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2006 DoD Cultural Resources Workshop Proceedings

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Proceedings for the
DoD Cultural Resources Workshop:
*Prioritizing Cultural Resources Needs in Support
of a Sound Investment Strategy*



11-13 July 2006
Seattle, Washington



SERDP
Strategic Environmental Research
and Development Program



FOREWORD

These proceedings encompass outcomes from the *DoD Cultural Resources Workshop: Prioritizing Cultural Resource Needs in Support of a Sound Investment Strategy*, and reflect the views and opinions of workshop participants, and not necessarily those of the Department of Defense. HGL supported this workshop and produced the resulting proceedings document through funding awarded by the DoD Strategic Environmental Research and Development Program and Environmental Security Technology Certification Program (Omaha COE contract W9128F-04-D-0025, TO 0003), and by the DoD Legacy Resource Management Program (Huntsville COE contract W912DY-06-2-0009, project 06-294).

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EXECUTIVE SUMMARY

The Department of Defense (DoD) manages nearly 30 million acres of land as well as substantial air and sea space to conduct missions vital to the national security of the United States. These same lands also contain significant amounts and types of cultural resources, from archaeological sites to historic buildings and structures. With the number of cultural resources continually growing (for example, as buildings and other infrastructure reach eligibility to be regarded as historic structures), it is imperative that DoD understand the relative importance of its cultural resource properties, be able to evaluate them in an efficient and cost-effective manner, and make the best management choices possible based on available information.

DoD is currently responsible for more than 150,000 archaeological sites, 71 National Historic Landmarks, and over 19,000 individual historic properties represented by over 600 entries in the National Register of Historic Places. Preserving the integrity of these resources is a significant aspect of DoD's stewardship responsibilities—a responsibility that daily must be balanced with its primary mission of training troops and testing weapons systems. With this balance in mind, DoD's Strategic Environmental Research and Development Program (SERDP) and Legacy Program jointly sponsored a workshop in 2000 focusing on cultural resource research and management needs.¹ By 2005, however, it became clear that DoD and the Military Services were again in need of refocusing their respective research and management agendas to ensure that efforts were not being duplicated and that future activities were appropriately coordinated. To meet these needs, the Environmental Security Technology Certification Program (ESTCP) joined the SERDP and DoD Legacy Resource Management Program (Legacy) as a sponsor for the 2006 Cultural Resources Workshop.

In preparation for this workshop, the sponsors commissioned a series of white papers to help elucidate the current state of cultural resources (CR) and CR management in the nation in general and within the DoD in particular. Paper topics ranged from exploring the challenges associated with identifying and evaluating cultural resources to preserving Cold War-era resources. These papers provided a common basis on which participant discussions could build.

The workshop opened with a series of presentations summarizing current military service CR policies, as well as DoD's current archaeological and historic infrastructure needs. Participants then toured Fort Lewis, Washington, to see examples of DoD's cultural resources, and to learn how DoD personnel manage these resources in light of training mission requirements. The following two days were comprised of four concurrent breakout groups within each of three technical sessions: identifying needs and goals, identifying gaps and barriers, and prioritizing recommendations. The four breakout groups were *Identification and Evaluation*, *Mitigation and Treatment*, *Management*, and *Knowledge Management*.

This proceedings document summarizes workshop discussions, identifies priority information gaps, and enumerates identified needs, including the need for improved or alternative mitigation and treatment options, the creation of a centralized repository/data clearinghouse, and updated historic building cost/benefit analyses. Additional priority needs identified by workshop participants include creating useable historic contexts, developing best management practices for

¹ See Section 1.3 for the 2000 Cultural Resource Workshop results.

Traditional Cultural Properties, and improving tools for identifying and evaluating cultural resources in inaccessible areas.

By considering the recommendations outlined in this document, SERDP, ESTCP, and Legacy can help address important needs across the more than 200 military installations that contain cultural resources, while ensuring that DoD maintains and maximizes its training and testing flexibility.

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LIST OF ACRONYMS

AFCEE	Air Force Center for Engineering and the Environment
AT/FP	Anti-Terrorism/Force Protection
BMP	Best Management Practice
CERL	Construction Engineering Research Laboratory
CR	Cultural Resource
CRM	Cultural Resource(s) Manager
DENIX	Defense Environmental Network & Information eXchange
DoD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
ERDC	Engineering Research Development Center
ESTCP	Environmental Security Technology Certification Program
FPO	Federal Preservation Officer
GIS	Geographic Information System
GPS	Global Positioning Satellite
HGL	HydroGeoLogic, Inc.
HQ	Headquarters
ICRMP	Integrated Cultural Resource Management Plan
Legacy	Legacy Resource Management Program
LIDAR	Light Detection and Ranging
NAGPRA	Native American Graves Protection and Repatriation Act
NHPA	National Historic Preservation Act
NGO	Non-Governmental Organization
SDSFIE	Spatial Data Standards for Facilities Infrastructure and Environment
SERDP	Strategic Environmental Research and Development Program
SHPO	State Historic Preservation Office(r)
USA	United States Army
USDA	United States Department of Agriculture

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- Ms. Sarah Bridges USDA, Natural Resources Conservation Service
- Mr. Lee Foster, US Army
- Ms. Caroline Hall, National Park Service
- Dr. John Hall, SERDP/ESTCP
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- Dr. Jay Thomas, Naval Facilities Engineering Command
- Dr. Michael Tomlan, Cornell University
- Ms. Nancy Schamu, National Council of State Historic Preservation Officers

Additional special thanks to Fort Lewis Garrison Commander Col. Thomas G. Knight,² and to Dr. Bret Ruby, Cultural Resources Manager/Coordinator for Native American Affairs, and his staff who facilitated and led the Fort Lewis field tour for workshop participants.

The sponsors also acknowledge the dedicated efforts of the HGL staff support, including Ms. Katharine Kerr and Ms. Veronica Rice.

Finally, the sponsors wish to thank all of the event's participants (see [Appendix A](#)), whose input provided the basis for this proceedings document.

For more information on the 2006 DoD Cultural Resources Workshop, please visit the <https://www.denix.osd.mil/denix/Public/Library/NCR/cr-presentations-crw-seattle-0706.html?fm-culres>.

² Col. Cynthia A. Murphy assumed Command in August 2006.

DOD CULTURAL RESOURCES WORKSHOP:
Prioritizing Cultural Resource Needs in Support of a Sound Investment Strategy

1.0 INTRODUCTION AND BACKGROUND

Maintaining access to land, airspace, and water is crucial for military training and testing operations, which are routinely conducted in the global commons. DoD has stewardship responsibility for nearly 30 million acres of land in the United States. These lands harbor a significant variety of natural and cultural resources that represent important contributions to our Nation’s heritage, including historic structures and irreplaceable archaeological sites. Through the Strategic Environmental Research and Development Program (SERDP), Environmental Security Technology Certification Program (ESTCP), and Legacy Resource Management Program (Legacy), DoD is working to support readiness, quality of life, adherence to legal mandates, and responsible stewardship of its cultural resources.

This document presents a summary of results from the Department of Defense (DoD) Cultural Resources Workshop sponsored by SERDP, ESTCP, and Legacy, and held 11-13 July 2006 in Seattle, Washington.

1.1 CURRENT STATE OF DOD HISTORIC PROPERTIES

DoD manages approximately 30 million acres of land, making it the third-largest land management agency in the United States. DoD manages more than 150,000 archaeological sites, 71 National Historic Landmarks, and nearly 600 entries listed on the National Register of Historic Places (encompassing over 19,000 individual historic properties), all located on the more than 200 military installations located across the United States, and totaling nearly 2.3 billion DoD square feet – 61% of all federal square footage.

According to information provided by the Military Services to the Secretary of the Interior’s FY 2005 Report to Congress, DoD had inventoried just 29% of its properties for archaeological sites ([Table 1](#)). Currently, DoD’s inventory includes 507,000 buildings and structures on 46,000 square miles of real estate. The Plant Replacement Value for these resources exceeds \$650 billion. Yet, in the next 20 years, DoD’s number of eligible buildings and structures to the National Register of Historic Places may increase by over 40% ([Figure 1](#)).

Table 1: FY 2005 DoD Archaeological Data

Total DoD Acreage		~30,000,000
Military Service	Total # of Recorded Sites	Total Acres Inventories
Department of the Army	68,605	5,713,447
Department of the Navy (including US Marine Corps)	17,788	943,656
Department of the Air Force	15,784	1,692,191
DoD-Wide	155,644	11,963,666 (29% of total)

507,000 Buildings and Structures in the DoD Inventory

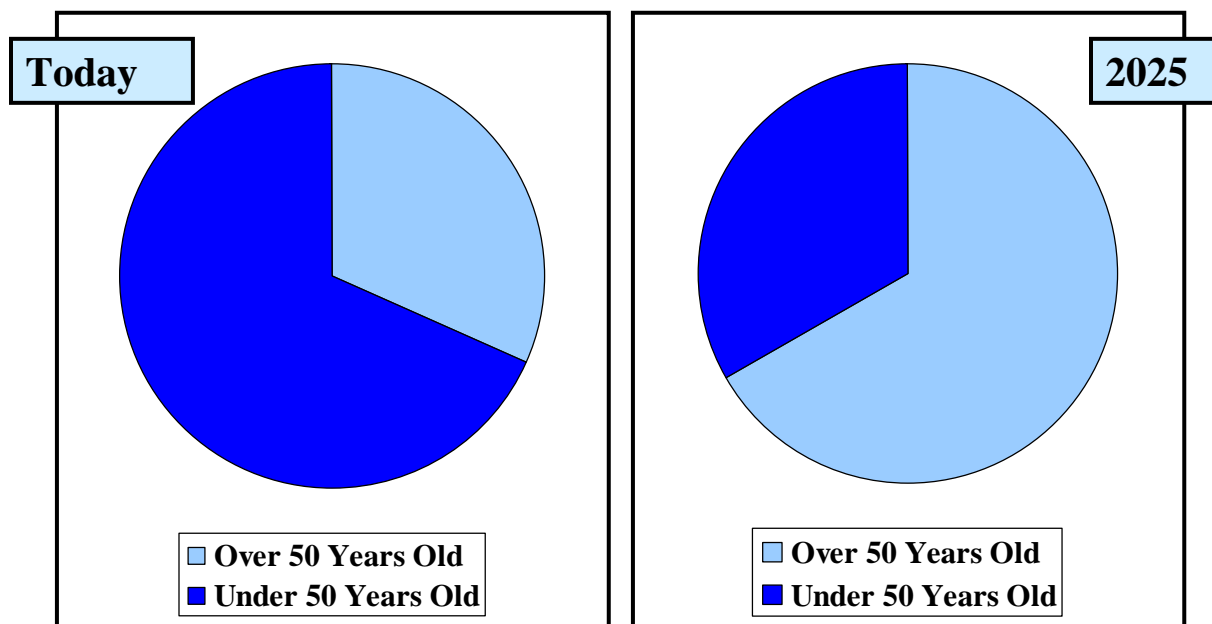


Figure 1: Projected Potential Inventory of DoD Historic Buildings and Structures (including ~345K buildings)³

DoD’s CR inventory includes historic buildings (e.g., the Pentagon), districts (e.g., West Point), structures (e.g., USS Nautilus), objects (e.g., Medical Museum Collection at Walter Reed), and archaeological sites (e.g., Petroglyphs at China Lake). Significantly, and as a portent of the future, DoD has two properties on the study list for the next World Heritage List nomination – Trinity Site, New Mexico (held over from 1992 study list) and Wright Field, Wright-Patterson AFB, Ohio (part of a multiple property History of Aviation theme for the 2007 list), and two more NHL nominations pending – Fort McCoy, Wisconsin (WWII on the Home Front) and, again, Wright Field – Aviation theme study.

DoD’s main tool for managing its CR responsibility and integrating CR actions with other mission responsibilities is the Integrated Cultural Resources Management Plan (ICRMP). ICRMPs serve to integrate CR management into installation mission and operations planning in compliance with CR legislative mandates and DoD policies. Successful implementation of ICRMPs will ensure installation assets are available to support mission requirements.

³ These numbers are based on a status quo assumption (i.e., no demolition, no programmatic alternatives, no BRAC and, for percentages, no new construction).

1.2 WORKSHOP SPONSORS

SERDP and ESCTP support CR efforts through the Sustainable Infrastructure program, while Legacy supports CR management efforts through specific areas of emphasis. Together, the three programs can function as an adaptive research, demonstration, and management implementation cycle whereby research and development (R&D) initiatives begun in SERDP may find opportunities for demonstration or validation through ESTCP or application and implementation through Legacy. Or, conversely, on-the-ground management funded by Legacy and demonstrations funded by ESTCP may result in the identification of new R&D needs that create new avenues of research investments through SERDP.

Through competitive processes, SERDP, ESTCP, and Legacy provide funding to academia, industry, nonprofit, and governmental organizations.

1.2.1 Strategic Environmental Research and Development Program

SERDP is DoD's environmental science and technology program, planned and executed in full partnership with the Department of Energy (DOE) and the Environmental Protection Agency (EPA), with participation by numerous other federal and non-federal organizations. To address the highest priority issues confronting the military, SERDP focuses on cross-service requirements and pursues high-risk/high pay-off solutions to DoD's most intractable environmental problems. SERDP's investments range from basic research through applied research to exploratory development in support of long-term sustainability of DoD's training and testing ranges, as well as to significantly reduce current and future environmental liabilities. Through its annual solicitation process, SERDP releases Statements of Need for specific efforts within each of its four focus areas:

- Environmental Restoration
- Munitions Management
- Weapons Systems and Platforms
- Sustainable Infrastructure

The Sustainable Infrastructure focus area encompasses natural and cultural resources, and facilities management issues. For more information on SERDP, please visit www.serdp.org.

1.2.2 Environmental Security Technology Certification Program

ESTCP is DoD's environmental technology demonstration and validation program. Its goal is to identify, demonstrate, and transfer technologies that address DoD's highest priority environmental requirements. ESTCP promotes innovative, cost-effective environmental technologies through demonstrations at DoD facilities and sites. These technologies provide a return on investment through improved efficiency, reduced liability, and direct cost savings. ESTCP's strategy is to select lab-proven technologies with broad DoD application, and subject them to rigorous field trials, then document their cost, performance, and market potential.

For more information on ESTCP, please visit www.estcp.org.

1.2.3 Legacy Resource Management Program

Legacy provides financial assistance to preserve our nation's natural and cultural heritage. The program assists DoD in protecting and enhancing resources while supporting military readiness. Three principles guide the Legacy Program: *stewardship*, *leadership*, and *partnership*. *Stewardship* initiatives assist DoD in safeguarding its irreplaceable resources for future generations. By embracing a *leadership* role as part of the program, the Department serves as a model for respectful use of natural and cultural resources. Through *partnerships*, the program strives to access the knowledge and talents of individuals outside of DoD.

Legacy's Areas of Emphasis for FY07 were:

- Readiness and Range Sustainment
- Integrated Natural Resources Management
- Regional Ecosystem Management Initiatives
- Invasive Species Control
- Monitoring and Predicting Migratory Patterns of Birds
- Cultural Resources Management
- National and International Initiatives
- Historic Preservation and Force Protection
- Cooperative Conservation
- Curation of Archaeological Collections, Associated Records and Documents, and Management of Archaeological Sites
- Native American Issues

Cultural resource conservation efforts are funded in several of these categories. For more information on Legacy, including the dates for their annual solicitation and to view past issues for the monthly CR newsletter, please visit www.denix.osd.mil/legacy. For general program information, please visit www.dodlegacy.org.

1.3 2000 CULTURAL RESOURCE MANAGEMENT WORKSHOP

The SERDP and Legacy programs jointly sponsored a "Cultural Resource Management (CRM) Workshop" held 13-16 June 2000 at the Patuxent River Naval Air Station, Lexington Park, Maryland. The workshop was organized in response to co-sponsor recognition that they needed to more fully consider the state of CRM and its impacts to DoD's mission. Specifically, the workshop sought to identify how research and development, processes and tools, and other methodologies can support CRM requirements on military installations.

Participants at the 2000 CRM Workshop developed goals, objectives, and priorities based on a 3-5 year planning horizon. The stated goals of the 2000 workshop were:

- To further define DoD's needs pertaining to CR management.
- To define the state-of-the-art in science and technology for CRM.

- To identify potential technologies that can be adapted to reduce cost, effort, and ineffectiveness in meeting CR stewardship requirements. Ideally, identify those technologies that generate environmental solutions from military investments.
- To identify possible avenues of development of frameworks for comprehensive management.
- To identify technology transfer opportunities and single research investments in products designed to be beneficial to the entire DoD CRM community.

Four topics were used to define the breadth of issues related to CR management. That is “Find-It,” “Conserve/Preserve-It,” “Manage-It,” and “Apply-It” (with “It” referring to cultural resources). Each group was tasked with defining their area’s major knowledge gaps, as well as the research, development, and demonstration needs. Although the sponsors’ intent was to focus on all CRM issues, the 2000 workshop dealt primarily with archaeological issues. The event’s proceedings are available on DENIX at <https://www.denix.osd.mil> (search for “CRM Workshop”). Outcomes from the workshop resulted in multiple projects funded by both SERDP and Legacy.

1.3.1 SERDP Funding of 2000 Workshop Outcomes

In FY 2002, SERDP released a Statement of Need (SON) entitled “Cultural Resources Management Detection and Evaluation Technologies.” This SON focused on archaeological methods that (1) effectively detect, locate, and identify historic and pre-historic archaeological resources on military and DOE lands and ranges, (2) produce improved models for predicting the location of resources, and (3) identify improved technologies for detecting surface and/or subsurface resources. Three projects were funded under this SON:

- *Detection and Identification of Archaeological Sites and Features Using Radar Data* (<http://www.serdp.org/research/upload/CS-1260.pdf>)
- *Developing an Efficient and Cost Effective Ground-Penetrating Radar Field Methodology for Subsurface Exploration and Mapping of Cultural Resources on Public Lands* (<http://www.serdp.org/research/upload/CS-1261.pdf>)
- *New Approaches to the Use and Integration of Multi-Sensor Remote Sensing for Historic Resources Identification and Evaluation* (<http://www.serdp.org/research/upload/CS-1263.pdf>)

1.3.2 Legacy Funding of 2000 Workshop Outcomes

The Legacy Program used the outcomes of the 2000 Workshop to improve relevant in-progress efforts and to guide future funding priorities. For example, projects involving management aspects of remote sensing, predictive modeling, and data standards continued from FY2001 through FY 2006. While not direct outcomes of the Workshop, the following projects benefited from its recommendations.

- *Predictive Modeling in the Military: Similar Goals, Divergent Paths*
(<https://www.denix.osd.mil>, search for 01-167)
- *Implement Cultural Resources Geospatial Database and Tool: Military Cultural Resources Analysis Database (MCRAD)*
(<https://www.denix.osd.mil>, search for 01-168)
- *A Workshop on Predictive Modeling and Cultural Resource Management on Military Installations*
(<https://www.denix.osd.mil>, search for 03-167)
- *Non-Invasive Burial Determination Using Near Surface Geophysical Survey and Soil Chemical Testing at Fort Hood, Texas and Camp Lejeune, North Carolina*
(<https://www.denix.osd.mil>, search for 03-193)
- *Integrating Predictive Models into the CRM Process* (in-progress)
- *Artifact Collection Data Integration - MCRAD Phase II* (in-progress)

2.0 APPROACH: 2006 DOD CULTURAL RESOURCES WORKSHOP

With recent changes within the CRM field due to aging resources, policy changes, Base Realignment and Closure, and other factors, it became clear in early 2006 that the action items identified at the 2000 CR workshop were in need of updating, and that a new evaluation was needed.

For the 2006 DoD Cultural Resources Workshop, the sponsors expanded the event's focus beyond archaeology-related research and management issues to also include a focus on issues related to DoD's built infrastructure (i.e., buildings, structures, objects), and to consider technology demonstration and validation needs. The specific workshop objectives were to:

- 1) identify and prioritize the needs for CR management across DoD;
- 2) examine the current state of practice across DoD for CR management;
- 3) identify the current state of the art for CR management relevant to DoD's requirements; and
- 4) identify the gaps in knowledge, technology, and management for cultural resources that limit both the transition of emerging technologies and the implementation or development of new management approaches.

2.1 STEERING COMMITTEE

Formal invitations were extended to representatives from the various sectors of the CR management and research communities, including federal, state, non-government organizations (NGO), and academia. The committee's purpose was to provide information and direction to help develop the agenda and set topical priorities. Members also were asked to identify potential speakers, chairpersons, and white paper topics and authors.⁴

2.2 WORKSHOP STRUCTURE AND CHARGE

With an end goal of developing prioritized recommendations that could be used to help formulate and guide a sound investment strategy, the workshop consisted of a small number of prepared papers and presentations followed by multiple breakout sessions. Based on the specific workshop objectives, the Steering Committee selected four breakout session themes as a way to categorize CR objectives and to provide sufficient breadth to facilitate diverse discussion. The themes were:

2.2.1 Identification and Evaluation

Properly identifying and evaluating cultural resources is a key component of CRM. Within DoD, installations are required to maintain an inventory of cultural resources in accordance with Section 110 of the National Historic Preservation Act of 1966 (NHPA).⁵ Once a cultural resource has been identified, it then needs to be evaluated for its eligibility to the National

⁴ See Acknowledgements section for list of Steering Committee members.

⁵ See <http://www.achp.gov/section110.html> for more information.

Register of Historic Places (National Register). If a cultural resource is found eligible for the National Register it can be nominated and listed on the National Register in accordance with the individual Military Service's policy. Whether the resource is listed on the National Register or not, eligibility requires that the resource be treated as if it were listed.

2.2.2 Mitigation and Treatment

In accordance with Section 106 of the NHPA,⁶ all federally funded undertakings must be evaluated for potential effects to cultural resources. When an eligible cultural resource is found within an project's area of potential effect, installation personnel must develop mitigation and treatment options with identified stakeholders (e.g., State Historic Preservation Office, Native American Indian tribes, and others) to eliminate and/or diminish any adverse effect of the project on the resource.⁷

2.2.3 Management

DoD installations are required to designate an individual as a Cultural Resources Manager to oversee the inventory of cultural resources. The day-to-day management of cultural resources includes, but is not limited to, conducting identification and evaluation studies, project review in accordance with Section 106 of the NHPA, and coordination with various installation departments, stakeholders, or other parties interested in the installation's cultural resources.

2.2.4 Knowledge Management

Managing the full complement of knowledge associated with cultural resources can be challenging. Information (e.g., Geographic Information System data, artifacts, photographs) must be maintained for identification, evaluation, mitigation, treatment, and management purposes, and its availability to interested parties must be considered. This is particularly important since multiple installations within a given region may share similar cultural resources (e.g., archaeological sites of a similar time period), thereby enhancing DoD's understanding of resources in a broader context and facilitating responses to various data calls.

2.3 PARTICIPANTS

In selecting workshop invitees, the sponsors wanted to ensure that participants represented a diverse group of archaeology and built infrastructure experts who could provide the broad technical basis for informing DoD's CR investment strategies within its research and development, technology demonstration and validation, and management programs. In addition to inviting installation and headquarters-level representatives from all of the Military Services, the sponsors also invited a balance of federal and non-federal CRMs, tribal representatives, academic researchers, and representatives from various private CRM firms. Of 120 invitees, 95 individuals participated in the workshop (see [Appendix A](#)).

⁶ See <http://www.achp.gov/regs.html> for more information.

⁷ An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.
Reference: www.afcee.brooks.af.mil/PRO-ACT/fact/crm.asp.

2.4 AGENDA STRUCTURE AND OBJECTIVES

In developing the agenda ([Appendix B](#)), the Steering Committee wanted to ensure that participants were provided with sufficient background information regarding DoD's archaeological and built infrastructure policies and resources, as well as the current state of science and practice, so that they could engage in informed and productive working group discussions. To help achieve this goal, the agenda was structured to include 1) presentations on current Military Service CRM policies and resources,⁸ 2) overviews of white papers on the State of the Science, Art, Knowledge, and Management of DoD cultural resources (see Section 5.0); and 3) a field tour, so participants could see first-hand how military personnel strive to achieve the dual missions of training soldiers and testing equipment while serving as good stewards of the cultural resources with which the military is entrusted.

Additionally, sponsors felt it was important to clarify the two distinct branches of cultural resources: archaeology (located below ground) and built infrastructure (above-ground buildings, structures, objects, etc). With these considerations in mind, the first two days of the workshop were devoted to providing attendees with background and contextual information.

The workshop opened with introductory talks from Ms. Maureen Sullivan, DoD Federal Preservation Officer (FPO); Mr. Bradley Smith, SERDP Executive Director; and Dr. Julie Schablitsky, former Cultural Resources Management Specialist, Legacy. Mr. Smith and Dr. John Hall, SERDP/ESTCP Sustainable Infrastructure Program Manager, then detailed the workshop's goals and expected outcomes. Following this, the individual military components provided overviews of their respective CRM programs and policies, and participants engaged in the first of three breakout sessions. In the afternoon, nearly all workshop attendees participated in a field tour of Fort Lewis, Washington (see Section 4.0).

The following two days were comprised of paper presentations and a series of breakout sessions on *Identification and Evaluation, Mitigation and Treatment, Management, and Knowledge Management*. Technical sessions concluded before lunch on Thursday, marking the end of the formal workshop. On Thursday afternoon, session chairs, rapporteurs, and Steering Committee members met to discuss, review, and refine priorities and recommendations identified during the workshop.

⁸ Identification of policy issues was not a specific workshop objective. It was agreed that if policy items were identified, they would be captured and relayed to the appropriate military service action officer.

3.0 ESTABLISHING A COMMON GROUND: PRESENTATION OVERVIEWS

The primary goal for this workshop was to identify and prioritize CR research, demonstration, management needs in ways compatible with the military training and testing mission. Towards that end, the sponsors felt it was important to lay a foundation of common understanding among all participants.

3.1 CURRENT DEFENSE CULTURAL RESOURCE POLICY AND MANAGEMENT NEEDS

Although DoD has specific policy and guidance for the identification, preservation, and management of its cultural resources, each military service has developed its own interpretations of this guidance, based on specific Service needs. Following is a summary of the DoD and each of the Service's CRM programs.⁹

3.1.1 U.S. Department of Defense Cultural Resource Program

Ms. Maureen Sullivan, DoD Federal Preservation Officer, provided an overview of the current status of DoD's CR programs and policies, and outlined the current and emerging challenges DoD faces in managing this ever-growing catalogue of resources. Specifically, Ms. Sullivan discussed:

- Scope of the Challenge: Historic Buildings, Federal Real Property Inventory, Archaeological Sites, Archaeological Collections
- DoD's Cultural Resources Vision
- The Defense Installations Strategic Plan
- New Cultural Resource Policy (updating DoD Instruction 4715.3, *Environmental Conservation Program*, May 1996)
- Access to Information (including web-enabled access)

Ms. Sullivan explained that DoD is the nation's third-largest federal land managing agency and the country's largest real property manager. DoD manages 507,000 buildings and structures, with a Plant Replacement Value of over \$650 Billion on 46,000 square miles (approximately 30 million acres) of real estate. Department-wide, DoD's cultural resources include 71 National Historic Landmarks and 600 entries in the National Register of Historic Places (encompassing over 19,000 historic properties).

3.1.2 U.S. Army Cultural Resource Program

Mr. Lee Foster, Cultural Resources Action Officer for the Army Chief of Staff for Installations Management, presented information on the Army's CR program. Specifically, after providing some general background, Mr. Foster discussed the Army's:

⁹ PowerPoint presentations are available <https://www.denix.osd.mil> (search for "CRM Workshop").

- Assistant Secretary of the Army for Installations and Environment's Cultural Resources Program Directive
- Historic Preservation Campaign Plan (including goals and objectives)
- Historic Preservation Vision Statement

Mr. Foster's presentation provided specific quantitative information designed to reveal the scope of the Army's CR challenge. For example, of their 150,000 buildings, nearly 63,000 are over 50 years old and, thus, subject to NHPA evaluation. Additionally, the Army manages approximately 90,000 archaeological sites and 38,000 cubic feet of archaeological collections. These resources are only a fraction of the projected total, Mr. Foster explained, since the Army has inventoried just 43% of its 13.3 million acres. The Army's current policy for cultural resources is Army Regulation (AR) 200-4, *Cultural Resources* (October 1998).

3.1.3 U.S. Navy Cultural Resource Program

Dr. Jay Thomas, Department of the Navy Deputy Federal Preservation Officer, then presented information on the Navy and Marine Corps programs. Dr. Thomas' presentation provided summary information in the following areas:

- Organization/staffing
 - Cultural Resources Program
 - Historical / Museum Program
- Types of Cultural Resources
- Number of Cultural Resources
- Characteristics of the Inventory
- Program and Technical Challenges
- Keys to Success for the Overall Program

The Department of the Navy, he stated, currently manages approximately 9,000 historic buildings (out of a total of 145,000) and 17,000 archaeological sites. An additional 17,000 air/ship wreck sites are estimated to exist, though many have not yet been located. The Navy's current CR policy is Secretary of the Navy Instruction (SECNAVINST) 4000.35, *Department of the Navy Cultural Resources Program* (April 2001).

3.1.4 U.S. Air Force Cultural Resources Program

Lieutenant Colonel Doug Burkett, Natural and Cultural Resources Program Manager for the Secretary of the Air Force, provided the Air Force overview. In his presentation, LtCol Burkett provided a general overview of the Air Force's program and policy, then provided highlights of:

- Installation Cultural Resources
- Historic Facilities
- Archaeology
- Native American Consultation and Partnerships

LtCol Burkett described the broad diversity of the Air Force's 166 installations (which together operate fighters, bombers, transport aircraft, and space systems), including the fact that the built areas contain an estimated 4,500 historic buildings. Similarly, though the bulk of the Air Force's eight million acres of land are used as ranges and test facilities, these sites contain most of the Air Force's natural resources and the majority of their approximately 15,000 archaeological sites. Air Force Instruction (AFI) 32-7065, *Cultural Resources Management*, is the current Air Force policy document (June 2004).

3.2 DOD ARCHAEOLOGY AND HISTORIC BUILT INFRASTRUCTURE

Following the Service-specific presentations, workshop participants were provided overviews of the current status and trends regarding DoD's archaeological and built infrastructure.

3.2.1 Current Department of Defense Needs for Cultural Resources—Archaeology: Planning for the Future Challenges, Issues, Trends, Innovations

Dr. Laurie Rush (Cultural Resource Manager, Fort Drum, New York) and Mr. Russ Kaldenberg (Cultural Resource Manager, Naval Air Station and Weapons Center, China Lake, California) provided a summary of DoD's archaeological needs. Their presentation focused on the ongoing challenges cultural resource managers (CRMs) face, including developing and evaluating management plans for tens of thousands of identified archaeological sites, dealing with the lack of an institutionalized CR network across DoD, and overcoming obstacles to transferring best management practices to new managers (i.e., DoD institutional knowledge).

They further identified the several specific needs to help overcome these and other challenges, including: 1) holding an annual DoD CR management meeting; 2) overcoming the moratorium on listing new sites and structures on the National Register; 3) developing methods of permanent protection for significant sites; 4) improved working relationships with SHPOs and Public Affairs Officers; 5) developing guidance on management of paleontological resources and collections, and 6) writing guidance to help manage historic military features in training areas. According to Dr. Rush and Mr. Kaldenberg, the greatest military CR needs are to increase visibility of CR programs among the war-fighting community and to demonstrate the tremendous potential that cultural resources have for mission support. This is especially important to convey to deployed personnel so they can better address the challenges associated with cultural heritage preservation in-theater. Further, there is a need to develop increasingly creative alternatives to data recovery for site mitigation, to emphasize heritage tourism and outreach, and to more effectively use volunteers. Innovation, the authors contend, is the key to addressing many of the military's current CR related challenges, issues, and needs.

Military CR programs, they stated, stand at the threshold of challenge and opportunity. Placing CR management responsibilities within the main structure of installation organization would encourage more effective support for the training and testing mission (e.g., placing CR personnel in planning offices or within range management). Additionally, the military needs to examine whether Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) or other data standardization initiatives may be imposed on CRMs in terms of how they manage program-specific data sets.

The more effectively CR management programs integrate with the military mission, the more opportunities the discipline will have for technology transfer and information sharing, especially in areas such as remote sensing, Geographic Information System (GIS), and field reconnaissance. Innovation offers solutions for improved networking and alternatives to data recovery and mitigation (e.g., virtual touring of archaeological sites and historic structures).

DoD's CR managers represent an extraordinary group of talented, intelligent, dedicated, and experienced professionals. With sufficient tools and capabilities, they will be able to work at maximum potential in supporting the military's dual missions.

3.2.2 Current Department of Defense Needs for Cultural Resources—Built Infrastructure

Mr. Adam Smith, Architectural Historian with US Army Corps of Engineers (Engineer Research and Development Center, Construction Engineering Research Lab-CERL), and Ms. Julia Cantrell, Project Manager at US Air Force Headquarters (Air Force Center for Engineering and the Environment-AFCEE), provided the overview on built infrastructure resources. By way of background, the presenters pointed out that, currently, more than a third of all DoD facilities are over 50 years of age and, therefore, subject to NHPA provisions. By 2025, they stated, this number will rise to two thirds of all DoD structures.¹⁰ Consequently, there will be an increased demand to identify historic properties within the built environment and, further, a need to view more strategically how DoD deals with this challenge.

For example, the physical maturation of DoD's built infrastructure combined with an improved understanding of historic significance will significantly increase DoD's CR management burden in the coming years. It also may result in increased building demolition, since the deteriorating physical condition of these buildings will otherwise mean replacing them or rehabilitating them through an adaptive reuse program, both costly options.

Three specific emerging issues may prove challenging to effective and efficient management of DoD's built infrastructure. First, the current use of the "50 Year Rule," which refers to the practice of evaluating structures for historic significance when they reach 50 years of age. This "rule" is in fact an arbitrary guideline. Blind application of this rule can result in problems with the evaluation of the recent past. For example, DoD Military Construction Appropriations often establish local construction programs that require as many as ten years to complete. Strict adherence to the "50 Year Rule" leads to an incomplete assessment of mid-century resources.

Second is a need to move beyond the "Cult of the Beautiful" (i.e., classifying only those buildings that are aesthetically appealing as historic). During the Cold War, the primary military construction method was to use concrete block and metal buildings. These buildings, originally intended to be temporary, are typically described as "uninteresting" or "ugly" and, thus, not meriting serious preservation consideration. This, combined with a CR management trend to base determinations of eligibility solely on the National Register's Criterion C (architecture)

¹⁰ This increase in age correlates with an increase in the number of properties that are eligible for listing to the National Register of Historic Places.

further reinforces the “Cult of the Beautiful” while minimizing the importance of Criterion A (historical events).

Third is a need to better understand the military’s 125 year history of standardized plan use. Recent research indicates that structures built from standardized plans are often determined to be ineligible for the National Register. For example, the same 1956 standardized plan for Army chapels was utilized at Fort Leonard Wood, Fort Gordon, Fort Bliss, Fort Bragg, and many others. At first glance, these buildings all appear to be the same; however, upon further inspection, one finds that each chapel is unique (e.g., the Fort Bragg chapels have stained glass windows depicting the history of the 82nd Airborne Division). Again, this blunt approach to evaluation tends to emphasize the National Register’s Criterion C over Criterion A.

In conclusion, Mr. Smith and Ms. Cantrell outlined their management and research recommendations. Specifically, they recommended the following actions be taken:

- develop a comprehensive Service- or DoD-wide inventory of eligible and listed historic properties;
- improve cross-Service and intra-Service information sharing;
- facilitate technical resource support;
- apply technologies for the management and treatment of the historic built environment that can be shared across Military Services;
- strategically target eligibility and management of “classes” or specific property types;
- develop a comprehensive approach to the inventory and evaluation of built environment resources;
- create a program comment for metal temporary and metal semi-permanent buildings
- conduct an analysis of overall Cold War master planning to respond to the “Cult of the Beautiful;” and
- examine Cold War standardized plans and how planned structures should be addressed.

4.0 FIELD TOUR OF FORT LEWIS, WASHINGTON

To better understand the challenges DoD personnel face in meeting both its CR stewardship and training mission responsibilities, workshop participants were provided an opportunity to tour an active military installation. Fort Lewis¹¹ is an 87,000 acre installation located outside of Tacoma, Washington, and adjacent to McChord AFB.¹² Despite increased mission responsibilities resulting from the 2005 Base Realignment and Closure, the installation's CRM has continued to demonstrate excellence in balancing stewardship responsibilities with day-to-day military operations. Further, over the last few years, the installation as a whole has repeatedly demonstrated its commitment to successfully balancing these responsibilities. This commitment is reflected in the base's motto: "Preserving the Past for a Sustainable Future."



Fort Lewis Military Museum, listed on the National Register of Historic Places. Photo courtesy of Fort Lewis.

Fort Lewis CRM personnel Dr. Bret Ruby (Cultural Resources Manager) and Mr. Dale Sadler (Cultural Resources Specialist) led participants on a bus tour through the post's Garrison Area Historic District and training areas. Key significant buildings, ranging from a World War I-era Red Cross Hostess House to Cold War-era barracks complexes, were highlighted in and outside of the Garrison Area Historic District. The tour extended into the range and training areas, where participants learned how CR management staff at Fort Lewis conduct archaeological investigations in the midst of an aggressive live-fire training mission. Participants also learned how the installation works hand-in-hand with the neighboring Nisqually Indian Tribe to protect, enhance, and provide access to natural resources, sacred sites, and properties of traditional cultural and religious importance.

¹¹ www.lewis.army.mil

¹² <http://public.mcchord.amc.af.mil/>.

5.0 WHITE PAPERS: STATE OF THE SCIENCE, ART, KNOWLEDGE, AND MANAGEMENT

To encourage participants to begin thinking about DoD CR management issues in advance of the workshop, the sponsors commissioned a series of informational white papers that would be used as read-ahead materials. Steering committee members selected topics and recommended authors. Invitees were asked to read those papers relevant to their area(s) of expertise. By way of refresher, authors were then given the opportunity to provide overviews of their papers at the workshop.

In all, there were eight “perspective” papers commissioned given on the following subjects: Identification/Evaluation, Mitigation/Treatment, Management, Knowledge Management, Cultural Landscapes, Traditional Cultural Properties, Underwater Archaeology, and The Recent Past.¹³

5.1 PERSPECTIVES IN IDENTIFICATION AND EVALUATION OF CULTURAL RESOURCES

Dr. Lynne Sebastian, SRI Foundation, opened with an overview of current approaches to identifying and evaluating the eligibility of terrestrial archaeological sites and the “built environment” (i.e., historic buildings, structures, and districts). She then discussed some of the challenges managers face in identifying and evaluating these resources, offering some suggestions for possible innovations in meeting these challenges. She concluded her presentation by encouraging flexibility, especially in using programmatic approaches to streamline compliance activities, to focus on historic places of significance, and to achieve a better balance of stewardship and mission needs.

5.2 GETTING THE PUBLIC BENEFITS FROM MITIGATION

Dr. Ray Luce, Deputy State Historic Preservation Officer for the state of Georgia, then summarized his thoughts on the mitigation and treatment of historic properties. Specifically, Dr. Luce examined some mitigation measures used in Georgia to make information more available to the public.

Mitigation and avoidance, Dr. Luce stated, are at the heart of the planning process established in Section 106 of the NHPA. When an adverse effect cannot be avoided, mitigation is the public benefit that balances the loss (or diminishment) of the historic resource. Too often, he contended, we follow the easy path of recording a property or excavating a site. Yet, the available mitigation options are broad and should be maximized to ensure that the public receives full value in compensation for a loss.

Many memoranda of agreement now include a community outreach and/or education clause as a way to ensure public benefit. Projects in Georgia that have utilized outreach components to allow for public education including an exhibit of artifacts excavated from the Ford Plantation near Richmond Hill, Georgia; publication of excavation activities for the Georgia Ports Authority in

¹³ See Appendix D for white papers and <https://www.denix.osd.mil> (search “CRM Workshop”) for presentations.

Savannah, which uncovered the remains of Mary Musgrove's trading post; and investigations for a new housing development near St. Mary, Georgia, where the site of the last battle in the War of 1812 was discovered.

In addition to a discussion of mitigation and its connection to public benefit, Dr. Luce identified a number of traditional publications that include results from mitigation efforts. His presentation concluded with an examination of how enhancement mitigation can focus on inventory, production of historic contexts, and rehabilitation and/or protection of adjacent historic properties.

5.3 PERSPECTIVES ON MANAGEMENT

Dr. Christopher Hamilton, Cultural Resource Manager at Fort Benning, Georgia, then provided a military installation-based perspective. Dr. Hamilton's presentation articulated how the management of cultural resources within an installation's primary mission involves goals that may appear to be contradictory. Specifically, how the need for new and improved infrastructure or training to meet current or anticipated mission objectives might conflict with the need for preservation and interpretation of cultural resources.

According to Dr. Hamilton, the keys to achieving CR management success are: 1) having the necessary and sufficient data to make informed decisions, 2) effectively communicating the data among relevant DoD staff, and 3) entering into consultation with stakeholders and the general public with a positive attitude, and an obvious willingness to achieve levels of mutual understanding. By employing these strategies, installation CRMs can help ensure that both the general and military publics get the opportunity to develop a connection to the past, an understanding of society, and an appreciation of military traditions.

5.4 INTEGRATING GIS AND GPS TECHNOLOGIES INTO CULTURAL RESOURCE MANAGEMENT STRATEGIES

Ms. Deidre McCarthy, National Park Service (NPS), Washington, DC, discussed knowledge management as a broad concept that applies to many subjects. With respect to cultural resources, managers collect data in the form of observations and documentation to identify patterns and understand other cultures and, thus, better understand the context within which resources are managed.

However, Ms. McCarthy contended, CRMs must use all available tools to assist in this data management, including newer technologies that enhance traditional data collection methods. These technologically-based tools provide the flexibility to better integrate data, bringing new perspectives to understanding and enhanced management of resources. Specifically, Global Positioning Satellite (GPS) offers a way to quickly locate important resources with enhanced levels of accuracy, while GIS provides the tools to analyze and integrate a wide variety of data types. GPS/GIS applications ranging from survey to documentation to predictive modeling can now be part of daily CR management procedures. Given that having accurate locational information is fundamental to understanding traditions of the past, and that this understanding is critical for determining how best to manage resources, GPS becomes the best tool to collect data

while GIS is the optimal tool for integrating data from various local, state, and national level sources.

In order to take full advantage of GIS, there must be defined standards for the spatial data that underpin the system. OMB Circular A-16¹⁴ defines the set of requirements that federal agencies must follow when creating spatial data. Further, A-16 identifies the National Park Service (NPS) as the lead agency for developing the CR spatial data set. In this role, the NPS must develop and implement standards compliant with the Federal Geographic Data Committee (FGDC). These standards, once implemented, will be used to guide federal agencies in the collection and management of their CR spatial data, allowing data to be shared across agencies, as well as with state and local groups.

As the inventory of cultural resources grows, GPS and GIS will become increasingly important. Cultural resource specialists have shown through individual projects that GIS is the best way to integrate data, evaluate its content, and protect our nation's heritage. Without standards to define the basic building block of GIS, efficient data sharing cannot take place.

5.5 CULTURAL LANDSCAPES AND THE DEPARTMENT OF DEFENSE

Dr. Cari Goetcheus, Clemson University, explored the critical role the Department of Defense has played in United States expansion, settlement, and development, as well as in the continued protection of the nation's lands and peoples. DoD manages a variety of National Historic Landmarks and National Register of Historic Places, designated and eligible historic buildings, archaeological sites, and historic districts. Yet, even with the cultural resources that DoD currently protects, only a portion of the story regarding its influence in U.S. history is revealed – cultural landscapes can help tell the rest of the story.

The NPS Cultural Resource Management Guidelines (CRMG) define cultural landscapes as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values" (CRMG, p.179).¹⁵ The NPS recognizes four cultural landscape categories, which are not mutually exclusive: historic designed landscapes, historic vernacular landscapes, historic sites, and ethnographic landscapes. While both designed and vernacular landscapes are somewhat self-explanatory, historic sites are defined as significant for their associations with important events, activities, and persons; whereas, ethnographic landscapes are defined as associated with contemporary groups, and typically are used or valued in traditional ways. These categories are helpful in distinguishing the values that make landscapes cultural resources and in determining how they should be treated, managed, and interpreted.

Essentially, a cultural landscape is a tapestry upon which other cultural resources, such as historic buildings, archaeological sites, etc. reside. The tapestry is made of layers of information that all overlap; natural factors such as topography, geology, soils, hydrology, etc. are mixed with human factors (e.g., past land uses, built/removed structures). Each of these information layers may remain in whole or only in part. The goal in understanding a cultural landscape is to

¹⁴ See http://www.whitehouse.gov/omb/circulars/a016/a016_rev.html.

¹⁵ See http://www.nps.gov/history/history/online_books/nps28/28contents.htm.

tease out each layer of information (or period of development) and see both what it reveals and what remains hidden. Cultural landscapes record land use changes over time, and the residual of those changes can be studied and understood. The cultural landscape methodology consists of historic research to determine significance and identify character-defining features; inventory of existing conditions; evaluation to determine integrity and extant historic features; and definition of an appropriate treatment approach and management/maintenance strategy.

Understanding military cultural landscapes completes gaps in history that cannot be understood solely from individual historic buildings or archaeological sites. In many cases, significant historic events happened within the context of a landscape (battles, military training on parade grounds, food production on farmsteads located on military lands). As such, it is critical to protect these varied cultural landscapes such that the entire context of an historic event is remembered into the future, inexorably linking public history to DoD.

5.6 PERSPECTIVES ON TRADITIONAL CULTURAL PROPERTIES

On behalf of Dr. Sherry Hutt, Native American Graves Protection and Repatriation Act (NAGPRA) Program Manager, who authored the paper, Mr. Reid Nelson, Assistant Director, Federal Programs Office, Advisory Council on Historic Preservation (ACHP), then provided some insight into Traditional Cultural Properties (TCPs), which are identified as districts, sites, buildings, structures, or objects eligible for nomination to the National Register. Examples of TCPs include the German Village Historic District in Columbus, Ohio; Honolulu's Chinatown; and Nicodemus Historic District in Nicodemus, Kansas (declared a National Historic Landmark in 1976). These areas are considered TCPs because they are characteristic of specific traditional economic, artistic, or other community life. Here, the examples are representative of historically significant German, Chinese, and African American communities, respectively and thus meet the NPS Bulletin 38 definition: "The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs and practices."

A TCP can also be a place "where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice" (NPS, National Register, Bulletin 38).¹⁶ It is the use of the place for customary ritual that forms the basis for protection, and not the ritual itself. Further, the term "culture" has been clarified as "a system of behaviors, values, ideologies, and social arrangements...in addition to tools and expressive elements such as graphic arts, [that] help humans interpret their universe as well as deal with features of the environments, natural and social" (NPS Director's Order-28).¹⁷

These definitions raise some challenges for federal agencies managing TCPs. There are a number of current and emerging issues involving the identification, evaluation, and treatment of these sites that must be considered. For example, there is a need to involve traditional cultural communities early in the planning process when there are undertakings involving cultural and natural resources in which they may have an interest, as well as a need to develop the means to

¹⁶ See <http://www.nps.gov/history/nr/publications/bulletins/nrb38/>.

¹⁷ See <http://www.nps.gov/policy/DOrders/DOrder28.html>.

integrate compliance with the cultural property laws into management decisions. Additional research is needed to fully inform the TCP management process, including how best to integrate decision making in NHPA with other cultural property laws.¹⁸

5.7 UNDERWATER ARCHAEOLOGY IN DOD

Shifting focus from land to sea, Dr. Robert Neyland, Naval Historical Center, opened his talk by clarifying that the wrecks of warships, military aircraft, spacecraft, and other government vessels are still U.S. owned. The principal government agency owners are the Military Services. The Underwater Archaeology Branch of the Naval Historical Center manages the Navy's ship and aircraft wrecks, including locating and assessing shipwrecks through real world survey. It is possible, Dr. Neyland contended, to combine CR management of shipwrecks with military R&D in a way that benefits both communities.

Underwater archaeology is dependent on advances in technology, but it also pushes the science and technology forward with the research questions it asks. The multi-disciplinary solutions can have benefits to the military and private sectors. Key research areas with potential for advancing the management of DoD ship and aircraft wrecks and, simultaneously, accomplishing new cutting edge R&D benefiting the DoD mission include: 1) technologies such as Autonomous Underwater Vehicles (AUVs) that enable economical remote mapping and identification of wrecks; 2) predictive modeling to determine the location of significant wrecks to minimize impacts from marine activities such as dredging and pipeline and cable laying, or to define search areas (e.g., drift or re-navigation models based on last historic sightings and projections of sinking locations from wind, current, and tide information); and 3) a GIS system to manage the inventory of wrecks and to store and manipulate large electronic files derived from remote sensing data – this would facilitate world-wide resource management through easy manipulation of large data files.

DoD manages and preserves wrecks for not only cultural reasons but also because of potential environmental hazards from oil spills, explosive ordnance, weapons systems, and war grave issues. Research is needed to discover ways to not remove (i.e., leave in place) ordnance and/or oils bunkers from wrecks, as the cost of salvage operations are high and the risk of spills great. Potential research efforts might focus on the development of technologies and identification of processes whereby wrecks survive longer on the sea bottom or are encapsulated. R&D for in situ preservation could take the form of studying the corrosion and deterioration of steel and aluminum hulls of ships and aircraft, in order to enable them to contain their contents indefinitely. Developing Remotely Operated Vehicles (ROV) and AUV technology, sensor packages, and processes can facilitate monitoring of wrecks, their rates of deterioration, and the water quality around them.

¹⁸ For additional information see: *CRM*, Volume 23, No.9, Beyond Compliance: Tribes of the Southwest, NPS, 2000: <http://crm.cr.nps.gov/issue.cfm?volume=23&number=09>.

5.8 PERSPECTIVES IN THE PRESERVATION OF COLD WAR ERA CULTURAL RESOURCES

Mr. Wayne Donaldson, California SHPO, provided his perspective on preserving Cold War era resources by describing the Cold War architecture of California military bases. This architecture, he stated, reflected three somewhat contradictory trends. First, for the comfort of its troops and officer corps, the military built administrative and residential buildings that were commodious and fashionable. Second, the military valued nimbleness and flexibility in its training and relied upon essentially temporary buildings for most operational purposes. Third, the military in California was heavily involved in weapons development and testing, giving California bases hundreds of permanent and odd-looking research and test facilities.

Although military designers occasionally called upon Modernist architects from the well-known to the unknown, the vast majority of Cold War buildings were built to be inexpensive and easily modified or moved. These structures, not having been built to last, probably will not last. Structures built for the third purpose, however, were quite different.

The third category of buildings associated with the Cold War includes a huge variety of structures used to develop and test weapons. Unlike Butler Buildings,¹⁹ these were not only extraordinarily well-built, but were dedicated to very specific purposes and could thus not easily be adapted. Examples in California include the famous rocket test tracks at Edwards and China Lake; the massive rocket test stands and silos at Vandenberg AFB; the great radar facilities like the PAVE PAWS at Beale; and the “always-ready” Strategic Air Command (SAC) bomber hangars at Travis AFB. In terms of historical significance and intrinsic interest, these Cold War design development and testing facilities are especially important.²⁰

¹⁹ Butler Buildings are semi-permanent metal structures built on concrete slabs. Originally, these structures were built by the Butler Company.

²⁰ For additional information on historic military buildings and structures of California, please visit: <https://www.denix.osd.mil/denix/Public/Library/NCR/NHL/ca.html>

6.0 TECHNICAL SESSIONS: PRIORITIZING MANAGEMENT NEEDS FOR A SOUND INVESTMENT STRATEGY

A primary objective for this workshop was to develop a list of prioritized research and development, technology demonstration and validation, and management needs for DoD cultural resources. Towards that end, participants were divided into four breakout groups, based on the four key themes of the workshop: 1) identification and evaluation; 2) mitigation and treatment; 3) management; 4) and knowledge management. In order to ensure a balance between archaeological sites and built infrastructure, each breakout session was chaired by an archaeologist and an architectural historian. Furthermore, to ensure identified DoD needs fit within a broader context and vice versa, each breakout group was chaired by both a DoD and non-DoD individual. Each breakout group was provided a workshop charge that was to form a common basis for discussions.²¹ Listed in each of the following sections are discussion outcomes reflecting priority needs and objectives identified within the each of the breakout groups.

6.1 BREAKOUT SESSION 1: NEEDS AND GOALS

During the first set of breakout groups, participants were asked to identify research, development, demonstration, and management needs in each of their topic areas.

6.1.1 Identification and Evaluation

The identification and evaluation of cultural resources is a key component of CR management on DoD installations. In accordance with Section 110 of the NHPA, installation personnel are required to inventory cultural resources and to determine, as appropriate, their eligibility to the National Register. Properly identifying and evaluating resources is therefore a significant issue.

The breakout group identified the following *identification and evaluation* needs:

- Improved understanding of historic land use for properties now occupied by Military Services. That is, rather than looking at an installation's cultural resources by type, there is a need to study cultural resources holistically (e.g., landscape).
- Identification of all potential burial sites or features on DoD installations, including their cultural affiliations.
- Identification of cultural resources in inaccessible areas to accomplish a true 100% CR inventory. Inaccessible areas include impact and high security areas, submerged environments, areas covered with heavy vegetation, and deeply buried horizons.
- Identification and evaluation of cultural resources in training areas. Resources evaluated and determined to be ineligible for the National Register should then be returned to training rotation (i.e., resource should be mitigated so area can be used for mission-related purposes).
- Increased training and improved communication among the DoD community to more effectively focus CR management efforts.

²¹ See Appendix C for workshop charge.

- Improved and expanded tools for identifying and evaluating cultural resources.
- Establishment of DoD-specific research priorities, as well as guidance for developing the tools needed to meet and achieve these priorities.

6.1.2 Mitigation and Treatment

In accordance with Section 106 of the NHPA, all federally funded projects must be evaluated for impacts to previously identified and evaluated cultural resources. When an eligible cultural resource is found within a project's area of potential effect, DoD installation personnel must determine mitigation and treatment options to eliminate and/or diminish the adverse effect.²²

The breakout group identified the following *mitigation and treatment* needs:

- Increased availability of information related to mitigation measures used at DoD installations, including but not limited to: Historic American Building Survey/Historic American Engineering Record (HABS/HAER) survey documentation; installation-specific history, interpretive books, and/or CR presentations; examples of adaptive reuse projects; agreements (e.g., MOA) between installations and stakeholders.
- Increased communication with stakeholders both within and outside of an installation regarding mitigation and treatment of cultural resources.
- Better defined relationship between *identification and evaluation* and *mitigation and treatment*.
- Because context helps determine significance, scale (i.e., local, state, regional, or national) also is an important consideration.
- Exploration of alternative and/or creative forms of mitigation.
- Focused mitigation and treatment on cultural resources with the greatest significance.
- Balancing Anti-Terrorism/Force Protection (AT/FP) measures with mitigation and treatment of cultural resources.
- Expanded discussion of CR issues, requirements, and management in installation plans beyond the required Integrated Cultural Resources Management Plans (ICRMPs).

6.1.3 Management

DoD installations are required to designate a Cultural Resources Manager to oversee the inventory of cultural resources and to ensure that mission operations can continue. The day-to-day management of cultural resources includes, but is not limited to, conducting identification and evaluation studies, project review in accordance with Section 106 of the NHPA, and consultation with stakeholders and interested parties.

The breakout group identified the following *management* needs:

²² An adverse effect is defined as an action that would compromise the integrity of a cultural resource and its eligibility to the National Register.

- Improved integration of CR management with the military mission, with a goal of achieving balance whereby neither impedes the other.
- Determination of which properties are “most significant” so that resources can be more efficiently targeted.
- Increased and improved communication with stakeholders outside the DoD community.

6.1.4 Knowledge Management

Managing both tangible and intangible knowledge associated with cultural resources can be a challenge, yet information (GIS layers, artifacts, photographs, etc.) is necessary for identification, evaluation, mitigation, treatment, and management purposes.

The breakout group identified the following *knowledge management* needs:

- Improved information sharing among DoD CRMs, SHPOs, and affiliated Native American Tribes.
- Increased flow of CR information within the installation management structure.
- Increased CRM knowledge and understanding of other installation offices and their needs and processes.
- Development of specific categories of known CR knowledge organized by importance and level of user access.
- Establishment of standards and practices for future archiving needs, including:
 - Current and future knowledge management protocols.
 - A common language to be used when storing CR knowledge.
- Improved access to CR information to better inform and direct CR-related projects, including:
 - Development of software to improved ability to keep and use past information about current project areas (e.g., grey literature).
 - Increased access to decision aids (e.g., economic analysis, lessons learned).

6.2 BREAKOUT SESSION 2: GAPS AND BARRIERS

In the second set of breakout sessions, participants were asked to identify gaps (i.e., what DoD needs to do in order to accomplish its goals) and barriers (i.e., obstacles preventing DoD from accomplishing its goals) for informing future research, development, demonstrations, and management initiatives.

6.2.1 Identification and Evaluation

Breakout group participants identified numerous gaps and barriers that hinder *CR identification and evaluation* efforts.

Gaps and Barriers:

- Lack of available and useful (i.e., functional) historic context information for identification and evaluation efforts that require:
 - Qualitative improvement;
 - Connection to specific historic properties;
 - Guidance on National Register requirements, including examples of eligible and non-eligible historic properties; and
 - Management recommendations or guidelines.
- Unreliability of existing data in identification and evaluation efforts.
- Inefficient and ineffective methods for remotely identifying and evaluating human burials (all types and affiliations).
- Poor understanding of cultural landscapes.
- Lack of integration of cultural landscape approach into existing processes (common terminology and clear definitions).
- Insufficient guidance and methodology for using cultural landscapes in identification and evaluation efforts.
- Insufficient standards and methodological guidance for using predictive models to aid in the identification of underground and underwater cultural resources (e.g., predictive modeling for Paleo-Indian, or earlier, land surfaces and environments).
- Paucity of studies to understand and help predict the likely effects and impacts of new land use practices, new training practices, or new vehicle uses across different environments and resource types.
- Lack of tools to prioritize identification and evaluation efforts (e.g., studies and predictive models) to understand the effects and impacts of different kinds of current military training.
- Lack of site monitoring strategies and methods to help guide new identification strategies.
- Insufficient thematic studies of recent periods (e.g., Korean War, Cold War).
- Insufficient guidance on evaluating the historic integrity of Cold War era cultural resources.
- Using real property inventory as basis for built infrastructure identification and evaluation efforts.
- Too few studies on DoD military construction efforts, built infrastructure uses, and special programs.
- Lack of emphasis and awareness of ethnographic resource types, needs, and standards for work and data management.

- Insufficient methodological guidance (i.e., determining boundaries, continued use, use by multiple Tribes) for identification and evaluation of Traditional Cultural Properties (TCPs).
- Lack of best management practices (BMPs) for identifying and evaluating cultural resources.
- Lack of Tribal access to collected information.
- Insufficient guidance on protection of sensitive information.
- Lack of training on predictive models, cultural landscapes, historic contexts, and TCPs for senior installation personnel, and installation CR management professionals who have no formal CR management education.
- Exclusion of CR information from GIS applications, including lack of an incorporation protocol.
- Poor communication among federal agencies.
- Insufficient access to CR management information for CR management professionals.
- Insufficient consultation with stakeholders.
- Lack of DoD data standards for archaeological survey and evaluation.
- Lack of studies on deterioration of metal artifacts.
- Outdated archaeological site monitoring technologies.
- Insufficient funding to perform basic identification and evaluation of resources.
- Increasingly limited access to training areas for archaeological inventories.
- Inability to identify archaeological features within sites without excavation (i.e., non-invasive).
- Inability to identify and evaluate cultural resources in inaccessible areas (e.g., impact areas, high security areas, submerged environments, heavily vegetated cover, deeply buried horizons).

6.2.2 Mitigation and Treatment

Breakout group participants identified a number of specific gaps and barriers that hinder CR *mitigation and treatment* efforts.

Gaps and Barriers:

- Unclear link between the management of cultural resources and a given installation's mission.
- Lack of guidance or protocols for prioritizing significant cultural resources when considering potential impacts, including how an installation's priorities fit into the broader regional context.

- Use of data recovery (i.e., digging it up) as “default” form of mitigation, versus first examining mitigation alternatives.
- Lack of useable historic context studies.
- Numerous issues involving the installation...
 - Planning process:
 - Not involving CR management staff and stakeholders from the beginning of a project, which results in higher mitigation costs and greater risks to cultural resources;
 - The unknown of new contracting requirements;
 - The process and speed of design/build; and
 - Privatization of installation resources that may subvert consultation responsibilities, involve contractors not familiar with historic fabrics, and the lack of standardization.
 - Lack of training for:
 - Senior decision makers;
 - Elected officials;
 - Installation personnel;
 - Installation residents;
 - Cultural resources managers and archaeologists by Native American Tribes; and
 - Developing Programmatic Agreements and Memorandum of Agreements.
 - Mitigation:
 - Development of alternative and/or creative mitigation and treatment strategies;
 - The unknown risks in attempting new mitigation and treatment strategies causing CRMs and stakeholders to be critical of the proposed strategy; and
 - Data recovery or alternative and/or creative mitigation and treatment strategies not being an either/or proposition.
 - Treatment:
 - Projects involving cultural resources not being reviewed by the cultural resources manager; and
 - AT/FP may not be immediately compatible resulting in negative impacts.
 - Public outreach:
 - Not knowing, and engaging, the appropriate stakeholder;
 - Poor cultural understanding among individuals;
 - CRMs building strong relationships with stakeholders and other installation personnel;
 - Turn over of CR management staff at the installation and with the stakeholder;
 - Lack of public access to cultural resources due to security issues;
 - Inconsistency for how the installation delivers information about cultural resources to the public.

6.2.3 Management

Breakout group participants identified the following gaps and barriers that hinder proper *management* of DoD cultural resources.

Gaps and Barriers:

- Inconsistent visibility, understanding, and respect of cultural resource at the command level. Specifically, CRMs should be placed within the installation structure in such a way as to be consistent across Military Services and bases and to allow increased opportunity for direct contact with command level personnel (note: policy issue).
- Low level of awareness among command and legal staff about the benefits of Section 106 program alternatives (and of ways to avoid the perceived drawbacks).
- Lack of partnerships and coalitions with other programs (e.g., installation planning, operations, energy).
- Poor communication among installation staff and information exchange with stakeholders.
- Low level of stewardship ethic and appreciation for the inherent value of cultural resources among installation personnel and the public.
- Lack of installation staff education on compliance process, needs, and limitations, as well as the importance of heritage resources.
- Confusion regarding CR business processes and practices (note: policy issue).
- Insufficient CR guidance; lack of examples from previous studies and efforts completed at other installations.
- Lack of a central repository for information on best practices, creative solutions, previous studies, etc.
- Lack of mechanisms/metrics for monitoring and gauging program success (i.e., how successfully are CR programs balancing stewardship and mission support).
- Insufficient legal consequences for failure to comply with CR laws (need something comparable to NEPA).
- Lack of a DoD-wide membership organization for CR staff (need something comparable to the National Military Fish and Wildlife Association).
- Insufficient emphasis on trust-building with stakeholders and regulators; the “Us vs. Them” approach whereby regulators are viewed as adversaries.
- The current focus on short-term compliance needs for individual projects (e.g., focusing on current costs rather than long-term costs and benefits).
- Unwillingness of installation management (and/or CRMs) to accept responsibility as the decision-maker for complying with Section 106 of NHPA (i.e., the “SHPO made me do it” syndrome).

6.2.4 Knowledge Management

Breakout group participants identified several gaps and barriers that hinder proper *knowledge management*.

Gaps and Barriers:

- Delays in converting and/or transferring CR knowledge through applications interface, existing data/reports, and assessing older data sets.
- Lack of common data standards or application of standards to existing CR data. Need to assemble CR knowledge through application of standards to create a common language and data integration.
- Not validating knowledge through quality assurance/quality control, understanding the exact purpose of the data, or correcting existing data sets (including oral histories).
- Not synthesizing CR related knowledge.
- Insufficient use of available information (knowledge) in established decision making aids such as economic analysis/feasibility studies; lessons learned (economic); flow charts; and core data elements.
- Lack of a standardized mechanism to disseminate information to the public, or utilize report content for differing purposes.
- Unavailability of standardized outreach tools (e.g., template for websites).
- Insufficient maintenance or preservation of knowledge through archival technologies or due to differing platform compatibilities.
- Loss of knowledge due to lack of security and confidentiality measures.
- DoD's limited and focused view of its information needs (i.e., enough to make a decision on Section 106 inventory, evaluation, or mitigation, but not the "big picture").
- Insufficient funding to use/apply CR data.
- Poor access to technology for all owners/users (e.g., CRMs).

6.3 BREAKOUT SESSION 3: PRIORITIZATION AND SYNTHESIS

Based on the presentations, white papers, and previous breakout sessions, the third workshop session synthesized input to develop a list of high-priority research and development, technology demonstration and validation, and management needs that SERDP, ESTCP, Legacy, or other stakeholders may use in guiding their funding decisions.

6.3.1 Identification and Evaluation

Following is a complete list of the priority *Identification and Evaluation* needs identified by workshop participants. The top priorities are discussed at greater length in Section 7.

- **Creating useable (i.e., functional) and available historic contexts as they are essential for identification and evaluation of historic buildings, structures, and other above-ground cultural resources.** This would include historic context studies on military environments created in the last fifty years, an inventory of Legacy-funded historic contexts, and the development of standards for historic contexts.

- **Developing best management practices (BMPs) guidance for Traditional Cultural Properties.** Guidance should provide examples showing sound inventory and evaluation methods, identify effective management practices, and demonstrate how capacity can be increased for identification and evaluation of Traditional Cultural Properties within Tribes and among government officials.
- **Analysis of existing cultural resources data.** Specifically, a determination of the quality of survey data collected to date, guidance on BMPs for installation-level CRMs, and a sound estimate for the error rate (i.e., percentage of cultural resources missed through standard survey methods) for DoD property surveyed.
- **Improved tools and strategies for identifying and evaluating cultural resources in inaccessible areas,** such as impact areas and danger zones. In addition to these areas, tools and strategies are needed for improved identification and evaluation of underwater cultural resources and artifacts.
- **Methodological guidance for identifying and evaluating cultural landscapes.** This guidance should show the analytical utility and data management benefits that can be achieved through the use of cultural landscape perspectives as a “holistic” approach, clarify misconceptions and misunderstandings about the concept of cultural landscapes, focus on specific resource types, and emphasize integration of archaeological landscape and built environment.
- **Identification of landscape features that can benefit military training needs.** Certain resource types are found around the world (e.g., petroglyphs are in the American southwest, the Middle East, and Central Asia). To train troops as they will fight, these resources should be identified and included in training exercises as sites of special interest or care, rather than being excluded. Military trainers should participate in the identification process to ensure full understanding of the potentially delicate nature of cultural resources. Not all sites or resources will be suitable candidates for "real world" training.
- **Research on understanding interface of natural and cultural processes in shaping landscapes on military installations.** In order to better understand existing landscapes, it is necessary to fully understand if existing land conditions are the result of natural impacts (e.g., storm events, invasive species) or of human habitation and development, or both.
- **Studies on how land-use and training practices affect archaeological resources.** Anecdotal evidence suggests that most military training activities have little or no effect on archaeological resources; however, there is currently no empirical evidence quantifying the effects of various training activities on different types of archaeological sites. Studies examining how different types of training affect archaeological sites could perhaps facilitate the expanded use of training sites. Further, if quantifiable effects are known, trainers can work with CRMs to better predict how new vehicles, training exercises, and land-use practices may affect archaeological resources.

- **Improved techniques for expediting archaeological excavations.** Specific concerns here include expediting excavations without undermining data-collection standards, and determining what methods and technologies can be used to increase efficiency.
- **Methodological guidance on conducting ethnographic research.** Standards and guidelines are needed for ethnographic research, as is increased awareness regarding the utility of ethnographic research.
- **Increased funding and additional trained professionals and general manpower to accomplish basic identification and evaluation of DoD cultural resources in accordance with Section 110 of the NHPA.** This might be achievable through implementation of awareness training for senior DoD leaders on the National Register (what it is, what its significance is, etc.); emerging CR issues (e.g., cultural landscapes, Traditional Cultural Properties); and ethnographic resource types, needs, and standards.
- **Use of existing DoD real property inventories to understand the full scope of the DoD built infrastructure.** The goals would be to determine what information about historic built infrastructure can be extrapolated from this inventory, and if data drawn from the real property inventory can serve as a basis for preliminary decision-making about cultural resources. Efforts are needed to compile available summaries of what is known about given cultural resource types and what DoD cultural resources have been nominated to the National Register. Such efforts constitute a necessary and useful first step towards understanding the scope of DoD's infrastructure.
- **Workshop(s) with State Historic Preservation Offices, Tribal Historic Preservation Offices, and other stakeholders.** These workshops will facilitate identification and evaluation efforts, improve communication, and enhance the timeliness and effectiveness of installation CR programs.
- **Research on determining cultural affiliation.** In accordance with Native American Graves Protection and Repatriation Act (NAGPRA), human remains and funerary objects discovered on DoD lands may be repatriated to Native American communities if studies can determine positive cultural affiliation of the objects and remains to a specific tribe. More research is needed to improve the determination process.
- **Guidance on paleontology for DoD.** Currently, there is no legal obligation for DoD to locate, identify or evaluate paleontological resources on their lands. There have been several attempts in recent years to secure legislation to protect or obligate a process to manage paleontological resources on federal property. In advance of a possible new legal requirement, DoD should consider drafting guidance on the subject.

6.3.2 Mitigation and Treatment

Following is a complete list of the priority *Mitigation and Treatment* needs identified by workshop participants. The top priorities are discussed at greater length in Section 7.

- **Development of alternative and/or creative mitigation and treatment options.** Recommendations included determining the types of alternatives currently available (e.g., mitigation banking, interpretation efforts); assessing decision processes in selecting mitigation alternatives; using/studying collections to identify past alternative and/or

creative mitigation or treatment options; conducting economic analyses of mothballing, rehabilitation, and demolition; producing a guidance document on how to seek, find, and work with partners for alternative and/or creative mitigation; developing training courses on alternative and/or creative mitigation and treatment options and working with stakeholders; and developing web-based tutorials on agreement documents, including templates.

- **Researching and validating the true impact of the design/build, performance-based, or privatization process on cultural resources.** Research is needed to provide scientifically derived cost-based analyses of life cycle costs, as well as to explore options that allow for alternative and/or creative retrofit options for built infrastructure.
- **Developing alternatives for anti-terrorist/force protection (AT/FP) measures amendable to historic fabrics and materials without compromising integrity (including new materials).** This would include analyzing blast effects; researching and evaluating commercial products and studies of hardened materials; updating the Standards for Treatment of Historic Properties document to include guidance on improving security of the built infrastructure; and looking at the Leadership in Energy & Environmental Design Standards (US Green Building Council) for security and built infrastructure overlaps, effects, and synergies.
- **More defined/clarified relationship between *identification and evaluation and mitigation and treatment*.** Because context helps determine significance, scale (i.e., local, state, regional, or national) is an important consideration. Archaeological sites are almost always eligible under Criterion D of the National Register; yet, built infrastructure is almost always the “Cult of the Beautiful” and found eligible under Criteria A, B, and/or C.²³ Also, some types of significance can be more easily mitigated (e.g., artifacts as information). Further, there is a need for usable contexts (either there are no historic contexts or contexts are not functional), and a need to define the term “usable.” Finally, a database that includes mitigation strategies exercised by other DoD installations is needed.
- **Increased communication with stakeholders both within and outside of an installation regarding mitigation and treatment of cultural resources.** For Section 106, consultation should include more than just Government-to-Government consultation with federally recognized Indian tribes or other stakeholders, such as SHPOs. Installation CRMs must determine what the installation’s public wants to see, know, and learn. They should develop and offer training sessions on CR management for installation staff (e.g., engineers and planners on issues of significance and re-use, or federal responsibilities in the Section 106 process), and develop and offer training sessions on DoD and its CR stewardship responsibilities to stakeholders (e.g., affiliated Indian tribes). CRMs need to ensure a high level of awareness regarding significant cultural resources as heritage assets (and significance as defined in law) to installation management, and find creative ways of communicating the importance of cultural resources as installation heritage assets to Congress, et al. In sum, the installation CRM should develop a comprehensive outreach plan for mitigation and treatment of cultural resources.

²³ See www.nps.gov/history/nr/listing.htm for information on National Register criteria.

- **Measurement studies on how land-use and training practices affect cultural resources.** Research is needed to determine what the impacts to cultural resources are from various activities and types of training (tracked activity on certain soils, wheeled activity on same surfaces, etc.). For example, overpressure and vibration studies on caves, rock art, and historic buildings are needed, as are over-flight noise studies. Determining quantitative compatibility between CR management and mission needs will facilitate the implementation and, if needed, development of mitigation technologies that will ensure the resource is saved yet still allow for its use.
- **Focused mitigation and treatment on cultural resources with the greatest significance.** It is important to define who decides the hierarchy of significance within the eligible/non-eligible context of the NHPA and the National Register. Local, state, and/or national significance levels should be taken into account, as should the level of importance of military events in relation to cultural significance. This is true both inside and outside of the installation boundary. CRMs should use established contexts to determine significance. There are several existing tools that can be used to help establish significance (e.g., cost-benefit analyses).
- **Standardized templates for agreement documents.** Using standardized templates across the Military Services will speed the development and approval of agreements, facilitate legal compliance with Section 106 of the NHPA, and improve relationships with consulting parties.

6.3.3 Management

Following is a complete list of the priority *Management* needs identified by workshop participants. The top priorities are discussed at greater length in Section 7.

- **Creation of a centralized repository/data clearinghouse on the DENIX.**²⁴ Develop structure for the website. Explore data availability, ways to make it accessible, and costs associated with its creation and maintenance. Include educational opportunities, drawings, photographs, grey literature, annotated bibliography of reports, a contact list of DoD CR management professionals, and “how to” modules/toolkits.
- **Updated historic building cost/benefit analyses.** Compile results from existing long-term maintenance studies of historic buildings vs. non-historic buildings. Conduct new studies to augment previous work. Discover effective ways to support re-use and re-habilitation (e.g., non-destructive evaluation techniques). Determine cost effectiveness of re-use and re-habilitation of historic vs. non-historic buildings, new construction, and archaeological sites.
- **Educational opportunities for all stakeholders.** This would include tutorials for installation personnel with multiple tracks on what cultural resources are, what has been identified on the installation, and what the responsibilities are under the law, as well as stakeholder training on the mission and regulations of DoD. The goals would be to integrate CR awareness/requirements into all relevant aspects of installation planning and operations, emphasize to installation managers that Section 106 is law and must be

²⁴ www.DENIX.osd.mil

followed, secure high level support for Programmatic Agreements and ICRMPs, and increase understanding of cultural landscapes in terms of mission objectives.

- **Current evaluations of the DoD CR management program both internally and externally.** The program can be improved by listening to, and working with, stakeholders. These stakeholders may include typical consulting parties as defined by the NHPA, as well as "internal" stakeholders (e.g., military trainers, housing and public works personnel) with a collateral interest in the management of cultural resources.
- **Connectivity for cultural resources managers and professionals across DoD.** That is, to provide adequate support to CRMs who may work in more than one position, are part-time, and/or who lack sufficient training in architecture, archaeology, landscape architecture, history, etc.

6.3.4 Knowledge Management

Following is a complete list of the priority *Knowledge Management* needs identified by workshop participants. The top priorities are discussed at greater length in Section 7.

- **Establish a DoD CR management information architecture.** Information architecture means an inventory, repository, or clearinghouse of CR knowledge management. This would include an inventory of grey literature, CR standards, criteria for National Register eligibility, historic contexts, Material Source books (blast storm windows, methods), current information about data resource/integration of existing databases/data, application of 3-dimensional spatial data modeling, validation of existing CR management systems, and more. In sum, a one-stop information shop.
- **Establish applied knowledge management for decision support tools and aids.** This would include conducting an economic analysis/feasibility study and cost/benefit analysis of CR scenarios; creating a flow chart for decision making, a toolbox of existing technologies, and a treatment source book; and establishing and implementing monitoring techniques to track the health of cultural resources.
- **Increased CRM knowledge and understanding of other installation offices, including their needs and processes.** This should include an understanding by the CRM of unique business processes in addition to any potential day-to-day cultural resource needs/chance for interaction. Identify "outside" communities that may be interested in cultural resources, and provide information to them.
- **Update the electronic ICRMP Toolbox to make it more dynamic.**²⁵

²⁵ See project #01-1726 at www.dodlegacy.org.

7.0 RECOMMENDATIONS

The formal workshop concluded on the afternoon of 13 July 2006. To further refine and synthesize priorities identified during breakout group discussions, a small working group comprised of session chairs, rapporteurs, and Steering Committee members reconvened later that afternoon. This group explored and expanded upon the top priority issues identified by workshop participants.

7.1 PRIORITY OUTCOMES

The top priorities for each thematic area are identified below. A full list of priority needs is included in Section 6.

7.1.1 Identification and Evaluation

- **Creating useable (i.e., functional) and available historic contexts.**

High quality historic contexts are essential for the proper identification and evaluation of historic buildings, structures, and other above-ground cultural resources. To ensure that data are accurate and that information can be shared among myriad stakeholders, standards for conducting historic context studies must be developed. This will result in their qualitative improvement; increased connection to specific historic properties; improved guidance on National Register requirements, including examples of eligible and non-eligible historic properties; establishment of management recommendations or guidelines; and consideration of the National Register Multiple Property Submission format.

Once standards are developed, an inventory of Legacy-funded historic contexts should be undertaken to establish what has already been completed and, then, how best to make these historic contexts available to CR management professionals and the public. Finally, to complete DoD's information profile, historic context studies should be undertaken for military environments created in the last fifty years, including for building programs associated with a national or regional scope (especially for the Korean and Vietnam wars), with improving quality of life at military installations (e.g., recreational facilities such as golf courses and movie theaters), and with military appropriations and specific preparedness initiatives.

- **Developing Best Management Practices Guidance for Traditional Cultural Properties (TCPs).**

In an era of tribal cooperation and mutual understanding, it is imperative that DoD CRMs fully understand how best to identify, evaluate, document, and manage TCPs. Currently, a strong need exists for improved and more clearly articulated guidance on the proper identification, evaluation, and documentation of TCPs, particularly on establishing boundaries and determining significance and values. Additionally, the concept of "continued use" needs to be clarified and methodological guidance on conducting ethnographic research needs to be developed.

A strongly related need is for research on identification and preservation of Tribal values. For example, does the TCP concept capture the values that are most important to the Tribes? What

Tribal values are overlooked or ignored when properties are categorized as Traditional Cultural Properties? What values and beliefs are most important to the Tribes, and how can they be preserved? What values are not being recognized within the National Register TCP framework?

Developing methodologies for proper identification and evaluation of TCPs will benefit not only the artifacts but also DoD-Tribal relations. Clearly defining effective TCP management practices and providing examples of sound inventory and evaluation methods is an important first step. Once established, stakeholders may then want to examine how capacity can be increased for identification and evaluation of TCPs within Tribes and among government officials.

- **Analysis of existing cultural resources data.**

An abundance of data on archaeological, paleontological, historic structure, and other CR data exist. Yet, not all these data are available or, if available, usable. An analysis of existing available data is needed to determine the quality of existing survey data and the error rate for surveyed DoD property (i.e., percentage of cultural resources missed through standard survey methods). Additionally, surveys of existing BMPs for installation-level CRMs are needed to determine if BMPs already exist that can be standardized and disseminated. If they do not exist, a complete assessment is needed to determine if such BMPs even should be developed.

- **Improved tools and strategies for identifying and evaluating cultural resources in inaccessible areas.**²⁶

An important first step would be for DoD CRMs at installations with confirmed CR inventories to investigate historical land uses from clean up studies. Beyond that, improved identification could likely be accomplished through geomorphic modeling to guide inventory, and validation of new technologies (e.g., Light Detection and Ranging-LIDAR) could be used to improve efficiency and effectiveness of resource documentation. Similarly, identification and evaluation techniques for underwater archaeological sites and artifacts might be achieved through demonstration and validation of removal techniques of salt from iron, or through the use of new techniques for identifying and evaluating human remains. Predictive models, technologies, and techniques for identifying shipwrecks and aircraft wrecks would also be valuable. Similarly, development and use of predictive models and validation of geomorphic modeling techniques could guide future planning and inventory efforts. Finally, to aid in identification of all potential burial sites or features on DoD installations, participants suggested developing guidance based on information from sites that resulted in work stoppages if burial sites or features are inadvertently discovered. They specifically recommended building upon experiences learned from the discovery of Iraqi mass graves.

²⁶ Inaccessible areas include all danger zones, as well as those areas where technologies are currently insufficient (e.g., subsurface areas, such as burial and underwater sites).

7.1.2 Mitigation and Treatment

- **Alternative and/or creative mitigation and treatment options.**

Increasing mitigation and treatment options is important for increasing flexibility and maximizing effectiveness when dealing with culture resources and related issues. The first step is to examine the types of alternatives currently available and which could potentially be maximized (e.g., mitigation banking, interpretation efforts), and to assess various decision processes when choosing mitigation alternatives. Using/studying collections to identify previous alternative and/or creative mitigation or treatment options, and consulting the public as a source of ideas for alternative and/or creative forms of mitigation are also useful.

Before undertaking any mitigation or treatment, it is important to consider project scale (e.g., larger projects may be more suitable for alternative mitigation strategies as opposed to smaller projects), to understand unintended consequences of mitigation and treatment options (e.g., mothballing a building), and, as appropriate, to expand the effort to consider and understand affiliated Tribal views on various options.

In addition to the guidance mentioned above, workshop participants also recommended that more assistance be provided to SHPOs to fulfill their mandate to create overall state historic contexts; that studies be done to examine the effects of site capping and use on site integrity, sediments, and artifacts; that economic analysis of mothballing, rehabilitation, and demolish-new construction vs. other kinds of mitigation be undertaken; that mitigation of effects on heavy training locales be explored; and that usable contexts be developed.

Once options have been investigated, participants expressed a strong need to establish mechanisms for technology and data transfer. These included establishing a DoD-wide database to share examples of alternative and/or creative forms of mitigation accomplished at DoD installations; producing a guidance document about how to seek, find, and work with partners for alternative and/or creative mitigation; developing training courses about alternative and/or creative mitigation and treatment options and working with stakeholders; and creating web-based tutorials about agreement documents that would include templates.

- **Research and validate the true impact of the design/build, performance-based, or privatization process on cultural resources.**

In recent years, the tendency has been to demolish historic structures or rehabilitate them in ways that diminish the elements or aspects that make them historically significant. These insensitive treatments are often justified by planners or engineers that cite information concerning the lower cost of new construction materials; however, this information is frequently anecdotal in nature. When based on actual statistics and costs, often only short-term cost estimates and the outlays of any one given fiscal year are considered rather than long-term costs measured in terms of the life cycle for construction materials.

For example, it may be less expensive to re-roof an historic building in asphalt shingles rather than historically correct slate; however, the asphalt shingles may last only 15 years before having

to be replaced again, whereas the slate roof could easily last 100 or more years. When one considers the cost of repeatedly replacing the roof in question over the life-span of the building, it may in fact be significantly less expensive over time to use the more costly materials up front. Research is needed to provide scientifically derived cost-based analyses of life cycle costs, as well as to explore options that allow for alternative and/or creative retrofit options for built infrastructure.

- **Alternatives for anti-terrorist/force protection (AT/FP) measures amenable to historic fabrics and materials without compromising integrity (including new materials).**

In today's political environment, it is important for military personnel to be protected and for structures to be designed in ways that maximize safety and meet sustainability goals. Building safe structures does not mean, however, that cultural and historic integrity should be discarded. On the contrary, historic fabrics, materials, and facades can be used in ways that complement the historic context and are aesthetically pleasing and accurate without compromising structural safety. How best to achieve this, however, remains uncertain.

Research and evaluation of commercial products and studies of hardened materials is needed, as is a thorough analysis of blast effects. Cost-benefit analyses on retrofitting built infrastructure for AT/FP and further study on current AT/FP efforts also is needed. Information garnered from these studies could help prevent a culture of demolition, which currently views destruction of historic properties and rebuilding with new materials as a less expensive option (see previous bullet). The true effects of AT/FP on public access and management of cultural resources also must be determined. For guidance, researchers should look at the Leadership in Energy & Environmental Design Standards (US Green Building Council) for security and built infrastructure overlaps, effects, and synergies.

Results should be provided to the Secretary of Interior Standards for Treatment of Historic Properties, and should include guidance on improving security of the built infrastructure.

7.1.3 Management

- **Creation of a centralized repository/data clearinghouse on the Defense Environmental Network & Information eXchange (DENIX).**

The DoD DENIX system is a web-based "Comprehensive Resource for Defense Installation and Environmental Communities."²⁷ It is, in essence, intended to be a full-service information resource where documents, data, and other information relevant to DoD's Installations and Environment personnel can be housed in one centralized online location. In order to facilitate information exchange and reduce redundancies, workshop participants suggested that DoD develop a site on DENIX structured specifically to meet DoD CR management needs.

To achieve this, a structure for the website must be developed. This structure must link to or incorporate information that is already available, facilitate access and ease of use, and consider costs associated with the site's creation and maintenance. From a content perspective, the site

²⁷ www.denix.osd.mil.

should include an annotated bibliography of reports, grey literature, photographs and drawings, information on current educational opportunities, an updatable contact list of DoD CR management professionals, and “How To” modules and toolkits. This site would be posted on the password-protected portion of the DENIX, though some information could potentially be posted on the publicly accessible side.

- **Updated historic building cost/benefit analyses.**

A great deal of disagreement exists regarding the costs and benefits associated with modernizing historic buildings, especially with respect to using historically appropriate versus new building materials. To make informed and cost-effective decisions, results from existing long-term maintenance studies of historic buildings vs. non-historic buildings need to be compiled, and new studies must be conducted to augment previous work to capture the true cost of demolition and new construction (e.g., through the use of non-destructive evaluation techniques). Similarly, DoD must investigate and perhaps develop more effective ways to support re-use and rehabilitation, such as through incentives to the installation/contractors. In this way, DoD can determine the true cost effectiveness of re-use and rehabilitation of historic and non-historic buildings, new construction, and even for archaeological sites.

- **Educational opportunities for all stakeholders.**

Increased and improved communication with stakeholders is an important goal for DoD—one that DoD is currently striving to achieve on many fronts. In the world of cultural resources, several options and opportunities exist that DoD personnel can and should explore. For internal stakeholders (i.e., installation personnel), tutorials describing what cultural resources are, what resources have been identified on that installation, and what DoD responsibilities are under the law would provide a strong starting point. Additional training could be provided as appropriate on integrating CR awareness and requirements into all relevant aspects of installation planning and operations, as well as increased understanding of cultural landscapes in terms of mission objectives.

For external stakeholders, guidance on BMPs for CR education should be developed. This guidance could provide specific suggestions and processes for facilitating education and communication with off-installation stakeholders. This training should include information on DoD’s mission objective and requirements, as well as applicable DoD regulations. The goal would be to educate stakeholders as a creative mitigation alternative.

In order to help CRMs accomplish their goals, they must emphasize to installation managers that Section 106 is law and must be followed, and they should strive to secure high level support for Programmatic Agreements and ICRMPs.

7.1.4 Knowledge Management

- **Establish a DoD CR Management Information Architecture.**

Interestingly, the top priority need identified by the *Knowledge Management* breakout group was basically the same as the top priority need identified by the *Management* breakout group: a

centralized repository of information. The *Knowledge Management* group, however, had a somewhat broader interpretation in that the information architecture should function as an inventory, repository, and clearinghouse for all CR knowledge management.

Content in the DoD CR Management Information Architecture would include all grey literature (a National Archaeological Database, including metadata, excavation reports, real property inventories, etc.); a complete description of CR standards; criteria for National Register eligibility; historic context studies; Material Source books (blast storm windows, methods); current information about data resource/integration of existing databases/data, application of 3-dimensional spatial data/modeling/GIS to assist in decision making; attributes analysis; information about DoD CR management professionals; security and confidentiality standards; and information on CR data systems already established and used on military installations.

The site also would need to incorporate a way to validate existing and emerging CR management applications, systems and technologies, and to establish a cyber infrastructure that would create an interconnected communications system. Components of interest would include a data repository (photographs, grey literature, archives, drawings); an information management system (CR management data fields including GIS); electronic digging permits; and development of a system for the design/build process. This infrastructure would need to be connected to DoD and/or military component real property systems.

- **Establish applied knowledge management for decision support tools and aids.**

For military CRMs to make informed and appropriate decisions, they need access to a variety of decision support tools. To aid in the development of these tools, an economic analysis/feasibility study using commercial-off-the-shelf technologies with DoD applicability is needed, as is a cost/benefit analysis of CR scenarios.

Other tools that would aid DoD CRMs include the development of a flow chart for decision making, creation of a toolbox describing existing technologies, and the publication of a treatment source book. Similarly, establishing and implementing monitoring techniques to track the condition of cultural resources as well as other data elements would be of value.

- **Increased CRM knowledge and understanding of other installation offices, their needs, and processes.**

DoD CRMs need to better understand all installation offices with which they may interact or that may affect on-base cultural resources. This includes understanding those offices' unique business processes, potential day-to-day CR needs, and any opportunities for interaction they provide. Specifically, CRMs need to know who the other installation personnel are, and what they might need from a CRM (e.g., the real property office will need to know if some of their buildings are historic, and to understand what that means). Similarly, the CRM needs to understand how other offices do business on a daily basis, so that they can better serve those needs while integrating sensitivity and awareness of CR issues into their processes. Outside the fence, it is important for DoD CRMs to identify both specialist and non-specialist communities (i.e., experts and laymen) with potential interest in DoD CR knowledge and information, and to then provide that

information in understandable forms (highly technical reports vs. popular publications). That is, it is the installation CRM who must determine who the potentially interested people are, what their level of interest and capacity to understand information are, and to then deliver information using appropriate methods.

7.2 CONCLUSIONS

The primary objectives of the 2006 DoD Cultural Resources Workshop were to identify and prioritize the needs for CR management across DoD, examine the current state of practice across DoD for CR management, identify the current state of the art for CR management relevant to DoD's requirements, and to identify the gaps in knowledge, technologies, and management for cultural resources. In assembling stakeholders from various sectors, this workshop sought to create a platform for future research and management actions that benefit both cultural resources and the military testing and training mission.

By considering the recommendations outlined in this proceedings document, interested stakeholders can guide their research, management, and policy actions to meet common objectives. For DoD, given the growing burden of its CR inventory, coupled with increasingly limited available resources, it is especially important to develop useable historic contexts to improve CR data and standardize management guidelines. Further, given the plethora of websites offering CR information and data, it is imperative that a centralized repository/data clearinghouse be established on the DENIX system, and that all DoD CRMs have access to this system. Such a centralized repository would facilitate information exchange among DoD CRMs, as well as between them and other stakeholders. DoD CRMs also need to better understand the priorities and processes of other installation offices. In this way, they can expand awareness of CR issues into other installation programs.

While it is unlikely that any one group or agency can undertake all the actions enumerated in this document, these proceedings provide a source document for helping prioritize annual planning and resource allocation activities, as well as a common platform to help stimulate the invigoration of old partnerships and the launching of new ones. Overall, it is hoped that workshop outcomes will prove valuable for interested stakeholders for the next several years.²⁸

²⁸ Note: Legacy, SERDP, and ESTCP all have funded projects relevant to ideas discussed at this workshop (e.g., FY2007 ESTCP, *Integrating Predictive Modeling in DoD Cultural Resource Compliance*, SI-0720).

Appendix A: List of Participants

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Appendix B: Agenda



DoD Cultural Resources Workshop



Seattle Marriot SEA-TAC Hotel
3201 South 176th Street, Seattle, Washington 98188
206-241-2000; <http://marriott.com/property/propertypage/SEAWA>

Tuesday, July 11, 2006			
0700	Continental Breakfast and Registration		
0800	Welcome and Introduction	Maureen Sullivan DoD Federal Preservation Officer	Bradley Smith SERDP Director
0810	Workshop Charge and Agenda		Julie Schablitsky, PhD Legacy Resource Management Program Brad Smith John Hall, PhD SERDP/ESTCP
Current DoD Policy and Needs for Cultural Resources Management			
0820	Cultural Resources Policy of DoD		Maureen Sullivan DoD FPO
0835	Cultural Resources Policy of U.S. Army		Lee Foster CR Action Officer, ACSIM
0850	Cultural Resources Policy of U.S. Navy and U.S. Marine Corps		Jay Thomas, PhD Navy Deputy FPO
0905	Cultural Resources Policy of U.S. Air Force		Lt. Col. Doug Burkett HQ USAF
0920	Current DoD Needs for CRM: Archaeology		Laurie Rush, PhD Fort Drum, NY Russell Kaldenberg, MA NAWS China Lake, CA
0935	Current DoD Needs for CRM: Built Infrastructure		Adam Smith USACE: ERDC-CERL Julia Cantrell HQ AFCEE/ISM
0950	Break		
1020	Breakout Session I: ID Needs and Goals <ul style="list-style-type: none"> ▪ Group 1: Identification/Evaluation (<i>Evergreen Salon G</i>) ▪ Group 2: Mitigation/Treatment (<i>Evergreen Salon H</i>) ▪ Group 3: Management (<i>Evergreen Salon I</i>) ▪ Group 4: Knowledge Management (<i>Washington Salon E</i>) 		Breakout Groups
1200	Lunch		
1300	Load Buses for Field Tour		Lobby of Hotel
1330	Field Tour		Fort Lewis, WA
1830	Opening Reception (through 2000)		Atrium Lounge

Wednesday, July 12, 2006		
0730	Continental Breakfast	
0800	SERDP/ESTCP Overview	John Hall, PhD SERDP/ESTCP
0815	Legacy Overview	Julie Schablitsky, PhD Legacy
0830	Report from Breakout Session I: Group 1	Paul Green, PhD Dan Vivian
0845	Report from Breakout Session I: Group 2	Horace Foxall Julie King, PhD
0900	Report from Breakout Session I: Group 3	Lee Foster Lynne Sebastian, PhD
0915	Report from Breakout Session I: Group 4	Jay Thomas, PhD Lee Keatinge
State of the Science, Art, Knowledge, Management in Cultural Resources		
0930	Perspectives in Identification/Evaluation	Lynne Sebastian, PhD SRI Foundation
0950	Perspectives in Mitigation/Treatment	Ray Luce, PhD Deputy, GASHPO
1010	Perspectives in Management	Chris Hamilton, PhD Fort Benning, GA
1020	Perspectives in Knowledge Management	Deidre McCarthy National Park Service
1040	Break	
1110	Perspectives in Landscapes	Cari Goetcheus Clemson University
1130	Perspectives in Traditional Cultural Properties	Sherry Hutt, PhD National Park Service
1150	Perspectives in Underwater Archaeology	Bob Neyland, PhD Naval Historical Center
1210	Perspectives in Recent History	Wayne Donaldson CASHPO
1230	Lunch	
1330	Breakout Session II: Identify Gaps/Barriers from White Papers for DoD <ul style="list-style-type: none"> ▪ Group 1: Identification/Evaluation (<i>Evergreen Salon G</i>) ▪ Group 2: Mitigation/Treatment (<i>Evergreen Salon H</i>) ▪ Group 3: Management (<i>Evergreen Salon I</i>) ▪ Group 4: Knowledge Management (<i>Washington Salon E</i>) 	Breakout Groups
1500	Break	
1530	Breakout Session II: Identify Gaps/Barriers from White Papers for DoD, cont. <ul style="list-style-type: none"> ▪ Group 1: Identification/Evaluation (<i>Evergreen Salon G</i>) ▪ Group 2: Mitigation/Treatment (<i>Evergreen Salon H</i>) ▪ Group 3: Management (<i>Evergreen Salon I</i>) ▪ Group 4: Knowledge Management (<i>Washington Salon E</i>) 	Breakout Groups
1700	Adjourn	

Thursday, July 13, 2006		
0730	Continental Breakfast	
0800	Report from Breakout Session II: Group 1	Paul Green, PhD Dan Vivian
0815	Report from Breakout Session II: Group 2	Horace Foxall Julie King, PhD
0830	Report from Breakout Session II: Group 3	Lee Foster Lynne Sebastian, PhD
0845	Report from Breakout Session II: Group 4	Jay Thomas, PhD Lee Keatinge
0900	Breakout Session III: Prioritize R&D, Mgt <ul style="list-style-type: none"> ▪ Group 1: Identification/Evaluation (<i>Evergreen Salon G</i>) ▪ Group 2: Mitigation/Treatment (<i>Evergreen Salon H</i>) ▪ Group 3: Management (<i>Evergreen Salon I</i>) ▪ Group 4: Knowledge Management (<i>Washington Salon E</i>) 	Breakout Groups
1000	Break	
1030	Breakout Session III: Prioritize R&D, Mgt, cont. <ul style="list-style-type: none"> ▪ Group 1: Identification/Evaluation (<i>Evergreen Salon G</i>) ▪ Group 2: Mitigation/Treatment (<i>Evergreen Salon H</i>) ▪ Group 3: Management (<i>Evergreen Salon I</i>) ▪ Group 4: Knowledge Management (<i>Washington Salon E</i>) 	Breakout Groups
1230	Adjourn	
1300	Lunch for Breakout Session Chairs, Rapporteurs, Steering Committee (i.e., Working Group)	
1400	Discuss and Prepare Draft Sections of Summary Document (Working Group)	
1530	BREAK	
1600	Discuss and Prepare Draft Sections of Summary Document (Working Group)	
1730	Adjourn	

Appendix C: Workshop Charge

Objective: The fundamental objective of this workshop is to prioritize investment opportunities for the Department of Defense (DoD) Strategic Environmental Research and Development Program (SERDP), Environmental Security Technology Certification Program (ESTCP), and Legacy Resource Management Program (Legacy). This workshop will:

1. identify and prioritize the needs for cultural resources management across DoD;
2. examine the current state of practice across DoD for cultural resources management;
3. identify the current state of the art for cultural resources management relevant to DoD's requirements; and
4. identify the gaps in knowledge, technology, and management for cultural resources that limit both the transition of emerging technologies and the implementation or development of new management approaches.

The identification of policy issues is not a specific objective of this workshop. Any policy issues identified during the workshop will be captured and passed to the appropriate action officers, either within the DoD or the individual Military Services.

Background: Protection of cultural resources associated with our national heritage is part of the DoD's mission. DoD's policy is to manage and maintain historic properties and other cultural resources under its control (on DoD land or under DoD management) through a comprehensive program that considers the preservation of their historic, archaeological, architectural and cultural values that is mission supporting and results in sound and responsible stewardship. DoD promotes and interprets the cultural resources under its care whenever it is operationally and economically appropriate, both to inspire DoD personnel and to encourage and maintain the American public's support for its military and its appreciation for its national heritage. DoD manages 30 million acres of land, making it the third-largest land management agency in the United States. DoD owns or controls more than 150,000 archaeological sites, 71 National Historic Landmarks, and nearly 600 entries listed on the National Register of Historic Places (encompassing over 19,000 individual historic properties), all located on over 200 military installations to meeting all of DoD's mission responsibilities.

SERDP and ESTCP are programs designed to support research, development, demonstration, and transition of environmental technologies required by the DoD to perform its mission. The Legacy Program supports DoD efforts to protect, enhance, and conserve natural and cultural heritage through stewardship, leadership, and partnership. All three programs seek to improve the DoD management of cultural resources through investments in research, development, demonstrations, or management initiatives.

Approach: The workshop is planned for July 11-13 2006. The workshop will consist of a small number of prepared papers and presentations followed by multiple breakout sessions. Invitees to the workshop include senior researchers and managers from DoD, other Federal agencies, tribal governments, state agencies, academia, NGOs, and industry.

Product: The outcome of this workshop will be a strategic plan for the SERDP, ESTCP, and Legacy programs to guide investments in the area of cultural resource management over the next five years.

Appendix D: White Papers

Perspectives in Identification and Evaluation of Cultural Resources

Lynne Sebastian
SRI Foundation

First, two disclaimers: The term “cultural resources” includes many kinds of places exhibiting a whole range of values, historical associations and significance among them. This paper focuses on historical values of only two types of cultural resources – terrestrial archaeological sites and the built environment – buildings, structures, and districts. Other papers for this workshop will address landscapes, traditional cultural places, and underwater archaeology.

Even this effort to minimize overlap between this paper and others runs immediately into complex issues, of course. Many archaeological sites, for example, have traditional cultural values for descendant communities; although I will focus on the scientific, information-oriented values of archaeological sites in this paper, the importance of traditional values has to be factored into all management decisions about archaeological sites, including decisions about identifying and evaluating them.

Another unavoidable overlap occurs between the discussions of identifying and evaluating built environment resources in this paper and the paper for the workshop addressing recent history issues. The single greatest cultural resource management challenge for the military today, in terms of the built environment, is the need for some rational, defensible approach to evaluating the historical significance of “recent past” properties and categorizing them for management.

The second disclaimer is that the term “cultural resource management” includes many things in addition to compliance with Section 106 of the National Historic Preservation Act (NHPA). Because the workshop is organized around the core concepts of Section 106 compliance, this paper, too, will focus on Section 106 issues. But some of the issues and recommendations have implications for the broader sphere of cultural resource management, and I will touch on those implications as well.

Introduction and Background

Like all Federal agencies, Department of Defense (DoD) installations are required by Federal law and regulations to carry out proactive management of historic properties under their jurisdiction and to complete reactive consideration of the effects of their actions on historic properties under their jurisdiction and beyond their perimeters. DoD installations are further bound by Executive Orders and memoranda and by DoD and service-specific directives and policies.

Compliance with the National Environmental Policy Act (NEPA) and with Section 106 of the NHPA requires that installations assess the nature of any effects on historic properties and, in the case of NEPA, many other aspects of the environment as well. Since the definition of a “historic property” is a place listed in or eligible for listing in the National Register of Historic Places, the critical first step in complying with these laws is to identify historic places that may meet the criteria for National Register eligibility, and to evaluate them to determine whether they are, in fact, eligible.

In this paper I have been asked to:

- discuss current approaches to identifying and evaluating the eligibility of terrestrial archaeological sites and the “built environment,” that is, historic buildings, structures, and districts,
- describe some of the management challenges in identifying and evaluating these kinds of historic places, and
- suggest some possible innovations for meeting those challenges

. . . in twenty minutes. Bring the warp drive on line, Mr. Scott.

Identifying Historic Places

In talking about the Section 106 process, I use the term “historic places” to distinguish “old stuff” from “historic properties,” which are old stuff that has been evaluated and found to be eligible to the National Register. Identification of historic places is probably the most straight-forward aspect of Section 106. There are standard methods for finding and recording archaeological sites through pedestrian survey, for using historical records to locate buildings and structures of appropriate age, and for “reading” and recording historical buildings and structures. In addition, there are clear standards for professional qualifications for those doing the researching, finding, and recording.

Challenges

The biggest challenge for *identification* of archaeological sites (other than dealing with archaeologists squabbling over appropriate spacing of shovel-test pits) has to do with locating deeply buried sites. How do we know where to look for sites that have no surface (in the West) or near-surface (in the East) expression?

The biggest challenge for *identification* of built-environment properties has to do with the so-called “50-year rule.” Identification efforts that routinely screen out all buildings and structures less than 50 years old run the risk of allowing damage to or destruction of properties that have already achieved significance. This may be especially of concern for military installations, given the often central role that our armed forces play in the political history of the U.S. On the other hand, it is impractical to examine in detail the potential historical associations of every modern building and structure within the area of potential effects for every undertaking on most installations.

Potential Solutions and Broader Implications

Like most of the solutions that I am going to suggest in this paper, the solutions to these case-specific problems – locating deeply buried archaeological sites and identifying buildings and structures that might meet the “exceptional significance” standard – are programmatic rather than case-by-case in nature. Although programmatic solutions require greater up-front investment, they pay off in the long run through expedited compliance and better stewardship.

As an archaeological philosopher once said, “If you want to find old sites, you have to look in old dirt.” A targeted, well-designed geomorphological study to determine the age of key soil units within an installation can enable managers to determine where deep testing should be included as part of Section 106 identification of archaeological sites. This decision is based on both the depth of the deposits of appropriate age and the anticipated depth of disturbance from the proposed undertaking.

Although geomorphological studies can be carried out on an undertaking-by-undertaking basis, it is more cost-effective to do this work at a larger scale, and information from larger-scaled studies can be used for both planning and NEPA compliance. Studies can be carried out on an installation-wide basis or restricted to areas slated for or likely to be considered for development, although changing installations missions can alter these designations very quickly. Geomorphic information can be used to direct activities toward or away from areas with high potential or low potential for buried sites. This information can also be used to evaluate NEPA impacts and alternatives for their relative potential to affect archaeological sites in general as well as sites of different ages and levels of integrity.

The issue of built environment properties that meet the standard for “exceptional significance,” like that of buried archaeological sites, can be addressed case by case, but is much more efficiently and cost-effectively addressed on a larger scale. A installation-wide study to identify major events, patterns of events, and significant individuals associated with the installation’s mission over the past 50 years should be relatively straight-forward to complete and even simpler to update on a periodic basis – in conjunction with five-year ICRMP revisions, for example. Such studies should address in general terms the likelihood that buildings or structures may exist on the installation that have an important association with these events or individuals.

With this background information, the question as to whether any given Section 106 undertaking is likely to affect recent buildings or structures meeting the standard of “exceptional historic significance” can be addressed quickly and simply. Beyond individual Section 106 undertakings, however, this type of study (if it is faithfully updated) can be used for all sorts of long-range planning involving facilities. It can help to avoid the costly and contentious situation where a significant recent building or structure is identified as such in the NEPA process, long after general plans have been developed that would lead to the building or structure being revamped or demolished. And, as addressed in the next section, such studies of recent-past events and associations will greatly simplify identification and eligibility decisions as these properties cross the 50-year threshold in the future.

One other, less tangible benefit of ongoing studies of an installation’s association with significant events and individuals is that such studies reflect and acknowledge the ongoing role of the installation and its people in history. We tend to forget sometimes that for those who make history and those who survive history, the places associated with their experience can be very important. And very worth preserving.

Evaluating Historic Places

If identifying archaeological and built-environment historic places is one of the most straight-forward aspect of Section 106 compliance, evaluating their significance in terms of the criteria of eligibility and qualities of integrity for the National Register is perhaps the least straight-forward. Issues of eligibility and integrity are more subjective, and the “costs” of being wrong in either direction (deciding that something is eligible when it isn’t or that it is not eligible when it is) can be very high – one being costs in money and time, the other being the cost of irreparably lost heritage.

Challenges – Built Environment

For the built environment, two of the most problematic issues for determinations of eligibility are:

- assessing the significance of the recent-past properties – especially those that are very common property types, and
- assessing the significance of buildings or structures that have a long history but have been continually modified and upgraded

These issues are not, of course, unique to military facilities, but both are especially problematic because of the large military build-ups associated with World War II, Korea, the Cold War, and Vietnam. There is no question but that these are extremely important themes in American history. The problem is that there are *so many* districts, buildings, and structures associated with these eras and so many of them are very modest in nature or badly deteriorated or substantially altered or all of the above. How do we determine whether an individual property has an important association with World War II or the Cold War?

The second problem arises because things change in the military, frequently and radically. New weapons systems, new technologies, new missions, new tenant organizations – all of these lead to frequent revamping, remodeling, retrofitting, and demolition. How do we assess the integrity of a district, for example, that has served as an aircraft maintenance facility since World War I, but started out with JN4D “Jenny” trainers, morphed into a P-51 Mustang facility in 1944, was fitted out for F-86 Sabres during the Korean conflicts, serviced F-4 Phantoms during Vietnam, and now has been mothballed but may be refitted for Predator drones. It is an aircraft maintenance facility with an extraordinary history, but it hasn’t got a shred of “historic fabric” left from WWI and almost none from WWII.

Potential Solutions and Broader Implications

The first challenge – large numbers of similar, modest, potentially redundant properties can only be addressed efficiently at a broad, programmatic level. The initial need is for a general sense of what the inventory comprises. We need to know what the property types are, what the rare or especially significant properties are, and what are the common properties. Preferably we need to know this at the Big Picture scale as well as at the regional and installation-specific scales. And what next? Although I am not, as you will learn in a moment, a big fan of “historic contexts” as a cure all for problems with evaluating historic properties, if there has ever been a case where “develop a good historic context” was the correct answer, this is it.

A “good” historic context, however, is one that makes specific recommendations about specific qualities of specific property types. For example, which types (and in some cases, which individual properties) are most important (that is, have the strongest association with the major themes of the context)? How do we identify the best examples? What kinds of integrity issues are important for each type? Can we develop an approach that preserves a representative sample from a very common property type? What is an appropriate treatment for those properties not included in the sample? A “good” historic context is one that doesn’t just tell you a bunch of interesting stuff about the Cold War but actually provides concrete guidance on how to evaluate and manage Cold War properties.

The second challenge – properties with a long history and many reincarnations – brings us to one of those areas where creativity in the application of National Register concepts is important. The most important “character-defining feature” of some kinds of structures or buildings or districts is their function, and in order to continue carrying out their historical function, they have to be constantly upgraded. This is true of many technological properties – irrigation systems, roads, pipelines, powerlines, for example – and it makes them difficult to assess using traditional historic preservation concepts like “historic fabric.” The fictional aircraft maintenance facility used as an example above has been in the same location, in a military “setting,” fulfilling the same mission for nearly 100 years. Does the lack of integrity of materials and workmanship disqualify it? How do we recognize the significant continuity of function in National Register terms? Can we stretch the concept of “integrity of design” to recognize function? How do we think about “period of significance” for a property such as this?

The challenge of large numbers of recent-past properties is not going to go away – like Baby Boomers going over that cliff marked “60,” new properties cross the 50-year threshold every day. By adopting programmatic, context-defined approaches to evaluation, and by building an ongoing history of the

installation's association with significant events and individuals, cultural resource managers can plan for that future flood of potential historic properties rather than being swept along by it.

Challenges – the Archaeological Record

For Section 106 purposes, archaeological sites are generally evaluated under eligibility criterion D, places that “have yielded, or may be likely to yield, information important in prehistory or history.” National Register Bulletin 15 tells us that

Information is considered “important” when it is shown to have a significant bearing on a research design that addresses such areas as: 1) current data gaps or alternative theories that challenge existing ones or 2) priority areas identified under a State or Federal agency management plan. (NR Bulletin 15:21)

The problem is that this concept of “important” information is incompatible with both the nature of the archaeological record and the temporal dimension of archaeological research.

There is no *unimportant* or *important* information in archaeology; there is just information. Every isolated artifact, every tiny site, every enormous site contains pieces of the total record of the past. Some sites contain many pieces, some very few. But no pieces are intrinsically important while others are not; they are all pieces of the same thing. Envision a library. There are huge thick books and tiny thin books; there are books about famous people and infamous people; there are books about World War II and the origins of the universe and tying fishing flies and sustainable agriculture and fellowship of the ring and the Russian revolution and a curious little monkey named George. No one book, large or small, is intrinsically more important than another; they are all part of the record of human thought and experience. If you've gone to the library in search of a recipe for Chicken Picatta, *The Joy of Cooking* is a far more important book than *War and Peace*. If you are seeking solace for your soul, a slender volume of Emily Dickinson may be far more important than the 34 volume collected works of Sir Winston Churchill.

The National Register process for archaeology requires that you adopt the Chicken Picatta approach (your definition of important depends on what you are looking for at the moment) when it says that the information from a particular site must “have a significant bearing on . . . such areas as *current* data gaps or alternative theories that challenge *existing* ones” [emphasis added]. This is where the analogy with a library breaks down. If we go to the library looking for Emily Dickinson, we don't then decide that Sir Winston is not important. Rather, we assume that someday we will want to know about Fortress Britain and read those stirring words, “We shall fight on the beaches, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender.” We leave that 34 volume collected works in place to await the day that they will become “important” in the sense that we now need the information that they contain.

And this is where the National Register approach to significance of archaeological sites runs afoul of archaeology's fourth dimension – time. The data gaps and theoretical issues of today are soon replaced as a result of the technological and methodological advances of tomorrow. If we judge the NRHP eligibility of archaeological sites – that is, the importance of the information that they contain – by today's standards and interests, the sites that don't make the cut, that are found “not eligible,” don't stay in the library for future needs; they are generally lost forever.

There are two kinds of sites that make it especially problematic to use the approach that says “important information” means information that addresses current needs. The first is sites that we would classify today as not having the potential to yield “important” information. Maybe they really don't. Or maybe we just don't yet know how to access or use the information that they contain. In the late 1800s, archaeological expeditions in the upland Southwest often used roof beams out of structures in

archaeological sites for firewood. And why not? It's not like they had any potential to yield important information, right? Or at least they didn't 50 years before tree-ring dating was developed.

The other problematic sites are those with information that is "redundant," given current questions and current techniques. These are classes of archaeological sites that we have studied intensively; additional data recovery at them yields diminishing returns and largely redundant data; they contain lots of information, but we don't know how to learn anything new from them. Yet.

Potential Solutions and Broader Implications

I have two suggestions. The first is this: let's be realistic about how eligibility of archaeological sites is actually assessed NOW. Because of the focus on current data gaps and theoretical perspectives, the National Register and the Secretary of the Interior's standards for archaeology and historic preservation require that eligibility to the NRHP be evaluated using developed "historic contexts," that is, discussions of important research issues grouped by place, time, and theme. Historic contexts, it is argued, enable us to define important information and thus identify NRHP-eligible archaeological sites. Virtually every theoretical discussion on the topic of making better decisions about eligibility for archaeological sites concludes that "what is needed are more and better historic contexts."

In practice, however, very few people making decisions about eligibility actually USE the historic contexts we have NOW in any meaningful way to make those decisions. What people actually do is to evaluate the physical characteristics and the morphology (the form, content, and structure) of the site and make a decision based on those. Is it largely intact or is it eroded or looted? Is it mostly buried or exposed on the surface? How many artifacts are visible? What kinds? Is there evidence of features? Structures? Are there temporal diagnostics?

When it comes to recovering archaeological data, it doesn't matter what the "historic context" is. Archaeologists gather a relatively fixed set of data from all archaeological sites: artifacts, features, structures, pollen samples, flotation samples, chronometric samples, ethnobotanical samples, perishables, faunal materials, human remains and grave goods, plus all of the provenience information for those things – maps, plans, notes, photos, drawings, etc. Some sites have all of these categories of data, others only a few. But by looking at the physical characteristics and morphology of a site, we can assess its potential to yield those categories of archaeological data. It doesn't matter whether the site's historic context is "Pueblo II fieldhouses of the San Juan Basin" or "Early Woodland camps in the Piedmont" or "Cahokia and the American Bottom during the Moorehead Phase."

What we want to know when assessing a site's potential to yield information about the past is:

- How likely is it to yield artifacts, features, structures, pollen samples, flotation samples, chronometric samples, ethnobotanical samples, perishables, faunal materials, or human remains and grave goods?
- Are the data in this site (whatever their characteristics) in their original context and spatial relationships (that is, does the site have integrity of location and materials)?

If we want to do a better job of assessing the significance of archaeological sites relative to their information potential, what we need is not more "historic context" documents but better geomorphic data and more synthesis of existing survey and excavation data. These would enable us to more accurately to predict the information potential of a given site based on its surface expression, location, and other associations.

The second suggestion is this: let's focus less on eligibility of archaeological sites in the sense of "important information about current research issues and data gaps" sense and focus more on the significance of archaeological sites as repositories of the only physical data we are *ever* going to have about the past. Rather than divide them into "important" and "not important" based on transitory information needs and current technical skills – with the "not important" ones all being destroyed without anyone reading the book – why not divide them into significance categories and managing them accordingly?

Significance categories might include: sites we know how to learn stuff from *now*, sites we don't know how to learn anything from *yet*, sites we've learned stuff from in the past but don't know how to learn anything new from, *yet*. Management approaches might include setting aside somewhere on the installation representative samples of all site categories for long-term future research needs. Treatment approaches for individual undertakings might include minimal or no investment in data recovery at most sites within an area of potential effects, with mitigation dollars being focused on those sites from which we have the greatest ability to learn important things now and on public outreach products.

Such an approach would also enable us to address the traditional cultural values that many tribes ascribe to archaeological sites – something that National Register Criteria A, B, C, and D don't really foster unless there is specific physical evidence or specific oral traditions linking an archaeological site with specific events or persons in the past. If we were to shift our focus from eligibility to a broader category call "significance," however, we could manage for those values under NEPA and EO 13007, and potentially under a broader, more programmatic approach to Section 106 as well.

Our challenge is really to take into account both current research importance (eligibility), as required by Section 106, and the need to address the broader issue of "loss or destruction of significant scientific, cultural, or historical resources" under NEPA. By managing for significance, an installation also could address its obligations under Section 110 of NHPA by establishing a program to preserve at least a representative sample of all archaeological information within the installation for future research needs.

Conclusions

The Advisory Council's regulation says that Section 106 is a process for accommodating historic preservation concerns with the needs of Federal undertakings through consultation. A rough translation might go something like this: "Be good stewards, do what it takes to preserve the stuff that really matters, and do it in a way that facilitates the mission." Section 106 is intended to be a flexible process; the regulation contains a whole section on "program alternatives," which are customized ways to comply with the law. And programmatic, rather than case-by-case, approaches are encouraged – four of the five program alternatives establish programmatic approaches. In this paper, I have suggested both flexibility and programmatic approaches as ways to streamline compliance activities, focus on historic places that matter, and achieve a better balance of stewardship and mission needs.

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Getting the Public Benefits from Mitigation

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Mitigation, and avoidance, are at the heart of the planning process established in Section 106 of the National Historic Preservation Act of 1966. When an adverse effect to properties eligible for or listed in the National Register of Historic Places cannot be avoided, mitigation is the public benefit that balances the loss (or diminishment) of the historic resource. I think this is one of the most important elements of the law, and one that has not been fully examined or utilized. Too often, I fear, we do a knee jerked reaction that we need to record the property—if above ground, or excavate the site—if below ground. Those reports are too often filed away and the actual usefulness to the public is much less than it should be. The options available for the public good from mitigation are much broader, and need to be examined to ensure that the public is getting its money's worth.

I would like to take a few minutes to talk about some mitigation measures used in Georgia. I would like to first look at how we can provide better public benefit for projects using normal mitigation measures then discuss some methods outside the normal toolbox. I would then like to look at some basic goals that should be part of the process and finally make some suggestions about how mitigation for Department of Defense projects can provide greater public benefits.

I will be using primarily Georgia examples—I have not taken a poll from other states to see what innovative mitigation they have done and what they have found most successful. Given additional time that may be a useful exercise to identify more “best practices.” There are enough available in Georgia, however to make the points I think are important.

Before talking about mitigation I would like to say a few words about avoidance. Three examples come to mind, all from Fort Benning, GA. The first was a proposed demolition of the base jail. The building could no longer continue its historic function and new facilities were needed. During consultation we collectively looked at alternatives, and the base did a great job of finding a new use for the building. It is now the headquarters for the Military Police on the base done in a way that provides up to date space while retaining the major historic elements of the former jail—a win-win situation after we all took a second look at the project. The second project involves the third parachute jump tower at Fort Benning. Every paratrooper in the armed forces took their training at Fort Benning and used the jump towers. Two of the towers are active training towers and the third was constructed to allow visitors to experience a limited, safer experience. Proposals have been made to demolish that tower. Feeling that it is a very important part of the history of the facility we have jointly looked for ways to preserve the tower. One of the suggestions—not yet implemented, is to place telecommunications antennae on the tower negating the need for additional cell towers in the area and providing a vital new role for the tower. The final example is one done with 20/20 hindsight. At Fort Benning 8 or 9 years ago we signed a memorandum for the recordation—before demolition—of the historic base theater—a wonderful art deco structure built in 1939 that had seen better days. The demolition was based on the lack of use and therefore the lack of need for the facility. The theater was demolished after recordation. Recently I heard that the base is considering building a new theater because of additional personnel assigned to the base. Mothballing the structure could have lessened costs and preserved an important historic building.

Standard mitigation—recordation and/or excavation—often provides important new information that is seen by a few professionals but not widely distributed to the public. A few years ago we decided that we needed to start discussing ways to make the information more available to the public. Many memorandum

of agreement since that time have included a community outreach and/or education clause to help provide more public benefits.

When excavations for the Georgia Ports Authority in Savannah, required for a US Army Corps of Engineer's permit, turned up more than expected, similar methods were used. Archaeological investigations by Southeastern Archaeological Services discovered the remains of Mary Musgrove's trading post. Mary Musgrove was the interpreter and advisor that was vital to Oglethorpe's successful colonization of Georgia. She was as important to his success as Sacagawea was to the Lewis and Clark expedition. We had known for years that her trading post was somewhere in the area, but only the evaluation under 106 ensured that the information from the site was saved rather than being bulldozed. As part of the mitigation, lesson plans and a video of the excavation were produced. The Society for Georgia Archaeology distributed more than 8 thousand to 8th grade classrooms throughout Georgia as part of its annual Archaeology Month promotion.

Brockington Associates developed similar lesson plans along with an exhibit of artifacts after excavations at the Ford Plantation near Richmond Hill, Georgia. A developer needed a CORPS permit before developing new housing on the plantation where Henry Ford wintered and tried to develop rubber from lettuce. More than the history of Ford's tenure was discovered on the property. Prehistoric sites were found along with particularly rich African American sites related to earlier plantations. Such sites are particularly important because the enslaved inhabitants left few written records and thus the site provided valuable information about their lives. Information which was made available to all 4th grade teachers in Bryan County.

Brockington Associates were also the principal investigators on a new housing development near St. Mary, Georgia. Investigations, again needed for a CORPS permit, rediscovered an intriguing bit of Georgia History—the last battle in the War of 1812. The British victory at Point Peter took place after the peace treaty—and after the Battle of New Orleans. The site had been abandoned, and hundreds of artifacts were discovered. The National Park Service museum in St. Mary, connected with Cumberland Island, now contains an exhibit that tells the story of the “Forgotten Invasion” using artifacts found on the site as well as developing education materials for local Camden county students. The developer is also preserving the site of the fort as a focal point of the development, and the city is preparing to play a much more important part in the bicentennial of the War of 1812.

One of Georgia's most successful projects was an excavation done by Southern Research for a Department of Transportation highway project on SR 61 in Bartow County Georgia. During the excavation they set up a website, www.bartowdig.com with real time photographs that showed the progress of the excavation. In addition they had an open house for 500 teachers and students from local schools. At the end of the project lesson plans were developed from the results and teacher trunks with artifacts and materials presented to the Bartow County school system. The website has a great deal of information on it, including information about what is going on in the lab and 9 handout pages for students which include a word find and a crossword puzzle.

There are still a number of traditional publications coming from mitigation efforts. The University of Alabama published the reports of two archaeological investigations on Fort Benning in the scholarly research series. Several publications, including [Invention and Technology](#), and the [Newsletter for the Society for Commercial Archaeology](#), and [American Heritage magazine](#) web version and some state archaeological society newsletters, published articles about a fallout shelter discovered, by TRC Garrow Associates, as part of a sewer project in Gainesville, Georgia.

One of the most comprehensive histories coming out of 106 in Georgia is a history of the Bell Bomber plant in Marietta, Georgia. The facility, owned by the Air Force, is currently operated by Lockheed to

produce F-22 and C-130s. Changes necessary to modify the plant for modern production necessitated the demolition of parts of the historic structure. Mitigation included a book about the plant and its importance in the defense effort. The publication contains a rich photographic record and tells the stories of the plant and its employees. We reviewed the draft of the book before its recent publication.

From these illustrations it is clear that there is much that we are doing and much more we should be doing to ensure that the information obtained during the 106 process is widely distributed and made available.

In Georgia we have also been looking at ways to mitigate adverse effects when the sites and impacts are more difficult.

For example, The Georgia Transmission Company constructs power lines for publicly owned power companies. Growing out of the REA, their actions require 106 review. When constructing a transmission line, even with sophisticated route planning processes, it is not always possible to avoid impacts on historic resources. After several years of trying, sometimes less than successfully, to mitigate the most difficult impacts of a power line, Georgia Transmission entered into an agreement with the University of Georgia's Historic Preservation Program and our office. Under the agreement Georgia Transmission pays the University \$100,000 a year for survey work to identify historic resources. In Georgia during the 40 years since the passage of the National Historic Preservation Act of 1966 we have been able to survey only about one-third of the state's 159 counties. The University of Georgia, working under our guidelines, trains students to undertake county surveys. The information is then added to our inventories and made available to all state citizens. This not only helps us complete our inventory, but helps Georgia Transmission when they are planning new electrical transmission lines.

A close working relationship with the Department of Transportation has also led to the development of two tools, which are not really mitigation, but help expand our ability to manage and understand Georgia's historic and archaeological resources. The first was a context on Georgia farming funded through their research grants along with our inventory funds. Evaluating individual farmsteads impacted by road construction had long been a major problem. New South Associates was hired to produce a context on agriculture in Georgia. The resulting Tilling the Earth, Georgia's Historic Agricultural Heritage, provided enough information to allow agreement between our office and the Georgia Department of Transportation on which farms are eligible and which are not. It has also helped us sharpen our questions for mitigation on farms that are eligible.

The second project undertaken with the Department of Transportation is NAHRGIS. The Natural Archaeological, and Historic Resources Geographic Information System is a web based GIS system open to all Georgians. It includes all inventory forms, and will soon include all National Register forms. The project, funded with federal highway ISTEA funds, will allow anyone to find what is historic in any part of Georgia that has been inventoried. The archaeological information is, of course, restricted to credentialed archaeologists.

We have also worked with a number of cell tower builders to mitigate effects to local historic resources. These efforts have resulted in the rehabilitation of one building in close proximity to a cell tower, and to inventories or nominations of other close related buildings. For example, in Stephens County, an attrition study of previously recorded resources (around 1100) was conducted with the finding that over 80% of the properties recorded in 1989 are extant and in at least fair condition. In Fayette County, a historic district information form for the city of Brooks was prepared—useful as a research tool but also allows property owners to pursue National Register listing if desired. A survey of unincorporated Chattahoochee County and the city of Cusseta (excluding Fort Benning property) provided county-wide coverage.

This brings us to the most difficult mitigation measures—that of increasing the worth of other nearby historic resources. In an ideal world historic resources would be preserved because there was general recognition of their importance and, in the case of the military, of their role in the military mission. To illustrate, some years ago a friend who became the Main Street manager in his hometown was making a presentation in a meeting about the wonderful things that were happening in his town. Someone in the audience asked him if they had an historic ordinance. He replied that they did not, but that they had something much more important—an ethic. He added that if he had to choose between an ethic and a law he would take the ethic every time. The question is not do we want a preservation ethic, but how can we get one. As part of the discussion of alternative regulations for Fort Benning we spent a good deal of time examining the question. We still have much to implement to get to where we need to be.

Fort Benning has made a good start—they have published a book on the base's history and at least two sets of posters about its history. But the real question is how do we link the historic structures of the base with its history as the home of the infantry. How do we ensure that all assigned personnel, managers, instructors, command structure, and students sense the base's tradition and the service of Eisenhower, Patton, Marshall and others on the post. How do we provide the pride that those taking jump school are using the same towers that every other paratrooper has used?

We have discussed a number of options including walking and driving tours of historic resources on the base, manuals for those living in historic housing, street signage in the historic district, and even playing the movie Patton every week at the base theater. Surely there must be real benefits to a captain living in the house where Eisenhower lived in while he was a captain. I was reminded that at the University of Virginia the student rooms on “the lawn” and ranges are among the worst at the University relative to creature comforts. They are a single, small room, with no air conditioning, heated with radiant heat and wood fires, with bathroom and shower facilities a walk away. (They do, however, have fiber optics) And yet they are among the most desired on campus. They are available only to fourth year students (seniors) through a peer selection process. They are so desired because they are an important part of the tradition of the University. They were designed by Thomas Jefferson and always been at the heart of the university. Residents are near the rooms where Edgar Allen Poe and Woodrow Wilson lived. We need to find similar ways to both preserve the historic military resources and to use them in instilling the tradition of the service into today's recruits.

Where does this leave us? I think there are several points we need to consider during this conference. How can we ensure that mitigation provides real worth for the American people? How can we ensure that we are addressing the most important questions? How can we ensure that information obtained through mitigation reaches the largest audience? We are, for example, looking at placing some of the photographs produced from recordation on our web site. How can we do the research to find out the best way to use the historic resources to instill the sense of tradition? And finally, how can we find ways to give added value to remaining resources—even as we record information from the losses.

Perspectives on Management: Installation Level Cultural Resources Management

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I. Introduction & Background:

Cultural Resources Management (CRM) in any setting is the responsibility of the landowner. In the Department of Defense (DoD), the landowner role is assigned to the installation Commander. Like any landowner, the installation Commander tends to concentrate on “making a living” which, in this case, is meeting the given mission of the installation such as training, force deployment, or other designated activity. CRM is a responsibility that can be a distracting esoteric exercise to the installation Commander and others unless it is properly integrated into the overall flow of decision-making in as seamless and efficient a manner as possible and its purpose is understood to be a part of, and in the advancement of, the installations’ mission.

Why CRM exists dates back to the mid 1960’s when government agencies at all levels were typically uncomprehending of the purpose of historic preservation, leading to blatant disregard for broader, long term public interests over narrow, short term private or personal interests. As a result, blunders like the demolition of Pennsylvania Station in Manhattan in 1964 and threatened construction on top of Grand Central Station in 1965 became a *cause celebre* leading to a series of state historic preservation laws and the passage of the National Historic Preservation Act of 1966 (NHPA). It is the determination of eligibility for the National Register of Historic Places (Register), a part of the NHPA that provides the basic rationale for all CRM programs. However, NHPA by itself does not provide a good incentive for the installation Commander, or anyone else, to actively support a CRM program.

NHPA has become grouped with a spectrum of environmental laws containing reporting and comment opportunity requirements within most installation environmental offices. To assure appropriate federal action for public notification and comment (i.e., transparency in decision making) the National Environmental Policy Act of 1969 (NEPA) was passed as an umbrella statute that provides a process very similar to NHPA for review of federal undertakings. NEPA is the fundamental system for keeping an organized and synchronized federal project review. However, the NEPA review and reporting system, like NHPA, does not meet all of the needs of a successful CRM program. A successful CRM program efficiently meets both basic legal requirements and advances public awareness and education on the importance of cultural resources and historic properties held in trust by the installation.

II. Summary of Findings and Issues

The management of cultural resources within an installations’ primary mission involves goals that occasionally may appear to be contradictory such as: (1) the need for new and improved infrastructure or training to meet current or anticipated mission objectives (i.e., change); versus (2) the preservation and interpretation of cultural resources (i.e., no change).

Successful CRM may be measured by how well the program resolves these seeming contradictions, thus allowing the maximum amount of (2), which promotes the maximum amount of support for (1).

The keys to achieving CRM success are:

(A) having the necessary and sufficient data obtaining to (1) and (2) above, and combining the data into a coherent body of information promoting B₁ and B₂ below;

(B₁) efficient communication among relevant DoD staff; and,

(B₂) consultation with Stakeholders and the general Public to achieve levels of mutual understanding while providing the Public (including soldiers, sailors, airmen, marines, and their families) with a connection to the past, an understanding of society and an appreciation of military tradition.

A. Necessary and Sufficient Information

The installation bears the responsibility for gathering all necessary data on its cultural resources for proper management, but a CRM program must go beyond simple data collection to be successful. For instance, identification of cultural resources that may be subjected to mission effects is a necessary condition, but identification is not sufficient to complete evaluations for the Register. Similarly, the installation bears responsibility for consultation and must communicate not only the necessary quantitative data, but also sufficient information for the Stakeholders to understand the reasons for and the meaning behind decisions to maintain or not, specific cultural resources on the installation. Identification of a building as over 50 years of age is not sufficient for making determinations of eligibility for the Register. It is eligibility for the Register that underlies decisions for any CRM program and eligibility rests on significance as measured in meeting Register criteria. Deciding upon significance and eligibility are the first steps in the preservation of a historic property. An installation must make objective decisions about preservation and transparency in its decision making process which reduces later disagreements among its Stakeholders and promotes the preservation of the resource.

Along with the identification of decision making processes the installation historic preservation plan, the Integrated Cultural Resource Management Plan (ICRMP) and/or other historic preservation documents, contain the historic context and locations for cultural resources and other pertinent information. A caveat accompanying the information is that locations of archaeological properties, grave sites, and some properties of traditional religious or cultural significance are available “For Official Use Only” (FOUO) and are not for public release.

A dynamic ICRMP or similar digital document (e.g., files linked to databases or other files, graphs, pictures) capable of being changed with new or updated information rather than a static paper document is one suggested advancement for CRM. As with any ICRMP, it should provide sufficient background information to support installation determinations of eligibility against which determinations of project effects and alternatives. Integration of determinations of eligibility, project effects and alternatives into installation decision making processes as a part of a similarly conceived Integrated Master Plan (IMP) is the most difficult part of the plan to achieve. Success or failure of a CRM program may depend on whether an ICRMP is effectively integrated into the IMP. Success may be measured by the ability of the Master Planner and others to access required cultural resource information held in the ICRMP through an IMP and that the information meets planning needs.

To the degree a cultural resources program exists without an ICRMP or Master Planning exists without an IMP then the functioning of the cultural resources program (or Master Planning) must rely solely on the experience and institutional knowledge of one or two key individuals working together harmoniously for proper decision making on a project by project basis.

B₁. Efficient Communication

World wide, efficient communications have increased dramatically over a number of years with the use of digital technology, including the advent of email and web-based technologies that supplement and

supplant telephone and hard copy mail services. Various computer programs are in routine use throughout DoD including text editors, spread sheets, relational data bases, drawing or photo editors, computer aided design and drafting (CADD), geographic information systems (GIS), and specialized programs only found within DoD and accessible by a limited number of DoD personnel with appropriate clearance and need. The functionality and interoperability of most software, even commercial-off-the-shelf, is never fully utilized by the vast majority of users. Specific programs aside, what is communicated and the format of communication are generally not well defined. Storage of information for CRM purposes is often idiosyncratic due to systems having been established by individual CR Managers rather than being identified and defined by overarching guidelines or regulations. Therefore, efficiencies that could be derived through clearer data requirements, shared formats, and compatible programs and systems are not fully realized.

In part, the above circumstances are the reason why personnel at higher headquarters cannot simply and routinely query data bases from their desks to rapidly obtain answers to questions on most installation level CRM issues. The other part of why this may not be possible is that the CRM program at the installation is not well developed, perhaps for lack of appropriate personnel with necessary skills, lack of sufficient resources, poor local support for the program, etc. Any or all of these factors may play a role in frustrating efficient communication.

B2. Consultation

Much of the effort of the cultural resources manager (who is often responsible for coordination with Federally recognized Tribes (Tribes) and/or other Native Americans) is devoted to consultation and who may be required to “multi-task” beyond CRM to uphold and maintain consultation, requests for comment, coordination, or whatever else extra-DoD communication is called. Consultation is fundamentally the process of providing sufficient information in a timely fashion, listening with respect without pre-decision and keeping decision making as transparent as possible throughout the process. While the mission of the installation and the best interest of the government remain as priorities, it does not mean that an adversarial relationship with Stakeholders must exist in the consultation process. Indeed, the opposite is true.

The significance of cultural resources is such that DoD installations, and the relevant Stakeholders, are much more likely to arrive at mutually acceptable solutions to potential impacts to cultural resources. DoD normally does not expend funds on change, development, expansion, reduction in force, Base Realignment and Closure without good reason (see 1 above). Stakeholders understand this, and typically wish to assist DoD in meeting mission requirements while preserving as much as possible the cultural resources that help provide meaning to the living for the sacrifices and contributions of past generations (see 2 above).

The cultural resources manager who acts as a Representative is a messenger and may not speak for the Federal Government. With regard to the Tribes, government-to-government consultation is the direct responsibility of the installation Commander and only when the installation Commander becomes directly involved and supportive of consultation efforts will they succeed, thereby contributing another necessary element for a successful CRM program. The treatment of cultural resources of at an installation is directly related to the trust engendered through open and honest discussion of issues and willingness of the installation to act proactively and supportively of Stakeholder interests whenever possible.

Modes of consultation are set through regulation, but success is only achieved when the installation communicates with Stakeholders demonstrates that it can be trusted to provide serious consideration to preservation alternatives as required by NEPA, NHPA and other legal mandates. When trust is earned,

then time consuming bureaucratic processes may be shortened by simplifying consultation procedures. Similarly, more efficient information transfer can be utilized in improving trust relationships.

As with DoD staff at higher headquarters, there is no reason why Stakeholders at appropriate levels might not view installation CRM information and review installation actions by simply querying the data from the computer on their desk. The “instant review” of installation actions and potential effects to cultural resources would continue to inspire trust and lend greater substance to consultation efforts, which ultimately would provide a better, more effective installation CRM program.

III. Future Research Issues:

Unquestionably, a successful CRM program relies on having professional “boots on the ground” to make reliable recommendations for CRM. But efficient communications that meet both DoD and Stakeholder requirements in today’s “Lean Sigma Six,” “Total Quality Management,” environment (i.e., “doing more with less”) demands improvements in the “who, what, when, and how” of information flow and its applications. In particular, the disparate requirements for information as expressed in scores of regulations as handled by the multitude of computer program types from installations to various services with differing missions and circumstances, managed by individuals with wildly varying levels of professional expertise and computer knowledge remains a key challenge for DoD. DoD and other Stakeholders would benefit from a consistent set of information in a web based system that can be used to answer questions posed by regulation as well as for research. Though web based programs are vulnerable to the dangers and reliability of the internet, pure desktop programs typically do not provide the continuity and consistency of communication web based programs can provide when run in a secure environment.

Bringing together the requirements expressed in the various legal mandates to meet mission requirements and promote efficiency and transparency within a web based enterprise system is not a new concept. In part, the development of dynamic, interactive and integrated management plans is an important step. An example of one such dynamic and interactive plan was provided by Johnston, *et al* (2001) with the prototype Dynamic Integrated Natural Resource Management Plan (DINRMP). The DINRMP was to have the following principle requirements:

- 1) Function requirements included support for multiple users with multiple levels of access.
- 2) Provide standard structure and document content sections common to all INRMPs.
- 3) Provide installation specific sections.
- 4) Provide multiple views of the INRMP (summary, management plans, background information, workflow organization, checklists, etc.).
- 5) Provide ability to cross-reference information to reduce duplication of content including information within the document and referencing to relevant information outside of the document (such as pertinent NEPA and other regulations).
- 6) Support updating of INRMP contents as per requirements.
- 7) Provide search capabilities through multiple indices including subject, location, or other filtering criteria.
- 8) Provide tools for fulfilling procedural requirements of INRMP development (checklists of required content, etc).
- 9) Provide graphic user interface via hyperlinks in text, tables, and maps.
- 10) Provide access to supporting data (LTER, geospatial, etc).
- 11) Support editing/updating and tracking/archiving of changes.
- 12) Provide for secure access and system of security notation within application.

The prototype DINRMP, while never implemented, does provide initial direction for future research. Emphasis should shift from desktop to web based service programs and it should be applied not only to natural resources and cultural resources, but should be part of an IMP.

As noted, the DINRMP was a concept that has not been brought into reality, at least not at the level that improves real functionality to the larger decision making system as conceived in installation master planning. There are probably some good examples of small scale working systems; however, simple piecemeal adoption by individual installations is inefficient and does not meet requirements for real integration in decision making. It is time for DoD to examine working systems and establish an overall system with flexible but uniform standards providing direction for information and organization within the Military Services CRM activities, and probably other programs as well.

In taking the suggested steps, recognition of the purpose of end products of the various DoD CRM programs should not be lost. Responding to legal mandates like NHPA provides the springboard for true public awareness and education of DoD cultural resources assets. The conservation or preservation of cultural resources assets not only results in better sustainability of a given installation, it also helps installation consultation efforts by communicating concrete examples of installation cultural resources stewardship efforts. Heightened public awareness and education efforts assist people who live in or near such assets, in maintaining continuity with proud military traditions, promoting a greater national awareness of the value of the installation and their central importance in the role of the military in the defense of the country. Given the significance of historic preservation, it is suggested that improving and expanding public awareness and education activities be given greater consideration within DoD, even without a specific legal or regulatory requirement.

IV. Conclusions:

Better communications through the expanded, structured and integrated use of web based computer programs, especially enterprise GIS, will increase efficiency, smooth reporting and analysis efforts as defined within an ICRMP or similar historic preservation document. Consultation based on systems accessible by Tribes and other Stakeholders will make for more transparent decision making and foster trust in installation CRM. Though this concept has been approached before, it should be taken to completion throughout DoD. Root information upon which decision making is based, such as significance derived through objective and quantitative measures as applicable, must be pursued and made available through the system to the Stakeholders.

An attempt to achieve a dynamic and interactive ICRMP should be pursued while care must be taken in developing and implementing such systems to assure critical themes within the historic contexts of installations and their historic properties are not lost or given too little consideration.

With secure, complete, and thorough dynamic ICRMPs, a good installation CRM program can then confidently focus more on supporting public awareness and education efforts. Providing the public with information illustrating the importance of historic properties on an installation yields enhanced meaning to the value of the installation and supports DoD through increased favorable public perception of its mission.

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Integrating GIS and GPS Technologies into Cultural Resource Management Strategies

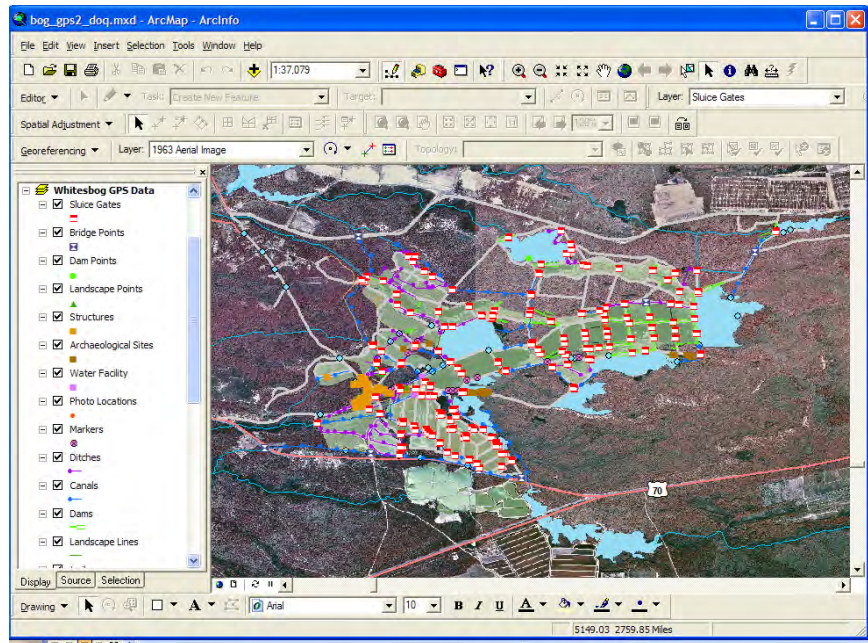
Deidre McCarthy

Heritage Documentation Programs
National Park Service

Knowledge management is a broad concept that touches on all subject matter areas, not simply cultural resources, or cultural resource management. The idea that we collect a variety of data, in a variety of formats, in an effort to help ourselves gain a better understanding of a particular subject is universal. For the cultural resource field, we collect data in the form of observations, surveys and documentation in the hope that we can use this information to better understand the context within which we manage important resources. The management of our cultural resource data helps us as historic preservationists identify patterns, examine landscapes, find connections, and understand different cultures.

As we move into the 21st century however, cultural resource specialists must explore all the tools at their disposal, including technologies such as geographic information systems (GIS) that can enhance traditional methods of gathering and interpreting data. Undeniably, technological tools provide the flexibility and power to integrate all the data, in all the formats that cultural resource managers collect, bringing new perspectives to our scholarship, our understanding, and our physical management of resources.

Throughout the field of historic preservation, accurate locational data remains a critical element in our understanding of cultural landscapes, building traditions, settlement patterns and past life ways. Using geographic clues about environmental and human influences on cultural resources can significantly aide in cultural resource management, conservation, as well as physical preservation of sites. Relying completely on our traditional survey and documentation methods, such as measured drawings, written accounts and photographs may cause us to lose sight of the larger environmental factors, resulting in the potential loss of key historical elements of our cultural landscapes.



The Technology

More than simply computerized cartography, GIS software represents real world features as individual map layers, according to feature type, such as roads, building footprints, county boundaries or archaeological sites. These map layers are stacked on top of each other, allowing users to view all of the data geographically in relationship to each other and in relationship to the earth. Each map feature is also

linked to a database containing attribute information that describes what it is, allowing users to query the data like a traditional database, or ask questions based on the geography itself.

Global positioning systems (GPS), a satellite-based navigational system, provides one way to collect accurate geographic coordinates for the various map layers inside the GIS software. GPS works by triangulating the position of a receiver on the earth using satellite signals, and can range in accuracy from approximately 20 meters to sub-centimeter detail. Together, GIS and GPS greatly improve the accuracy of cultural resource mapping, in addition to enhancing our traditional data sets, by allowing us to attach documentation to geographic locations, providing critical contextual information.

Although these two technologies have existed for many years, their primary uses have been within fields other than cultural resource management. Roger Tomlinson began developing the first GIS in the 1960s to help manage natural resources in Canada. Since this initial effort, GIS has grown exponentially into almost every industry and discipline, becoming more sophisticated with every step. In 1993, GPS reached full operational capability, primarily for use by the military, but open to the public. The use of GPS has also grown exponentially since its first limited utility, becoming a part of today's critical commercial and navigational infrastructure, with many applications.

Cultural resource specialists are now beginning to take advantage of these technologies as tools to help them in their daily work. GPS offers a clear alternative to quickly locate important resources with enhanced levels of accuracy, while GIS provides the tools to analyze data, organize data, help interpret data as well as integrate a variety of data types. GIS/GPS applications ranging from survey to documentation to predictive modeling can now be part of daily cultural resource management procedures.

Current Status of Cultural Resource GIS

Today there are over 5 million cultural resources listed on state inventories of historic structures, archaeological sites, landscapes and objects. Many state historic preservation offices (SHPOs) manage their resources through GIS, and some now require locational information collected via GPS. At the National level, each Federal land holding agency keeps its own inventory of historic resources, similar to the states, and most utilize GPS to help locate those sites. In addition, each Federal agency that undertakes a project that may adversely affect a historic property must track those resources and any mitigation effort performed in the process to comply with Section 106 of the National Historic Preservation Act.

Taken by themselves, each of these efforts to perform cultural resource management through the use of GIS and GPS technologies functions effectively within the separate states and Federal agencies. However, data produced at the state or local level should be shared with Federal agencies and vice versa for truly productive cultural resource management, and knowledge management, to take place. Further, data must be shared within the various disciplines of historic preservation, such as museum management, conservation, archaeology, architecture, etc., particularly at the Federal level where it remains their responsibility to fully manage cultural properties under their control, as mandated by Section 110 of the National Historic Preservation Act.

For instance, within the Cultural Resource Division of the National Park Service, approximately 15 different databases track cultural resources, landscapes, related documentation, gray literature, and museum objects. In order to better understand the context of each of the resources described in these various databases they should share data, and particularly locational information, however many of the databases have no way to relate to other fields or disciplines, and some do not require the collection of spatial data. Unfortunately, this situation is not unique to the National Park Service, to Federal agencies or even state and local entities.

If cultural resource specialists can agree that locational information remains a key factor in understanding our resources, as well as how to manage them, GIS then becomes the ultimate tool to bring all the data from all the various disciplines together, at local, state and National levels. This integration of data allows cultural resource managers to see the full context of the resources they work with, following the knowledge management flow from the data itself, to integrated information, and finally to a better understanding of the resources.

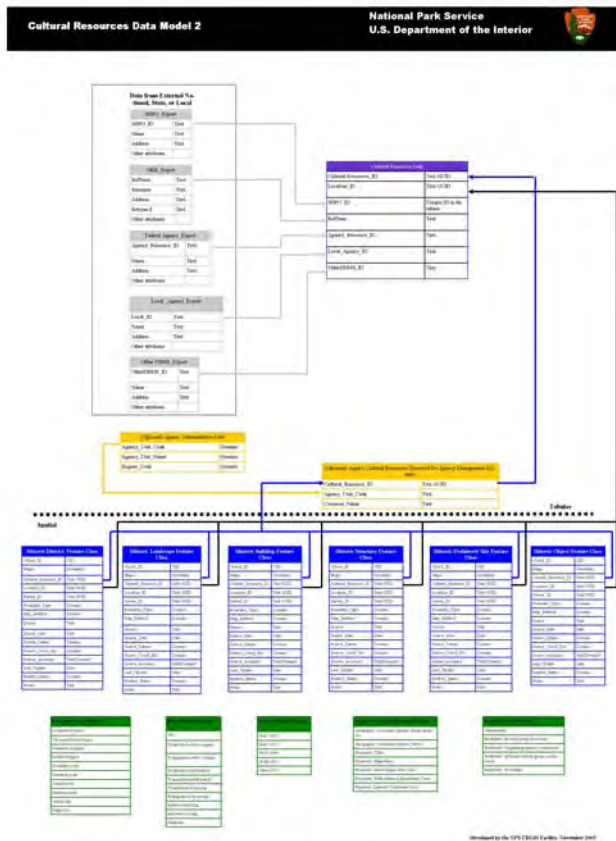
The Role of the National Park Service (NPS)

In order to take full advantage of the powerful tool GIS offers cultural resource managers however, clearly standards must define the spatial data that forms the keystone of the system, allowing data sharing and integration. OMB Circular A-16 defines the set of requirements that Federal agencies must follow when they create, manage or distribute spatial data. In 2002, OMB Circular A-16 identified the National Park Service as the lead agency for developing the cultural resource spatial dataset. Developing this dataset includes a variety of tasks, such as setting data content standards and metadata standards, monitoring progress toward converting paper inventories into digital data, coordinating cultural resource databases with spatial data, eliminating duplication of spatial data, and disseminating best practices information.

As the cultural resource spatial dataset steward under Circular A-16, the NPS must assess the existing standards, identify where there are additional needs, as well as develop and implement standards compliant with the Federal Geographic Data Committee (FGDC). These standards would then guide all Federal agencies in the collection and management of their cultural resource spatial data as they create inventories, perform Section 106/110 activities or nominate resources to the National Register of Historic Places. The standards will open the door to share cultural resource data across Federal agencies, as well as with state and local entities through GIS.

The NPS recognizes the need to establish standards for both legacy data already collected by various agencies, and data to be collected in the future. These standards should describe the collection of cultural resource spatial data, in terms of the geometry itself, the coordinate system to use and entities to create, among many other items. Standards should also describe the relationship of the spatial data to the attribute or descriptive data regarding each resource, as well as the security of any sensitive information that may be contained in either spatial or attribute information. Finally, standards should define what information is contained within the metadata for the spatial dataset as a whole, and for each resource represented within the dataset.

Focusing on the identification of existing standards, the evaluation of gaps in those standards and the development of new standards, the NPS examined the existing cultural resource databases within the Cultural Resource Division of the NPS. Based on the input of subject matter experts from all of the cultural resource disciplines represented, the NPS developed a set of guiding principles that all NPS cultural resource specialists and GIS specialists could agree on to help direct the standard creation process.



From this process, the Cultural Resource GIS Facility (CRGIS) of the NPS developed a draft set of standards describing how to create cultural resource spatial data, how to link spatial data to external databases, how to safeguard sensitive cultural resource information, and what to include in dataset as well as feature level metadata. In 2005, CRGIS began presenting these draft standards to other Federal agencies, and began soliciting existing standards from those agencies to help in the identification of gaps as well as redundancies. At the same time, CRGIS created a draft data model to describe how these draft standards could be implemented within the NPS, and potentially within other Federal agencies.

CRGIS is pursuing a Federal agency-wide workshop to review the draft standards and explore various ways to implement these standards outside the data model prepared for the NPS. This workshop would include State and Tribal Historic Preservation Officers, with the goal to develop consensus and revise the draft standards presented. Following this, CRGIS will field test the standards and begin

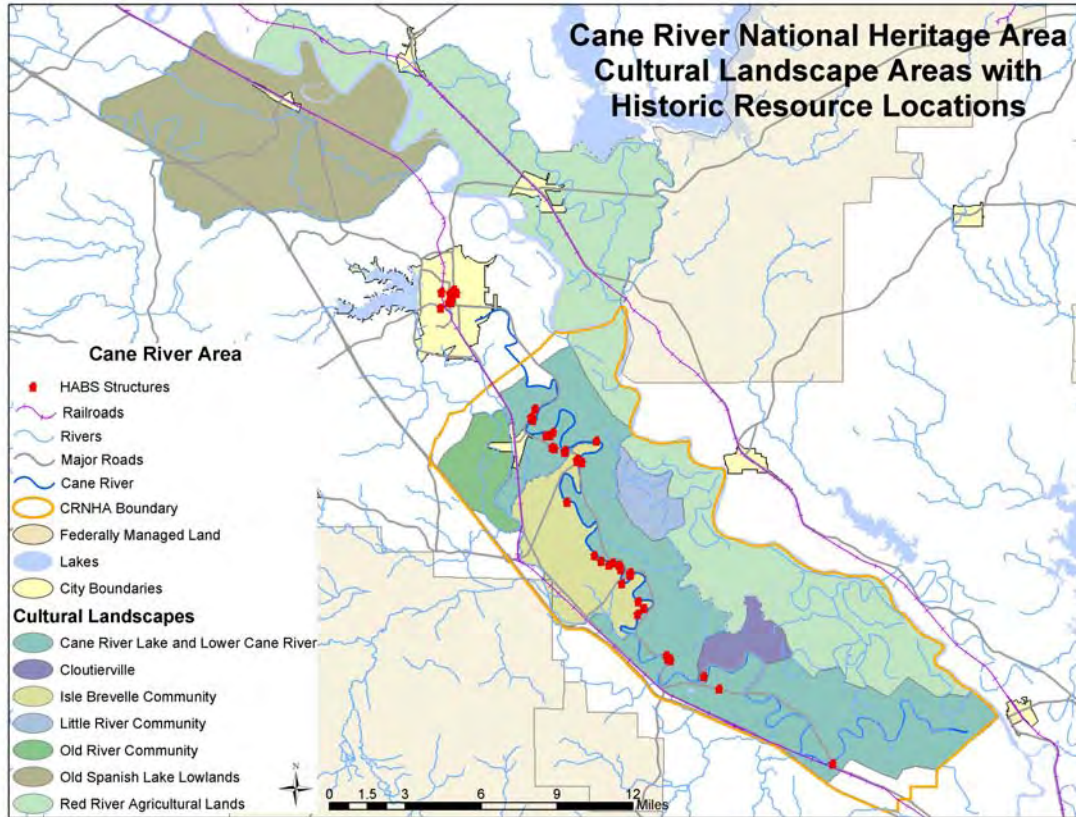
to shepherd the draft standards through the formal FGDC standard creation process.

With consensus among the Federal agencies, state and local entities on the creation, development and management of cultural resource spatial data, the cultural resource management community can begin to take full advantage of the power of GIS to help integrate data sets and data types. Without such standards and consensus, individual agencies will continue to use these technologies to meet their own goals, however the larger goal of sharing data across all boundaries to reach a better understanding of historical context will not be attainable.

Cultural Resource GIS/GPS Examples

Until the cultural resource community reaches the point where firm cultural resource spatial data standards can be established, Federal, state and local agencies will continue to utilize GIS and GPS technologies to better manage their resources within the context of their own individual projects. Many examples of the use of these technologies exist to illustrate their utility in bringing all aspects of cultural resource management together.

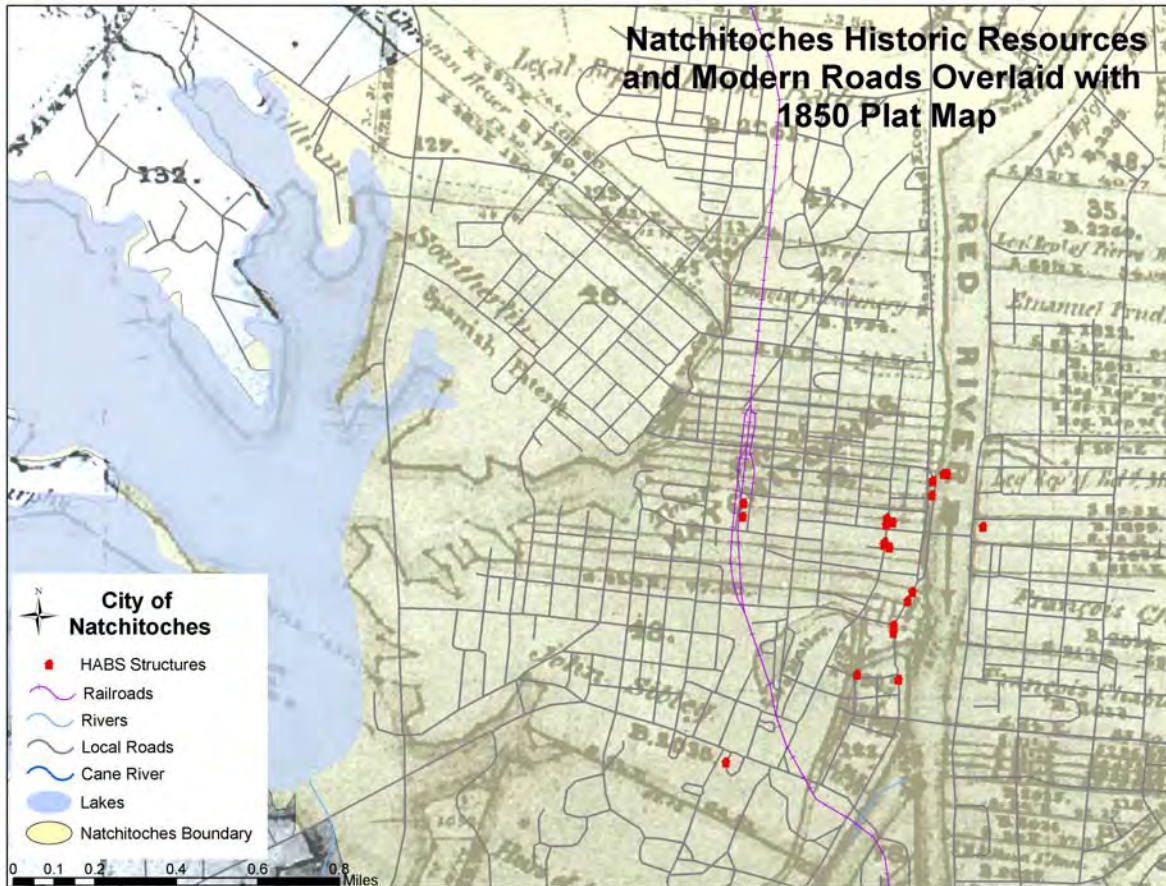
In 2002, CRGIS began working with the Historic American Buildings Survey (HABS) to create a GIS for the Cane River National Heritage Area in Natchitoches Parish, Louisiana. For the Heritage Area Commission, GIS is a powerful tool for preservation planning, resource management and education, linking historical documentation to a complex multicultural landscape visualized through the GIS. Users can watch the landscape change over time and document the history of the heritage area through a variety of data types, such as measured drawings of structures, photographs, historic maps and data collected via GPS.



Helpful for managing such a large and complex landscape, the GIS currently shows the historic resources documented by the NPS through HABS within the context of the modern landscape, such as road networks, as well as within the historic landscape. Drawings and photographs generated by HABS documentation teams' link to each resource location. Additional attribute information allows users to query information such as construction dates, periods of significance, type of construction or cultural affiliation.

Adding other data, such as geo-referenced historic maps allows users to expand their analysis of the landscape. Overlaying current tax parcel maps with 19th century property boundaries for instance, will help the heritage area locate significant historic resources within the modern landscape and target specific areas for protection. As more information is added to the GIS, users will be able to watch the landscape change from the 18th century to the present by overlaying data layers from different time periods, from many different data sources.

At the Cane River National Heritage Area, a diverse collection of paper documentation, in the form of historic documents, photographs, historic maps and drawings powerfully combines with data collected via GPS, as well as other data gathered for use in the GIS. In this example, the true flow of knowledge management is illustrated, moving from data elements, to data analysis, to products based on information derived from those data elements leading to new understandings of the region, cultural influences in the region, and cultural interactions with the landscape. The heritage area is now able to interpret its complex and multi-cultural history, as it relates to the entire region, for its own use and for public interpretation.

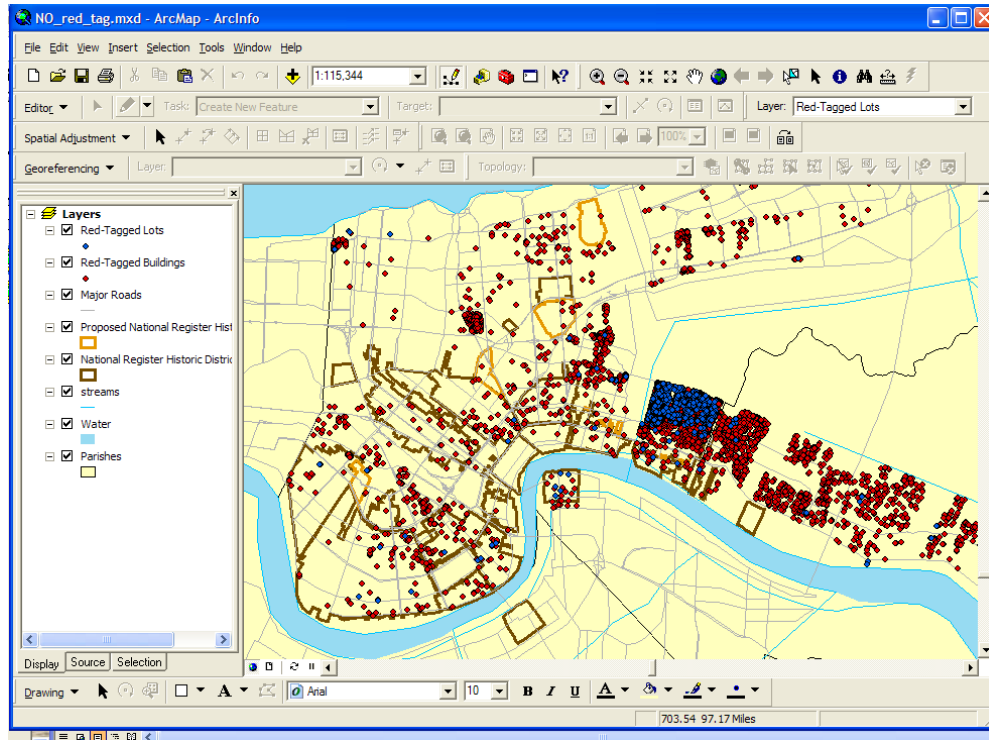


Other examples illustrate how the lack of adequate knowledge management can be mitigated by the introduction of technologies such as GIS and GPS. Hurricanes Katrina and Rita devastated the Gulf Coast region and created the single largest disaster for cultural resources that the United States has witnessed since the inception of the National Historic Preservation Act. Many Federal agencies responded to the disaster, primarily the Federal Emergency Management Agency (FEMA). For FEMA the Katrina/Rita disaster is the largest Section 106 project ever, and managing the information, as well as the logistics associated with the recovery is critical.

FEMA asked CRGIS to create a strategy for documenting all of the cultural resources which may be adversely affected by FEMA activities, for Section 106 compliance. Using a combination of GPS and GIS, CRGIS constructed a methodology to identify and evaluate all of the affected properties in Orleans Parish, and the surrounding Parishes, in addition to providing a means for historic preservation professionals to review and determine the historic integrity or significance of each property through GIS. CRGIS took the opportunity to incorporate the draft cultural resource spatial data standards in this situation, hoping to impose some structure in the flow of data, and to allow the GIS to truly serve as a knowledge management tool, promoting the sharing of data among all the Federal, state and local government entities involved in the recovery efforts.

In order to comply with Section 106, FEMA must survey and evaluate all potential demolitions for their historic significance, consult with the SHPO to develop concurrence on significance and determine what actions to take to mitigate the adverse affects of destroying historic resources. To accomplish this, FEMA needs accurate locational information for any potential undertaking to understand the scope of the

problem. In addition, FEMA needs an accurate evaluation of the historic significance and nature of the resources in question. Finally, to place any potentially historic resource into context, FEMA must have an understanding of the historic nature of the area as a whole and a clear image of the interaction of various resources which might contribute to their significance.



CRGIS developed a GPS survey strategy for the properties slated for demolition using hand-held GPS receivers with a detailed digital survey form attached to each location, recording the historic characteristics, condition, integrity and National Register eligibility of each structure. This highly accurate survey produced a form of documentation, as required by Section 106, leaving FEMA with GPS documentation and a GIS view of the area showing how all of the resources relate.

Part of the CRGIS strategy included creating a GeoDatabase for the resources to incorporate not only potential undertakings, and their status, but structures identified as potentially eligible for the National Register for mitigation purposes. This GeoDatabase becomes part of the FEMA collection of data for the disaster as a whole, in addition to a form of mitigation itself, as it can be shared with the SHPO, other Federal agencies and local partners all working to help in the recovery efforts.

The survey of structures scheduled for demolition in Orleans Parish is now complete, although survey continues in other Parishes. The successful survey strategy and GeoDatabase implementation of the draft standards in Orleans Parish allowed the Federal and state partners to quickly and digitally form concurrence on National Register eligible properties through the GIS. The GPS documentation of cultural resources, the GIS data produced and the method of reviewing each site for Section 106 purposes is digital for the first time, and now serves as a treatment measure for the first time, providing direct links between FEMA, the SHPO and the City of New Orleans, opening communication and enhancing our understanding of the devastating affect of this disaster on cultural resources as a whole.

The Future of GIS with Cultural Resources

As documentation and data gathering tools, GIS and GPS certainly provide additional perspective and context for cultural resource specialists looking at small or large landscapes. As a communication tool however, GIS provides a critical means to make powerful, visual and quantifiable statements to the public and to organizations responsible for protecting cultural resources. It is important to keep in mind however that GIS and GPS are technological tools which cultural resource managers can take advantage of, not technologies which replace already established methods. These tools can be extremely powerful, but must rely on the underlying data, which truly shows the detail, significance and context of the resources themselves.

Like any other technology, barriers exist to hinder full implementation of their capabilities for cultural resources. Software changes will occur, data formats will change, storage media will adapt to new technologies themselves. Few solutions to these problems exist at this time, other than to insure that the cultural resource community is aware of the trends in GIS and GPS technology and that they change with the changing circumstances.

Choosing to establish cultural resource spatial data standards that focus on data creation and the documentation of that data, outside a particular platform or format helps to insure that any data produced today by cultural resource specialists will transfer from one format or media to the next more seamlessly. Establishing these standards to guide the creation of our spatial data remains the critical element for moving forward however. Without standards to define the basic building block of the GIS, no sharing of data can take place. Losing that tool and opportunity eliminates the possibility of creating a knowledge management system that will add to our overall productivity.

Currently, using technologies such as GIS and GPS is optional for cultural resource managers. Today, cultural resource managers can rely on traditional methods to accomplish most of their needs. As the number of resources on state, local and Federal inventories grows however, and the need to understand the larger context of these resources increases, GIS and GPS tools will be a required part of our daily cultural resource management strategy.

Cultural resource specialists have proven many times over that GIS technologies are the best way to integrate the variety of data types and datasets we need to fully understand, evaluate and protect our important heritage. GIS continues to serve as the best way to use our data, perform analysis and generate new perspectives as we assess the significance and integrity of our resources. Without standards to guide how we produce the data that contributes to the GIS however, we can not break down the inevitable barriers which technology brings to the cultural resource management world. Having a strong framework to base conclusions off of allows cultural resource specialists to work toward a truly efficient knowledge management system that will contribute meaningful new insight into our understanding of all our cultural resources.

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GIS Information

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Website for Environmental Systems Research Institute, the company that makes the most popular GIS software products, specifically ArcGIS, used by all Federal agencies, as well as most state and local government agencies.

2. <http://www.geography.wisc.edu/cartography/>

Website for the Wisconsin State Cartographer's Office, which contains a synopsis of the history of GIS and the major milestones reached in the field of GIS. Additionally, the site contains basic definitions of terms related to GIS.

3. www.nps.gov/gis

Website for the National Park Service, National GIS program, containing basic GIS information, as well as data and tools for downloading.

4. <http://www.nps.gov/history/hdp/crgis/>

Website for the Cultural Resource GIS Facility of the National Park Service, containing basic information on GIS and GPS, as well as project information and applications within cultural resource management.

GPS Information

1. www.navcen.uscg.gov

Website for the US Coast Guard Navigation Center, containing basic information on the GPS system, constellation of satellites, as well as links to many other GPS internet resources.

2. www.trimble.com

Website for the Trimble company, a major manufacturer of GPS receivers. This site contains tutorials on how GPS works, and explains what types of GPS products are available to the public.

3. www.nps.gov/gis/gps

Website for the National Park Service, National GIS program, GPS component, containing information regarding the history of GPS, and its applications within the National Park Service.

General Information

1. www.whitehouse.gov/omb/circulars/a016/a016_rev.html

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Cultural Landscapes and the Department of Defense

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Introduction

The Department of Defense manages a variety of National Historic Landmarks and National Register of Historic Places designated and eligible historic buildings, archaeological sites and historic districts that reveal the critical role it has played in United States expansion, settlement, development and continued protection of its soil and people. Yet, even with the cultural resources that it currently protects, only a portion of that story is being revealed; cultural landscapes can assist in telling the rest of the story.

Encompassed within the same legal mechanisms that provide direction for historic buildings and archaeological resource conservation (i.e. 1935 Historic Sites Act, 1964 National Historic Preservation Act, etc.), since the early 1980s there has been a growing recognition of and appreciation for cultural landscapes within the field of historic preservation. As the agency that has expanded the discussion and philosophy of cultural landscapes the furthest, as well as defined their standards and guidelines, the National Park Service (NPS) Cultural Resource Management Guidelines defines cultural landscapes as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values."ⁱⁱ

The NPS recognizes four cultural landscape categories, which are not mutually exclusive: *historic designed landscapes*, *historic vernacular landscapes*, *historic sites*, and *ethnographic landscapes*. These categories are helpful in distinguishing the values that make landscapes cultural resources and in determining how they should be treated, managed, and interpreted.

Historic designed landscapes are landscapes significant as a design or work of art; was consciously designed and laid out either by a master gardener, landscape architect, architect, or horticulturist to a design principle, or by an owner or other amateur according to a recognized style or tradition; has a historical association with a significant person, trend, or movement in landscape gardening or architecture, or a significant relationship to the theory and practice of landscape architecture. Examples include The White House and its grounds, military bases that have officers quarters encircling parade grounds, the many city and county parks attributed to the design of Frederick Law Olmsted or the designed Blue Ridge Parkway.

Historic vernacular landscapes are landscapes whose use, construction, or physical layout reflects endemic traditions, customs, beliefs, or values; in which the expression of cultural values, social behavior, and individual actions over time is manifested in physical features and materials and their interrelationships, including patterns of spatial organization, land use, circulation, vegetation, structures, and objects; in which the physical, biological and cultural features reflect the customs and everyday lives of people. Vernacular landscapes are found in large rural areas and small suburban and urban districts. Agricultural areas, homesteads, fishing villages and mining districts are examples.

Historic sites are significant for their associations with important events, activities, and persons. Battlefields and presidential homes are prominent examples. At these areas, existing features and conditions are defined and interpreted primarily in terms of what happened there at particular times in the past.

Ethnographic landscapes are associated with contemporary groups and typically are used or valued in traditional ways. In the expansive Alaska parks, Native Alaskans hunt, fish, trap, and gather and imbue features with spiritual meanings. Jean Lafitte National Historical Park and Preserve illustrates the strong interrelationship between the dynamic natural system of the Mississippi Delta region and several cultural groups through many generations. Numerous cultural centers maintain ties to distinctive, long-established groups with ethnic identities.

As noted earlier, these types are not exclusive; it is very common for one cultural landscape type to be predominant, and associated with another subordinate cultural landscape type (s). For example, it is possible that within a 300 acre ranch (vernacular landscape), there is a 2 acre formal garden surrounding a residence (designed landscape), and that the entire ranch is located on the original lands of a Native American group (ethnographic landscape).

Essentially, a cultural landscape is a tapestry upon which other cultural resources, such as historic buildings or archaeological sites reside. The tapestry is made of layers of information that all overlap; natural factors such as topography, hydrology, etc. are mixed with human factors such as past land uses and built/removed structures, etc. Each of these layers of information may remain in whole or only in part. The goal in understanding a cultural landscape is to tease out each layer of information and see what it reveals.

Similar to a building which can have pieces added or removed over time and the residual of those changes can be seen and understood, the same is true for a landscape. Cultural landscapes record land use change over time – if a new building is constructed forcing a path to change course, the outline of the former path remains; or if a lake is constructed then the dam removed, the impact of the former shoreline can still be seen. In addition to these static physical remnants that are layered over time, landscapes are composed of dynamic elements - rivers flow creating and cutting off channels over time; trees and shrubs grow and die leaving their mark which can be then be studied and understood.

Why would we want to study, understand and protect cultural landscapes? Because the physical remains of events that occurred in the landscape complete gaps in history that can not be understood solely from individual historic buildings or archaeological sites. In many cases significant historic events happened in the landscape, such as battles, military training on parade grounds, food production on farmsteads within military bases and demonstrations in parks. As such, it is critical to protect these varied cultural landscapes such that the entire context of a historic event is remembered into the future, ultimately tying public history to the Department of Defense.

Evolution of Cultural Landscape Principles and National Register Guidance

Although study of historic landscapes, gardens and landscape archaeology began in the NPS as early as the 1920s, NPS exploration of cultural landscapes intensified with a study of rural historic districts in 1984.ⁱⁱ Since then, several overarching guidance documents have been produced that offer a basic understanding of cultural landscape concepts including Preservation Brief No. 36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes and the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.

Even though several different programs exist in the NPS to address cultural landscapes,ⁱⁱⁱ the National Register of Historic Places program has played a key role by providing specific guidance on how to nominate cultural landscapes to the National Register. National Register Bulletins that can assist cultural landscape research directions and nomination creation include: *How to Evaluate and Nominate Designed Historic Landscapes*; *Guidelines for Evaluating and Documenting Rural Historic Landscapes*;

Guidelines for Identifying, Evaluating, and Registering America's Historic Battlefields; Guidelines for Evaluating and Registering Cemeteries and Burial Places; Guidelines for Identifying, Evaluating, and Registering Historic Mining Properties; Guidelines for Evaluating and Nominating Properties that Have Achieved Significance Within the Past Fifty Years; and Guidelines for Evaluating and Documenting Traditional Cultural Properties.

Over the past 25 years, the National Register has matured in its ability to provide assistance to more comprehensively incorporate cultural landscape information into nominations. When one looks to early National Register nominations there is an emphasis on documentation of the building, but rarely an adequate description of the relationship of that building to its site, its landscape context or any unique details of a designed or vernacular landscape. In most cases, if a landscape is mentioned it refers to a formally designed garden or landscape directly adjacent to the building. This comment is not to fault the nomination preparers of those times, but to reinforce that it is crucial in understanding the “whole story” that nomination preparers incorporate as much information as possible into each nomination form (i.e. archaeological, architectural, landscape information).

Cultural landscapes are typically nominated to the National Register as either sites or in whole or part of a historic district. Additionally, the unique qualities of many vernacular landscapes have been identified via Rural Historic Districts. Examples of rural historic districts that have been successfully nominated to the National Register include tobacco farm settlements in Kentucky and North Carolina, historic farm valleys in western Virginia, and cattle ranches in the West.

National Register guidelines provide the framework and criteria for determining significance, integrity, boundaries, and contributing and non-contributing resources. To be eligible for the National Register a historic landscape must possess the quality of significance in American history, architecture (interpreted in the broadest sense to include landscape architecture and planning), archaeology, engineering, and culture and integrity of location, design, setting, materials, workmanship, feeling, and association and

- A. be associated with events that have made a significant contribution to the broad patterns of our history; or
- B. be associated with the lives of persons significant in our past; or
- C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. have yielded, or may be likely to yield, information important in prehistory or history.

Significance is determined by relating a landscape's history and existing characteristics and features to its historic context. The features, materials, patterns, and relationships that contribute to its historical significance must be present and have integrity. Because of the layers of information that overlap, it is common for cultural landscapes to have multiple periods of significance in whole or for individual parts.

The National Register criteria recognize seven aspects, or qualities, which, in various combinations, define integrity. Historic location, design, setting, materials, workmanship, feeling, and association must be considered in determining whether a landscape retains enough of its important features to convey its historically significant appearance or associations. Landscapes have unique attributes that often complicate the evaluation of integrity, but the degree to which the overall landscape and its significant features are present today must be evaluated. In general, the researcher should ask the following questions when evaluating integrity: 1) To what degree does the landscape convey its historic character? 2) To what degree has the original fabric been retained? 3) Are changes to the landscape irrevocable or can they be corrected so that the property retains integrity?

The integrity of a cultural landscape is judged by the degree to which the characteristics that define its historical significance are present. Because some aspects such as vegetation and land use change over time, integrity also depends on how evident the general character of the historic period is and the degree to which incompatible elements are reversible. With some vernacular and ethnographic landscapes, change itself is a significant factor and must be considered in assessing their integrity. For example, in updating to current agricultural practices, how does that change impact the historic land patterns, hedgerows and boundaries of a vernacular farming landscape? Or how does continued collecting of specimens for a religious ceremony impact an ethnographic landscape?

In a designed landscape, a specific feature or area may survive in better condition than other equally important features or areas. In this case, an assessment of integrity should focus on the role of the individual feature in the overall historic design and the degree to which it contributes to the integrity of the design. In a similar way, as vegetation matures, the change in tree canopy, scale, and massing may affect the overall character of the landscape. It is important to consider how such changes affect the landscape as a whole and the degree to which they impact or obscure it.

Finally, within the existing National Register framework and terminology, it can be difficult to identify all cultural landscape contributing resources. As defined by the National Register, a contributing resource is a building, site, structure, or object that adds to the historic significance of a property. For example, a building or structure can be classified as an independent cultural resource by the National Register and defined as either a “contributing resource” or “non-contributing resource,” depending upon whether or not it adds to the historic significance of the landscape. However, the term “contributing resource” cannot be substituted for other landscape features that are not considered to be independent cultural resources by the National Register (i.e. vegetation and spatial organization). In some cases, those landscape features may be the most critical contributing feature of a cultural landscape, yet it can not be identified as contributing within the current National Register nomination process.

Cultural Landscape Inventory and Evaluation Process

Within the publications noted above, the National Park Service has defined a process to inventory, analyze, and evaluate the significance of cultural landscapes, as well as suggest appropriate methods for their treatment and management.

The first step in the process is to undertake ***historical research***. The intent of the research is to get a broad understanding of the context of the cultural landscape, begin to define the historic significance of the site whether international, national, regional, or local, and identify specific historic landscape features. The research entails studying both natural resources and processes (topography, hydrology, vegetation, etc.), as well as the layers of historic events and land use changes that have occurred on the site over time. Site specific research typically references plat maps, land surveys, illustrated atlases, insurance maps, postcards, pictures, paintings, engravings, photographs, journals, diaries, newspapers and similar sources.

During the historical research it may be possible to construct historic period maps that reflect major changes in the cultural landscape; these period maps typically correlate to changes in land ownership or major physical changes to the landscape. For each historic period, it is critical to identify specific landscape features that were constructed or removed. Identifying the significant characteristics and features in a landscape and understanding them in relation to each other and to significant historic events, trends, and persons allows us to read the landscape as a cultural resource.

Landscape features are the tangible and intangible aspects of a landscape that have either influenced the development of the landscape or are a product of that development. It is important to identify these features not only to determine when things come and go, but to assist in determining if any particular landscape feature contributes to the historic significance of the site. The historic landscape aspects

typically studied provide insight into spatial organization and land patterns, topography, vegetation, circulation features, water features, structures, site furnishings and small scale features or objects. The historical research documentation may include a written narrative, historic images, as well as graphic maps illustrating the historic periods and associated landscape features.

After the historical research phase, the next step is to ***inventory the existing conditions*** of the cultural landscape. Typically the existing conditions inventory is guided by the historical research findings, especially related to any specific historic landscape patterns or features. The existing conditions survey identifies any and all landscape elements, no matter from which historic period; it is a current snapshot of the site. Documentation typically includes a written narrative and photographic log as well as graphic maps illustrating the location of landscape features. Technologies such as GIS, GPS and CAD are useful in documenting and understanding landscapes. The recently developed Historic American Landscapes Survey (HALS) program may also assist cultural landscape documentation efforts. A condition assessment of the landscape features is also a useful part of the existing conditions survey process.^{iv}

Following the historical research and existing conditions survey, it is then possible to ***analyze and evaluate the overall cultural landscape and its features***. By comparing the historical research findings to the existing conditions survey, it is possible not only to identify which historic landscape elements remain intact, but also craft a significance statement based on the integrity of those landscape elements. As noted earlier, the National Register guidance on determining significance and assessing integrity also apply to cultural landscapes.

Cultural landscapes can be complex cultural resources to work with; as such it demands trained professionals to undertake the work. The NPS has trained Historical Landscape Architects, who in turn have developed a Cultural Landscapes Inventory (CLI) system for evaluating the 390 parks in the National Park System. The CLI provides the NPS with baseline information about cultural landscapes in the national parks. Landscapes addressed in the CLI include those listed in or eligible for the National Register of Historic Places. NPS Regional Historical Landscape Architects work with State Historic Preservation Officers (SHPOs) to confirm the eligibility of park cultural landscapes, as well as which landscape features contribute to the significance of the property. The other NPS programs that work with cultural landscapes use modified versions of the CLI process for their work. Several outside contractors have performed the work successfully, following review of their professional qualifications, and in some cases providing training opportunities.

Cultural Landscape Treatment and Management

Following the evaluation of significance and determination of integrity, it is possible to ***define an appropriate treatment and management strategy for a cultural landscape***. Because treatment of cultural landscapes is a specialized field within landscape architecture, the project team should be led by a landscape architect experienced in working with cultural landscapes. Depending on the unique qualities of the cultural landscape being treated, the team may include historians, horticulturalists, engineers, architects, archaeologists, ecologists, or other specialists. The site curators, managers and maintenance staff are an essential part of the team from the inception of the project, because its long term success depends on their continued investment in preserving the historic fabric of the site.

The focus of the project team is to use the historical research, existing conditions, and analysis and evaluation information to inform the cultural landscape treatment and management decisions. Typically this is done through creation of a Cultural Landscapes Report (CLR). The CLR serves two important functions: it is the principle treatment document for cultural landscapes and the primary tool for long-term management of those landscapes. A CLR guides management and treatment decisions about a landscape's physical attributes, biotic systems, and use when that use contributes to historical significance.

A CLR establishes preservation goals for the cultural landscape; compiles information on the historical development, significance and existing character of the landscape; identifies landscape features and values that make the landscape historically significant according to National Register of Historic Places criteria; analyzes and evaluates historic landscape features as compared to extant features; and proposes treatment consistent with the landscape's significance, condition and planned use.

A treatment is a physical intervention carried out to achieve a historic preservation goal -- it cannot be considered in a vacuum. There are many practical and philosophical variables that influence the selection of a treatment for a landscape. These include, but are not limited to, the extent of historic documentation, existing physical conditions, historic value, proposed use, long and short term objectives, operational and code requirements (e.g. accessibility, fire, security) and anticipated capital improvement, staffing and maintenance costs. The impact of the treatment on any significant archaeological and natural resources should also be considered in this decision making process. Therefore, it is necessary to consider a broad array of dynamic and interrelated variables in selecting a treatment for a cultural landscape preservation project.

Some additional factors that should be considered when selecting an appropriate treatment for a cultural landscape include: change and continuity; relative significance in history; integrity and existing physical condition; geographic context; use; archaeological resources; natural systems; management and maintenance; interpretation; accessibility; health and safety; environmental protection requirements; and energy efficiency.

One of the first things that may be done to a cultural landscape is stabilization. The intent of stabilization is to minimize any further degradation of the site and its landscape features while retaining its historic character. This may be the best interim protection while the historical research, existing conditions, evaluation and development of a CLR is underway, or if legal issues, fundraising or long-term management decisions are in process.

In 1996, the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* was published. The guidelines define the four potential treatment options: Preservation, Rehabilitation, Restoration and Reconstruction, and illustrates how to apply the four treatments to cultural landscapes in a way that meets the *Standards*.

Preservation standards require retention of the greatest amount of historic fabric, including the landscape's historic form, features, and details as they have evolved over time. Rehabilitation standards acknowledge the need to alter or add to a cultural landscape to meet continuing or new uses while retaining the landscape's historic character. Restoration standards allow for the depiction of a landscape at a particular time in US history by preserving materials from the period of significance and removing materials from other periods. Reconstruction standards establish a framework for recreating a vanished or non-surviving landscape with new materials, primarily for interpretive purposes. Reconstruction is undertaken only in extenuating circumstances where extensive historic documentation is available.

Depending on the scale and complexity of the landscape, it is not uncommon to define one overarching treatment for the entire cultural landscape (i.e. rehabilitation) while smaller defined areas might have specific treatments such as preservation or restoration. Once a specific treatment is selected, the *Standards* can provide the necessary philosophical framework for a consistent and holistic approach for a cultural landscape project.

Long-term management plans and maintenance plans should work hand-in-hand with the chosen cultural landscape treatment. Management strategies are typically long-term and comprehensive, while maintenance tasks vary from day-to-day, seasonal, or cyclical, as determined by management strategies.

Maintenance activities are implemented before, during and after a treatment has been chosen, so maintenance must be considered as part of the protection strategy. The intent is to maintain the historic character of the landscape and its features by monitoring change, controlling growth and if need be, replacing with in-kind materials. Although routine horticultural activities, such as mowing and weeding, or general grounds maintenance, such as re-laying pavement or curbs, may appear routine, such activities can cumulatively alter the character of a landscape. In contrast, well-conceived management and maintenance activities can sustain character and integrity over an extended period. Therefore, it is critical that the management and maintenance of cultural landscapes should be considered when selecting a treatment.

One aspect of management that can play a critical role in understanding the cultural landscape is interpretation. In many cases, not all aspects of a cultural landscape will be intact for any former historic period. As such, it will be necessary to “fill in the historical blanks” through interpretation via brochures, maps, illustrations, narrative and photographs.

The Historic American Landscapes Survey (HALS)

One related program that can assist the process of cultural landscape documentation but should *never* be considered a replacement for full inventory and evaluation of a cultural landscape, is the recently established Historic American Landscapes Survey (HALS) program.

Since its establishment in 1934 to comprehensively document historic American architecture, the Historic American Buildings Survey (HABS) has documented over 28,000 structures and made those records publicly available through the Library of Congress. The Historic American Engineering Record (HAER) was established in 1969 as a response to an increased appreciation for significant sites, structures and objects associated with the development of engineering and industry. Since the early 1970s, HAER has recorded over 7,500 engineering and industrial sites that are also publicly available through the Library of Congress.

Although landscape documentation has occurred at local, state and federal levels since the early 1900s, it has never been done systematically. And the past 25 years of growing interest in historic landscape research and good stewardship of cultural resources underscores the value of a similar program devoted to historic landscape documentation. Hence, in October 2000 the National Park Service officially established the Historic American Landscapes Survey (HALS) as a sister program to HABS and HAER.

Historic landscapes are typically “invisible” to both the public and the policy makers. Hence, like many historic properties, America's historic landscapes are subject to loss and change through inappropriate use, development, vandalism, and natural forces such as flooding. When historic landscapes are publicly identified as significant, unique resources they become “visible” and can be incorporated into local, state, and federal planning and documentation processes.

HALS will build on the HABS/HAER documentation tradition, capturing the dynamics of landscapes. Teams of students in landscape architecture, architecture, planning, horticulture, and related disciplines, as well as interested professionals, will record significant historic landscapes nationwide through measured and interpretive drawings, large-format photography, written narrative and other documentation techniques. The HALS project team works closely, learning from each other's disciplines, while creating a comprehensive documentation package of the historic landscape.

The National Park Service oversees the daily operation of HALS and formulates policies, sets standards, and drafts procedural guidelines in consultation with the American Society of Landscape Architects (ASLA). The ASLA provides professional guidance and technical advice through their Historic

Preservation Professional Interest Group subcommittee on HALS. The Prints & Photographs Division of the Library of Congress preserves the documentation for posterity and makes it available to the general public as it currently does for HABS and HAER.

The location, duration, and complexity of HALS projects are determined on the basis of historical significance, landscape type and potential partnership opportunities. HALS will work with the ASLA, state, local and national preservation organizations, academic institutions and other interested parties to develop projects and explore funding possibilities for both short and long-term documentation efforts. HALS encourages partnerships with private, government and educational institutions to develop landscape documentation and encourage landscape preservation.

Working with the National Park Service, the ASLA Historic Preservation HALS Subcommittee oversaw the development of the recently released HALS Measured Drawings Guidelines, Photography Guidelines and Historical Narrative Guidelines. All of the HALS Guidelines have evolved from well-established principles and methodologies set forth previously by HABS and HAER. Although each HALS Guideline relies upon this base methodology, they have each been uniquely adapted to meet the specific practices of landscape documentation.

During the summer of 2001, NPS undertook one of its first formal HALS documentation projects at the Marsh-Billings-Rockefeller National Historical Park in Woodstock, Vermont. A team of five landscape architecture students and young professionals created a series of 20 drawings depicting the formal and informal elements within this 200-acre managed farm and woodlot property. Some of the elements that were captured included the main house and associated formal gardens, the woodland transition gardens, the working forest and associated carriage roads that wind through the site, as well as the evolution of the site over time. Drawing and photographs were produced.

Other recent HABS efforts that are landscape-focused include documenting a natural and managed cranberry bog in New Jersey that played a critical role in the development of that industry in the early 1900s; Woodlands Cemetery, a former estate on the banks of the Schuylkill River south of Philadelphia, and the John Bartam house and gardens also in Philadelphia.

Cultural Landscape Challenges for the Department of Defense

In reviewing the existing National Historic Landmarks and National Register properties already listed under the management of the Army, Navy, Air Force, Marines, Army Corps of Engineers and Department of Defense, it is clear that cultural landscapes are currently identified, whether or not they are thought of as such. For example, the Carlisle Indian School in Pennsylvania wasn't just a building, but had associated grounds when it became a pioneer in Indian education; the numerous forts across this country (i.e. Fort Douglas, Fort Myer, Fort Adams) each acted as revolutionary entrenchments, westward expansion bastions, and Civil War sanctuaries that encompassed land as well as buildings. Finally, historic airfields, canal and lock systems and aqueducts all reside in a landscape that was studied and used to its best advantage while creating these engineering feats.

Although many of the following thoughts are challenges for any agency or individual addressing cultural landscapes, there are several particular challenges for the DOD.

1. Because no program or process currently exists within DOD or any of its military branches to address cultural landscape research, inventory, analysis, evaluation and management, they must be developed. It would be prudent to take advantage of existing philosophies and resources as defined by the NPS, specifically the National Register of Historic Places to guide development of those programs and processes.

2. Critical to development of the program and process is identification of appropriately qualified professionals to oversee the program and process. Minimally, teams evaluating cultural landscapes should include Historical Landscape Architects. Once again professional qualification standards have been defined by NPS and would be worth reviewing.
3. Knowledge Management. Because landscapes are inextricably tied to land, it is feasible to use GIS to assist in managing any acquired cultural landscape data. This could begin with existing geospatial information that is expanded over time to include images, narratives and links between other cultural and natural resource information.
4. Defining cultural landscape boundaries. Defining boundaries can be difficult because it directly relates to available historic documentation, especially land ownership over time. Several National Register bulletins provide an adequate approach to defining cultural landscape boundaries. The definition of boundaries will more than likely impact the discussion of to what extent is cultural landscape conservation compatible with the DOD mission? I believe the answer revolves around how DOD chooses to define the boundaries of the cultural landscape.
5. Defining historic significance. The National Register relies on existing historic contexts to compare historic resources against to assist in determining relative significance. This puts cultural landscapes at a huge disadvantage because few historic contexts have been written specifically for cultural landscapes. As such, typically much more primary research needs to be undertaken to create not only the basic historical research for a site, but the historic context as well. This is especially true for vernacular and ethnographic landscapes. Various regions of the NPS have created cultural landscape contexts on an as needed basis. For example, the Northeast and Southeast regions have created a colonial revival context and have an expertise in military earthworks, while the Midwest region created logging camp contexts for their use. Although it is unknown how many military landscape contexts have been created, because the NPS manages many forts, battlefields, earthworks and other resources similar to DOD resources, it is possible to expand and adapt existing references for DOD needs.
6. Assessing integrity and defining contributing resources. The limitations of the National Register framework and terminology can impact the amount of cultural landscape documentation needed to assess integrity and specifically identify landscape features that contribute to the historic significance of a site, as noted in earlier discussions.
7. Many existing National Register Bulletins address the kinds of existing DOD cultural landscape resources that are managed including battlefields, aviation properties, mining properties, properties achieving significance within the past fifty years, designed landscapes, vernacular landscapes and traditional cultural properties.
8. Need for Historic Contexts. There is a need for military-based historic contexts that encompass cultural landscapes such as study of the spaces that support the DOD mission: airfields, runways, roads, rivers, munitions complexes, as well as support facilities such as housing, the BX/Commissary, gym, warehouses, etc. These should be researched not per individual sites, but systemically. Recent NPS context research which may relate to existing DOD managed resources includes historic roads, historic trails and orchards.

RESOURCES

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National Park Service publications that may assist working with Cultural Landscapes

National Register Bulletins

How to Apply the National Register Criteria for Evaluation

How to Evaluate and Nominate Designed Historic Landscapes

How to Improve the Quality of Photographs for National Register Nominations
Guidelines for Evaluating and Documenting Rural Historic Landscapes
Guidelines for Evaluating and Documenting Traditional Cultural Properties
Researching Historic Properties
Guidelines for Identifying, Evaluating and Registering America's Historic Battlefields
Guidelines for Evaluating, and Registering Cemeteries and Burial Grounds
Guidelines for Evaluating and Registering Historic Mining Properties
Historic Residential Suburbs: Guidelines for Evaluating and Documentation for the National Register of Historic Places
Guidelines for Evaluating and Documenting Historic Aviation Properties

Preservation Briefs

Preservation Brief No. 32: Making Historic Properties Accessible
Preservation Brief No. 36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes

Olmsted Center for Landscape Preservation

A Guide to Preparing a Plant Inventory for a Historic Property
Guide to Developing a Preservation Maintenance Plan for a Historic Landscape

On-line Sources for Cultural Landscapes

Alliance for Historic Landscape Preservation (<http://www.ahlp.org/>)
ASLA Historic Preservation Professional Network (<http://host.asla.org/groups/hppigroup/>)
Association for Preservation Technology (<http://www.apti.org/>)
Institute for Cultural Landscape Studies (<http://www.icls.harvard.edu/>)
National Park Service Historic Landscape Initiative (<http://www2.cr.nps.gov/hli/index.htm>)
National Park Service Park Cultural Landscapes Program (<http://www.cr.nps.gov/phscl/>)
National Park Service Cultural Landscape Currents: (<http://www2.cr.nps.gov/hli/currents/>)
National Trust for Historic Preservation (<http://www.nationaltrust.org/>)
Olmsted Center for Landscape Preservation (<http://www.nps.gov/oclp/>)
The Cultural Landscape Foundation (<http://www.tclf.org/>)

ⁱ *National Park Service, Cultural Resource Management Guideline, Release No. 5, 1997 (NPS-28), p. 179.*

ⁱⁱ Melnick, Robert. *Cultural Landscapes: Rural Historic Districts in the National Park System*. Washington, DC: U.S. Department of the Interior, National Park Service, Park Historic Architecture Division, 1984.

ⁱⁱⁱ Within the Park Historic Structures and Cultural Landscape program, the Park Cultural Landscapes program addresses cultural landscape issues within the nearly 400 units of the national park system. Within the Heritage Preservation Services Division, the Historic Landscape Initiative assists states, counties, municipalities, non-profits and individual property owners, in essence everything outside of the national park system, to address cultural landscape issues. The recently established Historic American Landscapes Survey (HALS), sister program to HABS and HAER, documents identified historic landscapes via written narratives, archival photography and measured drawings. The National Register of Historic Places provides guidance on how to nominate cultural landscapes to the National Register.

^{iv} In assessing cultural landscape condition, the NPS CLI process uses the following definitions: *Good*: The landscape shows no clear evidence of major negative disturbance and deterioration by natural and/or human forces. The landscape's cultural and natural values are as well preserved and no immediate corrective action is required to maintain its current condition. *Fair*: The landscape shows clear evidence of minor disturbances and deterioration by natural and/or human forces, and some degree of corrective action is needed within 3-5 years to prevent further harm to its cultural and/or natural values. If left to continue without the appropriate corrective action, the cumulative effect of the deterioration of many of the landscape characteristics will cause the landscape to degrade to a poor

condition. *Poor*: the landscape shows clear evidence of major disturbance and rapid deterioration by natural and/or human forces. Immediate corrective action is required to protect and preserve the remaining historical and natural values.

Underwater Archaeology in DoD

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Introduction and Background

The wrecks of warships, military aircraft, spacecraft and other government vessels are still U.S. owned. The principal government agency owners are the Military Services-U.S. Navy, U.S. Army and the U.S. Air Force. U.S. Coast Guard, General Services Administration (GSA) and the National Air and Space Administration (NASA) are also agencies with ship and aircraft wrecks. The Underwater Archaeology Branch (UA Branch) of the Naval Historical Center (NHC) manages the Navy's ship and aircraft wrecks. Authorization for this management comes to the NHC under the Secretary of the Navy (SECNAV) and the Office of the Chief of Naval Operations (OPNAV) Instructions and is conducted in accordance with the National Historic Preservation Act (NHPA). The basis for ownership is the Property Clause of the Constitution. A more recent legislative addition is the Sunken Military Craft Act (SMCA) of 2004. This Act codifies precedents in international and admiralty law and U.S. civil court cases. It establishes that U.S. Government-owned ships, aircraft, and spacecraft remain the property of the government even though lost at sea or on land. It also emphasizes that many of these are the burial sites of U.S. military personnel, thus also are war graves, treated according to the Geneva Convention, and are recognized as such in the Law of the Sea Convention. The Defense Prisoner of War (POW)/Missing Personnel (MP) Office (DPMO) and Joint POW/Missing in Action (MIA) Accounting Command (JPAC) are active in recovery of MIAs from the aircraft crash sites and the former is preparing inventories of MIAs from the WWII period as well as later periods of conflict. There are other concerns with the wrecks besides their cultural significance and war grave status. Environmental contaminants such as oil, ordnance, and weapon systems also are issues that come under consideration. U.S. ownership is not impacted by the passage of time or disuse of the property. There is no time line in the SMCA, for it applies equally to ships lost today as it does those lost by the Continental Army and Navy during the American Revolution.

The UA Branch beginnings go back to 1993 and the receipt of Department of Defense (DoD) Legacy Resource Management Program (Legacy) funds to develop a management plan for the Navy's shipwrecks. A major focus at the inception of the underwater archaeology program was to create a wreck database from the archival sources. This inventory now contains some 3,000 ship and 12,000 aircraft wrecks. Besides Navy wrecks, the numbers include U.S. Army shipwrecks such as troop transports and Confederate wrecks, which come under GSA, as generic U.S. Government property. The 12,000 aircraft wrecks in the database are only US Navy planes. We have no tally of Army Air Corps or U.S. Air Force.

Over the last 10 years, Legacy support has helped the underwater archaeology community to document and preserve some of the United States' most significant sunken archaeological treasures: *H.L. Hunley*, *USS Monitor*, *CSS Alabama*, and *USS Arizona* are familiar names that reached national awareness. Perhaps less known, although equally significant, are the Revolutionary War fleet scuttled by Continental Army and Navy forces in the Penobscot River, Maine, and Benedict Arnold's Revolutionary War gunboat sunk in Lake Champlain, VT. The Civil War shipwreck *USS Tulip*, the artifacts of which were recovered from looters and conserved, is the Navy's largest single collection of Civil War artifacts. There are also well over a dozen state-specific management plans and Memorandum of Agreements (MOA) for the cooperative federal/state management of DoD ship and aircraft wrecks. The three most recent inventory projects -- Virginia, South Carolina, and Georgia -- are primarily Geographic Information System (GIS) projects. There are also GIS projects for specific shipwreck survey projects such as D-Day, *USS Alligator*, and John Paul Jones' *Bonhomme Richard*. We have also addressed the question of aircraft as

archaeological sites and historic properties under NHPA. The National Register's Aviation Bulletin was funded through Legacy.

Summary of Findings and Issues

Archival research alone is an inadequate tool to inventory and manage wrecks. Written records never show what still exists. They are at best sketchy, containing inaccuracies, and failing to answer questions of the state of preservation, rate of deterioration, and environmental hazards of wrecks. The Navy's UA Branch locates and assesses shipwrecks through real world survey. An example is the survey of the wrecks lost during WWII D-Day operations during the invasion of Normandy—Omaha and Utah Beaches and Point du Hoc. The UA Branch has an in-house archaeological team and also works with Navy dive teams, as well as National Oceanic and Atmospheric Administration (NOAA) and the National Park Service (NPS) divers. Collaboration with states, universities and not-for-profits are frequent mechanisms to accomplish goals through partnership. Outside groups are interested for manifold reasons, including pure archaeological research, thrill of discovery, locating remains of lost servicemen/women, and other areas of complementary scientific research. Advances in the technologies of remote sensing, global positioning, robotic vehicles, and technical diving make it possible to locate any ship or aircraft that was ever lost. Awareness and discovery coupled with affordable technologies is forcing us within DoD to address the management issues of these wrecks. Laws and ethics do not keep up with advances in technology and their environment alone no longer protects sunken wrecks. There is increased expectation by members of Congress and the public that the government will look after these wrecks, as archaeological sites and as war graves. In many ways these are like undiscovered islands, but which are already titled as U.S. property and are distributed worldwide.

Typical survey work includes remote sensing with side scan sonar, magnetometer, and multi-beam sonar. The raw data is processed with specialized software systems and can be managed in GIS systems. Imagery can mosaic into site maps of the wrecks and with multi-beam sonar can be placed in a 3-dimensional format. Remotely Operated Vehicles (ROV) and Autonomous Underwater Vehicles (AUV) are increasingly used replacing divers for many activities. Diving technology has advanced, however, with technical divers using mixed gas and rebreathers to dive to unheard of depths. New technologies and processes enable us to do increasingly more to interpret shipwrecks. These technologies have their parallel uses in the military, salvage, and engineering disciplines.

Archaeology can use cutting edge technologies and help move the innovation process forward. A recent example is the survey work of the remains of USS *Cumberland*, the wooden-hulled sailing vessel destroyed by CSS *Virginia*. A new sonar camera mounted on an ROV revealed stunningly clear images in zero visibility water. The wreck site was reinterpreted and found to have more archaeological integrity than previously thought. Development of such technology can directly benefit Navy divers allowing them to work in zero visibility.

Future Research Issues

It is possible to combine cultural resources management of shipwrecks with military R&D that will benefit both communities, such as DoD labs, and the federal cultural resource teams. Underwater archaeology is dependent on advances in technology but it also pushes the science and technology forward with the research questions it asks, and the multi-disciplinary solutions can have benefits to the military and private sectors. Underwater archaeology is heavily dependent upon other scientists and engineers with diverse backgrounds. The *Hunley* project is a good example of this for it brought in engineers, material scientists, physical scientists, forensic anthropologists, genetic researchers, geologists and others to work alongside the archaeologists and conservators. The multi-disciplinary nature of the work brings scientists together that might not otherwise meet.

For this workshop I have identified five key research areas for the future that meet the criteria of advancing the management of DoD ship and aircraft wrecks and at the same time accomplishing new cutting edge research and development (R&D) benefiting the DoD mission.

Identification and assessment of US Government-owned wrecks are essential to the management of these resources. You cannot respond to issues or questions concerning the cultural resources aspect, human remains/MIAs, ordnance, and environmental concerns without intelligence locating the wrecks.

- 1) Technologies that enable remotely searching for and identification of wrecks at economical costs such as with AUVs can be one way of accomplishing the mapping process. The Navy and private sector are already involved in AUV research and use.
- 2) Predictive Modeling of where significant wrecks are located in order to be aware of the impact of marine activities such as dredging and pipeline and cable laying, or to define where to search. Examples of such modeling could be creating drift or re-navigation models based on last historic sightings of wrecks and projecting the sinking locations forward using wind, current and tide information. Marrying this information into a GIS system provides a new product that designates areas of interest. It also has benefits to other sciences such as oceanography and furthers the military's identification of non-submarine contacts.
- 3) In order to manage this inventory of wrecks and be able to store and manipulate large electronic files derived from remote sensing data a GIS system is needed. It must allow a world-wide resource management by manipulating large data files easily.

As mentioned above, we manage and preserve wrecks for not only cultural reasons but also because of potential environmental hazards from oil spills, explosive ordnance, weapon systems, and war grave issues. We might look at ways of not removing ordnance or bunkers of oils from wrecks, as the cost of such salvage operations would be very high and the risk of a spill great. Instead we might research technology or identify the processes whereby wrecks survive longer in situ on the sea bottom or even be encapsulated.

- 1) R& D for in situ preservation might take the form of studying the corrosion and deterioration of steel and aluminum hulls of ships and aircraft. The study of iron corrosion is currently being pushed forward by the conservation research of the USS *Monitor* and *H.L. Hunley* projects. In the latter case a new method of removing salts from iron is being investigated. If successful, it could result in not only better preservation of artifacts such as *Hunley* and *Monitor* but have applications for modern materials including those owned by DoD. Aluminum corrosion is one area where even less is understood than with iron. The wrecks of WWII aircraft "warbirds" are under intense pressure by private collectors and museums, as well as the environment. However, when these are recovered from salt water they deteriorate more rapidly on land than in the water. Obviously advances in aluminum conservation and limiting corrosion have other benefits to the built environment including the military.
- 2) Developing ROV and AUV technology, sensor packages, and processes can enable monitoring of wrecks, their rates of deterioration, and the quality of water around them. Likewise, continuing innovations in affordable ROV technology will allow archaeologists to do more remote monitoring of wreck sites particularly those that are deep, have limited visibility, high currents, and other environmental difficulties.

Conclusions

Underwater archaeology can accomplish mutual goals of R&D and cultural resource management (CRM) thus benefiting the Navy and DoD. This partnership between R&D and CRM can be a joint service

approach not only benefiting the Navy but also U.S. Army, U.S. Air Force, and U.S. Marine Corps. As mentioned above, all are stakeholders having lost ships and aircraft, and are still U.S. government managers of these wrecks.

The military wrecks are also a means of interpreting the history of the Military Services. Other benefits to DoD also include public education particularly as awareness pertains to the history and mission of the Military Services and role the military plays in the past, present, and future in protecting the country. Discovery of a military wreck and in the case of the MIAs the resolution for family members captures the public's imagination and raises that awareness. This occurs in the normal process of complying with our management mandate.

Perspectives in the Preservation of Cold War Era Cultural Resources

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During the Cold War, the architecture of California military bases reflected three somewhat contradictory trends. First, for the comfort of its troops, especially the officer corps, the military built administrative and residential buildings that were commodious and fashionably Modern. Second, the military valued nimbleness and flexibility in its training and relied upon essentially temporary buildings for most operational purposes. Third, the military in California was heavily involved in weapons development and testing, giving California bases hundreds of very permanent and very odd looking research and test facilities.

In the first category, the military adopted Modernism because it was the stylish look of the Cold War. Here and there, military designers called upon well-known Modernist architects, as with the Skidmore, Owings, and Merrill buildings at the Naval Postgraduate School in Monterey, or Richard Neutra in his design of what is still called the Neutra School in Lemoore. More often, the Modernist buildings were the work of lesser-known private architects, such as Stanley Gogerty, who laid out the Modern buildings at the weapons station at China Lake, or by unnamed architects at the Bureau of Yards and Docks, who designed the beautiful Building A33 at SPAWAR, San Diego.

The vast majority of Cold War buildings, however, were built to be inexpensive and easily modified or moved. If one searches for the site of some great Cold War advance, the odds are great that it was accomplished in some variation on a Butler Building. This range of Cold War architecture was not built to last and probably will not last.

The third category includes a huge variety of buildings and structures associated with the Cold War weapons development and testing program, which was so vital in California. These were the opposite of the Butler Buildings; they were extraordinarily well-built and were dedicated to very specific purposes and could not easily be adapted. These would include the famous rocket test tracks at Edwards and China Lake; the massive rocket test stands and silos at Vandenberg; the great radar facilities like the PAVE PAWS at Beale; “always-ready” SAC bomber hangars at Travis; and so forth throughout the state. In terms of Cold War design that was historically significant and of intrinsic interest, these development and testing facilities are especially important.

The power point will discuss issues outlined above; update the current concerns with Department of Defense installations within National Historic Landmarks and the challenges with the adaptive reuse of installations closed during Base Realignment and Closure (BRAC) where Cold War Era buildings are extant.

For additional information on historic military buildings and structures of California, please visit:

<https://www.denix.osd.mil/denix/Public/ES-Programs/Conservation/Legacy/Historicbuilding/CA/historicbldg.html>