-environmental data, how the data is gathered and analyzed, and its limitations. The relevance of a particular data type to management questions is discussed. For instance, under the topic "faunal bone" is an explanation of how bone is recovered from archeological sites and pack rat middens, and some of the issues with interpreting faunal bone data. The relevance of this sort of data to the management issue of animal species re-introductions is that they can shed light on which species were present in an area at a particular time. The user would then go to the database and construct a query, such as for *Antilocapra americana* (pronghorn antelope) bone.

The User Data Files are lists of known species, plant and animal, from the land managing agencies within the Tularosa Basin. The Reports section contains 83 of the annotated reports, or

the relevant portions of them. The Photos section has 120 historic photographs, many of which are paired with recent photos of the same location, while the Maps component contains maps portraying modern environmental and geographic information. The Resources component lists all of the references used in the database. Each of these files can be queried separately. The Reports and Photos records are also hyper-linked to the individual abstracts.

This project was developed with the participation of natural resources specialists and managers, and the design of the database reflects their needs and concerns. Training sessions are scheduled for local users. A follow-up phase one year after the training will focus on identifying the actual and practical use of the project and gathering suggestions for revision of the prototype format. A summary of the Basin's climatic and vegetative history may also be produced.

The anticipated outcome of the project is improved ecosystem management, because:

- decision makers will better understand the factors that shaped the present ecosystem and its potential under various management options;
- the origin of certain ecosystem changes (e.g., human activity, natural long-term cycles) can be discerned and management practices adjusted accordingly; and
- future studies and inventories will be well focused since the pilot project will identify crucial data gaps.

Improved ecosystem management contributes to agencies' missions in two significant ways. First, by enabling wiser decisions on how natural resources on training lands are managed, a savings is realized in time and money. The project could well pay for itself by preventing even one ill-conceived project planned with inaccurate baseline data. Further, management projects intended to comply with other laws, such as protecting endangered species habitat, can now be more productively and efficiently conducted. Secondly, the archeological, historic, and paleo-environmental data that has been collected for years will be providing a good return on the investment.

Shelley J. Smith is the Bureau of Land Management Liaison to the Army Environmental Center, where she is also the Cultural Resources Team Leader.

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